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THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY

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Vol. LXXIV. No. 23

NEW YORK AND CHICAGO, JUNE 8, 1922

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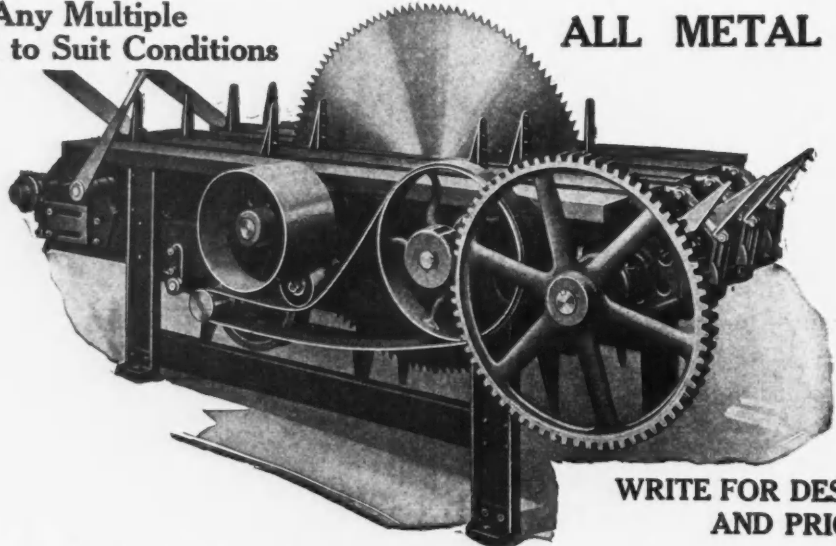
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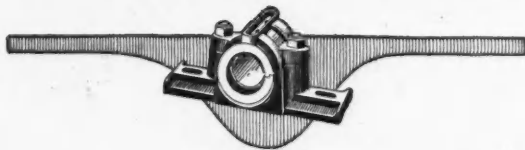
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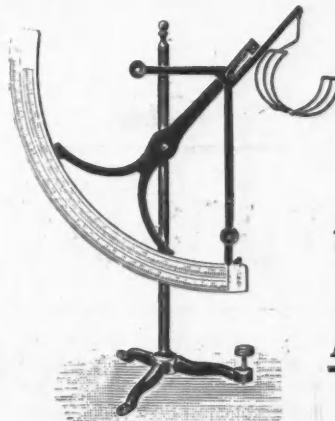
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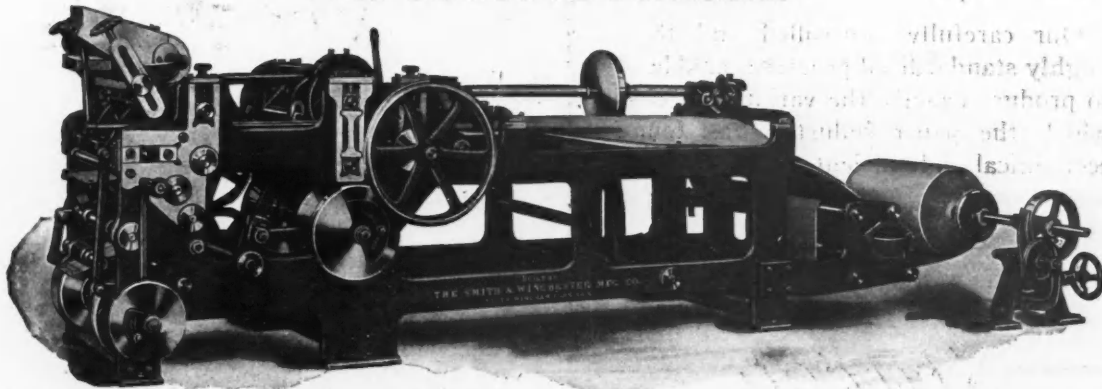
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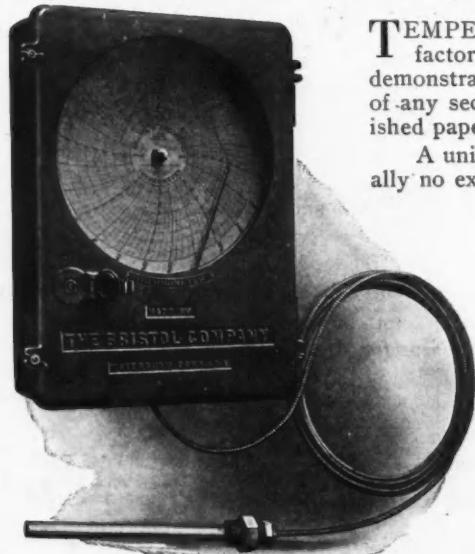
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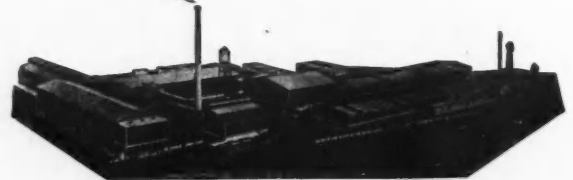
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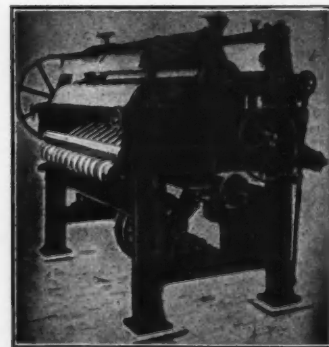


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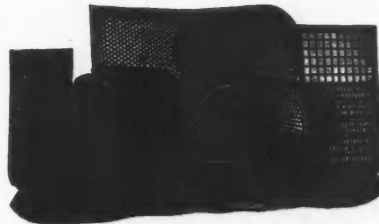
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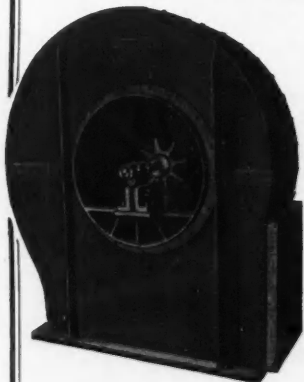
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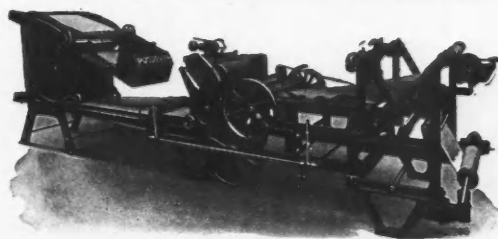
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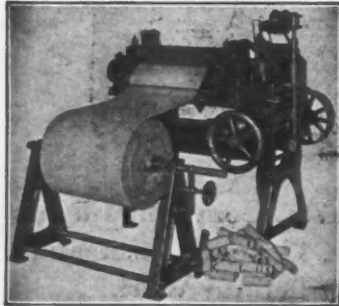
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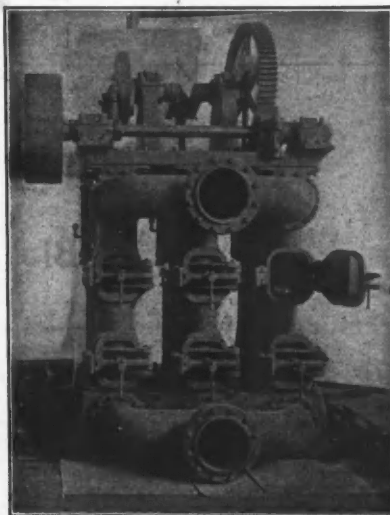
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Thursday, June 8, 1922

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SUPERINTENDENTS AND COST MEN AT KALAMAZOO

Joint Convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry Is a Big Success in Every Respect—President John H. O'Connell Is Unanimously Re-elected to Head the Association for Another Year—Many Papers of More than Usual Interest to Both Superintendents and Cost Men Are Read

[FROM OUR REGULAR CORRESPONDENT.]

KALAMAZOO, Mich., June 3, 1922.—In recognition of valuable services rendered during the administration, the American Pulp and Paper Mill Superintendents' Association today re-elected John H. O'Connell national president of the organization and to serve during 1922-23. The action was unanimous, being so carried out on the recommendation of the nominating committee, N. M. Brisbois, chairman.

Other Officers Elected

The other officers elected, all without contest, were: First vice-president, Nelson R. Davis, S. D. Warren Company, Cumberland, Me.; second vice-president, Al. O. Rolfe, Champion Coated Paper Company, Hamilton, Ohio; third vice-president, William A. Anderson, Kinlieth Paper Company, Ltd., St. Catherines, Ontario; treasurer, Peter J. Massey, Chicago; secretary, to be named by the president.

The executives, named by President O'Connell, consists of the national officials, also the chairmen of the six divisions of the association, as follows: Michigan, N. M. Brisbois, Sutherland Paper Company, Kalamazoo, Mich.; Northwestern, John Hercher, John Strange Paper Company, Menasha, Wis.; Miami Valley, Al. O. Rolfe, Champion Coated Paper Company, Hamilton, Ohio; Northeastern, Nelson R. Davis, S. D. Warren Company, Cumberland, Me.; Northern New York, Homer Stafford, Knowlton Brothers Company, Watertown, N. Y.; Canadian, W. A. Anderson, Kinlieth Paper Company, St. Catherines, Ontario; also three members at large, John A. Bowers, Hammermill Paper Company, Erie, Pa.; Frank Barstow, Falula Paper Company, Fitchburg, Mass.; Daniel Davern, Provenial Paper Company, St. Catherines, Ontario.

Provisions of Resolutions Adopted

Election of officers came Saturday morning, the afternoon and final business session being devoted to consideration of resolutions, which had previously passed the approval of the executive committee. The resolutions adopted carried the following provisions:

Accept the invitation of the Technical men to meet with them in Detroit in October, but only as guests, the superintendents not taking any active part in business deliberations.

The Miami, Northeastern and Canadian divisions to be divided into six divisions, to facilitate organization and expansion.

That in the future the executive committee shall include in its membership a vice-president from each division.

Treasurer Massey will be bonded to the extent of \$5,000.

An important matter tabled by the convention was the offer submitted by Dr. Hugh P. Baker, secretary of the American Pulp & Paper Association, to handle all secretarial matter for the superintendents' organization from the American Pulp and Paper Association offices in New York City.

May Meet Next in Holyoke

Selection of the next meeting place was left to the executive committee. There seems to be a general desire on the part of delegates present at Kalamazoo that the next meeting be held at Holyoke, Mass. There is no superintendents' division in the Bay State and a convention held there would certainly stimulate interest in the organization, at the same time be easily accessible to superintendents from all over the East and Canada.

The interesting features of the election were the advancement of Nelson R. Davis to the post of first vice-president and recognition of the Miami Valley's right for one of the national officers.

The joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry opened on time Thursday morning. The superintendents gathered in the Burdick Hotel ballroom, and the cost men being at the community house.

President O'Connell stated the purposes of the superintendents' gathering in his opening address, which follows:

Address of President O'Connell

John H. O'Connell, national president delivered the following address:

"We are again meeting in international convention, and in the wisdom of the executive committee they chose this city of Kalamazoo for our deliberations. That their choice was an excellent one it is the intention of the arrangement committee, and in fact every member of the Michigan division, to prove thoroughly to you. We feel very confident of your approval of the efforts to entertain you while in the city.

"In choosing Kalamazoo, the executive committee was promoted by the fact that we have never held our convention



GROUP PICTURE TAKEN AT THE JOINT CONVENTION OF THE AMERICAN PULP AND PAPER MILL SUPERINTENDENTS

in a paper making town. As Kalamazoo is ideally located and is perhaps the largest paper making center in the world, the committee felt very confident that those that came here could derive more direct benefit by a visit to any or all of the mills in the valley, and thus see in actual practice how the other fellow makes paper.

"Right here let me add that we have the endorsement and hearty co-operation of every mill manager and executive in this community. They have indorsed our convention and assured us that we are at liberty to visit their mills as often as we choose during the stay here.

"We are also honored this year by having with us the cost accountants of our great industry, and at our joint meetings each afternoon, subjects of great interest to each superintendent and cost accountant are to be discussed. And from these meetings we all should get information that will be of great assistance in the future.

"The program prepared for you is a lengthy one and it is only by your prompt attendance at the meetings scheduled, opening on time, that we can expect to carry it out to completion. I must ask those who are to read a paper to be here at the time assigned you as we cannot wait if we are to get through our program in the time allotted us.

"I will not burden you by going into detail on the merits of each paper to be presented, but wish to say that the men that are here for that purpose are experts in their line. They have given their subjects much thought and study, and are prepared to answer any and all questions you may choose to ask them.

"At our afternoon meetings we are to be addressed by some of the ablest men in our industry as well as expert accountants who have traveled a great many miles to give us the benefit of their time and study on paper mill costs.

"Nor has the committee neglected to arrange for your recreation after your day's work is done. They have prepared for you a very elaborate program of entertainments and banquets so as to enable you to combine pleasure with your labors and enjoy an evening of fun and merriment.

"I have no fear of contradiction in saying that this is to be the most successful gathering of presidents, mill managers, cost accountants, superintendents and in fact representatives from every branch of our great industry from all parts of the United States and Canada ever held.

Important Matters to Be Considered

"You are to be asked to pass upon several recommendations to our constitution and many things of great importance are to come up at our meetings here. It is hoped that you will attend as many of these sessions as possible so as to

give us the benefit of your council and advice on any and all subjects that are to be discussed here for the success of our organization in the future.

"At this time you are to elect your officers and each and every one of you should express your choice in selecting the ones who are to lead you during the coming year.

"You are to pass upon an invitation extended by the Technical Association to hold a joint meeting with them in the city of Detroit, the first week in October.

"You are to have placed before you for your consideration a recommendation from the Technical Association for the Standardization of Paper Mill Felts. As there are men here from the great woolen mills that supply most of our needs as well as representatives from the Technical Association, this subject should be given the consideration it deserves, for we all know that felts are a large item of expense in most every mill.

"You are to consider the advisability of closer relationship with the American Pulp and Paper Association in regard to secretaryship and finances.

"All these subjects are of great moment and I ask you one and all, who have the future of our great organization at heart, to attend as many of these meetings as possible and help solve the problems presented. By so doing you will aid us greatly in making this our fourth annual convention the best ever.

Trying Period of Business Depression

"It is perhaps needless for me to remind you that we have gone through a very trying period of business depression. Your labors have been more exacting than at any other time in the memory of most of us here. You were called upon to work in conjunction with the management and try and cut down expenses where it was at all possible. You perhaps had many unpleasant duties to perform in the interest of economy. Your orders were smaller than usual, necessitating more changing and consequently more personal attention on your part as the trade was more 'finicky' and your customers were more apt to be critical than in normal times. That you were equal to the unusual demands made upon you is clearly demonstrated by the fact that our industry, of which you are a necessary and governing factor suffered, perhaps less than any of the other large industries in our country. True there have been some failures and near failures. That was to be expected in such a large industry as ours.

"The business depression coming upon us without any warning after a period of most unusual activity and prosperity, found most every one heavily stocked with high-priced materials; losses were unusually heavy from depreciation alone. Mills were shut down either wholly or in part by cancellation



ASSOCIATION AND THE COST ASSOCIATION OF THE PAPER INDUSTRY, KALAMAZOO, JUNE 1-3, 1922

of orders, and a period of readjustment had to come as a result of such a condition. Our executives were called upon to exercise their business judgment as in no other time in the history of the industry. That they were equal to the occasion was clearly manifested by the way they buckled on their armor, dug right in and took their losses and worked as never before to put the industry back in its rightful place in the world's market of today. That their untiring labors have borne fruit is clearly manifest on every side today. Business is better and is going to be better, and they are going to see that it stays that way.

"There is not going to be such a wide margin of profits as in the past few years. Competition is going to be much keener and the mills that are going to stay in the running and share in the profits are those that have for executives men that are big enough to realize that the superintendent is going to be largely responsible for their keeping in the running. And where is there a better place for the superintendent to keep abreast of the times than at the divisional meetings of our organization and its annual conventions.

Should Attend Divisional Meetings

"There are none of us too big but what we can learn something from the other fellow and if we are honest with ourselves and the companies we are connected with, we will at all times avail ourselves of the opportunity that our organization places before us for such education. Go to your divisional meetings, listen to what the other fellow has to say, ask him questions, and answer his. You can profit by his experience and he can profit by yours. There is something new coming up every day in every paper mill; today it is your problem to solve, tomorrow it is mine. And so on in our every day experience.

"What is more pleasing than that spirit of comradeship that is so manifest at our annual conventions when we meet our brother paper makers and friends from all over the United



JOHN H. O'CONNELL, President

States and Canada? You grasp his hand in warm friendship, you are glad to see him and he is glad to see you. You are perhaps interested in some new equipment or have had trouble with some new machinery that you have just installed. You have been told that he has had experience with just what is troubling you. You do not hesitate to ask some member for information because you may know in advance that he is going to tell you the facts as he knows them. This exchange

of confidence is a direct product of our organization and as long as we show that spirit just so long will our association be a factor in the paper industry. Take away that exchange of confidence and you remove the very foundation on which we rely for existence and recognition. Be ever zealous there-



PETER J. MASSEY, Treasurer

fore of that which is our strength, then we will need have no fear for the future.

"At our last international convention held in the city of New York, you honored me by choosing me to lead you for a year. At the time I told you that I would do all within my power to maintain the high standard set by my worthy predecessor and his able assistants. I have tried to fulfill that promise. If I have failed it is not because I have not tried. You must admit that the same illness from which business was suffering would surely be felt by allied institutions.

Need for More Missionary Work

"Our organization has not grown as I would have liked to have had it. True we have gained in membership, but there are still a great many who are not counted among us. There must be a great deal more missionary work before we can say that we are 100 per cent organized.

"I would recommend an active campaign for membership and organizing of new divisions for the coming year. There is still plenty of room for new divisions. Massachusetts should have one. Pennsylvania should have one. Eastern Canada is also a good field. And perhaps one could be started on the Pacific Coast, and with the assurance of continuation of good business the outcome for the coming year is more hopeful than the one just ending.

"Realizing the necessity of getting the news and activities of the various divisions to the membership as a whole, your executive committee designated and appointed the *Paper Mill and Wood Pulp News* to be the official organ of our association. The appointment was not made with the intention of depriving any of the other trade papers of the association news and at no time will they be denied that privilege but we feel that we must be assured of at least one full page each week so that our whole membership could know just what each division was doing at all times. I feel confident that you will agree that the *Paper Mill* has faithfully performed its part of the agreement as surely you will admit that the superintendents' page is neatly gotten up and it is up to us to see that they get

our news to print. As a further proof of their sincerity in acting as our official organ, you have only to refer to the recent issues of the *Paper Mill* and read what they have had to say about our convention. At no other time and by no other publication have we been given such publicity. A front page story about our convention arrangements written by the only 'Derb' himself is proof enough for me that the choice was a wise one. I recommend that the present arrangements continue in force as long as both parties live up to their part of the agreement.

Necessity for Closer Co-operation

"Realizing the necessity of closer co-operation between service branches of our industry, I wish to make the following recommendation: That we accept the invitation of the Technical Association to meet with them in the city of Detroit the first week in October. And that a committee of three be appointed from this convention to work with a committee from their association. Said committee to be given full power to represent us, in assisting in making the necessary arrangements for holding the meeting.

"In making the above recommendation I have in mind the future welfare of the organization. I personally feel that a joint meeting with all four branches, namely: Cost, technical, salesman and ourselves, would be of great benefit to all. However I am willing to leave it to you gentlemen to decide as to how far we want to go along those lines."

C. S. Campbell Makes Address of Welcome

Charles S. Campbell, president of the Chamber of Commerce, welcomed the visitors to Kalamazoo, pointing to this city as an ideal place for such a gathering, a town quite in sympathy with their aims and aspirations.

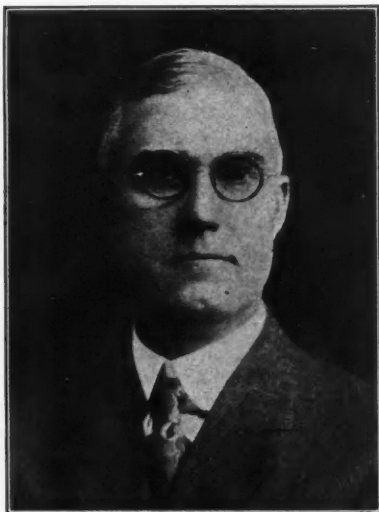
Then the superintendents got right down to brass tacks and were regaled with a series of splendid papers touching various technical

Lining of Sulphate Digesters with Brick.....P. C. Austin
 Handling of Wood Room Equipment.....F. J. Carroll
 Freeness Control in the Ground Wood Mill.....F. M. Williams
 Some Aspects of Engine Sizing.....E. J. Turner
 Handling of Old Paper Stock.....E. G. Milham



E. T. A. COUGHLIN,
 Chairman, Committee of Arrangements

Latest Development of Coating Mill Machinery...W. H. Waldron
 Power Transmissions in the Paper Mill.....G. T. Vanderhoef
 Handling Raw Materials in Paper Mills.....K. M. Herman



NELSON R. DAVIS, Second Vice-President

phases of the industry. Several of the papers were illustrated with lantern slides, or illumined by the use of diagrams, or models of the appliances talked about. The exclusive superintendents' sessions occupied Thursday, Friday and Saturday mornings.

Among the Subjects Handled

Among the subjects handled by this division during its three sessions, together with the speakers, were:



AL O. ROLFE, THIRD VICE-PRESIDENT

Underfeed Stoker in Paper Mill Work.....F. A. De Boos
 The Modern Steam Boiler.....H. E. Willis
 Section Drive in Paper Mills.....S. A. Staeger
 Reclaiming Water from Condensate in Machine Room..J. O. Ross
 Some Observations on the De-Inking of Old News Papers.
 Prof. Sidney D. Wells
 Vocational EducationA. D. Woods
 Use of Starch in Paper Manufacturing.....W. A. Nivling

Use and Abuse of Paper Mill Felts.....G. H. Harvey
As the Printer Sees Us.....P. J. Massey, H. D. De Forest
Advantages of Using Metallic Packing in the Paper Mill,
Charles C. Hall

Cost Men Meet at Community House

The Cost Association meetings were held at the community house, Thursday morning. Secretary Thomas J. Burke, of New York City, read reports on "Beater Furnish" and "Depreciation," prepared by H. F. Miller, of the American Writing Paper Company, and Edgar S. Catlin, respectively. Friday morning there was a very fine paper by Paul Koenig, of the Continental Paper & Bag Mills, his subject being "A Simple Cost System for One or Two Machine Mill." R. P. Hill, of the Hammersly Manufacturing Company, spoke on "Power Costs."

The Cost Association went on record as favoring closer co-operation, an extension of activities and membership, a uniform plan of programs that will appeal to all divisions of the paper industry and monthly meetings by all divisions. These suggestions were offered when Secretary Burke threw the subject open for discussion.

The joint meetings occupied both Thursday and Friday afternoons, being held in the community house auditorium. Topics of vital interest to both associations were considered.

Welcomed by President Kindleberger

The visitors were welcomed to the community house by President Kindleberger, of the Kalamazoo Vegetable Parchment Company.

"We may not have all the advantages of New York City, Chicago or Buffalo here in Kalamazoo," he remarked, "but when it comes to extending the glad hand and making you welcome, we have got those towns beaten a thousand miles," and the visitors cheered his statement.

"This marks the dawning of a new era. The light in the east tells us that men are to forget their differences and sit down together in council. There has been a tremendous advance in the paper industry in the past twenty-five years. When I started as a boy of ten, the superintendent was a man who could take five cents' worth of tobacco at a chew, swear at his men and blow about the wonderful things he had done with a machine some other chap couldn't run. They are not like that today.

"The cost man isn't worth a nickel to his employer unless he is willing to co-operate with superintendents and foremen. A cost system is worth nothing unless it is based on sound, accurate information.

"We talk about our machines that turn out a thousand feet of paper a minute, but those machines are no good without men to run them. So I say to you superintendents, go home and learn how to handle men.

"This community house functions spiritually, mentally and physically. When you go back home spread the gospel of the community house at your mills. If you try to make men, you will not be forgotten when you pass on."

On a motion of J. A. Reilly, manager of the cost and inventory department of the American Writing Paper Company, a vote of thanks was extended Mr. Kindleberger by the convention.

Speakers of the Convention

Dr. Hugh P. Baker, secretary of the American Pulp and Paper Association, spoke on "Association Activities in the Paper Industry." Dr. Reinfuss read an ably prepared paper by G. A. Galliver, president of the American Writing Paper Company. The subject was "An Executive's Viewpoint on the Subject of Co-operation Between Superintendents and Cost Departments." C. Oliver Wellington, of Boston, spoke on "How Cost Systems Help Superintendents." F. M. Hodge, president of the Kalamazoo Paper Company, treated in lighter vein the topic "Cost Accounting as Relating to Superintendents."

Friday afternoon, A. B. Thomas, manager of the Eddy Paper Company, gave an address on "relation of Employer to Employee." J. A. Reilly, manager of the cost and inventory department of the American Writing Paper Company, spoke on "How Superintendents Are Benefited by Cost Reports Based on Accurate Manufacturing Data." "Mill Costs from a Technical Man's Standpoint" was handled by W. G. McNaughton, secretary of the Technical Association. There were several interesting short addresses by Fred Sutherland, Joseph Slater, Fred C. Boyce, C. A. Jasperton, C. A. Clarke and Ed. T. A. Coughlin.

Excellent Entertainment

The entertainment features of the convention were elaborate and quite as perfectly carried out as the more serious details.

The complimentary banquet tendered by the Western Paper Makers' Chemical Company was a very enjoyable affair. Four hundred and fifty guests sat down at the tables, which were made still more attractive by a number of very beautiful old-fashioned bouquets. Claude E. Nicely, president of the La Salle Paper Company, was a happy choice for toastmaster. There were addresses by Hon. Charles F. Moore, New York City, and Congressman Patrick H. Kelly, of Michigan. Special musical features were furnished by the Gibson Melody Maids.

Friday evening there was another dinner at the community house, with entertainment by the Benson Sextet, of Chicago, and Fischer's orchestra. It was a night of fun and hilarity. Late Saturday afternoon the remaining delegates journeyed to La Belle resort, Gull Lake, for a dinner, boating, swimming and a good time.

The convention brought out fifty to sixty ladies, and they were not forgotten. Under the guidance of Mrs. Elizabeth W. Stone, welfare worker at the Kalamazoo Paper Company, a delightful number of events were given, making their time pass merrily.

Thursday afternoon they were entertained in the welfare department of the Kalamazoo Paper Company. There was a special vaudeville skit by mill girls and tea was served. Thursday evening the ladies attended the annual banquet.

Friday morning the ladies motored to Turner's resort, Gull Lake, for lunch and trip around the lake. On the return drive to Kalamazoo a stop was made at beautiful Brook Lodge, property of Dr. W. E. Upjohn, and one of the most famous peony farms in the world. Friday evening there was a dinner and entertainment at the Kalamazoo Country Club.

Saturday noon luncheon was served at the Park-American Hotel, followed by a drive about the city and then an automobile trip to Battle Creek, with a visit to the famous sanitarium and dinner at the Post Tavern.

THOSE WHO ATTENDED THE CONVENTION

The list of those who registered at the convention of the American Pulp and Paper Mill Superintendents' Convention was as follows:

C. K. Andrews, Itasca Paper Co., Grand Rapids, Minn.; R. T. Anderson, Paterson Parchment Paper Co., Passaic, N. J.; W. A. Anderson, Kinleith Paper Mills, St. Catharines, Ont.; R. H. Alexander, Nekosoa Edwards, Ft. Edwards, Wis.; H. K. Anderson, Dayton, Ohio; H. A. Allison, Dayton, Ohio; Walter Ahlers, New York, N. Y.; A. G. Adams, Chicago; C. B. Andrews, Taylor-Wharton Iron & Steel Co., Highbridge, N. J.

F. C. Boyce, Jansen Paper Mills, Brokaw, Wis.; O. L. Berger, G. D. Jansen Co., New York, N. Y.; F. K. Becker, So. Walpole, Mass.; Geo. L. Bidwell, Riggleville, Pa.; Charles Beebe, New York, N. Y.; W. E. B. Baker, York Haven Paper Co., York Haven, Pa.; William Brydges, Niagara Falls, N. Y.; F. L. Barstow, Falulah Paper Co., Fitchburg, Mass.; Ray Brundage, Kalamazoo, Mich.; J. A. Bowers, Hammermill Paper Co., Erie, Pa.; M. V. Brooks, Miamisburg Paper, Miamisburg, Ohio; Frank Brewer, Easy Opener Bag Co., Taylorville, Ill.; F. A. Beisel, Menasha Printing & Carton Co.,

Menasha, Wis.; M. M. Beckett, Beckett Paper Co., Hamilton, Ohio; William Battles, Franklin Board & Paper, Franklin, Ohio; R. A. Brenner, Chicago; H. P. Baughman, Chicago; A. Benson, Chicago; N. M. Brisbois, Sutherland Paper Co., Kalamazoo, Mich.; A. M. Benzing, Champion Fibre Co., Canton, N. C.; Barney Benson, Chicago; L. H. Breyfogle, Canton, Mass.; A. E. Bridge, Middletown, Ohio; Bryant, Alfred, Bryant Paper Co., Kalamazoo, Mich.; Balsley, Henry E., Hamilton, Ohio; Boggess, R. C., Buffalo, N. Y.; Brant, E. G., Chicago, Ill.; Bunce, W. T., Providence R. I.; Oscar

Byers, Kal Veg Parchment Co., Glendale Div.; H. Bing, Sandusky Fryer & Machine Co., Sandusky, Ohio; D. D. Bowsher, N. P. Bowsher Co., South Bend, Ind.; Dr. Hugh P. Baker, American Pulp & Paper Association, New York; Fred Booth, J. M. Huber Co., Chicago.

John Cornell, New York; F. J. Carroll, Chicago; Charles R. Chapman, Marion Paper Co., Marion, Ind.; E. T. A. Coughlin, Allied Paper Mills, Kalamazoo, Mich.; Ralph S. Clark, Kalamazoo Vegetable Parchment, Kalamazoo, Mich.; W. M. Carroll, Otsego, Mich.; O. B. Cohoon, Chicago; C. J. Christianson, Chicago; C. A. Croxen, Chicago; A. S. Cosler, Chicago; Fred Cherrie, New York; J. E. Cooney, Peninsular Paper Co., Ypsilanti, Mich.; James Cameron, Brooklyn, N. Y.; C. S. Campbell, Kalamazoo, Mich.; F. B. Caton, Canadian Paper Co., Montreal; J. R. Carter, Tama, Iowa; J. L. Carey, Chicago; John Calder, Wrenn Paper Co., Middletown, Ohio.

Nelson R. Davis, S. D. Warren Co., Cumberland, Me.; Frank J. Dunaway, New York; Peter F. Denner, Kalamazoo Paper Co., Kalamazoo, Mich.; Dan L. Daverin, Therold, Ont.; Harry E. Dennis, Chicago; Peter W. Drysdale, Appleton, Wis.; T. E. Dial, Chicago; T. I. Dunbar, Watertown, N. Y.; A. F. Driscoll, Smith Paper Co., Lee, Mass.; J. E. Dalton, Chicago; Frederick W. Drake, Piqua, Ohio; Jno. E. Daley, Port Huron Sulphite & Paper Co., Port Huron, Mich.; Wm. H. Donaldson, New York; A. C. Duncan, Kalamazoo, Mich.; A. Scott Dowd, Chicago; T. J. Dunn, Sturtevant Co., Boston, Mass.; Theodore Dunn, Detroit, Mich.; W. L. Davis, Dells Paper & Pulp Co., Eau Clair, Wis.; A. F. Duernberger, Westinghouse Electric & Mfg. Co., Detroit, Mich.

Edmonds, Doc, Wausau Paper Co., Brokaw, Wis.; T. L. Edmonds, Wausau Paper Mills, Brokaw, Wis.; H. D. Eliason, Newton Falls, N. Y.; Chas. L. Ellis, Downingtown, Pa.; Harry Eurich, Mac Sim Bar Paper Co., Otsego, Mich.; W. F. Ebbing, Cincinnati, Ohio; Frank B. Eilers, Kalamazoo, Mich.; G. R. Ellis, Electro Bleaching Co., E. B. Fritz, Chicago; L. G. Fell, Michigan Carton Co., Battle Creek, Mich.; W. B. Fulton, Middletown, Ohio; C. A. Fourness, Kimberly Clark Co., Neenah, Wis.; A. C. Ford, Dayton, Ohio; Otto Fisher, Bryant Paper Co., Kalamazoo, Mich.; Caleb B. Forsythe, Kalamazoo, Mich.; Jno. F. Forsyth, Chicago; James Foxgrover, Kalamazoo, Mich.; F. C. Farnsworth, Farnsworth Co., Morristown, Pa.

Frank S. Gardner, Dayton, Ohio; W. V. Grant, Provincial Paper Co., Georgetown, Ont.; W. S. Gregg, Kansas City, Mo.; E. H. Gilman, Bryant Paper Co., Kalamazoo, Mich.; R. M. Gue, Philadelphia, Pa.; Herman Gumbinski, Chicago; W. H. Guidotti, Neenah, Wis.; Geo. W. Gould, Plant, Theis & Gould Paper Co., Chicago; E. H. Groff, Kalamazoo, Mich.

J. R. Hunter, Kalamazoo, Mich.; John Herscher, John Strange Paper Co., Menasha, Wis.; Thomas Harvey, Gardner-Harvey, Middletown, Ohio; Howard P. Hall, PAPER TRADE JOURNAL, Kalamazoo, Mich.; F. E. Hemmings, New York; W. C. Hurley, Oriskany, N. Y.; J. R. Howard, Middletown, Ohio; C. L. Harter, Rex Paper Co., Kalamazoo, Mich.; K. Hugin, Burlington, Ont.; C. H. Helvey, Hamilton, Ohio; C. T. Hamill, Albany, N. Y.; J. H. Hollingsworth, Oswego Falls Paper Co., Fulton, N. Y.; L. E. Houslee, Voorhees Rubber Mfg. Co.; K. I. Herman, K. I. Herman Chem. Corp., Matteson, Ill.; Geo. Hendrick, Bryant Paper Co., Kalamazoo, Mich.; Arthur Holbrook, Eng. Clay Sales Corp., New York, N. Y.

S. W. Jacobs, New York; Frank A. Johnson, King Paper Co., Kalamazoo, Mich.; J. B. Jones, Dyes Distributing Co., Chicago; O. B. Johnson, Hewitt Rubber Co., Buffalo, N. Y.; Nils R. Johanson, Johanson-Wales & Sparre, Inc., New York; E. S. Jenkins, M. W. Jenkins' Sons, Cedar Grove, N. J.

K. T. King, Chicago; C. H. Kephart, York Haven Paper Co., York Haven, Pa.; T. J. Keenan, New York; Fred Kranhold, Kimberly, Clark Co., Kimberly, Wis.; H. F. Kent, Kinleith Paper Mills, St. Katherine's, Ont.; F. A. Karls, Champion Coated Paper Co., Hamilton, Ohio; Robert Krudner, New York; R. H. Kelley, Marathon Paper Mills, Rothschild, Wis.; Jno. Kepke, Jr., New York; C. H. Knight, Easton, Penn.; J. Kuss, Allied Paper Co., Kalamazoo, Mich.; Ernest Keyes, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.

B. T. Larrabee, S. D. Warren Co., Cumberland, Me.; A. G. Lutz, New York; Jno. R. Long, Tarentum Paper Mills, Tarentum, Pa.; Michael Ludwig, Wood Pulp & Paper Co., Chillicothe, Ohio; C. L. LaRoux, Nekoosa-Edwards, Ft. Edwards, Wis.; N. J. Lewis, Pittsburgh, Pa.; P. J. Lamoreaux, Marinette & Menominee Paper Co., Marinette, Wis.; Herbert Lippitt, New York; J. E. Loughhead, Kalamazoo, Mich.; Wm. J. Lawrence, Kalamazoo, Mich.; William Lee, Lockport Felt Co., New Fane, N. Y.; F. H. Luaders, Seybold Mach. Co., Dayton, Ohio; F. H. Lehecka, Taylor-Wharton Iron & Steel Co., Chicago; E. R. MacLaren, Albany Felt Co., Albany.

W. F. McGraw, Chicago; A. M. McLintock, New York; W. G. McNaughton, New York; C. W. McAlpine, La Salle Paper Co., South Bend, Ind.;

D. McDonald, Lawler Paper Co., E. Rochester, N. Y.; James H. McMahon, New York; Edw. McWirter, Provincial Paper Co., Georgetown, Ont.; W. S. McClellan, F. Glafelder & Sons, Spring Grove, Pa.; B. T. McBain, Nekoosa-Edwards Paper Co., Ft. Edwards, Wis.; C. J. McMahon, New York; C. G. McClellan, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.; L. M. Mongreig, Kalamazoo, Mich.; Thos. F. Martin, Hammersley Paper Co., Garfield, N. J.; G. S. Martindale, Champion Coated Paper Co., Hamilton, Ohio; J. S. Matthal, Chicago; Chas. N. Mooney, Smith Paper Co., Lee, Mass.; A. M. Marcel, Portland, Me.; L. H. Miller, La Salle Paper Co., South Bend, Ind.; C. E. Mosser, Green Bay, Wis.; H. D. Martindale, Middletown, Ohio; L. T. Murphy, Auglaize Boxboard Co., St. Marys, Ohio; F. J. Milton, Hamilton & Sons; Miquon, Penn.; D. H. Montville, Middletown, Ohio; J. A. Murray, Fitchburg, Mass.; Alex Macvie, Kalamazoo, Mich.; L. O. Moffitt, Highbridge, N. J.; E. B. Morse, Valley Iron Works, Appleton, Wis.; Chas. F. Moore, Seaman Paper Co., New York, N. Y.; P. J. Massey, W. F. Hall Printing Co., Chicago; O. W. Middleton, Magazine Box Board Co., Chicago; Frank Murphy, Lockport Felt Co., Appleton, Wis.

R. A. North, Green Bay, Wis.; W. A. Nivling, Boston, Mass.; N. J. Nike, Chillicothe Paper Co., Chillicothe, Ohio; C. E. Nicely, La Salle Paper Co., South Bend, Ind.; Chas. Noble, Kalamazoo, Mich.; J. W. Outerson, Megargee Paper Mills, Modena, Pa.; Max Oberdorfer, Filer Fils Co., Filer City, Mich.; Henry Obermans, Hammermill Paper Co., Erie, Pa.; J. H. O'Connell, President American Pulp and Paper Mills Superintendents' Association, Kalamazoo, Mich.; Eugene O'Brien, Dells Paper & Pulp Mills, Eau Clair, Wis.

E. A. Peterson, Appleton, Wis.; P. W. Porter, Highbridge, N. J.; H. M. Palmerlee, American Boxboard Co., Grand Rapids, Mich.; W. A. Packard, Hammemill Paper Co., Erie, Pa.; B. Frinz, Chicago; Edw. Panushka, Milwaukee, Wis.; Jacob Parent, Western Board & Paper Co., Kalamazoo, Mich.; Geo. Pountain, Allied Paper Co., Kalamazoo, Mich.; L. D. Post, Paper Mills News; A. L. Poidevant, Pensacola, Fla.; Frank E. Pearson, Munising Paper Co., Munising, Mich.; C. A. Poland, W. A. Cole Paper Co., Putney, Vt.; L. A. Parker, Bryant Paper Co., Kalamazoo, Mich.; C. A. Poland, W. A. Cole Paper Co., Putney, N. Y.

R. J. Quinn, Chicago; Gus Reidel, Kalamazoo, Mich.; J. O. Ross, New York; W. H. Reynolds, Kalamazoo Paper Co., Kalamazoo, Mich.; Frank Z. Ranson, Chicago; Fred J. Rooney, Upson Board Co., Lockport, N. Y.; A. G. Rasch, American Boxboard Co., Grand Rapids, Mich.; J. C. Reber, Chicago; W. J. Redmond, Kalamazoo Paper Co., Kalamazoo, Mich.; Michael Redmond, Kalamazoo Paper Co., Kalamazoo, Mich.; W. W. Reddig, Gardner-Harvey Paper Co., Middletown, Ohio; Herbert Reynolds, Chicago; T. E. Roe, Munising Paper Co., Munising, Mich.; Lou Rosenberg, Kalamazoo, Mich.; James Rosenberg, Amer. Wood Pulp Corp., New York, N. Y.; F. G. Rodgers, Underfeed Stoker Co., Detroit, Mich.; Robbins, Dodge Sales & Engineering Co., Mishawaka, Ind.; J. Slater, Escanaba Paper Co., Escanaba, Mich.; E. A. Smith, Cleveland, Ohio; H. Y. Saxon, So. Walpole, Mass.; S. A. Stage, Pittsburgh, Pa.; C. Stewart, Newton Falls Paper Co., Newton Falls, N. Y.; Arthur Sigel, New York; Sam'l Simpson, Allied Paper Co., Otsego, Mich.; H. E. Stafford, Watertown, N. Y.; A. W. Simpson, De Grosse Paper Co., Pyrites, N. Y.; R. J. Sprang, Champion Fibre Co., Canton, N. C.; B. F. Soffe, Chicago; H. B. Sherwood, Chicago; W. P. Schenk, Champion Paper Co., Hamilton, Ohio; H. F. Schenk, Fitchburg, Mass.; H. W. Server, Miami Paper Co., W. Carleton, Ohio; E. W. Sharpless, Menasha Printing & Carton Co., Menasha, Wis.; J. Shroeter, Chicago; L. E. Smith, Nekoosa-Edwards Paper Co., Nekoosa, Wis.; A. C. Stepau, Niagara Falls, N. Y.; A. G. Sleicher, New York; Ralph Snell, Holyoke, Mass.; Fred Sutherland, Sutherland Paper Co., Kalamazoo, Mich.; W. Merritt Smith, Philadelphia Paper Mfg. Co., Philadelphia, Pa.; F. A. Smith, Mullen Bros. Paper Co., St. Jose; T. H. Savery, Nash Engineering Co., Chicago; W. H. Swanson, Forest Products Lab., Madison, Wis.

W. H. Theroux, Sandusky, Ohio; Floyd Tiff, Carthage, N. Y.; J. A. Turner, Chicago; E. F. Troop, P. H. Glafelder Sons, Spring Grove, Pa.; J. A. Temple, Kalamazoo, Mich.; A. A. Tanyane, PAPER TRADE JOURNAL, New York; C. O. Thorn, Watervliet Paper Co., Watervliet, Mich.

C. R. Ulrich, Junkin Paper Mills, Ft. Madison, Iowa; C. W. Ulrich, Wolverine Paper Co., Otsego, Mich.; W. A. Uhl, Albany, N. Y.; Van Alstyn, Jno. Peshtigo Fibre Co., Peshtigo, Wis.; H. K. Vinton, PAPER TRADE JOURNAL, Chicago; L. R. Verdon, Kalamazoo, Mich.; G. N. Van Derhof, Dodge Sales & Engineering Co., Mishawaka, Ind.; Lee Wilson, Morris Paper Mills, Morris, Ill.; W. J. Williams, Kalamazoo, Mich.; J. J. Wall, Milwaukee, Wis.; Wm. H. Wightman, Lee Paper Co., Vicksburg, Mich.; F. M. Williams, Watertown, N. Y.; J. L. Williamson, Chicago; L. V. Welsh,

Fitchburg, Pa.; W. Weston, Woonsocket, R. I.; J. H. Wright, Kalamazoo, Mich.; C. W. Whitehouse, Abitibi Paper & Power Co., Iroquois Falls, Ont.; M. M. Whitman, Marathon Paper Mills, Rothschild, Wis.; A. F. Wilcox, Chicago; P. L. Wilson, Leavenworth, Kan.; A. G. Wightman, Hawthorne Paper Co., Kalamazoo, Mich.; Robert Williams, Chicago; S. D. Wells, Forest Products Lab., Madison, Wis.

C. E. Youngchild, Nekoosa-Edwards Co., Nekoosa, Wis.

Jos. Zelinske, McGillan-Asmuth Co., Menasha, Wis.

Cost Association Registration

The list of those who registered at the convention of the Cost Association of the Paper Industry was as follows:

William Allan, Waste Paper Packing Co., Kalamazoo, Mich.

Jay T. Bachelder, Standard Paper Company, Kalamazoo, Mich.

Harry D. Barney, Allied Paper Mills, Kalamazoo, Mich.

Peter F. Bosker, Rex Paper Co. (Lincoln Ave.), Kalamazoo, Mich.

R. F. Boutillier, Knowlton Bros., Watertown, New York.

Harry C. Bradford, Allied Paper Mills, Kalamazoo, Mich.

Paul L. Broesamle, Allied Paper Mills, Kalamazoo, Mich.

Thomas J. Burke, secretary and treasurer, Cost Association of the Paper Industry.

J. C. Carter, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.

M. C. Dickoff, Marinette & Menominee Paper Co., Marinette, Wis.

Edward J. Fitzgerald, Scott Paper Co., Chester, Pa.

R. W. Gowdy, The Hagar Straw Board & Paper Co., Cedarville, Ohio.

Marvin A. Hart, Mac Sim Bar Paper Co., Otsego, Mich.

H. F. Hunnell, Sutherland Paper Co., Kalamazoo, Mich.

John E. Hyde, S. D. Warren Company, Cumberland Mills, Me.

G. T. Ingling, Kalamazoo Paper Co., Kalamazoo, Mich.

C. A. Jaspersen, Nekoosa Edwards Paper Co., Port Edwards, Wis.

Paul Koenig, Marinette & Menominee Paper Co., Marinette, Wis.

Arthur W. Lewis, Michigan Carton Co., Battle Creek, Mich.

D. J. Mc Ibsen, Falls Mfg. Co., Oconto Falls, Wis.

Earl F. Metcalf, Standard Paper Co., Kalamazoo, Mich.

Edward A. Meyer, Menasha Printing & Carton Co., Menasha, Wis.

Allan B. Milham, Bryant Paper Co., Kalamazoo, Mich.

Eibert G. Milham, Bryant Paper Co., Kalamazoo, Mich.

P. V. Millard, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

Ralph H. Morrill, Chemical Paper Mfg. Co., Holyoke, Mass.

Robt. M. Mudgett, Strathmore Paper Co., Mittleague, Mass.

C. F. Niederman, Beckett Paper Co., Hamilton, Ohio.

W. H. Oliver, Allied Paper Mills, Kalamazoo, Mich.

J. A. Reilly, American Writing Paper Co., Holyoke, Mass.

Henry J. C. Rosenow, McGillan-Asmuth Paper Mills, Menasha, Wis.

L. N. Russell, Wolverine Paper Company, Otsego, Mich.

A. M. Van Douser, Marathon Paper Mills Co., Rothschild, Wis.

Robert L. Wall, Standard Paper Co., Kalamazoo, Mich.

L. R. Wegner, Mac Sim Bar Paper Co., Otsego, Mich.

John Balch, Horace P. Griffith & Co., Philadelphia, Pa.

Lawrence Ouellette, Munising Paper Co., Munising, Mich.

J. Platt Glezen, Allied Paper Mills, Kalamazoo, Mich.

Harold F. Dewey, Lee Paper Co., Vicksburg, Mich.

C. A. Brown, Great Western Paper Co., Lady-smith, Wis.

R. P. Hill, Hammersley Mfg. Co., Garfield, N. J.

S. A. Hummer, York Haven Paper Co., York Haven, Pa.

J. H. Kline, York Haven Paper Co., York Haven, Pa.

R. E. Rindfus, American Writing Paper Co., Holyoke, Mass.

C. A. Wellington.

A. W. Lewis.

D. C. Shaw, Jr., Tarentum Paper Mills, Pittsburgh, Pa.

THE UNDER-FEED STOKER IN PAPER MILL WORK*

By F. A. DE BOSS, UNDERFEED STOKER CO., DETROIT, MICH.

Production costs are now claiming the serious attention of managers of industrial enterprises to a greater extent than at almost any time in the past. Statistical organizations report a great diversity of production among similar enterprises, some receiving orders sufficient to keep their plants running at capacity while others, producing similar commodities are barely able to operate. These reports in explanation also state that the first class have succeeded in reducing production costs to such a point that they can make selling prices which attract business, while the second class, not having reduced production costs are unable to compete in securing orders. The effect is obviously accumulative, since increased production still further reduces costs and increases total profit. There is then a double benefit to be secured by reducing production costs, first, an increase in volume of business, and second, an increase in net profits, and the two results tend to pyramid. Not the least in the items entering into cost of paper products is fuel. It is improbable that there will be any appreciable reduction in price of fuel delivered, regardless of efforts to influence the mine operators and the railway executives. Mining costs continue to increase since mining difficulties increase year by year and since the miner's organizations bring continual pressure to bear for increased wages. In regard to reduction in railway hauling costs, the Interstate Commerce Commission has recently stated that it cannot order such reductions as might be desirable since it is restricted by act of Congress.

The only way then to reduce the fuel item charge is to reduce the quantity of fuel per unit of production. The Under-Feed Stoker Company of America is serving manufacturers with equipment which is accomplishing this purpose in all lines of industry. Automobile factories are using less pounds of coal per automobile delivered, smelters are using less coal per pound of copper produced, textile mills are using less coal per yard of cloth woven, steel mills are using less coal

that resulted in the creation of the Jones Stoker. Thirty years ago the paper mills of the northwest were using green wood as fuel for steam production. Cost of coal delivered to their plants was prohibitive, but the wood was conveniently available. The wood, however, was difficult to burn since it contained so much water that fires were maintained and steam

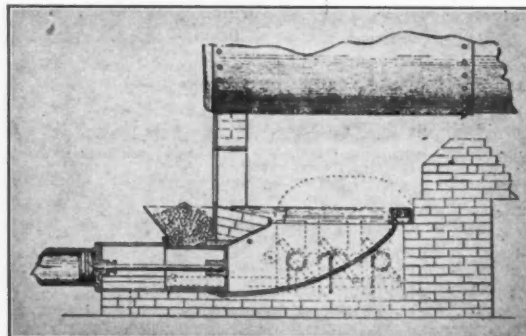


FIG. 2

loads carried with difficulty. The problem of drying the wood was referred to Evan William Jones, who at that time was president of the Union Iron Works of Portland, Ore. As a result of study of the problem, Mr. Jones produced the first

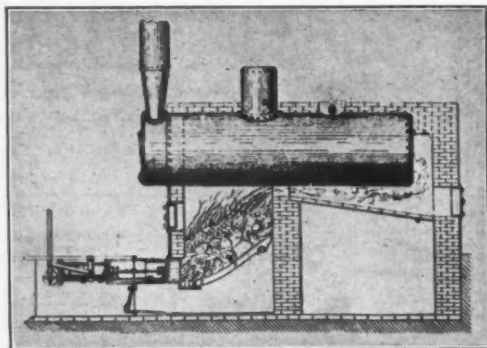


FIG. 1

per ton of steel rolled, flour mills are using less coal per sack of flour milled, and paper mills are using less coal per pound of paper manufactured, through the economies in coal consumption effected by use of the Jones Under-Feed Stoker.

Problem an Old One

This problem is not new but existed years ago, and it was the attempt to solve just such a problem in the paper mill industry

*Read at the joint convention of the American Pulp and Paper Trade Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

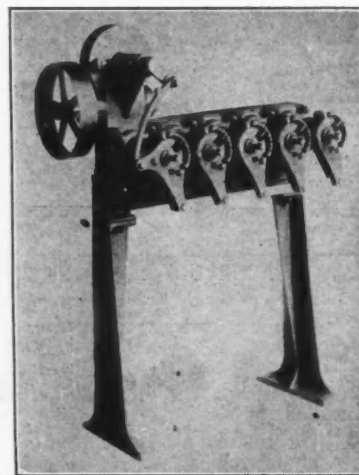


FIG. 3

under-feed stoker in 1888. This stoker had grates within the furnace which sloped upward and to the rear and which supported the bed of burning fuel. Wood in cord-wood lengths was forced into the furnace and under the fuel bed by means of a ram, which was driven by a steam cylinder. The green wood was heated from the hot fuel above and its moisture driven off. As successive sticks were forced into the furnace, the dried wood was advanced into the fire zone and burned without the hinderance of high moisture content. The moisture rising from the green wood below did not offset combustion

since the temperature resulting from burning dry wood above was sufficient to maintain ignition and a hot fire. This stoker is shown in Fig. 1. It thus happened that the first under-feed stoker was used in paper mills to burn wood and to meet a problem with which the paper mills were particularly concerned.

Coal vs. Wood

Paper mills now use coal for fuel, together with mill refuse. The Jones under-feed stoker has kept pace with this change in fuel and has solved the problems of coal and refuse burning as it formerly solved the problem of burning green wood. Mr. Jones soon saw that the principle contained in the wood burning stoker was applicable to burning coal. He then built a stoker having a retort within the furnace and with dead plates on each side, in place of grates, a ram without the furnace suitable for pushing coal into the retort, and a rod, containing push blocks, in the bottom of the retort and actuated from the ram, to distribute the coal uniformly the length of the retort. This first coal burning under-feed stoker is shown in Fig. 2. These first under-feed stokers operated by natural draft but later forced draft was substituted, and properly designed tuyeres arranged around the rim of the retort to uniformly distribute the air to the fuel bed. The next step was to control the speed of the fan, supplying air to the stoker, in accordance with the demand for steam. If the steam pressure dropped the fan speeded up causing coal to burn faster and steam to be made at a greater rate. When the steam pressure rose to the desired point the fan slowed down. The practical results of such control was to constantly maintain steam pressure within a few pounds of the desired pressure, regardless of demand for steam. The valves which admitted steam to the stoker cylinders were then connected to the fan, or fan drive, by a belt, or other means, with the result that the rate of ram strokes and consequently the rate of coal feed increased or decreased with fan speed, and a relation could be maintained between air supply and coal feed. The valve was so arranged that the speed of the valves relative to the speed of the fan could be varied by the stoker operator, thus giving the operator individual control over each stoker even though all stokers in a plant were supplied with air from the same fan and all the stoker valves driven from this fan. This valve is called the "Cole Automotive Valve" and is shown in Fig. 3.

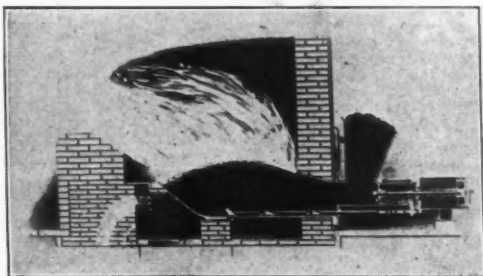


FIG. 4

The stoker as finally developed and described above is called the "Jones Standard Under-Feed Stoker" and is shown in Figs. 4 and 5.

Stoker Is Self-Cleaning

From the Jones standard stoker was developed the Jones "A-C" or automatic cleaning stoker. This stoker has retorts side by side but separated by rows of tuyeres. The retorts are supplied with coal by rams without the furnace. The coal is moved through the retorts from front to rear, by incoming

fuel and push rods and blocks in the bottom of the retorts. The refuse resulting from the burning of the coal is moved from the ends of the retorts across a dead plate onto a dump plate. The operation of the dump plate discharges the ash into an ash pit below. The operation of this stoker is automatic and is self-cleaning as compared with the stokers from which the ash and refuse must be removed by hand. Figs. 6 and 7 show longitudinal and cross sections of the "A-C" stoker. In the "A-C" stoker, coal feed into the stoker, distribution of coal through the retorts and discharge of ash

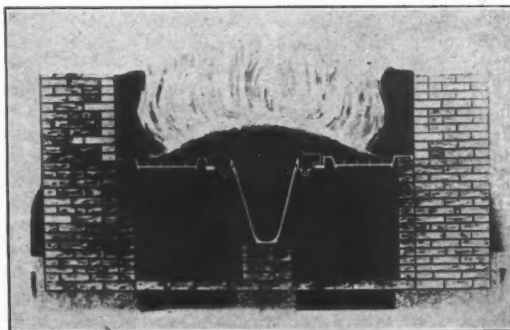


FIG. 5

onto the dump plates, are automatic. The supply of air and coal are proportional to the demand for steam. Each ram and retort are under the control of the operator, just as if they were single stokers, giving the operator complete control over the condition of the fire.

To use the least amount of coal per unit of product output in any plant requires getting the greatest amount of heat possible from each pound of coal into the steam. Roughly it takes just so much heat to make a pound of steam and the more heat that can be transferred from each pound of coal to

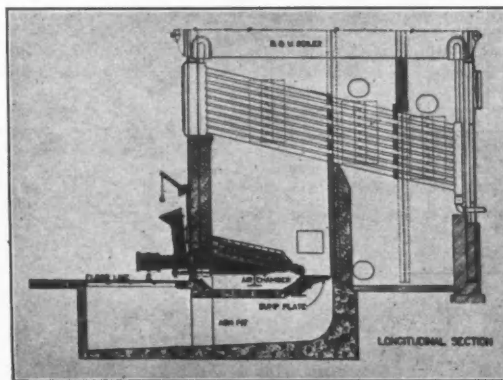


FIG. 6

the steam, the more pounds of steam can be made for each pound of coal burned, or the less pounds of coal that will be necessary to produce a required quantity of steam. The coal bill in most plants is too high because too much of the heat in coal is lost instead of going to make steam. The bulk of this loss occurs in two forms: That lost up the stack in the hot gases, and that lost as unburned fuel in the ash. Usually some attention is given to the latter form of loss since it can be seen, but the first form of loss is invisible and usually receives scant consideration.

Fuel Waste is Enormous

If the average manager realized that out of every five dollars he paid for coal, two or more of these dollars were passed through the chimney and out to the surrounding atmosphere as hot air, he would at least give some consideration to means for reducing this loss. This loss actually exists in the average plant and it has been abundantly proven in properly equipped and operated plants that the bulk of this loss can be eliminated. The manager of paper mill would not think of making pulp from logs and then allowing fifty per cent of the pulp to float away down stream. But he quite often does the equivalent with the heat in the coal he buys. It is generally conceded that the fuel efficiency of the average boiler plant is from forty to fifty per cent. That is, the average plant utilizes only forty to fifty per cent of the heat in the fuel burned to make steam. The rest of the heat is lost, the bulk of the loss being up the stack. Any manager can tell quite closely how much this loss is in his own plant by having a few tests made of the boiler flue gases with a simple instrument, called an Orsat, to determine the percentage of carbon dioxide, or CO_2 , in the gases. When coal burns the oxygen in the air units with the carbon in the coal and the product of the union is a gas called carbon dioxide. The effect of the union is to produce heat. However, if more air is passed through the boiler than is necessary to supply the required amount of oxygen for burning the coal, this excess air merely takes up some of the heat generated and carries it out the stack. Suppose coal is being burned which contains 12,000 heat units per pound and that 9 pounds of air will supply just the right amount of oxygen to burn this coal. It would not be unusual for 40 pounds of air to be used instead of nine. The extra 31 pounds would come into the furnace at boiler room temperature, say 70 degrees, and pass out the boiler at stack temperature, say 600 degrees, without doing anything whatever except take up heat. The temperature of this 31 pounds of air would then be raised 530 degrees. The amount of heat required to raise the temperature of 31 pounds of air 530 degrees is 4,000 heat units or one-third of the heat in the coal. It is not possible to burn the coal and use just the 9 pounds of air for each pound of coal, but properly equipped and operated plants are doing the work with 12 pounds of air. If 40 pounds of air are used the heat carried out by the 28 pounds of unnecessary air is 3,400 heat

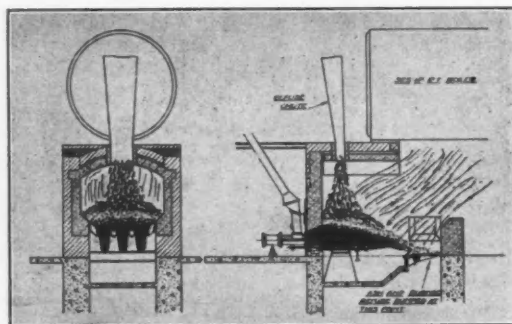


FIG. 8

units or 28 per cent of the heat in the coal. If an Orsat were used to determine the per cent of carbon dioxide in the flue gas, this percentage would be found to be about 19 per cent should the theoretical 9 pounds of air be used per pound of coal, about 15 per cent should the economical quantity of 12 pounds of air be used per pound of coal, and about 5 per cent should the 40 pounds of air be used.

Saves One-Third of Heat

The Jones Under-Feed Stoker makes it possible to burn the coal with the 12 pounds of air and to save 30 per cent or more, of the heat which goes up the stack. The principle of operation makes this possible. Green coal is fed under a bed of burning

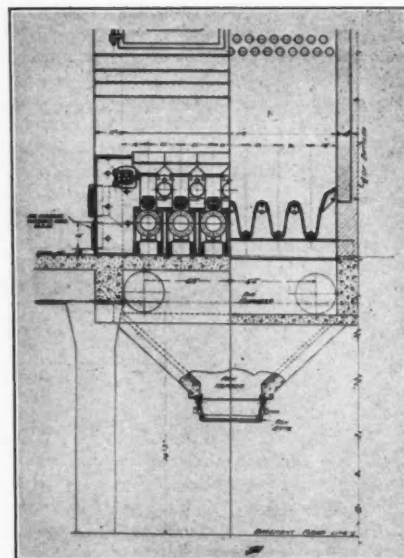


FIG. 7

fuel. Heat from above drives off the gases from this green coal in the same way that water was driven off from green wood in the case of the first under-fed stoker. These gases travel upward through the fuel bed and past the tuyeres where they thoroughly mix with the incoming air. The mixture passes through the fire zone and becomes highly heated. It is then in an ideal condition for complete and efficient combustion

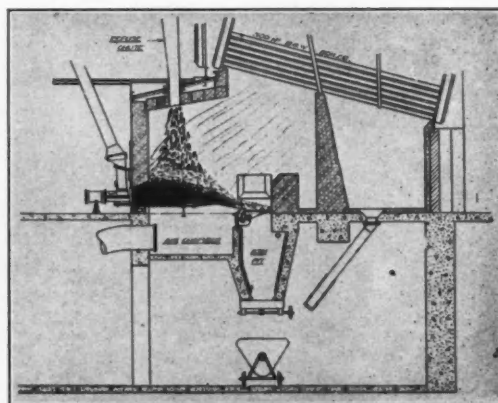


FIG. 9

in the furnace space above. The coal, in a coke condition due to the gases being driven off, is pushed up into the fire zone by incoming fuel. The distribution effected by the push rods and blocks, and the individual control over the operation of each retort by the fireman prohibits the formation of holes in the fuel bed and maintains the correct thickness at all parts for uniform burning. The result is efficient and, economical

combustion of the coal with the practical minimum of air and the maximum of heat available for making steam. Any plant with this type of stoker can easily operate with a continuous efficiency of from 70 per cent to 75 per cent. Hundreds of comparative tests made before and after installation of Jones Under-Feed Stokers show an average reduction in coal of over 20 per cent effected by the stokers.

As compared with over-feed method of stoking, under-feed stokers will give greater capacity, produce higher efficiency, require less expense of installation, permit of greater flexibility of control and allow practically unlimited range in selection of coal.

Over-feed and Under-feed Stokers

Over-feed stokers are usually limited in capacity by available stack draft and danger to iron work. Under-feed stokers can avail themselves of greater air supplies from forced draft fans. Also they are not subjected to danger from high furnace temperatures, resulting from high rates of combustion, since the iron work is protected by ash and green coal.

Under-feed stokers produce higher efficiencies than over-feed since the distillation of gases occurs below the burning fuel instead of above, since the gases have a greater opportunity to mix with air and the mixture to become highly heated by passing through hot burning fuel, since the opportunity for excess air to pass through holes in the fuel bed does not exist as the coal is forced into contact, and since arches are not required to promote ignition, thus permitting the boiler heating surface to absorb more heat by radiation.

Operators, firing under-feed stokers have complete control of the fuel bed. The bed may be built up or burned down in any section of the furnace. The rate of travel of fuel through individual retorts is subject to control. The distribution of fuel over the area of the stoker surface may be regulated. When coal is fired by over-feed method, after it is once within the furnace it is practically beyond all means of control.

Over-feed stokers are subject to troubles when attempting to burn certain kinds and grades of coal. High ash coal retards the air flow. Low fusing ash clogs the fuel bed and fills the air spaces in the grates with slag. Caking coal fuses over and retards combustion. Fine coal drops through the air spaces

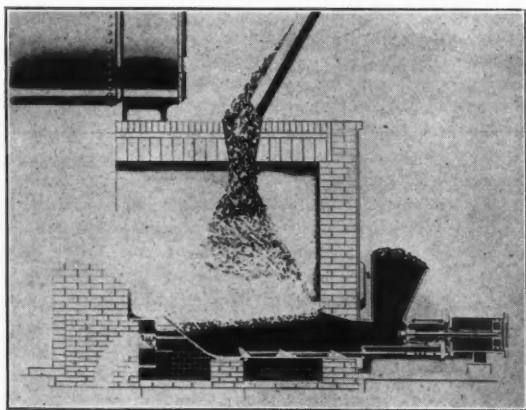


FIG. 10

in the grates. With under-feed stokers the ash is continuously and automatically ejected, molten ash cannot get to the air spaces, caking coal is kept free by air blast, and fine coal is so directed by under-feeding that the drippage through the air spaces is slight. The ability to burn practically an unlimited range of fuel results in an economic advantage in the purchase of fuel.

Under-Feed Stokers not only reduce the quantity of coal by efficient combustion, but, where there is mill refuse they make available the greatest amount of heat possible from the burning of such refuse. A large number of plants are using these stokers to burn wet bark, hog fuel, and saw-dust and shavings and are effecting a saving in coal while at the same time



FIG. 11

affording a means for disposal of a waste product. Wood refuse is burned to better advantage on under-feed stokers than by any other means. As ordinarily burned the refuse falls into a furnace and forms a conical pile. Burning occurs mostly on the surface and at the edge of the pile causing holes to form at the edges. The quantity that can be burned by some methods, such as natural draft, is small and the net amount of heat that can be produced, available for making steam, is small, since a large amount of excess air is usually admitted around the edge of the pile. If the refuse is very wet it is difficult to maintain ignition, and in any case the rate of steam production, resulting from refuse combustion, is low in comparison to the capacity of the boiler for making steam.

Fig. 8 shows an under-feed stoker set under a return tubular

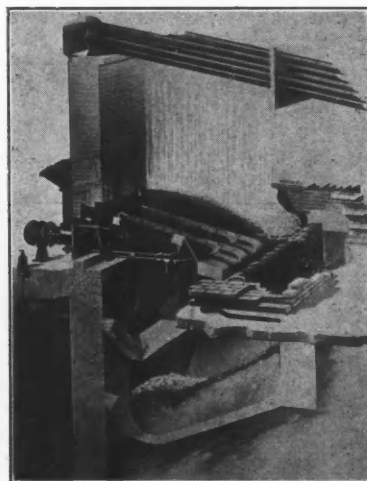


FIG. 12

boiler with a furnace designed for burning wet hog fuel. Fig. 9 shows a similar setting under a water tube boiler. In each case there is an extended oven with an arched top. The refuse is fed through a hole in the top of the arch and falls on the coal bed. The hole is suitably located to give proper distribution of the refuse over the stoker. Since coal is fed upward below the refuse and some burning of the coal occurs, and

since air is forced in from below and uniformly distributed over the stoker area, burning occurs throughout the bed of refuse and a high rate of refuse combustion is maintained.

Results of Actual Tests

Tests were made in the power plant of one paper mill, burning wood refuse. The boiler was a 250-h.p. B. & W., and was equipped with Jones Stokers. An average of 388-h.p. was developed or 155 per cent of rating. Coal was burned at the rate of 311 pounds per hour. The hog feed contained 53 per cent of water. Steam was made at the rate of 43 pounds, from and at 212°, per pound of coal fired. The boiler shown in Fig. 8 is 325-h.p. and equipped with Jones "A-C" Stokers. Tests were made on this boiler and stoker installation using hog fuel containing 41.7 per cent of water, in combination with coal. The horse-power developed was 577.2 or 177 per cent of rating. Only 0.43 pounds of coal was burned per horse-power hour produced. The coal supplied only about 10 per cent of the heat consumed by steam production while the wet refuse supplied 90 per cent of the heat. Other plants have burned refuse containing 37 per cent to 65 per cent of water without the use of any coal whatever. In general some coal is necessary to maintain ignition when burning wet wood-refuse, the percentage of coal depending on the amount of moisture in the wood, but this need not supply over 10 per cent of the heat absorbed by the boiler. Where wet wood refuse is available instead of being a disposal problem it can be made to save 90 per cent of the coal that would be required to operate the boilers.

Apart from the saving in fuel, the use of the under-feed stoker produces economies in other ways. The stoker makes possible a greater production of steam per boiler than is possible with other methods of firing. More steam per boiler

means less boilers, and consequently less money tied up in equipment. Less ground area and less building space are required resulting in less investment in grounds and buildings. Interest, insurance, tax, repair, and depreciation charges are less. It is true that maintenance and repair charges against each boiler will be higher, but this will be offset by less number of boilers carrying the charge so that the total will be very little increased, while the saving in other items results in a net gain. Not the least in importance is assured, steady and reliable steam production. There is less probability of shut downs and consequent loss of output. One such shut down may cause loss of business and profits sufficient to pay for a stoker installation.

Summary of Benefits

In general the use of under-feed stokers result in less labor employed, the reduction depending on previous firing methods used. This item, however, is usually worthy of consideration in the boiler room.

To summarize; the under-feed stoker will reduce costs, reduce capital expenditures, increase volume of business and increase total profits.

(A) Savings are effected through more efficient combustion of fuel resulting in less fuel required per unit of product, and through less labor charges in the boiler room.

(B) Capital expenditures are reduced through less requirement in ground, buildings and boiler equipment. Overhead charges against capital expenditures are thus reduced.

(C) Since cost per unit of product are reduced, the prices of product to buyers can be reduced, thus attracting business and increasing total output.

(D) Finally, as a result of savings in costs and charges and greater volume of output, the net profit on the total business will be increased.

RECLAIMING WASTE HEAT IN MACHINE ROOM*

By J. O. ROSS, PRES. AND GEN. MGR., J. O. ROSS ENGINEERING CORP., NEW YORK

In the last few years the cost of ventilating a machine room has become a subject that requires a great deal of individual study. The old rule of thumb way of figuring a ventilating system for a machine room has no place at this time. In the years gone by a ventilating system for a machine room consisted of anything from a few coils of steam pipes strung along the roof to the most extravagant system that might be designed. If the system kept the roof dry, it was a good system. If the roof did not stay dry, it was a poor system. Sometimes a system was principally admired because there wasn't a sign of a drip anywhere and the room was nice and cool and comfortable. The cost of operating this system was very seldom considered.

Some Mistaken Ideas

It began to be recognized that simply pulling air out of a machine room without making any provision for the incoming air was not right and systems of blowing air into the machine rooms became more and more common. The amount of air blown in depended a great deal on the judgment of the man who was designing it, tempered also by the amount of money he thought the purchaser was willing to spend for a system. A certain number of air changes was allowed and in general it was considered that this must be fresh air and that it must be warmed enough to prevent condensation from the moisture rising from the machine. In general it was felt that if a machine did not have a hood, it would

probably need more air supply, but the system was designed more for the room than for any relation to the paper produced. This way of figuring explains why the country is dotted with good systems and poor systems. As the size of paper machines kept increasing, due either to the speeds going up, or the width of the machines being increased, these designers of systems kept getting deeper and deeper into trouble. The machine room for the new big machine wasn't much bigger than the room required for the smaller machine, therefore about the same ventilating system was all that was necessary. The fact that it might have to do twice the work of absorbing vapor was not very seriously considered.

Today we are beyond that stage and the proper ventilation of a machine room is a science in itself and a specialty which requires not only a clear understanding of the theoretical principles but a very great deal depends on a wide experience under all classes of paper production. There are a few basic principles which must be borne in mind before any system can be designed.

What a Ventilating System Should Do

First, a ventilating system must be designed to absorb the vapor arising from the paper machine without allowing it to condense in the building. This means that a clear understanding of the amount of vapor must be obtained and also the general construction and details of the building itself must be studied in order that the heat loss of the building may be offset.

Secondly, all the air which passes out of the monitor or ventilators of a machine room is heated somewhere in the mill. It doesn't matter where this air is heated, steam has been used to

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

do the work and must be charged against the cost of ventilation. If a machine room has a system for drawing air out and no provision for letting it in, the steam has been used somewhere either in adjoining parts of the mill such as the beater room or finishing room or from steam coils in the machine room or from the dryers themselves. You cannot get something for nothing and you cannot discharge to the atmosphere large quantities of hot air without having paid for heating it.

When some of the mills installed definite systems for blowing warm air into the machine room, they were astounded at the amount of steam that these systems used. Sometimes a mill felt when a proposal was submitted to them that they could not afford to use the amount of steam that was specified and that they would go on just pulling air out of the room. They forgot, however, that they were using probably as much or more steam than and that they were like the ostrich, burying its head in the sand, in feeling that they were not using steam, simply because they couldn't see it concentrated at one point. If you had a continuous stream of coal flowing down from your plant into the river, you would be pretty sure you were paying for it, even if the pile of coal in the boiler house didn't seem to be any smaller.

That is exactly the condition in ventilating a machine room. As a matter of fact, the chances are that the man who has no way of blowing the air into his machine room, is using more steam than the man who has. This is due to the fact that the air entering the room by leakage probably short circuits to the ventilators without spreading over the room and keeping the whole roof dry. Sometimes this has the effect of keeping the machine room cool, but the fact is lost sight of that if the air is cool leaving the machine room, it has not got the capacity to carry out enough vapor and therefore a great excess quantity of air must be used with the consequent greater amount of steam required for heating this air. If this fact is clearly borne in mind: that you must heat all the air which is leaving your machine room, it will be much easier to figure what you need in the way of a ventilating system.

The Question of a Hood

The question of a hood is not a question for guessing at or vague theorizing about, but has certain definite advantages and disadvantages that can be clearly understood and a decision made as to whether or not a hood should be used. From a ventilation standpoint, a hood is a great advantage. It does not allow the vapor to spread over the room but concentrates it and carries it to the monitor or ventilator at the highest possible temperature and at the greatest possible degree of saturation. This means that each cubic foot of air removed from the room will carry much more moisture and therefore a very much smaller quantity of air must be used with a great consequent saving in steam. From the papermakers' standpoint, there may be objections to hoods. It blocks the light and may be more or less in the way and in some cases was blamed for collecting dirt, which would fall off on the paper machine and as constructed in the past was often a fire menace and a general nuisance. There are new types of hoods on the market, however, which are fireproof, clean, actually prevent dirt from falling on the paper, are substantial and good-looking and perform very valuable work in reducing the cost of ventilation. There was a very interesting paper written by Howard S. Tyler a short time ago in regard to the use of a hood versus no hoods on paper machines. He demonstrated clearly this point of carrying the air out at a higher temperature and showed the enormous saving in steam.

The Matter of Cost

The cost of ventilation of the machine room is a good deal more than many people realize. It is often a large percentage of the amount of steam required for drying the paper. In a recent test on a forty ton mill, they were using on a day which was 10° above zero outdoors 244 H.P. for ventilating the machine room. To

dry the paper on the machine they required 230 H.P. They were therefore spending more money for ventilating than they were for drying which is absurd. They were carrying the air to the atmosphere only 32 per cent saturated and were using altogether too much air. With a properly designed system using steam for heating the air, they should have been using only 90 H.P. for ventilating the room which was about 40 per cent of the steam required for drying.

On a recent test made on a book mill, which had no system of blowing air in but had a very definite method of drying the air out, and was provided with steam coils on the ceiling of the machine room to keep the roof dry, we found by testing the amount of air passing out of the machine that they were sending to the atmosphere approximately 57,000 cubic feet of air per minute and were using 8,100 pounds of steam per hour, yet the roof dripped. A proper ventilating system designed and installed would have only supplied 48,000 cubic feet of air per minute and would have taken 6,500 pounds of steam per hour and kept everything dry. In other words, they were using more steam than they should have been using if they had had a first-class system, which shows the progress that has been made in figuring the steam required to ventilate a room.

Utilizing Waste Heat

There is no other way that this can be improved except by utilizing the waste heat which passes out of the room and this is now being done. Two-thirds of the steam that is used on the paper machine dryers for drying the paper, is used up in turning the water into vapor. If this vapor can be turned back into water, this heat can be recovered and this is the basis of the so-called Briner economizer. This is an ingenious machine which extracts the heat from the air passing out of the machine room and puts this heat into the air going into the machine room. The waste air passing out cools down and begins to condense. In condensing it gives up the latent heat which is an enormous quantity.

Several of these economizers are now in use and several are being installed at the present time. On tests made on the machines in use, the air supplied to the machine room is heated from zero to about 90°. In many cases this is sufficient to provide all the ventilation for the machine room without the use of steam. Referring back to our forty ton mill which was taking 244 H.P. of steam but with a first-class system would have taken 90 H.P. of steam, we would only require 26 H.P. of steam with a Briner economizer.

There is another method of utilizing this waste heat and that is to draw the vapor through sprays of water. These sprays of water cool down the vapor and the heat released raises the temperature of the water very considerably. This is the latest development in the utilization of waste heat in the paper mill. It is a waste which has gone on from the beginning of the industry and a waste which has probably troubled the conscience of the papermaker more than any other waste. He has realized the enormous heat being carried out of the mill in the form of hot vapor and yet it has always seemed a source of waste that could not be prevented. With these methods, however, this waste can be turned into useful work and the time is coming when a mill which allows the vapor to escape to the atmosphere while they use steam for heating air in the mill, will be considered just as bad as the mill which now throws steam to the atmosphere continuously while they use live steam for heating water.

Lime Association to Meet in Cleveland

The annual convention of the National Lime Association will be held June 14-16, Hotel Statler, Cleveland, Ohio. The activities of this convention will deal with the technology of the uses of lime and the industrial problems of manufacturing and marketing lime.

ELECTRICAL SECTION DRIVE IN PAPER MILLS*

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We are all fairly familiar with the mechanical way of doing things, as that is the way most of our work has been accomplished since the physical way was abandoned in favor of the easier and more satisfactory mechanical method.

In the paper mill we saw for many years the conveyors, chippers, screens, beaters, jordans, super calenders, etc., belted and driven from the long line shaft in the mill, as was also the case with the paper machine; until quite recently, that is to say, within the last ten to twenty years. Since this time the electrical way has rapidly come to supersede the mechanical system.

Not only is the electrical way rapidly superseding the mechanical way, but in manifold instances is stepping in and superseding the physical way of doing work without the usual intermediate stage of development, the mechanical way. Especially is this true in the use of electrical household appliances.

The electrical way of carrying on the industry and commerce of the world is an accepted fact, and the only open question in regard to its further use is our knowledge of how best to apply it, and the economical questions entering into its consideration. It also seems that the more completely we are able to adopt the electrical way in our industrial work, the more efficient we become and the higher the plane of science, industry and civilization and the electrical developments of the past few years have further elevated our social plane by reason of the reduction in drudgery of mechanical and physical labor.

What the Electrical Way Has Done

The purpose of this paper is primarily to point out what the electrical way has accomplished for us in paper machine drive, and how its benefits have increased with our knowledge of how to use it.

There has been a great struggle in getting away from the mechanical idea and conception of doing things. It is easier to continue as we are than to change to something new and untried, even though much better. Following the partial abandonment of the steam engine for paper machine drive, the constant speed motor was used in its place, utilizing the entire mechanical system formerly necessary including the ponderous speed changing devices of the cone pulley type, or the less flexible step pulleys, and of course including the long line shaft, section cone pulleys, open type bevel and spur gears and friction clutches.

One of the next steps of improvement was the abandonment of the mechanical speed changing devices which had previously been depended upon for varying the speed of the paper machine and replacing it with the adjustable speed type of direct current motor, thereby eliminating one of the large sources of power loss, and greatly increasing the flexibility and dependability of the paper machine control and operation, providing at the same time a notable example of the advantages attendant upon the more complete adoption of the electrical way.

Efforts to Further Simplify

Next in the course of events there came several efforts to further simplify the paper machine drive by eliminating the long variable speed line shaft, the section cone pulleys, the belts, the mortice bevel and spur gears, as well as the friction clutches, and to replace all of these possible sources of trouble heretofore supposedly necessary equipment by individual motors for each section of the machine. This revolutionary step was conceived by men who had passed through much experience of development in the art and who appreciated the economic meaning of the

possibilities as presented by individual motor drive. Unfortunately for immediate further development along this line, there seemingly was a failure to fully understand all of the exacting requirements in paper machine operation and the limitations of the electrical apparatus then available and the tendency was to slow up and discourage further effort in this direction.

Not all of those early efforts were failures, however, as some are still in successful operation. Progress was slow, for so much time and expense was involved in the initial development required to obtain satisfactory performance, that neither the electrical manufacturer or the paper mill owner cared again to hazard such an undertaking on account of the uncertainties involved, and it was not until such time as the problems to be confronted could be approached with greater assurance of quick and complete success that interest was renewed.

In each of the installations of this period of sectional paper machine drive, entire dependence for speed regulation was placed in the inherent characteristics of the motors themselves, and up to this time no automatic regulating or control equipment had yet been devised of such a character as to meet the special problems here encountered.

Years passed and the electrification of paper mills became more complete, demonstrating, and securing the almost universal acknowledgment of the superiority of the electrical way. Hardly a machine remained to which the electrical motor was not directly applied without fear or hesitation, with the exception of the paper machine. Fortunately, however, in sectional paper machine drive the obstacles have now been overcome, and the electrical way has been placed upon a firm foundation, and today there are in use several types of the electrical way or system of sectional paper machine drive and control which are successfully performing the function for which they were intended.

It is readily conceded by all, I believe, that for high speed paper machine operation electrical sectional drive is the best, if not the only practicable way. For very slow speed machines, some have felt and still feel that the old style of mechanical system is entirely adequate, and that the possible somewhat higher initial cost of the electrical sectional drive is not warranted. There is also the intermediate zone of speeds in which sentiment also appears to be divided as to just when and where any additional initial expense attendant upon the installation of electrical sectional drive over and above that for the mechanical system, may be warranted.

The Question of Economy

The question of economy of course enters into any consideration of the subject. However, there is the possibility of exercising a short sighted vision of the elements entering into the real question of overall, real and lasting economy.

Of course, the nearer the cost of the paper machine equipped with electrical sectional drive approaches to the cost of the same machine equipped with the mechanical system of drive, the stronger does the argument for electrical sectional drive become. However, the importance of the question of relative first cost may be small as compared with other factors which should enter into the determination of the relative merits.

I believe it can now be demonstrated that in all classes and kinds of paper machine drive, the electrical way is the best way, and that it is now simply a case of determining what is the best electrical way consistent with the various economical considerations.

Then arises the question—What is the best electrical way? Is it not the most simple, the most reliable, most flexible, efficient and economical, and the way best adapted to meet the local conditions where it is to be installed.

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

In the development of electrical sectional drive, effort has been made to get away from and eliminate as much of the mechanical system as possible. All have gone in the same general direction, but some have branched one way and some another, and some have perhaps been able to get farther away from the old mechanical system or way of doing it, but all has been progress. While we are unable to eliminate entirely the mechanical, the more electrical and the less mechanical the trend of our development is, the less susceptible is it to those influences tending to reduce efficiency and impede progress.

In making the transition from mechanical drive to electrical sectional drive, it was necessary that the apparatus from the start have a high degree of refinement and natural regulating ability in order to work at all and permit of normal or satisfactory paper production.

A Satisfactory System Made Possible

Following those early efforts at sectional drive, though some years later, the development of speed regulating means whereby the speeds of the several section motors could be accurately determined and controlled, has made possible a wholly satisfactory and reliable system of sectional paper machine drive.

Seldom does a new system appear, especially one so comprehensive as the paper machine drive and control, wherein some further degree of refinement cannot be obtained, based upon the experience and observation of several years of practical operation in the field. Such has been the case with electrical sectional paper machine drive. And the latest practice, which I am to describe to you is the result of such experience and effort in the line of simplification, refinement, adaptability and service.

In the Westinghouse system of electrical sectional drive a direct current adjustable speed motor is coupled to each section intake shaft, either directly or through the medium of a reduction gear unit. These motors receive their current from an adjustable voltage direct current generator, which may be driven by a synchronous motor, constituting a synchronous motor generator set, or it may be driven by a steam turbine or other motive power.

Features of the Drive

The direct current generator and all of the section driving motors receive separate field excitation from an exciter unit which may be coupled to the direct current generator, or may be a separately driven exciter set. Control of the speed of the paper machine is obtained by adjusting the voltage of the generator which correspondingly changes the speed of the entire machine, or in some cases where especially wide range of speed is required, a certain part of the speed range may be obtained by simultaneous adjustment of the shunt field circuits of all of the section motors by means of a master rheostat or control.

The automatic speed control of the individual section motor, whereby the speed of each section is maintained at its correct relative value, is obtained by the use of simple slow speed little devices known as the rotary contactors.

There is a master rotary contactor driven by a small direct current motor, located at any convenient point, and one section rotary contactor driven by each of the main section driving motors. These section rotary contactors are not coupled directly to the main motor, but are coupled to a small speed changer, which in turn is driven from the main motor or reduction gear unit through a small chain drive. This speed changer and section rotary contactor forms a part of the control system; and all of the section rotary contactors and speed changers together and including the master rotary contactor, require but a small fraction of a horsepower to operate, the only power being consumed is the friction of the brushes on the rotors and the ball bearing friction which is negligible. These section rotary contactors, speed changers, and master rotary contactor, together with a few resistance tubes, constitute the entire speed control system.

The rotary contactors consist of a small motor frame without winding and containing only a rotating drum resembling somewhat a commutator, having several fixed brushes which make contact therewith. The master rotary contactor has similar construction and the two are electrically connected together, that is, the master rotary contactor and the section rotary contactor; and operating together perform a function which takes the place of a rheostat in the shunt field circuit of the motor to which they are connected.

There is no moving part of the speed control system located on the control board. The only moving parts of the control system are the slowly rotating drums or rotors of the rotary contactors, the brushes being entirely stationary as in the case of an ordinary motor.

Through the means of the speed changers, or cone pulleys, to which the section rotary contactors are coupled, the "draw" or relative speed of the section can be adjusted as desired.

The usual starting equipment is provided for each section motor, which is usually mounted on a section panel with knife switch, overload, relay and ammeter; the starting equipment itself consisting of motor operated cam accelerating switches, which automatically cut out the resistance in series with the motor armature circuit as the motor is being started up, the whole operation being affected by push button control.

A generator panel is also required of the usual type carrying switches, circuit breaker, voltmeter, ammeter, etc., as well as rheostat for the exciter.

The exact arrangement of panel and instruments depending upon the particular installation.

The functioning of this speed control system is similar to the performance of synchronous motors, inasmuch as the direct current motors can be definitely locked together, thereby permitting of no variation in relative speeds. They are different, however, from synchronous motors, in that the direct current motors can be locked together in any desired speed relation, which they will thereafter maintain, whereas synchronous motors can only be run together in one particular speed relation.

There are no synchronous motors used in this system of paper machine drive or control, nor are there any other kind of motors used beside the main section driven motors, with the exception of the small direct current motor driving the master rotary contactor. The section rotary contactor and the master rotary contactor effectively lock the motors together in such a manner that relative speeds cannot be changed except by changing the adjustment of the speed changer, that is, by shifting the belt on the cone pulley; as the rotor of the section rotary contactor operates at all times at absolutely the same speed as the rotor of the master rotary contactor.

Another Likeness

There is another likeness between the synchronous motor and these direct current motors thus locked together, and yet an unlikeness. In the case of any synchronous motor, when a load is thrown on, the revolving rotor of the motor falls back somewhat in angular position or phase relation with the generator which is driving it, or with any other synchronous motor operating from the same frequency source, although it does not lose any revolutions per minute, and continues to rotate at the same speed as soon as this displacement has taken place, and again, when the load has been reduced on the motor, its rotor moves forward a certain degree, thereby again changing its phase relation possibly back to the original value. In a similar manner, when a load is thrown on the direct current motors locked to the master by the rotary contactors, the motor does not change in revolutions per minute, but simply falls back a few degrees in angular displacement or phase relation with the master and with the other section motors being controlled by the same master rotary contactor. Similarly, when the load is thrown off again, the armature or rotor of the direct current motor will move forward a slight amount, thereby

retaining perhaps its former phase position, but in no case will it actually change in revolutions per minute, but will only tend to change the same as does the synchronous motor; and the way in which the functioning of the direct current motors, as referred to, is different from the synchronous motor is that the direct current motor can be so constructed that it may not necessarily have to fall back in angular position or phase relation when a load is thrown on, not even as much as would be necessary in the case of the synchronous motor, inasmuch as the direct current motor can be built with what is known as a flat load speed characteristic.

Examining Method More Closely

Examining more closely into the exact method by which these very simple little rotary contactors are able to do such extraordinary work in controlling the speed of the direct current motors with absolute precision, we find that an operation takes place insofar as electrical effect is concerned, closely related to the performance of the well known voltage regulators, the primary difference, however, being that there are no moving or vibrating contacts or parts such as are used in the conventional types of voltage regulators.

As has previously been stated, the section rotary contactor operates at exactly the same speed as the master rotary contactor. If there is any tendency for the section motor to slow down in speed, thereby causing a slight falling back or angular displacement of the sectional rotary contactor with respect to the master rotary contactor, additional resistance is in this way introduced into the shunt field circuit of the section driving motor, or more correctly speaking, given values of resistance are inserted into the motor field circuit a greater percentage of the time. As a matter of fact, both of these things happen; that is, when the section rotary contactor falls back a few degrees in angular displacement with the master rotary contactor, a given value or values of resistance are cut into the motor shunt field circuit periodically at a relatively high rate of speed, a greater percentage of the total time, and a larger actual value of resistance also may at the same time be automatically introduced. In this way any change in the angular or phase relation of the section rotary contactor with the master causes a change in the voltage impressed across the shunt field circuit of the motor and a corresponding change in field current, thereby synchronously holding the motors together.

All of this regulating operation goes on absolutely without sound and with nothing to be seen.

Control Maintained With Nicety

It is of course, obvious that with such sensitive and positive control and effectually synchronous operation of the direct current motors that the draw of each section can be controlled and maintained with a nicety, and it is of course, unnecessary to make any adjustment at the speed changers unless it is desired to change the relative speeds of the sections.

In the full push button control, that is where the starting equipment is mounted on the section control panels at some remote distance perhaps from the paper machine itself, push buttons are provided for each section and a master push button station for the entire machine. Each section push button station has an inch, a start, and a stop button, and in addition has a lock or safe button which when locked makes it impossible for anyone to start up the section until it is again unlocked with the key. This prevents any injury to employees or damage to the machine by the possible starting by unauthorized persons, or at times when someone might be working on the machine without the knowledge of the operator. The master push button station has a fast and slow button, by means of which the speed of the entire machine can be raised or lowered at will.

The cam starting switches, in the case of the full push button control are motor driven and are started and stopped by the section

push button stations, whereas in the hand starting equipment, the starters are hand operated, the cam starting switches being much the same as in the former case but operated by a hand lever instead of by a small motor. In the case of the hand starters, stop push buttons are provided, however, for each section.

Operation Very Simple

With this type of electrical sectional drive and control the operation is very simple. Assuming that the generator is running, the operator simply pushes the start button and the section driving motor starts, comes up to speed and pulls into phase with the master automatically, and is then held at the desired speed. Every other section can be started up in the same way and can be stopped when desired without interfering with the other sections.

The generator panel and section starting panels, for they are only starting panels, can be located in a room by themselves or at a convenient point on the back side of the paper machine, or at any point desired within a reasonable distance from the paper machine motors. In the case of hand starters, these may be located on the back of the machine or the front side as desired, where found most convenient.

In the case of either direct connected motors or motors with reduction gear units, flexible couplings are provided between the driving motor or gear units and the paper machine intake shaft. This is done in order that any misalignment which may develop on account of a bearing on the paper machine wearing down may not cause any serious accident which might result were a rigid coupling used.

A flexible coupling is also provided in the case of the reduction gear unit, between the motor and high speed shaft of the gear unit.

In all cases where the reduction gear unit is used, both gear unit and motor are mounted on a common bedplate which also carries the small speed changer and section rotary contactor in an inconspicuous position between the motor and gear unit, the speed changer being driven by a small chain drive from a sprocket on the slow speed shaft of the gear unit. In the case of the direct connected motor, the speed changer is driven from a sprocket mounted directly upon the motor shaft.

The type of reduction gear unit usually employed provides a right angle drive which can be made either right hand or left hand to best accommodate the space available, and equipment of this kind for complete electrical sectional paper machine drive can be installed in any plant where a mechanical system of drive has been employed and in the same or less space than was required on the machine room floor for the mechanical system. This and the further fact that with this type of drive no depression in the machine room floor is required to accommodate the gear unit or motor, makes possible the changeover of any and all existing mechanical drives to electrical sectional drive. It is even possible and practicable to change over one section of a paper machine drive at a time in order to prevent interruption of production during the changeover period, part of the machine being driven as before from the line shaft while other sections may be driven from the new section motors, but all will be so synchronized together as not to interfere with the usual operation.

Evidence of Durability

Evidence of the durability and reliability of electrical sectional drive is to be seen in the performance obtained from drives of the earlier type installed some ten or twelve years ago. The installation which was made of a Westinghouse sectional paper machine drive at the Defiance Paper Company, Niagara Falls, N. Y., on a 90' Pusey and Jones Fourdrinier machine, has been in practically continuous operation for twelve years, and is in excellent condition today, no repairs of any consequence having been made to the motors, generator, gears or control equipment. As a matter of fact, there has never been an armature or field coil repaired or

replaced. The reduction gears used are open spur gears with rawhide pinions. The life of the rawhide pinion has been about three years, which means that there have been about three replacements of the pinions, but the gears have shown no appreciable wear.

More Recent Installations

The more recent installations of sectional paper machine drive, employing reduction gear units, are similar in general characteristics, except that the gear units now used are of totally enclosed type and of more refined form, the starting equipment has been greatly improved, and most important of all, automatic speed control means have been provided. Systems of this type are now in operation at the Abitibi Power and Paper Company, Iroquois Falls, Ontario, on a 158" Pusey & Jones Fourdrinier paper machine having a speed range of from 400 to 1,000 ft. per minute; at the Arrowhead Mills, Fulton, N. Y., on a 144" Rice Barton & Fales cylinder board machine, having a speed range from 50 to 200 ft. per minute; and at the West Virginia Pulp and Paper Company plant at Tyrone, Pa., on a 168" Pusey & Jones Fourdrinier book machine, and also on a 98" Fourdrinier book machine, both of which machines have a speed range of from 250 to 500 ft. per minute.

The electrical installation of sectional drive on the 98" Fourdrinier book machine at the Tyrone plant of the West Virginia Pulp and Paper Company, is of the latest improved and simplified form of speed control, using the master and section rotary contactors which I have already described.

Westinghouse sectional paper machine drive is to be installed at the Washington Pulp and Paper Company, Port Angeles, Washington, on their new 164" Bagley & Sewell Fourdrinier news print machine, to have a speed range from 400 to 1,200 ft. per minute; for the Brown Company, Berlin, New Hampshire, on their

new 136" Bagley & Sewell Fourdrinier machine, to have a speed range of 400 to 1,200 ft. per minute; and at the Riverside Fiber & Paper Co., Appleton, Wisconsin, on their new 120" Beloit Iron Works machine, which will have a speed range ratio of 7 to 1.

Applicable to All Types

I have tried to point out to you that sectional paper machine drive is applicable to all types and speeds of paper machines from the highest speed to the lowest speed, and for any and all ranges of speed, and not only that it is applicable but that it has been tried and demonstrated to be satisfactory and efficient.

I have also endeavored to show how that even in old mills where but little space is available, sectional drive can be installed, and the many advantages be obtained from its use.

In the case of new mills or new machine rooms where sectional drive is to be installed on high speed paper machines, it is possible to use either direct connected motors or drives with reduction gear units inasmuch as provision can be made in the building construction to accommodate direct connected motors if desired, and the choice between direct connected motor and motor with reduction gear unit should be made on the basis of efficiency, performance, economy, and general suitability to the particular case, it being possible to obtain entirely satisfactory performance in the case of most medium and high speed machines with either direct connected drives or motors with reduction gear units.

Sectional paper machine drive with its simplicity, flexibility, and adaptability is now within the reach of every paper mill and suitable for every paper machine drive. Therefore, for the common good of the industry and for your own prosperity in particular, let the Electrical Way be the foreword, and let your installation be the Best Electrical Way.

HANDLING WOOD ROOM EQUIPMENT*

By F. J. CARROLL, SIMONDS MFG. CO., CHICAGO

In the preparation of a paper covering the above subject, one naturally leans to that part of the wood room equipment which is most familiar to him, hence I will confine my remarks to the care of saws and machine knives.

If I can indulge on your good nature for a few moments to tell you a little about how saws and knives are manufactured, I know that I will be able to make my talk more interesting and instructive.

Many Operations Necessary

It may surprise you to know that in the manufacture of a chipper knife for instance, there are fourteen distinct and separate operations before it is finished, and about the same number in the manufacture of a saw. Each operation is under the supervision of an expert in order that each saw and knife be uniform in quality.

I was reading a Government report recently on "Reforestation" and was somewhat surprised to learn that there is cut each year in the United States, about five and one-half million cords of wood, to be ground or cut up into pulp to make paper. Also that one New York paper alone uses about two thousand acres of forest a year.

In the manufacture of this vast amount of wood into paper, saws and machine knives play an important part, indeed, and it is no wonder that the saw and machine knife manufacturer has to produce an article that will do this amount of cutting and do it well.

It is most essential that the saw and knife be made from the right kind of steel in order to get the best results; also that they be heat-treated properly so that they will retain their cutting edge and do good work.

In the manufacture of steel for saws and knives, it is absolutely necessary to have the right kind of steel, or what we term, the correct mix, in order to obtain the best results and every manufacturer of saws or knives is always on the alert to improve his steel if possible.

As with the manufacture of paper, so with the manufacture of steel. It is necessary that you have the correct proportion of sulphite, groundwood and sizing in order to get a satisfactory sheet. In steel, we have to have the correct amount of iron, carbon, scrap and whatever alloy is used to get a steel that will serve as an edge cutting tool.

In order to make a uniform article of steel, it is most essential that a manufacturer know what his steel is made from, and the most successful ones are those that are able to manufacture their own steel for their saws and knives.

Proper Care of Saws and Knives

In the handling and care of wood room equipment, such as I have been referring to, it is important that they be given the same attention as other operations which may seem more important, in order to get the best results, and this leads me to the point where I wish to say a few words as to the proper care of saws and knives.

Knives to be properly hardened should be thoroughly annealed and brought to a state of complete relaxation. This causes a more uniform hardening and lessens the liability of so-called Hard and Soft Spots. To obtain the best results in the heat-treatment of steel, the exact ingredients of the steel must be known and the metal heat-treated accordingly.

Perfect hardening, however, will avail nothing, if a suitable temper is not given for the kind of work the tool is expected to

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, Mich., June 1-3.

do. Whenever possible the kind of wood to be cut and the conditions under which it is done should be known. The knife manufacturer is then in a position to furnish the temper best adapted for this particular condition.

Oil tempering is generally recognized as being superior to any other method heretofore used, for by its circulation it permits a uniform heat throughout the bath and has penetrating qualities superior to any other method. The degree of hardness is determined by the temperature of the oil while the time of immersion is governed by the mass of metal and thickness of the material.

After all these desirable qualities are imparted to the steel, they may be rendered useless in an instant by improper grinding.

Tools Frequently Ruined in Grinding

There are probably more tools ruined in grinding than from any other cause and governing this, are several reasons, which, if kept in mind, will eliminate a great deal of expense and annoyance. Among these are the kind of metal being ground, speed of the wheel, grade and grain of the wheel, pressure applied to work, and probably the most important of all, the cooling medium and how it is applied.

Water is usually used for this purpose with good results. To be more effective it should be applied as close to the point of contact as possible as this is where the heat is generated. Too much water cannot be used and an insufficient amount is as bad or in fact worse than none at all. The reason for this will be readily understood when it is borne in mind that the heat is generated at the point of contact and when the volume of water is not great enough to absorb and carry away this heat, a segregated area of highly heated steel is set up, surrounded by a hard unyielding metal.

The localized expansion set up by this small heated area results in producing undue strains in the metal which will distort the knife, cause soft spots by drawing the temper and if carried a little farther, will result in cracks, caused by small particles of water striking the over-heated metal, and also causing small cracks by the rapid local contraction of the steel.

Wheels which are too hard or run at too high a speed will also bring about this condition. Some care should also be given the condition of the wheel and machine.

A grinder with badly worn bearings or other working parts will cause excessive vibration which will at times cause unequal pressure at the point of contact. Care should also be used to see that the wheel does not become clogged or loaded. Both of these conditions will cause over-heating. In a glazed wheel the small abrasive particles or cutting points break off instead of dislodging and allowing new points to come into play. This denotes too soft a wheel, while in a loaded wheel the cutting points do not break or dislodge, but the areas between become clogged or loaded with the material being ground, and ceases to cut effectually. This denotes too hard a wheel.

When a grinding wheel becomes small in diameter it leaves an excessively concave bevel which impairs the strength of the cutting edge. As a small wheel rapidly decreases in efficiency it is usually economy to replace with a new one. It is sometimes thought that a grinding wheel is a grinding wheel, and should cut under any conditions. This is a mistaken idea. The hardness and grain or fineness of a wheel should be determined by the material to be cut. As a rule, the harder the metal the softer the wheel should be and vice versa. Within certain ranges this can be remedied by increasing or decreasing the speed as the case may be, but where the range varies very much it is economy to procure the proper wheel.

Bevel an Important Matter

The length of the bevel on a knife is another important matter. The manufacturer of knives, through years of experience, can determine the length of the bevel best adapted for a particular knife and it is well to retain, if possible, this same degree of bevel in regrinding. If the bevel becomes too long it weakens the cutting

edge and if too short you will run into cutting trouble and also the knife might not clear itself. It is good policy, however, to shorten the cutting bevel during the winter months in the north, for the Barker and Chipper Knives are under a terrific strain when cutting frozen woods.

As to solid and plated steel knives this is a matter of personal opinion as to the best results obtained from each, and a knife manufacturer is always willing to furnish one or the other, but my personal opinion is that a solid steel chipper knife is the best knife.

If it is important to run knives with care and attention, it is also important that saws be given the same attention and care.

The teeth should all be of the same length, so that each tooth does an equal share of the cutting. They should have the correct pitch for their particular purpose.

Main Reasons for Cracking

One of the main reasons for cutoff saws cracking is because the teeth are too long. The main purpose of the gullets is to contain and carry out the sawdust and therefore they should not be larger in area than the amount of timber severed by each tooth as determined by multiplying the amount cut by each tooth by the depth of the cut.

To illustrate, if each tooth cuts 1/16 of an inch and the log is 16 inches in diameter, you will have one square inch of sawdust that each gullet must carry off.

As a rule we find the gullets two or three times larger than necessary.

Inasmuch as cracking is usually the result of vibration you will readily understand that the longer teeth are more subject to vibration than the shorter or stiffer teeth. Also in this connection it is well to bear in mind that a narrow gullet concentrates whatever vibration there may be in the teeth and therefore causes cracking whereas with a shorter tooth and wider gullet these vibrations are distributed over a greater area of the saw blade without doing any damage.

Another cause of saws cracking is that some saws are run for too long a time without having the tension restored by hammering. Due to the wearing away of the rim or tire, of a saw, it gets into a condition which saw makers term, fast under the gullets, which causes repeated undulation or vibration of the rim. It is therefore imperative that the saws be left opened or tensioned properly for the speed they are to run. In the winter sawing it is better to reduce your set and shorten the bevel to get the best results.

The pitch or hook of the teeth should be determined by the position the saw occupies in relation to the material being cut. If the work passes above the center of the saw it can have more pitch than if the work passed beneath the center where too much pitch would have a tendency to pull the work onto the saw which might cause accidents or breakage of the saw.

Wallpaper Industry Returning to Normal

[FROM OUR REGULAR CORRESPONDENT.]

NIAGARA FALLS, N. Y., June 5, 1922.—That business in the wall papermaking industry is fast returning to normal is indicated in announcement made today that the Defiance Paper Company and the Niagara Wall Paper Company, subsidiary concerns, will immediately enlarge their plants to meet the demands for increased business.

According to a statement issued by Thomas M. Uptegraff, vice-president and treasurer of both companies, old buildings at Second street and Walnut avenue will be torn down and replaced by modern structures. Another paper-making machine will be installed and the capacity of the plant increased from about 25 to 50 tons a day. About 100 additional employees will be put on, making about 350 to be hired when the new plant is operated late this year. Two additional printing machines will be added to keep up with the rush of orders. The total expenditure for the new improvement is estimated by Mr. Uptegraff at between \$150,000 and \$200,000.

HOW COST SYSTEMS HELP SUPERINTENDENTS*

By C. OLIVER WELLINGTON OF SCOVELL, WELLINGTON & CO., ACCOUNTANT ENGINEERS, BOSTON, MASS.

Many financial executives think that the term "cost system" means merely a clerical department which is engaged in working out the costs of the different products in order to determine proper selling prices and put the greatest sales efforts on the most profitable lines. Although the selling and financial advantages of a cost system are very important in helping the business to make more money, a properly designed system is of even greater help in controlling the manufacturing operations.

The trouble with many cost systems is that they have been developed from the office down to the mill, having in mind solely the sales and financial viewpoint, instead of being developed from the mill up to the office, to conform to the actual operating conditions in the mill. A system developed from this latter viewpoint is more practical in its operation, and yet at the same time it can be tied-in with the financial books and will give not only the necessary manufacturing figures but also complete sales and financial statistics. If the man developing the system knows the mill conditions, and appreciates the problems which the superintendent must face from day to day, he can build up reports and records which are really helpful and which are not merely so much "red tape."

Labor reports, material reports, and production reports are kept in every business no matter whether it has a cost system or not. All that a properly developed cost system requires is that the labor, material, and production information come in promptly, regularly and in satisfactory form, and there should be very little, if any, extra work required in the mill in preparing such reports.

The first thought of the cost department should be service to the superintendent. It is much more important that the superintendent know currently, for each tour, the production of each department and operation, compared with the number of employees in the department, and a record of any time down and the causes thereof, than it is for him to know several days or weeks later that a particular order has cost so many cents per pound. Although this last information is important, it is merely the result of work that has been currently done; and if the cost is unduly high, it is too late to make any corrections. On the other hand, current reports while an order is in process will often lead to immediate correction and savings.

Budget Cost vs. Actual Cost

The standard plan adopted by the Cost Association of the Paper Industry emphasizes the advantages of the budget system for determining costs. Although actual costs are important, their value cannot be appreciated except as they are compared with some standards. Consciously, or not, we all use standards daily and hourly in our own lives. These standards change from time to time with varying conditions, but all the time we have definite ideas that certain results are reasonable and certain ones are unreasonable, and in the latter cases we immediately take steps toward correction.

A budget cost system means merely the careful review and analysis of the operating costs, and then the setting up of reasonable standards with which to compare the actual results. These standards of cost are similar to standards you undoubtedly have; such as the pounds, weight and width of a certain furnish that should be made per hour on each machine, the speed that a certain machine should run with a certain grade and weight of paper, or the percentage of finishing waste that is reasonable for each finishing operation.

*Read at the joint convention of the Cost Association of the Paper Industry and the American Pulp and Paper Mill Superintendents' Association, Kalamazoo, June 1-3.

You are all more or less familiar with the methods followed in developing a cost system on the budget plan. Each department is charged with the floor space it occupies, with fixed charges of interest, taxes, insurance and depreciation on the investment re-

COMPARATIVE STATEMENT OF BURDEN

DEPARTMENT	Paper Machine No. 1 118"			Productive Unit-Machine Hour		
	STANDARD	ACTUAL	GAIN*	AMOUNT	AMOUNT	GAIN*
<small>*BASED ON 100% EFFICIENCY. THIS FORM IS SUITED TO DIFFERENT TYPES OF OPERATIONS.</small>						
		Jan. 28, 1922	Feb. 25, 1922	March 25, 1922		
ANALYSIS	No.					
Labor (Cumulative Totals on Red Lines)						
Machine Tenders	\$1,802	1,737	65	1,603	1,725	77
General Labor	67	51	16	47	82	*15
Supplies						
Felts	763	871	*208	656	107	736
Wires	410	700	*290	580	*170	320
Belting	12	7	5	44	*32	9
Lubricants	58	37	21	64	*6	47
General Supplies	57	40	17	71	*14	72
Repairs to Buildings	54	112	*58	14	40	82
Repairs to Machinery and Equipment	538	693	*155	547	*9	563
Total Direct Charges	5,761	4,348	*1,413	3,628	135	3,636
Water	45	57	*12	26	19	56
Steam-Process	916	902	14	883	33	893
Electric Power	1,187	1,201	*14	1,152	47	1,197
Compensation Insurance	33	31	2	28	5	31
General Mill Burden	568	575	*7	608	*40	567
Fixed Charges	1,387	1,387		1,387	*47	1,387
Total Burden	\$7,897	8,501	*604	7,710	187	7,787
Burden Earned		7,520	*377	7,188	*417	7,942
Burden Unearned	\$3,981	*981	*522	*522	155	*155
Rate per Machine Hour	\$ 15.10					
Machine Hours Charged to Cost	523	496	*27	476	*47	526

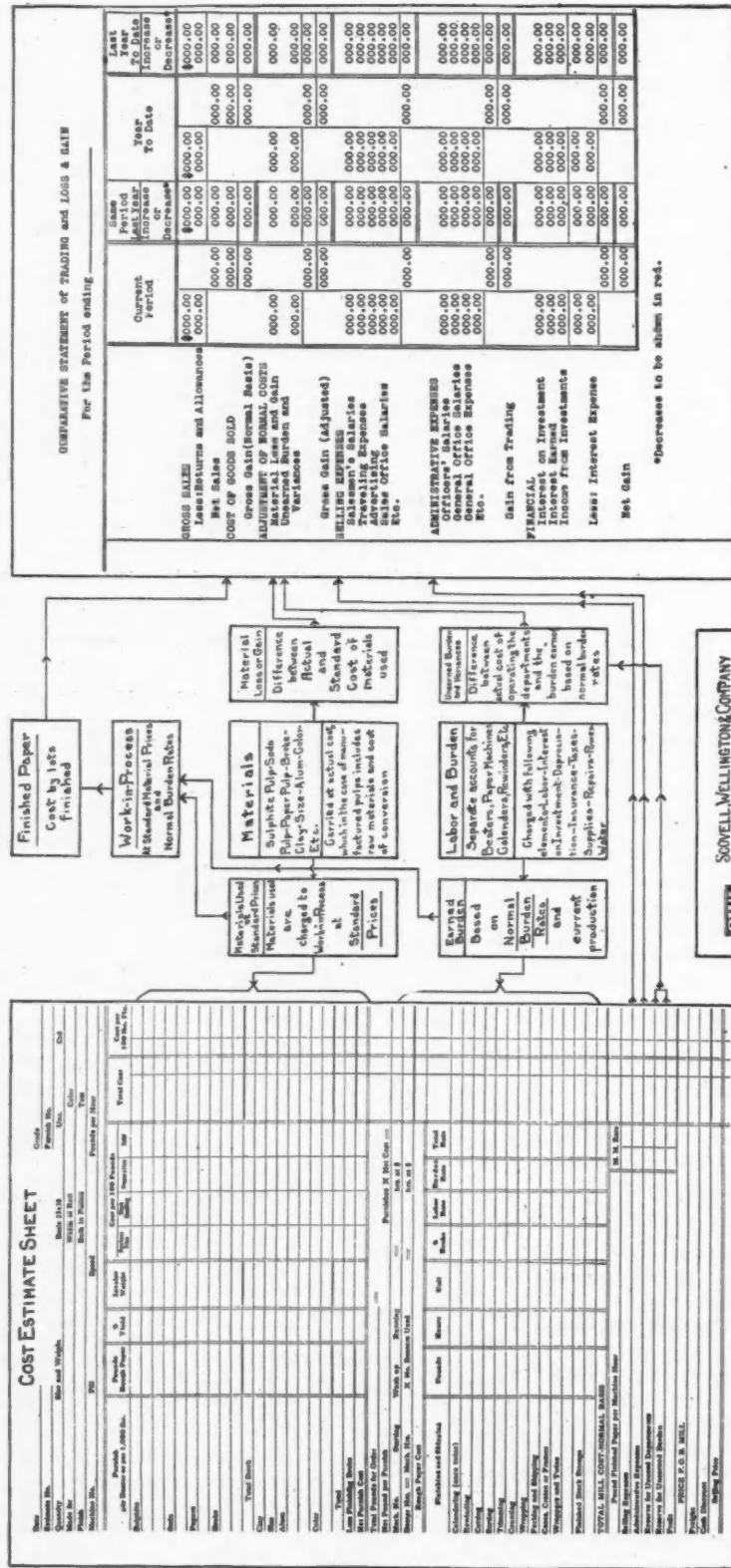
quired, and with its share of water, steam, power, and general mill burden, and with its consumption of supplies, labor, repairs, and other direct charges. The total cost as figured for the department or operation is then divided by some unit of production, preferably the machine-hour, to give a rate which is used in figuring the cost of work done.

Comparative Statement of Burden

The accompanying form which is filled in with items and figures, illustrates the kind of operating statements that the superintendent of every mill should have each period of four weeks. The first money column shows the standard or budget set up for this particular department, which is Paper Machine No. 1. This budget shows in detail the labor, supplies, and repairs, in total making up the direct charges, which are most definitely under the control of the superintendent. Below this total are shown the service charges for water, steam, etc., which are distributed to this and other departments in accordance with their requirements; a proportion of the general mill burden, and the fixed charges of interest, taxes, insurance, and depreciation, as already mentioned.

The total burden divided by the total machine hours reasonably expected to be operated in a four-week period, gives the rate per machine hour of \$15.10, as shown. The standard total of 523 hours, you will note, is slightly less than 22 hours a day, which is all that is expected to be charged to orders, in this case used

DIAGRAM SHOWING CONNECTION BETWEEN ESTIMATE SHEET, ELEMENTS OF COST AND PERIODICAL STATEMENT



as an illustration. The balance represents lost time due to starting and stopping at the beginning and the end of the week, and necessary repairs and general washups during the week. No allowance is made for time down for lack of orders, as that is represented by unearned burden, and is usually due to causes outside the control of the superintendent.

In the next two money columns, under the heading "Jan. 28, 1922," are shown the actual operating costs for the first period. In the second of these columns, under the heading Gain, are shown the gains or losses as compared with the standard. Opposite the item Total Direct Charges you will note that there has been a loss of \$587 in direct charges for the period, and opposite the item Total Burden a loss of \$604, which is the excess of actual expenses over the estimate. During the period there was charged against the cost of work done only 498 hours on the machine as compared with the estimate of 523 hours, or a loss of 25 hours. This 25 hours, multiplied by the standard cost per machine hour of \$15.10, gives the loss of \$377, due to not running at full capacity as figured. The final result of the losses from excess operating costs and unused capacity is a total loss of \$981.

For the second period ended Feb. 25, 1922, similar figures are shown. In addition to the figures for the current period on the blue horizontal lines, the cumulative totals for the two periods are shown on the red horizontal lines immediately below the figures for the current period.

The third set of columns shows corresponding figures for the third four-week period. As this sheet is designed to be used in a ring binder, the succeeding periods of the year would be carried out on the opposite page. With a statement like this for each department or operation, you can see at a glance where you are gaining or losing as compared with the standards, and you do not have to depend solely on personal observation, or on verbal reports that you may get from time to time. This statement, of course, does not take

SUMMATIVE STATEMENT OF TRADING AND LOSS & GAIN
For the Period ending _____

	Current Period	Same Period as Last Year (Increase or Decrease)	Year To Date	Last Year To Date (Increase or Decrease)
GROSS SALES	\$000.00	\$000.00	\$000.00	\$000.00
Less Returns and Allowances	000.00	000.00	000.00	000.00
Net Sales	000.00	000.00	000.00	000.00
COST OF GOODS SOLD	000.00	000.00	000.00	000.00
ADJUSTMENT OF NORMAL COSTS	000.00	000.00	000.00	000.00
Unearned Burden and Variance	000.00	000.00	000.00	000.00
Gross Gain (adjusted)	000.00	000.00	000.00	000.00
Less: Salaries	000.00	000.00	000.00	000.00
Traveling Expenses	000.00	000.00	000.00	000.00
Advertising	000.00	000.00	000.00	000.00
Office Salaries	000.00	000.00	000.00	000.00
Etc.	000.00	000.00	000.00	000.00
ADJUSTED NET GAIN	000.00	000.00	000.00	000.00
OFFICIALS' SALARIES	000.00	000.00	000.00	000.00
General Office Expenses	000.00	000.00	000.00	000.00
Etc.	000.00	000.00	000.00	000.00
Gain from Trading	000.00	000.00	000.00	000.00
Interest on Investment	000.00	000.00	000.00	000.00
Interest Earned	000.00	000.00	000.00	000.00
Income from Investments	000.00	000.00	000.00	000.00
Less Interest Expense	000.00	000.00	000.00	000.00
Net Gain	000.00	000.00	000.00	000.00

Decreases to be shown in red.

SOVELL, WELLINGTON & COMPANY
ACCOUNTANTS-ENGINEERS
BOSTON NEW YORK CHICAGO
SPRINGFIELD CLEVELAND

the place of daily and weekly reports, but it does summarize the results for each four-week period; and as improvements are made in the operating results, they will be clearly shown.

Complete "Tied-in" System

In considering the comparative statement of burden and other similar reports, it is great satisfaction to a superintendent to know that these reports are part of a complete "tied-in" cost system wherein every expenditure is accounted for. You will want to be sure that you are not being charged with expenses that do not properly belong to you, and that you are being charged with everything that should be included; and you cannot have this assurance unless you know that the cost system is part of the general financial accounting.

Whenever there is an item on one of these reports that is not clear or seems incorrect, further information can readily be produced by the cost department, and the total of these reports for all the operating departments shows on the current financial statement as the item Unearned Burden and Variances. If you will refer to the accompanying chart in the section at the right, you will find Unearned Burden and Variances on the Comparative Statement of Trading and Loss & Gain under the heading "Adjustment of Normal Costs." The cost is first figured on the normal or budget basis, and then the differences between the standard and the actual costs are added or deducted to give the adjusted gross gain on the paper sold. Deducting from this the selling and administrative expenses, and the financial items, gives the *net gain* for the business, which is in proof with the balance sheet.

Basis on Which System Is Built

Although this chart illustrates primarily the importance of a cost system from the sales standpoint, it shows the basis on which the system is built up and the close connection between the operating costs, the cost estimate and the final financial results. Back of this summary are the individual sheets for the operating departments showing you in detail just what each has been doing, both actually and in comparison with the standards set up.

Sheets for individual departments, or at least some of the figures on these sheets, can well be given to the heads of those departments so that they will have a current measure of what they are accomplishing. It is also a good plan to tell the machine tenders (to stick to our illustration of Paper Machine No. 1) that it cost the company \$15.10 per hour for their machine, as, with this knowledge, they appreciate more clearly the loss to the company when the machine is down.

Danger of Average Costs

We still occasionally find cost systems built on the basis of averages, thus obscuring individual facts of real importance. For example, some mills figure a machine-hour cost, but include in this cost all of the preparatory and finishing operations which have nothing directly to do with the paper machines. As a result, they cannot determine the true relative cost of producing a paper with a large percentage of purchased pulp as compared with another paper with a large percentage of half stock made from preparing rags or papers. They cannot get a true comparison between papers that are sold in the roll, or with very little finishing, and others that require a good deal of finishing, and therefore a heavy investment in finishing equipment as well as power and other expenses in addition to the direct labor, which they may keep separate.

The danger of such systems is that they give a false sense of security. The world seems to have many people who know things that "ain't so." You may have found such people in the paper industry, and it is up to all of us to spread the gospel of better education on cost principles and clearer knowledge of real costs.

The practical advantages of having real costs as compared with average costs have been proved again and again. In the case of

one mill in which we installed a cost system several years ago, the average cost that they had used was very accurate in total and checked out closely when they took a physical inventory. Yet we found that the cost of individual products varied considerably from the average they had used. They were selling some papers at a considerable profit but others at a heavy loss.

Paid on First Order

In another mill making specialties they thought, on the basis of their average cost, that they were getting a fair price on a rather fussy product for a particular customer. When the results of the new cost system showed the real cost of the first order made of this specialty the loss was so great that they immediately took the matter up with the customer, showed him the cost figures and obtained an increased price. The difference in price on the very next order more than paid for the total cost of installing the system.

Similarly experiences can undoubtedly be related by many of you who have helped to work out a real cost system by which you determine the cost of each lot of paper made. Although the errors may not have been so large or so obvious, many superintendents have been led to wrong conclusions by using averages to check up operating results. Averages are often useful, but they must be watched carefully and frequently picked to pieces to be sure they are giving information and not mis-information.

While the cost of each lot is important to the sales department in checking up estimates and making prices, the comparison with the last previous lot, or earlier lots of the same grade and weight, gives very valuable information to the superintendent. Although many practical paper mill men are able to guess very closely as to what a paper costs, and may not in the first instance feel the need for a system, we find the most practical superintendents are the ones who make the greatest use of the cost figures, if they have had a hand in developing the system and are satisfied that the figures they are getting are reliable and tell the whole truth.

Conclusion

These are times when operating expenses must be watched as never before. It is not enough merely to reduce expenses. That is important, but what makes money for the company is to reduce expenses in proportion to the production, that is, reduce the *unit* cost of the product made.

In a mill that is conducted with reasonable efficiency, it rarely happens that a very large saving can be made on any one item. Improvement will come by a little saving here, a little greater production there, a better balancing of departments, and a tuning-up all through the mill. Set your standards on a reasonable basis, and then have the cost department report to you daily, weekly, and monthly how much you are gaining or losing as compared with the standards. Each little improvement will not, by itself greatly affect the total expenses of the mill, but it will show up clearly in the operating statements for the individual department, and in the course of time you will be surprised at the total general savings that have been accumulated.

The cost department is a net loss or a dead expense to a business unless it is used, unless the information obtained is made available promptly to the executives. Your cost department undoubtedly asks you and your men for a lot of reports of various kinds. If in return they do not give you back information which is valuable in itself and which is reported in a form that clearly shows what is going on, the cost department is not fulfilling its real function in your business, and is not helping you to run the mill most effectively.

If you don't get the information you want and get it promptly, kick, and keep on kicking until you get what you want when you want it. Superintendents in other mills are getting valuable operating information and using it, and in times like the present no superintendent can afford to take chances in running his mill without complete and up-to-date information.

PRODUCTION OF HALF-STUFF FROM WASTE PAPERS*

By E. G. MILHAM, BRYANT PAPER CO., KALAMAZOO

As practiced at the present time, the production of half-stuff from graded waste papers may be divided into four distinct operations, namely:—sorting, dusting, cooking and washing. The first two operations have become pretty well standardized and will consequently receive comparatively little attention in this paper. However, the last two processes, cooking and washing, are in a state of rapid development and are entitled to considerable attention.

Sorting

The sorting operation involves the inspection of stock going into the process and the removal of undesirable foreign materials and of papers containing groundwood or other unbleachable fibers. In addition to this, it involves the blending of the sorted papers in such a way that the papers in different cooks will be as nearly uniform as possible. For example, colored papers or papers carrying a large amount of solid inks are blended with white papers carrying comparatively little ink so that the resulting mixture will represent as nearly as possible, the average run of papers.

At present, there are two methods of sorting, known respectively as the screen method and the carrier method. In the former, the papers are thrown from the bale into a 4' x 6' box provided with a heavy screen bottom, and sorted from this box into barrels. The barrels are then trucked from the various screens to the dusting or shredding machine. The advantages of such a system are very apparent and may be summed up briefly as follows:

1. It makes it possible to put the sorting on a piece work basis.
2. It enables the foreman to check up on each sorter, since the sorted papers are again looked over as they are fed into the dusting machine.
3. It makes the proper blending of stock a comparatively easy matter.
4. It enables the sorting room to run continuously and without interruptions caused by temporary shut downs of the dusting or cooking departments.
5. It makes it possible to do the sorting in parts of the room where the best light is available.
6. The resultant of these five advantages is cleaner sorting, better blending, more uniform half-stuff and cleaner paper.

The disadvantages of the screen system are:

1. Excessive labor costs.
2. Excessive space requirements for both screens and barrels.
3. Excessive wear on floors.

In order to overcome these very serious disadvantages, many mills have discontinued the screen system and have adopted the carrier system. The latter consists of sorting directly from the bale onto a belt conveyor or carrier which is attached to the dusting machine.

The advantages of this system over the screen system are:

1. An enormous saving of labor, often amounting to six to eight cents per 100 pounds.
2. Greatly decreased floor space.
3. Greatly increased output per sorter.

Among the disadvantages of the carrier system we have:

1. Careless sorting, since no check-up is possible.
2. Frequent interruptions of the sorting due to clogging of dusters, temporary shut-downs, etc.
3. Excessive rushing to make up time lost by interruptions.
4. Little opportunity to blend different types of papers properly.
5. Dirtier and less uniform paper.

Upon summing up the advantages and disadvantages of the two

systems, there can be little doubt but that, from a quality standpoint, everything is in favor of the screen system and that from a cost standpoint, practically everything is in favor of the carrier system. There can be little compromise between the systems. The screen system is unavoidably expensive and the carrier system, by its very nature, does not lend itself readily to close sorting and blending. The whole subject of sorting systems becomes a question of whether quality shall be somewhat sacrificed in order that low costs may be obtained. The proper answer to this question is obviously up to the management of each individual mill.

Dusting and Shredding

During recent years, many paper mill superintendents have discovered that the so-called dust removed by the various types of dusting machines is composed largely of perfectly good fiber. This has led them to believe that there is such a thing as over-doing the dusting operation, especially in cases where finely torn papers are not required by the cooking process. In the case of the rotary and vat cooking processes, which are by far the most prevalent today, it is only necessary that the stock be opened up and that the heavier stitches be broken. Consequently, where these processes are in use a very slight shredding and a light dusting in a fan duster is about all the preparation which a stock requires before going to the cookers. As a matter of fact, in many book mills where heavily stitched stock is not used, it is customary to sort the stock directly into the cookers without any preliminary treatment at all. This, however, is not a safe practice and should not be followed unless exceptional stock is used.

Cooking

The cooking process, as you all know, consists of treating the stock with soda ash in such a way that the ink, size, etc., in the papers are saponified or rendered soluble so that they may be washed out with water. At present there are three distinct processes which are accomplishing this work. These are, the vomiting tub process, the rotary process, and the vat process. As these processes are rather interesting, they will be dealt with in some detail.

Vomiting Tub Process

In cooking papers by the vomiting tub process, the sorted papers, which have been dusted and torn very fine, are thrown into a specially constructed tank of about five thousand gallons capacity. This tank is provided with a perforated false bottom and a six-inch vertical spray pipe arranged in way that hot soda ash liquor may be intermittently sprayed over the papers in a manner similar to that of the ordinary coffee percolator. The hot liquor sprayed onto the papers at the top of the tank gradually trickles down through the papers and through the false bottom of the tank, whence it is again forced up through the spray pipe by means of a steam injector provided for the purpose. During the cooking period, which lasts from eight to fifteen hours, the stock is sprayed six to ten times per minute with the hot liquor. At the end of this period, a simple hoisting mechanism is attached to the spray pipe which, in turn, is attached to the false bottom of the tank, and the entire six or seven thousand pounds of cooked papers are gradually raised from the tank. The papers are then forked by hand into carts and hauled to the washer room, where it is necessary to fork them into the washer.

The advantages of this process may be enumerated as follows:

1. The original investment is very small.
2. The space required is very small.
3. The consumption of soda ash is moderate (about 6 per cent for book stock).

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

4. The steam cost is low, since it is necessary to heat only two pounds of water per pound of stock cooked.

To counterbalance these slight advantages we have the following:

1. Enormous labor costs which are three to four times that of the rotary or vat processes.
2. Constant danger of poor cooks due to faulty manipulation.
3. A dirty, wet, and steam filled cooker room.

These very serious disadvantages are rapidly making the vomiting tub process obsolete.

Rotary Process

In the rotary process, the sorted and dusted papers are put into a horizontal cylindrical boiler about 9' Dia. x 25' long. Water is added in the ratio of about two and one-half pounds of water per pound of stock and the required amount of soda ash solution is added. The man-hole covers are then put in place and the stock cooked at about 30 lbs. steam pressure for six to ten hours while the boiler is rotated at a speed of $\frac{1}{2}$ to $1\frac{1}{2}$ revolutions per minute. At the end of the cooking period, the pressure is relieved, the man-hole covers removed and the rotary again revolved until the entire twelve thousand pound charge of papers has run through the man-holes into a hopper shaped pit located directly beneath the rotary. From this pit, the stock is pumped directly to the washer.

This process has many advantages, namely:

1. The labor cost is about one-third that required by the vomiting tub process.
2. The process is very nearly fool proof.
3. It avoids the necessity of tearing papers up fine, which results in lower dusting costs and losses.
4. It provides a clean, dry, and practically noiseless cooking department.

The disadvantages of the rotary process are:

1. A rather high first cost.
2. A rather large space requirement.
3. A higher steam cost than the vomiting tub process, since more water has to be heated to a higher temperature.
4. A sudden draft of steam at the beginning of the cook.
5. Somewhat higher power costs than the vomiting tub process, since everything is pumped rather than handled by hand.

In spite of these few disadvantages, the rotary process is giving very good satisfaction and there can be little doubt, but that the rotary process can cook paper stock just as economically and well as any other process in general use at the present time.

Vat Process

Under the head of vat processes can be included all those which cook at 5 to 8 per cent consistency. In these cases the sorted and dusted papers are put into tanks provided with agitators or into special cooker-beaters provided with tight fitting covers. The required amount of water and soda ash is put into the cooker and the steam turned on. By the time the required amount of papers have been added, the temperature is very near the boiling point. The temperature is maintained near the boiling point for about an hour, which is sufficient cooking time for most classes of paper stock. After the cooking period has been completed, the stock is pumped to a storage tank, to the washer, or to a special defibering apparatus, which will be mentioned later.

The advantages of the vat process are as follows:

1. Extremely low first cost.
2. A slight saving in labor over the rotary process, since practically no labor is required to load the vats.
3. A saving of about 25 per cent of the soda ash required by the rotary process, since the high dilution promotes contact between the soda ash and the papers.
4. A stock is produced which is easier to de-fiber and wash than rotary stock.

The disadvantages of the vat process are as follows:

1. An enormous amount of steam is required since it is neces-

sary to boil sixteen pounds of water for every pound of papers cooked.

2. A large storage space is required if sorting room is run only eight hours per day.

3. The process is not as fool proof as the rotary process.

4. Less uniformity is obtained, due to the fact that it is necessary to cook smaller batches than in the case of the rotary process.

It will be noted that the high steam and storage costs are very serious disadvantages. In fact, these very disadvantages are enabling the rotary process to compete with the various vat processes very successfully at the present time.

Washing

By far the most interesting phase of paper stock treatment is that of defibering and washing the cooked stock. At present, there are three distinct processes for doing this work. They are: 1. Processes where defibering and washing are carried out in one operation. 2. Processes where defibering is carried out in a separate unit and washing is accomplished by means of an improved intermittent type of washer, working on the principle of progressive dilution. 3. Processes where defibering is carried out in a separate unit and washing is accomplished by means of a continuous washer working on the principle of alternate dilution and extraction.

Process No. 1. The Beater Washer

As the name indicates, this washer is an ordinary beater provided with drums for extracting dirty water. Clean water is added in front of the roll, is mixed with the stock as it passes under the roll, and is extracted behind the roll. It will be noted that the beater roll performs the triple function of circulator, mixer, and defiberer, which may or may not be advantageous. In fact, about the only advantage which can be claimed for this type of washer is its simplicity.

The disadvantages of the beater-washer are many and varied. They may be summed up briefly as follows:

1. The power consumed is very excessive, often amounting to 200 horse power hours per ton or about fifteen cents per hundred pounds of papers.
2. The amount of water used is excessive, since it is only partially mixed with the stock before it is extracted.
3. The beater roll tends to grind the dirt into the stock, which makes complete washing very difficult.
4. The original investment is necessarily very high, since one 2,000 lb. washer will handle only four or five tons per twenty-four hours.
5. The floor space required per ton per day is excessively high.

It will be noted from the above comparison that nearly everything is against the beater type of washer. In fact, it is quite probable that within a very few years this type of washer will become obsolete.

Class No. 2. Intermittent Washers for Defibered Stock

This class of washer has been developed because of the fact that fully defibered stock can be washed more rapidly, completely and economically than semi-defibered stock. To accomplish this, many clever devices have been developed for defibering cooked stock more or less completely. Some of these devices do the work by violently churning the stock in a closed space by means of impellers driven at high speed. Others achieve the same result by discharging a stream of stock at high velocity against an opposing stream of stock also discharging at high speed. Of course, there are multitudinous claims and counter-claims for the various types of defibering apparatus. However, it has been the writer's experience that from the standpoint of economy and quality of output, there is very little difference between the three types of apparatus.

There are many types of intermittent washers for handling completely defibered stock. However, they are all practically identical

in principle, so it will be necessary to describe only one of them here.

The Herrbold-Keelan Intermittent Washer

The Herrbold-Keelan washer consists of a rectangular extracting box containing four regular washer drums, a horizontal cylindrical chest located directly beneath this box, and a pump for circulating the stock. When operating, hot stock from the defiberer is pumped into the front end of the extracting box, where a large amount of dirty water is extracted. By the time the stock reaches the rear of the box it is quite thick and still very hot. From the rear of the box, it falls into the horizontal chest of about 6,000 gallons capacity, where it is thoroughly mixed with clean water by means of the agitator provided for this purpose. The stock, mixed with fresh water, is continuously pumped from this chest into the front end of the extracting box. This process of continuous dilution and extraction is continued until the entire three thousand pounds of stock in the batch have been washed. The washing operation with this type of apparatus requires from 35 to 50 minutes. The advantages of this type of washer over the beater type are as follows:

1. An enormous saving of power, often amounting to 100 horse power-hours per ton, or about eight cents per hundred pounds of paper.
2. A saving of one-third to one-half of the water required by the beater type of washer.
3. A bright, clean stock, since none of the dirt is ground into the fiber and since a large proportion of the dirt is removed from the stock while the latter is still hot.
4. A very small investment is required since only a few units are needed.
5. Extremely small floor space is required per ton per day.

The disadvantages of this type of apparatus are as follows:

1. It is by no means as simple or fool proof as the beater type.
2. There is an ever present danger of dead spots.
3. There is an ever present danger of lumps or blocks due to an occasional failure of the defibering apparatus. Experience has shown, however, that this is not a serious draw-back if proper precautions are taken.

It will be noted that the advantages of this type of washer far outweigh the disadvantages. In fact, it is quite possible that a washer of this sort may some day take the place of the beater-washers which are very largely used at the present time.

Class No. 3. Continuous Washers

This class of washer is designed on the principle that maximum washing efficiency can be obtained only when perfectly defibered stock is greatly diluted and completely extracted several times in rapid succession. The so-called Lancaster washer is the most interesting example of the type. It consists of three or more ordinary deckers or thickeners set up in series, with a diluting and mixing tank located between each one. When operating, hot stock from the defiberer is diluted to about 1 per cent consistency and pumped to No. 1 decker and thickened. The thickened stock falls into No. 1 diluting tank where it is again diluted and thoroughly agitated. From here, it passes successively to No. 2 decker, No. 2 diluting tank, No. 3 decker, and stock chest or bleacher.

The advantages of this type of washer are as follows:

1. A continuous process with a minimum consumption of power, labor and water per ton of pulp.
2. Pulp of an extremely bright color.
3. Very small floor space per ton per day.
4. A modern investment.

The disadvantages of this type are:

1. It is rather complicated.
2. It is hard to control.
3. Separate bleachers and bleach washing units are required if it becomes necessary to bleach the stock.

It will be noted that while the continuous washer is ideal theoretically, it has several practical disadvantages which will greatly hinder its general adoption by paper mills.

Summary

In summing up the above paragraphs, it is possible to draw the following conclusions:

1. If a quality job of sorting is desired, it will be necessary to use the screen system of sorting even though it may cost a few cents more per hundred pounds.
2. Except in cases where the vomiting tub process is used, violent dusting should be avoided.
3. At the present time, the rotary and vat processes are running about neck and neck so far as economy and efficiency are concerned.
4. The beater type of washer is both wasteful and inefficient.
5. There is still a tremendous amount of room for improvement in the processes used for producing half-stuff from waste papers.

Kalamazoo Against Casein Duty

KALAMAZOO, Mich., June 3, 1922.—The Kalamazoo manufacturers decided at a meeting at the Country Club on Friday to hold up the hands of the committee meeting in New York to try to prevent the enactment of a four cent per pound duty on casein. Meeting while the New York conference was in progress, the Kalamazoo manufacturers decided to leave their part in the movement to Felix Pagenstecher, who attended the first of the New York conference.

The whole situation was discussed, after Dr. Hugh P. Baker had described the progress of the New York meetings, and the plans to present a brief to the Senate Finance committee, protesting against such a tariff, which he said was shown by the New York conference participants to be disastrous to the coated paper industry.

Dr. Baker told of the work of the American Paper and Pulp Association in behalf of the industry, where it could represent the entire industry on the major problems involving legislation, forestry and similar problems. Dr. Baker gave the Kalamazoo manufacturers the list of ten major accomplishments of the Association during 1921, which made such a strong impression at the conference of Black River paper makers recently. He said that the work which was thus shown to have been accomplished was already resulting in the admission of new members to the association, as well as a greater interest in association activities by those already members.

News of the Michigan Trade

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., June 5, 1922.—Executives and sales force of the Chope-Stevens Paper Company, Detroit, to the number of 14, were the guests of the Allied Paper Mills of Kalamazoo, Friday, May 26. Luncheon was served at the Kalamazoo Country Club and the visitors were given opportunity to inspect the King, Monarch and Bardeen divisions of the big concern.

The Secretary of State announces that the Whittaker Paper Company, Cincinnati and Detroit, has increased its capital stock from \$1,000,000 to \$5,000,000.

The Weis Fiber Container Company, Monroe, whose plant was destroyed by fire this spring, has decided to continue in business. No action regarding the rebuilding of the destroyed factory has as yet been taken. The loss in the fire was over \$500,000, well covered by insurance.

The Sutherland Paper Company, of Kalamazoo, now has orders booked for over 50,000,000 cartons and according to President L. W. Sutherland, there is a very decided improvement in the business outlook.

HOW THE SUPERINTENDENTS ARE BENEFITED BY COST REPORTS BASED ON ACCURATE MANUFACTURING DATA*

By J. A. REILLY, MGR. COST AND INVENTORY DEPT. AMERICAN WRITING PAPER CO., HOLYOKE, MASS.

A superintendent was recently asked two questions by the president of his company, before he would approve the request for an appropriation for a safety screen and guard rail around an exposed gear where his men had occasion to pass several times during the three tours:

First: Why is this safety device necessary?

Second: Is this safety device foolproof, and are you sure it will prevent all accidents at this point?

The superintendent replied as follows:

To the first:

- A. Will reduce number of accidents.
- B. Protect my men from loss of life and limb.
- C. Reduce the number of hours of lost time of employees—due to accidents.
- D. Minimize the hardships, that usually accompany accidents, to employee and family.
- E. Reduce the cost of accident insurance to the company.

To the second:

- A. I have yet to see a safety device that is absolutely foolproof, yet this safety screen is necessary because it serves as a warning that this is a danger spot, and it is entirely up to the employee to take heed and keep outside the danger zone. Moreover, we must have it. Insurance companies insist that we have it, and regardless of practices years ago, things are different today; therefore, we consider it as imperative.

I was very much interested in this case, and often thought: What would the superintendent of today say if the president should substitute the phrase, "cost system" in place of "safety work" as follows:

First: Is it necessary that we have installed in our mill a Practical Cost System?

Second: Will that Practical Cost System prevent waste, reduce cost, increase efficiency, and increase our profits; if so, how?

There is no doubt in my mind but that, if the above questions were put to paper mill superintendents fifteen years ago, the majority would have replied in the negative with a few unsolicited remarks regarding the cost man, as follows:

"The Cost Accountant is:

1. A d—n nuisance!
2. A red tape artist.
3. A spy for the boss.
4. Knows nothing about the paper business.
5. An added overhead expense that the mill will have to absorb."

Perhaps the superintendent was justified in forming his opinion as thus related. I must admit that personally I know of cases where the cost man has been at fault. A mutual friend, the president of the company, has explained the workings of both sides, and bridged the gap of misunderstanding with planks of harmony and co-operation. We know that, as a natural result, today where a better understanding of manufacturing conditions is known, close bidding and competition of the cleanest kind have a tendency to increase business relations of like manufacturers

rather than did former acts of piracy toward one another; so likewise does this good feeling exist between executive and heads of departments, within each organization.

Now, what good results can a Practical Cost System produce that will really assist in the problems of the real works—the manufacturing department? By a Practical Cost System, we mean one that is based on accurate and continuous reports, and which, when summarizing the daily records for the monthly or periodical closing, gives results that balance with the commercial books, bearing out a term often applied to cost work as "tying in with commercial books."

We are not in favor of what is often spoken of as a "hit or miss" Cost System—getting records today and then not again until someone desires certain information about an order and have the cost man or accountant ascertain the facts. Results obtained by means of this "hit or miss" system are not accurate. They do not tie in with the commercial books; they are dangerous to use, and are often misunderstood by those who must interpret them.

Continuous cost records are as essential as the accurate reporting of all shipments. You hardly think of requesting your shipper to report to your office only part of the shipments; you even go a step farther and take double precaution to see that all that goes out is recorded correctly for billing purposes, and this you do by using records of shipments that are numbered consecutively, and by having a check to see that all records of shipments are properly accounted for. You also operate perpetual inventory records and check periodically by physical inventories to see that your records are properly maintained. So likewise, with continuous cost reports—they are summarized and are balanced with the figures of the accounting department for the same purpose; as in checking perpetual inventory records with physical inventories—namely, accuracy.

Cost Reports vs. Safety Signals

You would not consider it practical for the superintendent to remain at the exposed gear for 24 hours a day for the purpose of preventing accidents to his employees, so you install some kind of a safety device to answer the same purpose, when he is elsewhere; so is it with cost reports as with safety devices; they serve to render information of his various departments, telling what has taken place when he is in other parts of the plant.

Rag Room

A bleach of rags comprised of various lots possibly has all the outward appearance of being up to standard, but when the rag department starts sorting, it runs into an excessive amount of dirt and finds that hooks and eyes have to be removed along with cloth covered metal rings, and various other undesirable elements that increase the labor cost of putting on the bleach.

Excess tare is also an item of cost if not charged back to vendor. You might say that our rag department foremen have all this dope. Yes, no doubt of it, but we will go a step farther and put the results into dollars and cents from baled rag to half stuff, not only items of direct labor, but overhead as well, and the total figure might be of such importance that you will make further investigation with very beneficial results to the company. Take the case of substitution, one rag for another, or possibly the use of cotton linters. Cost reports will itemize the difference in actual cost, whereas the Mullen Tester or other testing devices, to-

*Read at the joint convention of the Cost Association of the Paper Industry and the American Pulp and Paper Mill Superintendents' Association, Kalamazoo, June 1-3.

gether with your practical knowledge, will merely measure the difference in physical qualities.

Difficulties often arise in carrying out your instructions in the rag room. Occasionally, the rag foreman, with an impunity due to long number of years in your employ, ignores your instructions, possibly not intentionally (he may not have clearly understood your desires), and when you put the questions to him regarding this particular bleach, replies that all is O. K. You feel satisfied until the cost reports come through, and you find that he has followed his usual routine rather than to make the changes you suggested. Let your cost reports be your safety device on matters of this kind.

Beater Room

You issue specific instructions as to materials and amount to put into each beater. If the beater man reports material correctly, we cost men will tell you whether or not he is doing it according to orders. Now, suppose he reports as per orders—all beaters furnished the same, *but* actually varies the furnish. Our double check system, by means of inventory, will show variances; and such variances are indications that your orders are not being executed properly, probably more paper is being made than the weight of material reported as used, or possibly 20 per cent beater shrinkage is shown on an order; that is not correct. Finally, men, we will assist you in hammering the sales department to secure larger orders—to discontinue the small one and two beater orders, especially on colors, by showing the large loss to the man who is interested in the "dollars and cents" of his company as well as "service"—the president. Let us be your safety device in the beater room.

Paper Machine

The cost of operating a paper machine varies from \$5.00 to \$75.00 per hour, depending, of course, on size and hitch up, and company organization. You will admit that there is something else figured in besides labor to bring the cost per hour to these figures. If we carefully analyze these cost figures, using a common unit as "per hour"—"per cwt. of paper"—"per day"—or "per month" and set up a comparative report whereby you can judge for yourself whether your men are as productive as they should be, or possibly whether the change in make of felts and wires was advantageous or not, and finally, whether the increased speed of 10 per cent or 20 per cent was not offset by higher operating cost or perhaps more broke. Will you let the cost reports be your safety device in the machine room?

Finishing Room

Some finishing rooms are complicated—some are not—but the average machine tender will say that the employees of the finishing department are past masters in the art of "passing the buck." We make good paper and they spoil it, although the damage, according to the finishing department, must have been caused by poor rolls, etc., that were made on the machine. No matter who's at fault, the company's the loser, yet how much? With the aid of cost reports, the loss is ascertained, and this the superintendent must explain to his superiors. What a wonderful incentive the superintendents have here to hold before their foremen to prevent manufacturing mistakes in the future? Again, what about your various finishing processes, different weights with different finishes? You surely know that on many an order the profit was wiped out on account of excess broke or excessive cost of finishing operation, due to light weights and through trying to obtain a finish to match samples.

We will put your argument up to the sales department in actual figures, then if they insist on accepting duplicates of these unsatisfactory orders, you need have no fear or worry about them. You have done your best, gone on record, and will receive the support of the cost department if it is necessary to have a "show down"—an excellent place to use your cost department as a safety committee!

Boiler Plant

The reports turned in by the fireman, water tender, or engineer, contain valuable information from an operating standpoint, but upon investigation, you frequently find the facts of the case have not been fully represented. You are somewhat at sea, and hesitate before making your decision. Why not let us give you a combination report of production and cost, with statistics showing distribution of steam by departments; production of paper by departments; quantity of steam used per cwt. of paper, together with cost of steam, percentage of ash, efficiency of boiler plant, etc.? Your cost man will co-operate with your engineering department to get the data necessary to incorporate in a really practical and useful boiler and steam plant report.

Installation of New Machinery

In these days of scientific investigation and wonderful progress that is being made in manufacturing equipment, you are constantly on the lookout for a chance to increase the efficiency of your plant. If you are located in a valley where you are subject to shut-downs due to water conditions, it might be to your advantage, both from a practical and financial standpoint, to consider the installation of electrical equipment or steam equipment for auxiliaries. If some large electrical concern should send their engineers to your plant to investigate the cost of installation of new power equipment, the first question that they will ask, is: "What does it cost to operate and furnish your power today?" If you have no figures available, then, they will determine, in their own way, what it is costing you, and knowing full well that they have something to sell, will endeavor to present a more or less biased report, especially attractive from their viewpoint. Is it not much better to have your own figures available for this comparison?

Service from Vendors

A short while ago an oil concern sent its experts into a plant for the purpose of showing where they could point out to the owners a great saving in oils. The report on lubrication submitted by the oil concern clearly showed that the investigation was warranted. The same grade of oil was not consistently used on the same piece of equipment. Oftentime a 50c. oil was applied where a 25c. oil was the better oil to use, and on the other hand, the oilers lubricated with a cheap oil expecting good results where a more expensive oil was the proper grade to use.

If that plant had installed a Practical Cost System and had reported the consumption of oil by departments, undoubtedly the cost man would have discovered this practice of using different oils on the same equipment, by comparison of requisitions and cost. Such comparisons would have prompted investigations either by an oil expert or by the engineering department which could have developed results involving great savings to the company.

Need for a Safety Device

Another case that I remember distinctly, was when we called the attention of the superintendent to the fact that on bleaches of rags that were cooked, the same quantity of lime, soda ash, etc., was used in a half boiler as in the full boiler. Upon investigation, we found that the man who had always taken care of the filling of the boilers, stated that he was told when he came there ten years ago, to put in a certain formula, and he carried out that formula regardless whether the boiler was full or only partly filled.

Cost Reports as Safety Devices

I am not criticising the superintendent in this particular case, as he had explicit confidence in the man, and not being around at all times when the boiler was being filled, he had no means of checking up. It is not possible for the superintendent to be at the plant 24 hours a day. Who is going to take the superintendent's place during his absence? It is true that he has assistants, and

has confidence in the assistants, but it is also impossible for the assistant superintendent to be everywhere in that plant at the same time, consequently, mistakes are made and possibly are not being called to his attention.

You will say: How is it possible for the cost man to give this information to the superintendent? Here is the answer: In operating a set of cost books, the total charge for expenditure of everything pertaining to the plant is charged by the accounting department to the cost controlled account. It is necessary, then, to have the distribution of these items of expense, and through the channels of a properly organized cost system, such as reports of the material consumed in beaters, requisitions of general supplies, a correct distribution of the payroll, checking with the clock records, etc., we are able to make comparative reports for the benefit of the superintendent, to judge whether or not the various departments are being operated on a sound economical basis. It may take some little time on particular cases where the duplicate orders are not frequent, and we have no chance for comparison, until repeat order goes through, and we can tabulate results. It might not be possible for us to call the superintendent's attention to these at once. However, after we have had these reports for a certain length of time and are able to give them careful study, then we will notify superintendent of conditions as we find them from records as submitted and let him take the next steps.

Conclusion

I have endeavored to cite instances whereby the superintendent would be directly benefited if he would carefully investigate those particular items that are called to his attention by the cost accountant in his analysis of the various cost reports emanating from a Practical Cost System. By correct reports I mean that the superintendent must insist on accurate mill reports from his subordinates to cost department. You men are using material that has value, and if you please, must be treated as dollars and cents. Haphazard methods for reporting of time and material must be discontinued, and more accurate reports submitted. It is utterly a waste of time and money to work cost based on inaccurate cost data from the mill. Manufacturing data for cost are the foundation of a good cost system. Inaccurate reports we term "quicksand foundations," and you can well imagine their "wobbly" superstructure.

As in the case of the old-fashioned journal in the country store, which today is referred to as the book of original entry, likewise we term manufacturing reports the original entries for cost. To burden a superintendent with cost that is made up of 50 to 75 per cent overhead that he has absolutely no control over is entirely wrong, in my opinion. Items of overhead must be included in manufacturing cost eventually, but costs that I believe the superintendent will find more valuable from a manufacturing standpoint include only items of "direct cost" as materials used in furnish, direct labor as per payroll classification, materials used in conversion supplies, and items of expense such as electric lighting, handling ashes, auto trucking, etc.

The cost man can, without any added expense to the company, supply to the superintendent such information in the form of monthly or periodical cost in comparative form, with added statistics, so as to bring the figures to a basis that the superintendent will always remember as "lbs. of coal per cwt. of paper"—"cost per 100 lbs. of steam"—"felts and wires—cost per cwt. of paper"—"lubricating oils—cost per cwt. of paper"—"per cent of labor to total conversion cost of operating plant"—"per cent of reduction in labor as compared with per cent of in operation of plant"—and many other items.

Finally, Mr. Superintendent, We of the cost department depend on you to:

1. Supply us promptly with accurate mill reports.
2. Investigate reports from the cost department.
3. Ask for changes and explanations if necessary until you get a useful report to fit your needs.

4. Consider the cost man's duties from a practical viewpoint, as production without figures leads eventually to financial ruin.

5. Show the same per cent of added interest during the next decade as you have shown during the past, and your company's batting average will be well over 300.

6. Accept the uniform cost finding system as applicable to your plant and just waiting to give you the information you desire.

7. Think of the cost man not as a red tape artist and trouble maker, but as a vital part of your organization, always rendering such assistance to the company as does the safety device, to those who pass within the danger zone.

The ultimate result of the successful operation of a cost system will be denoted in increased remuneration to each of you individually, and the company you represent will measure its reward in a better financial condition in dollars and cents.

Fiber Box Manufacturers to Meet

B. C. Tamlin, secretary-treasurer of the National Association of Corrugated and Fiber Box Manufacturers, announces that the annual meeting of this organization will be held at Atlantic City, N. J., July 18, 19 and 20.

While a program for the meeting had not been drawn up, Mr. Tamlin said that the annual election of officers would be held at this convention, and that several matters of importance would be brought up for discussion. One of the reports to be made at this meeting will be delivered by President F. J. Kress, covering the proceedings at the annual meeting of the Chamber of Commerce of the United States which he attended as a representative of the association.

The meeting is to be held at the Traymore Hotel in the so-called "America's Playground," and even at this early date, Mr. Tamlin said, requests for reservations have arrived and he is urging everyone intending to attend to get their reservations in early.

The officers serving this organization during the past year whose terms expire with this annual convention are: F. J. Kress, of the Kress Paper Box Company, Pittsburgh, president; T. D. Griley, of the Fairfield Paper Company, Baltimore, Md., vice-president; J. M. Connor, The Fiber Container Company of Pennsylvania, Philadelphia, vice-president; B. C. Tamlin, secretary-treasurer.

A nominating committee to present a slate of candidates for office are said to have been appointed, but the names of the candidates were not ready for announcement.

Pulp and Paper Men Interested in Maine Reservoir

[FROM OUR REGULAR CORRESPONDENT]

AUGUSTA, Me., June 5, 1922.—Maine pulp and paper manufacturers are much interested in the announcement by the Maine Water Power commission recommending the construction by the state of a storage reservoir on the headwaters of the Kennebec river at Brassua lake in the Moosehead lake region. Such a reservoir would be of much value in driving logs and pulpwood down the Kennebec, insuring a better supply of water, and would also mean a more even flow for the water powers of the paper mills on the Kennebec.

The 1919 legislature considered a project for construction of a reservoir at Hiram, which would have enlarged the existing lakes in that section. The Water Power commission expresses the opinion that to erect a dam here would mean the flooding of valuable farm lands, and that if the state is to build a storage dam it should be constructed in the most available location where the land damages would be comparatively small and where settled and inhabited communities would not be interfered with and flooded out. This can be done in the forested part of the state, such as at Brassua lake, and the commission advocates that the reservoir be located there.

SULPHATE DIGESTER LININGS*

By P. C. AUSTIN, BATHURST LUMBER CO., BATHURST, N. B.

The lining of sulphate digesters is quite a radical change from previous practice, but the results obtained have been so satisfactory, that it may be of interest to some sulphate mill superintendents.

Digester Lined with Brick

Having three riveted digesters which we found impossible to keep free from leaks, after having these welded at all joints and rivets, it was decided to try an experiment and put a brick lining in one digester.

The digester was lined in June, 1920, and a bronze sleeve was put in the bottom and a bronze neck in the top also the other necessary fittings for cooking sulphite pulp. This digester was used for cooking sulphite pulp until September, 1920, while the sulphite digester linings were being overhauled.

It was then stripped of all the bronze fittings, which were replaced with steel with the exception of the top neck, which we continued to use while cooking sulphate for over a year, when it began to give trouble, owing to the face of the top flange where the cover fits on, getting badly scored, making it hard to get a good joint with a pulp gasket, so the bronze neck was then removed and replaced by a steel one.

The first cook of sulphate pulp was made on October 7, 1920.

This digester was lined by The Stebbins Engineering and Manufacturing Company, of Watertown, N. Y., as follows: Backing to a thickness of one inch of equal proportions of Quartz and Cement mixed with a solution of Silicate of Soda. The face brick, single layer of fire-brick on its side, gives a thickness of two and a half inches, giving a total thickness of three and a half inches, set and pointed with the same cement mixture as the backing.

Of course it is well known that caustic liquor used in the sulphate process is destructive to high silica brick, therefore, it is necessary to use a brick of the lowest silica contents. Another point is that the joint material which was used, stands up under the action of the sulphate liquor in a very satisfactory manner, and also this joint material is not expensive, and in fact the whole lining installation for a sulphate digester is considerably cheaper than the lining of a Sulphite digester.

Owing to the leaking state of the digesters it was found impossible to cover them with asbestos as an insulator, therefore, the lining, besides stopping the leaks, is also a great help in acting as an insulator, and thereby saving a considerable amount of steam.

How the Test Was Conducted

A test made in November, 1921, on the lined and unlined digesters was as follows:

Average of six cooks in unlined digester Number 3 with no covering on the outside.

Steam consumed per digester of 9,580 lbs. air-dry pulp 32,436 lbs.

Steam consumed per lb. of air-dry pulp 3.385 lbs.

Steam consumed per ton of air-dry pulp 6,770 lbs.

Average of six cooks in lined digester Number 2 with no covering on the outside.

Steam consumed per digester of 8,220 lbs. air-dry pulp 26,040 lbs.

Steam consumed per lb. of air-dry pulp 3.168 lbs.

Steam consumed per ton of air-dry pulp 6,336 lbs.

Therefore $6,770 - 6,336 = 434$ lbs. of steam per ton of air-dry pulp saved in the lined digester.

Yield Taken Over Period of Two Weeks

The yield was taken over a period of two weeks and it was as-

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, Mich., June 1-3.

sumed that the yield of each digester was proportional to the volume. It was found that the yield of air dry pulp per cubic foot of digester capacity equals 4.455 lbs.; so the lined digester gives a yield of 14.2 per cent less than the unlined digester, or in other words the lining occupies about 305 cubic feet of digester space.

The size of the digester unlined is 50 feet 4 inches overall by 8 feet diameter, which figures out at 2,150 cubic feet capacity for the unlined digester against 1,845 cubic feet capacity for the lined digester.

The lined digester made 76 cooks of sulphite pulp and taking this on a basis yield of 3.5 lbs. air dry pulp per cubic foot then $3.5 \times 1,845 \div 2,000$ equals 3.23 tons air dry pulp per digester, therefore 76×3.23 equals 245 tons air dry sulphite pulp produced.

The yield of 3.23 tons air dry sulphite pulp per digester is slightly lower than usually found in regular practice but this was on account of being unable to completely fill this digester with chips when cooking sulphite owing to the steep cone at the top.

This lined digester made 1,151 cooks of sulphate pulp and taking this on a basis yield of 4.455 lbs. air dry sulphate pulp per cubic foot then $4.455 \times 1,845 \div 2,000$ equals 4.11 tons air dry sulphate pulp per digester, therefore $1,151 \times 4.11$ equals 4,730 tons air dry sulphate pulp produced making a total of $245 + 4,730$ equals 4,975 tons of air dry pulp produced to the end of April, 1922.

Repairs Very Small

The repairs on the digester lining to the end of April have been very small and are as follows: It has been painted twice. The first time was immediately after cooking on sulphite and the second time was during the month of April, 1922. The neck at the top grouted up once and a few new bricks were put in immediately round the bottom outlet which had been worn by friction in blowing.

It has been found that in the bottom and also the top cones, which were put in with a regular digester brick, instead of the firebrick that these have stood up considerably better, so that a digester lined with the right kind of brick made to shape would not only give more capacity to the digester, but also have a longer life. With the 9" straight firebrick there are too many places where the edges of the brick stand out in making the circle, causing friction, and therefore causing the brick to spaul which would be eliminated in a lining made to shape. This, in the writer's opinion could not help but increase the life of the lining.

This lined digester is still in operation and appears to be good for some time yet. It has been in continual use the whole period except when the mill was shut down during the slump period.

Up to the present time there has never been any sign of leak whatever on this digester.

It has been found that this digester will cook slightly faster than the unlined one, with active alkali in the same ratio to its cubical contents, owing of course to the loss by radiation being considerable less.

A Point to Be Considered

A point to be considered on the installation of new digesters would be the cost of a welded digester against that of a riveted digester, similar to those used in the sulphite process plus the lining. There would be another saving on a lined digester on the outside covering, which if any were used at all, it would not need to be so thick as on an unlined digester.

This is a point which would have to be gone into more thoroughly at the time of buying.

FREENESS TESTING OF PULP*

BY F. M. WILLIAMS, CHEMICAL ENGINEER AND CONSULTING CHEMIST, WATERTOWN, N. Y.

There never was a time in the history of paper making when it was so important as now to give careful heed to the savings which may be made in production. The days of cheap labor and cheap raw material are apparently passed so that in the future it is a matter of life or death in the paper industry to give head to the possible savings in operating costs.

The importance in dollars and cents of maintaining pulp and paper stock at the desired degree of freeness can not be over-estimated. The advantages may be briefly summarized as follows: First, in the grinder room, increased production at a decreased horsepower per ton, by knowing immediately when a stone needs dressing or burning and not allowing power to be consumed indefinitely and unproductively by dull or glazed stones.

Valuable Data Obtained

Some very valuable data has been obtained upon this point showing that it is possible to grind day after day with as low a horsepower consumption as 50 to 55 per ton of pulp. In other mills where no attention is paid to freeness control, as high as 100 horsepower is often required to produce a ten of pulp. From 65 to 85 is a fair average.

In the machine room, the savings from maintaining stock of uniform freeness are probably even greater than the savings of horsepower back in the grinder room. Every practical paper maker is well aware of the troubles and loss of production that come from variations in the freeness of his stock. If this is too slow, the proper amount of water is not removed back on the wire and press rolls, placing extra burden upon the driers with consequent increase in steam consumption for drying. Breaks occur on the machine with the resulting loss of time and production.

When the stock is too free, it is impossible to obtain the desired finish and the paper is over-dry and brittle, also resulting in breaks and loss of production.

Only Method of Accurate Measure

In the beater room, a freeness test is an accurate means of determining the degree of beating of the stock and is practically the only known method of accurately measuring this. The length of time of beating is not a measure as it is a well-known fact that the time element will vary greatly according to the kind of stock, condition of the beater bars and bed plate, set of the roll, temperature of the water, etc.

Some beaters in the same room, working on the same stock require different lengths of time to get the stock into condition. Even this matter of proper condition is only a very rough estimate. There is no known method of telling exactly when stock is finished except in a general way, by the feel, and waiting till it goes over the machine. To be sure a man, by practice, gets fairly expert in telling by the feel as to whether or not the stock is slippery, etc., but the same thing would hold that a man may be able to tell the time of day reasonably well by looking at the sun but this is no argument against the use of a watch or clock in this day and generation.

The Williams Standard Freeness Testing Outfit in its present form has been developed by the writer, member of the Rules Committee on Standard Methods for the Sampling and Testing of Pulp of the Technical Association of the Pulp and Paper Industry.

Main Idea in the Design

The main idea in the design of this outfit has been:

First, to produce an instrument which will give quickly and accurately the degree of freeness of pulp even when operated by persons not having special skill or training in technical manipulation.

Second, to produce an outfit which will withstand the hard usage and trying conditions well-known to a pulp mill. With this in view, metal parts exposed to moisture are of bronze nickel-plated. The bearings of the scales are of agate, therefore nonrusting. The cabinet or work table is of special fireproof waterproof asbestos material which can easily be sponged off without injury. The electric wiring of the table is in waterproof housing with convenient outlets for attachment of electrically driven apparatus.

Third, in order to eliminate the variations due to the human element, an electric stirrer or mixer is provided thereby insuring an absolutely uniform mixture of the stock at all times which could not be obtained by hand stirring.

What the Outfit Consists Of

The outfit consists of:

Cabinet of fireproof and waterproof asbestos material to stand slop and moisture of grinder room, electrically wired for electric, stirrer, electric centrifugal machine, electric heater for constant temperature control. The cabinet is provided with doors with locks for housing balance and other small parts when not in use. Waste pipes which may be either connected directly with drain or waste pails.

Sedimentation bowl and funnel of heavily nicked bronze with special device for instantaneous tripping and discharge of contents.

Centrifuge for extracting water from samples, direct connected to one-sixth horsepower vertical motor, revolving basket of copper with heavily nicked bronze outside bowl with waste discharge pipe.

Accurate balances with rustproof agate bearings and weights for weighing samples.

Electric stirrer or mixer for thoroughly beating and mixing samples to uniform consistency. With this, even dry samples of either pulp or paper stock may be quickly and thoroughly beaten up.

Accurate measuring glasses giving direct readings of freeness without calculation.

Blue glass plate for examination of stock.

Principle of Freeness Testing

The freeness of pulp is the rapidity with which a weighed quantity of pulp mixed with a known quantity of water will deliver this water through a strainer.

The principle of the Williams Standard Freeness Testing Outfit is the measurement of the water over-flowing through the side outlet of a funnel having an opening at the bottom of insufficient capacity to take care of entire discharge of water from the strainer above. The amount of water collected and measured at the side outlet is a measure of the freeness of the pulp. The freer the pulp, the larger the quantity of water obtained.

Directions for Using

Average samples may be taken either from grinder pits, deckers, beaters or finished stock at the machine.

The centrifuge provides a rapid means of obtaining a sample of known moisture content for weighing.

Obtain dryness factor of centrifuge as follows:

Whirl in the centrifuge for one minute from 25 to 50 grams of well mixed sample after which this test sample is dried bone dry. Divide bone dry weight obtained by wet weight of sample extracted.

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

The dryness factor of the centrifuge should be checked in this manner at least once a day to avoid any errors due to screen becoming clogged.

After obtaining dryness factor of centrifuge, extract another sample and weigh out the calculated equivalent of four grams of bone dry stock. This will be about thirty grams. Place this weighed sample in glass mixing jar, fill with water to top graduation mark and stir one minute with Electric Stirrer, after which the contents are poured immediately into bowl of freeness tester making sure that discharge valve is closed. Then immediately, open discharge valve and collect overflow of water from side outlet

in graduated measuring cylinder. Number of cc. of water collected gives freeness of pulp.

It is important that the temperature of the mixed water shall always be the same. Hot water will increase the freeness of the pulp, cold water will decrease it. 80 deg. Centigrade is suggested as easy to maintain both in summer and winter.

In conclusion, I wish to thank the members of the Superintendents' Association for your kindly interest and trust you will find this testing outfit a practical aid in producing more and better pulp and paper at less cost, at the same time reducing the mill worries and troubles which make the superintendent old before his time.

THE COST ACCOUNTANT AND THE SUPERINTENDENT

By FRED C. BOYCE, SUPERINTENDENT, WAUSAU PAPER MILLS

The discussion of cost accounting at a meeting of superintendents it would seem to me is, to say the least somewhat of an innovation. The cost accountant has generally been considered as a good deal of a nuisance about the plant by the superintendent. He comes to the mill superintendent with instructions from the manager to give him every possible assistance, and to see that every pound of stock, and every ounce of other material used in the manufacture of his paper, be kept accurate account of, and the cost accountant has, as a matter of fact, been the bane of the superintendent's otherwise peaceful and happy existence.

Becoming a More Important Position

The mere fact that a superintendent is asked and expected to prepare a paper, or to make a talk on costs, only goes to show that the superintendent's position is becoming more and more to be recognized as one of the very important cogs in the wheel that makes for a smooth running and successful paper mill plant.

A cost system in a plant making but one grade and but one weight of paper should be a very simple proposition, as all of the stock and all other materials and items of cost of whatever nature, are charged up against this one item, and it is an easy matter to determine the cost.

In a mill making a dozen or more grades of paper, in many different weights, and in several different colors, the job of determining the exact cost of each little lot and each weight of paper is not an enviable one, and there is quite a question in my mind as to whether or not a very accurate and exact cost can be arrived at on small special orders, and if it can, and if the exact cost has been arrived at, I question sometimes as to whether or not the cost of obtaining such knowledge on a small lot of a special paper may not have been more than the value of such knowledge.

Cost System Should Be Reasonable

I may perhaps be stirring up a hornet's nest in even suggesting that the sacred cost system can be carried too far, and that it may cost too much. I do not want to be misunderstood in this regard. I believe in a cost system carried on in a reasonable and in an economical way, a cost system that will give the costs with reasonable accuracy, so that the management and selling department may know what the goods must be sold for in order to show a profit, but I still maintain that when a cost system is featured as the most important part of the whole industry it may be carried too far.

I do not presume that it is within the province of a superintendent to make suggestions to the expert cost accountant as to his methods in obtaining the correct results as to actual costs. I will say, however, that the work of the cost accountant in the mill end of it can be very materially assisted by the careful and cheerful co-operation of the superintendent.

It should be the province of the superintendent to endeavor to do everything within his power, especially in times like the present, actually to reduce and keep down the costs in production, rather

than to attempt to suggest methods to the cost accountant as to how his figures should be tabulated.

The manner in which labor is handled in a mill may result in a large saving in the course of a year. In my opinion, there should be one general superintendent, who has general charge over all of the men, so that men may be moved about from one department to another as required and not feel that their rights have been infringed upon. In many paper mill plants there is no one man who is held responsible for the whole operation of the plant. The responsibility is divided among several heads of departments, who are individually accountable to the general manager only. In a case of this kind, each department superintendent must have his own crew of men who are responsible to him. The men naturally feel that their work should be confined to the one department only, and that they should not be asked or expected to shift around from one place to another in order to accommodate some foreman or superintendent who may temporarily need extra help. The result of this is that each department head must keep a crew of sufficient size at all times to take care of his maximum requirements.

This system is apt also to breed jealousies between heads of the different departments, as well as differences between the several crews. So, as I said before, I believe that there should be one general superintendent in every paper mill plant, who has not only the authority, but who actually does take charge of and who superintends the whole operation of the plant. Much may also be accomplished in the way of reducing actual costs by keeping up with the times, and by the adoption of new methods, new machinery and new ideas, that have worked out successfully in other mills, or that may be evolved from one's own brain, or suggested by some of the men who, through actual contact with a certain machine or with certain old methods of performing some operation, may think out some new way of doing it that will result in a saving of labor, or in the lowering of costs in some other way.

It might perhaps be well to suggest that while mill costs may and should be kept down at the mill to the lowest possible point that only a portion of the actual cost of the production of paper is chargeable to the mill itself. After the mill cost has been arrived at, there are still many large items to be added before the actual and exact cost can be determined, such as salaries, taxes, insurance, advertising and selling, and much in the way of reducing costs may perhaps be accomplished by looking carefully after other items as well as at the mill end of the cost problem.

This talk might go on at great lengths in the discussion of different methods for saving, but as I presume that my time should be limited, I will say in conclusion that I think that it will be found, that the mill producing paper at the lowest cost, other things being equal, will be the mill where there is the best feeling and the most co-operation between the manager, the superintendent and the men themselves, and who all work together in harmony as a unit in their endeavor to produce the best and most satisfactory results possible.

ASSOCIATION ACTIVITIES IN THE PAPER INDUSTRY*

BY DR. HUGH P. BAKER, SECRETARY, AMERICAN PULP AND PAPER ASSOCIATION, NEW YORK.

Any basic industry producing fundamental necessities of life, such as those produced by the paper industry and doing business in such a country as this can be assured that it is a part of a great going organization and that those having to do with such an industry shall have all of the opportunities which can be sought by any people for hard work, good health, and the wherewithal to live.

Other Markets Improve Correspondingly

It is not out of place to strike a note of optimism, with reports coming from this section and that section, that mills are running full, that volume has been achieved even though prices are not what they should be and will be. Other industries are feeling the urge of better times. The steel industry, which is supposed to be the barometer of business in this country, is in better condition than it has been in months. More railroad cars were ordered during the months of March and April than during the entire previous year. For reasons, either local, national or international, some industries are not yet responding as they must in the passing of the summer and fall months. Business may be spotty but there is courage in the hearts of American business men, and we know that we are going to see it through effectively, and the experience, though it has depressed and often made mortal wounds, has been not entirely an unhealthy experience. We are but repeating the experiences following the wars of the past; under extravagance, over development, unhealthy conditions morally so that the purging of the past year and a half means a return to what is more nearly normal health and strength in our industrial life.

Advancement Has Come Through Organized Effort

Only as our ancestors in the distant past overcome somewhat their suspicions and distrusts, and learned to act with other individuals and other groups, did they begin to develop individually and as societies of intelligent men. No one knows how far back in the ages we attained our physical development. There has been little change in men, physically, for thousands of years. In the early years of the race the days of a man's life were made up of a tremendous struggle merely to live and to continue the race. Fear and force brought the first united action, and these factors have continued to make for civilization through the years. These factors have been followed, of course, by the more important influences of developing intellect and religion. It would be out of place to attempt to trace the ways in which men have grouped themselves for different purposes; religious, commercial, or governmental, though we have but to read the story of the race to know that development and achievement has come through organized effort.

Men have grouped themselves together for commercial purposes, as trade associations, since the days of the Old Testament. The guilds of medieval and of modern Europe were trade associations, and there have been trade associations of one kind or another in this country since we became a nation. The greatest obstacle in developing trade organizations, from the very beginning, has been the selfishness of men. One man thinks that his ways are the best, that he is strong enough to take care of himself alone, and so he refuses to come into trade association activities. Sometimes a developing need forces him to put into the background his entirely selfish interests to work intermittently with others. Prosperity makes it easy for men to work together. Adversity brings out selfish interests and makes it difficult for men to act together. It is hard enough as individuals to carry work forward in times of great adversity. Often in industry during periods of difficult business

times, such as the period through which we have just been passing, a man's individual needs loom so large to him that he fails to appreciate that the good of the group is after all the permanent good toward which he is working. American industry is suffering not only now, but it is going to continue to suffer from the direct and the indirect results of business men demanding that they buy raw and finished materials in the cheapest market regardless of the effect of such buying upon American labor, industry and finance.

Organized Effort in the Paper Industry

The character of the paper industry is such that it has been rather slow in organizing itself into groups and through these groups working together for the upbuilding of the industry as a whole. Like the lumberman who, in early days at least, worked in isolated sections, solving his own difficult problems, and through such experiences becoming an extreme individualist, so the paper manufacturer has very often developed his mill in isolated sections where he might get cheap power, or be close to raw materials, and like the lumberman, he has often become an extreme individualist. It has not been an easy development to bring a manufacturer from this, that, and another section, possibly hundreds of miles apart, into close co-operation in the solving of common problems. It is a simple matter for the butcher, the baker, and the candlestick maker, living and working next door to each other in our communities, to come together in commercial organizations or in other organizations where they have learned quickly that their competitors are human like themselves, with the same needs and the same ambitions.

The reference to the earlier paper manufacturer as an extreme individualist is not decrying the kind of individual development which has proved in our past experiences to make for success. We need men with strong individuality and with initiative, who can shape their activities and their destinies upon the anvil of hard times and adverse conditions.

It must have taken vision, patience and hard work to bring together the small group of paper manufacturers who 45 years ago formed the American Paper and Pulp Association. Man is after all a social animal and, under normal conditions, where his selfish interests are not too close to the surface, he likes to mix with his kind. Social inclinations had their part in the first gathering of the men who made up the American Paper and Pulp Association. We must not lose sight of these social inclinations in our trade association activities today. They are an important factor in the gathering of men in our industry.

Business Conditions Reflected in Associations

Trade associations in the paper industry, like other organizations of men over a period of years, have had their ups and downs. In the one year there has been a particular reason for men to come together to protect themselves and their industry; another year there will be less reason and therefore less interest. In periods of prosperity it has been comparatively simple to get the funds necessary to carry on association work, and in some cases, possibly, money has been unwisely spent. It would be a marvel indeed if in the many years of trade association activities in our industry money had always been wisely spent. Associations have been reorganized and reorganized, and it may mean decay in our organization activities if we do not in the future see the necessity for perfecting our association activities, through readjustment and reorganization.

Gradually, and as needs arose, separate groups of the industry formed their own associations, and these were finally brought together in the American Paper and Pulp Association, to serve as sections of a central organization. It would make for economy in

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

the carrying on of association work today in such a diversified industry as the paper industry, if association activities could be more closely related to the central organization. Our experience has been not so very different from that of other industries where, because of special interests, or for selfish reasons, the central organization has not been developed in a way entirely fair to all groups. We have suffered in the past by lack of vision rather than lack of ability in sensing what is best for association development in the industry.

All trade associations in the past few years have been affected by the growing tendency at Washington to bring the business of the country under the control of government. This tendency is, unfortunately, still growing, and it would be reason enough for the existence of the American Paper and Pulp Association or any other association merely to protect the industry against the tendency of government to dominate and control, meaning, as it does, the crippling of the independence and the initiative not only of the individual but of the association. Industry generally in this country is suffering today from failure to come together as an aggressive unity through which it might maintain its independence, and share as it should with labor and the agricultural interests of the country in the business of government.

The path along which we must travel as trade associations has been so clearly marked out that there is little reason for our associations to be running to Washington or anywhere else seeking assistance or guidance for fear that we may get off the path. We should co-operate in an honest, businesslike and effective way with the departments with which our industry is concerned at Washington. We are but biting off our own noses if we fail to co-operate. In the past two years our associations in the paper industry have co-operated as never before with such of the Federal Departments as Commerce, Treasury, Agriculture and Interior. The American Paper and Pulp Association, representing as it does all phases of the industry, and confining its activities to the general problems of the industry, should keep in close touch, not only with the executive departments in Washington but with the men who are making our laws there. It isn't to be supposed that a lawyer or a merchant, or some other man coming from a paper-making state, and not a paper manufacturer, can know of the problems of the industry or what the industry needs in the way of legislation. It is entirely reasonable that the industry, through its central organization, should make it possible for the men in Congress to know the industry thoroughly. How can we expect them to legislate fairly and effectively for us if they do not know our problems. And taking our problems effectively to the members of Congress, through personal contact and in other ways, is not lobbying, as that word has been used in the past.

As it is necessary for men who make our laws at Washington to know something of the industries and conditions for which they are supposed to legislate, so the public, which is the motive power behind those who legislate for us, should know something of our industries. The president of one of the National Coal Associations, in addressing a group of business men in New York City a short time ago, and in commenting upon the relations of the industry to labor and to the public, stated that "the greatest mistake which the industry has made in the past was its failure to tell the public its problems through telling them the story of the production of coal." If the public knows the problems of an industry, it is after all going to be more fair-minded than if it knows one side of the question only, and it is very likely to know the troubles of the laborer living in its community, or the side of the idealist who refuses to understand the practical phases of the exploitation of a national resource in serving an industry.

The Future of Association Activities

What the future of trade associations will be in the paper industry has been indicated somewhat by outlining the present de-

velopments in our associations. As there have been well-managed trade associations in the paper industry for more than 40 years, there is no question but that there are going to be effective trade associations in the paper industry as long as the industry counts itself a national industry, which doubtless will be for all time, as far as anyone can imagine the condition of our national industries in the years ahead. It is like saying that water runs down hill to say that the success of associations in the paper industry will depend upon the willingness of our manufacturers to work together for the common good.

Some time ago a welfare agency made a rather comprehensive study of organizations of men of all kinds, largely to determine the factors influencing the interest of men in organizations and to determine a basis for increasing this interest. This agency found that upon the basis of interest and work of an individual for an organization that in all organizations, whether formed for religious, fraternal, or commercial purposes, the grouping of individuals as to their interest and willingness to work is practically the same. About one-third of any organization will be aggressive workers for that organization. The second third will work if the proper urge is put behind them. The last third allow their selfish interest to dominate them to such an extent that they will do little or nothing for the organization and are in the organization largely because they do not dare stay out.

Experience with organizations of all kinds will lead you to appreciate the general correctness of this conclusion. The future of associations in the paper industry, therefore, depends upon our interesting the second and third parts of our membership, and at the same time of so carrying on the work that when new members are brought in they will go into the first and second groups and not the last.

The common problems of an industry form the interests which bring men together for organized efforts. These interests may be protective in character only, or they may be of the character that cause men to work aggressively for the betterment of the whole, and, therefore, of their own individual interests. The time must come in the paper industry when the industry in all of its activities will be looked upon as a common industry. No one is ready to say that the paper industry is made up of the manufacturer only. Any industry such as this must start with the producer of raw materials. There is, then, the manufacturer who receives the raw materials to convert them into a finished or a semi-finished product. The manufacturer is followed by the converter, and in between these groups, and between the groups as a whole, and the public, there is the merchant who, after all, has proven himself to be an indispensable part of the industry. There are problems common to all of these various groups, and while it may be years ahead, the great paper industry must eventually merge all of its elements into some form of an organization which will represent it in its common problems. This very development has come about in some of the other larger industries, possibly forced by economic conditions, but, nevertheless, working out successfully today. The National Automobile Chamber of Commerce, the Music Industries Chamber of Commerce, and similar organizations, presage a development in the paper industry that must eventually mean a national paper institute, or a national organization that will in some way bring all of the elements of the industry together. A very common remark in the industry is that the interest of the manufacturer and the merchant, for instance, are so conflicting that they will never come together. The same thing was said in the earlier days as between the manufacturers themselves, and so the same thing has been said in other industries which finally have developed an organization to further the common interests of the entire industry.

It is becoming increasingly apparent that the paper industry of this country cannot live entirely unto itself. Turn to statistics as to the importation of pulp and paper from Canada and from Eu-

rope, and you are immediately impressed with the fact that this country appears to be dependent upon Canada and Europe both for raw materials and finished products. If it is a fact, and it appears to be so, that we are facing a period of declining prices, meaning tremendously increased competition, we must face the idea that we have a real fight before us for our own domestic market, to say nothing of foreign markets. With this situation confronting us, it has been surprising to see how little the paper industry in this country actually knows of the pulp and paper industry in Europe. We have figures as to what the various paper manufacturing countries of Europe are exporting, but we know little of their capacity and of what we may expect in our competition with them for foreign markets. We should have definite contacts in each one of the paper-making countries in Europe through which we may be kept in close touch with these countries, and especially with the developments taking place in various phases of the industry.

This situation is to be met somewhat by a visit to Europe this summer by a past president and the secretary of the asso-

ciation, but such a trip as is proposed can be but superficial, and there must be more definite ways of maintaining the desired contact.

In a hasty survey of trade association activities in the paper industry—and more is not possible in a short paper—we can but bring before you certain suggestions as to what can be accomplished in the paper industry by organized effort through the trade association. The trade associations in this industry are permanent and we need the assistance of everyone connected with the industry in making our unified effort, as these efforts touch the industry, the federal government, and foreign conditions, more effective and worthwhile. After all, the individual will advance only as the industry as a whole advances. That we can work together as satisfactorily as men in other industries has been proved beyond a doubt, but we need to stimulate the entire industry with what might be called "an industry consciousness," such as will put extreme individual selfishness into the background and let all work for the maintenance of an industry essential to the welfare of the American people.

PROGRESS IN DEVELOPMENT OF COATING MACHINERY*

BY WILLIAM H. WALDRON, VICE-PRESIDENT JOHN WALDRON CO., NEW BRUNSWICK, N. J.

Mr. Coughlin has asked me to say a few words on the above subject. I think what I may say should be prefaced by an apology for reference to the records of the company I am connected with, but that is the only source to which I can go for information as to the history of coating machinery.

This element in the making of this machinery, going back to the earliest days of the industry, coupled with the fact that you are all personal friends, to whom this company owes a great debt for most kindly co-operation and help for many years, is the reason that these remarks are more in the way of a talk on the subject than a formal treatise.

The first knowledge I have been able to gather from our old records of the coating of paper by machinery is the shipment of a grounding or coating machine in 1850 to one R. C. Barnes for use in the making of wall paper. Four machines were built for the same purpose in 1851. Where the thought came from that created this machine I am unable to trace. It is possible a few machines might have been built by ourselves or others before that time, but there is no remembrance of them today by the president of this company, who at that time was a boy of eighteen. Prior to that time the small quantities of coated papers produced in this country were doubtless generally made by hand.

These early machines were called "Sun and Planet" machines, as the color was smoothed out by the action of four revolving flat brushes in the shape of a disc attached to the ends of a cross, which also revolved on its own center. These machines came into general use for applying the ground coat on wall papers in the few factories of the time.

In 1852 a coating mill still in active business that was then making colored papers by hand heard of these machines and ordered one for the making of their product. It is probably the first instance in this country of the use of a coating machine in the industry you are connected with. Somewhat later their use crept into other coating mills, which for many years only made what are known as fancy papers.

The coated paper makers had but a very limited market for their product, and the growth in the use of these machines was very slow till the discovery was made that a clay coating on paper produced better results in the printing art for certain kinds of printing. That was probably within the past thirty-five years. It was the beginning of the large business in coated book and lithograph papers of today.

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

The use of coated papers for printing purposes soon caused a demand for papers coated both sides, and a great advance was made in the art of making it by the invention of the double coater by C. M. Gage about thirty years ago. This machine is still in regular use for that purpose.

To come down to present times. Within the past fifteen or twenty years the business has reached an importance where there has been a constantly increasing demand for better built machinery capable of greater speed, and a very marked growth in the width of sheet coated by reason of the increase in size of printing presses and the necessity of reducing cost of production.

The desire for greater speed has only been made possible by the use of warm air for heating and ventilating, which has fast replaced the use of steam pipes, which not only had limitations in speed of drying unless abnormally long buildings were used, but were actually detrimental to the coated paper. A still later advance in this line is the conditioning of the paper before rolling it up, which puts a normal amount of moisture in it if overdried. These aids to the coating of paper have made it possible and worth while to build coating machines capable of higher speeds and greater widths than were practical before.

Wall papers are now coated up to 400 feet a minute and speeds in coating mills of 200 to 250 feet a minute are not uncommon. This is perhaps double the average of only a few years ago. Coating machines running a sheet 96 inches wide, coating one side, are now in successful operation, and one coating both sides of an 82 inch sheet will soon be in use. These are double the average widths of about twenty years ago.

There is no reason whatsoever, from a mechanical standpoint, why both the width and speed of double and single coating machines should not be increased still further. It is only a question of meeting simple mechanical requirements. The only limitations as to width being the width of sheet turned out by paper machine which produces the raw stock used and speed within reason only means better, heavier machinery built to stand the strain.

It would seem that the coating industry is still in its infancy. Far greater advances have been made in the past twenty-five years or less than in the previous fifty years, and in the past year 96 inch coated board has been made most successfully as a continuous operation from beater engine to the finished, calendered, coated product cut in sheets ready for inspection and shipment. This is the greatest event in the history of coating. It may be that it is the beginning of a new era where large output is desirable at lowest possible cost.

REPORT OF COMMITTEE ON BEATER FURNISH*

By H. F. MILLER, AMERICAN WRITING PAPER COMPANY, HOLYOKE, MASS.

This investigation of beater furnishing was proposed by the Cost Association of the Paper Industry for the purpose of finding the best method of handling each raw material used in making paper to determine the cost and amount of each kind of material actually furnished to the beaters. As many of the problems involved would be of a technical nature, the Technical Association was invited to form a committee to co-operate with the cost committee on beater furnishing. This investigation is of interest not only from a cost viewpoint, but from a manufacturing viewpoint as well. The value of uniform furnishing is too well known to need comment.

The report as submitted herewith is not final, as the committee has plans to make it much more complete. It is the wish of the committee that the members of the convention will feel free to discuss the report and assist the committee by offering any suggestions which they may care to make.

Wood Pulp

The measurement of mechanical and chemical wood pulp may be divided into the three following groups, which require different treatment:

1. Slush pulp (own make).
2. Lap and hydraulic pulp (own make).
3. Purchased pulp (lap, hydraulic and machine dried).

Group 1.—Slush pulp is usually run over deckers and delivered to the paper mill at a consistency of 3 per cent to 6 per cent. The volume of this slush pulp can be determined by a measuring tank of known cubical contents. In news print mills the volume is measured in the mixing tanks. The quantity of slush stock may also be obtained by means of the stock meter. If the consistency is controlled by means of a regulator the air dry weight of the pulp can be computed. This method necessitates (1) a record of the number of measuring or mixing tanks dropped; (2) volume per tank; (3) average consistency of stock.

If the mill is not equipped with measuring tanks or consistence regulators, the amount of pulp delivered to the paper mill is usually determined as follows:

(a) Ground Wood Pulp.—Production of ground wood mill is figured from the number of cords of wood ground, using an average yield per cord. The latter is usually determined by tests. Any lapped stock placed in storage is weighed, tested for moisture and deducted from production and the remainder charged to the paper mill.

(b) Chemical Pulp.—The production of pulp is computed from the number of "cooks" or "blows," using a predetermined figure for the production per digester. If any stock is lapped, it is weighed, tested for moisture and deducted from the total estimated production to determine the amount to be charged to the paper mill. The above methods (a and b) may be checked from the paper production figures. The total of the mechanical and chemical pulp delivered should equal the paper made, allowing approximately a 7 per cent loss in conversion and deducting the difference due to moisture content of an air dry pulp and finished paper. This percentage of stock loss in conversion can be checked by the measurement of the white water losses.

Many mills manufacturing one grade of paper continuously use the method of "working back from paper made." The total figure of furnish consumed can be obtained with consistent accuracy, but the percentage of the different kinds of pulp must be assumed. This percentage figure can be determined if one kind of stock is slushed and the others furnished in lapped form.

*Presented at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

The above methods of computing beater furnish of slush stock, either from pulp production (a) and (b) or from "paper made," have several varying factors that are difficult to control. Consequently errors in computing slush pulp production are reflected in the furnish percentage. Accurate figures computed from paper made are dependent upon the correctness of the method of calculating white water losses. Moreover, these methods do not provide for an adequate control of operations.

Group 2.—Lap and hydraulic pulp (made in mill).

Many mills during certain periods make a surplus of mechanical and chemical pulp. This is weighed and stored. When it is necessary to use this pulp it should be weighed and tested for moisture when sent to the beater room. The quantity, kind and grade can be specified on the "Beater Furnish Order," as described later in section 3.

If all of the chemical pulp is in lap, hydraulic or dry form, the furnish of a certain period may be checked against production. The total pulp consumption of any grade for a month may also be checked by inventory figures. The inventory of a pile of stored pulp can be quite accurately computed by measuring the cubical contents of the pile and applying the predetermined weight per cubic foot of pulp. This weight per cubic foot must be tested at different points in the pile to determine the variation due to pressure of stored lapped pulp.

Group 3.—Purchased Pulp.

The method of handling purchased pulp depends largely on the form in which it is received. The most important kinds are given below with the various forms in which they are usually sold.

Ordinary Wet Lap Rogers Wet Lapped	Hydraulic Pressed Lap	Rolls	Bales
Ground Wood Sulphite Sulphate	Ground Wood Sulphite	Sulphite Soda	Sulphite Sulphate

Checking Invoiced Weight.—Each shipment of pulp as it is being unloaded should be weighed carefully on tested scales and the number of bales, rolls or skid loads counted. At the same time the pulp should be sampled for the moisture test to check the air dry weight invoiced. If received in lap form the cubical contents of the car of pulp should be found. The weight of air dry pulp per cubic foot should be obtained and used to charge out any pulp used from the storage pile. If the pulp is regularly piled so that each pile is separated, the average weight of air dry pulp per inch in height should be determined. As each pile is used out it should be measured and charged to furnish, using this basis of figuring the quantity consumed.

The square foot method is applicable to large storage piles, while the inch method can be used on small regularly piled lots of pulp. As the pulp dries out in storage the units of measurement change very little and they give the most accurate method of furnishing wet lap pulp which has been long in storage.

Tagging Shipments.—It is very important for accurate beater furnishing that shipments of pulp be so handled that the furnish order may be followed without any possibility of the wrong shipment or grade of pulp being used. If there is sufficient storage room the pulp may be separated by shipments and the lot marked as a whole.

However, such close piling is usually necessary that individual tags are needed for each bale, roll or skid load, as the case may be, to prevent mixing of shipments. The tags should give the kind and grade, the number of packages, and the date of invoice or

some identifying lot number from which the information may be obtained.

Beater Furnish Order.—The beater furnish order should specify the kind and grade of each pulp to be used, and also the date of invoice or lot number. The air dry weight of each kind is given and then its equivalent in wet weight or number of inches of pulp to be actually furnished. It is better to also show the air dry per cent for checking the wet weight specified.

Furnishing.—The methods to be used in getting the correct air dry weights into the beaters can be separated into three classes:

1. Wet pulp which has not been dried.
2. Partially dried pulp.
3. Pulp which is practically 100 per cent air dry.

Class 1.—Pulp which has not been dried.

This class included:

- Rogers wet lap.
- Regular wet lap.
- Hydraulic pressed lap.

If this pulp is fresh and has not dried out since the air dry percentage was determined, it may be furnished by the wet weight necessary to give the specified air dry weight. However, as this is not often the case, it is better to use the inch or square foot measurement already described. These methods are in successful use by several mills and the factor of pounds air dry weight per inch or pounds per cubic foot is very constant, particularly for hydraulic pressed pulp.

Class 2.—Partially dried pulp.

Pulp which has been partially dried, such as most roll pulp and some baled pulp, will vary greatly in air dry percentage between shipments and even in the same shipment. The air dry weight per roll or bale is also anything but uniform. The accurate furnishing of this pulp is very difficult. The following methods are suggested:

1. Mark the wet weight on each roll or bale as weighed. The wet weight of pulp specified on the furnish order can then be made up from a number of whole packages and from one split to approximately the exact amount.
2. Some pulp makers mark the wet weight on each package. This weight and their air dry per cent are often satisfactory to use in the above method.
3. Baled pulp can be furnished by the inch measurement method previously described.
4. If packages could be produced sufficiently uniform in air dry content, then the pulp could be furnished by number of packages per beater.

Class 3.—Pulp practically 100 per cent dry.

Under ordinary conditions pulp 100 per cent air dry should not change very much in moisture content during storage. The air dry weight called for on the furnish order can therefore be weighed directly without correction.

Suggestions to Pulp Manufacturers.—If the manufacturers of pulp would comply with the following suggestions they would aid greatly in accurate furnishing:

1. Pulp 90 per cent to 100 per cent air dry.
If pulp which varies between 90 per cent and 100 per cent air dry was always as close to 100 per cent as much as foreign pulp is, it could be weighed directly in air dry weight.
2. Partially dried pulp.
If partially dried pulp could be produced in packages of uniform air dry weight, it would be possible to furnish this kind of pulp by number of packages.

Rags

Weighing.—The invoiced weight of each shipment should be carefully checked by weighing on tested scales as the rags are received. If the moisture exceeds 8 per cent of the bale weight, the excess should be determined and charged back to the vendor. This standard for per cent moisture has been tentatively accepted by the

Waste Material Dealers' Association. The method for testing is described in the Technical Association Paper, Series 4, pages 55 and 56.

Tagging Shipments.—A tag should be fastened to each bale, giving the grade, the shipper, the date of invoice, the number of bales in the shipment and the weight of the bale. This is very necessary both to prevent mixing of shipments and to determine the yield of each lot, as described below.

Yield of Sorted Rags.—It is recommended where possible to purchase on a yield basis, particularly in rags, where there is a great chance of variation in quality, such as thirds and blues. By yield is meant the percentage of sorted rags to the gross weight. For thirds and blue, 90 per cent is considered a fair figure.

Rotary Boiler Furnish.—It is customary to furnish the rotary boiler by the weight of sorted rags before cutting and dusting. As the loss from these two operations is probably a fairly constant quantity for each grade of rags, the proportions of rags to chemicals should not be seriously altered by this procedure. The lime and soda ash to be used should be weighed according to the standard rotary furnish order for each grade of rags. A recording thermometer to show the actual temperature in the rotary is advised in place of pressure gauges for cooking control. A gauge on the steam line gives no indication of the temperature in the caustic solution.

Bleaching.—It is desirable that a standard quantity of rags be maintained for each rotary furnished. Then when dumped, the cook may be divided equally among a specified number of rag cars and the washers may be furnished uniformly by so many cars of cooked rags. The whole cook should be handled by a definite number of washers.

The bleaching liquor, if supplied from storage, should be furnished from a measuring tank. The liquor should be held at a standard strength by regular titration tests for available chlorine, and the yield of liquor from bleaching powder or liquid chlorine, as the case may be, should be known. If the bleaching is done with liquid chlorine, without use of storage but by controlling the quantity used by a valve which delivers a constant quantity in a given time, then the furnishing should be checked by direct weighing of the liquid chlorine cylinders. Soda ash used in this bleaching method is added by weight.

Furnishing Drainer Stock.—The handling of drainer stock is probably the most difficult problem in beater furnishing. The moisture in a drainer of rags varies with the time the drainer has been standing, and there will be 15 per cent or more difference between the top and bottom of the same drainer of stock.

In many mills at present the amount of drainer stock furnished is left entirely to the beater engineer's judgment. If all other materials are added accurately, it is possible by comparing average production per beater over periods to check the uniformity with which the drainer stock is being added. This, however, does not give any clue to the actual amount furnished per beater. Of course, if the run of a grade of paper should completely use up an even number of drainers of stock, then the rags used could be traced back to the sorted weight of rags going into these drainers. But this is not often possible.

In other mills, a number of cars of stock filled to a definite mark is specified on the furnish order. The air dry weight of the stock in a car will vary according to the time the drainer has been standing and whether it was dug from near the top or the bottom of the drainer. The latter objection may be met in drainers opening to the floor, where it is possible to dig from front to back, mixing top and bottom stock in the same car. Most drainers, however, do not open down to the floor and the stock is dug from top to bottom. It is often possible when furnishing by number of cars to find how many are obtained from a rotary cook of rags. This gives us the average weight of sorted rags required per a stock car.

Neither of these methods gives anything approaching the exact amount of air dry fiber furnished each beater. This information is desirable for uniform manufacturing conditions, for determining the yield of fiber from different grades of rags and for accurate costs.

Air Dry Fiber in a Car of Drainer Stock.—The air dry content of a car of drainer stock may be found by getting the air dry per cent of a representative sample by drying at 100 degrees centigrade. The wet weight of stock multiplied by the air dry per cent gives the air dry weight. This method is impractical because too slow. The only known method of obtaining this result, which is in successful operation, is that employed by the Eastern Manufacturing Company. Their method uses a centrifuge, 36 inch diameter, 12 inch deep, 7 cubic feet capacity. After whirling a weighed amount of stock for a definite time and weighing again, the dry weight of stock can be found from tables worked out for the purpose. The operations are as follows:

1. Place twenty pounds of rag half-stock in the centrifuge (30 pounds if using shavings).
 - a. Whirl three minutes and stop.
 - b. Scrape all stock from sides of centrifuge.
 - c. Whirl again for three minutes.
 - d. Take stock from centrifuge and weigh.
2. From special chart find what the car of wet stock should weigh to give the standard air dry weight of stock per car.
3. Weigh the car and stock, taking out or adding stock to get the correct wet weight as found in the chart.

One objection to this method is the cost of the centrifuge and the labor required. It has been suggested that the air dry per cent be found by passing the sample of moisture between rubber squeeze rolls weighted to give a constant and uniform pressure. The pressed stock should have a sufficiently constant moisture content, making it possible to construct charts similar to those used in the centrifuge method. It would seem to be less expensive both for apparatus and labor.

Size, Alum and Filler

Rosin Size.—The rosin size furnished as an emulsion should be supplied from calibrated tanks in which the total amount can be measured at one time. The old method of depending upon the beater helper to count the number of pails, is both much more liable to error and sloppy. The strength of the emulsion can be checked and held to the standard by means of a special hydrometer reading 0 to 2 degrees Bé and graduated to 1/50 degree.

Alum.—The alum solution should be handled in the same manner as the rosin size emulsion. The standard strength may be maintained by the use of a hydrometer, or better yet, by volumetric determination of the combined alumina.

Filler.—The filler may be added by dry weight or as a suspension from measuring tanks from a well agitated storage tank. The dry content of the suspension should be checked regularly. The moisture in the filler when received should be carefully tested and held to an agreed standard.

Old Papers

Receiving.—Old papers are bought in bales. Each shipment should be weighed on tested mill scales to check the invoiced weight. Each bale should be tagged, giving grade, shipper, date of invoice and weight, or if shipment can be separated, a lot number may be used from which all this information, except weight, can be found.

Sorting and Dusting.—In sorting, the recoveries are separated according to kind, such as ground wood, wire, etc., and weighed. The dust may be determined by actual weight or from the loss in weight of the sorted stock through the dusters. It is not practical, however, to reweigh after dusting. The average percentage of dust for each grade can be found from test runs. The alkali should be weighed out according to the standard rotary furnish and should be dissolved before adding. A recording thermometer is recommended for cooking control as described for cooking rags.

Washing and Bleaching.—The furnishing of washers and the handling of bleach is the same as in the case of rags. The procedure for rags then can be applied directly to old papers.

Yield.—The yield of air dry material from old papers is usually much less than from rags due to the loss of filler in washing. This shrinkage in each washer can be found by getting the density of the stock at the beginning and the end of washing, provided the volume is the same at the times the samples are taken. If this volume is known and each washer is tested, the yield of dry material for each rotary cook can be obtained. Another way of calculating yield is to use the record of beaters furnished, provided a division between rotary cooks can be made and the furnishing is accurate.

Furnishing Beaters.—Keep the stock in the beater chest at a constant density by means of a density regulator or some other control. The volume furnished the beater will then determine the amount of dry material used or added.

VOCATIONAL EDUCATION AND THE SUPERINTENDENT*

BY A. D. WOOD, OF THE CHAMPION FIBRE COMPANY, CANTON, N. C.

It happens often that we start out to do one thing and actually do another. Columbus started out from Spain with the hope that he might discover a short route to India; he accomplished a more important thing in the discovery of America.

By-Products Often of Greatest Value

In reading the history of many industries we find that by-products often prove of greater value than the main product for which the work was built.

An inventor will work for years upon some problem and secure a patent upon some device. He will employ energetic attorneys who will make the claims as broad as possible and many claims will be allowed. But the inventor may find, after his device is on the market, that a new field for its use will be developed. His original claims as set forth in his patent papers may not include the use of the invention in what proves eventually to be its most

important field of usefulness. He has accomplished something greater than he planned. So the reward of our labor sometimes exceeds our expectations.

The T. A. P. P. I. boys, who act as the Vocational Educational Committee of the Technical Association of the Pulp and Paper Industry, conceived the idea of editing and publishing a set of textbooks on Pulp and Paper Making, and made several claims concerning the value of this work to the industry at large. This was done through the paper trade publications, by letter, pamphlets, etc., and I believe that all the claims which they made, relative to the value of this organized effort, are perfectly valid, but as classes are organized and the textbooks put into service, we men who are watching the work and its reactions have been astonished at some new developments. There are some claims which might have been made, to favorably impress the paper manufacturer with the project, which were omitted for the very good reason that the committee didn't know it was going to work out that way. This work is actually going to be of tremendous value to the superintendents.

*Read at the Joint Convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

It wasn't the intention of the committee—they didn't mean to do it—but it is working out that way. So I am going to try to tell you about it.

Looking Backward

A song was written a few years ago entitled "School Days," and one line runs like this: "Let's take a trip on Memory's Ship," and I am going to ask you to do this, "not back to childhood days," but back to the time when you first began to assume the responsibilities which have been piling up on you ever since. How many times have you, in your years as a superintendent, wished in your innermost heart, whether you gave voice to the wish or not, that you could fill many positions in the mill with men who would attend to things as you attended to them when you were serving your apprenticeship in the mill? How many times has your mill suffered from a delay in one department or another, which you felt would have been foreseen and avoided, if you, instead of some other fellow, had been on the job in the department responsible for the delay?

What quality did you possess which the other man nowadays seems to lack? Wasn't it a willingness to accept responsibility? Isn't it a difficult matter today to find a man who gives evidence of feeling as keen a sense of responsibility as you felt when you were working your way up?

In my study and observation of men who attend classes in pulp and paper making at our plant, I came to the conclusion that a very large percentage of these men, subconsciously perhaps, seemed to welcome responsibility. And this seemed to grow with them as they progressed with the class work. The superintendents who taught the other branches of study agree with me. This reaction was felt by electricians, bricklayers, pipe fitters and boiler-house men, as well as by the pulp and paper makers. These men are preparing to accept responsible positions, so why shouldn't they shoulder, with thanks, any additional duties and responsibilities which come their way?

What Technical Men Didn't Claim

Here is where the technical men fell down—they didn't claim any result like this when they asked for funds. They didn't know that this frame of mind would be a by-product of this kind of education.

I want to hammer this in. If someone came to your plant and interviewed the man who holds the pursestrings and convinced him that for a few hundred dollars he could change the mental attitude of the working force so that the members of that force would be inviting you to make them responsible for more details of their work, right on the job on which they are working, he'd immediately send for you and ask you what you thought about it. He certainly couldn't raise any objection if a man wanted to watch a sulphite digester as though it belonged to him personally, or if he felt a great pride when he beat the best former record for quality and quantity. But the trouble seems to be that the fellow who holds the pursestrings might willingly hire a man to preach a sermon on responsibility development, but isn't willing to pay for vocational educational work of which responsibility development is a by-product.

I will not make a positive statement as to why men change their attitude toward their work as they progress with their studies. Perhaps we all like to apply the knowledge we gain, and we naturally do not object to assuming responsibility for something we know all about. It seems natural, as we know more, for us to try and find ways to express it.

You may say there are only a few men who would avail themselves of the opportunity for education, but if you have a few men here and there throughout the plant who are accepting responsibility and working loyally as a result of vocational education, this educational work will prove to be a good investment for your company. And you don't have to sermonize at all. These men will be on your side and won't know how they get there.

Accepting Responsibilities

Again I ask you to resume the trip upon the "Ship of Memory." As you accepted responsibilities, the acceptance of which put you in your present position and kept you there, isn't it so that you frequently saw scientific devices which you thought would be workable, and would be dividend earners for your company, but they were not "fool-proof"? That is what you said about them. Then you'd continue: "It's all right if I was there myself, or if I had someone to stay with it, but those fellows up there wouldn't take any interest in it. They don't like the new things any too well, especially if it's one of those things which will cut out a man from the crew." So you didn't have time to fool with it. Of course, you could have someone come in and preach another sermon about it, and then try it out. You remember all about it, and how it actually worked. Right here I want to state that you'll be astonished to learn how hungry many of the class men are concerning a thing like this, and I might add that it was understood in our classes that when a group of our men wanted to know something about some special feature of the work, it was up to the teacher to set aside the textbook and devote a session, or more if necessary, upon the subject named. We did not stick to the textbooks, anyway. We simply used them for three-quarters of an hour at each session, and so far we have been studying simple arithmetic; then the other half of the session, forty-five minutes was given over to the description of some device with which men were working, or some process with which they were familiar. If the class wanted to discuss acid making and the acid plant, we'd let the acid maker help put on the work, under the guidance of the teacher. If you want to learn a whole lot about the mill you are running, I'd suggest that you start a class like that and teach it yourself. (The "tech" man also forgot to mention what a help these classes would be to the "super," if he taught them.)

But to go back to the question of these new devices which are not "fool-proof." The technical man didn't mention, did he, when he invited the trade to contribute to the textbook fund, that the class man would be eager to work with devices which were not "fool-proof" and that he'd try and find out all about them and make an honest effort to be responsible for them, just as though he were the "super"?

Just one more thought: Some time or other in your mill life you've had to deal with a man who was absolutely unreasonable. You recollect how just and reasonable you tried to be with him, but he was an absolutely hopeless case. You had to fire him. Costly business, firing men. Again, some of you have had the same kind of dealings with groups of men who were just as unreasonable and just as much of a nuisance; you'd think by the way some of them acted that they thought the letters U. L. on the Union Label stood for Unreasonable Lopsidedness. But you let them work on. Hell of an expense, wasn't it? I believe that vocational education will improve this state of affairs.

Influence of Superintendents Needed

The suggestion was made at the last meeting of the Vocational Educational Committee of the Technical Association of the Pulp and Paper Industry that some money toward completing the work on the textbooks might be obtained through the influence of the superintendents.

All you fellows have good judgment. You all are close observers. There isn't a man here who couldn't track an elephant through four feet of snow, and I think you'll accept vocational education as worthwhile.

I am not asking you to pass the hat, though if anyone present wishes to make a personal contribution it will be gratefully received. But I am asking you superintendents to interest yourselves in this work and ask your companies to support it. Here is an opportunity for you to take part in a splendid work. It's a good thing; let us push it along.

THE RELATION OF EMPLOYER AND EMPLOYEE*

By A. B. THOMAS, GENERAL MANAGER, EDDY PAPER COMPANY, THREE RIVERS, MICH.

In the organization of business, either large or small, there is nothing as important as the relationship established between employer and employee.

The Biggest Element in Success

The success or failure of an institution usually, if not always, depends more on this one thing than any other, and the company that brings harmony and understanding into this relationship is going a long way toward solving one of the big business problems that has bothered business since it began.

There was a time when business was done on a smaller scale; companies were not as large as now, and the manager of an institution knew every man in his employ by his first name, and in a great many instances knew his family. This made the relationship of employer and employee one which was influenced by the character of the individual employer, and not one of principle.

You will doubtless agree that the relationship of these two interests was not what it should be, and that a situation of distrust and lack of confidence arose that was detrimental to efficiency in business.

Selfishness on one hand led to selfishness on the other, and one tried to get as much as possible for the least pay, while the other tried to get all he could and give as little as he dared.

Usually the man with the most will-power was the most successful in managing a business, although there were then, as there always has been, some men who recognized the principle on which harmonious relationship must be built and carried fair and square 50-50 dealings into business.

These are the kind of men who are building the real lasting business structure. The right relationship of employer and employee must be built on "The Golden Rule."

The Golden Rule Paraphrased

In looking around you today in the business world you will see men who are dressing this doctrine up in all kinds of home-made garbs, fearing that someone will accuse them of being religious fanatics, but this is the only solution to the situation that now exists and the only one that will get the confidence necessary for a close working arrangement.

Every few days some noted business man comes forward with the statement that our need is more of God in business, just another way of saying we must apply "The Golden Rule."

Right here some people will point to Henry Ford as a world example of driving efficiency methods, and no one can say his system did not make money, but any close student of economics will agree that it was not successful in building up character, self-reliance, initiative and other qualities that make a happy, satisfied employee.

Following some of his later projects, it appears that he is beginning to inject into his plans more of this principle.

No doubt a great many of you have read of Golden Rule Nash, a manufacturer of clothing in Cincinnati, who was about to fail, and who called in his two sons and advised them he was going to apply the Golden Rule to his business and start by raising pay, when every apparent fact pointed that he should lower it. Against his sons' advice he raised all pay, one small cripple and an old man, 200 per cent, from \$4 to \$12 per week. The efficiency came up so fast in his plant that in a short time he was making money beyond

all dreams. The fact that this principle is right was further demonstrated during the garment workers' strike a few years ago in this plant. Hundreds of people were out of work in Cincinnati, and in a petition signed by these employees they requested that Mr. Nash cut the selling price on clothing, thereby getting more orders so he could employ some of the strikers out of work, or if this was not feasible they would lay off for a period of 30 days and give people who were not working their jobs. This is recognized as the greatest example of the application of this principle in modern business. The strike was settled about this time, so neither plan was necessary.

I am speaking to paper mill men, and my remarks will cover this industry to a great extent, but the principles set forth may be applied to most any line of business.

Superintendent in New Roles

This is a cost accountants' and superintendents' convention, and as other speakers are setting forth the relationship of the cost department to the mill, to the management and to the superintendent, I will deal principally with the superintendent, as he fills a very important part.

A superintendent today is not the same man he was a few years ago. He fills a great many roles, such as right-hand man to the management, co-operative agent to the accounting and cost system, and father to the mill employees.

A superintendent has more influence in bringing around the right relationship between management and men than anyone, and might be called a "confidence man," not as used in newspapers and criminal courts, but as the man who establishes confidence between employer and employee.

Value of Mutual Understanding

A few superintendents overlook the importance of their jobs in this respect, but the up-to-date man must realize his position and stand for honesty and fair dealing when the men in an institution can feel that what the management and superintendent says or does is the best for all connected with the company, and when the management knows that the men are unreservedly working with them, a relationship is established that does away with bickerings and strikes that cause trouble and discontent.

A mill may be equipped 100 per cent perfect, with a superintendent who is not fully awake to present standards, and with men working in a distrustful state of mind, and they will not get out the tonnage that a mill less perfect in equipment with a harmonious, happy organization will do. At the Eddy Paper Company new mill we do not claim any honors as far as perfection is concerned, and do not have men posing as individual stars, but by a very humble application of working together we ran a board machine 275 feet per minute, so that I am not talking theory altogether. Other facts have been brought to my attention that prove these things to me.

Things to Remember

The thoughts I would leave with you are these:

1. The relationship of employer and employee is the most important thing in business organization.
2. The superintendent is a very important man in a paper mill.
3. The best relationship is established by applying the Golden Rule to your business and teaching your employees to do so; this establishes confidence, you will be happy, your business will prosper.

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industries, Kalamazoo, June 1-2.

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AN EXECUTIVE'S VIEWPOINT ON THE SUBJECT OF CO-OPERATION BETWEEN SUPERINTENDENTS AND COST DEPARTMENTS*

By GEORGE A. GALLIVER, PRESIDENT, AMERICAN WRITING PAPER COMPANY.

That the subject assigned me is pertinent and timely, is evidenced by the fact that your two associations are meeting here today jointly for the exchange of ideas and for the building up of closer co-operation. Each group probably has a somewhat different idea as to the object to be gained by this meeting. The cost men feel that it is to settle for all time any question in the minds of the superintendents as to the real value of cost systems and cost accountants in the mills. Very good. You superintendents are undoubtedly hoping that you can make the cost accountants come out of the clouds and either get down where you live and help you solve your problems, or else get out and not bother you. Again, very good. As representing the executive point of view, I hope both of you are successful, and shall attempt to make some contribution to the cause of each.

Main Business to Sell Paper at a Profit

Obvious as it is, we must ever keep in mind that the object of the paper mills in this country from the standpoint of the administrators is to make and sell paper at a profit. The mills are not run to allow the superintendent to show his skill, wonderful and important as that skill is; nor to allow the cost accountant to show what a magnificent cost system he can build up, necessary as that is. They are run to manufacture a product of such kind and quality and uniformity and at such a cost that it can be sold in competition at a price that will bring a fair return to the owners for their investment, and for the risk they take in manufacturing. This fair return must contend with one factor among others, that each of you, from widely differing viewpoints peculiar to your vocations, must consider. I refer to waste, for example. We often find ourselves thinking of waste or of savings in their proportion to the entire cost of the manufactured article. This is misleading. For take notice, if a machine makes a thousand pounds of paper an hour, probably seventy-five pounds of that paper represent the profit to the mill. Now, if it makes fifty pounds of broke, which is small compared to the thousand pounds, it takes out two-thirds of the profit. The margin between a loss and a profit, or between a product that can sell in a competitive market and one that cannot, is very small indeed, and you can see from this single consideration that everything, therefore, that leads toward exactness in control of manufacturing methods on the one hand, and accurate knowledge of costs on the other, is of the most vital importance. How necessary it is that you should work together.

The executive, human as he may be personally, on account of the responsibility he holds, usually for other peoples' property and investment, can never eliminate from his mind the question of costs and returns. You may talk to him about your good work, you may golf with him, and he may consider you a good fellow, but finally he has to judge by the one test, are you a paying proposition. For the main part, however, the growth of our different companies has brought you largely out of contact with the chief executive, and he is forced to judge by the cold figures that represent your work. I would say at once that the wise superintendent will make use of these figures before they go to the executive, for studying the efficiency of the various processes under his control and for improving his work. Therefore, superintendence and costs should go hand in hand.

At once will come the obvious objection that cost reports are

often unreliable, that they are put up in such a way that the superintendent cannot understand them, and that they evidence gross ignorance of the papermaking process. These criticisms are often true, but they offer not an excuse for lack of co-operation between the cost man and the superintendent, but an evidence of the need of it. One of the prime functions of the cost accountant is to furnish material that shall be helpful to the superintendent and his superior officers. The cost man's business is to serve. It is his duty, therefore, to put his material in such form that the superintendent can understand it and use it. Both have the same end in view. Correct data and serviceable reports can be brought about only by the closest co-operation and the mutual confidence between the manufacturing staff and the accounting staff. The securing of such harmonious co-operation between the departments is one of the matters of chief concern to the executive. I may add here that the man who hopes to make a hit with his boss by repeatedly going to him with the tale, "I did this," and "I did that," is making a grave mistake. One part of an organization must function and contribute to the strength of the other parts, and the "I did it" man shows at once that he has one of two weaknesses, either he is a conceited boaster, or he is a selfish individualist, and does not know how to get the teamwork that helps him along and that is open to him from the other parts of the organization. Here is a prime source of error. In your own mill and in meetings like this you should seek to find great good in each other.

Why Cost Data Are Essential

A few of the outstanding reasons why efficient cost data is absolutely essential from the managerial standpoint may well be stated here. It should be understood that efficient data is the information that can be obtained only by the closest co-operation of the cost and manufacturing departments. An executive will look with doubting on cost information given him by a set of accountants who are out of harmony with the manufacturing department.

Cost Accounting in the Home

First, the control of business necessitates accurate and detailed knowledge of costs in every department of that business. Even the farmers are rapidly learning this and have their systems of farm accounting, and I venture that a good proportion of you maintain your household accounts so that you may control your personal expenditures. Today bankers judge an industrial concern more on the basis of its management and the accuracy with which this management knows and controls its affairs than on its earnings of the past or its property accounts. The executive without accurate knowledge of his costs is like a man walking blindfolded on a narrow path with a precipice on each side. He cannot expect to have the confidence of his bankers, his directors, his stockholders, nor his business connections.

A Good Barometer of Business

Second, it is only through the reliable cost data that the manager can determine the weak spots in his departments and strengthen them as needed. If a mill has some old equipment that is operating inefficiently, there is no surer way of bringing about its repair or replacement than by showing cost figures which indicate a waste. Likewise, there is not an easier way for a superintendent to bring up the work of a foreman than by showing him the actual record of his performances. The correction of both men and machines are thereby facilitated. Effective cost figures are in fact statistical

*Read at the Joint Convention of the Cost Association of the Paper Industry and the American Pulp and Paper Mill Superintendents' Association, at Kalamazoo, June 1-3.



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THE paper dyes offered by this company are prepared with special reference to the specific purposes for which they are intended. Our experience has proved that the most satisfactory results are obtained only after painstaking care in the selection of proper dyes.

We are therefore publishing in this paper a series of advertisements giving our recommendations for the types which we consider are best suited for the coloring of various kinds of papers.

The manufacturers of sulfite bond require dyes which will be permanent during the effective life of the paper which they color. Economy of use, and ease of application are both important considerations.

"National" direct and acid dyes form the main dependence of the sulfite bond dyer in view of these requirements and the character of the raw material used.

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National Brilliant Paper Yellow C
National Erie Yellow 2 R F P
National Acid Orange Y P
National Erie Brown C N P
National Croceine Scarlet M O O P
National Erie Fast Scarlet 4 B A P
National Erie Pink B B P
National Acid Violet 4 B N P
National Fast Tinting Blue R
National Fast Tinting Blue B
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reports on the performances of the different departments, and any superintendent or foreman who is not willing to co-operate with the cost man at once lays himself open to the suspicion of being afraid to have his record known. Fortunately such reports work also the other way and bring the accomplishments of the efficient superintendent to the attention of his chief.

Third, a knowledge of costs is essential for the determination of selling prices. This one thing alone would more than justify the expense of a good cost system. If, due to an inaccurate knowledge of costs, prices are set too high, there will be a lack of orders and the mills will go down. If, on the other hand, they are unintelligently set too low, the mill will be operating at a loss, with its consequent lack of funds for better equipment or improvement, or for better salaries, thus making impossible the betterments you superintendents are so anxious to have, and your executives would be glad to give you. In the final analysis, the prosperity of each employee must be dependent upon the prosperity of the company he serves. Not only does the ignorant pricing of goods injure the company practising it, but due to its effect on the general market, it works an injustice to every competitor and to every employee of such competitor, and to the industry on the whole. It is far-reaching, indeed, in its blighting effects.

Another Instance

Let me cite another instance. Some of our very best paper-makers believe that they can make paper in their particular mill just as cheaply as any other papermaker can make paper in his mill. A great deal of pricemaking is based upon this idea. If one mill makes a low price on paper, another mill will say that if that mill can afford to do it, he can likewise do it, and will book the business at the same price or a shade lower in order to have something to run upon. This sort of reasoning is foolish, and I believe it is rapidly becoming obsolete. I know it is so far as our mills are concerned. The fallacy lies in the fact that one mill with its equipment can handle any specific pulp at a certain cost and another mill can better this or not do as well, one or the other. We are able in our group of twenty-six mills, to check this up absolutely. Every mill we have varies from every other mill in its ability to utilize some material or other economically. I do not mean by this that some mills are no good at all and others splendid, but that some mills are the best for the utilization of some materials and other mills are the best for the utilization of other materials, and that each mill has its particular forte. If a management knows this it can make money with its mill by putting it upon certain papers in which this particular mill can beat competition, and cutting out absolutely other papers upon which the mill could not meet competition. Selection is, therefore, the watchword. The superintendent in a case of this kind is entirely dependent upon accurate cost work in order to have the data upon which to make the selection. Any superintendent before me who is in a company that has more than one machine and more than one set of equipment before and behind each respective machine, will, upon due consideration of this matter, agree with me, I am sure. In referring to mill in this connection, we might just as well refer to the machine, with its fore and aft equipment. Here is where the cost department, by co-operating with the superintendent, can accomplish a great deal toward making its company a success.

Advice to the Cost Accountant

If I may be allowed as a representative of paper mill executives to venture some advice to the cost accountant, I would say:

First. "Do not become absorbed with the idea that your 'system' is absolutely right, and therefore a fixture, but keep it always flexible, subject to change whenever such change will make it more serviceable. Let it be subject to evolution. Here lies a valid reason for your association activities."

Second. "Do not be too ready to criticise the manufacturing de-

partment. You probably do not know all there is to know about papermaking. Live and learn."

Third. "Cultivate the greatest tact and diplomacy possible, both in installing your system and in operating it. Remember it cannot be successful unless you have the full co-operation of the manufacturing men. You cannot get this by arbitrary rulings."

Fourth. "With the co-operation of the manufacturing men, establish standards for each operation. Having done so, notify the parties interested only when variations from these standards occur. This will do away with a mass of uninteresting and unnecessary reports. It will bring about 'standard practice,' the aim of cost accounting."

Fifth. "Work with and through the superintendents and foremen, not against them. Do not make a report to your superior officials about a manufacturing problem until you consult your superintendent. Your analysis may be all wrong, and he will gladly explain the manufacturing department's side, with which you are probably not familiar."

Sixth. "Carefully explain the workings of your cost system to the superintendent, together with the ends you hope to accomplish through it, and he in turn will give you the information you must comprehend concerning the manufacturing."

Advice to the Superintendent

To the superintendent I would say: "When a cost system is installed in your mill, make all possible use of it. Do not let prejudice or reports you have heard from some other mill influence you when you have not developed your own experience. You can know more than the other fellow only when you have actually experienced—not otherwise."

Second. "Remember the cost system is there to serve you, and see that the reports are so made out that you can understand and use them. You have your own ideas as to economies. Have the cost man check them up. You may be wrong. For instance, you may think you know the relative costs of bleached pulp or of bleaching unbleached, or of costs of beating different grades, or of shrinkages. Do not depend on figuring you do in your head. Consult your cost man."

Third. "Back up the cost man. Insist that your men fill in all the forms promptly and accurately. Remember that the data given the cost man by your own men is the very foundation upon which the entire superstructure is reared, and inaccuracies in the cost accountant's work are just as likely to be reflections on you as on him."

In Conclusion

In closing I would point out that the conditions of the past few years when we contended with continually rising prices, through no credit to ourselves, saved us from the consequences of the many inaccurate and inefficient methods we countenanced. Now the general price tendency in all lines has recently been downward, and in the paper business must immediately be turned upward. Therefore, you must for yourselves assume the full responsibility for any ignorance and inefficiency or lagging, if you do your duty by your own mills. The manager who knows his business so well, and has his information so accurate that he can control his affairs along a very narrow path, will be able to bring success to his company and satisfaction to its rank and file. Superintendents and cost men, do your best in double harness for the good of all.

One last injunction for superintendents and cost men, respectively, I wish to leave you. If you can together turn out standard papers and definite costs you will enable your association to serve, through its executive committee, or some other committee in authority, the whole paper industry in a way that will make your industry as outstanding and as successful as any other. You know we are considered a very backward industry. I have seen it stated more than once that there are two industries in the United States that do not know their costs, and also which have no definite or concerted merchandising policy; to wit, the paper industry and

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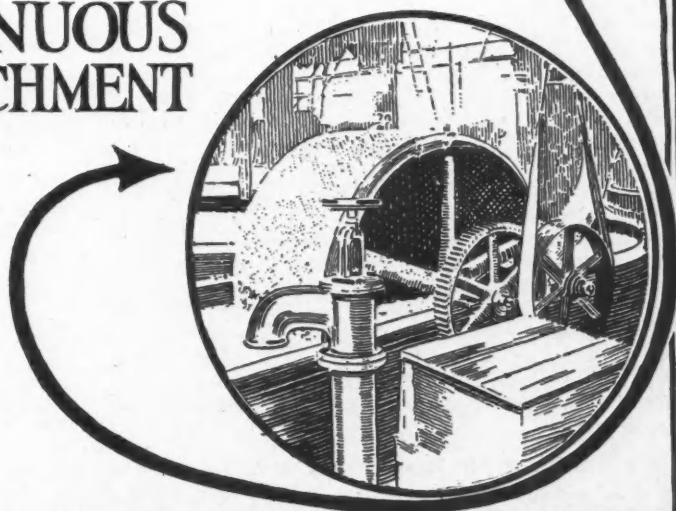
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textiles in general. I give you this on the authority as well of a big business man who is interested in both. We want confidence restored in the paper industry, not only from the standpoint of investment therein, but in order that what the constant increase in population and business activity of America does for other industries and has not yet been able to do for paper, it may now do.

If Judge Landis can restore confidence in baseball, and Mr. Hays in moving pictures, an authoritative committee of your paper associations should do likewise for you. This is a Hoover idea. The co-operation of superintendents with cost men, and vice versa, is fundamental to this. See to it that you meet the responsibilities thus laid upon you and come through with flying colors.

TO MAKE PAPER IN MEXICO FROM HENEQUEN PLANT

Mexico is destined, if all experimental results are proven in practical application, to revolutionize the paper manufacturing business and relieve the drain on the pulpwoods of the northern countries; offering a substitute for them which is of easy replacement and which immense areas of land in this country are peculiarly suited to grow. In fact, there are millions of acres which will grow nothing else with any degree of success.

Experiments Furnish Satisfactory Results

Some time since, a citizen of Yucatan with intelligence above the average and an inquisitive turn of mind became possessed of the idea that the henequen plant, which is grown for the production of fiber, had paper stock possibilities in it. He began a series of experiments in the manufacture of paper from the pulp of this plant. The apparatus and his methods were crude and his knowledge of the best methods of treatment was not of the widest experience, but the results were so satisfactory and the product so fine and strong that when made public the planters of henequen were roused to a high pitch of enthusiasm.

Henequen, which is best known in the United States for its fiber in the form of binder twine, is the real backbone of life in most districts of the State of Yucatan, where immense areas are given over to its cultivation. Heretofore the only use for it has been that of removing its fiber, but this new invention promises to make a market for the pulp, which is by far the greatest portion of its bulk, and will turn what has been waste into a source of profit, beside doing away with what has been a nuisance—its disposal.

Other Plants Available for Pulp Making

But henequen is not the only plant which this experimenter has found suitable for paper pulp as he has, by experiment, ascertained that all plants of the agave family, to which the henequen belongs, are equally suitable. There are many plants in this family, but the most common of them are the maguey and the henequen. The former is generally distributed over Mexico, being that from which the national beverage, pulque, is made. As noted above, there are vast tracts which will grow nothing else of economic value and there are millions of acres of ground on which this plant can be grown without attention and without water. One of the most economic characteristics of the plant is that in the highlands it will grow and flourish on lands where no other crop can exist. The henequen is essentially a low land plant.

There are a dozen or so plants of this family whose pulp is of identical composition and extensive experiments carried on by a French scientist have perfected the distilling of alcohol from this pulp. The still residue consists of the portion from which the paper is made and it is believed that the more advanced experiments now in process will resolve the investigation to the point where it will be possible to save the fiber, when desired; extract the alcohol and use the balance of the plant material for the manufacture of paper.

Use of Plant for Paper Making Not New

The use of these plants, particularly the maguey, for the manufacture of paper is nothing new, as the Aztecs, prior to the invasion of the Spaniards, recorded much of their chronicles on a

kind of paper made from this plant. Many specimens of this are in existence today, perfectly preserved and giving evidence of the possibilities of durability of paper made from the same base under modern advanced scientific treatment and processes.

The fact that paper can be produced from the henequen has been amply proven, as well as the fact that paper so produced is unusually strong and fine in quality, but a still more careful experiment, on a commercial scale, is being carried on at the largest paper factory in the republic.

Success of Processes Seems Sure

While no announcement has been made as to the probable outcome of these experiments, it is generally believed that they are meeting with success as a highly capitalized company has been formed with the avowed object of engaging in the manufacture of paper from this pulp. The company is headed by the manager of the San Rafael Paper Company who is considered the greatest expert on paper and paper manufacturing in Mexico, which is taken to indicate that the absolute commercial success of the processes adopted is sure.

Great secrecy has been observed in the conduct of the experiments and no definite results have been given out, but the statement has been made that for the manufacture of paper, where it is not desired to save the fiber and alcohol, the machinery used does not differ from that used for wood pulp, so that any factory now operating on other bases will have no material changes to make to change over to the agave pulp. It has been announced that the macerating of the agave pulp by chemical process has been the most difficult point to work out in the development, as the formulæ which applies in the handling of wood pulps will not attain the desired results. No explanation has been made, but it is supposed that neutralizing factors have been encountered which destroyed the reactions made by the old process.

The original experimenter solved this problem, after repeated trials and the macerating and bleaching formulæ are well developed. But very little of the mechanical maceration is used in the treatment of the agave pulp, the results being almost entirely attained by chemical process.

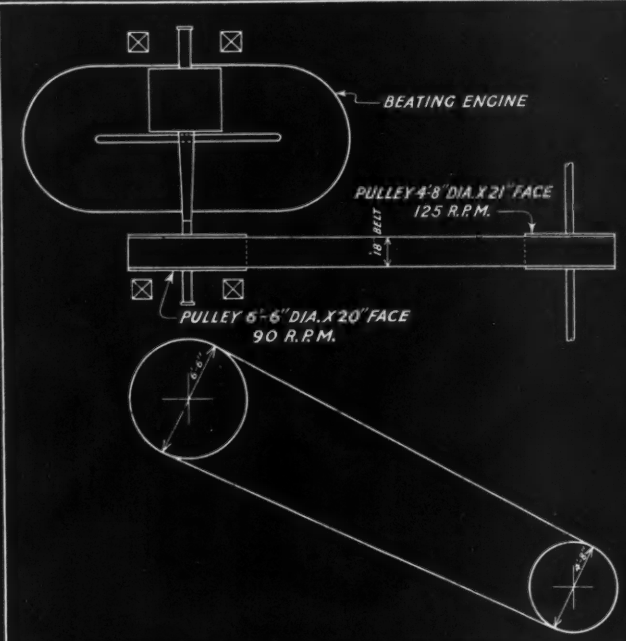
Mexico May Become Exporter of Paper

It is anticipated by those who have developed this process up to the present point that Mexico will, as soon as the manufacture from this stock is commercially perfected, become an exporter of paper instead of the large importer which it now is, as it is claimed that paper from this base can be produced cheaper than from any other known stock; while, at the same time, a better quality than the pulpwood paper will be made.

Printing Committee to Open Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 7, 1922.—The Joint Congressional Committee on Printing will open bids the latter part of July for paper for the use of the Government Printing Office for a six months' period. It is expected that the Specifications Committee will meet in a week or so to begin consideration of the paper item.



SPECIFIED:- GOODYEAR BELT
 TYPICAL BEATER DRIVE
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 OF THE AMERICAN WRITING PAPER COMPANY
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18"-6 PLY GOODYEAR BLUE STREAK BELT
 DRIVING PULLEY, 4-8" X 21" FACE, 125 R.P.M.
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 MAXIMUM H.R.-50

Blueprint sketch of Goodyear-belted beater drive in the Crocker Division Mill of the American Writing Paper Company, Holyoke, Mass., and insert photograph of the Crocker Division Mill

Copyright 1922, by The Goodyear Tire & Rubber Co., Inc.

Twenty-six Eagle-A Mills and the G. T. M.

The American Writing Paper Company, of Holyoke, Massachusetts, comprises 26 mills throughout the country, making the nationally celebrated Eagle-A Quality-Standards of printing papers. The belting equipment and requirements of their every plant, involving hundreds of drives, have been analyzed in the past two years by a G. T. M.—Goodyear Technical Man.

"This analysis of the belt equipment in each of our 26 plants is the most comprehensive and valuable work of its kind that has ever come to my attention," writes Mr. J. Moles, Chief Engineer of the American Writing Paper Company. "The actual G. T. M. work required months, and the final report, together with recommendations submitted by the Goodyear Company, comprises several volumes."

A great deal of the equipment installed on the basis of this expert analysis is Goodyear Blue Streak Belting. This is particularly true of the equipment of the great beater drives which transmit the power from the main shaft to the great revolving cylinders where numerous knives beat rags into stock for the paper machines.

Two of these Goodyear Blue Streak Belts, 18-inch, 6-ply, were installed in the Crocker

Division in Holyoke, in June, 1920. These two Goodyears have been in constant operation for two years now, and have never been touched. They never required taking-up or repairing. Mr. Moles says they are as good today as the day they were installed, though they have been working on this heavy drive for 24 hours a day, six days a week.

Hundreds of other Goodyear Belts in American Writing Paper plants are giving correspondingly faithful, trouble-free and long-wearing service. Their efficient and economical performance is a tribute to the quality built into them and to the correctness and exactness with which they are specified to their jobs.

This is a splendid example of the work of the G. T. M., the working of the Goodyear Plant Analysis Method, and the performance of Goodyear Belts. You can have a similar survey made of your transmission or conveying problem. There is a G. T. M. in your neighborhood, and you may rely on his recommendations and on the quality of Goodyear Belts. For further information about the Goodyear Analysis Plan, write to Goodyear, Akron, Ohio, or Los Angeles, California.

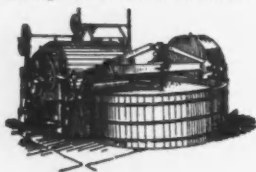


Friction meets its master

A Lubrication Audit

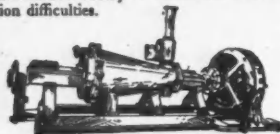
in the Paper Industry

would point out the Correct Lubrication for the important machines as follows:



Beaters

Beater bearings, generally unnecessarily hot, will run cooler if the stock leakage is eliminated and oiling is regularly attended to. The regular use of Gargoyle D. T. E. Oil Extra Heavy overcomes beater lubrication difficulties.



Jordans

Because of the high speeds and heavy pressures which are always present, and the side pull on bearings when belt driven, it is necessary to use a heavy bodied oil. For this purpose we recommend Gargoyle Etna Oil Heavy Medium.

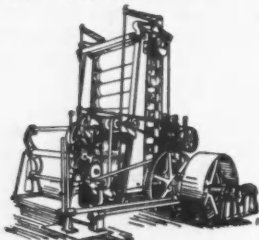
Paper Machines



For bearings of the paper machine, subjected to induced heat from steam used for drying, an extra heavy bodied oil is required such as Gargoyle

D. T. E. Oil Extra Heavy.

The rolls at the wet end subjected to moisture and heavy pressure demand a compounded oil which will resist the washing tendency and maintain a perfect oil film. We recommend Gargoyle D. T. E. Oil Heavy X for these specially trying conditions.



Calenders

Paper machine production is directly dependent upon uniform speed. Calender bearings are subjected to heavy pressures and high frictional heat. The regular application of Gargoyle D. T. E. Oil Extra Heavy insures uniform speed, and consequently minimizes "broke."

FRICITION is the unseen enemy of production in every plant in the world. There can be no mastery of friction save by Correct Lubrication.

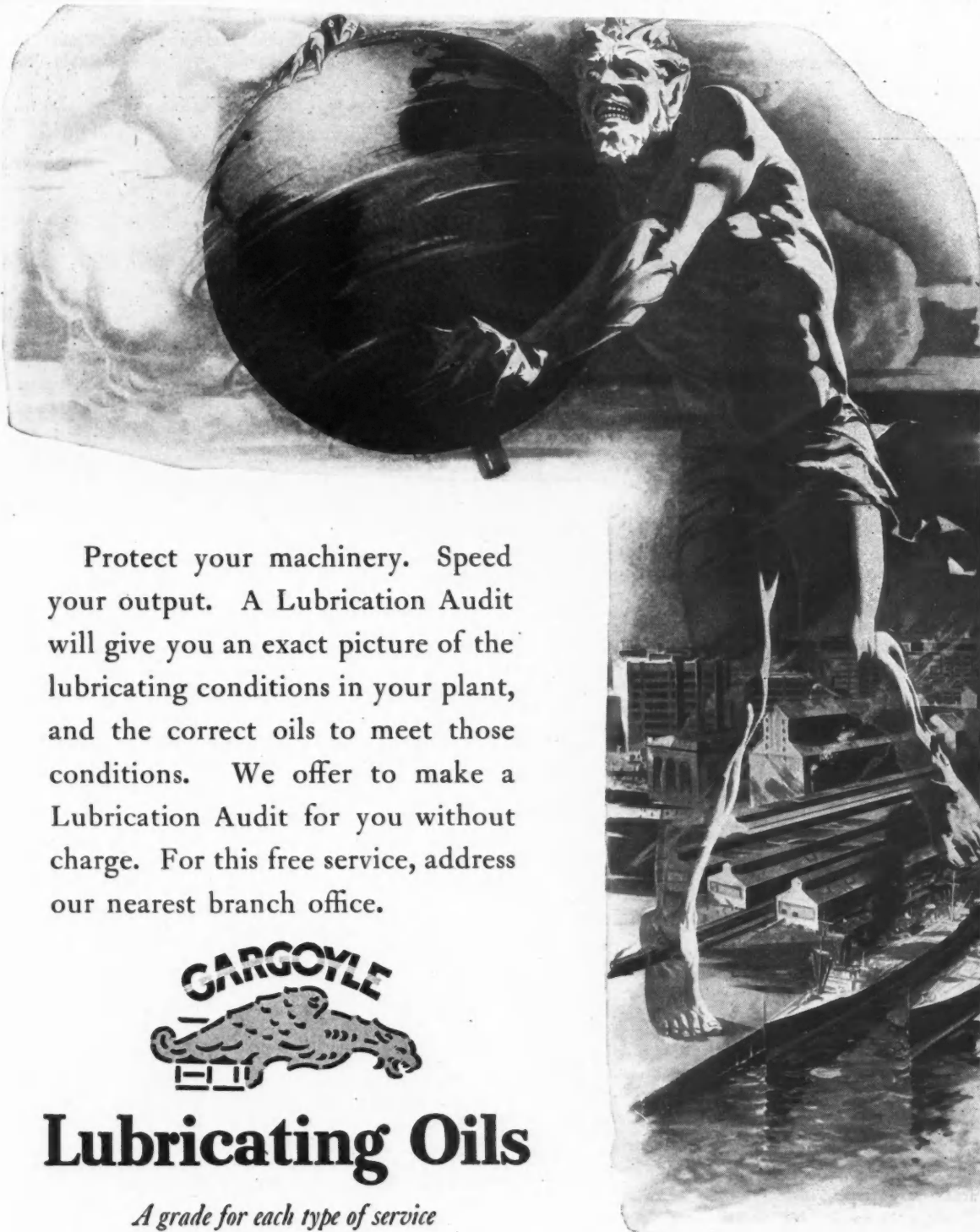
The Vacuum Oil Company, for 56 years the world's leading specialist in lubrication, operates on this principle:

First: to scientifically analyze the lubricating requirements of every engine and machine used in modern industry.

Then: to manufacture, specify and supply the correct oils to meet those requirements.

Due largely to the wide acceptance of this Vacuum Oil principle, the old thoughtless assumption that "oil is oil" now stands universally disproved and discredited.

VACUUM



Protect your machinery. Speed your output. A Lubrication Audit will give you an exact picture of the lubricating conditions in your plant, and the correct oils to meet those conditions. We offer to make a Lubrication Audit for you without charge. For this free service, address our nearest branch office.



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		Kansas City, Kan.		Dallas	

*Friction—the Unseen Enemy
of Production in Your Plant*

OIL COMPANY

Editorial

Vol. LXXIV New York, June 8, 1922 No. 23
FIFTIETH YEAR

The Kalamazoo Convention

The joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry was a pronounced success in every respect.

The convention demonstrated one thing conclusively and that was that a small town can successfully handle the national convention of superintendents, and include the cost men in addition, that is if everyone on the committees takes hold and works before hand and during the gathering. They worked in Kalamazoo and the convention closed with the satisfaction that not an instance had occurred to mar the occasion.

President O'Connell was on the job morning, noon and night devoting himself untiringly to the welfare of his guests. Visitors were loud in their praise of his executive ability, as demonstrated in handling the gathering. System was back of every move and things went off like clockwork. Programs began and ended on time. The attendance was large at all sessions and interest was sustained throughout. The program was altogether the most comprehensive ever offered at a gathering of this nature.

One of the best pieces of work done was that of the transportation committee of which Jacob Kuss was chairman. He was most ably assisted by Charles Noble, of the Stamsocott Company. Under their direction there were automobiles enough for everyone to go wherever they chose to. It was a real job, this end of the convention, but the committee heads and their loyal aides got by without a flutter or hitch.

A. W. Wightman, of the Hawthorne Paper Company, was in charge of the luncheon committee. The needs of the guests were liberally supplied. Everything available in a Volstead Act town was available for the asking. The two luncheons at the Parchment community house were particularly enjoyable, good entertainment being furnished in addition to good food.

Incidentally, it must be mentioned that Kalamazoo valley paper mill executives gave the gathering their most hearty endorsement and did everything in their power to make the convention a success. They were liberal in their financial support and more than cordial in their reception of guests. Every mill was wide open to visitors and everywhere the glad hand was out.

Local mills, always efficiently maintained, looked a little bit better than their usual best for the visitors. It is stated that at more than one of the local plants strenuous housecleaning tactics were put into effect and orders given all hands to look their sweetest and neatest.

Particularly commendable was the action of President Jacob Kindleberger, in opening his beautiful community house for the use of the convention, at no cost whatever, also the very fine complimentary banquet tendered the visitors by W. J. Lawrence, vice-president and manager of the Western Paper Makers Chemical Company.

The executive office was well handled. Registrations were

systematically handled and there was a courteous answer for all questions asked. This work was in charge of Miss Barrett, secretary, who demonstrated her official ability.

Water Power in Canada

The following editorial was written by B. T. McBain, director of manufacturing of the Nekoosa-Edwards Paper Company Port Edwards, Wis. As may be seen it furnishes matter for careful reflection:

"The pulp and paper mills in the United States are greatly handicapped for want of cheap power in sufficient quantity to produce paper as cheaply as their competitors and neighbors in Canada. Where the mills in America have water power measured in the thousands and probably tens of thousands of horse power, many of the mills in Canada measure theirs by the hundreds of thousands of horsepower and the Canadian Government in many instances has provided reservoirs in the far North at the head waters of the streams to store enough water during the flood times to provide a steady flow of water in the streams and a steady generation of power for manufacturing purposes for the entire year, should a dry year come and no rain fall.

"In the region North of Montreal, Quebec, there are many pulp and paper mills and many wonderfully large water powers some of them running as high as 200,000 to 300,000 H. P. and others yet undeveloped. This power costs practically nothing beyond the interest on cost of development. It is used for making groundwood, driving all kinds of machinery and even to make steam to dry the paper at the old no tariff 16 to 1 ratio—or 16 electric H. P. to produce one steam horsepower, yet steam can be produced in this manner much cheaper than with coal fired boilers.

"Labor in that country is plentiful—rates of pay in many lines less than in America, but above all, their water power is so great that they can produce on such a large scale, and provide labor saving equipment of all kinds, power driven, to the point that the men per ton is down to two and one-half or three or even less, while many American mills are employing as high as six though the average is nearer five.

"There is no desire on my part to use this article as a political argument, but if our dear friends at the head of our Government at Washington need any further evidence for the need for a tariff on pulp and paper coming from foreign countries, let them just take the train to Canada and see for themselves. American labor and American industries must be protected by a tariff of suitable proportion or more American business will be driven across the border and more and more, as time goes on, American paper mill workingmen and American paper manufacturers forced to give up their present homes and factories for want of business at a profitable price."

Foreign Paper Prices

The monthly average import price of news print paper which has been showing a steady decline for the past year or more showed a slight recovery for March which is the latest month for which statistics are available. The monthly average import price per

pound for the month was \$.035 as compared with \$.0346 for February and \$.0621 for March of last year.

The monthly average import price per cord of pulpwood which also has been declining steadily for a number of months past also showed a slight recovery for March. The average price per cord for the month was \$10.45 as compared with \$10.10 for February and \$14.36 for March of last year.

The average import price of mechanical pulp for March showed a decline of about \$6.00 per ton, the price per ton being \$26.69 for the month as compared with \$32.34 for February and \$14.36 for March of last year.

The average import price per ton of unbleached chemical pulp also showed a considerable decline, the price for the month being \$58.18 as compared with \$63.12 for February and \$112.10 for March of last year.

The average monthly import price of bleached chemical pulp for March, on the other hand showed a rather substantial increase the price being \$91.99 as compared with \$85.67 for February and \$134.85 for March of last year.

The average export price of news print per pound for March was \$.031 as compared with \$.034 for February and \$.078 for March of last year.

The average export price per ton of wood pulp for March was \$43.85 as compared with \$48.75 for February and \$83.25 for March of last year.

Pejepscot Paper Co. Improvements

[FROM OUR REGULAR CORRESPONDENT]

TOPSHAM, Me., June 6, 1922.—The Pejepscot Paper Company, now controlled by the International Development Company, which has brought a large amount of new capital into the industry, has already expended between \$2,000,000 and \$3,000,000 in development of its plants at Pejepscot and Lisbon Falls. Further development is likely to call for the expenditure of a million dollars in all and the Topsham and Bowdoin plants will probably be included in the completed plan of development.

The International Development Company, with which Herbert Hoover, secretary of commerce in the Hoover administration and Julius H. Barnes, former head of the United States Food Administration grain corporation, are associated, controls a number of important industries in various parts of the country, the two most noteworthy being the Pejepscot Paper Company, one of the long established paper and pulp plants of the state, and the Klenflak Linen Rug Company of Duluth, Minn.

In the reorganization of the Pejepscot Paper Company, Edgar Rickard of New York succeeds Julius A. B. Cowles as president. Fred C. Clark of New York became vice president and general manager a short time ago in the place of W. W. Nearing, who retired after a long period of service with the company. Mr. Rickard, the new president, is a mining engineer, was an assistant of Mr. Hoover in the work of the food administration and acted for him in the United States in 1918 and 1919.

The industrial end of the development of the Pejepscot Paper Company is in the hands of R. B. Wolf Company of New York and William C. Cham, Jr., has been in Maine making a general survey of the plants and overseeing the development work at Pejepscot and Lisbon Falls. Edward M. Flesh of New York is treasurer, George L. Henderson, secretary and Carleton C. Young, manager of woodlands.

The Pejepscot Company manufactures news print, groundwood and sulphite in the four plants mentioned and the new owners have made a survey of the entire plant with the idea of working out a scheme which will increase the output and efficiency of the plant.

Three of the mills now produce an aggregate of 121 tons of newsprint weekly, the Bowdoin mill being down at the present time. When the slump in paper prices came following the close of the war, the Pejepscot Company suffered with others and the developments that are being made are along the line of securing profitable and enlarged operations.

Additional penstock and improved power plants have been put in at Pejepscot and Lisbon Falls and a large amount of new machinery installed.

Timberland holdings of the Pejepscot Paper Company are extensive including many thousands of acres in Compton county, Quebec, St. John's and Queen's County, New Brunswick, and Washington Co., Me. While general reforestation has not yet been undertaken, it is understood that such plans are included in the rehabilitation of the industry. Much has already been done in the way of more adequate fire protection of the timberlands, both in the provinces and Maine, the fire loss being much less than last year.

Trustees for Cushnoc and Kennebec Paper Companies

[FROM OUR REGULAR CORRESPONDENT.]

AUGUSTA, Me., June 5, 1922.—At a meeting of the creditors of the Cushnoc Paper Company and Kennebec Paper Company, Walter S. Wyman of Augusta, treasurer of the Central Maine Power Company; Edwin W. Frye of Harrington, lumberman, and Frank D. True of Portland, wholesale grocer, were appointed trustees. The concerns, which are affiliated, were adjudicated bankrupt in January, with total liabilities of about \$1,500,000. Nearly 300 claims against the company have already been filed aggregating \$750,000.

Action on these claims will be taken up by the referee in a week or so.

Since the petition in bankruptcy the companies have been managed by Walter S. Wyman, receiver, and he will continue to run them until the trustees file bonds. The appraisers, Ernest F. Gedney and William B. Getchell of Augusta and Arthur G. Anderson of Bangor, made their report at the creditors' meeting, showing the depreciated and replacement values of the properties as \$1,054,719.66 and the appraised values as \$759,554.07. No examination was made of the officials of the companies although the president, Richard P. Smith of Pelham, N. Y., and the assistant treasurer, R. H. Jackson of Augusta, were present.

Nashwaak Pulp Co. Postpones Work on New Mill

[FROM OUR REGULAR CORRESPONDENT.]

MONTREAL, Que., June 5, 1922.—Hon. M. M. Jones, president and general manager of the Nashwaak Pulp and Paper Company, Limited, St. John, N. B., has announced that the company's plan to construct the pulp and paper mill in South Devon, at the mouth of the Nashwaak river, has been postponed in order that further investigation may be made as to the real extent of damage to the standing timber by the spruce budworm.

The *Fredericton Gleaner* says that the company was about ready to proceed with the project but that the ravages of the spruce budworm in the woods on the upper waters of the Nashwaak have been such that the executives of the organization have decided it would not be wise to go on with the construction of an extensive plant involving the expenditure of several hundreds of thousands of dollars for a matter of five or possibly eight years.

Fort Griswold Paper Co. to Operate Bank Mill

[FROM OUR REGULAR CORRESPONDENT.]

MONTVILLE, Conn., June 5, 1922.—Weston W. Goodnow, who recently bought the Bank mill of S. W. Board Company will operate the plant under the style of the Fort Griswold Paper Company which has filed articles of incorporation. Mr. Goodnow is president of the new corporation. The plant will be operated on box board and specialties.

A COST SYSTEM FOR ONE OR TWO MACHINE-MILLS*

By PAUL KOENIG, CONTINENTAL PAPER AND BAG MILLS

In talking of a simple cost system for smaller paper mills, I shall not say much upon the imperative necessity of a cost system for every paper mill in the country, for today every executive is convinced that he ought to have at his command accurate manufacturing data, and true facts about the costs of his products as soon as possible.

I like to compare the executive of a paper mill without a proper working general and grade-cost system to the captain of a big ship, who finds himself in a stormy, shallow sea without navigation charts regarding depths, sandbanks, reefs, etc. This captain, provided a good fate does not accompany him, finds his boat soon on the rocks, being battered to pieces by the wild, high-running waves. In these strongly competitive times, a similar fate may be experienced by the executive of a mill without a proper, accurate cost system.

The Road to Better Conditions

Of the just as important questions of a standard of unity for cost systems of the related groups in the paper industry, I shall not talk now; the various committees appointed for this purpose will ultimately (I hope in not too distant a time) succeed in their difficult tasks. As soon as each related group of paper manufacturers has adopted the uniform cost system, ignorance regarding manufacturing costs and the evil arising out of this will be eliminated, and then the road to healthier conditions in the paper industry will be opened.

When I, at first, looked more closely at the topic of my talk, "A Simple Cost System," I came to the conclusion that "simple" may mean to many of you something entirely different than it does to me. Our friends from the big, fine, paper mills will undoubtedly call it "very simple," and quite a few visitors may think our simple system "quite complicated."

If we, however, look upon the complicated process of paper manufacturing we are prepared to find a more intricate system, and proportionately more people are necessary to work out these costs than perhaps in the case of a foundry.

Together with the words "simple cost system" goes for most of us the words "inexpensive cost system." Yes, indeed, I can say our system is inexpensive, for if we look upon the great savings that are made through the knowledge of facts regarding actual time used on individual grades, unprofitableness of certain grades, wastefulness here and there, then every good cost system with a fundamentally correct basis is not a liability, but an asset paying big dividends.

In describing our simple cost system, which is along the lines of the York Haven Paper Company's system, I don't like to fail in expressing my thanks to my friend, Mr. Kline of the York Haven Paper Company, for his many and helpful suggestions.

System Adaptable to Other Mills

This system which I am going to explain, is a cost system used in our wrapping paper mills, but, as you will see later on, it can be easily adapted for tissue paper mills and others.

It may be worth while to mention before discussing the actual grade costs, that in our accounting practice we employ the voucher check system with voucher debit and credit registers. (These forms are also exhibited). From the voucher debit book sheets we copy at the end of the month the consumption of raw materials, supplies, etc., direct to our financial and operating statements.

We are making up every month complete financial statements, such as treasurer's report, general statement of earnings, analysis

of inventories, loss and gain A/C. according to the productive departments, that is, paper, ground wood, sulphite, and sulphate department. In addition to these, we furnish manufacturing statements, giving all the expenditures for the operations of the various departments, excluding here, however, sales and inventories. Unit cost figures on the latter mentioned statements make these reports very valuable.

Owing to the fact that we carry all of our monthly financial and operating figures on loose leaf columnar forms, we close our general ledger only once a year.

All of the manufacturing data, as well as the manufacturing statements, are accessible to our superintendents and foremen, for only in this way they can intelligently direct the various operations in their mills.

Divided Into Two Main Groups

Our cost system at the Marinette and Menominee Paper Company and the Falls Manufacturing Company can be divided into two main groups, viz., into the productive departments, and the non-productive departments.

When you have a few minutes afterwards to study the "Cost chart," you will notice the two top rows of circles constituting the productive departments, and all the lower circles—in different sizes regarding their importance to each other—signifying the non-productive departments.

I am perfectly frank in admitting that up to a comparatively short time ago, we did not keep such detailed costs on our non-productive departments, but now where we must attain the highest efficiency in each, even the most unimportant department, we can only reach our aim in analyzing or synthesizing conditions and data, as shown on the various reports. In this way we are able to give to our executives and our superintendents these instructive statements as guide charts for efficiency from month to month.

The Non-Productive Groups

The groups of costs which we obtain under the non-productive departments are as follows: Wood room, wet machine, steam power, electric power, water power, mechanics and repair, storehouse and reclaiming, stable, trucking and teaming, fire protection, woodyard, and general: unloading, sundries, new construction and erection department.

The wood room department shows, like all the other departments, the actual amount of dollars and cents expended for each item, such as: belting, electric lamps, oils and lubricants, repair material, proportionate amounts from the steam power department, mechanics and repair department, fire protection department, stable, team and trucking department. Furthermore, labor, general wood preparing, chipper department repairs; then overhead, mill burden, insurance, and taxes.

Besides this information we show unit costs on these reports, in the above mentioned case for instance the "Cost per Cord." The wet machine department gives the cost per 100 pounds of pulp, going either through the wet machines or over the deckers.

Very essential are the costs of the steam power department. We figure these on a basis of 1,000 pounds of steam generated and also on the boiler horsepower hours.

For the mechanics and repair department, etc., the costs are figured on the man-hour basis.

Before going any further, I would like to point out that our payroll classification is standardized in all of our mills and arranged according to departments as shown on the general cost chart. All of our books, private as well as general, follow the outline of the cost chart regarding arrangement of accounts.

*Read at the joint convention of the American Pulp and Paper Mill Superintendents' Association and the Cost Association of the Paper Industry, Kalamazoo, June 1-3.

**FOR QUALITY PAPERS
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MANUFACTURED BY

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SOLE AGENTS FOR U. S.

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WAYAGAMACK

KRAFT PULP

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Essential for Strength Requirement*

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Sole Agents for United States for

CANADIAN KRAFT, Ltd.

Three Rivers, Canada

The Productive Groups

Now let me discuss the productive departments in order to hurry to the main topic, viz., the actual grade costs.

As mentioned before, we are making up monthly manufacturing statements with "per hundred pound cost units" inserted alongside of the dollars and cents columns.

It is obvious that the information contained on these statements represents only average costs. These are sufficient for the ground wood, sulphite and sulphate costs; separate cost for spruce and hemlock sulphite should, of course, be figured under all circumstances, supplementing the average sulphite costs.

For the paper costs, however, the executive needs more detailed information, viz., actual individual grades and basis weights costs. We obtain these very easily.

The first form we use for this purpose is the paper machine record and back tenders report. We take from the first report the actual machine production of the particular grades, the individual time used per grade and machine, and find in the back tenders weight report a check on the total production.

From the beater engineer's reports we take the data regarding consumption of stock, sizing, colors, etc. As we do not advocate the figuring of small runs for the sake of more accurate costs and for the sake of simplicity, we add all furnishes of the same nature together regardless of colors; as you will see we have a way of taking care of these afterwards on a separate basis weight cost sheet.

Outline of General Cost Statement

In order to enable you to understand more clearly the outline of our general cost statement, I had this form enlarged and hope that you are able to follow my explanations more easily. I shall start in the left-hand corner here.

The red letters A, B, C, etc., under "Quantities Used," indicate a group of papers of the same furnish. Here you see the composition of the stock for this particular furnish. Our new forms give a subdivision regarding spruce, hemlock and foreign pulps.

Sizing, alum and fillers are shown also under these headings, until we arrive at the total stock weight in this column. We deduct from the "Total Stock Weights" our finished weights under the same headings and arrive at the gross loss of stock expressed on this line in percentages.

The next line shows under the total cost, the colors used per month in one total. Continuing under the total cost line, we show our various items of conversion and general manufacturing as outlined on our paper manufacturing statement. This cost statement gives exactly the same data only in condensed form.

You will notice, furthermore, one heading of "Overhead Costs" including the proportion of general administration applicable against the paper department, the insurance, taxes, and miscellaneous expenses.

Then follows the line of "Depreciation."

Furthermore, we add under a separate heading "Sales and Shipping Expenses."

The last line shows, therefore, the total cost of our product in one lump sum, f. o. b. our mill.

Here in the next three columns, we give the actual costs according to our various machines.

Most of this data is worked out on the trim basis with the exception of the labor, which is distributed actually over the machines as it is incurred. The same applies against machine clothing, belting, packing and repair items.

The boiler plant charges are divided on the tonnage of actual paper made according to machines; the same applies against the finishing and shipping items. At present we are installing flow meters on our engines in order to arrive at an accurate distribution of steam according to machines and grades.

Then we come to the next three columns, designating the costs

of the various machines "Per Hour." These, as the name indicates, are worked out on the machine hour basis.

The remaining part of the cost statement is taken up with columns of the actual grade costs of the various papers. We show here all the details commencing with the raw materials, going down to the conversion, general manufacturing, direct costs, overhead, sales and shipping expenses.

At this stage, we have the average cost of all runs of the same kind of paper, of same furnishes regardless of colors, bunched together for the whole month. I would like to point out here once more, that no colors are charged in the individual costs just shown to you; they are distributed on this form.

Statement Gives Valuable Information

This statement, of course, gives very valuable information to our executives and superintendents; however, it is not intended to give the final cost of the grades and basic weights. For this purpose, we use another form.

We show under the heading of "Grade F," for instance, the different basic weights; here we list the average production per hour as gotten from our machine records, and in multiplying the equivalent average production per hour and ton with the cost per ton as shown on the general cost statement, we find the cost of this particular grade per ton, exclusive of the color, finishing and shipping expenses.

Inasmuch as one of these group furnishes may include three or four different colors or trade brands, we add to the respective costs the actual amount of color charges per ton in a separate item.

We keep a separate cost on our finishing department; however, for these statistics we take the average price of finishing for rolls and sheets according to labor and material during the month.

Special Efficiency Campaigns

In conjunction with the foregoing general cost system, we have special efficiency campaigns going on from time to time. For instance, I like to cite the case of "Electric Lamp" consumption, which, of course, does not amount to \$1,000 a month, but which plays an important part in every mill.

Our costs were exceedingly high; we had tried different ways to reduce the costs, but did not succeed until we obtained the actual facts regarding breakage, burnt-out lamps and "missing" lamps. We departmentized this information and today after having paid continuous attention to these reports in our foremen meetings, we have reduced our costs for electric lamps over 65 per cent.

You can hardly believe what conditions were pointed out to us through the summarization of these daily reports, and of what great help this information was to our superintendents.

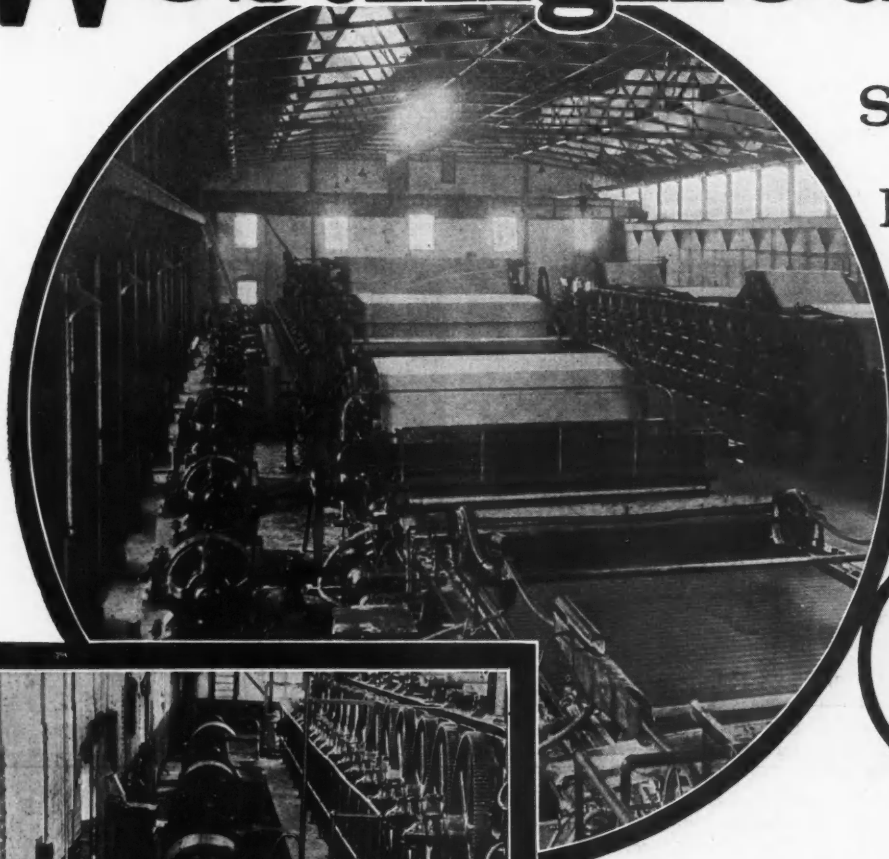
Similar costs are kept on the consumption of oils, lubricants; sizing costs are made up as to grades, and, of course, a thorough check is kept on all incoming and outgoing materials and supplies by our storekeeper.

In connection with our storehouse department, I should like to mention our special salvage or reclaiming man, who finds a "real gold mine" in the old scrap material and in the odds and ends left around so often after the completion of a job.

Conclusion

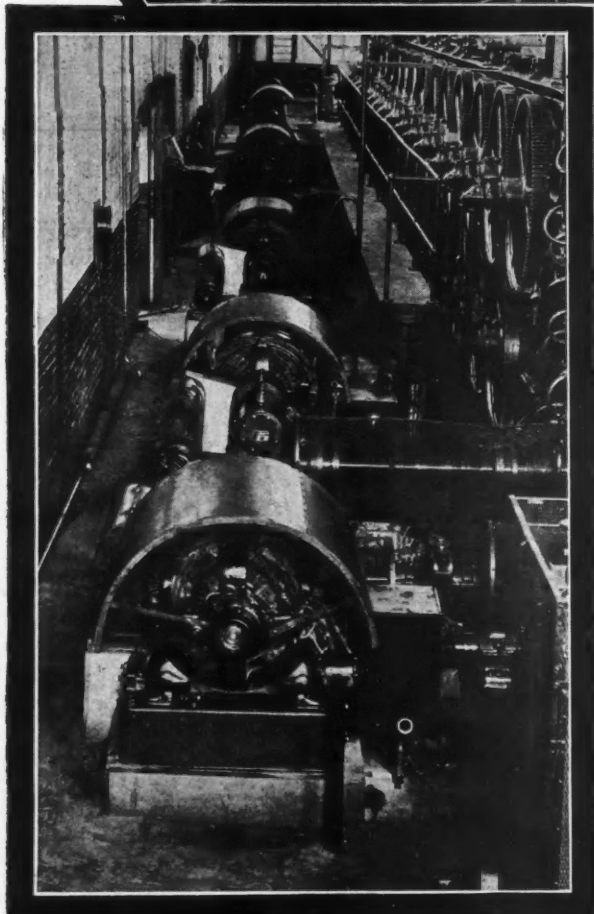
In conclusion, I would like to repeat once more, this: In order to record correct data and to obtain true facts, we must go into details; we must spend money for this most important purpose, but should we not be glad to do this, as the returns out of this comparatively small investment are so big and manifold? If we hear of a new machine or a new device for cutting down expenses in prevailing operating conditions 15 per cent to 20 per cent, we do not hesitate a minute and immediately invest in such a machine. Here you have this machine! A good cost system is not a theoretical abstraction; it is one of the most powerful machines that simply coins money and pays for itself in no time!

Westinghouse



Sectional Paper Machine Drive

98 inch Pusey & Jones Fourdrinier Book Machines, 250 to 500 feet per minute.
 98 inch Machine Started July 25 and the 166 inch. Oct. 22, 1921.



West Virginia Pulp & Paper Co.

The Westinghouse Sectional Paper Machine Drives in the Tyrone (Pa.) mill of the West Virginia Pulp and Paper Company have been in service about ten months.

The performance of this, and similar installations, recommends Westinghouse Sectional Paper Machine Drive to the consideration of all paper manufacturers.

Westinghouse Electric & Manufacturing Company
 East Pittsburgh, Pa.
 Sales Offices in All Principal American Cities

New York Trade Jottings

Gerofsky Brothers, Inc., dealers in new cotton and linen cuttings and paper makers' supplies, have removed their office and warehouse to their new and larger building at 19 Bond street, New York City.

* * *

Thomas W. Cole has recently accepted the managership of the Wrapping Division of the Hudson Trading Company, 300 Madison avenue, New York. Mr. Cole has been connected with the wrapping paper industry for the past twenty years.

* * *

Dominick Palmieri, manager of the Paper Stock Department of the Box Board & Lining Company, is now assisted by his brother, Rocco Palmieri, in the management of the department. The change was made June 1, when P. J. Palmieri severed his connection with that division of the company.

* * *

A. L. Brookhouse, formerly of the Liberty Paper Company, has been elected president of the Moore & Thompson Paper Company of Bellows Falls, Vt. This concern has installed the largest gumming machine in the world and its product of gummed stay and gummed tape will be on the market in about a week's time.

* * *

Jacob J. Patricof, formerly president of the J. J. Patricof Company, Inc., which was absorbed by the American Woodpulp Corporation, 347 Madison avenue, New York, has, together with W. and S. Wacht, incorporated under the name Waste Material Trading Corporation, Manhattan. The new organization is capitalized at \$50,000 and has for its attorney, S. D. Spector, of 305 Broadway.

* * *

C. R. McMillen, vice-president of the Union Bag and Paper Corporation, acted as spokesman at the luncheon of the New York and New England members of the Salesmen's Association of the paper industry, which was held Wednesday, June 7, at the Arkwright Club, New York. Mr. McMillen spoke on, "Some Observations That May Help Paper Salesmen," and he was followed by Roger Taft of the Hammermill Paper Company, who discussed current conditions in the writing and cover paper fields.

* * *

Failures in May totaled 1,960, according to a report by R. G. Dunn & Co., or 28 per cent below the high point of the current year. A comparison with the April returns reveals a numerical reduction of approximately 9.5 per cent, while the May indebtedness of \$44,402,886 is practically 40 per cent under that of the immediately preceding month. "The May indebtedness, however," says the report, "is not only the smallest of all months since last September, but shows a decline of about 23 per cent from the \$57,000,000 of May, 1921, and last month's defaults of exceptional size, though ten more in number, involved about \$18,000,000 less than those of May last year. Thus, the seventy-seven failures for \$100,000 or more in each instance in May, this year, supplied \$21,561,000 altogether, or 48.6 per cent of the aggregate for the month, and the sixty-seven similar insolvencies in May, 1921, had liabilities of \$39,404,000, or 69 per cent of the total of all defaults."

News of the Chicago Trade

[FROM OUR REGULAR CORRESPONDENT.]

CHICAGO, June 5, 1922.—On Friday, June 9, the Pink Poodle Farm will again be the scene of a day's outing for the paper box trade and its supply men of Chicago. On that date the first of the annual summer picnics which the Chicago trade have been holding for the past years, will be held. Cover paper men, board men and other supply men will be there as well as members of the box trade. The committee in charge of the picnic consists of,

Harry Williams, of the Chicago branch of the C. L. La Boiteaux Company; Harry Zorn, of the Zorn, Bierdeman Paper Box Company; J. J. Wilkins, of the Imperial Paper Box Company, and E. B. Hoy, of the *American Box Maker*.

William and John McLaurin, of the McLaurin-Jones Company, Brookfield, Mass., terminated a visit of several days in Chicago this week, when they looked over the local plant, making headquarters with Frank Sanborn, Chicago manager.

E. B. Sode, formerly of the Sode Paper Box Co., Chicago, who sold his interest in that plant recently to his former partner, is said to have identified himself with the Eagle Paper Box Co., of this city, of which Harry Cohen is proprietor. It is also said that the name of the Eagle Paper Box Company will probably be changed.

The real estate annals of Chicago, show that Robert B. Burch, secretary and treasurer of the Whitaker Paper Co., of Cincinnati, O., purchased one of Chicago's largest apartment buildings on the north side of the city. The building, the Kenilworth Arms apartments, has just been completed and is considered one of the finest buildings of its kind in the city, being three stories with 42 apartments and said to bring an annual income of \$50,000. Eighty-three acres of land in Madison Park, Cincinnati, were given in trade by Mr. Burch. This land is valued at \$250,000.

Paper Making Films for South America

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 7, 1922.—The Paper Division of the Bureau of Foreign and Domestic Commerce is calling the attention of paper manufacturers to the desirability of preparing moving picture films of the American paper industry to be shown in South America and other foreign countries. The paper industry is unusually well adapted for motion pictures by reason of the popular appeal involved in the processes of cutting and handling pulpwood in the woods, the log drive, the wood grinder, the paper machine in operation, etc.

So far M. F. Leopold, moving picture specialist for the Department of Commerce, who is working in co-operation with the American Paper and Pulp Association has not found any films of the requisite sort for such a purpose. The moving pictures shown in foreign countries under the auspices of the Department of Commerce should be general expositions of paper manufacture in the United States, and should not attempt to attract undue attention to the wares of any one manufacturer.

The Paper Division feels that the preparation of films for this purpose will be a profitable enterprise for the American paper industry. It would also be useful in enabling the American Paper and Pulp Association to satisfy requests for motion pictures of this type which are constantly coming in from various parts of the United States. In case a number of manufacturers wish to combine for the purpose of having such films made, the Paper Division or Mr. Leopold will be glad to be the intermediary for their preparation.

Southwest Paper Co. Opens Bids for New Plant

MONROE, La., June 5, 1922.—The Southwest Pulp and Paper Company, which will build a \$1,000,000 pulp and paper mill a half-mile south of Monroe, opened bids for the construction of the plant on June 1. The proposed plant will have an area of 10,000 square feet and will be absolutely fireproof and will have a daily capacity of 100 tons of No. 1 refined Kraft pulp. Bids were received at the office of Joseph G. Mayo, president and general manager of the company. The company is now negotiating for pulp and timber on one hundred thousand acres of land in Northwestern Louisiana. The company has purchased its site of eighteen acres on the Ouachita river and Missouri Pacific railway.

Every buyer and seller of paper should have a copy of Lockwood's Directory of the Paper and Allied Trades.

EXACT MICROMETER

**Actual
Size**

**Height
6¼ in.**

**Diam.
Dial
5¼ in.**

**Depth
of throat
3⅝ in.**



**Bevel
Plate
Glass**

**Nickel
finish
top**

**Black
enamel
base**

The Exact Micrometer is automatic in its action, and as its name implies, Exact, in recording the thickness, because it is built on the only correct principle. There are no Pinions, no Levers, no Gears of any kind used for transferring the action of the Plunger to the reading Indicator. The Indicator hand is firmly attached to and becomes a part of the measuring Plunger, hence, accuracy.

It contemplates .300, registers .100 around the dial, repeating three times (trip indicator). The graduations are three times as far apart as on any of our previous Micrometers or as on the German Micrometer, hence, are more easily read.

"For Automatic Weighing Scales for giving the weight of 480 sheets or 500 sheets of paper or for ascertaining the weight per M Sq. Ft. of box boards write to us for full description and price."

Write for Life Size Circular

E. J. CADY & COMPANY, 326 West Madison Street, Chicago

These instruments are carried in stock by C. B. Hewitt & Bros., 16-24 Ferry Street, New York

DEMAND IN PHILADELPHIA IS BETTER FOR FINE PAPER

Orders, However, Are Generally for Small Quantities—Paper Stock Market Shows More Life Than in a Long Time Past—Philadelphia Typothetæ Perfect Plans for Collections of Printers' Waste Paper and Its Disposal Through One Contract—D. L. Ward Co. Again Occupies Its Old Home at Corner of Sixth and Ranstead Streets—Paper Men and Printers to Play Golf June 27.

[FROM OUR REGULAR CORRESPONDENT.]

PHILADELPHIA, Pa., June 6, 1922.—If there could be any criticism made of the week's experience with its very general increase in activity in fine papers, it is that orders were largely of the small lot class, which, as pointed out in THE PAPER TRADE JOURNAL, is giving the trade concern and is the basis for a study now being made by the special committee headed by George W. Ward, looking to some means of equitable relief and readjustment. Although months ago June 1 was pointed to as a time when price revisions might be expected, no change of any importance took place, and there are now few in the trade who are not convinced that complete stability has been attained and that if any change does take place at the end of the month it will be in the nature of an advance. There is almost conviction for instance, that if as is thought entirely possible bond paper is advanced it will be the signal for an increase all along the line, a result which the trade looks forward to with some desire for the reason that it believes that just as soon as there is a real and substantial upward tendency, buying will be stimulated.

In the coarse paper division improvement was slight if at all. There still exists intense competition to get business and the slashing of prices continues although there was remarked some tendency not to be as generous in the cutting as before because a number of the mills have placed a time limit on orders at present price levels.

Paper Stock More Active

The paper stock market revived during the week from the lethargy into which it sank many months ago and perhaps for the first time this year there was an approach to activity. The mills are in the market for the better grades of paper stock and since supplies of these are rather limited, prices moved up from $\frac{1}{4}$ to $\frac{1}{2}$ cent. Soft white and book stock was in particularly good demand and dealers who had any quantity on hand found no difficulty in moving it. But there was no market for mixed and commons.

To Collect and Dispose of Printer's Waste

It is exceedingly probable that, in view of the fact that the Typothetæ of Philadelphia, through District Secretary J. O. Adams, has perfected its long considered plan of a systematic collection of printer waste and of disposal through one contract, and as a matter of fact actually has signed up such a contract with the Hemingway Company, a new factor in the paper stock situation in this city has been developed. The contract will run for a year and under its terms it is believed that there will be gathered together from those members of the Typothetæ who will join a new division to be known as the Waste Paper Division about two hundred tons of stock every month.

All the details were worked up by District Secretary J. O. Adams, of the U. T. A., who has had experience either in installing or in supervising similar arrangements in Detroit, Cincinnati, Cleveland, Buffalo, Pittsburgh, and Chicago. While the amount of stock involved in Chicago is of course the largest in any city, the arrangements there involve several divisions, so that the Philadelphia plant covering the entire city actually will be the largest in the country.

All the details have been perfected and arrangements have reached such a stage that a contract has been drawn up to be signed this week. In making the contract Mr. Adams, while, of course, giving proper consideration to the matter of prices, was guided chiefly by the consideration of service. It is understood that the price to be paid by the stock dealer who secured the contract will be determined on a sliding scale as the market recedes or advances and that the contract covering a year will make definite provision for the collection of waste daily several times a week, or but once a week, as the individual requirements of the printers who join in the collective sales proposition, make necessary. Mr. Adams says that while in the other cities as in Philadelphia service was the chief consideration, the returns in terms of dollars and cents show a very considerable gain to the subscriber.

D. L. Ward Co. Moves

Almost over night and unquestionably with an amount of expedition perhaps never equalled in trade annals, there was effected during the week the removal of all the executive offices and virtually all the stock of the D. L. Ward Company from the warehouse at Front street and Washington avenue occupied for several months to the old home in the heart of the paper district at the N. W. corner of 6th and Ranstead streets. When last week closed the Ward organization was doing business at Federal street; with the first business day of the new week excluding the one before the holiday which really was a near holiday in itself, business was being transacted as for many years past on 6th street. By Wednesday evening of last week transfer had been made of 800 tons of paper and of 117 desks from the old to the new and the congratulations which President Ward received were all disclaimed by him and credit for the remarkable moving was given to Superintendent of Service Stinson, and building superintendent Albright. All the five floors of the Ranstead street warehouse save the front half of the first floor will be used for the storage of stock and for shipping facilities. All the executive offices have been combined at the 6th street end first floor and absence of partitions makes all the executives and sales forces a consolidated whole. The private offices, formerly occupied by Mr. Ward and located on the second floor front, will be used only for sales conferences and the noon-day luncheon and consultation of the executives.

A rather novel system of racks carried on upright iron pipe with cross pieces of wood equipped with rollers so that even a child can pull out the cases has been installed throughout the building. On the fifth floor there are stored more than 500 cases of the book paper which the firm carries in stock, all so arranged as to make instant access possible.

The fourth floor is given over entirely to the wrapping paper department. On the third floor there are 2,000 bins for the accommodation of the bonds, covers, and writing papers. On the second floor rear the out of town orders will be gathered together and packed. A section of the front is being given over to the accounting department. Local delivery service will be from the first floor.

In recognition of the moving and in memory of pleasant days of the past "the boys" of the sales and accounting room departments placed on President Ward's desk, which stands immediately next to that of Willard Seery, a massive bouquet of roses and peonies, etc. The only change in personnel incident to the removal has been the assignment of the veterans of the sales department, Daniel Bishop and Washington Markert, known to all the firm's customers, to take charge of the floor. Hitherto both were on the street visiting the trade.

Paper Men and Printers to Play Golf

Invitations will go out during the week to the golf enthusiasts in the paper and in its closely allied printing industry, bidding them

(Continued on page 72)

VELURE-SURFACE FELTS

This is the name we have adopted for our high finish FELTS to distinguish from similar felts not of our make.


NOT a new FELT with us, simply a new name so the trade will know our SUPERIOR and DISTINCTIVE FELTS by a DISTINCTIVE name.

We recommend VELURE-SURFACE FELTS where high finish is required and YOUR conditions will warrant.

Write for our blanks so you can furnish us the information we need, and we will guide you right and save you MONEY.

YOURS FOR SERVICE.

LOCKPORT FELT COMPANY
NEWFANE, N. Y.



WOOD PULP

We solicit your inquiries for

Bleached Sulphite
Unbleached Sulphite
Bleached Soda Pulp
Groundwood
Kraft

THE MEAD SALES CO.
111 West Washington St., Chicago, Ill. PULP DEPT. Callahan Bank Bldg., Dayton, Ohio.

DEMAND IN PHILADELPHIA IS BETTER FOR FINE PAPER

(Continued from page 70)

to send in their names to Irwin F. Megargee, care of Curtis & Bros. Company, secretary of a committee whose other members are Arthur B. Sherrill, of Riegel & Co., and Al Sorensen, of the Beck Engraving Company, for a contest on the green to be held on the links of the Philmont Country Club on June 27. The contest, though it is participated in by paper men and master printers, will in no sense be one between them as a class. Teams will be made up with the representatives of the two trades assigned, not along trade lines, but solely on the basis of their prowess with niblick, and putter. In the morning there are to be twosomes in a dinner match and in the afternoon twosomes and foursomes and individual exhibitions. On behalf of the paper men the match is to be conducted under the auspices as a nucleus of the Paper Trades Golf Association, a body entirely distinct from the Trade Association of similar name. It is hoped that eventually an association of the golfers in the printing trade also will be organized. The treasury of the Golf Association, while not plethoric, is ample to afford a magnificent cup to be offered for the first time, but hereafter to be contested for annually, and to remain the property of the winner on three successive occasions. While in view of the increase in amicable relationship between printer and paper dealer following the recent series of conferences between the Trade Relation Committees of the two, the time is regarded particularly auspicious, the coming event has no other significance than that of a contest between sportsmen on the green.

Open Paper Bids at Harrisburg

Bids opened this week at Harrisburg by the Public Printer of Pennsylvania for about 100 tons of regular book paper and for bill paper a hard sized book brought out an unusually large number of bidders and prices which were regarded as surprisingly low. For book papers the lowest bid was 5.675 cents per lb. and for bill papers 6.175 cents per lb. For standard grades of paper the prices which now are being scheduled also were reported to be low but many bidders offered substitutes and what action will be taken was not announced. The principal bidders were A. Hartung & Co., Inc.; Barton, Duer & Koch Paper Company; Lindsay Brothers; The Whiting Paper Company; The Paper House of Pennsylvania; R. P. Andrews Paper Company; Donaldson Paper Company; Whitaker Paper Company; Paul Johnston; Charles Beck Company; P. H. Glatfelter Company and the Chatfield & Woods Company. It is understood that the Glatfelter firm which for several years has the book contract was underbid by Chatfield & Wood Company and by the R. P. Andrews Company but official tabulation of the figures must be made before this can be determined exactly. The Garrett-Buchanan Company and the D. L. Ward Company which hitherto had been bidders did not submit the prices.

General News of the Trade

The paper trade, through its Association, has been invited to participate in a movement which is just being launched by the Typotheta of Philadelphia to participate in the forthcoming "Sesqui-Centennial Exposition" to be held in this city in 1926. While plans at the present time are only tentative, it is proposed to erect a temple to the Graphic Arts and to have in it exhibitions of printing, paper making, engraving, lithography and all the allied branches of the Art Preservative and as well to make it a press headquarters for the scribes who are expected to come to Philadelphia from all parts of the world to tell the story of what is planned to be the greatest world fair thus far held.

George Weaver, in charge of the cover page department of the Garrett-Buchanan Company, has returned from an extensive trip visiting western mills. The firm now has ready samples for distribution and has laid in a complete stock of the new Algerian

cover made by the A. M. Collins Manufacturing Company. It is a striking leatherette effect and is carried in seven colors and in two sizes, 20 x 26 and 23 x 33, all however in but one weight.

Mervin Seiffert, lately connected with the fine paper department of the D. L. Ward Company, has joined the sales organization of the new Wilcox Walter & Furlong Paper Company, and will visit the printing trades. The Miami Paper Company has sent out local announcements that Wilcox, Walter & Furlong are its distributors for Triton Bond.

A party of representatives of the Paper House of Pennsylvania has left for a special trip of inspection and instruction to the mill of the Strathmore Paper Company at Woronoco, Mass. It consisted of Charles Papst; Leonard A. Peck; Leslie G. Biles; Thomas A. Convery and Henry J. Considine.

Paper Exports From Finland Increase

WASHINGTON, D. C., June 7, 1922.—American Consul Davis, at Helsingfors, has made the following report to the Department of Commerce on the exports of paper and pulp from Finland:

The exports of paper from Finland in March were twice as great as for February, amounting to 19,377 tons, which brings the total exports of paper during the first three months of this year up to 40,677 tons. The greater part of this was news print. The severe winter continued to hamper shipping, as foreign ships were unable to come after goods previously sold. The exports would probably have been about 5,000 tons greater had the ice not formed an obstacle. The amount of paper exported in March, 1921, was 6,759 tons, and the total for the first quarter of 1921 was 20,268 tons.

The situation in the paper industries is considered satisfactory, the demand in Finland and abroad having greatly increased as compared with last spring. Most of the recent exports have gone to Russia and England, although small quantities have gone to France.

Prices are about the same as a year ago. Some varieties of paper have changed in price, however, due to the fluctuations in the prices of certain chemicals needed in their manufacture.

There are good prospects for continued production. Stocks both abroad and in Finland are small, and the sales which have been made have been short-period ones, due naturally to the critical financial conditions. It is thought that the demand will be still greater in the fall.

The export of cardboard shows a decided increase in quantity in comparison with last year, but the prices have remained about the same. The exports during March amounted to 1,464 tons, and those during the first quarter of the year to 3,652 tons. The corresponding figures for 1920 were 506 and 1,804 tons, respectively.

Exports of ground wood continue to be small, amounting to only 1,413 tons of dry pulp in March and 6,498 tons during the first quarter of the year. No wet pulp has been exported this year. The corresponding figures for 1921 were 380 and 2,458 tons, respectively.

The markets have continued dull, and prices have further decreased, the present prices being about 50 per cent lower than those in December.

Trading circles hold the opinion that the groundwood markets will improve in the near future, as stocks already purchased have been consumed, and it is thought that the users of this article will buy for transportation during next open water. It is also thought that increased demand will increase prices. The inland trade also has improved, the sales so far this year amounting to from 4,000 to 5,000 tons.

**GROUND WOOD
CHEMICAL PULPS**

PERKINS-GOODWIN CO.
NEW YORK

PAPER

ALFRED LEEDS, President
KARL BECKER, Vice President

ERNEST R. COLLINS, Secretary
EDWARD M. MILLER, Treasurer

Becker Paper Corporation

350 Madison Ave., New York, N.Y.

317 Main Street, Springfield, Mass., Branch Office for New England States

Dealers in All Grades of Paper

SPECIALISTS IN

**BOOK PAPER, GLASSINE and EMBOSSED
GLASSINE PAPERS**

Exclusive Distributors for

**WESTFIELD RIVER PAPER COMPANY
RUSSELL, MASS.**

WESTMINSTER PAPER MILLS TO BE STARTED IN OCTOBER

Company Which Is Erecting a Tissue Plant at New Westminster, B. C., Is Incorporated for \$250,000 and Will Install a 132 Inch Tissue Machine Made by the Beloit Iron Works—Peshtigo Paper Co. Will Resume Operations Soon and Will Expend About \$350,000 on Plant Improvements—Fred La Brot to Manage Stevens Point Division of Consolidated Paper Co.

[FROM OUR REGULAR CORRESPONDENT.]

APPLETON, Wis., June 6, 1922.—Plans of the newly organized Westminster Paper Mills Company, Ltd., which is constructing a tissue mill at New Westminster, British Columbia, were revealed by John J. Herb, president of the new company, who recently visited Appleton. The company is incorporated under Canadian laws for \$250,000. John J. Herb is president, M. F. Herb, vice-president; H. H. Lord, secretary, and A. M. Onkels, treasurer. All of the officers are practical papermill men. John J. Herb was connected with the Interlake Tissue Mills Company, Ltd., Merriton, Ont., for about ten years and M. F. Herb was connected with the Marinette and Menominee Paper Company. Mr. Onkels was employed at Merriton.

Mr. Herb said the new plant will be ready to begin operations next October. A tissue machine, capable of turning out a sheet 132 inches wide, is being manufactured by the Beloit Iron Works. Most of the stock in the new concern is held by John J. Herb, M. F. Herb and Mr. Onkels. Only about \$40,000 in stock will be disposed of outside the officers.

The nearest tissue mill to the new plant is at Merriton, about 2,500 miles away. A factory site of eight acres, valued at \$35,000, was given the company by citizens of New Westminster if the plant would be located there. This property includes dock front of 700 feet on Frazer river which, it is said, is deep enough so ocean steamers can dock at the company's doors. The largest pulpwood supply in America is said to be in close proximity to the new mill. The Great Northern railroad runs through the property and an electric line passes alongside of it. Power will be purchased from the British Columbia Electric Power Company and filtered water will be obtained from the city's supply.

According to Mr. Herb, the new company is one of the very few that have been organized entirely by practical papermill men. No promoters or large financiers are included in the stockholders.

Plans for the mill were prepared by L. F. DeGuerre, Wisconsin Rapids, who designed several of the new mills erected in Wisconsin in the last few years.

Peshtigo Paper Co. to Resume Soon

The papermill of the Peshtigo Paper Company, which has been closed down for some time, will resume operations soon, probably within the next three weeks, it was announced following a meeting of officers and directors last week. Preparations are being made to manufacture an exceptionally high grade of tissue to be known as "Peshtigo Tissue," it was said. Plans for reconstruction and financing of the company were discussed at the meeting.

The fiber plant probably will not begin operations until in fall. Rebuilding of the mill, according to plans outlined in the PAPER TRADE JOURNAL a few weeks ago, will be started at once. About \$350,000 will be expended for improvements this year.

"Our plans for rebuilding and enlarging the fiber mill are going ahead just as we outlined them a few weeks ago," an official of the company said after the meeting. "Everything connected with the new company is proceeding even more rapidly than we expected."

To Manage Consolidated Paper Co. Mill

Fred La Brot has been named mill manager of the Stevens Point division of the Consolidated Water Power and Paper Company to succeed Frank Youngman who is to go to Port Arthur, Canada, to assume charge of the Consolidated company's interests in Canada. Mr. Youngman will be manager of the new pulp mill which the company recently purchased and also will have charge of the firm's tug lines, timber lands and other interests. The new Canadian mill will be known as the Thunder Bay Paper Company and is to start operation soon. The plant, which is the fifth acquired by the Consolidated company, was purchased from its former owners shortly after it was built. Mr. Youngman will move his family to Port Arthur.

Mr. La Brot, who will have charge of the Stevens Point mill, has served the Consolidated company in many capacities. For many years he was in the sales department and about a year ago he was transferred to the production end of the Wisconsin Rapids division. He will move his family to Stevens Point.

New Wage Agreement

A new wage agreement has been entered into by the Wisconsin Rapids, Biron and Stevens Point divisions of the Consolidated Water Power and Paper Company and the Paper Makers and Pulp Workers Unions. The agreement, it is said, provides for old working conditions and wages with the exception of four laborers whose rate of pay was increased from 32 to 35 cents an hour. The new contract will remain in force until May 1, 1923, and provides that wages of certain skilled employees may be adjusted during the period of the agreement.

Company officials and labor leaders said the agreement was satisfactory in all respects.

New Dam Construction

Directors of the Wisconsin Valley Improvement Company at their annual meeting in Wausau last week, voted to build a dam across Spirit river in Lincoln county to create a huge storage reservoir. The work will involve an expenditure of from \$75,000 to \$100,000. The work is to be started at once, it was said. The following officers and directors were re-elected: W. E. Brown, Rhinelander, president; Walter Alexander, Wausau, vice-president; G. D. Jones, Wausau, secretary and treasurer; W. E. Brooks, Wausau, manager; D. A. Pride of Tomahawk, W. J. Sullivan of Merrill, L. M. Alexander of Port Edwards, W. E. Brown of Rhinelander, Walter Alexander, G. D. Jones and W. E. Brooks of Wausau, directors.

The Marinette and Menominee Paper Company has started reconstruction of a portion of one of its dams which was carried away by ice and high water last spring. The work required a week or more.

Contract for reconstruction of the Peshtigo Electric Company's dam at Peshtigo has been awarded and work soon will be started. The company is to increase its production facilities. About \$60,000 will be expended.

Mr. Fowler Will Talk About Paper Export Trade

[FROM OUR REGULAR CORRESPONDENT.]

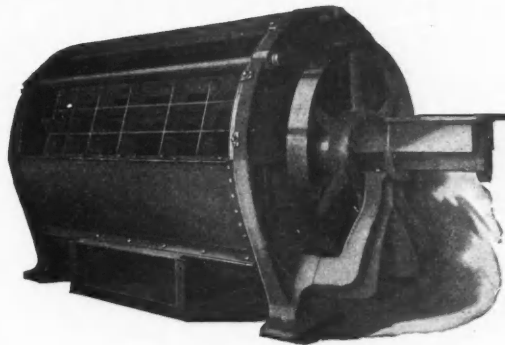
WASHINGTON, D. C., June 7, 1922.—The Paper Division of the Department of Commerce announced that Trade Commissioner John A. Fowler, who has just returned from the Far East, will be glad to talk to paper manufacturers and jobbers located in and about New York regarding the possibility of export trade in the Far East. Mr. Fowler can be reached through the New York office of the Bureau of Foreign and Domestic Commerce.

The Paper Division is working out a plan whereby it can learn the exact needs of the paper trade regarding the information needed and the desires of the trade.

“IMPCO” TAILING SCREENER

FOR SCREENING GROUND WOOD TAILINGS

Very Low
Power
and
Upkeep Expense



Delivers
Rejections Free
from Good
Stock

ANOTHER UNIT OF OUR CLOSED SYSTEM FOR PULP SCREENING
WRITE FOR FULL DETAILS *CORRESPONDENCE A PLEASURE*

IMPROVED PAPER MACHINERY CO. Nashua, N. H.
SHERBROOKE MACHINERY CO., LIMITED, SHERBROOKE, CANADA

WHALEN SULPHITE PULPS

Made from the SITKA SPRUCE of BRITISH COLUMBIA
Noted for Fibre, Color and Strength

**SNOWHITE
BLEACHED
SULPHITE**

**GLACIER
EASY BLEACHING
SULPHITE**

**SWAN
STRONG
SULPHITE**

As exclusive Sales Agents for all of the products of the WHALEN PULP & PAPER MILLS, LTD., in addition to stocks at the mills, we will carry large stocks of the above well-known brands in New York, thus insuring prompt deliveries.

Your inquiries addressed to any of our offices will bring prompt quotations by wire.

CANADIAN ROBERT DOLLAR CO., Limited
VANCOUVER, B. C.

U. S. ADDRESSES

Robert Dollar Co., Robert Dollar Bldg., San Francisco.
Robert Dollar Co., 15 Moore Street, New York, N. Y.
Robert Dollar Co., Harris Trust Bldg., Chicago, Ill.
Robert Dollar Co., L. C. Smith Bldg., Seattle, Wash.

FOREIGN OFFICES

Robert Dollar Co.,
Shanghai, Hong Kong,
Hankow, Tientsin,
Ichang, Chungking, and
Pekin, China; Kobe,
Japan; Calcutta, India;
Manila, P. I.; Singapore,
S. S.

IMPROVEMENT IN BOSTON IS REPORTED STEADY BUT SLOW

While the Volume of Business Is Larger Than at This Time Last Year Individual Orders Are Small and Are Expensive to Handle—Prospects Point to a Gratifying Improvement in Business Soon—"Boston American" Said to Be the Only Paper in Boston Using German News Print—Boxboard Men Report Betterment in Business—Other News of the Boston Trade.

[FROM OUR REGULAR CORRESPONDENT.]

BOSTON, Mass., June 5, 1922.—Boston paper merchants report a slow but steady improvement in business with prospects of a gratifying improvement soon.

Many of the Boston men are discussing the volume and number of orders which are being received by their firms. This year has witnessed a peculiar situation which has put a burden on the paper merchants. The volume of orders is much larger than last year but the orders themselves are small, thus involving a big expense according to W. L. McLellan of Carter, Rice & Co. and John Andrew of Stone & Andrew Company.

Union Bag Mills Busy

Boston representatives of the Union Bag and Paper Corporation report that practically every one of the mills owned by the corporation with the exception of the bag mill at Hudson Falls, New York are operating at full capacity. They also report that working and wage scale agreements were signed with the skilled workers continuing the old agreements which expired on May 1; no agreements have been made with the unskilled workers who are now working on a non-union basis. The usual quarterly dividend of 1½ per cent, payable on June 15 to stock on record on June 5, has been declared.

Great Northern Improvements

Representatives of the Great Northern Paper Company of Madison, Me., report that comprehensive plans are now under consideration for improving the property and equipment of the company at Madison which will necessitate the employment of a large crew of men for some time. The major part of the proposed development will include the deepening and widening of the canal at the mills, the installation of a tube for the automatic conveyance of logs from above the head gates into the mill thus doing away with the assistance of men in this work, and a new and considerably longer bridge across the canal. The contemplated improvements will cost approximately \$1,000,000.

General News of the Trade

Boston paper men and representatives in this city of paper mills in this section of the country are deeply interested in the recent visit of Captain Robert Dollar, the Pacific Coast lumber king and head of the Robert Dollar Steamship Company, who promises to make Boston one of the stops on his new round-the-world service which he is contemplating. Captain Dollar inspected the Army Base in South Boston at which one of his vessels, the *Elizabeth Dollar*, was then unloading on the first trip of the new service, and various lumber terminals on the waterfront. With Captain Dollar was his eastern manager, W. H. Elliott of New York.

It is understood among Boston paper men that the *Boston American*, a William Randolph Hearst paper, is the only Boston newspaper which is using German-made print paper. Practically two thirds of their supply comes from German mills while the remainder is supplied by the St. Regis Paper Company, the St. Croix Paper Company, and the Pejeboscot Paper Company.

Boxboard manufacturers report business improved. With the

increased sales in footwear, sugar, and other commodities bigger supplies of boxboard material is required and large orders from shippers of other commodities are reported by the boxboard makers. The slump in the paper industry has not been felt as keenly by the boxboard people as by the others because of the fact that other commodities being manufactured in large quantities all the time demanded boxes, and this alone has kept the orders flowing to the manufacturers of these boxes.

Forest Fires in Canada Cause Concern

[FROM OUR REGULAR CORRESPONDENT.]

MONTREAL, Que., June 5, 1922.—The past week has been an anxious one in the pulp and paper industry owing to the widespread prevalence of forest fires in many parts of Quebec and the Maritime provinces.

In Quebec province fires have broken out in practically every forest district and the fire fighting forces of the Forestry Department of the Province have been hard at work keeping the fires within bounds. Some of the fires have been close to the border and the fire fighting forces of Maine have combined with those of Quebec in checking the flames. Fortunately, destruction to the standing timber has not been great, as in most cases the outbreak was in slash and on cleared land.

It is believed that, owing to the many fires this spring, the government is seriously thinking of restricting the activities of fishermen who frequent the lakes and rivers in the northern forests at this season. It is not unlikely that the government may decide to prohibit fishing parties from going to the woods in future between the 20th of May and the 15th of June every year. Officials of the Forestry Department hold that there is much carelessness on the part of fishermen, who leave their camp fires burning and who smoke freely while travelling through the woods in times of great drought.

The contention is that another prime cause of fire in the woods is the great amount of slash which is heaped up after extensive lumbering operations, and steps may be taken to compel lumber companies and others cutting wood to destroy the slash at seasons when there is no danger of fire spreading.

In New Brunswick, there were several fires which looked very serious for the time, but they were got under control before they managed to spread very far. In Nova Scotia serious damage has been done, and at the time of writing, fires are still raging. In Prince Edward Island bad forest fires, fanned by a high wind, have cut a swath several miles long through valuable standing timber between Greenwich and Cablehead.

National Waste Paper Dealers to Meet

The National Association of Waste Material Dealers, Inc., will hold its regular quarterly meeting at the Hotel Astor, Wednesday, June 21, at 2.30 in the afternoon. This meeting will follow a luncheon, to be served at 1.00 o'clock, the cover charge being \$2. The luncheon will come at the close of the meetings of the Waste Paper, Paper Stock and Foreign Trade Divisions of the Association, scheduled to meet at 10.00, 11.00 and 12.00 o'clock respectively Wednesday forenoon.

Since the last meeting of the Paper Stock Division in March, the Writing Paper Manufacturers' Association has been considering a revised classification covering New and Old Cotton Rags, and has submitted a final draft for the approval of the division. Those interested in these items are especially urged to be in attendance. At 4.30 p. m., Tuesday, June 20, the Board of Directors will meet at the Association headquarters, 1109-1112 Times Building, New York. Any matters to be acted upon in the coming meeting must be in the hands of the Secretary of the board ten days before the meeting. This also holds for new applications.



Making Belting A Profitable Investment

Republic Belts do more than just cut costs. They actually pay dividends in service rendered.

Quality, strength, long life and low upkeep—these are the reasons why few plants that have given Republic Belting a trial have ever changed to other brands.

There is a Republic Belt specially designed and prescribed by experts for every purpose of conveyance and power transmission.

Consult our engineers about your belting problems.

THE REPUBLIC RUBBER COMPANY
Youngstown, Ohio

REPUBLIC BELTING

ATTENTION

OF

Pulp and Paper Manufacturers

THIS MAY BE YOUR OPPORTUNITY

LARGE NEW YORK PULP AND PAPER CONCERN IS DESIROUS OF ACQUIRING A FINANCIAL INTEREST IN AN UP-TO-DATE PULP OR PAPER MILL. IF YOU ARE INTERESTED, WE FEEL IT WOULD BE TO YOUR ADVANTAGE TO DISCUSS THIS MATTER FURTHER WITH US. ALL COMMUNICATIONS ABSOLUTELY CONFIDENTIAL. ADDRESS PRESIDENT, BOX 5147, CARE PAPER TRADE JOURNAL.

Obituary

Mrs. Vienna V. Bell

DAYTON, Ohio, June 7, 1922.—Mrs. Vienna V. Bell, aged 60, wife of Charles W. Bell, long prominently connected with the paper industry and now the consulting specialist in the manufacture of paper box board, etc., at Dayton, died Saturday morning, June 3, at the residence, 1047 Grand avenue, after an illness of several months.

During her early life Mrs. Bell lived in Dayton, being a daughter of the late Dr. A. S. Iddings, a prominent physician of the city for many years. After her marriage to Charles W. Bell she lived in several different states, including Tennessee and New York. About six months ago she returned to Dayton with her family. She belonged to Christ Episcopal church.

Survivors are her husband and three children, Dr. Bernard I. Bell, president of St. Stephens College, Annandale-on-the-Hudson, Miss Florence E. Bell, of New York, and Alfred N. Bell.

Henry L. Albro

[FROM OUR REGULAR CORRESPONDENT]

SYRACUSE, N. Y., June 5, 1922.—Henry L. Albro, who had been the representative for nearly twenty-five years in the New England territory of Springfield Mass., of Castle, Gottheil & Overton, paper mill supplies, 200 Fifth avenue, New York, died here Saturday, June 3.

Mr. Albro, was in his sixty-fourth year, and is survived by a wife, sister and one son. Although born in Granville, Mass., he had made Springfield, Mass., his home since he was five years of age. He was a man of sterling character, absolutely honest in his dealings and highly esteemed by everybody that he came in contact with. Castle, Gottheil & Overton will greatly miss his valuable services and advice.

Frederick Smith Coffman

INDIANAPOLIS, Ind., June 5, 1922.—Frederick Smith Coffman, age fifty-five, president of the American Paper Stock Company, was found dead in bed in his room at 24½ Kentucky avenue, May 13. His death was due to organic heart disease.

Mr. Coffman was a member of Centre lodge No. 23, F. and A. M.; the Scottish Rite, and the Mystic Shrine. He is survived by a son, Albert S. Coffman, secretary-treasurer of the American Paper Stock Company.

Mr. Coffman was born in Marion county and was a farmer for a number of years near Indianapolis. On moving to the city, he became identified with the Metropolitan Life Insurance Company and remained with the company until 1914, when he organized the American Paper Stock Company. His wife died several years ago.

Fine Stationery Manufacturers to Advertise

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, June 5, 1922.—A tentative program to start on extensive and intensive advertising campaign, pushing fine writing paper to the front, is said to be under consideration by the Fine Stationery Manufacturers' Association.

Information available here states that this association, representative manufacturers of fine writing papers, intends to use mediums of national distribution for publicity on boxed fine stationery for gift purposes. The campaign is expected to be started this coming fall, and a drive made for holiday business. The stationery manufacturers, are said to have felt that the gift field, once looked upon as fertile for their product has been entered by many other items of merchandise to advantage. Much of the display space formerly given to writing papers has been taken over by other lines due it is thought to a lack of publicity for the stationery line.

Imports of News Print

Imports of news print from Europe since September, 1920, the date of the first German paper order, according to the News Print Service Bureau, have been as follows the figures given being in tons:

1920	From					Total
	Germany	Sweden	Finland	Norway	Other Countries	
September	676	1,414	.....	.....	933	3,023
October	2,125	31	.....	58	.....	2,214
November	4,059	2,920	.....	1,471	.....	8,450
December	14,206	5,268	2,797	839	404	23,514
1921						
January	4,061	1,991	2,912	5,612	327	14,903
February	3,642	694	417	2,858	63	9,674
March	3,740	5,600	5,358	1,229	62	15,989
April	1,329	3,622	1,763	522	670	7,906
May	1,669	37	9	2,314	21	4,050
June	97	2,600	1,062	56	743	4,558
July	4,586	2,344	11	.....	994	7,935
August	4,289	5,797	3,894	2,163	389	16,532
September	4,920	5,791	2,490	1,093	189	14,483
October	4,140	5,405	1,469	180	144	11,338
November	2,295	5,416	1,110	1,736	720	11,277
December	2,170	9,635	2,166	2,430	291	16,692
1922						
January	3,476	5,452	839	2,376	127	12,270
February	3,098	10,871	2,263	2,431	212	18,875
March	2,086	532	657	1,262	363	4,900
April	2,427	3,180	3,490	667	43	9,807
Total	71,091	78,600	33,707	29,297	6,695	218,390
Average for last 9 months						12,908
Average for 20 months						10,920

Kimberly-Clark to Build at Niagara Falls

NIAGARA FALLS, N. Y., June 1, 1922.—Contracts were awarded yesterday by the Kimberly-Clark Company to Harding & Crea of Buffalo, to erect additions to the plant in Packard road, this city, to include a new pulp house, grinder room, finishing room and screen room. The cost is estimated at \$60,000. Brass Brothers, contractors of this city, have started work laying the foundation for another papermaking machine for the Kimberly-Clark Company, which will double the capacity of the concern. No estimate has yet been made of the big increase in the number of employees when the new additions are in operation. All four new buildings will be one-story high of re-inforced steel and concrete. Two of the buildings will be 50 by 100 feet and the others 50 by 120 feet. The total cost of buildings and machinery will be over \$100,000. It is expected to have the output of the company doubled before the end of the present year.

Jespersen News Print Corp. to Start

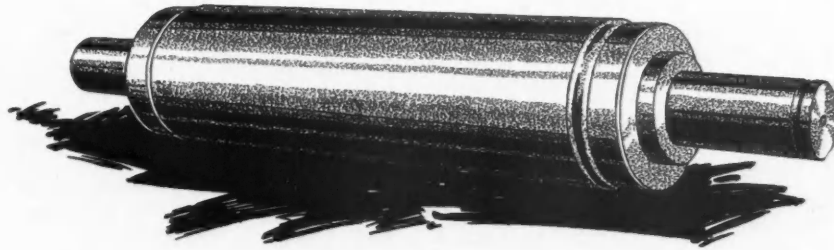
LAMBERTVILLE, N. J., June 5, 1922.—The Jespersen News Print Corporation, which controls exclusively the manufacture of news print by the Jespersen chemical and mechanical patents and processes, will begin operations here soon.

The plant, which was formerly the old Perseverance Paper Mill, has been almost completely remodeled, and additions added, and the engine and machinery have both been operated for short periods during the past few days, as a test. They will be put into full operation shortly, producing news print paper from old paper stock. A large sum of money has been expended in making the changes and improvements, under the direction of H. T. Weeks, president and treasurer of the corporation.

J. R. Rosenstein Paper Co. in New Quarters

ST. LOUIS, Mo., June 5, 1922.—The J. R. Rosenstein Paper Company, after being located at 319 N. 4th street, St. Louis, Mo., for the past three years, has moved into its new quarters at 504 N. 2nd street, where it has combined its office and warehouse.

At the new location the firm is carrying everything in the wrapping paper, and bag line as well as twines and toilet paper, and specialties, and is fully prepared to take care of any business in a proper and efficient manner.



SUPER CALENDER ROLLS

The final touch is given your paper stock by the Calender Rolls. For half a century our rolls have been putting that finishing touch upon papers that have an acknowledged superiority.

THE APPLETON MACHINE COMPANY

APPLETON WISCONSIN

"AMERICAN"



PAPER MAKERS TWINE

TUBE ROPE

WALL PAPER TWINE

HAY ROPE

FINE AND COARSE POLISHED TWINES

"AMERICAN" BRAND MANILA ROPE

"AMERICAN" BRAND TRANSMISSION ROPE

The name "AMERICAN" as applied to cordage means "more value in every way." Send for copy of our General Catalogue, Prices and samples. Address Department M.

Largest Makers of Commercial Twines and Rope in the World

AMERICAN MANUFACTURING CO.

NOBLE AND WEST STREETS, BROOKLYN, NEW YORK CITY

CORDAGE

PRINTERS AND PAPER MEN MEET IN PHILADELPHIA

As a Result of the Meeting It Is Expected That the Controversy Long Waged Over the Long Price List Will Close—Adopt Compromise Plan Which in Substance Provides That Fine Paper Distributors Will Sell Only to Converters and Not Ultimate Consumers and Printers Will Look to the Paper Distributors and Not to the Mills for Their Supplies—Meeting Largely Attended.

[FROM OUR REGULAR CORRESPONDENT.]

PHILADELPHIA, June 5, 1922.—More paper house executives and salesmen than ever before assembled together for friendly conference with their chief customers, the printers, gathered tonight in the Kugler Café, 15th and Chestnut streets in a meeting of national importance. One hundred and seventy-five paper men and two hundred printers, engravers and other converters of paper, dined together and then listened to addresses by the chairmen of the Trades Relations Committees of the Paper Trade Association of Philadelphia and the Typothetæ of Philadelphia present the plan of co-operation evolved during the series of conferences at which the demand of the printers for the establishment of the Long Price List or Retail Price List had been considered. Such good fellowship existed that there was vociferous response to the suggestion that hereafter paper men and printers meet at least once a year in friendly conference.

The compromise plan which has been adopted and which was ratified at this the most important meeting in the annals of the two industries provides in substance that fine paper distributors will sell printing papers only to the converters and not to the ultimate consumer and that the printers in turn will look to the paper distributors and not to the mills for their supplies and finally that the long list, while it will not be adopted by the paper distributors who are members of the Paper Trade Association and thus are affiliated with the National Paper Trade Association, will be carried on by the Typothetæ only in an educational and not in an aggressive way. Because the long list controversy was carried in Philadelphia as in no other city in the United States, the conference of tonight had a significance greater than similar meetings could have in any other city. So large was the gathering that accommodation plans were overtaxed and an overflow gathering of diners had to be accommodated elsewhere in the main dining room although after dinner all crowded into it to hear the addresses.

Wm. T. Innes Presides

President Wm. T. Innes, of the Typothetæ, presided. In his address he outlined the history and activity of the organization, concluding with the statement, "If the present plan fails to work out, I predict that the long price list will return like an avalanche.

"This meeting, I believe, is unique in the history of the printing and paper industries, not only of this city, but perhaps of the entire country. I never saw in an experience of some time, the equal of this meeting both for numbers and representative character. And much older men in the industry tell me that never before has there been such a gathering. It is my hope that hereafter, at least once a year, we have a meeting of this kind. No doubt there are men in this audience who have done business with each other for years and years, but who only knew each other's telephone voice, but never before met face to face, and if a gathering of this kind did nothing more than bring about that personal contact, it would be justified."

George W. Ward Speaks

As chairman of the Trades Relations Committee of the Paper Trade Association of Philadelphia, George W. Ward said:

"Any question as to whether the paper and printing industries

are interested in the get-together meeting, is clearly demonstrated in the showing of this meeting, which in round figures consists of over two hundred printers, and one hundred and seventy-five paper men. I hope that it is the general wish that this is the first of many such gatherings, because it is on occasions of this sort that we all come to know each other better, and it is here that we have the opportunity to plant and nurture the seed of co-operation.

"This, after all, is the day of co-operation. Business men are coming to realize that co-operation—and not competition—is the life of trade. This is the day of creative selling and not price selling (and this applies whether the article to be sold is paper or printing). In order to obtain the greatest degree of co-operation and to obtain it quickly, one cannot work with individuals because this is a slow method. Such ends are achieved more easily, more efficiently with greater dispatch through the trade organizations.

"To iron out misunderstandings and to create a sound equitable basis upon which two kindred industries may conduct their respective business with a view of extending the greatest possible amount of co-operation, each to the other, is one of the most important functions of these trade organizations and is the reason that they should have the support of each and every individual member of the industry.

Good Work of Typothetæ

"Those of us who are in the paper business realize and appreciate what the printers' association—the Typothetæ—is doing for that industry. Having been in close contact with the printer for a long time, we can notice the change. We can see that the printer is becoming more efficient through his association with the Typothetæ and his fellow members. He now has a cost system; his credit is fast improving; he is learning the great advantage of the gain he makes in discounting his bills; and not the least, he is acquiring the appreciation of the value of good materials, which in turn, improve the quality and value of his product. The Typothetæ deserves the support of its members and those of us who are engaged in lines likely to benefit should urge that non-members of the Typothetæ give serious consideration to the many advantages they would receive by joining. There is no reason why the membership should not be 100 per cent.

"A prominent mill has visualized the spirit of co-operation that is present at this dinner tonight, by having a picture painted which shows very clearly the bond between the four partners—the paper mill, the paper merchant, the printer and the consumer. All four are very necessary to each other. There can be no difficulty to this co-operative work providing each organization and each member practices the Golden Rule. In other words, if each man would stop for a moment to view the situation from the other man's position, nearly every difficulty that besets us will be solved.

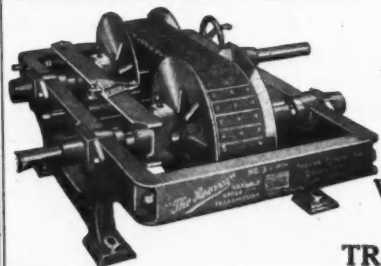
The Temptation to Straddle

"One of the most unfortunate situations that seems to have entered into the way business is conducted today, is the constant temptation to "straddle." The mill is tempted to "straddle" by an opportunity to sell direct. The paper merchant is economically an important factor and the mills cannot conduct their distribution without the merchant. The mill cannot "straddle." On the other hand, the fair-minded printer who appreciates the service offered by the paper merchant on small orders will not try to save the small percentage of profit made on the large orders by attempting to purchase direct.

"The paper merchant is tempted to "straddle" by an opportunity to sell the consumer direct. He, too, must make up his mind that he can sell one or the other, but not both. Paper that is to be printed must be sold by the paper merchant only to the printer, who in turn sells it to the consumer in form of printed materials. Only paper that is to be used for other than printing purposes can be sold directly between the paper merchant and the consumer.

"Through my contact with some of the most prominent members of the paper industry throughout the country, I can safely say that

(Continued on page 82)



The Reeves

**VARIABLE
SPEED
TRANSMISSION**

It doesn't matter how fine a variation of speed you want or what kind of paper machine you wish to regulate, "THE REEVES" Variable Speed Transmission will do it. It will give the exact speed wanted to suit the condition and requirements of the paper being manufactured.

Valuable and interesting improvements have been made in the construction of "THE REEVES" Transmission, such as

TWO KEYS, FULL LENGTH OF SHAFT between boxes, LARGER ROLLER THRUST BEARINGS, LARGER DISCS, PATENT EQUALIZING COLLARS

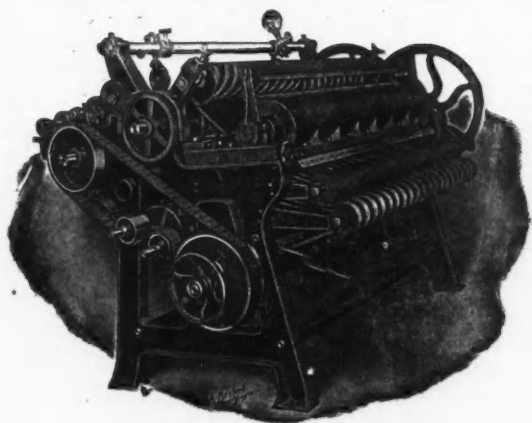
all of which tends to give larger wearing surface, greater carrying capacity and longer life. We are furnishing Special High Duty Ball Bearings for main boxes if desired. They can be applied to any REEVES Transmission now in use.

It is the only Variable Speed device with 25 years' service record.

**REEVES PULLEY COMPANY
COLUMBUS, INDIANA**

Paper Cutters

Single, Duplex and Diagonal



Cutter Knives Patent Top Slitters

**HAMBLET MACHINE CO.
Lawrence, Mass.**



*The best way
is the easiest way!*

CONCENTRATE

on

**LAWRENCE
GROCERS' BAGS**

*Avoid loading your warehouse
with many lines*

CONCENTRATE!

James Lawrence, Pres.

**THE LAWRENCE BAG COMPANY
MIAMISBURG, OHIO**

PRINTERS AND PAPER MEN MEET IN PHILADELPHIA

(Continued from page 80)

they are firmly convinced that it is only fair and right to the interest of the printers that they be protected and any arguments on the subject are merely differences of opinion as to the plan that would assure the proper results. My wide and pleasant acquaintanceship with the printers here in Philadelphia show me that their only desire is that a plan be made out and operated that will secure the proper results.

"Let me emphasize that it is too much to expect of any plan that it will work perfectly at first. We must be willing to try it out with a certain amount of patience and tolerance because wherever the human element enters into a proposition of this kind, there is bound to be the possibility of error and misunderstanding. By reporting such infractions in detail, and more important, perhaps, in the proper spirit, it should be but a short time until the plan for general co-operation is working out to the entire satisfaction of any reasonable person. Before giving you an outline of the plan to be submitted by your committee, I want to give you the assurance that every member of the Trade Relations Committee of the Paper Trade as well as the corresponding committees of the Printing Trade has the keenest desire that the committee's effort to establish harmony and co-operation have the support of all the printers and paper merchants, and I do not exaggerate when I say there is not a committee man unwilling to work day and night in order that this may be accomplished. I believe that you will agree with me that it will be desirable henceforth to hold monthly conferences for the purpose of straightening out any matters that need adjustment.

Plan Agreed Upon

"The plan agreed upon is as follows:

"1. To do everything possible to increase cordial business relations with the printers and as a means to that end to refrain from selling direct to consumers any merchandise which is normally used by the printers in the manufacture of printing.

"2. To submit to the proper representatives of the Typothetae any matter affecting the above arrangement, previous to consummation.

"3. To make proper adjustment of violations of article 1.

"4. To not oppose educational efforts of the Typothetae, or of individual printers to establish the retail price list.

"5. To not oppose the issuance of letters by the Typothetae to the printers of Philadelphia, advising them the names of those merchants who become a party to and maintain the provisions of all of the above.

"6. To consider only the following as the proper buyers of paper:

1. Commercial Printers; 2. Commercial Lithographers; 3. Commercial Bookbinders; 4. Commercial Paper Rulers; 5. Blank Book Manufacturers; 6. Stationers; 7. Book Publishers; 8. Publishers of Second Class Mail Matter; 9. Accredited Advertising Agents; 10. Envelope manufacturers; 11. Paper Box Manufacturers; 12. Accredited Private Plants for Known Equipment Only; 13. Commercial Facsimile Letter Producers (material for manufacture on known plant equipment only); 14. Accredited Private Facsimile Letters producers making purchases of at least one case of a kind, and for known equipment only."

Wm. Sharpless Speaks for Printers

On behalf of the printers, Wm. Sharpless, chairman of their trades relations committee, said:

"The previous speakers have referred to co-operation in an able manner, but only in the abstract. Now I am going to try and point out in a concrete way just how this co-operation can be carried out.

"I must assume that the paper salesmen is the connecting link in every transaction between the printer and the paper house. He has the power to help build up or injure his own house and at the same time to vitally affect the individual printer and the whole industry. He comes into close contact with the every day life of the printer. He has the opportunity to see and know the conditions

in every shop in town, and he also has the opportunity to make himself invaluable by rendering a real service to every one with whom he comes in contact. Uniform dependable service will make him a friend to his customers and a valuable asset to his house.

"For instance, when a piece of paper is shown him with a request to be told what paper it is, he should not simply say 'The nearest we have is so and so.' No, he should tell the printer what it is and whose it is. Ten chances to one the printer will say 'I guess yours will do.' Or, if the printer buys a competitor's goods, the memory of your courtesy and the service you give will more than repay you in the future for the loss of that one order.

Good Will of Printers Make Re-Orders

"It isn't the one single order you want, it's the re-orders and the good will of the printers which make re-orders.

"Here is something which helps to destroy confidence in a salesman and his house: a salesman will affectionately put his hand on your shoulder, lean over and almost whisper 'Now if you can use this lot of paper I think I can shade the price a little.'

"I wonder if the salesman who uses this method to try to sell prices instead of merchandise realizes that such methods merely make the printer distrustful and suspicious of him and his house. The printer knows that if a price is being shaded for him, it will more than likely be shaded lower for some other buyer so that the advantage offered him is of no value.

"Then again a real salesman will not convey the impression that he is calling just to get the order. You paper merchants can hire clerks and keep them at your end of the wire to do that. The real salesman is one who is always welcome because he shows a sincere desire to be of service, to help the printer solve his paper problems and leave behind a pleasant memory of his visit.

"There are many salesmen who carry their customers in their vest pocket with them wherever they go. This is as it should be, and is due entirely to the personality of the salesman. I believe there is more paper sold on account of a pleasing personality on the part of the salesman than for all the other reasons combined including prices.

Look at It from Printer's Standpoint

"The true salesman is always courteous and friendly; knows when to talk and when to listen. He knows his own stock and what results should be secured from each kind and grade and has some knowledge of what his competitor carries. He ought to be able to advise his customer the right paper for any class of work or job, or if asked to give an intelligent and unoffending opinion of any piece of work shown to him. It is within his province to create among printers more interest in this Association of ours—the Typothetae—and thus help to make it a powerful means to improve the printing and paper industries of Philadelphia. Our aims are identical and cannot be separated. Should the printing industry become sick the paper industry will suffer also; if your paper salesman gives out poison and gas and undermines the printers by direct selling or other unfair practices, you and your house will suffer from the reaction, and it will become harder for you to do good business. Be fair, look at it from the printer's standpoint; be truthful, always state only what you know to be the facts, and above all be honest; honest with your customer, honest with your house, and honest with yourself.

Will Prevent Unpleasant Incidents

"Mr. Ward has read a statement of sound business principles which the paper merchants of Philadelphia will abide by in their dealings with us printers. While I don't like to rehash old stuff, I want to point out that the first principle will prevent a repetition of the following incident:

(Continued on page 84)

New York Office
280 Broadway

Chicago Office
1148 Otis Bldg.

Howard Bond



Howard Ledger

"The Paper of Many Uses"

Manufactured by

THE HOWARD PAPER COMPANY, Urbana, Ohio

CENTRAL MANUFACTURING COMPANY

THE QUICK SERVICE HOUSE

KALAMAZOO, MICH.

Manufacturers of

High Grade Brass and Bronze Screen Plates and Dandy Rolls

OLD PLATES
CLOSED AND RECUT



DANDY ROLLS AND
WATER MARKING

Secure Our
Prices



We Can
Please You

Super Calenders
Breaker Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps



Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company

PROVIDENCE, R. I.



Dilts Machine Works, Inc.

Fulton, N. Y., U. S. A.

Manufacturers of

BEATING and WASHING ENGINES

FLY BARS—BED PLATES—

MACHINE KNIVES

Our new KEYED TYPE BANDLESS ROLL is the final result of Many Years of Experience.

May we not tell you about its many advantages?

PRINTERS AND PAPER MEN MEET IN PHILADELPHIA

(Continued from page 82)

"Some time ago a paper house delivered to one of our Typothetae members a case of writing paper which had been sold and billed to a large manufacturer. Of course, the printer was sore, so to test out his theory that he and other printers were being injured by unfair practice, he called the paper house and asked: 'How in hell can you sell my customer for a lower price than you do me?' In justice to the paper house involved, I must say that after an investigation the printer received from that house a check for 20% of the amount billed to the customer. These printed forms seem to show another case where a paper house became a competitor of the printer. Not only did the paper house sell the paper to the customer, but also had the printing done and evidently sold the job at a lower price than was asked by one of our Typothetae members who had the forms standing. I could give numerous similar occurrences, but these two incidents are sufficient to show a woeful lack of knowledge on the part of paper salesmen as to what constitutes proper business methods. We can all understand how a salesman wants to make good for his house and for himself by getting every possible order in sight. But he is certainly very short-sighted if he cannot see that these and similar practices are a discredit to him and his house and are unfair to the printer.

"Another bad practice is the carrying of hearsay gossip from one printer to another, either about his own or the printer's competitor. Vague insinuations about something done by another house, or how much some other house has lost in the latest failure; how little his house had lost, and thereby try to show how he and his house were too wise to get burned, and then wind up with the usual query—How about an order today? This desire to talk about his competitors can be turned into proper channels by reporting to the head of his house any infractions of Article 1 of the Paper Merchants' statement of principles, giving specific and detailed information so that the occurrence can be taken up with the proper representatives of either industry for investigation and adjustment.

Should Have Right Kind of Salesmen

"Now Mr. Paper Merchant, it is up to you to see that you have on your staff the right kind of salesmen and to back them up in their work. Whether they have used good or bad judgment is for you to say, but give them a chance to use judgment, and if it is bad, don't hesitate to assume the responsibility for their acts, acknowledge at once it is your error. Don't seek a justification for a wrong act.

"We printers look to you to be on the job of buying and holding for us the right kind of merchandise and plenty of it. It is for you to scour the markets and help us be successful in our business, and thereby contribute to your success. Make it possible for us to have unbounded faith and trust in your judgment of our needs. I believe that it is only fair when you have spent your time and money in assembling a wide variety of papers for our convenience, and have built up an organization of capable assistants whose ability and knowledge are at our disposal, that our purchases should be confined to the channels that have been made for us. Mr. Ward used the word 'straddle' awhile ago. It seems to fit existing conditions perfectly.

The mills, the merchants and the printers all 'straddle.' So it looks to me as if the three industries should all get down and live together on one side of the fence.

"Another thought the paper merchants might use for their own and perhaps our benefit is this: how many times have you proprietors dropped in for a friendly visit to us printers? Do you know some of us don't even know the name of the head of some of the houses, much less their personality? You don't have to wait to have a specific kick to bring you face to face with your customers. In fact if we knew you better I believe there would be less kicks.

Surely you could spare enough time from your duties to let us see you at least once a year.

A Word About Retail Price List

"Now just a few words about the retail price list. The retail price list will be generally adopted by our Philadelphia merchants when every printer recognizes that not only himself but also his competitor is entitled to a profit from the sale of his merchandise and labor. When the cost system is more generally used and adhered to when making estimates, and when a sincere desire to live and let live is evident, then a united desire can be expressed and it will be heard and heeded. I am glad of this opportunity to get my message across. It has been with me for years and I hope it will be received in the same spirit it is given; for the improvement of our trade relations and getting them on an honorable basis. If this object is accomplished from our intimate association tonight, I firmly believe that the Golden Rule will again come into use and we will receive a high reward."

The meeting was brought to a close by an address, the speaker being President Whiting of the Sheldon School, on Salesmanship.

Finnish Paper Market Quiet

WASHINGTON, D. C., June 5, 1922.—The Finnish paper market is quiet, according to the *Finnish Paper Journal*. The lockout in Sweden did not change the situation in the Finnish mills.

Some lots of better grades, free from mechanical wood, have been sold, but the prices remain low. In regard to mechanical wood pulp, and cardboard, the same authority reports nothing of special interest, quotations being unchanged.

The Finnish mills are unable to count upon any special favors arising from the present low level of the Finnish mark. On the contrary, the value of the Finnish currency has, during the last weeks, had an upward tendency, which is causing some uneasiness among Finnish exporters.

The margin of profit in the paper and pulp trade in Finland is not very large, and the longer the currency of the country remains at its present level, the more difficult the competition grows. There has been some talk in industrial and agricultural circles of Finland about stabilizing the value of the Finnish mark by aid of an external loan.

The total value of paper exported from Finland during the month of February, 1922, was 69,640,659 Finnish marks, as compared with a value of 46,608,612 Finnish marks in February, 1921. (1 Finnish mark is worth \$0.193 at normal exchange, although its present value is about \$0.02.)

The quantity of paper exported during the month of February, 1922, and the corresponding month of 1921 is shown in the following table:

Kinds of paper	1921 Kilos.	1922 Kilos.
Wrapping:		
Nature brown	674,696	1,525,356
Other kinds	233,113	226,751
Grease-proof		158,520
News Print	4,231,476	6,315,716
Foolscap	26,696	422,890
Writing paper	77,128	401,960
Letter paper		2,278
Tissue paper	8,411	1,453
Cigarette tissue paper	47,883	98,721
Hanging paper and borders.....		972
Other kinds of paper.....	362	550,688

How Much Industrial Waste Does Your Plant Commit Daily?



Belt Conveyor Handling Coal



Jeffrey Flat and Round Link Chain Conveyor handling cooked straw over beaters in paper and board mill.

Plant Commit Daily?

ARE you employing modern methods that will bring your works to a high state of efficiency and your operating costs down to rock bottom—or, are you using obsolete expensive and wasteful methods?

Jeffrey Labor-Aiding equipment has eliminated industrial waste in many of the leading pulp and paper mills, through the rapid and efficient handling of Logs, Pulpwood, Pulp Laps, Straw, Bark, Bales, Coal and Ashes and other materials.

A complete line of conveying and Elevating Machinery; Chains; Sprockets; Portable Loaders and Conveyers; Pulpwood Stackers; Crushers; Pulverizers; Shredders; Coal and Ashes Handling Equipments; Electric Industrial Locomotives, etc.

Let Jeffrey Expert Engineers help you to plan the "right equipment."

THE JEFFREY MFG. CO., 931 North Columbus, Ohio
Fourth St.

JEFFREY

MATERIAL HANDLING MACHINERY

ROGERS WET MACHINE

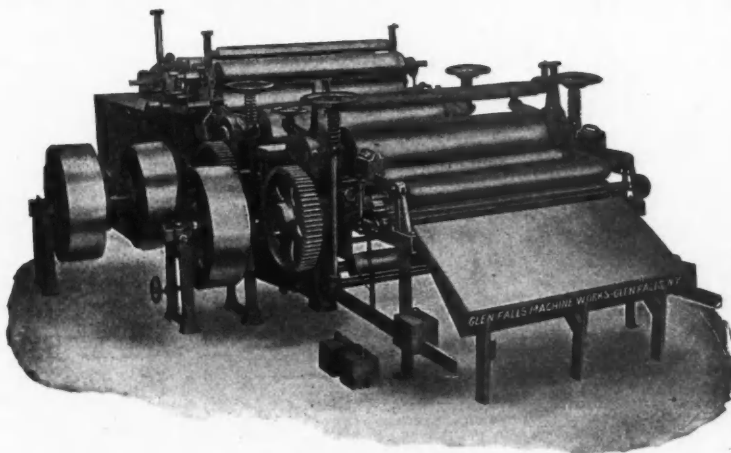


Illustration Shows Rogers Double Press Wet Machine

FOR CHEMICAL PULP—including Sulphite, Sulphate, Soda, also Cotton and Waste Paper fiber.

TYPES—Single and Double Press 72" wide.

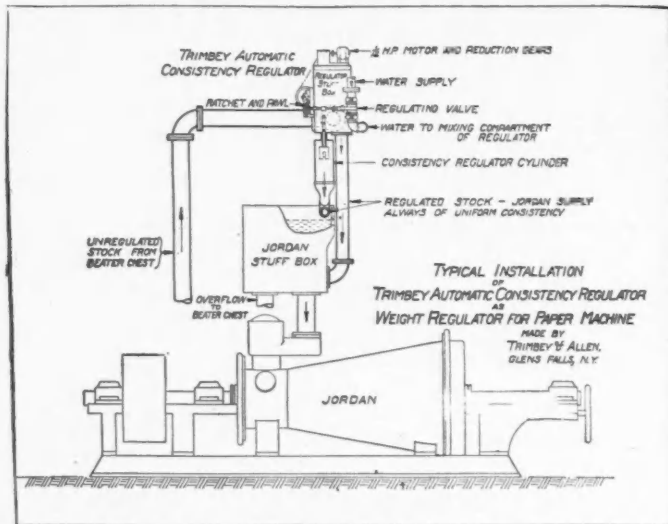
CAPACITY—either type 25-30 tons air dry stock per 24 hours.

SHEETS produced by the Double Press Machine uniformly 48% dry. By the Single Press Machine uniformly 40% dry. There is no fold to contain excessive moisture. Sheets are handy size, 33"x36", and are folded once into most convenient bundles for storage, for the beater or for shipping. By this great capacity, high dry test, small amount of floor space per ton pulp produced, exceedingly low cost for labor and maintenance, users are assured that the machine will completely pay for itself within one year, and are promised a handsome return on their investment.

WORKMANSHIP AND MATERIAL GUARANTEED
GLENS FALLS MACHINE WORKS Glens Falls, N. Y.

Try Our Split Cams for Your Flat Screens

UNIFORM STOCK



This is the machine that will regulate your paper stock to a uniform consistency, thus insuring **UNIFORM BRUSHING ACTION** at the Jordan. Given stock of uniform character and consistency going on to the wire you will get **UNIFORM WEIGHTS** and **UNIFORM RUNNING CONDITIONS**.

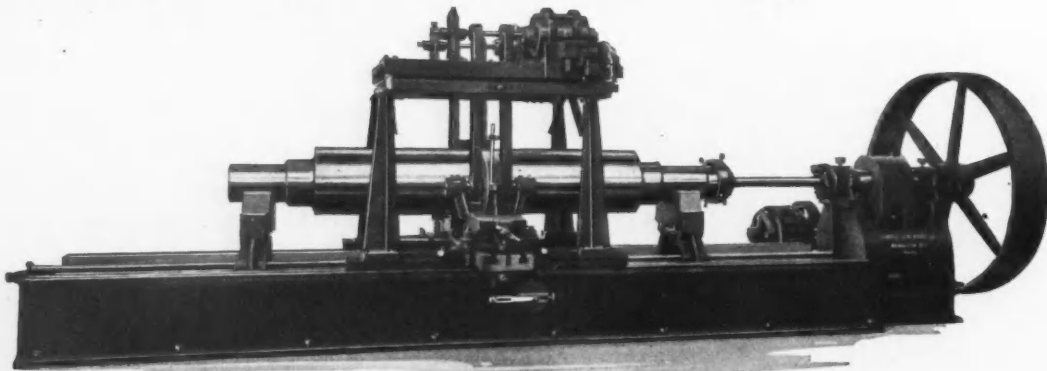
This regulator will also cause to be delivered at Beaters, Mixers or Bleachers, stock of a set, uniform consistency.

TRIMBEY MACHINE WORKS

Glens Falls, N. Y.

M. G. TIBBITTS, Sales Manager

LOBDELL **ROLL GRINDERS** are the only machines of the kind fitted with automatic crowning device which develops a perfect crown without the use of a guide or former and repeated trying for the correct setting.



LOBDELL Calenders are equipped with Patent Electric Motor, Hydraulic or Ratchet Lift all operated from the floor.

LOBDELL Micrometer Calipers are handy and accurate.

LOBDELL CAR WHEEL CO. Est. 1836 **Wilmington, Del. U. S. A.**

Section of the

Technical Association of the Pulp and Paper Industry



AN ORGANIZATION FOR THE ENCOURAGEMENT OF ORIGINAL INVESTIGATION AND RESEARCH WORK IN MILL ENGINEERING AND THE CHEMISTRY OF PAPER, CELLULOSE AND PAPER-MAKING FIBERS GENERALLY; IT AIMS TO PROVIDE MEANS FOR THE INTERCHANGE OF IDEAS AMONG ITS MEMBERS IN ORDER THAT PROCESSES OF MANUFACTURE MAY BE MADE MORE EFFICIENT AND IMPROVED ALONG TECHNICAL LINES.



Conducted by **W.G. MacNAUGHTON, Secretary**

MILL COSTS FROM A TECHNICAL MAN'S STANDPOINT*

By **W. G. MacNAUGHTON, SECRETARY-TREASURER, TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY**

This joint meeting of Superintendents and Cost Accountants shows the close contact between them that has been achieved the past few years. It used to be that the mill superintendent looked on a bookkeeper much in the same way a dog looks at a cat. If the bookkeeper ventured into the mill, he was by no means welcome and was made to feel that his room was better than his company. There may be some concerns still where this feeling exists.

The man engaged in production has come to see that a cost system may be to him as Burke has suggested what the compass and patent log is to the seafaring man. The mill man deals with quantities while the cost man deals with dollars and cents. In large operations the gap between them is filled by a man known as a cost engineer—a sort of hybrid.

Such joint meeting as this helps to develop that spirit of cooperation so necessary between the men represented in the association. The cost man is dependent in the final analysis on the mill for the quantities of material used in production, the labor, power and other items. From these by extending the unit value he gets his dollars and cents. On the correctness of the quantity figures depends the correctness of the cost.

In too many places it is the chief desire to preserve uniformity of figures from day to day and from month to month. To preserve this uniformity and avoid comment the practice is to adjust the figures—doctor them—thereby destroying the chief value of a cost system—its correctness.

The fault in such a practice does not lie primarily with the mill man but frequently with the management which insists on narrow fluctuations in the cost records without going to the bottom for the reasons of such fluctuations.

It is plain that if adjustment of the inventory figures is to be made the place to do it is in the office but in doing so at all the cost system is shot to pieces.

The Cost Association has done a conspicuous piece of work in developing a uniform cost system but its successful application depends to a considerable extent on the mill and of the plant organization.

If I were a manager, superintendent or cost accountant, I would want to know the cost of the product both in terms of quantities and in terms of dollars and cents and so divided as to show the efficiency and cost of each of the main departments.

One of the great difficulties in paper manufacturing today of getting costs is the measurement of the quantities and keeping track of the inventories. In most mills there is too much guess work and in many, even those with cost systems, the work might as well be done in the office.

Taking a mill using wood and making its own sulphite, mechanical pulp and paper therefrom it is well known that too often there is nothing but guess work between the wood pile and the finishing room. At the wood pile those who have studied the present methods of wood estimation know to what extent it too is a guess. Another large item entering into the cost of paper is the fuel and in many mills too there is a guess on the coal pile and generally a poor guess the rest of the way through.

You will agree that the vital element in a true cost system is the accuracy of the quantities. The technical man or engineer must bring his training and experience to bear on this question to assist both of you.

Power Plant

Let us take the fuel first—the fuel, if oil, can be measured—where coal alone is used, properly equipped power plants have scales to give a record of the coal used. The difficulty usually comes where woodroom refuse is burned in the boiler house. This is frequently not taken account of either in charging the boiler house or crediting the wood preparation department.

The power plant should be run as an independent department of the mill charged with the fuel, labor and maintenance and credited with the pounds of steam and power developed. The output of steam and power should be capable of distribution by flowmeters and wattmeters to each department of the mill.

My contention is that such a mill as we are considering should be divided into at least the following departments:

Wood preparation, sulphite, mechanical pulp, bleach plant, power plant and paper mill.

When we come to the wood there is work to do to get a unit of measurement applied that will represent the actual quantity of material. The stacked cord of 128 cubic feet is reasonably accurate when used as it was on fuel wood. There the wood is cut to four foot lengths and split to uniform size. When applied to pulpwood of all lengths from two foot lengths to 16 logs and diameters of 3 inches to perhaps 48 inches the inaccuracy of such a unit is plainly seen.

Log scale in board feet is little better. The use of the weight as a system of measurement has been ardently advocated but I am inclined to believe that the practical difficulties in application

*Address before the joint convention of the Cost Association of the Paper Industry and the American Pulp and Paper Mill Superintendents' Association, Kalamazoo, June 1-3, 1922.

except perhaps in the mill are insuperable. A system to which I am favorable is the solid cubic measure of the wood. It is in general use in Ontario, parts of Quebec, in Scandinavia and to some extent I believe by New England mills. It is true that the pulp yield will vary with the specific gravity of the dry wood. This variation in specific gravity usually depends on the locality or species of wood. This variation could be used to govern the purchase price.

The solid cubic measurement can be used uniformly from the woods to the mill quite as readily as the logscale measurement is now used by lumber mills. Instead, then, of continuing the term *cord* as is done even in Ontario, I would discard it for the solid cubic measure with the unit of pulpwood as 100 cubic feet.

Wood Preparation Department

As the wood room supplies chips to the sulphite mill and cleaned wood to the mechanical pulp mill its raw material input is the solid cubic measure of rough wood and its output or product the chips and prepared wood.

The most satisfactory method of recording the output so far as chips are concerned is undoubtedly the use of the weightometer, a conveyor scale. This with the moisture test of the chips to the chip bin, would give the bone dry weight of the raw material to the sulphite departments. A similar weightometer and test on the conveyor for the refuse from the wood room to the boiler house would give the figures to make the proper debit and credit between the departments and to check the shrinkage in preparation. The prepared wood to the grinder room would most readily be had by solid cubic measurement.

Sulphite Mill

In this the yield of pulp when it is not weighed but slushed in whole or in part to the paper mill is obtainable only by the use of a consistency regulator and a stock meter. Too frequently the sulphite mill production is calculated from the number of digesters blown and the yield factor based on an estimation of rough wood supplied to the wood room. The proper factor would be percent of pulp on dry weight of the chips cooked. Right here I would also advocate discarding for mill practice at least the "air dry" calculation, using in all cases the dry content or otherwise known as the bone dry. The steam used should be measured by flowmeter. The sulphur and limestone or lime being bought by weight and used in the same basis should give no particular difficulty in getting correct figures if ordinary care is used. It is safe to say, however, that many sulphite mills have no adequate system in regard to the inventory of these materials and periodical-ly have to "gulp down" large shortages.

Mechanical Pulp Mill

In this department with the dry weight of wood delivered and a similar figure computed from the measurement of the stock produced, the yield of pulp would be based on the prepared wood received. The chief items entering in are the prepared wood, power, labor and maintenance.

Bleach Plant

Even in mills making all their sulphite in bleached form I hold that this department and the sulphite mill should be kept separate in order that the efficiencies of the two are not confused. Here the input is the weight of unbleached sulphite the chlorine or bleaching powder, steam, labor, power and maintenance, while the output is the bleached product. The case is frequently seen where the rough wood is at one end and bleached sulphite at the other thereby confusing the three logically separated departments, wood preparation, sulphite mill and bleach plant.

Power Plant

I have dealt with this already and fortunately the tendency now-

adays is to regard this as a manufacturing department producing steam and power for distribution from fuel, water and labor.

Paper Mill

One of the bones of contention usually found between the mill and the office is the yield of paper from the materials furnished. In plenty of mills there is only one quantity known approaching accuracy—the paper made and the materials used are calculated back from it. Then the inventories of sulphite and mechanical pulp are adjusted in accordance and in many cases this calculation covers even the production of the pulp mills.

These are facts with which you are all more or less familiar. It is only by the employment of apparatus such as consistency regulators and stock meters that the quantity of pulp supplied in slush form to the paper mill can be arrived at with reasonable accuracy. Even when weighed there is difficulty on account of inadequate moisture tests systems and lack of care in weighing.

Besides computing the cost of paper and the product of each of the departments I have named in dollars I would have corresponding factors based on quantities.

Wood Preparation

The cost record of this department based on quantities should include such factors as:

- Per cent shrinkage in preparation on rough wood.
- Man hours per unit of prepared wood.
- Hp. hours per unit of prepared wood.

Sulphite Mill

Per cent yield of unbleached sulphite (not screenings) based on prepared wood.

- Per cent screenings on sulphite produced.
- Lb. steam per ton sulphite made.
- Lb. sulphur per ton sulphite made.
- Lb. limestone or lime per ton sulphite made.
- Man hrs. productive labor per ton sulphite.
- All figures based on bone dry content.

Mechanical Pulp

Per cent yield of mechanical pulp based on prepared wood.

- Per cent screenings based on mechanical pulp produced.
- Hp. hrs. per ton pulp produced.
- Man hrs. (productive labor) per ton pulp produced.
- All figures based on bone dry content.

Bleached Pulp

Per cent shrinkage based on unbleached sulphite.
Per cent yield of bleached pulp based on unbleached sulphite.
Per cent of bleaching powder or chlorine per ton unbleached sulphite.

- Lb. steam per lb. bleached sulphite.
- Man hrs. (productive labor) per ton bleached sulphite.
- All figures based on bone dry content.

Power Plant

The factors covered by the standard record of a power plant.

Paper Mill

Per cent fiber constituent and filler based on finished paper.
Per cent shrinkage.

- Lb. steam per ton paper made.
- By subtracting the heat returned to the boilers in the condensate the net heat used in drying per lb. paper made.
- By computation of water evaporated in drying, the heat units used per lb. water evaporated against the theoretical heat required get the drying efficiency.

- Man hours per ton paper.
- Hp. hours per ton paper.
- Lb. alum per ton paper.
- Lb. size per ton paper.

Lb. paper per lb. felt.

Lb. paper per lb. or per sq. ft. wire

and various other factors as may be required all based on an analysis of the cost figures.

In logging operations or in a saw mill the figure of most value to the superintendent is the thousand feet per man or per team per day, rather than the cost in dollars. In some paper mills there is what is known as the statistical department, not connected with the accounting department, so that there is no conformity of the two departments' figures.

In the investigation begun on drying of paper we found that various mills had different systems by which comparison might be made but the nearest any came were two or three that had the steam per lb. paper made. Some two or three made use of a factor entirely unrelated to cost, although valuable the lbs. paper dried per sq. ft. drying surface per hour.

The cost system along the lines I have mentioned is probably no different from that you are accustomed to operate but I have given it in order if only to bring it before you.

In the paper industry the men dealing with accounting matters should know the steps in the process with which the figures deal so that they need not take the figures blindly. The superintendent and men in the mill need to realize the value of cost records in order that they may be impressed with the need for accuracy. The engineer by training along analytical lines and by his knowledge of appliances should be in a position to assist both of you towards accurate process records and to obviate otherwise unrecognized errors.

In the case of up-to-date power plants they are now not regarded as fully equipped unless provided with steam flowmeters, water meter and coal and ash scales as well as control instruments. The same is true of the sulphite mill in the case of control instruments such as temperature and pressure recorders. While consistency regulators and stock meters are used to some extent in news print mills they are not by any means commonly used. Undoubtedly the time is not far distant when they will be regarded as part of the necessary equipment to be provided. The same is true of weightometers or conveyor scales.

OPPOSE DUTY ON CASEIN

[FROM OUR REGULAR CORRESPONDENT.]

Following the meeting of seventy-five coated paper manufacturers at the offices of the Oxford Paper Company, 200 Fifth avenue, Monday, May 29, in which a committee was selected to oppose the amendment to the Tariff Bill endorsed by the Senate and placing a duty of four cents a pound on imported casein, a letter was drawn up and sent to the Committee on Finance the following day.

The letter was sent from the offices of the American Paper and Pulp Association, 18 East 41st street, and was signed by the five members of the committee: Martin Cantine, Chairman, of the Martin Cantine Company, Saugerties, New York; Charles A. Gordon, of the Oxford Paper Company; Walter D. Randall, of the Champion Coated Paper Company; Charles F. Shirley, of the Forbes Lithograph Company of Boston, and Dr. Hugh P. Baker, Secretary of the American Paper and Pulp Association.

The brief submitted by the manufacturers states, among other things that a duty of four cents per pound on casein would be disastrous to the coated paper industry and denies that hide glue or starch products may be used as a substitute in the coating of high grade papers in this country. It goes on to give some idea as to the size of the industry, employing over 15,000 wage earners and representing a yearly capacity of 330,000 tons, and follows this with a concise paragraph showing the wide variety of uses for coated paper and the number of consumers who would be affected through the proposed measure.

"With such a duty," the brief continues, "American paper manufacturers could not compete in the world markets with the German and other European manufacturers, who would then be able to import from the Argentine the casein which now comes to this country. Under normal conditions a large tonnage of coated paper is exported from this country to foreign countries. With the present capacity of the American coated paper manufacturers they cannot run their mills full unless they can retain the share of export trade which they have enjoyed in the past. As the production of casein in the United States is not sufficient to supply the home demand it would mean, with the Argentine supply cut off, that many of them, would have to go out of business, with the consequent unemployment of thousands of wage earners. During the past few months, even without a duty, thousands of tons of casein have been diverted to Germany which ordinarily would have been shipped to the United States. With the duty proposed in effect the European coated paper manufacturers can outbid the Ameri-

cans in purchasing the Argentine product, and the American producers of casein cannot meet, as they never have met, the home demand. Since it was published in the press that the Senate voted a duty of 4 cents per pound on casein the price of imported casein in the American market has advanced from 10 cents to 15 cents per pound, with a corresponding advance in the price of American casein."

A comparison between production of casein in the United States, importation of casein into this country and the total consumption of casein here, according to the latter, showed conclusively that the American producers of casein cannot supply the demand for the home market. After a discussion of "The farmer and the Casein Market," in which it was shown that he uses this product as a binder for chemicals used in sprays, the concluding paragraph is devoted to the quality of imported casein. Argentine casein is held to be of a much finer quality than the American product, and, a certain proportion must be mixed with the domestic to meet the requirements of consumers.

"For the reasons stated above," the brief concludes, "we submit that casein should remain on the free list where it is at the present time and where it always has been heretofore, but we do not object to a reasonable duty. A duty of 4 cents a pound, however, is absolutely unreasonable, and in effect would be prohibitive."

Protest to Senate Against Casein Duty

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., June 6, 1922.—A committee of coated paper manufacturers filed a protest with the Senate Finance Committee today against the imposition of the four cents per pound duty on casein. The committee had conference with influential members of the Senate but the general impression seemed to be that the matter should be adjusted in conference after the bill had passed the Senate.

Coughlin Paper Co. Incorporates

BUTTE, Mont., June 6, 1922.—The Coughlin Paper and Supply Company has filed articles of incorporation with the clerk and recorder. The company will engage in the general paper business and Butte will be the principal office. The life of the company is 40 years, capital stock \$30,000, divided into shares at \$1 each and the directors are: John H., James J. and George Coughlin and Fred Magart, all of Butte.

A DICTIONARY OF PAPER TERMS

(Continued from last week)

- Bond Papers.** Similar in character to banks, but heavier in weight. The term is often applied to superior looking engine-sized writings of medium substance, but strength is essential in all papers included in this class (Bromley). A certain translucency and rattle are desirable, the former due to absence of filler and the latter imparted by alum in excess or silicate of soda or both. The stock is beaten longer than for ordinary writings, and with dull knives or much pressure. The effect is due to partial hydrolysis of the cellulosic material. Cf. sulphite bond (rag bond).
- Bone Dry.** Containing no moisture, absolutely dry, the condition of wood, wood pulp, or paper after drying in an oven at 105 deg. Centigrade to constant weight. See Air-Dry.
- Book End.** A term applied to the papers used for the finishing of the insides of the covers of books. Of all qualities and colors.
- Boom.** (1) Timbers or logs chained together at the ends to hold logs in place on a stream or lake, sometimes several timbers side by side bolted together and battened or planked over.
(2) Swinging arm of derrick to raise and move loads inside its radius. Its foot is fixed at the base of the mast and a rope or cable runs through a pulley at its head.
- Boot Boards.** Specially hard boards prepared from waste papers and tough fiber, used for the insoles and heels of boots. Frequently toughened by the addition of pulped leather clippings.
- Borax.** A weak alkali (sodium baborate $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$) used as a solvent for casein in coating for paper. Sometimes used in de-inking process.
- Bowl.** Special soft paper used for making rolls or bowls of paper required in the supercalender machine. Made solely of or from mixtures of soft rag, wool, asbestos, beaten quickly and not sized. Made from the waste of flax spinning mills, unsized, bleached or unbleached, used for the paper rolls in calendering machines, where there are alternate rolls of compressed paper and chilled iron. (Bromley.) In some instances the paper has been partially parchmented.
- Bowls.** Calender rolls made of paper. Discs of paper with hole in center, placed on edge and mounted on a shaft—set up by screwed washers at each end.
- Box Board.** A stiff paper made from straw, mechanical pulp, sulphite or sulphate pulp for making paper boxes or cartons. Some grades must be of specified bursting strength.
- Box Enamels.** White or colored coated papers of the cheapest description used for covering boxes. Coated on one side only and very highly glazed.
- Break.** A rupture of the continuous sheet of paper running on a paper machine. May be a "wet" or "dry" break depending on its location on the machine. A wet break is that occurring at the couch or on the presses. A dry break usually refers to one at the calenders or at the reel.
- Breaker.** See Beater and Potcher.
- Breaking Length.** Such length of a strip of paper, of stated width, that its weight, suspended freely would break the strip. The factor of tensile strength commonly used in Europe determined by the Schopper strength tester.
- Breast Roll.** The roll, usually of gun metal, carrying the wire at the end of a fourdrinier machine next to the flow box.
- Bright Enamels.** Enamelled papers, coated on one side only, finished with a high polish produced by calendering and brushing. Used for labels.
- Bristol.** A special form of board first made in Bristol, England. Used for plate printing, menu cards, calendars, and high class advertising. Made of rag stock alone, rag and bleached sulphite, or sulphate only.
Fourdrinier machine used and preparation of surface commences from the wire and must be carefully attended to throughout the process. Hot pressing is not now depended on for surface.
Index Bristol is to be ink resisting and smooth without gloss. *Wedding Bristol* must be free from gloss. When gloss is required, the surface prepared as above needs only increased pressure. Inferior grades, sometimes on a cylinder machine contain a filler or cheaper material, even mechanical pulp, sandwiched between two thin layers of higher grade.
- Broke.** Refuse paper. In general that produced during the operation of the paper machine, either "wet" or "dry," produced at beginning of operations, or as a result of breaks in the sheet, on account of imperfections, or while making adjustments. "Wet broke" is that accumulating at the presses. "Dry broke" at the calenders, reels and winder.
Cf. Machine broke, finishing broke.
- Browns.** Brown wrapping paper of every description—Rope brown, air dried, machine dried. Air dried browns are more flexible and durable than machine dried browns.
- Buff Printings.** Ordinary printing paper colored buff, the tone being produced generally by iron salts added to the stock in the beater.
- Burner.** (1) The pan, revolving cylinder, retort or other form of furnace in sulphite acid plants in which sulphur is burned.
(2) The long revolving cylinder in soda and sulphate recovery plants in which the black ash is produced—known as the rotary burner.
(3) In a boiler room, the dutch oven in which the wood-room refuse is fired—otherwise "refuse burner."
- Burr.** A tool used for roughening the worn face of a pulp grindstone by pressing it against the moving face of the stone. The surface of the burr is covered with various cutting patterns about a quarter of an inch deep which are reproduced on the grinding face of the stone. Variations in the surface patterns have been found to have important effects on the ground stock, both in yield and quality.
Cf. Diamond point burr, spiral burr, straight burr.
- Bushroll.** See Burr.
- Bursting Strength.** The resistance of paper in pounds per square inch, usually referred to in percentage of the weight per ream of paper tested. The test is made on Ashcroft, Mullen or District of Columbia instruments.
- Butter.** Papers used for wrapping butter, lard, and similar greasy goods. Usually some form of vegetable parchment or its substitute, imitation parchment.

C

- Cable Papers.** Also called insulating papers. Made from manila, jute and sometimes all wood pulp. Some are unsized and some are hard-sized. Strength is essential.
- Calcined Lime.** See Caustic Lime.
- Calcium Bisulphite.** See Bisulphite of Lime.

- Calcium Carbide.** CaC_2 a compound made by subjecting a mixture of quicklime and carbon to the heat of an electric arc. In contact with water acetylene is produced.
- Calcium Carbonate.** Limestone, CaCO_3 , marble, chalk, calcite, calcspar.
- Calcium Hydroxide.** See Slaked Lime, also called calcium hydrate. (Milk of lime.)
- Calcium Hypochlorite.** See Bleach.
- Calcium Oxide.** See Caustic Lime.
- Calcium Sulphate.** A compound ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) found in nature as a mineral called gypsum or alabaster. Prepared artificially it is called crown filler or pearl hardening and used in papermaking. See gypsum. (gyps.)
- Calcium Sulphite.** $\text{CaSO}_3 \cdot 2\text{H}_2\text{O}$, or "mono sulphite" of lime, the salt formed by sulphurous acid in contact with an excess of lime and is the first step in the production of calcium bisulphite liquor. Insoluble in water, but dissolves with excess SO_2 .
- Calender.** A set or stack of superimposed rolls of steel, or alternately steel and paper rolls, through which paper is passed from top to bottom for the production of a smooth surface thereon and to improve the printing or other surface properties of paper.
(Cf. super calender.)
- Calender Cut.** A defect in paper. The split edges of wrinkles in the paper web nipped in the passage through the calenders.
- Calendered.** Paper having a smooth and more or less polished surface imparted by passing through the calender as opposed to rough or "unfinished."
- Calender Spots.** Defects caused in paper by particles adhering to calender rolls. Sometimes caused by the effect of the calender on damp spots in the paper.
- Calf.** A more or less embossed stout paper, colored to suit fancy, made to imitate leather. Used for bookbinding.
- Campeachy Wood.** See Logwood.
- Canada Balsam.** A pale-colored oleo-resin obtained from the Balsam fir. (*Abies Balsamea*). Used by woodmen for treatment of light cuts and abrasions. Used for mounting objects in preparing permanent microscopic slides. Its refractive index is 1.53 which is nearly equal to glass. It hardens with age.
- Canary Yellow.** See Lead Chromate.
- Cannabis Sativa, Hemp.** A plant grown in India yielding fiber of great strength. It comes to the paper mill in the form of canvas, sail-cloth, ropes, &c., and is the basis of rope stock. Used for special bag, cable and insulation papers. Cannot be readily bleached to a good color.
- Cap.** (1) A metal cover to screw on the ends of piping or place over ends of shafts, etc.
(2) Abbreviation for foolscap, a writing paper sheet. There are several "cap" sizes in both writing and wrapping papers. See sizes of paper.
- Carbide.** See Calcium Carbide.
- Carbolic.** Paper impregnated or surfaced with a mixture of stearin and carbolic acid. Used as a wrapping paper for food in special cases, not in contact of course.
- Carbon Paper.** Usually thin strong tissue used for the production of duplicate copies of letters, bills, etc. Surfaced with a mixture of lampblack or coloring matters and substances such as grain, wax, soap (better) or fatty oils. It consists of a paper with a coating of color, ground in an oily or waxy medium, applied to one or both sides of the sheet. The pigment, for the black, mauve and blue carbons, is largely composed of lampblack, but other coloring materials are used. The paper is unrolled from the web, passing through the machine, and the color applied to the surface and brushed to rub the coating into the paper. Passing over heated and cooled cylinders, the paper receives its finish and is reeled and allowed to mature.
- Carbonate of Lime.** Limestone, see Calcium Carbonate.
- Carbonate of Soda.** Soda ash, see Sodium Carbonate.
- Cardboard.** Thick paper used for cards, a loose term generally applied to thick stiff paper, or to the stiff board obtained by pasting a number of layers of paper together.
- Cards.** 1. Pasteboards, ivory boards, and pulp boards cut into desired size and put up into packets of 52 and 1,040.
2. A term used of chips in a chemical pulp mill to describe a broad mass of chips but of the desired length.
- Carpet Felt.** A soft, thick, spongy paper used between floor and carpet. Prepared usually on a multicylinder machine from common waste paper, rags and similar residues.
- Carriage Panel.** Hard stiff boards made from waste paper, etc., very heavily pressed. Frequently hardened and stiffened by vulcanizing.
Used for ceilings of railway and other cars and to some extent automobile parts.
- Carron Oil.** A mixture of equal parts of lime water and cotton seed, or olive oil used in treatment of burns. One of the indispensables in a first aid cabinet.
- Carton Pierre.** A French term meaning stone card. An imitation stone prepared by molding pulp or waste paper into various shapes under pressure. Used for theatrical properties and similar objects.
- Cartridge.** A strong tough paper originally used for cartridges, now used for rough drawing. There are several standard sizes in the trade, that known as "cartridge size" being 26" x 21".
- Casein.** A compound obtained by precipitation from skim milk, using dilute acids in excess. It is insoluble in water, alcohol or ether. Soluble in alkalis, alkali carbonate, strong acids, and borax. Used as the adhesive in preparing coatings for paper.
- Casing Paper.** Special Wrappings. Usually waterproof. See sizes of paper.
- Cassie.** A term once used to describe the few outside sheets of a ream of paper. From the French word *Cassé*,—broken.
- Catechu.** A natural dye-stuff obtained from certain species of *Acacia*, *Areca* and *Uncaria*, growing in India. Gives brown, olive, grey and black shades.
- Cathode.** See Kathode.
- Caustic.** Biting, corroding. The hydroxides of the alkalis and of lime are so called from their possession of this property. Commonly used of caustic soda in solid form.
- Causticizing.** Treatment of soda ash solution with quick lime to produce caustic soda.
The final treatment in preparing the cooking liquor in a soda or sulphate mill.
- Caustic Lime.** Quick lime, Calcium oxide, CaO , prepared from limestone or marble, by heating in kilns to a temperature exceeding 825 deg. C. Sometimes referred to as *Calx*. As opposed to slaked or hydrated lime.
- Caustic Soda.** Sodium hydroxide, NaOH . A strong alkali. The active agent in the cooking of pulp by the soda process, and the chief agent in cooking by the sulphate process.
One of the by-products of an electro bleach plant producing chlorine.
- Cellophane.** A thin transparent film, simulating paper, used for wrapping purposes and made from a solution of cellulose as viscose or cellulose acetate.

- Celluloid.** A cellulose product obtained by mixing camphor with nitro-cellulose. The camphor is dissolved in alcohol and the nitro-cellulose added. It is then worked between rollers and warm pressed. It is inflammable, but not explosive. The nitro-cellulose is called pyroxylin. It is sometimes a nitrated paper and is a mixture of terra- and pentanitate of cellulose.
- Cellulose.** A solid carbohydrate found in the structure of plants, usually in the form of long thin cells and constitutes the fibrous raw material for papermaking. It is a definite chemical compound, whose molecule is an unknown multiple of $C_6H_{10}O_5$ and is generally written $(C_6H_{10}O_5)_x$.
In cotton the purest form is found. The common term for chemical wood pulp.
- Cellulose Acetate.** Compounds of cellulose, three in number, varying in molecular content, prepared by treating cellulose with acetic acid in the presence of sulphuric acid. After further treatment it is sometimes formed into threads and used for the manufacture of artificial silk. It is not inflammable and thus is a safe material for moving picture films, for which it is used to some extent.
- Cement.** (1) To cause to adhere or stick. (2) In building work—a fine powder prepared by grinding a sintered mixture of clay and lime having the property of setting to a hard rock-like mass with proper admixture of water.
- Centigrade.** See thermometers.
- Centrifugal.** The action of a force tending to throw liquids or solids away from a revolving center.
A machine by which liquids are separated from solids by the use of centrifugal force, a centrifuge.
- Centrifugal pump.** See rotary pumps.
- Centrifugal Screens.** See screens.
- Centrifuge.** See centrifugal.
- Chance Sulphur.** See recovered sulphur.
- Charging Floor.** In a chemical pulp mill the floor below the chip loft, where the operation of loading the digester is carried out.
- Chart.** A strong tub-sized rag paper of medium surface, used for charts and maps. Inferior qualities are made from wood pulp. It is specially treated so as to stretch as little as possible. Must be strong, pliable, tough, resistant to wear, and at the same time a good printing surface is essential.
The record of an operation or a period of time as by a recording thermometer.
- Checker Work.** Bricks or blocks so laid that spaces are left between them for the passage of gases or liquids which in so doing are retarded, mixed, or made to yield their heat.
Cf. Reclaiming tower of a sulphite mill.
- Chemical Pulp.** Wood pulp produced by the sulphite, sulphate or soda processes as differentiated from mechanically prepared pulp obtained by grinding wood.
- Chemick.** A term sometimes used in the textile trade for solution of bleaching powder.
- Cheque Papers.** Good quality of bond paper, specially made for strength, sometimes of chemical pulp but usually all rag. Some cheque papers contain chemical compounds which render alterations or erasures easy of detection.
- Chest.** The vat or tank equipped with an agitator holding the reserve of paper stock.
Referred to as "machine chest," etc.
- China Clay.** Kaolin, silicate of alumina, found in nature and used as a paper filler on account of its whiteness and other physical properties.
Chief sources Cornwall, England and the southern United States.
- China Grass.** See Ramie.
- Chip.** (1) To produce chips. (2) A small piece of pulp wood prepared for digestion and produced in the chipper, which see. (3) A term to indicate a certain quality of paper board made from waste paper.
- Chip Loft.** That portion of a chemical pulp mill, holding the chip bin and usually directly above the digesters.
- Chipper.** A machine consisting of a heavy metal disc, rotating vertically, with knives mounted obliquely in its face. Used in a chemical pulp mill for cutting pulpwood blocks into chips.
- Chip Screen.** A revolving or shaking strainer, receiving the chips from the chipper for classification by removing the saw dust, splinters, and oversize chips.
- Chloride of Lime.** Bleaching powder. See Bleach.
- Chlorine.** Cl_2 . A greenish gas of pungent odor, produced by electrolysis of salt solution. Absorbed by dry lime it yields bleaching powder. Fibers previously boiled in caustic soda are readily bleached when exposed to chlorine gas. Liquid chlorine is now transported in tank cars or cylinders for convenience in preparing bleach at the mills from milk of lime.
- Chlorophyll.** The green coloring matter of plants.
- Chromate of Lead.** See Lead Chromate.
- Chrome Yellow.** A coloring material consisting of lead chromate produced in the beater by the use of sodium chromate followed by lead nitrate.
- Chromo.** A heavily coated paper used in chrome-lithography. The body is usually a stout paper of sulphite or soda; the surface somewhat dull and more absorbent than an art paper. The term is derived from the Greek word meaning color.
- Cigarette.** A specially made tissue, unsized, containing little or no loading material.
- Cloth Lined Paper.** Cotton cloth, equivalent to scrim or common muslins, according to quality, having a paper facing. Cloth centered paper has thin paper pasted on each side, while cloth backed papers are of better quality, with a fair quality of cloth on the back. Cloth lined cards (linen-lined) are thicker than papers. Surface enamelled cloth lined cards are first made as cloth backed cards and then enamelled with the colored coating and plate-glazed.
- Coal on Specification.** The purchase of coal on a stated basis of heating value and quality determined by analysis or operation.
- Coal Tar Colors.** So-called because the color materials are derived from organic substance found in coal-tar.
Cf. Aniline colors.
- Coated—Coating.** (a) Paper which has been covered with a special surface, brushed upon it. (b) To cover with a special mixture composed of casein and blanc fixe, colored or uncolored. The casein is rendered soluble by the use of borax or other alkali.
- Cochineal—Carmine.** The dried bodies of the female insects *Coccus Cacti* formerly used as a coloring matter for paper and in solution as a chemical indicator.
- Cockle.** A wave at the edges of a sheet of paper, or small wrinkles caused by uneven drying.
- Cocoon Fiber.** See *Cocus Nucifera*.
- Cocus Nucifera—Coir.** Used only for matting sometimes to cover drainer bottoms not being suitable for paper.
- Coils.** (1) Paper used for various purposes, such as telegraphs, time-recording machines, cash registers, music rolls, wiping the die in relief stamping, and for printing small forms on the reel. Papers are slit from the full reel, and re-wound on centers suitable for the machine or other spindles. (2) An arrangement of pipes for gas or liquid to be cooled or to impart heat.

- Coir.** See Cocus Nucifera.
- Collar.** (1) Paper prepared from cheap wood pulps, surfaced with linen muslin heavily coated with mineral matter and highly glazed. Used for paper collars. (2) A metal ring clamped on a shaft to maintain it in proper longitudinal position.
- Collodion.** A solution of nitrated cellulose in alcohol and ether.
- Collotype Printings.** Thick papers or boards made of rags or a mixture of rag and esparto. Surface generally a little rough. Must be fairly hard sized to resist the damp surface of the jelly used in printing.
- Colombier.** See Sizes of Paper. Frequently termed Columbia. The word is French and means pigeon hole.
- Colophony.** See rosin.
- Color.** The degree in which a surface absorbs or reflects light.
- Columbian Spirits.** Methyl Alcohol, Methanol, Methyl hydrate.
- Compensating.** A balancing of forces, restoration of conditions. An appliance that balances effects.
- Cone drive.** See Marshall drive.
Equipment by which the speed of a machine may be varied although driven by a prime mover of constant speed. It consists essentially of two cone shaped pulleys connected by a belt which may be moved along the cones thereby varying the final speed.
- Conifer.** A tree or shrub belonging to the order *Coniferae*, so called because the fruit is a cone, as in the pines and firs.
- Constant Speed.** (1) Non-varying motion.
(2) That portion of the paper machine of which the speed is not varied, e. g., driving the screws and stock pump.
- Conveyor.** A mechanical appliance travelling in a more or less horizontal position to move materials, such as blocks of pulp wood usually in a trough, by a wire cable with flights (which see); chips, usually on a belt, without flights, or coal by chains and flat scrapers or buckets if the conveyor is inclined. There are many varieties. See Elevator.
- Cook.** (1) A unit of production in chemical pulp mills referring to the number of digesters discharged as "thirteen cooks in 24 hours." (2) The contents of a digester as "raw or burnt cook." (3) The man in charge of operations in the digester house of a chemical pulp mill.
- Cooking.** (1) The treatment of rags or chips with steam, chemicals and pressure.
(2) The period from "pressure up" to blow off in digesting pulp.
- Cooler.** Apparatus used for cooling the burner gases in the acid plant, and the relief gas and liquid from the sulphite digester consisting usually of antimonial lead pipes submerged in water.
- Copperas.** See Ferrous Sulphate.
- Copper Sulphate.** Bluestone, Blue Vitriol, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, a blue crystalline salt used in water treatment, and electric batteries.
- Copying.** Used for the manufacture of letter-books, for copying. A special tissue paper, thin, strong, unsized but usually glazed. Buff Japanese paper is specially suited for this purpose.
- Corchorus Capsularis, Jute.** An Indian plant, the fiber of which is used for manufacture of coarse sacks and bags. Among raw materials used by paper makers are the used gunny and sacking.
- Cork.** Paper used for packing glass and fragile goods, consisting of heavy coarse paper surfaced with a mixture of glue and powdered cork.
- Core.** (1) The hollow spindle of iron pipe, wood or paper upon which a roll of paper is built up. (2) In patterns a hole in a casting to be provided for by the pattern maker. See Tap.
(3) The revolving cone or plug in a refining engine.
- Core Bar.** One of the bars inserted in the core or plug of a refining engine. These bars act in a similar way to those of the beater roll. They are set up against the shell bars by a screw actuated by a hand wheel.
- Corrugated Paper.** The corrugation is effected by running the dampened paper between meshing gears and afterward dried, the corrugated paper being glued or pasted to a flat web of similar paper, usually for shipping containers. Commonly the thinnest strawboards are used, but for better classes white papers are employed.
- Cotton Linters.** See Linters.
- Cotton Sampling.** White or colored wrappers used for the display of packing of cottons and cotton goods. Made from strong fibers, such as jute, soda, wood, and rag.
- Couch Roll.** A felt covered roll running on the wire or cylinder, which takes the formed paper away from the wire and carries it to the presses. This refers in a fourdrinier machine to the top couch roll. There is also a bottom couch roll of gummetal around which the wire travels and on which the top couch roll rests.
Cf. Suction couch.
- Cover.** Thick heavy rag or wood pulp paper, rough machine finished and soft sized, used as covers.
- Crayon.** High class heavy rag paper, tinted or plain colored, glazed on one side only. Used for crayon drawings, water color and sepia drawings.
- Cream.** The very light tints of brown.
- Cream Laid.** An ordinary writing paper of creamy color, made on a laid wire mold, or on a machine provided with a laid dandy roll.
- Crenothrix.** One of the algæ which grows rapidly in iron water pipes, sometimes completely blocking them. See Algæ.
- Crepe.** Papers simulating crepe. The effect is produced by crowding the wet sheet on a roll by means of a doctor. Strong sulphite makes best grades but mixtures with mechanical pulp may be used. The creping is made coarser or finer by changes in furnish and handling.
- Crinkled tissue.** Common tissue plain or colored, crinkled by specially embossed rolls.
- Cross.** A pipe fitting having four outlets at right angles.
- Cross Head.** That part of a reciprocating engine or pump which connects the crank rod to the piston rod.
- Crotalaria juncea.** See sunn hemp.
- Crown.** (1) A progressive increase in diameter from the outer edges towards the center as on a pulley to hold belt in place or on a heavy roll to compensate for sagging between bearings or compression due to pressure. (2) See Sizes of Paper.
- Crown Filler.** A paper coating material precipitated Sulphate of Lime, produced by reaction between sodium sulphate and calcium chloride. See Pearl Hardening and Calcium Sulphate.
- Crown Sheet.** That part of a boiler over the fire box.
- Crush.** To pass a wet sheet of paper or pulp between rolls or presses under too high pressure. Resulting in a "crowding" effect or breakage.
- Cudbear.** A coloring matter obtained by the action of air and ammonia on certain lichens. It is very little used in paper-making.

(To be continued)

CURRENT PAPER TRADE LITERATURE

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts of Literature of the Technical Association of the Pulp and Paper Industry

Properties, Chemistry and Testing of Raw Materials and Finished Product

Deciduous Trees for Paper Making: Poplar.—Ch. Groud. *Papier*, xxiv, 503-506 (Nov., 1921).—A general description of various species of poplars.—A. P.-C.

Paper Making Woods: Birch.—Ch. Groud. *Papier*, xxv, 11-13 (Jan., 1922).—A general description of birch and of its distribution.—A. P.-C.

Spruces.—Ch. Groud. *Monit. Papeterie Française*, lii, 751-752 (Dec. 1, 1921).—Brief description of black, white, red, Engelmann, and Sitka spruces.—A. P.-C.

Firs.—Ch. Groud. *Monit. Papeterie Française*, liii, 8-9 (Jan. 1, 1922).—Brief description of various species of firs (*Abies*).—A. P.-C.

Soda Pulp from Australian Hardwoods.—R. A. Fowler.—*Australian Forestry J.*, July 15, 1921; *Paper*, xxix, No. 8, 24-25 (Oct. 26, 1921).—Experiments were carried out with the following Australian hardwoods: Mountain ash, blackbutt, spotted gum, mountain gum, karri, and silky oak. The woods were pulped by the soda process and made into waterleaf papers which were then tested by means of a Schopper tensile strength machine and a Mullen tester, comparing them with stationery selected at random from office stock. The experimental sheets were stronger in almost every respect than the samples taken from stock, which contained little or no groundwood.—A. P.-C.

The Chemical Changes Involved During the Infection and Decay of Wood and Wood Pulp.—Mark W. Bray and Joseph A. Staidl, Forest Products Laboratory, Madison, Wis. *J. Ind. Eng. Chem.*, xiv, 35-40 (Jan., 1922). (Compare Mahood and Cable, *Pulp and Paper*, xviii, 900, A-5, D-O, Aug. 26, 1920.)—In all cases the infected woods produce less pulp (mechanical, sulphite, and soda) per unit weight of wood than the sound woods. The points of inferiority of the infected woods over the sound woods are: (1) Cold- and hot-water soluble materials increase during decay and are a direct loss to the mills. (2) High alkali-soluble materials are found, showing a lower resistance to the action of chemical agents. (3) Increase in copper number. (4) In most cases of extreme decay, the rate of degradation of lignin and cellulose is selective and not uniform. (5) Lower percentage of alpha- or stable, cellulose, higher percentage of beta- or less stable, cellulose. The large losses sustained in converting infected woods into pulp, together with the additional losses of further converting these pulps (made from infected woods which undergo further decomposition when stored) into paper, are pointed out. The paper made from decayed woods and pulp is dirty, brash, and has very little strength. It requires more sizing, offers difficulty in sticking to the couch and press rolls, and foams excessively. The yield of finished paper is greatly reduced, while the cost of production is increased, because the decayed chips occupy the same space in the digester and use therefore the same amount of chemical as the sound wood, and in some cases more. Decayed wood also requires the same expenditure in grinding.—A. P.-C.

Utilization of Jack Pine in the Manufacture of News Print.—Maurice Neilson, Belgian Industrial Co. *Pulp and Paper*, xx, 61-63 (Jan. 26, 1922); *Paper Ind.*, iii, 1510-1513 (Feb., 1922); *Paper*, xxx, No. 24, 7-10 (Feb. 15, 1922); *PAPER TRADE J.*, lxxiv, No. 7, 45-47 (Feb. 16, 1922).—Experiments were carried out on a commercial scale on the utilization of Jack pine for the manufacture of news print sulphite. It was found that a fair yield of pulp could be obtained from Jack pine; but the screenings are somewhat

higher than with spruce when steamed under the same conditions and for the same length of time, about 8 per cent for spruce and 14 per cent for Jack pine. After some experimenting the steaming time was reduced from 11 hours to about 9 hours; but it is suggested that a better yield could be obtained with a relatively short cooking time by using chips considerably smaller than what at present is standard for spruce chips. With the seasoned wood used in the experiments, no pitch troubles were experienced on the paper machine. The number of breaks and time lost were actually less than during the other periods compared, while speeds compared favorably. Paper production did not suffer during the period of the experiments (12 days), and the bursting strength and moisture were well maintained. Green wood is apt to cause a considerable amount of pitch trouble, but, in the author's opinion, the same is true of green spruce. Though no tests were run on the utilization of Jack pine for groundwood, as much as 35 per cent Jack pine has been used in the groundwood mill on some occasions, and no pitch trouble was encountered as long as the stock was kept free and the stones were properly dressed to take care of this wood.—A. P.-C.

Forestry

Growth Measurement of Trees.—A. H. Berkhout. *Schweiz. Zeitschr. Forstw.*, lxxi, 377-379 (1920); *Botan. Abs.*, viii, 144 (June, 1921).—A formula is worked out on the basis of relation of diameter to cubic contents. Ten trees are selected in each type. One group is in small, one in medium, and one in large trees. The average diameter and cubic contents are obtained by careful measurements, and the average tree is used for the stand to be studied. If desirable, the trees measured may be remeasured at any time and the annual or periodic increment may be obtained. It is recommended that the trees be climbed and measured.—A. P.-C.

The Measurement of Trees in Connection with Their Growth.—A. H. Berkhout. *Mededeel. Landbouwhoogeschool Wageningen*, xvii, 109-225 (1920); *Botan. Abs.*, viii, 144 (June, 1921).—It is desirable in measuring lumber for forest calculations that the laws of probability be more generally used. A great number of examples are given.—A. P.-C.

Disease in Forest Trees Caused by the Larger Fungi.—E. Cheel and J. B. Cleland. Forest Commission of New South Wales, *Bull.* 12 (1918); *Botan. Abs.*, viii, 307 (July, 1921).—The authors emphasize the importance of the study of fungi causing decay of living trees, stored lumber, and building timbers, giving non-technical descriptions of various members of the genera *Armillaria*, *Pholiota*, *Polyporus*, *Polystictus*, *Fomes Hexagona*, and *Trametes*, which have been found or may be found causing the decay of important woods. Plates are given illustrating the rots produced by, or the sporophores of, several forms of fungi.—A. P.-C.

Use of Caterpillar Tractors in Logging.—G. Huffel. *Rev. Eaux et Forêts*, lix, 40-42 (1921); *Botan. Abs.*, ix, 24 (Aug., 1921).—Experiments in the forest of Haguenau (Bas-Rhin) showed that a small 35 h. p. caterpillar tractor weighing 660 lbs. can easily climb slopes of 35 to 40 per cent and cross swamps, ditches and small streams. It is not of interest in regions where logging is easy and not expensive, but can be used to advantage in removing logs in mountainous country without good roads or in other regions difficult of access or where team transportation is costly. Its usefulness in felling coniferous trees is limited to cases where it is desired to extract the stumps, as is usually the case, and then only when labor is particularly expensive.—A. P.-C.

Monorail for Logging.—K. Moldenhawer. *Dansk Skovforenings Tidsski*, vi, 19-25 (1921); *Botan. Abs.* ix, 29 (Aug., 1921).—A description of a monorail for transporting logs from the wood, which consists of one ordinary rail laid on posts set in the ground; a wheel running on this rail carries a balanced carrier of logs on each side of the rail line. The advantages of this method of transportation are that it is cheaply constructed, does not require wide clearings or bridges, the grade is obtained by having posts longer or shorter according to the lay of the ground, and logs are readily carried over rough ground and across creeks, roads, and natural depressions. The speed of the loads can be controlled by a brake.—A. P.-C.

Use of Motor Trucks in Woods Operations.—F. W. Fenn. *PAPER TRADE J.*, lxxiii, No. 19, 46, 48 (Nov. 10, 1921); *Papier*, xxix, No. 12, 22-24 (Nov. 23, 1921).—A brief discussion of the advantages of developing the use of motor trucks for general purposes and more particularly for woods operations, illustrated by the case of what has been done in this line by the Great Northern Paper Co.—A. P.-C.

Use of Tractors in Logging.—N. C. Brown, State College of Forestry, Syracuse, N. Y. *Paper*, xxix, No. 13, 16-17 (Nov. 30, 1921).—A brief discussion of the merits of tractors for logging. A. P.-C.

Tractors for Logging Operations.—*Paper*, xxix, No. 13, 18-19 (Nov. 30, 1921). Figures are given (taken from actual operations), showing the saving that can be effected by the use of tractors instead of teams for hauling pulp wood and timber.—A. P.-C.

The Wood Resources of the Pacific Northwest.—K. Rattiger. *Forstwiss. Centralbl.*, xliii, 293-305, 360-374 (1920); *Botan. Abs.*, ix, 30 (Aug., 1921).—The forest regions of Canada are described in some detail, and more particularly the Pacific Northwest.—A. P.-C.

Mechanical Pulp Manufacturing and Equipment

Water Used in Pulp and Paper Making.—Arthur S. M. Klein. *Paper*, xxix, No. 11, 12-13 (Nov. 16, 1921).—Figures (many of them taken from the personal experience of the writer), are given for the water consumption of sulphite, groundwood, and paper mills operating under various conditions. The waste water from paper mills should not contain more than 0.006 per cent of fiber, calculated on the gross effluent of the mill, in a given mill, Klein obtained an effluent containing about 0.005 per cent.—A. P.-C.

Sulphite Manufacturing and Equipment

Cutting Oil from Sulphite Waste Liquor.—Fr. patent No. 516,392, F. Gerling, April 18, 1921.—*Papeterie*, xliii, 1072 (Dec. 10, 1921).—Saponifying agents, and more particularly alkaline solutions, are added to the sulphite waste liquor which can be either in a liquid, solid, or pulverized state. For example, 20 per cent of soda liquor, and 80 per cent of sulphite waste liquor are heated to 60 to 70 degrees while agitating vigorously.—A. P.-C.

Using Sulphite Waste Liquor Residue for Fuel.—G. Hallberg. *Paper Mill*, xlv, No. 52, 4, 34 (Dec. 24, 1921); *Paper Trade J.*, lxxiii, No. 26, 45-47 (Dec. 29, 1921); *Paper Ind.*, iii, 1395-1398 (Jan., 1922); *Paper*, xxix, No. 19 7-10 (Jan. 11, 1922).—An account of experiments carried out at a Swedish mill on the concentration of sulphite waste liquor and its use as a fuel, showing the considerable advantages to be obtained. It is claimed that a sulphite mill having sufficient hydroelectric power to drive its machinery will be able to cover its fuel requirements for cooking, drying, heating, etc., without any other fuel except the bark from the wood room and the fuel from the evaporated waste liquor.—A. P.-C.

Recovery of By-Products from Wood Before Sulphite Cooking.—Can. patent No. 214,081, C. F. Burgess Laboratories,

assignee of H. F. Weiss, Nov. 1, 1922.—The chipped wood is leached with hot water (preferably on the counter-current principle), and the extract is treated for the recovery of the organic substances dissolved out. The chips are then treated as usual for making into chemical pulp, the pulp making being facilitated and the consumption of chemicals reduced. The process is particularly suited to the treatment of Western larch, which contains 600 to 850 pounds of extract per ton of wood, and the main by-product in this case is galactan.—A. P.-C.

Soda and Sulphate Manufacturing and Equipment

Alkali Recovery in the Sulphate Process.—Clinton K. Textor, Alberene Stone Co., New York. *Paper* xxix, No. 20, 17-19, No. 22, 7-9 (Jan. 18, Feb. 1 1922); *Paper Trade J.*, lxxiv, No. 7, 50-52 Feb. 16, 1922).—A description of the recovery of alkali from the spent liquor of the sulphate process, based on personal experiences and observations in mills, which may be taken as typical of American practice.—A. P.-C.

The Bad Odor from Sulphate Pulp Mills.—Bror N. Segerfelt. *Pulp and Paper* xix, 1281-1282 (Dec. 22, 1921).—The bad odor evolved during the cooking process is due to the action of the sodium sulphide in the liquor, and in the recovery process is due to evaporating and burning black liquor regained from the cooking process. It can almost be eliminated by cooling the gases sufficiently and diluting the condensate with a great amount of water. The bad odor is decreased by decreasing the amount of sodium sulphate added to the smelters, and is always serious when sodium bisulphate is used. It is almost eliminated in the recovery process by having a high temperature in the furnace and combustion chamber, and by exchanging the disc evaporator for boiler and economizer (Sundblad and Sandberg's method). It is entirely eliminated in Rinman's method which does not use sodium sulphate.—A. P.-C.

Removal of Odors from Digester Blow in Sulphate Mills.—Gustaf F. Enderlein, Nekoosa-Edwards Paper Co., Port Edwards, Wis. *Paper Trade J.*, lxxiii, No. 21, 40, 42 (Nov. 24, 1921); *Paper*, xxix, No. 12, 9-10 (Nov. 23, 1921); *Pulp and Paper*, xix, 1233-1234 (Dec. 8, 1921); *Paper Ind.*, iii, 1287, 1289 (Dec., 1921).—The most difficult part of the problem is the removal of the odors from the furnace gases on account of their dilution and large volume; the removal of the odor from the digester is more inside of the possible with apparatus that is easy and relatively cheap to construct. The article describes an apparatus for the latter purpose, consisting essentially of a barometric condenser made up by means of two stand pipes placed side by side, each of which has a set of sprays inside and dip into a common well. The relief gases from the saveall room are sent to this apparatus, and the hot water coming from the well has no smell. The action is one both of condensation and of oxidation of the evil smelling compounds by the oxygen of the air.—A. P.-C.

Rapid and Continuous Process for the Preparation of Paper Pulp.—Fr. Pat. No. 523,871, V. Bernot and Raymond Fournier. *Papier*, xxiv, 500-502 (Nov., 1921).—The essential points of the invention consist in that the material is subjected to mechanical action when it is still in the liquor and that after the latter has acted for some time, and as soon as the fibers have been isolated, they are removed from the liquor so as to prevent deterioration by prolonged action of the liquor. The advantages claimed are: (1) A single chemico-mechanical operation replaces the two operations of cooking and defibering. (2) The production of disincrustated fibers (i. e., paper pulp), can be rendered continuous, thereby reducing the amount of equipment and the labor required. (3) Complete utilization of the liquor, with a consequent decrease in consumption. (4) As the fibers are removed from the sphere of action of the liquor as soon as they have been disincrustated, the tendency to be hydrolyzed is reduced to a minimum.

(5) As the defibering is carried out in the liquor itself, deterioration of the fibers is reduced to a minimum. (6) The action of this chemico-mechanical action is such that nearly all natural or artificial vegetable materials can be treated with the same equipment, and that even such fabrics as dirty wiper rags can be treated directly without preliminary washing. (7) As the actual amount of material under treatment at any one time is relatively very small, it follows that it is just as economical to treat a small amount of material as to treat a large amount; and different kinds of materials can be treated successively without having to shut down to clean out the apparatus. (8) As the consumption of liquor is reduced to a minimum, the fibers have little or no tendency to gather into lumps; and when the treatment is carried out at a high temperature the loss of heat is very small owing to the small amount of material undergoing treatment at any time. The raw material is fed into a hopper from which it falls into a cylindrical shell (preferably horizontal), closed at one end, and having a screw throughout its length to make the material travel from one end to the other. The first turn of the screw is made to act as a cutter so as to cut the larger portions of the material. The shell is filled with a suitable liquor. A suitable device is provided to prevent the material from turning with the screw, which would prevent it from travelling forward. The second portion of the apparatus consists of a cylindrical box closed at both extremities by means of perforated metal plates, between Rapid and Continuous Process for the Preparation of Paper Pulp, which revolve blades having either sharp or dull edges according to the results desired. The number of perforated plates and of blades and the diameter and shape of the perforations vary according to the nature of the material being treated.

On leaving the apparatus the excess of liquor is removed and returned to the cycle, any losses being made up with fresh liquor; and the pulp is washed and is then ready for use as half-stuff.—A. P.-C.

Kraft Pulp and Kraft Paper.—Arthur S. M. Klein. *Paper*, xxix, No. 13, 9-12 (Nov. 30, 1921).—Observations on the wood, digesters, chemicals and power used in the manufacture of kraft pulp and paper.—A. P.-C.

Pulp Treatment

Process and Apparatus for the Concentration and Purification of Half-Stuff and of Paper Mill Waste Waters.—Fr. Patent No. 527,491, E. Clement, July 27, 1921. *Papier*, xxv, 15-16, (Jan., 1922).—The apparatus consists essentially of a cylindrical tank containing a series of concentric cylinders which are open at both ends, the length of which increases with the diameter. The tops of all the cylinders are at the same level, slightly higher than that of the tank which contains them. The pulp, or waste water, is fed at the top at the axis of the cylinders. As it passes downwards, on passing from the first cylinder to the second the increase in diameter slows down the speed, which causes a partial separation of the water from the pulp and causes the lighter impurities in the pulp to rise in the annular space between the cylinders. The same thing is repeated at each change in diameter; and thickened pulp rises in the annular space between the last cylinder and the body of the tank, while practically pure water is drawn off at the bottom of the conical portion of the tank and the lighter impurities are removed from the spaces between the cylinders by any suitable means that may be selected.—A. P.-C.

Pulp Screen.—U. S. A. Patent No. 1,404,566, J. H. Baker, Jan. 24, 1922.—A series of circumferentially arranged diaphragms are used to force the stock against the screen and through the meshes of the drum to the interior thereof.

Means also are provided for freeing the screen of the tailings.—A. P.-C.

List of Abbreviated and Full Titles and of Addresses of the Journals from Which Abstracts Have Been Prepared for This Issue.

Botan. Abs.	Botanical Abstracts, Williams & Wilkins Co., Mount Royal and Guilford avenues, Baltimore, Md.
J. Ind. Eng. Chem.	The Journal of Industrial and Engineering Chemistry, Charles L. Parsons, 1709 G street, N. W., Washington, D. C.
Monit. Papeterie Française.	Le Moniteur de la Papeterie Française, 154 Boulevard Haussmann, Paris (8 ^e), France.
Paper	Paper, 251 West Nineteenth street, New York City.
Paper Ind.	The Paper Industry, 356 Monadnock Block, Chicago, Ill.
Paper Mill	The Paper Mill and Wood Pulp News, L. D. Post, Tribune Bldg., 154 Nassau street, New York City.
PAPER TRADE J.	PAPER TRADE JOURNAL, 10 East Thirty-ninth street, New York City.
Papeterie	La Papeterie, 9 Rue Lagrange, Paris (5 ^e), France.
Papier	Le Papier, 16 Rue du Rocher, Paris (8 ^e), France.
Pulp and Paper.	Pulp and Paper Magazine of Canada, Garden-vale, Que., Canada.

Canadian Paper Company Reorganized

[FROM OUR REGULAR CORRESPONDENT.]

MONTREAL, Que., June 5, 1922.—The Three Rivers Pulp and Paper Company, Ltd., of which N. A. Timmins is the president, is being reorganized and will be hereafter known as the St. Lawrence Pulp and Paper Company, Ltd. Shareholders in the old company will receive a like amount of stock in the new company. The capitalization of the new company will be as follows: \$1,000,000 eight per cent cumulative, participating, preferred shares and 40,000 common shares of no nominal or par value. It is intended subsequently to make an issue of three million dollars of first mortgage gold bonds, secured upon the properties of the company, the proceeds of which will be utilized to defray the cost of the construction of the news print paper mill. The dividends on the preferred shares of the new company will be cumulative as and from the first of January, 1923, and will be payable quarterly. No public offering of the bonds will be made at the present time.

The arrangement under which the company will revert to a new company, St. Lawrence Pulp and Paper Company, are of special interest. It will be remembered that this company was floated during the war boom and a certain amount of money was spent in making a start. It became apparent before the company had gone very far that unfavorable conditions were ahead and that the project was allowed to stand. Arrangements are now being made to go ahead with construction and the interesting part of the deal is that the original shareholders, Hollinger holders having been given a preference, owing to the connection of President Timmins with the new company, will not lose a cent but will have their full equity preserved in the new company.

It is understood that the promoters of the Three Rivers personally absorbed what loss there was in connection with the original plans. The shareholders who make the change will also receive the equivalent of double the amount of common stock they were to receive in the first instance. It is seldom that in a reorganization of this character that shareholders receive such favorable treatment.

Belgian Canadian Co. to Extend

[FROM OUR REGULAR CORRESPONDENT.]

MONTREAL, Que., June 5, 1922.—The Belgian Canadian Pulp and Paper Company, Ltd., of Shawinigan Falls, Que., now has orders which will keep its pulp and news print plant running all the year at full capacity. It is stated that it is not able to fill all the orders it is receiving and it has started on a new extension to accommodate two more paper machines, one of which will be ready about January next year, the other in July.

PRODUCTION OF WOOD PULP DURING THE MONTH OF APRIL

According to Statistics Just Furnished by the Federal Trade Commission Total Mill Stocks in the Mills on April 30 Amounted to 212,896 Tons—Ground Wood Stocks Equaled Thirty-five Days' Average Output, News Grade Sulphite Mill Stocks Equaled Ten Days' Average Output and Bleached Sulphite Mill Stocks Equaled Six Days' Average Output.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 1, 1922.—In connection with the Federal Trade Commission's current statistics of the paper industry, a summary of the monthly reports from manufacturers of wood pulp and other kinds of pulp used in papermaking is submitted herewith for the month of April, 1922. The table shows the kind of pulp, the stocks, production, pulp used and shipments for the month. The pulp shipped during each month represents only pulp shipped to a concern different from the one producing it. Loss of production is shown by giving the idle machine time reported by each company for each kind of pulp.

Pulp Production

The following is a tabulation of the production, pulp used by the company producing it, shipments to outside concerns, and stocks of finished pulp, in tons of 2,000 pounds on an air-dry basis, for April, 1922, compared with April, 1921, for the operating mills. The average production is based upon the reports covering the years 1917, to 1921, inclusive, and the average stocks are based upon the stocks carried for the years 1919, 1920 and 1921.

	Number of mills	On hand first of month Net tons	Production for month Net tons	Used during month Net tons	Shipped during month Net tons	On hand end of month Net tons
Groundwood Pulp:						
April, 1922.....	158	139,390	147,608	119,188	8,098	159,712
April, 1921.....	162	182,027	159,442	116,788	7,373	217,308
April, 1920.....	167	106,809	163,086	132,444	10,758	126,693
April, 1919.....	162	150,678	146,896	114,657	8,139	174,778
Average.....	...	...	115,150	...	...	147,073
Sulphite, News Grade:						
April, 1922.....	62	23,201	58,816	53,943	5,098	22,976
April, 1921.....	63	24,626	50,381	45,498	6,164	23,345
April, 1920.....	64	18,436	70,795	60,277	10,706	18,248
April, 1919.....	62	27,128	50,059	41,144	7,436	28,607
Average.....	...	...	60,125	...	...	20,685
Sulphite, Bleached:						
April, 1922.....	32	9,889	34,183	23,371	11,301	9,400
April, 1921.....	31	14,147	22,966	11,488	11,918	13,707
April, 1920.....	34	6,682	47,660	27,003	22,585	4,754
April, 1919.....	33	13,971	37,610	19,860	15,350	16,371
Average.....	...	...	39,800	...	...	9,507

	Number of mills	On hand first of month Net tons	Production for month Net tons	Used during month Net tons	Shipped during month Net tons	On hand end of month Net tons
Sulphite, Easy Bleaching:						
April, 1922.....	10	1,318	4,860	3,999	1,126	1,053
April, 1921.....	9	918	5,594	2,879	2,857	776
April, 1920.....	7	873	6,230	3,631	2,898	574
April, 1919.....	7	3,037	4,296	3,167	1,491	2,673
Average.....	...	...	6,000	...	...	1,346
Sulphite, Mitscherlich:						
April, 1922.....	7	2,585	6,544	4,367	2,014	2,748
April, 1921.....	7	2,834	4,102	3,472	1,187	2,277
April, 1920.....	7	1,677	6,998	4,521	2,368	1,786
April, 1919.....	7	2,470	6,322	3,902	2,484	2,406
Average.....	...	...	6,125	...	...	1,831
Sulphate Pulp:						
April, 1922.....	22	8,457	19,219	14,511	5,771	7,394
April, 1921.....	20	8,067	8,910	8,249	1,588	7,140
April, 1920.....	21	5,145	18,038	12,104	6,711	4,368
April, 1919.....	22	6,529	10,651	6,874	3,215	7,091
Average.....	...	...	13,050	...	...	6,499
Soda Pulp:						
April, 1922.....	28	11,323	25,609	16,968	10,497	9,467
April, 1921.....	25	9,742	16,701	10,701	6,197	9,545
April, 1920.....	27	3,537	36,610	20,397	15,852	3,898
April, 1919.....	28	7,380	28,225	17,574	8,411	9,620
Average.....	...	...	29,800	...	...	6,931
Other Than Wood Pulp:						
April, 1922.....	6	94	628	490	86	146
April, 1921.....	5	155	710	640	31	194
April, 1920.....	4	117	777	629	71	194
April, 1919.....	7	127	925	824	163	65
Average.....	...	...	800	...	...	134
Total, for all Grades:						
April, 1922.....	...	196,257	297,467	236,837	43,991	212,896
April, 1921.....	...	242,516	268,806	199,715	37,315	274,292
April, 1920.....	...	143,276	350,194	261,006	71,949	160,515
April, 1919.....	...	211,320	284,984	208,002	46,689	241,613
Average.....	...	...	270,850	...	...	194,026

Total stocks of all grades of pulp in the mills on April 30, amounted to 212,896 tons. Mill stocks of Groundwood, Mitscherlich and other than Wood Pulp increased during the month.

Ratio of Stocks to Average Production

Comparing the stocks on hand at the domestic pulp mills at the end of the month with their average daily production based on the reports covering the years 1917-1921, inclusive, the figures show that:

- Groundwood pulp stocks equal 35 days' average output.
- News grade sulphite mill stocks equal 10 days' average output.
- Bleached sulphite mill stocks equal 6 days' average output.
- Easy Bleaching sulphite mill stocks equal 4 days' average output.
- Mitscherlich sulphite mill stocks equal 11 days' average output.
- Sulphate mill stocks equal 14 days' average output.
- Soda pulp mill stocks equal 8 days' average output.
- Mill stocks of "other than wood pulp" equal 5 days' average output.

Total mill stocks of all grades equal 20 days' average output.

(Continued on page 98)

Grade	Lack of Orders		Repairs		Other Reasons		Total	
	1922	1921	1922	1921	1922	1921	1922	1921
Groundwood Pulp:								
Number of grinders.....	71	180	101	105	337	157	509	442
Total hours idle.....	24,459	56,748	12,710	14,274	32,338	*25,239	69,507	96,251
Sulphite, News Grade:								
Number of digesters.....	28	45	5	7	24	29	57	81
Total hours idle.....	2,017	10,947	498	1,389	1,692	5,472	4,207	17,808
Sulphite, Bleached:								
Number of digesters.....	27	60	8	8	12	8	47	76
Total hours idle.....	4,777	20,883	136	1,598	201	618	5,114	23,099
Sulphite, Easy Bleaching:								
Number of digesters.....	9	3	0	1	3	3	12	7
Total hours idle.....	456	1,332	0	51	1,594	83	2,050	1,466
Sulphite, Mitscherlich:								
Number of digesters.....	0	22	31	2	0	0	31	24
Total hours idle.....	0	8,002	1,525	900	0	0	1,525	8,903
Sulphate Pulp:								
Number of digesters.....	19	26	8	0	10	4	37	30
Total hours idle.....	888	6,814	396	0	2,808	2,304	4,092	9,118
Soda Pulp:								
Number of digesters.....	69	105	5	15	49	30	123	150
Total hours idle.....	7,701	28,137	120	2,609	7,370	11,168	15,191	41,014
Other Grades:								
Number of digesters.....	4	3	0	0	3	1	13	4
Total hours idle.....	500	904	46	0	1,250	632	1,796	1,536
Total number machines.....	227	444	159	138	443	232	829	814
Total hours idle.....	40,796	133,767	15,431	20,821	47,253	45,506	103,482	200,094

*Includes 21,489 hours due to water and power conditions.

Foreman Training Courses in Far West

An interesting report has been received from the far west of a foremen's conference held in January, along the general lines of the similar conferences held for the foremen of the Champion Fibre Company at Canton, N. C., and the Hammermill Company at Erie, Pa. The Portland conference was held for the foremen of the Crown Willamette, Everett and Inland Empire Paper Companies, and the foremen of some of the companies traveled several hundred miles to attend. These companies have been holding mill conferences of foremen to discuss plant problems, as part of advanced and efficient personnel programs. The Portland conference was to take to the foremen a different type of training, to help them learn to discharge their responsibilities better.

The state supervisors of trade and education of Oregon and Washington participated in organizing the work, which was so planned as to be in harmony with the important work being done along vocational educational lines by the Technical Association of the Pulp and Paper Industry. As was the case at Canton and Erie, however, the foremanship training was entirely different from the work being done with the text books, for whose preparation the paper industry of the United States and Canada expended over \$40,000, and which are in use by mill employes in several mills where classes have been established.

The Portland course lasted two weeks.

Strikers Held in Contempt of Court

[FROM OUR REGULAR CORRESPONDENT.]

NIAGARA FALLS, N. Y., May 27, 1922.—Five striking papermakers of the Tonawanda Board and Paper Company are held in contempt of court for violating provisions of an injunction order, fined \$250 and a thirty-day sentence for each. The men are: Thomas Ryan, Philip M. Thiebold, Thomas Blount, Summers Ehlers and Thomas Wall. The order was handed down by Justice Horton in Supreme Court in Buffalo this morning. The sheriff of Erie county is expected to swear out warrants and arrest the men on Monday.

The men are accused of violating an injunction order of April 4, 1921, in regard to the picketing of the company's plant in Tonawanda. The company claims that many acts of violence were committed, that workmen were threatened and profane language used by the pickets named in the action. Referee Clark H. Timmerman of Buffalo found the men guilty of committing the alleged violations and Justice Horton approved his decision and fixed the fines and sentences. A similar action brought against Thomas Lahey, another striking picket, has not yet been decided because of extenuating evidence.

Paper & Pulp Products Co. Formed at Hartford

HARTFORD, Conn., June 5, 1922.—The Paper and Pulp Products Company, just incorporated at Hartford, plans to "de-ink, clean and restore printed paper" as well as to "manufacture pulp and paper" according to the certificate of incorporation.

Plans of the new company are not sufficiently advanced for a statement. Incorporators are Grant Hammond, Everett M. Sime, and Arthur W. Chambers.

The company starts business with a capital of \$55,000. The authorized capital stock is \$100,000.

Charles A. Esty Paper Co. Issues New Price List

WORCESTER, Mass., June 5, 1922.—A new catalog and price list has just been mailed to the trade by the Charles A. Esty Paper Company. It is pocket size and is printed on salmon Nibroc Bond which together with Black Reconstruction Cover gives it a wholly pleasing and distinctive character. The catalog covers only those lines sold by the firm's Fine Paper Department.

Two new lines have recently been added by this house—Ranger Cover, made by the Holyoke Card and Paper Company, which is becoming so generally known through the national advertising of both the manufacturer and its merchant distributors. Also Whip Cord Stripe, an M. G. Colored Stripe Wrapping in brown, gray, green, purple, old rose and blue, of unusual strength and pleasing appearance.

Directory of Paper Board Mills

The Eastern Paperboard Manufacturers' Association, of which Charles R. White is secretary, 1410 G street, Washington, D. C., has just issued a directory of all of the boxboard and paperboard mills in the United States, together with the location, the type of machines and trim, and the class of product made.

The directory is designed as a convenience for the association's mill management and is not intended for distribution among the trade generally, except that it is planned to put several copies in the hands of representatives of the Department of Commerce in foreign countries, in order that they may intelligently answer inquiries concerning these mills and their products.

Copies of this book are available to any boxboard or paperboard mill upon the payment of the cost price of forty cents each.

Canadian Kraft for Australian Trade

[FROM OUR REGULAR CORRESPONDENT.]

MONTREAL, Que., June 5, 1922.—It is reported that there is an increasing demand for Canadian kraft paper from all large overseas markets and especially from Australia. The Wayagamack Pulp and Paper Company, Ltd., the largest Canadian producers in that line, has developed a considerable trade with the Commonwealth. The steamer *Opawa* which sailed recently is carrying a large shipment of orders of Wayagamack paper to Australia. In fact, this is the largest single shipment which the company has made in years. Exports of sulphate kraft paper for April as compared with last year show an increase of nearly \$100,000 in the figures. Altogether pulp exports for that month amount to \$1,800,000 as compared with \$1,200,000 in 1921. It is an indication that business is picking up in that line to a noticeable extent.

To Explore for Pulpwood in Labrador

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., June 5, 1922.—Announcement that the Government of Quebec intends to explore Labrador, Ungava and the Hudson Bay region for pulpwood has been made by Provincial Forester G. C. Piche. The Provincial Government expects to build various forest stations along the North shore of the St. Lawrence, the coast of Labrador, in the Bay of Ungava, and also along the shore of Hudson Bay, and airplanes will be utilized by the engineers in exploring the surrounding territory. These reconnaissances will enable the Government, it is reported, to put into production various units for pulp and power development.

WOOD PULP PRODUCTION

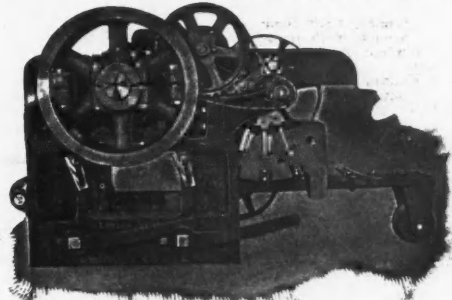
(Continued from page 97)

The idle machine time of grinders and digesters reported to the commission for the month of March, 1922, is shown in detail in the attached tabulation. The number of grinders and digesters includes only those for which idle time was reported during the month.

The total number of machines may include duplications because the reports may count the same machine twice if idle for different reasons during different parts of the month. The reasons tabulated for lost time are lack of orders and repairs. "Other Reasons" include water conditions, etc. The time lost in March, 1921, is shown by grades and reasons for purposes of comparison.

Don't Use Your Beaters For Rag Cutters

Put in a
GIANT
and cut your stock
thoroughly and evenly



Capacity 2 Tons per
hour
Weight 8500 lbs.
For Roofing and Felt
Stock

NO. 11 TRIPLEX



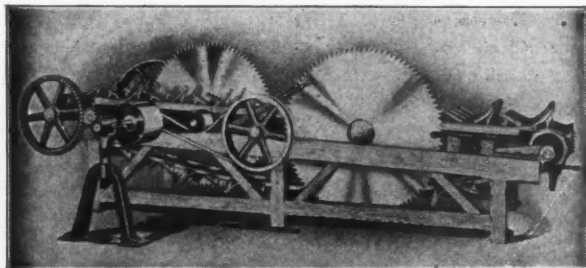
Canadian Manufacturers Under Patents: WATEROUS ENGINE WORKS CO., Brantford, Ont., Can.
I. MARX & CO., London, E. C., sole agents for the United Kingdom

Increased Capacity Lower Cost per Cord

THE

Ryther Slasher

is the most efficient and the lowest cost method of reducing long logs to uniform short lengths suitable for further manufacture into pulp and paper.



Built in all sizes to handle logs from 4 feet to 32 feet in length. Can be arranged to trim either one or both ends of logs if desired.

RYTHER & PRINGLE CO.,
Carthage, N. Y.



Imports and Exports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JUNE 3, 1922

SUMMARY

News Print.....	196 bls.	397 rolls.
Printing Paper.....	76 ca.	
Wrapping Paper.....	2,353 bls.,	2,952 rolls.
Cigarette Paper.....	28 ca.	
Wall Paper.....	956 bls.,	10 ca., 2,584 rolls.
Paper Hangings.....	14 bls.,	1 ca.
Writing Paper.....	4 ca.	
Packing Paper.....	1,083 rolls,	6 bls.
Parchment Paper.....	3 ca.,	1 bl.
Crepe Paper.....	58 ca.	
Drawing Paper.....	5 ca.	
Surface Coated Paper.....	170 ca.	
Photo Paper.....	38 ca.	
Kraft.....	56 bls.,	278 rolls.
Decalcomania.....	12 ca.	
Silk Paper.....	68 bls.	
Tissue Paper.....	15 bls.	
Filter Paper.....	3 ca.	
Colored Paper.....	7 ca.	
Miscellaneous Paper.....	177 ca.,	1,921 bls., 768 rolls.

CIGARETTE PAPER

British-American Tobacco Co., Celtic, Liverpool, 28 ca.

WALL PAPER

A. C. Dodman, Jr., Berengaria, Liverpool, 6 bls.
 Walkem, McLoughlin & Co., by same, 1 ca.
 A. C. Dodman, Jr., Zealand, Antwerp, 1 ca.
 A. C. Dodman, Jr., by same, 3 bls.
 F. G. Prager, by same, 636 rolls.
 R. F. Lang, St. Paul, Hamburg, 930 bls.
 M. G. Lange & Co., Mt. Carroll, Hamburg, 5 ca.
 F. A. Binder, Geo. Washington, Bremen, 13 bls.
 F. G. Prager, Kroonland, Antwerp, 1,951 rolls.
 R. F. Downing & Co., Pres. Monroe, London, 9 bls.
 M. J. Carbett & Co., Hansa, Hansa, 3 ca.

PAPER HANGINGS

W. H. S. Lloyd & Co., Montana, London, 14 bls.
 W. H. S. Lloyd & Co., by same, 1 ca.

WRITING PAPER

Lunham & Meare, Montana, London, 1 ca.
 C. Steiner, Noordam, Rotterdam, 3 ca.

PACKING PAPER

Birn & Wachenheim, Noordam, Rotterdam, 145 rolls.
 W. D. Morosoff, by same, 6 bls.
 Republic Bag & Paper Co., Western Scout, Hamburg, 839 rolls.

WRAPPING PAPER

M. O'Meara Co., Drottingholm, Gothenburg, 1,351 bls.
 M. O'Meara Co., by same, 1,059 rolls.
 M. M. Cohen, by same, 321 rolls.
 Hudson Trading Co., by same, 1,387 rolls.
 Hudson Trading Co., by same, 9 bls.
 Arkell Safety Bag Co., by same, 57 bls.
 Arkell Safety Bag Co., by same, 30 rolls.
 Chemical Nat'l Bank, by same, 60 rolls.
 Pulp & Paper Trading Co., by same, 702 rolls.
 Wilkinson Bros. & Co., Inc., Bergensfjord, Trondhjem, 995 rolls.
 Wilkinson Bros. & Co., Inc., by same, 936 bls.

PARCHMENT PAPER

F. C. Stryfe, Kroonland, Antwerp, 3 ca., 1 bl.

CREPE PAPER

Globe Shipping Co., N. Amsterdam, Rotterdam, 58 ca.

DRAWING PAPER

H. Reeve-Angel & Co., Montana, London, 1ca.
 P. Puttmann, Kroonland, Antwerp, 4 ca.

SURFACE COATED PAPER

P. C. Zuhlke, Kroonland, Antwerp, 129 ca.
 L. A. Consmiller, Eastern Cloud, Hamburg, 11 ca.
 Gevaert Co. of America, Zealand, Antwerp, 30 ca.

PHOTO PAPER

Gevaert Co. of America, Zealand, Antwerp, 17 ca.
 Gevaert Co. of America, Kroonland, Antwerp, 21 ca.

PRINTING PAPER

P. C. Zuhlke, Kroonland, Antwerp, 31 ca.
 P. Puttmann, by same, 45 ca.
 J. L. W. Smythe & Co., Hansa, Hamburg, 18 rolls.
 E. F. Drakenfeld & Co., Celtic, Liverpool, 14 ca.

NEWS PRINT

C. B. Hewitt & Bros., Western Scout, Hamburg, 9 bls.

Chemical Nat'l Bank, by same, 187 bls.
 Chemical Nat'l Bank, by same, 111 rolls.
 Hudson Trading Co., Chickasaw, Hamburg, 43 rolls.
 Hudson Trading Co., Bayern, Hamburg, 55 rolls.
 Hudson Trading Co., Orduña, Hamburg, 185 rolls.

KRAFT PAPER

Hudson Trading Co., Stockholm, Gothenburg, 86 bls.
 Hudson Trading Co., by same, 278 rolls.

DECALCOMANIA

L. A. Consmiller, Mt. Carroll, Hamburg, 12 ca.

SILK PAPER

Bura Bros., Juliana, Valencia, 68 bls.

TISSUE PAPER

Wilkinson Bros. & Co., Inc., Celtic, Liverpool, 15 bls.

FILTER PAPER

H. Reeve-Angel & Co., Montana, London, 3 ca.

COLORED PAPER

E. Daiber, Zealand, Antwerp, 7 ca.

PAPER

W. F. Ethrington, Cameronia, Glasgow, 82 ca.
 U. S. Forwarding Co., N. Amsterdam, Rotterdam, 12 ca.
 U. S. Forwarding Co., Noordam, Rotterdam, 8 ca.
 Hensel, Bruckman & Lorbacher, E. Cloud, Hamburg, 11 ca.
 C. K. MacAlpine, Drothingholm, Gothenburg, 93 bls.

C. K. MacAlpine, by same, 124 rolls.
 M. M. Cohen, by same, 100 rolls.
 M. M. Cohen, by same, 95 rolls.
 Gilbert Paper Co., by same, 247 rolls.
 Gilbert Paper Co., by same, 101 rolls.
 Coy Desbrow & Co., Inc., by same, 50 rolls.
 Coy, Desbrow & Co., Inc., by same, 48 rolls.
 Foreign Paper Mills, Inc., by same, 86 bls.
 Hudson Trading Co., by same, 137 bls.
 M. O'Meara Co., by same, 767 bls.
 M. O'Meara Co., by same, 14 rolls.
 C. F. Hubbs & Co., by same, 46 rolls.
 Coy, Hunt & Co., by same, 250 rolls.
 Coy, Hunt & Co., by same, 273 bls.
 International Acceptance Bank, by same, 265 bls.
 International Acceptance Bank, by same, 35 rolls.
 E. Fougere & Co., Olympic, Bordeaux, 55 ca.
 Ladenburg, Thalman & Co., W. Scout, Hamburg, 599 bls.
 Favor, Ruhl & Co., C. Maurice Eugene, Genoa, 13 ca.

RAGS, BAGGING, ETC.

S. Silberman & Co., N. Amsterdam, Rotterdam, 4 bls. paper stock.
 R. F. Downing & Co., by same, 124 bls. rags.
 W. Hughes & Co., Inc., by same, shoppories.
 J. J. Patrikoff & Co., Inc., by same, 400 bls. shoppories.
 J. J. Patrikoff & Co., Inc., by same, 297 bls. baggings.
 J. Perlman, Ulna, Havana, 6 bls. rags.
 M. Wolfer, by same, 3 bls. rags.
 Ladenburg, Thalman & Co., Cameronia, Glasgow, 38 bls. paper stock.
 Berkstein & Sons, Inc., by same, 65 bls. rags.
 R. F. Downing & Co., Zealand, Antwerp, 156 bls. flax waste.
 American Express Co., France, Havre, 10 bls. rags.
 First Nat'l Bank of Boston, by same, 50 bls. rags.

Nat'l Shawmut Bank, by same, 19 bls. rags.
 E. J. Keller Co., Inc., Stanmore, Dundee, 29 bls. linen threads.
 R. F. Downing Co., Celtic, Liverpool, 40 bls. baggings.
 Goldman, Sachs & Co., Mt. Carroll, Hamburg, 148 bls. rags.
 Castle, Gotthel & Overton, W. Scout, Hamburg, 40 bls. rags.

Nat'l Park Bank, by same, 19 bls. new cuttings.
 E. J. Keller Co., Inc., by same, 11 bls. gray linen cuttings.
 E. J. Keller Co., Inc., Archimedes, Manchester, 292 bls. baggings.
 Equitable Trust Co., by same, 150-lb. baggings.
 M. O'Meara Co., by same, 21 bls. baggings.
 Ladenburg, Thalman & Co., by same, 97 bls. new cuttings.

Irving Nat'l Bank, by same, 85 bls. new cuttings.
 J. J. Patrikoff, Londonier, Antwerp, 425 bls. rags.
 J. J. Patrikoff, Edgehill, Antwerp, 157 bls. baggings.

Castle, Gotthel & Overton, by same, 109 bls. rags.
 Castle, Gotthel & Overton, Rochambeau, Havre, 54 bls. rags.
 Dextar Trading Co., Inc., Chicago City, Bristol, 252 bls. rags.
 Goldman, Sachs & Co., Hansa, Hamburg, 28 bls. rags.
 R. F. Downing & Co., Noordam, Rotterdam, 103 bls. rags.

OLD ROPE

E. J. Keller Co., Inc., Noordam, Rotterdam, 78 coils.
 Ladenburg, Thalman & Co., by same, 117 coils.
 Mechanics & Metals Nat'l Bank, Chicago City, Bristol, 56 coils.

Brown Bros. & Co., by same, 298 coils.
 American Exchange Nat'l Bank, by same, 123 coils.
 American Exchange Nat'l Bank, Boston City, Bristol, 87 coils.

Brown Bros. & Co., by same, 119 coils.
 Brown Bros. & Co., Stanmore, Newcastle, 184 coils.
 American Exchange Nat'l Bank, Stanmore, Leith, 31 coils.

First Nat'l Bank of Boston, N. Amsterdam, Rotterdam, 79 coils.
 J. Perlman, Ulna, Havana, 2 coils.
 J. Perlman, Tolosa, Havana, 2 coils.

WOOD PULP

Johaneson, Wales & Sparre, Inc., Drothingholm, Gothenburg, 1,524 bales.
 Scandinavian-American Trading Co., by same, 153 bales.

M. Gottesman & Co., Inc., by same, 1,250 bales.
 J. Andersen & Co., Bergensfjord, Kristiania, 600 bales, 101 tons.
 Castle, Gotthel & Overton, W. Scout, Hamburg, 1,135 bales, 227 tons.

CHINA CLAY

Moore & Munger, Boston City, Bristol, 50 casks.

WOOD FLOUR

B. L. Soberski, Bergensfjord, Kristiania, 2,839 bags, 193 tons.

PITTSBURGH IMPORTS

WEEK ENDING JUNE 3, 1922

Scientific Materials Co., Hannover, Bremen, 1 ca. filter paper.

SYRACUSE IMPORTS

WEEK ENDING JUNE 3, 1922

Miller Paper Co., Drothingholm, Gothenburg, 238 rolls, 8 bds. paper.

AUSTIN, ILL., IMPORTS

WEEK ENDING JUNE 3, 1922

Meyercord Co., Celtic, Liverpool, 14 ca. printing paper.

PHILADELPHIA IMPORTS

WEEK ENDING JUNE 3, 1922

F. Weber & Co., C. M. Eugene, Genoa, 6 ca. paper.

J. F. Patton & Co., Seneca, Chatham, N. B., 15,472 bls. wood pulp.
 Castle, Gotthel & Overton, Chickasaw, Hamburg, 350 bls. wood pulp.
 Castle, Gotthel & Overton, W. Scout, Hamburg, 550 bls. wood pulp.

E. J. Keller Co., Inc., Carlsholm, Gothenburg, 500 bls. wood pulp.
 E. J. Keller Co., Inc., Stadsdyk, Rotterdam, 1,029 bales rags.

E. J. Keller Co., Inc., Themisto, Hamburg, 43 bales rags.
 Castle, Gotthel & Overton, Ontario, Rouen, 319 bales rags.
 Castle, Gotthel & Overton, Felicians, London, 250 coils old rope.

Castle, Gotthel & Overton, by same, 8 bls. old rope.

(Continued on page 104)



“The Cheapest Pipe is the Most Expensive”

“and you don't learn that until you've had a good lesson,” said the paper mill superintendent. “If you select ordinary pipe you'll find it's by far the most expensive. And here's why: A very few years after the ordinary pipe was installed in our mill it went bad. Replacements were made. Production in the meantime had to stop. Costs went up. It was then I found out a thing or two. The cheapest pipe is the kind that lasts for years. That's why I use Reading Genuine Wrought Iron Pipe.”

Reading Genuine Wrought Iron Pipe is entirely different from steel pipe. Each particle of iron in Reading Pipe has a coating of siliceous slag which resists corrosion. This makes Reading last two and three times as long as the best steel pipe.

That's why Reading is called low ultimate cost pipe. It saves those costly frequent pipe replacements. It helps to keep production costs down. It's the pipe that renders the kind of service which is vitally important to the paper mill.

Just remember, Reading is 100% genuine wrought iron and is your insurance against early corrosion and short pipe life. See that it is installed in your mill.

Information will be sent to you upon request.

READING IRON COMPANY
Reading, Pennsylvania

New York	Baltimore	Chicago
Boston	Pittsburgh	Fort Worth
Philadelphia	Cincinnati	Los Angeles

World's largest makers of Genuine Wrought Iron Pipe.

READING
GUARANTEED GENUINE
WROUGHT IRON PIPE

THE SHEPARD ELECTRIC
LIFTABOUT



The *LiftAbout* provides power lifting for every handling operation

The *LiftAbout*, the new and smaller electric hoist performs every necessary lifting and conveying operation. It serves sidewalk hatch or stairway, taking the heavy and bulky rolls from wagon or truck and lowers them to storage rooms. This is but one of the many duties that a *LiftAbout* performs in paper mill, warehouse, or printing plant.

With a *LiftAbout* one man can do the work of many, in less time and with far more efficiency. Due to quantity production, it is surprisingly low in cost. Easily and quickly installed to operate on overhead track, anywhere.

Now is the time to scrutinize your handling costs. Investigate the economies of the *LiftAbout* for your load moving jobs. Furnished for both direct and alternating current. Capacities 1/2 and 1 ton.

Shepard also builds electric cranes and hoists in capacities to 30 tons.

SHEPARD ELECTRIC CRANE & HOIST CO.
378 Schuyler Ave., Montour Falls, N. Y.
Branches in principal cities
Member Electric Hoist Mfrs. Assn.

New York Market Review

OFFICE OF THE PAPER TRADE JOURNAL,
WEDNESDAY, JUNE 7, 1922.

A general stiffening in price all the way along the line, especially in the waste paper and rag markets, has been noticeable throughout the past week. This is attributed to several factors, the most important of which is that mill stocks are rapidly diminishing and the supplies which have been top-heavy for so many months are depleting to the point where they are covered by the consumer's demand. With the approach of summer, it is doubtful whether many mills which have been temporarily closed will reopen. If such is the case, the present situation will become even more aggravated, and the early fall months should see a satisfying volume of production and the signing of many new contracts. Paper dealers of the city find that many of their customers are still using the tail end of supplies purchased from six months to a year ago, and the fact that confidence has been fully restored in most markets, together with the logical demand for new materials which is bound to exist immediately after the summer period of slack production, bode a return of normal business conditions in the not far distant future.

News print paper is riding on the crest of a flood tide of prosperity. Many of the smaller newspapers which were closed down during the war have re-entered the field, and publishers no longer encounter the same strenuous difficulties in increasing the number of their readers. News print prices are firming in consequence, and the decreased imports from Germany and other European countries has done much to remove the strain of cut-throat competition from the shoulders of domestic manufacturers. Several large news print producers have signified their intention of maintaining operations full blast even during the summer months in order to meet the contracts which they now have on hand.

Book paper has continued in increasingly good demand for export, and domestic manufacturers feel that the market is slowly working back to a healthy condition. Prices have not altered in some time, giving an appearance of firmness, and the many inquiries which have been received, both from this country and from foreign countries, Latin America especially, are bound to bring a satisfying volume of business.

Fine papers are just one step ahead of book in that activity has become quite pronounced. New York dealers in this commodity have observed a steady increase in their volume of business for the past eight weeks, and from all appearances there will be no drastic let-down over the summer. Exporters of fine paper are particularly optimistic about the manner in which American paper is coming to supplant foreign paper in the markets of Mexico, Central and South America, and it is believed that the bulk of this trade is still forthcoming. American manufacturers are no longer averse to extending credits for 90 or 120 days on exported goods, as the economic situation in this country has accustomed them to long time payments. This, together with the fact that the American exporter of fine paper has made a careful survey of his Latin-American field and exercises extreme care in packing and shipping his product south, has done much to place American paper in the high esteem of the exacting South American.

Tissue has not yet fully recovered from the blow dealt it by the recent strikes in the clothing and shoe industries, and manufacturers are experiencing considerable difficulty in disposing of their supplies on hand at prices that will allow them any profit at all. In the natural order of events, the culmination of the strikes should bring about a return of the heavy demand from the textile trade and this, in turn, should have a decidedly strengthening effect upon the market. The fact is, however, that sufficient time has not elapsed for all the cogs in the mechanism to get back into running order, and in the meantime tissue mills are bearing the brunt of

the burden, scarcely able to realize a profit at the present quoted prices.

Kraft papers have been in better demand during the past week than they have been in several months. It is not generally thought that there will be a return of normal business in this market, however, until early fall, although the slight picking up in consumption recently may indicate another such period of prosperity as wrapping paper manufacturers enjoyed several months ago. Prices are still holding the same and the recent stimulus to the market has led many consumers to make inquiries.

Board manufacturers are still unable to see how they fit into the scheme of things, with prices of finished board equaling production cost. There has been some lightening of the intense competition, and extreme price-cutters are coming to realize that while they are able to turn over their stocks by underselling their competitors, they are strangling the market and keeping everyone, themselves included, from making any profit. Through several months of bitter experience, they have attempted to bring about an artificial demand, but with the gradual and certain return of normal business, this evil will be obviated. Boxboard has been the mainstay for many dealers in this line, and has proved practically the only source of profit in the board industry.

Mechanical Pulp

That ground wood pulp is due for a rise in price in the near future is predicted by the increased buying on the part of the mills in view of the approaching dry season. Foreign pulp is commanding a price which is relatively much higher than the domestic. Imported pulp was quoted in the neighborhood of \$38 a ton during last week, occasionally hitting as high a mark as \$40. Domestic has ranged between \$28 and \$34.

Chemical Pulp

Many merchants anticipate a slight rise in several grades of chemical pulp within the next week or ten days, and there has already been some stiffening in both foreign and domestic bleached sulphite. Activity in the market is very pronounced at present and dealers are satisfied that it will continue well into the summer.

Old Rope and Bagging

While bagging fails to register a forward movement of any nature, old rope, on the other hand, has been picking up in a promising manner from week to week. Manila is in active demand and nearly every grade of old rope can find a ready market due to the depletion of stocks and scarcity of available supplies now on hand.

Waste Paper

As has been predicted in recent numbers of the PAPER TRADE JOURNAL, the waste paper market has stiffened up along many lines. All grades of shavings and practically all flat stock has increased in price and machine-compressed, old kraft papers in bales have taken a rise together with strictly folded news. Mills are anxiously competing for the better grades, of which there is a decided scarcity, and dealers feel that good business is again at hand.

Rags

There has been an even better demand for blues in the rag market and roofing is still stiffening up. Whites and bleachable grades of rags, both new and old, are turned over without the slightest difficulty, and a note of confidence in the entire situation has been struck. Old rags have increased in price all the way along the line, and among the foreign rags, dark cottons and shoppery show a slight advance.

Twine

Dealers in this commodity insist that all grades of twine should take a corresponding rise in price along with the recent boost in raw jute fiber. The break has not yet arrived but is eagerly anticipated by twine merchants, whose season of slack business has been a long one. At present prices, the handling of twine is less than a break-even proposition.

Market Quotations

Paper Company Securities

New York Stock Exchange closing quotations June 6, 1922:

STOCKS	BID.	ASKED.
American Writing Paper Company, pref.	33 3/4	34
International Paper Company, com.	51 1/2	53 3/4
International Paper Company, pref., stamped.	69	69 1/2
Union Bag & Paper Corporation.	65	66

Because of the unusual conditions prevailing in the various markets quotations are more or less nominal.

Paper

F. o. b. Mill.	
Ledgers	10.50 @ 30.00
Bonds	8.50 @ 55.00
Writings—	
Extra Superfine	14 @ 25
Superfine	13 @ 20
Tub Sized	10 @ 16
Engine Sized	9.00 @ 15.00
News—f. o. b. Mill—	
Rolls, contract	3.50 @ 3.75
Rolls, transit	3.50 @
Sheets	4.00 @
Side Runs	3.25 @ 3.50
Book, Cased—f. o. b. Mill	
S. & S. C.	6.25 @ 7.25
M. F.	6.00 @ 7.00
Coated and Enamel	8.00 @ 10.00
Lithograph	8.00 @ 10.00
Tissues—f. o. b. Mill	
White, No. 1	.75 @ .80
Colored	1.00 @ 2.00
Anti-Tarnish	.75 @ .80
Silver Tissue	1.50 @ 2.70
Manila	.75 @ .80
Kraft—f. o. b. Mill—	
No. 1 Domestic	7.00 @ 7.50
No. 2 Domestic	5.75 @ 6.25
Imported	6.00 @ 6.25
Screenings	2.50 @ 3.50
Manila—	
No. 1 Jute	8.50 @ 9.00
No. 2 Jute	7.75 @ 8.50
No. 1 Wood	4.50 @ 5.50
No. 2 Wood	4.00 @ 4.50
Butchers	4.25 @ 4.75
Fiber Papers—	
No. 1 Fiber	6.00 @ 6.25
No. 2 Fiber	5.00 @ 5.25
Common Bogus	1.75 @ 2.25
Card Middies	4.00 @ 5.00
Boards—per ton—	
News	35.00 @ 45.00
Straw	40.00 @ 45.00
Chip	32.50 @ 40.00
Binders' Board	60.00 @ 70.00
Spl. Mia. L.I. Chip	52.50 @ 62.50
Wood Pulp	75.00 @ 90.00
Container	60.00 @ 70.00
Wax Paper—	
Self Sealing White	
28 and 30 lb.	
basis	10.00 @ 11.00
Waxed Tissue	1.40 @ 1.60
Glassine—	
Bleached, basis 25	
lbs.	12.75 @ 13.25
Bleached, basis 20	
lbs.	13.75 @ 15.25

Mechanical Pulp

(Ex-Dock.)

No. 1 Imported	32.00 @ 38.00
(F. o. b. Pulp Mills.)	
No. 1 Domestic	28.00 @ 34.00

Chemical Pulp

(Ex-Dock, Atlantic Ports.)

Sulphite (Imported)—	
Bleached	4.00 @ 4.50
Easy Bleaching	2.85 @ 3.10
No. 1 strong unbleached	2.50 @ 2.75
No. 2 Strong unbleached	2.25 @ 2.50
No. 1 Kraft	2.50 @ 3.00
Sulphate—	
Bleached	3.90 @ 4.00
(F. o. b. Pulp Mill.)	
Sulphite (Domestic)	
Bleached	4.00 @ 4.50
Strong unbleached	2.60 @ 2.80
Easy Bleaching	
Sulphite	2.60 @ 3.10
News Sulphite	2.50 @ 2.80
Mitscherlich	2.80 @ 3.10
Kraft (Domestic)	2.50 @ 3.00
Soda Bleached	3.50 @ 3.75

Domestic Rags

Prices to Mill, f. o. b. N. Y.	
Shirt Cuttings—	
New White, No. 1	10.25 @ 10.75
New White, No. 2	6.00 @ 6.50
Silecias, No. 1	6.00 @ 6.50
New Unbleached	8.50 @ 9.00
Washables	3.30 @ 3.60
Fancy	4.85 @ 5.25
Cotton—according to Grades—	
Blue Overall	5.50 @ 6.00
New Blue	4.00 @ 4.50
New Black Soft	3.00 @ 3.25
New Light Seconds	2.75 @ 3.00
O. D. Khaki Cuttings	3.25 @ 3.60
Men's Corduroy	2.50 @ 2.75
New Canvas	6.50 @ 7.00
New Black Mixed	2.25 @ 2.75
Old	
White, No. 1—	
Repacked	5.60 @ 6.10
Miscellaneous	4.50 @ 5.00
White, No. 2—	
Repacked	2.75 @ 3.00
Miscellaneous	2.10 @ 2.35
St. Soiled White	1.15 @ 1.25
Thirds and Blues—	
Repacked	1.60 @ 1.75
Miscellaneous	1.15 @ 1.25
Black stockings	2.25 @ 2.50
Cloth Strippings	.95 @ 1.00
No. 1	.95 @ 1.00
No. 2	.85 @ .95
No. 3	.60 @ .70
No. 4	.60 @ .70
No. 5A	.90 nominal

Foreign Rags

New Light Silecias	6.00 nominal
Light Flannelettes	6.75 nominal
Unbleached Cottons	7.50 nominal
New White Cuttings	9.50 nominal
New Light Oxfords	6.00 nominal
New Light Prints	4.50 nominal
New Mixed Cuttings	2.90 @ 2.50
New Dark Cuttings	1.90 @ 2.10
No. 1 White Linens	9.00 @ 11.00
No. 2 White Linens	6.50 nominal
No. 3 White Linens	5.00 nominal
No. 4 White Linens	3.50 nominal
Old Extra Light Prints	2.00 nominal
Ord. Light Prints	1.75 nominal
Med. Light Prints	1.50 nominal
Dutch Blue Cottons	1.85 nominal
German Blue Cottons	1.50 nominal
Ger. Blue Linens	3.50 nominal
Checks and Blues	1.50 nominal
Dark Cottons	1.00 @ 1.10
Shoppery	.90 @ .95
French Blues	2.00 nominal

Bagging

Prices to Mill f. o. b. N. Y.

Gunny No. 1—	
Foreign	.80 @ .85
Domestic	.80 @ .85
Wool, Tares, light	1.00 @ 1.10
Wool, Tares, heavy	1.10 @ 1.15
Bright Bagging	.90 @ 1.00
No. 1 Scrap	.80 @ .90
Sound Bagging	.75 @ .85
Manila Rope—	
Foreign	4.60 @ 4.85
Domestic	4.75 @ 5.00
New Bu. Cut	1.80 @ 1.90
Hessian Jute Threads—	
Foreign	4.25 @ 4.50
Domestic	4.00 @ 4.25
Mixed Strings	.75 @ .85

Twines

Cotton—(F. o. b. Mill)	
No. 1	32 @ 34
No. 2	30 @ 32
No. 3	26 @ 28

India, No. 6 basis—	
Light	17 @ 18
Dark	17 @ 18
B. C., 18 Basis	38 @ 40
A. B. Italian, 18 Basis	50 @ 60
Finished Jute—	
Light, 18 basis	25 @ 26
Dark, 18 basis	26 @ 28
Jute Wrapping, 3-6 Ply—	
No. 1	22 @ 23
No. 2	30 @ 31
Tube Rope—	
4-ply and larger	14 @ 16
Fine Tube Yarn—	
5-ply and larger	18 @ 20
4-ply	19 @ 21
3-ply	20 @ 22
Unfinished India—	
Basis	15 @ 16
Paper Makers Twine	
Balls	12 @ 14
Box Twine, 2-3 ply	16 @ 17
Jute Rope	12 @ 14
Amer. Hemp, 6	32 @ 34
Sisal Hay Rope—	
No. 1 Basis	14 @ 16
No. 2 Basis	12 @ 14
Sisal Lath Yarn—	
No. 1	13 @ 14
No. 2	10 @ 12
Manila Rope	17 @ 18

Old Waste Papers

(F. o. b. New York)

Shavings—	
Hard, White, No. 1	3.85 @ 4.10
Hard, White, No. 2	3.40 @ 3.60
Soft, White, No. 1	3.40 @ 3.50
Flat Stock—	
Stitchless	1.70 @ 1.80
Over Issue Mag.	1.70 @ 1.80
Solid Flat Book	1.60 @ 1.70
Crumpled No. 1	1.20 @ 1.30
Solid Book Ledger	2.00 @ 2.25
Ledger Stock	1.70 @ 1.85
No. 1 White News	1.65 @ 1.75
New B. B. Chips	.50 @ .55
Manilas—	
New Env. Cut	2.50 @ 2.75
New Cut No. 1	1.60 @ 1.75
Extra No. 1, Old	1.50 @ 1.60
Print	.85 @ .95
Container Board	.60 @ .70
Bogus Wrapper	.55 @ .60
Old Krafts, machine compressed	
Bales	1.70 @ 1.80
News—	
Strictly Overissue	.70 @ .80
Strictly Folded	.55 @ .60
No. 1 Mixed Paper	.45 @ .50
Common Paper	.32 1/2 @ .37 1/2

CHICAGO

[FROM OUR REGULAR CORRESPONDENT.]

Paper	
F. o. b. Mill	
All Rag Bond	35 @ 40
No. 1 Rag Bond	30 @ 35
No. 2 Rag Bond	18 @ 20
Water Marked Sulphite Bond	10 @ 14
Sulphite Bond	9 @ 12
Sulphite Ledger	12 @ 13
Superfine Writing	18 @ 24
No. 1 Fine Writing	14 @ 22
No. 2 Fine Writing	12 @ 20
No. 3 Fine Writing	8 @ 12
No. 1 M. F. Book	6 1/2 @ 7
No. 2 S. & S. C.	6 1/2 @ 7 1/2
Coated Book	8 1/2 @ 10 1/2
Coated Label	8 1/2 @ 10 1/2
News—Rolls, mill	3 1/2 @ 4 1/2
News—Sheets, mill	3 1/2 @ 4 1/2
No. 1 Manila	5 1/2 @ 6
No. 1 Fiber	5 @ —
No. 2 Manila	4 1/2 @ —
Butchers' Manila	7 @ —
No. 1 Kraft	6 @ —
No. 2 Kraft	6 @ —
Wood Tag Boards	4 @ —
Screenings	2 1/2 @ —
Boards, per ton—	
Plain Chip	35.00 @ 40.00
Solid News	40.00 @ 45.00
Manila Lined	
Chip	45.00 @ 52.50
Container Line—	
85 Test	60.00 @ 65.00
100 Test	65.00 @ 70.00

PHILADELPHIA

[FROM OUR REGULAR CORRESPONDENT.]

Paper	
Bonds	.10 @ .60
Ledgers	.15 @ .40
Writings—	
Superfine	.15 @ .20
Extra fine	.12 @ .22
Fine	.20 @ .30
Fine, No. 2	.20 @ .25
Fine, No. 3	.15 @ .20
Book, M. F.	.06 @ .09
Book, S. S. & C.	.08 @ .15
Book, Coated	.08 @ .13
Coated Lithograph	.10 @ .15
Label	.08 @ .15
News	.05 @ .07
No. 1 Jute Manila	.12 @ .13
Manila Sul.	.08 @ .08 1/2
Manila No. 2	.07 1/2 @ .08
No. 2 Kraft	— @ .08 1/2
No. 1 Kraft	— @ .09 1/2
Common Bogus	.02 1/2 @ .03
Straw Board	35.00 @ 45.00
News Board	32.50 @ 35.00
Chip Board	27.50 @ 32.00
Wood Pulp Board	90.00 @ 100.00
(Carload Lots)	
Binder Boards—	
Per ton	\$65.00 @ 75.00
Carload lots	60.00 @ 65.00
Tarred Felts—	
Regular	48.00 @ 50.00
Slaters	54.00 @ 56.00

Bagging

F. o. b. Phila.

Gunny No. 1—	
Foreign	.75 @ —
Domestic	.70 @ —
Manila Rope	4.00 @ 4.50
Sisal Rope	.75 @ .80
Mixed Rope	.75 @ .80
Scrap Burlaps	1.00 @ 1.25
Wool Tares, heavy	2.50 @ 2.75
Mixed Strings	.75 @ .80
No. 1, New Lt. Burlap	.75 @ .80
New Burlap Cuttings	1.75 @ 2.10

Old Papers

F. o. b. Phila.

Shavings—	
No. 1, Hard White	4.00 @ 4.25
No. 2, Hard White	3.50 @ 3.75
No. 1 Soft White	3.35 @ 3.50
No. 2 Soft White	2.00 @ 2.25
No. 1 Mixed	1.50 @ 1.75
No. 2 Mixed	1.00 @ 1.25

(Continued on page 106)

Imports and Exports of Paper and Paper Stock

(Continued from page 100)

BOSTON IMPORTS

WEEK ENDING JUNE 3, 1922

J. E. Lodge, La Lorraine, Havre, 51 bls. rags.
Burmon & Bolonsky, by same, 17 bls. rags.
Hudson Trading Co., Georgian, Hamburg, 56
rolls news print.

BALTIMORE IMPORTS

WEEK ENDING JUNE 3, 1922

Certainteed Products Co., W. Lashaway, Mar-
scilles, 547 bls. rags.

NEW ORLEANS IMPORTS

WEEK ENDING JUNE 3, 1922

E. J. Keller Co., Inc., De La Salle, Havre, 242
bls. bagging.
Castle, Gottheil & Overton, Hannington Court,
Rouen, 675 bls. rags.

BIDS AND AWARDS FOR GOVERNMENT PAPER

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 7, 1922.—The purchasing officer of the Government Printing Office has received the following paper bids: 40,000 lbs. 24 x 36—80. High Finish Sulphite Manila Paper in 18" rolls: Whitaker Paper Company, at \$.087 per lb.; Maurice O'Meara Company, \$.0609; R. P. Andrews Paper Company, \$.062; D. L. Ward Company, \$.0534; Geo. W. Millar & Co., \$.0636; Mathers-Lamm Paper Company, \$.0545; Old Dominion Paper Company, \$.0699; Wilkinson Bros. & Co., \$.05545; Samuel S. Alcorn, \$.0565; B. F. Bond Paper Company, \$.084; Reese & Reese, \$.0616; Dobler & Mudge, \$.063.

305 lbs. 17 x 28—30½. No. 24 Blue Safety Writing Paper: The Perfect Safety Paper Company, \$.26 per lb.; Geo. La Monte & Son, \$.244; R. P. Andrews Paper Company, \$.251; Dobler & Mudge, \$.332.

1,350 lbs. 16 x 21—18. No. 20, Fine White Glazed Bond Paper: The Aetna Paper Company, \$.1623 per lb.; R. P. Andrews Paper Company, \$.325; Dobler & Mudge, \$.265.

2,190 lbs. buff commercial ledger paper, 21 x 32½—109½. No. 60: Dobler & Mudge, 20 cents per lb.; Whitaker Paper Company, \$.2025 per lb.

4,800 lbs. goblin blue cover paper 20 x 25—48 lb.: Dobler & Mudge, \$.0922 per lb.; Whitaker Paper Company, \$.0909; Mathers-Lamm Paper Company, \$.091; B. F. Bond Paper Company, \$.0948; Geo. W. Millar & Co., Inc., \$.0985; Old Dominion Paper Company, \$.0943; Thos. Barrett & Son., \$.0962; Reese & Reese, \$.0921; Knowlton Brothers, \$.095.

8,600 lbs. white glazed bond paper, 21 x 32—43. No. 24: The Aetna Paper Company, 12 cents per lb.; Strathmore Paper Company, 20 cents; B. F. Bond Paper Company, \$.167; Old Dominion Paper Company, \$.1439; R. P. Andrews Paper Company, \$.13; Mathers-Lamm Paper Company, 19 cents; Dobler & Mudge 16 cents.

1,150 lbs. 17 x 22—23. Gummed paper, non-curling: Whitaker Paper Company, at \$.164 per lb.; Dobler & Mudge, \$.155; Mid States Gummed Paper Company, \$.174; Mathers-Lamm Paper Company, \$.1565; Dennison Manufacturing Company, \$.198; Old Dominion Paper Company, \$.157; Maurice O'Meara Company, \$.183; Knickerbocker Supply Company, \$.156; Reese & Reese, \$.1597; C. J. Vanella Company, \$.185.

The purchasing officer will open bids on June 12, for the following:

1,810 lbs. (10 reams) 22½ x 28½—181. Fawn Index Bristol Board.

7,800 lbs. (100 reams) 38 x 48—78. No. 16, Map Paper.

The Purchasing Officer of the Government Printing Office has received the following bids for 6,000 lbs. of pink-calendered tag board, 24 inch rolls: Dobler & Mudge, 10 cents per lb.; Reese & Reese at \$.0659; R. P. Andrews Paper Company, \$.0764.

2,400 lbs. Moss Green Cover paper 20 x 25—48: R. P. An-

draws Paper Company, \$.0975 per lb.; The Whitaker Paper Company, \$.0909; Dobler & Mudge, \$.0973; Mathers-Lamm Paper Company, \$.0965; Reese & Reese, \$.0970; Knowlton Brothers, \$.1027; Old Dominion Paper Company, \$.0994; Thos. Barrett & Son, \$.1014; Garrett-Buchanan Company, \$.10.

5,150 lbs. map paper, sample B, 30 x 40—51½, No. 16: R. P. Andrews Paper Company, \$.199 per lb.; George W. Millar & Co., Inc., 22 cents; Dobler & Mudge, \$.1649; Old Dominion Paper Co., \$.1699; Barton, Duer & Koch Paper Company, \$.1710; The Whitaker Paper Company, \$.1695; B. F. Bond Paper Company, \$.169; Reese & Reese, \$.1824; Garrett-Buchanan Company, \$.178.

Dobler & Mudge have been awarded the contract by the Purchasing Officer of the Government Printing Office for furnishing 10,400 pounds (100 reams) of 26½ x 41—104. India tint coated cover paper at \$.089 per pound, bids for which were opened on May 22.

Dobler and Mudge have been awarded the contract by the Purchasing Officer of the Government Printing Office for furnishing 9,500 lbs. (100 reams) of 27 x 38—95 rope manila paper at \$.1099 per pound, bids for which were opened on May 19.

The Aetna Paper Company will furnish 1,350 lbs. (75 reams) of 16 x 21—18. No. 20 fine white glazed bond paper at \$.1623 per pound, bids for which were opened on May 26.

Wilkinson Brothers Company have been awarded the contract by the Purchasing Officer of the Government Printing Office for furnishing 40,000 pounds of high finish sulphite manila paper in 18" rolls at \$.05545 per pound, bids for which were opened on May 26.

The Aetna Paper Company will furnish 8,600 pounds (200 reams) of 21 x 32—43. No. 24 white glazed bond paper at 12 cents per pound and the Whitaker Paper Company will furnish 4,800 pounds (100 reams) of 20 x 25—48. Goblin blue rough cover paper at \$.0909 per pound. Bids for these items were opened on May 29.

Dobler and Mudge have been awarded the contract by the Purchasing Officer of the Government Printing Office for furnishing 4,000 pounds of rope manila paper in 11½ inch rolls at \$.1099 per pound, bids for which were opened on May 22.

George LaMonte & Son have been awarded the contract by the Purchasing Officer of the Government Printing Office for furnishing 305 pounds of 17 x 28, 30½, No. 24 blue safety writing paper at \$.244 per pound, bids for which were opened on May 26.

Dobler & Mudge will furnish 2,190 pounds of 21 x 32½, 109½ No. 60 buff commercial ledger paper at 20 cents per pound, bids for which were opened on May 29.

The Purchasing Officer of the Government Printing Office will open bids for the following material on June 12:

20,000 lbs. (20,000 sheets) 26 x 38, No. 50, strawboard;

35,000 lbs. (22,000 sheets) 25 x 30, No. 2 quality binders' board;

16,000 lbs. (7,800 sheets) various sizes binders' board.

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Miscellaneous Markets

OFFICE OF THE PAPER TRADE JOURNAL,
WEDNESDAY, JUNE 7, 1922.

ALUM.—No drastic changes have been apparent in the alum market during the past week. The situation is taking on a firmer aspect but the demand still continues slack. The quoted prices are: lump, 3.50 cents a pound; ground, 3.65; and powdered, 3.90.

BLEACHING POWDER.—The bleach market is practically at a standstill with the coming of summer, and a break is not generally anticipated until the early fall months. Demand is below normal and the price of 1.60 cents a pound may be shaded on quantity shipments.

BLANC FIXE.—The quoted price of \$40 to \$50 per ton on blanc fixe pulp is regarded as a firm one, and the dry product has continued at 3.50 to 3.75 cents a pound. Activity has been gradual but steady.

CASEIN.—What with the heated discussions and protests regarding the tax of 4.00 cents a pound on imported casein, the demand for this product has picked up considerably within the past week in anticipation of the impending tariff measure. Competition for the limited Argentine supply is keen, and casein dealers of this city are, in the main, holding out for a better price than the quoted 10.00 cents a pound, f. o. b. New York.

CAUSTIC SODA.—Domestic consumption of caustic appears to be lightening somewhat, though the demand abroad still continues strong. Prices on the domestic are quoted at 3.26 cents a pound and it is not believed that this will change appreciably throughout the summer.

CHINA CLAY.—Domestic unwashed clay is listed at \$6 to \$8 a ton, a price that has prevailed for some weeks, the washed at \$8 to \$10 and the English clays at the wider range of \$13 to \$18. Dealers report that plants in England have large supplies of the commodity on the ground, and that production is being curtailed temporarily.

LIQUID CHLORINE.—Transactions in chlorine are falling off in corresponding amounts with those other chemicals which are difficult to store any length of time in the summer, but there is still a steady activity. Quotations on tank car lots are found to be considerably shaded under the price of 5.50 to 7.00 cents a pound for the 100-pound cylinders.

ROSIN.—Grades E, F, and G are holding quite firm at \$5.20 for barrels containing 280 pounds. Demand here and abroad is steadily on the incline and merchants are doing good business in the commodity.

SALTCAKE.—This market is stiffening up to a great extent due to the curtailed production of acids. Available supplies are rapidly being consumed, and quotations are fairly firm. Chrome cake sells for \$18 a ton and acid cake for \$20 to \$21.

SATIN WHITE.—Quoted at 1.50 cents a pound, contract, satin white has been in steady demand.

SULPHUR.—The absence of cut-throat competition in the brimstone market has served to keep prices more stable than those of any other commodity listed. Quotations on the ground, of \$15 to \$17 a ton, and \$18 to \$20 f. o. b. New York, have held for many months.

STARCH.—Paper maker's starch is quoted by several of the largest houses handling the product at 2.47 cents per pound for bag quantities and 2.75 for barrels. Pearl starch averages 0.10 cents a pound lower for these amounts.

SULPHATE OF ALUMINA.—With an irregular demand and strenuous Western competition, aluminum sulphate is not generally considered too firm at the quoted price of 1.40 to 1.50 cents a pound. Iron free is listed at 2.15 to 2.35.

SODA ASH.—In spite of a fairly regular consumption, the soda ash market seems to be lapsing into a period of quiet over the summer months. The price has been listed in the neighborhood of 1.50 cents a pound, works, for some time.

Market Quotations

(Continued from page 103)

Solid Ledger Stock.....	2.25 @ 2.50	New Black Soft.....	.03 @ .03 1/4
Writing Paper.....	1.80 @ 2.00	New Light Sec- onds.....	.02 @ .02 1/4
No. 1 Books, heavy.....	1.60 @ 1.75	Khaki Cuttings.....	.02 3/4 @ .03 1/4
No. 2 Books, light.....	1.40 @ 1.50	Corduroy.....	.02 @ .02 1/4
No. 1 New Manila.....	2.75 @ 3.00	New Canvas.....	.07 @ .07 1/4
No. 1 Old Manila.....	1.50 @ 1.75	New Black Mixed Old	.27 @ 3.00
Container Manila.....	1.00 @ 1.10	White, No. 1— Repacked.....	.06 @ .06 1/4
Old Kraft.....	2.00 @ 2.25	Miscellaneous.....	.04 1/4 @ .04 1/4
Overissue News.....	.75 @ .80	White, No. 2— Repacked.....	.03 @ .03 1/4
Old Newspaper.....	.50 @ .60	Miscellaneous.....	.02 1/4 @ .02 1/4
No. 1 Mixed Paper.....	.45 @ .50	Thirds and Blues— Repacked.....	1.65 @ 1.80
Common Paper.....	.40 @ .50	Miscellaneous.....	1.40 @ 1.55
Straw Board, Chip.....	.40 @ .45	Black Stockings.....	1.75 @ 2.25
Binders' Bd. Chip.....	.40 @ .45	Roofing Stock— No. 1.....	.90 @ 1.00
Domestic Rags—New Price to Mill, f. o. b. Phila.		No. 2.....	.80 @ .90
Shirt Cuttings— New White, No. 1.....	.09 1/4 @ .09 1/4	No. 3.....	.70 @ .80
New White, No. 2.....	.05 @ .06	No. 4.....	.70 @ .80
Silesias, No. 1.....	.04 1/4 @ .05	No. 5A.....	nominal
New Unbleached.....	.08 1/4 @ .08 1/4	B.....	nominal
Washables.....	.03 @ .03 1/4	C.....	nominal
Fancy.....	.04 1/4 @ .05		
Cottons—according to grades— Blue Overall.....	.04 @ .04 1/4		
New Blue.....	.02 @ .02 1/4		

BOSTON

[FROM OUR REGULAR CORRESPONDENT.]

Paper		Wood, Vat Lined.....	.47.25 @
Bonds.....	.06 @ —	Filled News Board.....	.37.50 @
Ledgers.....	.07 1/2 @ .08 1/2	Solid News Board.....	.42.00 @ 45.00
Writings.....	— @ .05	S. Manila Chip.....	.52.50 @
Superfine.....	.11 1/2 @ .13	Pat. Coated.....	.70.00 @ 75.00
Fine.....	.08 @ .09 1/4		
Books, S. & S. C.....	.06 @ .07 1/4	Old Papers	
Books, M. F.....	.05 @ .06 1/4	Shavings— No. 1 Hard White.....	3.50 @ 3.75
Books, coated.....	.07 1/4 @ .08 1/4	No. 1 Soft White.....	3.00 @ 3.25
Label.....	.08 @ .08 1/4	No. 1 Mixed.....	1.50 @ 1.75
News sheets.....	3.05 @ —	Ledgers & Writings.....	.03 1/4 @ —
News, rolls.....	3.75 @ 4.00	Solid Books.....	1.75 @ 2.00
Manila.....		Blanks.....	1.30 @ 1.45
No. 1 Manila.....	\$6.75 @ 6.25	No. 2 Books Light.....	.60 @ .70
No. 1 Fibre.....	6.00 @ 6.25	Folded News, over- issues.....	\$11.25 @ 12.50
No. 1 Jute.....	8.50 @ 8.75	Mixed paper.....	.47.50 @ 50.00
Kraft Wrapping.....	7.00 @ —	Gunny Bagging.....	.70 @ .75
Common Bogus.....	3.00 @ —	Manila Rope.....	4.25 @ 4.50
		Common Paper.....	.35 @ .40
Boards		Old News.....	.80 @ —
(Per Ton Destination)		Old Kraft.....	1.75 @ 1.80
Chip.....	\$33.50 @		
News, Vat Lined.....	.35.00 @ 37.00		

TORONTO

[FROM OUR REGULAR CORRESPONDENT.]

Paper		Sulphite, bleached.....	.90.00 @ 95.00
(Mill Prices to Jobbers f. o. b. Mill)		Sulphate.....	.70.00 @
Board— Sulphite.....	.11 @ .12 1/4	Old Waste Papers	
Light tinted.....	.12 @ .13 1/4	(In carload lots, f. o. b. Toronto)	
Dark tinted.....	.13 1/4 @ .15	Shavings— White Env. Cut.....	3.75 @ —
Ledgers (sulphite).....	— @ .13	Soft White Book Shavings.....	3.25 @ —
Writing.....	.10 1/2 @ .13 1/4	White Bl'k News.....	1.60 @ —
News, f. o. b. Mills— Rolls (carloads).....	3.50 @ 4.25	Book and Ledger— Flat Magazine and Book Stock (old).....	1.45 @ —
Sheets (carloads).....	— @ 4.25	Light and Crum- pled Book Stock.....	1.30 @ —
Sheets (2 tons or over).....	— @ 4.50	Ledgers and Writ- ings.....	1.80 @ —
Book— No. 1 M. F. (car- loads).....	9.50 @ —	Solid Ledgers.....	1.80 @ —
No. 2 M. F. (car- loads).....	8.50 @ —	Manila— New Manila Cut.....	1.90 @ —
No. 3 M. F. (car- loads).....	8.00 @ —	Printed Manilas.....	.90 @ —
No. 1 S. C. (car- loads).....	10.00 @ —	Kraft.....	2.25 @ —
No. 2 S. C. (car- loads).....	9.00 @ —	News and Scrap— Strictly Overissue.....	.90 @ —
No. 1 Coated and litho.....	14.00 @ —	Folded News.....	.80 @ —
No. 2 Coated and litho.....	13.00 @ —	No. 1 Mixed Pa- pers.....	.60 @ —
No. 3 Coated and litho.....	12.25 @ —	Domestic Rags— Price to mills, f. o. b. Toronto. Per lb.	
Coated and litho, colored.....	14.25 @ —	No. 1 White shirt cuttings.....	.09 1/4 @ .10
Wrapping— Grey.....	4.50 @ —	No. 2 White shirt cuttings.....	.05 1/2 @ .05 1/4
White Wrap.....	5.00 @ —	Fancy shirt cut- tings.....	.04 1/4 @ .04 1/4
"B" Manila.....	5.50 @ —	No. 1 Old whites.....	.04 @ —
No. 1 Manila.....	6.75 @ —	Thirds and blues.....	.02 @ .02 1/4
Fibre.....	6.75 @ —	Per cwt.	
Kraft, M. F.....	8.00 @ —	Black stockings.....	1.75 @ 1.85
M. G.....	8.15 @ —	Roofing stock: No. 1.....	1.35 @ —
		No. 2.....	1.20 @ —
Pulp		Roofing stock: Manila rope.....	.04 1/4 @ .04 1/4
(F. o. b. Mill)		No. 2.....	.01 1/4 @ —
Ground wood.....	\$27.50 @ 35.00	Gunny bagging.....	1.00 @ 1.25
Sulphite easy bleach- ing.....	.60.00 @ 65.00		
Sulphite news grade.....	50.00 @ 60.00		

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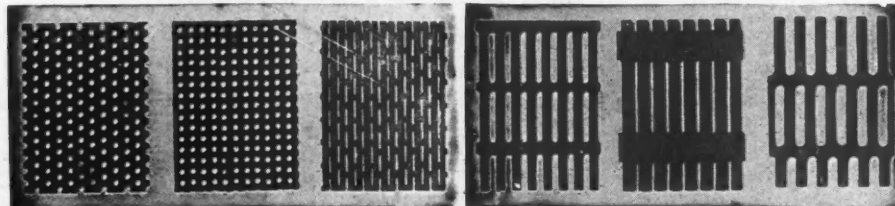
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WANTED—Boss finisher, mill making high grade bonds and ledgers; located Western Massachusetts. In replying give age, experience and references. Address, Box 5073, care Paper Trade Journal. Je-8

MACHINE DESIGNER WANTED: One having experience in designing pulp screens, thickeners and wet machines preferred. Plant located half way between Boston and Providence. Address, Box 5043, care Paper Trade Journal. Je-8

WANTED: One good steady Fourdrinier Machine Tender used to running light weight bond. Married man preferred. Address, Box 5104, care Paper Trade Journal. Je-8

POSITION OPEN for first class assistant superintendent in mill making Book Papers, also operating Greenwood Mill in connection therewith. Only a man who has had experience in both lines and understands the handling of help will be considered. All letters treated confidentially. Address, Box 5110, care Paper Trade Journal. Je-8

WANTED: First class thoroughly experienced machine tender for modern mill. One with experience on M.G. Tissue and light weight papers preferred. Give full details of qualifications, experience and reference in first letter. Address, Box 5111, care Paper Trade Journal. Je-8

WANTED: Two first class machine tenders and two beater engineers for book and railroad writing mill on Pacific Coast. None but A-1 men need apply. Send references in first letter. Address, Box 5112, care Paper Trade Journal. Je-8

WANTED—First class super calender man. Good pay for right party. Address, Box 5125, care Paper Trade Journal. Je-8

WANTED: One calender man on glassine and book papers. Good pay to right party. State whether married or single. Previous employment. All correspondence treated confidentially. Address, Box 5126, care Paper Trade Journal. Je-15

OPPORTUNITY: A rare opening for an experienced man as assistant to general manager of large Box Board Mill. A thorough knowledge of up-to-date costs necessary but not a part of the job. Address, Box 5127, care Paper Trade Journal. Je-8

WANTED: Clay Coated Board Salesman who has had practical experience in mill as well as sales experience. Good position open for right man. Address, Box 5128, care Paper Trade Journal. Je-8

WANTED: Experienced Machine Tender. Cylinder Machine. Tissue Mill. Give references. Address, Box 5130, care Paper Trade Journal. Je-8

WANTED: Boss Machine Tender and Beater Engineer for Mill making container board. Must be A-1 man, strictly sober and reliable. None other need apply. State wages and references in first letter. Address, Box 5136, care Paper Trade Journal. Je-15

WANTED: Responsible Paper Salesman with established following in converting and large consuming trade; New York and vicinity. Reply with full particulars. Address, Box 5137, care Paper Trade Journal. Je-8

WANTED: Outside Paper Salesman, prefer one familiar with fine papers. State experience, where, when and with whom employed. Address, C. F. Earl, care M. J. Earl, Reading, Pa. Je-22

NIGHT SUPERINTENDENT wanted for one machine board mill manufacturing .009 straw and straw board and chip board for set-up box work. Middle aged married man preferred. State salary and also references in your first letter. Mill located in the South. Address, Box 5138, care Paper Trade Journal. Je-22

YOUNG MAN with experience to direct manufacture and sales of Duplex Coffee Bag. Address, Box 5165, care Paper Trade Journal. Je-15

HELP WANTED

WANTED: First Class Back Tender for News Machine; Feed, six fifty per minute. Wages, 97 cents per hour. Have references and don't write unless you can do the work. Good mill and good town in Michigan. Address, Box 5142, care Paper Trade Journal. Je-8

WANTED—Operating Superintendent for small high grade coating mill. Permanent position for high grade man able to furnish first-class references indicating ability to handle men and knowledge of coating machinery and color mixing. Address, Box 5148, care Paper Trade Journal. Je-8

WANTED—Experienced Beaterman for Kraft and Manila Wrapping Papers. Apply with full particulars to Box 5149, care Paper Trade Journal. Je-15

WANTED—Capable and reliable Beater Engineer for Mill well located in middle west. Manufacturers of sulphite papers and specialties. Experience necessary on colors. Good wages. Three tour day. Address, Box 5150, care Paper Trade Journal. Je-15

WANTED—By large manufacturers with New York office and warehouse, young man about 25, who is sufficiently ambitious and progressive to make himself useful in every capacity from the ground up with the ultimate intention of being of service in the sales and executive end of the business. State salary and experience. Address, Box 5151, care Paper Trade Journal. Je-15

WANTED—An energetic experienced Sulphite Superintendent for 50-ton mill making bleached and unbleached pulp. Tower system. Good opportunity for the right man. Give references. State salary. Address, Box 5152, care Paper Trade Journal. Je-15

WANTED—Competent man to take charge of converting department of mill making toiles and toweling. Excellent opportunity for right man. Address, Box 5153, care Paper Trade Journal. Je-8

WANTED—Night boss for mill making Book Paper; two tours. Steady work. State age and experience. Give references. Address, Box 5154, care Paper Trade Journal. Je-8

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required for Mill in England. 3 multi-cylinder Beloit Machines. Must be capable of taking charge of mechanical and power side (steam and electrical), as well as the manufacturing. State experience fully and give particulars regarding salary, age, family, etc. Apply marked, "PRIVATE," Thames Paper Co., Purfleet, Essex, England.

Je-8

SITUATIONS WANTED

POSITION WANTED by practical paper maker and mechanic and good organizer. What kind of position have you to offer? Address, Box 5079, care Paper Trade Journal. Je-2

PAPER SALESMAN in New York City who can produce a large volume of business with adequate co-operation, desires connection. Drawing account on Commission basis. Correspondence invited. Address, Box 4635, care Paper Trade Journal. Je-8

WANTED POSITION—As superintendent. Twenty-one years' experience; used to Specialties, Colors and Wrapping, all grades of Boards and Fibres. Knows how to handle help. Can keep up repairs. Used to Fourdrinier and Cylinder Machines. Address, Box 4786, care Paper Trade Journal. Je-8

MASTER MECHANIC desires position. Twenty years' experience in mills of all grades of paper and pulp, also on steam, water and electric power. Best references. Address, Box 5014, care Paper Trade Journal. Je-15

EXECUTIVE with managerial ability, trained office manager, accountant and cost expert, student of Walton School of Commerce, Alexander Hamilton Institute and Industrial Extension Institute; specially experienced in paper mill administrative problems, seeks position of trust and responsibility. Highest references given. Address, E. J. B., P. O. Box 760, Cincinnati, Ohio. Je-8

WANTED position as superintendent or assistant superintendent. 19 years' experience on box board and container board. Good on repairs and can get results. Good references. Address, Box 5052, care Paper Trade Journal. Je-8

WANTED: By a New York Manager and Representative of an out of town Manufacturer of Toilet Paper and Paper Towels, similar connection with reputable manufacturer. Have been in the line over 20 years, over 15 years of which I have spent with my concern. Address, Box 5114, care Paper Trade Journal. Je-8

MANAGER AND SUPERINTENDENT: Two men with many years of experience in rebuilding and bringing mills up highest efficiency. If you require the best that practical experience and training can give. It is at your disposal on a salary basis; on salary and a percentage of net profits on increased production. If your mill is not on a paying basis, write us at once. Our experience covers the following on cylinder machines. Boards: Best, fancy, box, single and double patent coated; Jute, chip (fancy and plain, single manila lined, bleached manila lined); Tag (Oak, manila and filler folder); and milk bottle cap. Specialties: Albums, Kodak, Book Covers, Electric Papers, Socket and Shell Papers; Battery Boards; Bristol (solid index and filler); Paraffin papers and wrappings. We have intimate knowledge of raw material markets and can furnish the best of skilled help. Address, Box 5115, care Paper Trade Journal. Je-8

A THOROUGH PAPERMAKER with twenty-eight years manufacturing experience, considerable wholesale and jobbing experience desires to connect with some good house as manager or buyer, high grade references furnished on request. Address, Box 5116, care Paper Trade Journal. Je-8

SUPERINTENDENT of many years' experience in producing Box Boards is seeking a connection where quantity and quality production at a minimum cost will be recognized. Have best of references, for efficiency and maintaining harmony among employees. Address, Box 5117, care Paper Trade Journal. Jy-13

TECHNICAL MAN with practical operation experience in Soda Pulp manufacture is open for engagement. Has developed technical control methods on mill operations and supervised the recovery of pulp making chemicals. Details furnished on inquiry. Good references. Address, Box 5122, care Paper Trade Journal. Je-8

UNIVERSITY GRADUATE with several years' paper mill experience wishes position with future. Will do anything, go any place. Address, Box 5140, care Paper Trade Journal. Je-8

SITUATIONS WANTED

SUPERINTENDENT now employed as such work who had practical experience on Cylinder, Harper, Fourdrinier and Combination machines, well posted on nearly all grades of paper, also practical experience on ground wood and sulphite; also mill construction and upkeep of same. Past records show good results. Would prefer commission proposition, also invest capital with reputable company. Address, Box 5132, care Paper Trade Journal. Jy-6

AN EXPERIENCED ACCOUNTANT wants to locate with live paper mill or box concern. Employed at present, but has best of reasons for desiring new connection that promises a future. Young married man with family, but will consider any location that offers advantages. Address, Box 5133, care Paper Trade Journal. Je-8

POSITION WANTED: Inside, Paper House or Mill Agency, by man with considerable experience with printing papers. Has also been selling and is acquainted with trade in New York. Will start at a small salary. Address, Box 5133, care Paper Trade Journal. Je-8

I HAVE about twelve years' experience in Toilet Paper, Towel and Napkin business. Practical experience in converting and printing departments and thoroughly familiar with all work and machinery. Am capable office man; experienced shipping and billing clerk. Traffic manager and sales manager. Have about five years' traveling experience covering the southern portion of the United States from Maryland to California. Also familiar with exports to the Latin Americas. Twenty-eight years of age. Desires position preferably "inside" with actual manufacturer, and one who would be interested in developing my towel and napkin cabinet, which is entirely different and much simpler than any on the market. Address, Box 5144, care Paper Trade Journal. Je-1

YOUNG MAN, 25, married, wishes to connect with Paper Mill. Has had experience in Paper Mill cost accounting, payrolls and mill systems; also selling experience. At present calling on printers and publishers. Feels qualified to fill almost any inside position or be useful in Sales Department. Address, Box 5145, care Paper Trade Journal. Je-15

PRACTICAL PAPER MAKER wants position as Boss Beater Engineer or Assistant Superintendent. Up to date on most all grades wood, rag and old papers. Fourdrinier and Cylinder experience on machine as well as beaters. Married and can give best references from best mills in the country. Address, Box 5155, care Paper Trade Journal. Je-15

SITUATION WANTED by first-class Cylinder Machine Tender. Married and steady. Can furnish best of references. Address, Box 5156, care Paper Trade Journal. Je-8

WANTED—Position as Superintendent or Assistant Superintendent. Fifteen years' experience, used to box board, container board, color and straw. Knows how to handle help and keep up repairs. Good references. Address, Box 5157, care Paper Trade Journal. Je-15

SULPHATE AND SODA PULP and Paper Maker, open for new connections, as Manager or General Superintendent. Fully experienced in details of construction, chemical control, and mechanical equipment. Successful in handling labor problems. Address, Box 5158, care Paper Trade Journal. Je-22

GRADUATE MECHANICAL ENGINEER, aged 36, desires position as Plant Engineer or Assistant Superintendent, where maintenance and improvements, relating to plant as well as production, would be chief duties. Thoroughly familiar with paper working and printing machinery. Address, Box 5159, care Paper Trade Journal. Je-22

MANUFACTURER of a novel paper specialty suitable for shopping bags and kindred lines, for shipping tags, for files and book covers, etc., desires to correspond with able distributors. Address, Box 5160, care Paper Trade Journal. Je-22

MILL MANAGER of several years' experience, will be open for position on August 1, with concern that can offer good future to ambitious and capable man. Wide experience on cylinder and fourdrinier machines making rope, jute, and wood specialties. References sent on request. Address, Box 5163, care Paper Trade Journal. Je-9

SITUATIONS WANTED

WE INVITE able, practical, paper mill men who have funds to invest in a mill property, and who wish to be in active management, to correspond with us. We have two good sized mills for sale whose chief owners are aging, and who are willing to sell their properties outright, or a controlling interest only, to capable men of high standing who know the business thoroughly. We are handling this business confidentially for the owners and will do likewise for prospective buyers. Gibbs Brower Co., 261 Broadway, New York. 166 W. Jackson St., Chicago, Ill. Je-8

SALESMAN, 34 years of age, well acquainted with New York Jobbing and Boxboard Trade, wishes to make connection with Mill in New York Office. Have exceptional knowledge of Book Papers and Boards. Address, Box 5164, care Paper Trade Journal. Je-25

SUPERINTENDENT of ability open for position with good company. Eighteen years practical experience making tissues, all grades, waxing tissues, white and colored, semi crepe, plain and colored crepe papers, all grades twine and carpet fibres, test papers. A No. 1 on colors. I am rated as a high grade man on kraft and kraft specialties. Fourdrinier and Cylinder Machines. First class references. Address, Box 5166, care Paper Trade Journal. Je-22

BEATER ENGINEER wishes to make a change from his present position. Experienced on high grade Box Boards, Tests, etc. Also fine papers. Married, sober. Good references. Address, Box 5167, care Paper Trade Journal. Je-22

UNIVERSITY GRADUATE, executive ability, extensive experience in mills and wholesale paper trade, seeks position of trust and responsibility. Highest references. Address, Box 5168, care Paper Trade Journal. Je-8

SUPERINTENDENT - MANAGER Wants position. Twenty years' experience on all grades paper. Expert on colors. Fourdrinier and cylinder machines. Best references. Address, Box 4988, care Paper Trade Journal. Je-22

MR. MANUFACTURER,
ATTENTION!

We are mill representatives and in a position to take on the selling agency for several more mills. Our specialty is the paper box making trade. We wish to consider other lines. Only straight commission and exclusive territory considered. Correspondence solicited. The R. T. Olsen Paper Co. 211 American Casualty Bldg., Reading, Pa. Je-15

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FOR SALE: 14 Calender Rolls, 53" face, 3' to 14" diameter. 2 No. 1 Clafin Engines. 1 small Jordan Engine. 1 6" Horizontal Water Pump. 2 Air Fans. Complete triple-deck frames for 44 Dryers. Will arrange terms to suit. Chesapeake Paper Board Co., Baltimore, Maryland. Jy-22

FOR SALE. Printing press. One 7 Single Color. Cottrell Rotary. Excellent condition. Sacrifice. Mr. Dudley, McCall Company, 236 West 37th Street, New York City, Telephone Longacre 2190. Je-8

FOR SALE: One Dietz Toilet Machine, will handle 76" Jumbo Rolls, cut sheets 4 1/2 x 5. Machine has no slitter bars, but have slitters. Address, Box 5155, care Paper Trade Journal. Je-22

FOR SALE—1 45-inch Knowlton Slitter with Double Rewinder. Complete with mill roll and rewinding shaft and 5 sets of Slitter Knives. This machine is in strictly first-class condition and is listed today at \$1,200 to \$1,400. Our bargain price is \$500 f.o.b. Chicago, by Mid-State Gummed Paper Company, 2453 South Robey St., Chicago, Ill. Je-8

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FOR SALE—One 36 x 48" Kidder, 2 color, rotary, roll product press. Never used. Address, Box 5161, care Paper Trade Journal. Je-8

FOR SALE

A partially dismantled paper mill. Good location. 400 H.P. Water Power. Permanent flow of pure Spring Water. Price extremely low. Unusual opportunity. Address, P. O. Box 366, Holyoke, Mass. Je-29

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WANTED—Cylinder machine to trim 60 inches, give full particulars of machine and drive. Could also use three to five beaters, 1200 to 1500 lbs. capacity, if in good condition. Address, Box 5162, care Paper Trade Journal. Je-8

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DILLON DOCTORS—For Machine Calenders 60" to 120" face.
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JORDANS—One Wagg Majestic, two No. 2 Dillon Improved, one Large Horne, three Monarch, one Jones Standard, two Pope Brushing Engines.
SCREENS—One 12 plate, six 10 plate open side Packer, two 6 plate, one Moore & White auxiliary.
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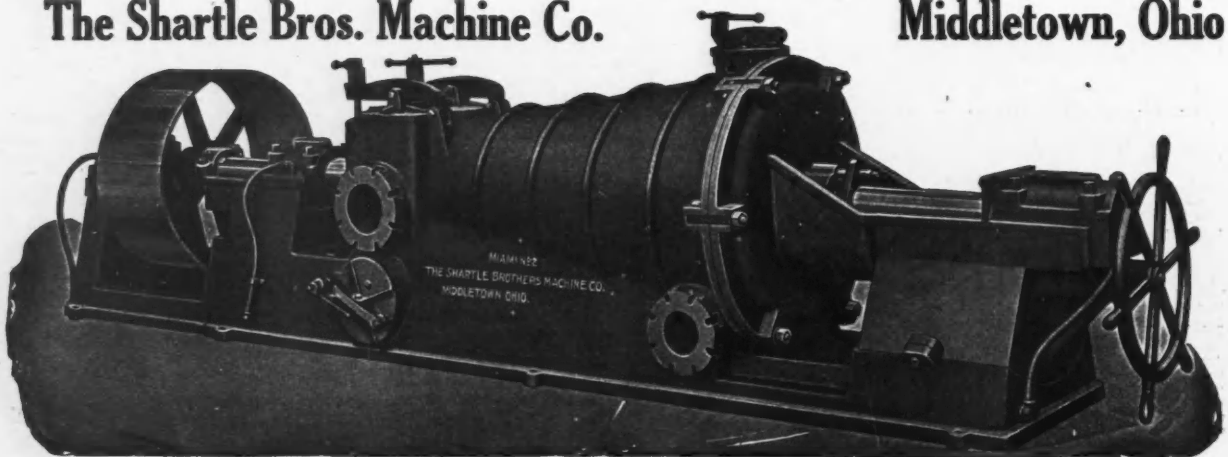
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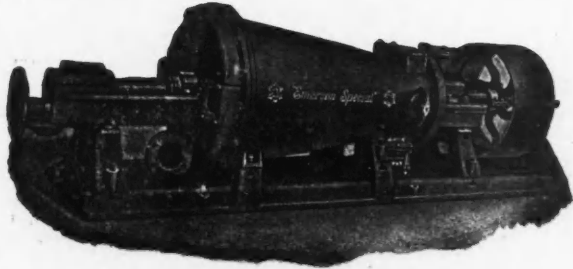
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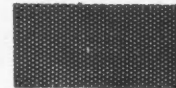
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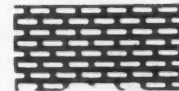
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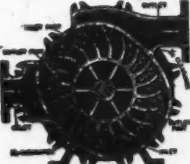
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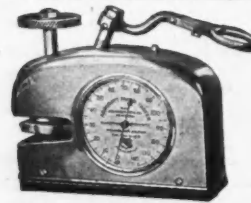
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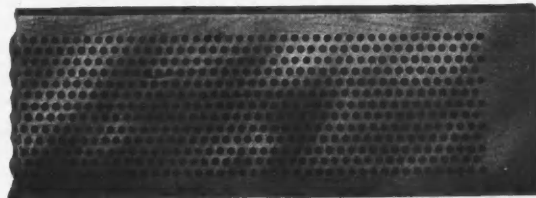
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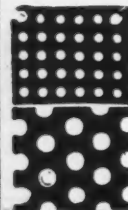
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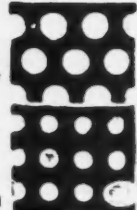
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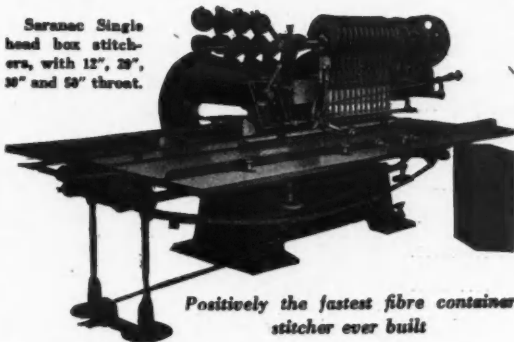
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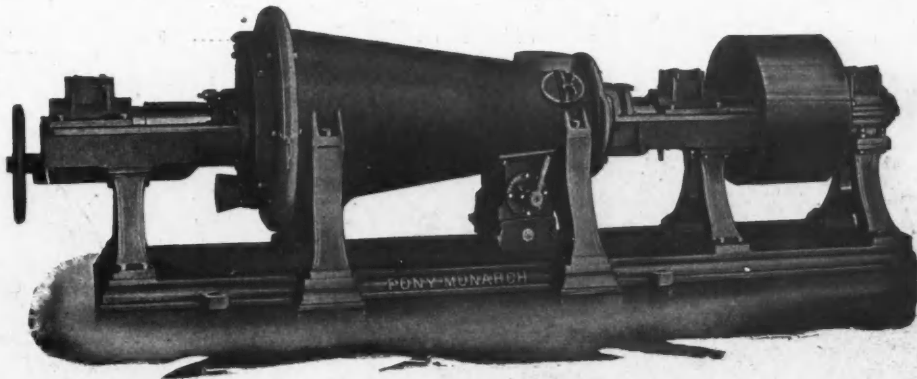
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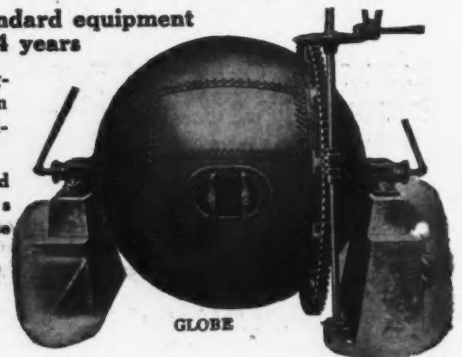


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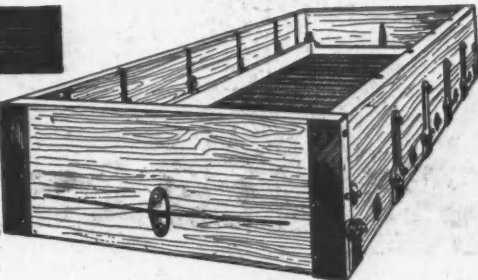
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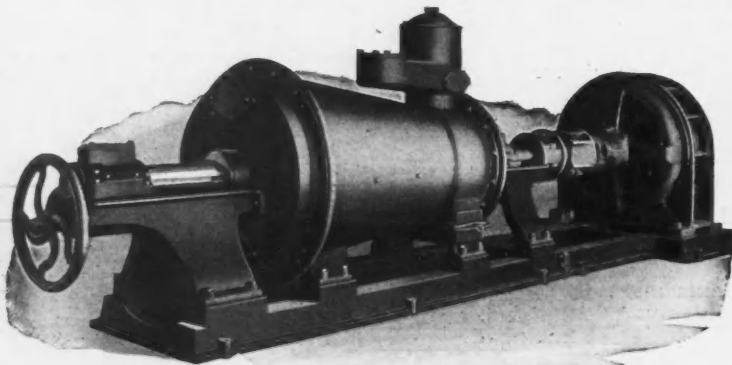
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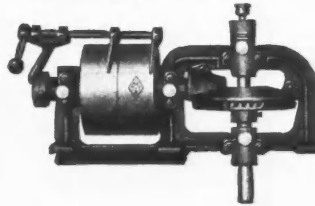
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