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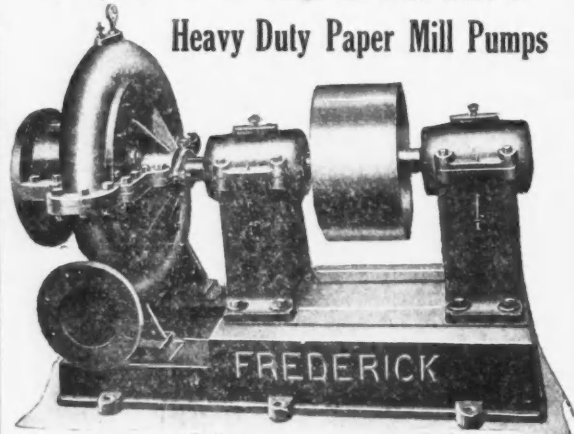
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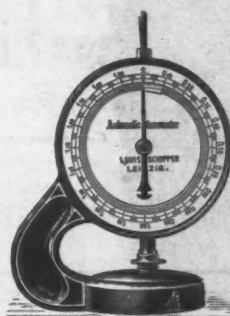
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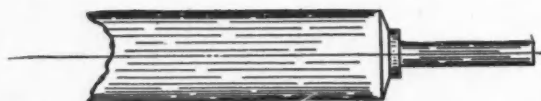
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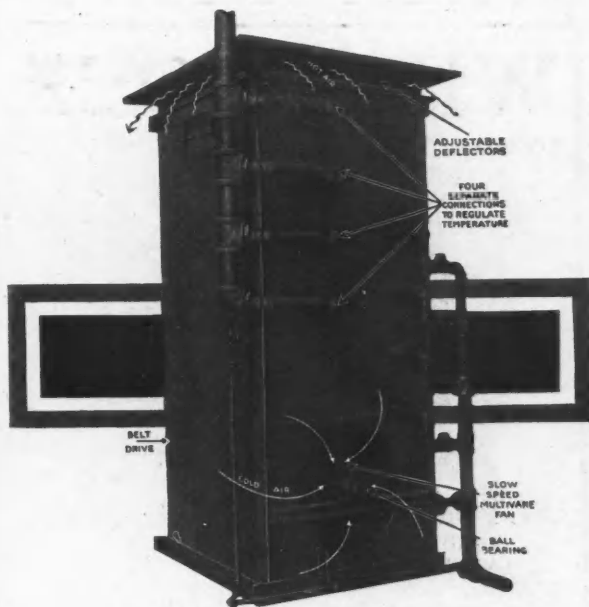
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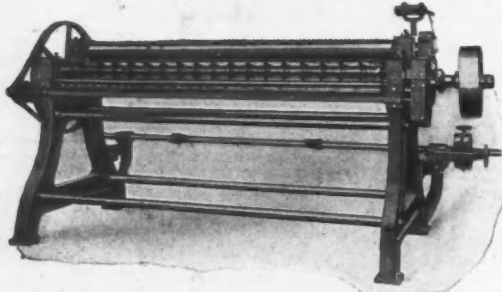
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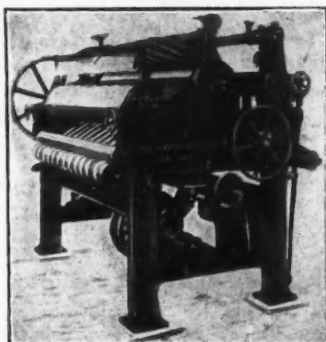
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THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY

FIFTIETH YEAR

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Thursday, December 29, 1921

Table of Contents

News of the Trade:

	PAGE
Production of All Paper During November.....	16
New York Foresters to Meet Monthly.....	17
Paper Production Bigger in November.....	17
Printers in Philadelphia Work for "Long List".....	18
Statement of Typhotetæ on "Long List".....	18
Trade Customs Amended by Philadelphia P. T. A....	18
General News of Philadelphia Trade.....	19
The Weight of Any Pile of Paper.....	19
Crisis Believed to Be Passed in Canadian Paper Trade.	20
Montreal Lumbermen's Association Meets.....	20
Toronto Paper Business Continues Rather Slow.....	21
General News of Toronto Trade.....	21
Paper Men Appear Before Finance Committee.....	21
Kalamazoo Cost Association Elects Officers.....	22
Production of Ground Wood During November	22
Improvement in Outlook Over Last Year in Chicago..	23
McNulty Paper Corp., Chicago, Increases Sales Force.	23
General News of Chicago Trade.....	23
Big Stock Frauds in Boston.....	23
Kalamazoo Paper Co. Buys Cutter.....	23
Power Costs in Paper Mill Accounting.....	24
New York Trade Jottings.....	28
Selection of Pumps for Paper Mills.....	30
Additional Support for Forestry Legislation.....	41
Propaganda Against American Valuations.....	41
An Interesting Message from Hamilton's Dandy.....	44
Rosin Sizing	52
Researches in Lignin.....	51
Saving Steam in Drying Machines.....	51
Engineering As Related to Pulp and Paper Industry..	54
Steam Jet Ash Conveyors in Paper and Pulp Mills...	60
Royal Paper Co. to Move.....	60

Rates in Paper, Rags, and Old Rope.....	62
Exports and Imports of Paper and Paper Stock.....	64

Editorial:

The Year's Outlook.....	40
American Valuation Plan.....	40

Technical Section:

Bleaching and Related Processes.....	43
Sulphite Mills Operated Without Fuel?.....	45
Sulphite Mills Operated Without Fuel.....	45
Notes on the Copying Qualities of Letter-Copying Paper	47
Utilization of Cellulose Waste Liquors.....	49
Current Paper Trade Literature.....	51

Practical and Technical:

Questions and Answers.....	58
----------------------------	----

Obituary:

Frank S. Arnold.....	28
George Hall	28
Josiah H. Drummond.....	28

Market Review:

New York Market Review.....	62
Market Quotations	63
Miscellaneous Markets	66

Want and For Sale Advertisements, Pages 68 and 69

PRODUCTION OF ALL PAPER DURING MONTH OF NOVEMBER

According to Statistics Just Furnished by the Federal Trade Commission, the Mill Stocks on Hand of News Print at the End of the Month Equalled Five Days' Average Output, Stocks of Book Paper Equalled Twelve Days' Average Output, Stocks of Paper Board Equalled Nine Days' Average Output, and Stocks of Wrapping Paper Equalled Twenty-One Days' Average Output.

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., December 28, 1921.—The attached tabulation is a summary of production, shipments and stocks of paper mills in the United States compiled by the Federal Trade Commission for the month of November, 1921. This summary is compared with the month of November, 1920, 1919 and 1918, and the average production and stocks based upon the production and stocks for the years, 1918, 1919 and 1920. The mills have been classified for convenience into 12 groups according to the grades of paper made. Some mills making several grades appear in more than one group which causes duplication in the body of the tonnage tables in the number of mills.

The variation in the number of mills from one period to another is due in part to the fact that some mills do not run continuously on the same grade.

The stocks of paper carried by different mills depend not only upon the condition of the market but also upon the kind of paper made, trade customs, etc.

Tonnage Summary

Production, Shipments and Stocks of paper, by Grades, for the month of November, 1921, compared with November, 1920, 1919, and 1918, and with average production and stocks:

Grade	Number of mills	Stocks on hand 1st of month Net tons	Production Net tons	Shipments Net tons	Stocks on hand end of month Net tons
News Print (Standard and Special Grades of News):					
November, 1921	86	23,015	104,604	104,492	23,127
November, 1920	83	22,596	122,993	125,323	20,266
November, 1919	81	16,100	116,603	117,367	15,336
November, 1918	61	20,732	101,403	101,838	20,297
Average	...	...	112,925	...	23,763
Standard News:					
November, 1921	67	18,227	97,521	96,853	18,895
November, 1920	67	19,651	111,313	114,365	16,599
November, 1919	56	12,646	101,264	102,120	11,790
November, 1918	50	16,731	86,371	86,406	16,696
Average	...	...	101,650	...	19,528
Book (M. F., S. S. C. & Coated):					
November, 1921	87	32,343	73,544	68,827	37,060
November, 1920	94	20,826	89,564	85,827	24,563
November, 1919	96	26,838	84,085	83,630	27,293
November, 1918	87	29,753	65,374	65,634	29,493
Average	...	...	78,125	...	28,328
Paperboard—total—(Straw, Fibre, Leather, Chip, etc.):					
November, 1921	223	57,169	172,582	169,971	59,780
November, 1920	252	42,222	133,818	127,072	48,969
November, 1919	254	48,417	182,940	188,273	43,084
November, 1918	227	41,756	148,671	148,922	41,505
Average	...	...	168,575	...	45,530
Boxboard:					
November, 1921	126	29,805	127,249	125,089	31,965
November, 1920	148	18,753	91,092	86,138	23,707
Average	...	...	112,600	...	19,303
Wrapping (Kraft, Manila, Fibre, etc.):					
November, 1921	130	52,378	65,905	68,078	50,205
November, 1920	144	20,700	65,920	61,034	25,586
November, 1919	164	39,596	63,394	70,434	32,556
November, 1918	160	34,595	59,572	59,001	35,166
Average	...	...	61,000	...	39,488
Bag (all kinds):					
November, 1921	38	3,737	19,161	19,148	3,750
November, 1920	40	2,362	13,152	12,729	2,785
November, 1919	46	2,765	17,047	17,380	2,432
November, 1918	40	3,938	14,150	14,138	3,950
Average	...	...	15,375	...	3,365

Fine (Writing Bonds, Ledgers, etc.):					
November, 1921	102	33,957	24,609	25,177	33,389
November, 1920	109	28,968	31,208	29,991	30,185
November, 1919	117	33,017	32,468	32,334	33,151
November, 1918	115	30,425	30,322	27,283	33,464
Average	...	...	29,975	...	31,835
Tissue (Toilet, Crepe, Fruit Wrappers, etc.):					
November, 1921	86	6,570	15,169	15,928	5,811
November, 1920	97	6,806	9,653	8,344	8,115
November, 1919	90	6,469	14,524	14,776	6,217
November, 1918	87	5,201	11,472	11,095	5,578
Average	...	...	12,975	...	6,453
Hanging (No. 2 Blank, Oatmeal, Tile, etc.):					
November, 1921	21	9,429	7,505	8,078	8,856
November, 1920	24	1,809	9,698	8,963	2,544
November, 1919	26	3,599	8,222	9,841	1,980
November, 1918	19	2,524	5,688	5,976	2,236
Average	...	...	7,325	...	3,296
Felts and Building (Roofing, Sheathing, etc.):					
November, 1921	45	6,513	29,759	29,533	6,739
November, 1920	50	13,461	16,961	16,306	14,116
November, 1919	51	5,956	28,416	28,827	5,545
November, 1918	50	8,514	19,698	20,818	7,394
Average	...	...	25,425	...	8,571
Other Grades (Specialties not otherwise classified):					
November, 1921	87	19,546	23,038	22,374	20,210
November, 1920	95	14,230	25,177	23,692	15,715
November, 1919	90	15,491	21,785	20,905	16,371
November, 1918	73	10,371	21,716	21,283	10,804
Average	...	...	21,425	...	17,784
Total—All Grades:					
November, 1921	...	244,657	538,876	531,606	248,927
November, 1920	...	173,980	518,144	499,281	192,843
November, 1919	...	198,248	569,484	583,767	183,965
November, 1918	...	187,809	478,066	475,988	189,887
Average	...	...	533,125	...	203,373

NOTE:—The average production of stocks are based upon the annual reports for 1918, 1919, and 1920.

The following stocks were reported on hand at terminal and delivery points on November 30 in addition to the mill stocks shown in the tabulation; News Print, 127 tons; Book Paper, 3,345 tons; Fine, 25 tons; Wrapping, 5 tons; and "Other Grades," 219 tons.

Stocks of News Print, Standard News, Book, Paperboard, Boxboard, Bag, Felts and Other Grades increased during the month. Stocks of all grades reported by manufacturers at the end of November amounted to 252,648 tons, including the stocks at terminal and delivery points. In addition to these stocks, jobbers and publishers reported news print in stock and in transit aggregating 211,131 tons.

Ratio of Stocks to Average Production

Comparing the stocks on hand at the domestic mills on November 31 with their average daily production based upon the combined production for 1918, 1919, and 1920, the figures show that:

- News print paper mill stocks equal 5 days' average output.
- Book paper mill stocks equal 12 days' average output.
- Paper board mill stocks equal 9 days' average output.
- Wrapping paper mill stocks equal 21 days' average output.
- Bag paper mill stocks equal about 6 days' average output.
- Fine paper mill stocks equal 28 days' average output.

Imports and Exports

The imports and exports of all grades of paper for October, 1921, compared with October, 1920, as shown by the records of the Department of Commerce were as follows:

	October, 1921		October, 1920	
	Pounds	Value	Pounds	Value
Imports:				
News print	151,195,091	\$6,118,982	116,778,979	\$6,444,285
Book paper	38,887	3,919	146,903	16,301
Wrapping	1,024,106	37,400	370,816	31,545
Hanging	...	22,427	...	21,288
All other grades (a)	...	186,794	...	277,607
Exports:				
News print	1,408,737	71,293	4,703,141	398,085
Book paper	1,471,958	134,040	7,058,787	1,143,236
Paper board	...	135,735	...	482,306
Wrapping	1,434,273	96,684	4,377,168	561,005
Bag	...	43,315	...	308,131
Fine	...	179,553	...	731,849
Tissue	...	107,540	...	272,763
Hanging	...	30,517	...	118,464
All other grades (a)	...	365,553	...	1,140,943
Total imports	...	6,369,522	...	6,791,026
Total exports	...	1,164,230	...	5,156,782

(a) Includes some paper already converted into commercial articles.

News print is the only grade of which the United States is a heavy importer. The bulk of this tonnage, the value of which amounted to \$6,118,982 for October, 1921, is imported from Canada. The value of the exports of News Print in October, 1921, amounted to \$71,293, which is about 1 per cent of the News Print imported.

Book, Wrapping, Paperboard, Fine, and Tissue were the principal grades exported, as to value.

The value of the total imports of all grades was about 2 per cent less than for September, 1921. The value of the total exports for October, 1921, was \$3,992,552 less than the value of the exports for October, 1920, and \$5,205,292 less than the value of the imports for October, 1921.

Loss of Production

The idle machine time reported to the Commission is shown by grades in the tabulation attached. This tabulation does not include the machines in 21 mills which were closed down completely. The reasons tabulated for lost time are lack of orders and repairs. "Other Reasons" include lack of material; lack of water power, etc. The time lost in November, 1920, is given by grades and reasons for purposes of comparison.

It was a surprise to most of those present to learn that in the New York district there are about eighty forest school graduates. Several of these are connected with commercial concerns in their professional capacity, especially those in the paper industry, which is going more and more deeply into the forestry problem. Among these are Dr. Hugh P. Baker, secretary of the American Paper and Pulp Association, the federated organization of the paper industry in the United States; O. M. Porter, secretary of the Woodlands Section, the raw material department of that association, and R. S. Kellogg, secretary of the News Print Service Bureau, also chairman of the National Forestry Program Committee. Julian Rother, of the forestry department of the International Paper Company, and E. A. Sterling, of the James D. Lacey Company, which has done extensive work in cruises of pulp wood timber, are others in the paper group.

Paper Production Bigger in November

"While business conditions are unquestionably far better than they have been in recent months, and the worst of the depression is over, there seems from a survey of the paper industry as compared with general business, to be no doubt that a spirit of conservatism should be maintained," says *The Paper and*

Grade	Lack of orders		Repairs		Other reasons		Total	
	1921	1920	1921	1920	1921	1920	1921	1920
News Print:								
Number of machines.....	11	8	15	12	17	11	43	31
Total hours idle.....	1,360	1,817	1,027	805	1,737	2,318	4,124	4,940
Book Paper:								
Number of machines.....	116	19	42	20	62	12	220	51
Total hours idle.....	15,555	2,197	2,859	2,063	3,232	1,803	21,646	6,063
Paper Board:								
Number of machines.....	152	147	46	67	74	55	272	269
Total hours idle.....	31,123	38,222	3,059	12,295	12,821	11,512	47,003	62,029
Wrapping:								
Number of machines.....	40	54	29	28	43	32	112	114
Total hours idle.....	10,324	10,593	1,962	4,199	3,800	6,945	16,086	21,737
Bag:								
Number of machines.....	4	5	7	4	8	8	19	17
Total hours idle.....	830	1,028	189	250	479	813	1,498	2,091
Fine:								
Number of machines.....	88	28	63	20	58	28	209	76
Total hours idle.....	14,762	8,279	7,394	6,258	3,780	4,035	25,936	18,572
Tissue:								
Number of machines.....	12	58	21	24	30	13	63	95
Total hours idle.....	664	17,671	2,271	2,972	3,228	1,785	6,163	22,428
Hanging:								
Number of machines.....	5	2	1	4	3	4	9	10
Total hours idle.....	680	62	129	164	397	343	1,206	569
Felts and Building:								
Number of machines.....	20	26	15	6	19	9	54	41
Total hours idle.....	4,165	7,564	783	567	1,243	2,035	6,191	10,156
Other Grades:								
Number of machines.....	30	12	26	10	23	17	79	39
Total hours idle.....	4,143	2,697	1,914	754	3,040	3,186	9,097	6,637
Total number of machines.....	478	359	265	195	337	189	1,080	743
Total hours idle.....	83,606	90,130	21,587	30,327	33,757	34,775	138,950	155,232

New York Foresters to Meet Monthly

The New York Forest Club, consisting of the foresters in and about New York City, has, after a year of informal organization, decided to make itself a more definite organization for the discussion of forestry problems, and has elected E. A. Sterling chairman and O. M. Porter secretary. The club has decided to hold monthly meetings, to which all foresters visiting in the city are invited, the meeting date being fixed as the second Tuesday of each month, with a 1 o'clock luncheon at the Yale Club. An effort will be made to have the foresters of the entire country so arrange their visits to New York, when possible, as to be present at this time.

At the first meeting of the year, when a more formal organization was decided upon, the foresters discussed the proposed transfer of the United States Forest Service from the Department of Agriculture to the Department of the Interior. While the sentiment of those present was evidently against such a transfer, it was decided that further facts regarding the proposition must be secured before any definite action could be taken either by the club or by the New York Section of the Society of American Foresters, to which most of those present belong.

Pulp Industry, the monthly bulletin of the American Paper and Pulp Association.

"Conditions in the paper industry, in all its branches, can be said to justify the statement that the industry has entirely liquidated, but there is no reason for undue optimism on this account, for any recovery of business will be slow, particularly until after the inventory and holiday period. Some pulp mills have sold up their output for a year at present prices.

"Orders and production in the fine paper market experienced steady gains during the fall months. Operations advanced from a 50 per cent level in September to a 75 per cent level in November.

"Early in December the volume of orders declined somewhat as is customary just before the inventory period. Nevertheless, manufacturers feel reasonably assured of a resumption of demand in fair volume immediately after the first of the year, as there is a general understocked condition straight through from the consumer to the paper manufacturer.

"After the first of the year there should be a tendency to increase these stocks, but the movement will probably be very cautious."

PRINTERS IN PHILADELPHIA WORK FOR THE "LONG LIST"

Members of Typothetae Who Attended Meeting Last Week Are Requested, It Is Said, to Sign Agreement to Make No Purchases from Firms Who Refuse to Agree to the "Long List" on January 1—Philadelphia Paper Trade Association Formulates Amended Trade Customs—New Trade Customs Approved by the Glazed Paper Members of Fine Paper Division of Philadelphia Paper Trade.

[FROM OUR REGULAR CORRESPONDENT.]

PHILADELPHIA, December 27, 1921.—The printer members of the Typothetae held a special meeting last week, apparently with the desire to keep the proceedings secret. The chairman of the Trades Customs Committee, William Sharpless, refused to give any account of the proceedings. The distributors, however, it is said, had promptly furnished them copies of an agreement which the fifty or sixty members who attended were requested to sign agreeing to make no purchases from firms which refused to accede to the "long list" on January 1. Typothetae officials insist that it has taken no attitude which would bring it within the scope of the law against unfair trade practices, but the distributors are by no means so sure that a meeting at which pledges of the kind signed do not constitute an actionable matter.

There was read at the meeting of the printers a telegram from Bryant Venable of the Whitaker Company, which according to Typothetae forecast will come out with a "long list" on January 1, but just what interpretation is to be placed upon the message seems to be a matter of diverse opinion. Stress was laid on the fact that during the week the West Virginia Pulp and Paper Company, through Lindsay Brothers, distributors, announced that beginning January 3, all Westvaco Mill brands of papers, sold through the Mill Price List will be sold only to printers, publishers, lithographers, stationers, converters and those operating printing plants. The Lindsay firm said that under no circumstances could the announcement be construed as in any way an endorsement of the "long list," but that on the contrary it merely reaffirmed the position taken by the Philadelphia distributors that they proposed to continue selling on a price list which was honest and that sales would be restricted to the trade as against the consumer.

Statement of the Typothetae

During the week the Typothetae sent out another circular letter on the long Price List. It follows:

"The retail or long price list is rapidly becoming a national issue. Its adoption is nearer every day. There is absolutely no doubt that the retail price list is the only fair and just method of merchandising paper; and when properly adhered to, will increase mutual respect between printers and paper merchants.

"Reports from New England, New York, Baltimore, Washington and Richmond show a fixed determination on the part of printers to compel its institution on January 1, 1922. The printers of New England have decided to issue and circulate a long price list of their own, listing only mill brands. This will offset the effect of jobbers' net lists which have always made the paper jobbers a competitor of the printer.

"At a very live conference held in New York by prominent printers representing all the New England and the entire Atlantic Coast, it was decided the retail price list as successfully used in Detroit for the past eight years must become the standard for all districts represented.

"Philadelphia is assured of the adoption of the retail price list by January 1, 1922, by several paper merchants to whom our unstinted support should be given in order that we may fully cash in on its benefits. These merchants have a most comprehensive line and are in a position to supply us with any or all our requirements.

"If such support is given, it will only be a short time before the retail price list will be recognized everywhere as the national standard list. It will not only benefit the printer and elevate the industry to an equal plane with other large industries, but will also benefit every paper merchant who adopts it as their standard."

Paper Men Take No Further Action

The Philadelphia Paper Trade Association having taken the position that the "long list" is absolutely a national issue, consistently took no further action regarding the issue as closed. However, the statement made by National Secretary William C. Ridgway, that should the printers insist in their attitude, the case will be laid before the public, which, after all, is most vitally concerned, has given the cue to the distributors. They are not fearful of a decision by the public when all the facts in the "net list" vs. the "long price" list are laid before it for judgment.

Amended Trade Customs

The amended trade customs adopted at the meeting of the Philadelphia Paper Trade Association a week ago were formulated during the week by William S. Wilcox, chairman of the committee which drew them up. Mimeographed copies were sent to the trade. They follow:

BROKEN PACKAGES

An advance of 25 per cent will be charged on less than an original package, for all ledgers, writings, bonds, book, coated books, blottings, covers, onion skin, and all light weight paper.

CUTTING CHARGES

Bonds, Writings, Linens and Ledgers:

One cent per pound to 8 x 10½. Smaller sizes two cents per pound.

Books, Coated, Covers, Posters and News Print:

One-half cent per pound to 9 x 12. Smaller sizes one cent per pound.

Blottings:

One-half cent per pound to 4 x 9½. Smaller sizes one cent per pound.

Onion Skins:

For folio, royal or double cap cut to 8 x 10½, 20 cents per ream. Smaller sizes 30 cents per ream.

Tissues:

Two cents per pound to 6 x 9. Smaller sizes four cents per pound.

Wrapping Papers:

One-half cent per pound to 6 x 9. Smaller sizes one cent per pound.

Glassine, Parchment and Wax:

Twenty-five cents per ream to 6 x 9. Smaller sizes 50 cents per ream.

Gummed Paper:

Fifty cents per ream—3 x 5. Smaller sizes time work.

Minimum Charge for any Cutting Job 25 Cents

TRADE CUSTOMS ON CARD CUTTING

On boards up to and including 6 ply, hand cut, stock size, to 4 x 5, including boxes 50 cents M.

Hand cut, special sizes, to 4 x 5, including boxes 60 cents M.

Machine cut to 7 x 11, 35 cents M.

All other cutting figured on the basis of time required.

Minimum charge of 25 cents.

Trade Customs approved by Glazed Paper Members of Fine Paper Division Philadelphia Paper Trade Association:

CUTTING CHARGES

Glazed Plated and Box Covering Papers:

Thirty-five cents per ream (basis 20 x 26) to 6 x 9; smaller sizes 50 cents per ream (basis 20 x 26).

Sheeting Stock Rolls:

Coated paper two cents per running inch per ream. Minimum charge on the above, ream rate. Special jobs of sheeting, time work.

Slitting and Rewinding Rolls:

Slitting Coated paper 1/2" and over, 50 cents per ream basis 20 x 24.

Slitting Gold, Half Fine Gold and papers of that character, \$1.50 per ream.

Slitting Coarse papers, weighing 24 x 36 — 50 and heavier, one cent per pound from rolls 24" wide and over.

Slitting lighter weights, such as Kraft, under 24 x 36—50, 1 1/2 cents per pound, from rolls 24" wide and over.

Diameter of all of the above not under 9".

Rewinding Coated paper 35 cents per ream.

Minimum charge on all slitting and rewinding not less than ream charge.

Slitting not covered by above subject to time charge.

General Trade Notes

Parke Weikert & Co., Inc., opened during the week a cordage and twine business at 24-26 South Marshall street. The firm consists of Parke Weikert formerly sales manager of the Twine Department of the D. L. Ward Company, and president of the new company; C. D. Shropshire formerly in charge of branches of the Wall Rope Works, Inc., and George H. P. Greenfield formerly engaged in the cordage business in Baltimore. The premises occupied are five stores in height and with basement give about 24,000 square feet of space. The business will be confined to cordage and twine but every description will be dealt in. The charter of the new company will be granted on December 27.

The final sales meeting of the year of the Charles Beck Company organization was held on Friday evening of last week at its offices. Harold LeDuc, advertising manager, spoke on Beck advertising, and together with sales manager Frederick Meinecke participated in a sketch emphasizing good salesmanship. Leon Beck extended the firm's holiday congratulations. The evening concluded with a good-natured "knockers' session" during the course of which humorously appropriate gifts were made to the members, as a bottle of reducing oil to Leon Beck, whose avoirdupois is increasing; a fire brick to Manager Meinecke, attesting to heavy sales and red hot sales arguments; a packet of foot ease to Edward Hahn, assiduous pursuer of elusive orders and the like.

The new Windsor Locks Mills at Windsor Locks, Connecticut, which have just been purchased by the J. L. N. Smythe Company, previously distributors for its line of absorbent towelings and the like, will be closed down in March for the purpose of a complete overhauling and of an increase of manufacturing capabilities and adaptabilities. A large measure of adaptability is to be given to the machines which will engage on the production of towelings and specialties. Hamilton R. Turner has been assigned to the New England sales district formerly covered from the New York office. He will make his headquarters at Windsor Locks, but will travel extensively.

Renovations have started in the new building recently purchased by S. Walter, Inc., coarse paper dealers. The firm expects to move into its new home which will be foremost in size of coarse paper houses in this city, about February 10.

The Weight of Any Pile of Paper

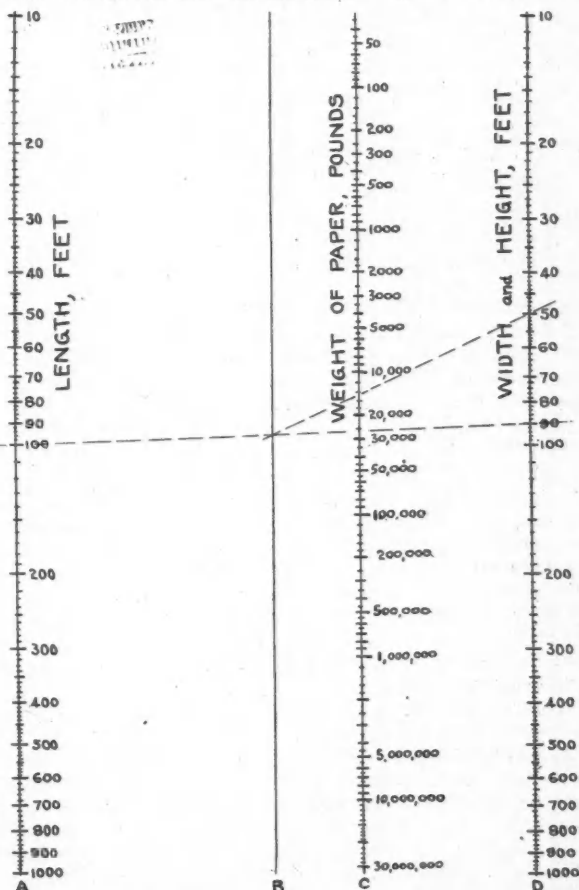
W. F. SCHAPHORST, M. E.

Paper manufacturers, paper dealers, and paper buyers will find this chart handy for determining the weight of paper in almost any pile. It is based on the average of about 58 pounds per cubic foot.

Just lay a straight edge across the chart twice as indicated by the dotted lines and the weight is immediately determined in column C.

For example, how many pounds of paper is in a pile 100 inches long, 90 inches wide, and 50 inches high.

Run a straight line from the 100 (column A) to the 90 (column



D) and locate the point of intersection with column B. Then from that point of intersection run over to the 50 (column D) and the intersection with column C gives the answer about 15,000 pounds. This would be close enough of course, for purposes of estimation. Where paper is sold by the pound the proper way is to actually weigh the paper unless it is first agreed that the measurement and chart method will be satisfactory to all concerned.

It will be noted that the range of the chart is very wide. It will give the weight of a cube as small as 10" x 10" x 10" and as large as 1,000" every way. Since 1,000 inches is equivalent to more than 80 feet it is plain that the chart includes a very large stock, the weight running up to a total of 30,000,000 pounds.

In case the pile is an actual cube, a single straight line will suffice. Take, for example, a 100-inch cube. A straight line from the 100 (column A) to the 100 (column D) intersects at about 33,000 pounds the weight of such an amount of paper.

In case two dimensions of the pile are the same, a single straight line, again, will do. For example, take a pile 100 inches long by 90" by 90". The single straight line intersects at 27,000 pounds.

CRISIS BELIEVED TO BE PAST IN PAPER TRADE IN CANADA

Liquidation Has About Run Its Course and Opinion Is Generally Held that Point of Stabilization Has Been Reached and that the Immediate Future Promises a Substantial Improvement—With the Great Drop in the Price of News Print, Newspapers, It Is Believed, Are Maintaining Inflated Prices—Mattagami Pulp & Paper Co. Makes Report—Lumbermen's Association Elects Officers.

[FROM OUR REGULAR CORRESPONDENT.]

MONTREAL, Que., December 26, 1921.—Price Bros. & Co. of Quebec, in a Christmas greeting to their customers, express the opinion that the crisis in trade depression has passed and that the distinct betterment in general conditions offers good ground for hope that the new year will see progressive improvement upon normal lines. This is the view entertained by most of the leaders in the industry and it formed the keynote of the addresses at the meeting just held here of the Montreal Paper Club.

Characterizing the current year as one of liquidation and price readjustment for this industry, as for others, the opinion was ventured that such liquidation had about run its course, that a point of price stabilization had been reached and that the immediate future promised a substantial improvement. Admitting that this year would show a falling off from \$30,000,000 to \$35,000,000 in the value of pulp and paper exported from Canada, as compared with last year, it was stated the loss resulted from a universal falling market rather than a permanently reduced demand for Canadian products of this character. The falling off in quantity was proportionately very much less than the decrease in value and there were indications that, so far as quantities were concerned, Canada would be back to normal soon.

On the ground that the paper mills of the Dominion are now equipped to produce over one million tons of news print annually, the prediction was made that next year would witness a total output and sale of not less than that amount, which represented over one-third of the total consumption of news print on the North American continent.

As to other pulp and paper products, Canada had advanced to the point where it could produce, in addition to news print, 137,578 tons of board, 60,000 tons of wrapping paper, over 58,000 tons of pulp of various grades, giving the entire industry a total yearly tonnage of pulp and paper exceeding 2,300,000 tons. These figures related only to the rated capacity of the mills now in actual operation and did not take into account new mills or expansions to old ones either planned or now in course of construction.

Newspapers Maintain Inflated Prices

It is a matter of comment here that although news print, the basic material of newspapers, has dropped from \$187 to \$70 a ton within less than a year, the newspapers are still maintaining inflated war prices both in regard to the retail price of newspapers and the cost of advertising. Of course, competitive conditions will eventually force a lower selling price, and when this is brought about there can be no doubt that there will be a large increase in the consumption of news print. As an instance of the way in which the cost of newspapers is restricting consumption it may be mentioned that one Montreal newspaper which before the war sold for 2 cents and which is now selling for 5 cents has within the past six months dropped something like 10,000 in circulation. Of course, publishers will not long allow high prices to affect their circulation so materially and, therefore, it may be expected that during the coming year there

will be considerable reductions made by publishers both in subscription rates and other charges.

Timber May Relieve Province of Taxation

Robson Black, director of the Canadian Forestry Association, in an address in Montreal during the week said it was quite possible that within fifty years the income from the forests of Quebec would be such as to relieve the province of all other forms of taxation. "The history of Canada up to date has been one of reckless exploitations of our timber resources that were placed here by Providence," declared Mr. Black. "Almost two-thirds of the original rich inheritance that Nature gave us has disappeared." The axe, he added, looked destructive, but when a tree was felled, there was something for it and it created a job, whereas fire swept away the tree without providing either material or using labor. In British Columbia forest fires had taken out more than twenty-two times as much timber as lumbermen had cut since the province was discovered. East of the Rockies these timber resources were on the wane, and the present situation was that with increasing population and industries growing which depended on raw materials, these resources were suffering rapid depreciation. Yet with proper conservation methods it might be possible in fifty years that this great mass of somebody else's timber might be sufficient to pay off all the cost of public administration in the Province of Quebec.

The speaker was introduced by Brigadier-General J. B. White, who stated that when Mr. Robson Black first became associated with the Canadian Forestry Association, the membership stood at 2,800 and the funds at \$5,000, whereas to-day the membership was 12,500 and the revenue about \$55,000. General White spoke of what forestry had meant in winning the war and of the benefit which France had derived at that time from her forests.

Makes Optimistic Mattagami Report

G. T. Clarkson, receiver and manager of the Mattagami Pulp and Paper Company, in a letter to bondholders, says, in part: "During the period of receivership, operations at the mills have been carried on and progress made has been fairly satisfactory, having regard to conditions which have obtained and in particular the low market price of pulp. It has been found, however, that a number of economies in operating can be effected, and these are being put into force as rapid as conditions will permit. When completed, it is expected that if an improvement in the price of pulp, such as is confidently hoped for in the near future, shall take place, the operations will yield a satisfactory return."

Montreal Lumbermen's Association

D. H. McLennan has been elected president of the Montreal Lumbermen's Association at their annual meeting at the Board of Trade. Other officers elected were: Vice-President, Stewart F. Rutherford; Treasurer, W. K. Grafty; Directors, W. S. Mason, A. H. Campbell, J. McLaurin, W. A. Filion.

Mr. McLennan was also chosen as the association's representative for nomination for election for the next council of the Board of Trade.

In his annual address the retiring president, George W. Grier, gave a sketch of the last year's activities which dealt with the Sales Tax which had threatened to seriously affect the lumber business, and, finally after much representation, resulted in an amendment to the Sales Tax Act whereby a sales tax of 2 per cent was imposed on all sales and deliveries by Canadian manufacturers and 3 per cent on all importations, but no further tax on resale, thus adding the tax to the cost of production.

Other matters dealt with in the report were weighing of car-load freight traffic, increase in freight rates, car demurrage rates and similar matters affecting shipments. The report was adopted.

TORONTO PAPER BUSINESS CONTINUES RATHER SLOW

This, However, Is Ascribed More Especially to the Fact that Practically Every One Is Getting Ready to Take Inventory—Business Expected to Show a Considerable Improvement After the First of the Year—Rag and Paper Stock Market Also Rather Quiet—Demand for News Print Continues Brisk and Has Shown Considerable Improvement in Past Few Weeks.

[FROM OUR REGULAR CORRESPONDENT.]

TORONTO, Ont., December 26, 1921.—There was not a great deal of business done in the paper line during the past week and the present one will also be quiet. Every one in the trade is getting ready to take inventories. Placing orders is not thought of very much and sales have been few except in small quantities for immediate necessity. On the whole, the past year has been a fairly good one and better than anticipated. At prices, which were considerably lower all around than those which prevailed in the runaway and speculative market of 1920, sales reports have proved in many cases a surprise.

In the rag and paper stock market mills are not buying freely before the end of the year owing to inventory, although prices are holding up surprisingly well, because of shortage of cotton cuttings. Business is expected to pick up in domestic rags shortly after the first of 1922. The waste paper market is quiet and continues to weaken.

The only price change in paper during the past few days was an advance of one cent on colored poster. Word has also been received from across the border that bogus Bristol has shot up half a cent. Otherwise, there are no alterations in values and none is looked for at the beginning of the year. Both jobbers and consumers expect present quotations to continue and, if they do, it will tend very much toward stabilizing the market.

News Print is in Strong Demand

The demand for news print continues brisk and has improved considerably in the last few weeks. Four of the largest mills in Canada had a production of one hundred per cent during the past month. The slackening in demand, that was anticipated, did not materialize. Recent statistics show that the shipment of Canadian news mill has exceeded production. In expressing an opinion on the paper outlook, several manufacturers have indicated that they expect an improvement in the market for the coming year. It is conceded that there will be keen competition for export business and high-priced pulpwood has not yet entirely been worked off.

Pulpwood Brings in Good Revenue

A number of Ontario timber sales have taken place recently. Among the successful bidders for pulpwood the price has differed considerably. A. G. Murray, of Fort Frances, has been awarded the pulpwood on six and a half square miles lying east of Stokes Bay and south of Pipestone river running into Rainy Lake at \$2 per cord for spruce and 35 cents per cord for other pulpwood, in addition to the usual Crown dues. In the township 2B of Mississauga Reserve, District of Algoma, McFadden and Malloy, of Spragge, will pay 75 cents per cord for spruce and the same sum for other pulpwood, plus the usual dues. The Indian Lake Lumber Company of Osaquan, on an area of fifty-three miles in the District of Kenora, are paying 75 cents per cord for spruce and 50 cents for other pulpwood, in addition to the dues. On thirty-six square miles in the township of Jack, district of Sudbury, the Harris Tie

and Timber Company, of Ottawa, will pay \$1 per cord for spruce and 45 cents for other pulpwood and in Fowler township, district of Thunder Bay, James T. Greer, of Port Arthur, gives 50 cents per cord for spruce and 25 cents per cord for other pulpwood on an area of ten miles.

Timber Inquiry Again in Progress

In the Ontario timber probe which has been going on during the past few days, the affairs of several companies have, at the sittings held in Toronto, been investigated. The Spanish River Pulp and Paper Mills of Sault Ste. Marie, Ont., have been under fire. George R. Gray, woods manager of the company, was on the stand for two hours and was questioned concerning the application of the company to the Ontario government for additional pulpwood limits in 1916 and, particularly regarding the statement then made, that, unless they obtained more wood, their mills would be shut down. The Crown endeavored to obtain an admission from the witness that the representations made in the company's letters to the Department of Lands and Forests, as to the prospect of the mills closing down were untrue. Mr. Gray conceded, in one instance, these representations were probably overdrawn to make an impression. Mr. Denison, counsel for the Crown, quoted from the balance sheets of the company and from reports to show that they had large stocks of pulpwood on hand when pressing applications for more territory were being made.

Pulpwood Being Cut at Low Cost

It is stated that the Spanish River Pulp and Paper Mills which have plants at Sault Ste. Marie, Espanola and Sturgeon Falls, Ont., are among the very few companies who are cutting any wood this Winter, having provision for over 200,000 cords. It is believed that this will be the cheapest wood in a good while, as there is a surplus of labor ready to work in the bush at a very low wage. The high cost wood of the company will be used up about a year ahead of most of its competitors, it is asserted, so that the infusion of a good cut of wood at approximately ten dollars per cord, will bring the average down and place the company in a good position to cope with the changed conditions in the paper trade.

Notes and Jottings of the Trade

T. J. Allen, of Paper Sales, Limited, Toronto, has returned from a business trip to Boston and other eastern centers.

George E. Challes, sales manager of the Riordon Pulp and Paper Company, has returned to Toronto after a five weeks' business trip to the paper mills of the Middle West States.

The Abitibi Power and Paper Company has declared its regular quarterly dividend of one and three-quarter per cent on the preferred stock of the company. The Provincial Paper Mills have also declared their regular quarterly dividend of one and three-quarter per cent on the preferred stock and one-half per cent on the common stock, while the Spanish River Pulp and Paper Mills are also in line with their quarterly dividend of one and three-quarter per cent on the preferred shares of the company.

Paper Men Appear Before Finance Committee

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, December 28, 1921.—Col. William E. Haskell, vice-president of the International Paper Company appeared today before the Senate Finance Committee asking protection for the news print paper industry of the country in the tariff bill. He appeared for 80 per cent of the production of news print of the country. A. G. Thompson filed a brief with the committee on behalf of the Miami Valley Paper Manufacturers Association asking for free pulp. Other paper manufacturers and newspaper publishers also appeared before the committee.

PRODUCTION OF GROUND WOOD DURING MONTH OF NOVEMBER

Summary of the Monthly Reports from Manufacturers Sent Out by the Federal Trade Commission Shows that There Were on Hand at the End of the Month Twenty-Four Days' Average Output of Ground Wood, Nine Days' Average Output of News Grade Sulphite, Three Days' Average Output of Bleached Sulphite, and Three Days' Average Output of Easy Bleaching Sulphite.

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., December 28, 1921.—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 paper making is submitted herewith for the month of November, 1921. 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 November, 1921, compared with November, 1920, for the operating mills. The average production is based upon the reports covering the years 1917, 1918, 1919, and 1920, and the average stocks are based upon the stocks carried for the years 1919 and 1920:

	Number of mills	On hand first of month	Production for month	Used during month	Shipped during month	On hand end of month
		Net tons	Net tons	Net tons	Net tons	Net tons
Ground Wood Pulp:						
November, 1921....	164	119,406	108,186	103,167	9,062	115,363
November, 1920....	161	94,150	139,535	114,757	10,399	108,529
November, 1919....	170	126,315	147,672	119,103	14,833	140,051
Average.....			118,025			137,165
Sulphite, News Grade:						
November, 1921....	65	22,442	59,392	51,057	9,134	21,643
November, 1920....	63	17,139	70,888	62,352	8,631	17,034
November, 1919....	65	19,799	68,699	56,494	10,569	21,435
Average.....			62,425			19,800
Sulphite, Bleached:						
November, 1921....	32	4,581	45,961	21,561	23,831	5,150
November, 1920....	32	4,448	49,932	27,333	22,666	4,381
November, 1919....	31	9,468	46,139	23,601	23,409	8,597
Average.....			42,400			8,710
Sulphite, Easy Bleaching:						
November, 1921....	8	639	4,170	3,140	828	841
November, 1920....	6	761	4,821	3,074	1,316	1,192
November, 1919....	8	1,731	5,984	3,791	2,402	1,522
Average.....			6,225			1,555
Sulphite, Mischelich:						
November, 1921....	6	1,064	5,655	3,434	2,220	1,065
November, 1920....	7	1,142	6,930	4,092	2,353	1,627
November, 1919....	7	1,359	6,283	3,310	2,358	1,974
Average.....			6,450			1,655
Sulphate Pulp:						
November, 1921....	21	7,409	17,229	12,887	3,772	7,979
November, 1920....	21	4,758	16,518	12,391	1,810	7,075
November, 1919....	22	7,081	17,144	10,375	6,070	7,780
Average.....			13,300			5,908
Soda Pulp:						
November, 1921....	27	6,281	30,332	17,092	13,215	6,306
November, 1920....	28	5,826	37,076	19,499	16,465	6,938
November, 1919....	27	7,338	31,709	18,288	13,511	7,248
Average.....			31,700			5,938
Other than Wood Pulp:						
November, 1921....	5	15	862	589	80	208
November, 1920....	4	238	341	224	163	192
November, 1919....	6	228	858	725	81	280
Average.....			875			159
Total—for all Grades:						
November, 1921....		161,837	271,787	212,927	62,142	158,555
November, 1920....		128,462	326,041	243,732	63,803	146,968
November, 1919....		173,319	324,488	235,687	73,233	188,887
Average.....			281,400			180,880

Total stocks of all grades of pulp in the mills on November 30, amounted to 158,555 tons. Mill stocks of Ground Wood and News Grade Sulphite decreased 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, 1918, 1919 and 1920, the figures show that:

Ground wood pulp stocks equal 24 days' average output.

News grade sulphite mill stocks equal 9 days' average output.

Bleached sulphite mill stocks equal 3 days' average output.

Total mill stocks of all grades equal 14 days' average output.

The idle machine time of grinders and digesters reported to the Commission for the month of November, 1921, is shown in detail in the following tabulation. The reasons tabulated for lost time are lack of orders, lack of power and repairs. "Other Reasons" include water conditions, etc. The time lost in November, 1920, is shown by grades and reasons for purposes of comparison. These figures do not include 17 mills not in operation:

Grade.	Lack of orders, 1921*	Repairs		Other reasons		Total	
		1921	1920	1921	1920*	1921	1920
Ground Wood Pulp:							
Number of grinders....	41	138	90	572	584	751	674
Total hours idle....	10,753	14,768	15,514	143,836†	90,383	169,357	105,897
Sulphite, News Grade:							
Number of digesters....	20	17	17	8	39	45	56
Total hours idle....	2,930	875	1,321	1,108	6,676	4,913	7,997
Sulphite, Bleached:							
Number of digesters....	14	8	4	6	11	28	15
Total hours idle....	1,536	628	404	248	897	2,412	1,301
Sulphite, Easy Bleaching:							
Number of digesters....	5	0	3	3	3	8	6
Total hours idle....	480	0	290	510	1,619	990	1,909
Sulphite, Mitscherlich:							
Number of digesters....	0	0	0	16	0	16	0
Total hours idle....	0	0	0	1,829	0	1,829	0
Sulphate Pulp:							
Number of digesters....	15	0	3	8	15	23	18
Total hours idle....	866	0	428	308	2,596	1,174	3,024
Soda Pulp:							
Number of digesters....	75	0	0	37	32	112	32
Total hours idle....	10,460	0	0	2,921	4,615	13,381	4,615
Other Grades:							
Number of digesters....	2	0	0	2	5	4	5
Total hours idle....	944	0	0	552	1,397	1,496	1,397
Total number of grinders and digesters....	172	163	117	652	689	987	806
Total hours idle.....	27,969	16,271	17,957	151,312	108,183	195,552	126,140

*Lack of orders, 1920, included in "Other Reasons."

†Includes 123,408 hours due to water and power conditions.

Kalamazoo Cost Association Elects Officers

[FROM OUR REGULAR CORRESPONDENT.]

KALAMAZOO, Mich., December 20, 1921.—Roy L. Strong, of the Lee Paper Company, was last night elected president of the Kalamazoo Valley local division of the Cost association of the Paper Industry. He succeeds Paul L. Broesamle. George K. Ferguson, of the Watervleit Paper Company, was named vice-president, while Harry C. Bradford, of the King Paper Company, was continued in the post of secretary-treasurer.

Committees for the ensuing year were named as follows: Program, George A. Ferguson, George Jobb and Harry C. Bradford, finance, Harry C. Bradford, Paul L. Broesamle and Harry Barney.

An interesting program of papers was offered. "Reports for Executives" was handled by George Jobb and George Ferguson. "Budget Control" was the topic of a paper by Roy L. Strong, while "Income Tax" was the subject for William Allen.

Paper Demand Slow in Boston

[FROM OUR REGULAR CORRESPONDENT.]

BOSTON, Mass., December 27, 1921.—The usual Christmas quietude in the paper trade was felt in this section this week, trade being practically at a standstill, with salesmen in from the road and all other activities dormant.

A slight spark of life was witnessed in the board business, however, when two or three more mills withdrew board prices, indicating at the same time a neat little advance for the predicted business of next month, for there are those who are positive that there will be a spurt after that date. This applies, they say, to all branches of the trade.

IMPROVEMENT IN OUTLOOK OVER LAST YEAR IN CHICAGO

While Business Has Been Rather Slow of Late, Indications Point to a Betterment After the First of the Year—McNulty Paper & Twine Corp. Adds to Its Sales Force—Irving Bachrach Heads New Paper Concern Which Has Incorporated with Capital of \$10,000 Under the Style of the General Paper Co.—Container Club to Have Interesting Meeting.

[FROM OUR REGULAR CORRESPONDENT.]

CHICAGO, December 23, 1921.—Paper men here state that while they have been doing a rather slow business recently, and with the approach of the holidays and the first of the year, business gradually grew duller, they are not discouraged, for the outlook this year is much better than it was a year ago.

Orders which have been coming to the paper merchants in the past week or two, have been small in volume. Inquiries asking for quotations on deliveries ranging from early next month to two and three months hence are being received.

Indications on all hands are toward a better year ahead. All the paper men here feel that the industry is in a better condition now than it was at the opening of 1921. As one leading merchant here said, "we know where we are at this year, and we didn't last year."

McNulty Paper Corp. Increases Sales Force

The McNulty Paper and Twine Corporation, 535 West Chicago avenue, is perfecting plans which were started early in the month, to have a more extensive sales force. Already six new salesman have been added to the staff. Judge M. Hawk, who went with this company December 1, is in charge of the new departments which are being opened and says that they expect to put on several experienced salesmen after the first of the year. The company has taken over the products of three mills. They will be ready to make a further and more detailed announcement regarding their plans and what lines have been added, early next month, Mr. Hawk said.

In reviewing existing conditions in the field, Mr. Hawk said that orders for immediate delivery were of small volume. "Buying right now is a little slow," he said. "This is probably due to inventory. But we have good reason to believe that business will be good after the holidays. Inquiries are heavier, and we have a good demand for both wrappings and fine paper for delivery after the first of the year."

General News of the Trade

J. P. Brunt, vice-president of the Mid-West Box Company, Chicago, left Chicago Tuesday, December 20, on a business trip to the East returning to this city Christmas evening.

Employees of the Parker, Thomas & Tucker Paper Company here, received their annual Christmas "cheer" envelope last Saturday.

This company has been moving stock and fixtures to its new location at 520-26 South Canal street, during the past two weeks. The last remaining stock and equipment was expected to be moved by the close of this week and the company expected to start the new year at its new home where it will have greatly increased facilities to handle business.

Irving Bachrach, is the president of a new paper company here, which has been incorporated under the title of the General Paper Company. The company has been capitalized at \$10,000. Officers are in the Transportation building, 608 South Dearborn street. Mr. Bachrach has been identified with the local paper industry for

the past several years. He was with the Barton-Hobart Paper Company, for eight years as a salesman and is well known to the buyers in the city. The company will handle a line of book and printing papers in a general brokerage way.

Announcement has been made that the next Container Club meeting will be held in Chicago, at the Blackstone Hotel, January 23, 24 and 25. The program for this meeting has not as yet been made known, but that the meeting, being the first one of the year, will be very interesting, is promised.

Frank Sanborn, of the Chicago office of the Ideal Coated Paper Company, has left here for the East. He will spend the holidays at Newbury Port, Mass., with his family, and is not expected back in Chicago until after the first of the year. He will probably visit the mills of the company at Brookfield while in the East.

C. J. Foley, of the Foley Paper Company, left the city last week for Cedar Rapids, Ia., where he spent the Christmas Holidays.

Visiting paper men to Chicago have been scarce in the past week. Most of them are said to be staying home until after the holidays.

In a recent issue referring to the Hanchett Paper Company as having purchased property at 866-874 Larrabee street, the name of the company was erroneously printed as the Hackett Paper Company. The \$72,000 cash paid in December 1 was the final cash payment for this property which the Hanchett Paper Company completed January 1, 1919. The company has been occupying this property since that time as an office building and paper warehouse and will make it its future home.

Big Stock Frauds Charged in Boston

[FROM OUR REGULAR CORRESPONDENT.]

BOSTON, Mass., December 21, 1921.—Activities of Hollister White & Co., Inc., investment underwriters, have resulted in Federal indictments being returned against officials of that corporation, singly and jointly, with the officers of several other Massachusetts corporations, charging them with using the mails in a scheme to defraud. The indictments have just been taken from the secret files.

It is charged that Hollister, White & Co., Inc., reorganized several companies, some of which were Massachusetts corporations originally and others of which became incorporated under the laws of this State by the reorganization scheme, and that false financial statements were issued to promote the sale of stocks and bonds issued by these corporations. An auditor who examined the books of the company at the order of the Federal District Attorney reported that nearly \$1,000,000 was paid by customers for stocks, notes, &c., which were never delivered to them.

The indictments also assert that securities of the corporations involved were represented to be free from State and income taxes in Massachusetts and State and local taxes in various other States.

Among the companies alleged to have been manipulated by Hollister, White & Co., Inc., are the Mount Holly Paper Company.

In the list of defendants of Hollister, White & Co., Inc., are Floyd R. Switzer, Allan H. MacCaffray, Rolland T. Veitch of Philadelphia, Eugene B. Yates, Huntington P. Faxon and Ralph E. Carpenter.

The Mount Holly Paper Company names are Messrs. MacCaffray, Yates, Watkins, Switzer, Carpenter, Paxon, Veitch, D. H. Newell and James B. Newton of Mount Holly, Pa.

Kalamazoo Paper Co. Buys Cutter

The Smith & Winchester Manufacturing Company, of South Windham, Conn., recently shipped to The Kalamazoo Paper Company at Kalamazoo, Mich., one of its latest Model 84" Undercut Cutters with Power Back-Gauge Drive complete.

POWER COSTS IN PAPER MILL ACCOUNTING*

While proper accounting for power costs is important in any manufacturing industry, it is especially important in pulp and paper manufacturing because of the large amount of power required.

The machinery used in the different processes—especially pulp grinders, barking drums, chippers, beaters, paper machines, etc.—requires a large amount of power. A large quantity of water is constantly being used, the pumping of which requires considerable power. Then there are the conveyors, steam for digestors, steam for drying the paper, steam for heating the buildings, electric current for lighting the buildings, power for the repair shop, etc.

Three Sources of Power

There are three sources of power usually employed in pulp and paper manufacture—steam, electricity and water. Steam is in practically every case generated in an adjacent power plant. Electricity may be either purchased or generated at the plant. Water power, of course, is available only if there is proximity to a stream of water of sufficient size to produce enough power.

The most economical source of power is naturally that obtained from the use of water, but it is rarely the case that there is a sufficient quantity to meet the requirements of all of the operations in a pulp and paper mill, so recourse is had to either steam or electricity, or both, in order to obtain the necessary amount of power.

The usual arrangement from an economical and efficient power viewpoint is probably one in which the grinders are directly coupled to either electric or water power, the paper machines directly driven by either steam, electricity, or water, and the other machinery driven by electricity through direct drive or by line shafting. However, these conditions are not always met with, as practical paper mill operators differ in their opinions as to the proper application of the different sources of power, and conditions and localities have much to do with the question.

Power expense may be classified as follows:

1. Steam generation,
2. Steam distribution (from central power plant to manufacturing buildings, and then to departments or machines),
3. Electric current generation,
4. Electric current distribution (from central power plant to manufacturing buildings, and then to departments or machines),
5. Electric current purchased,
6. Water.

There are many cases, of course, where there is no central power plant, and steam or electricity, or both, are generated at each manufacturing building, and distributed direct to departments or machines within the building.

Power costs comprise the following elements:

	1.	2.	3.
	Steam	Electric	Water
Wages of power house employees.....	x	x	..
Fuel	x	Water	..
		Steam	..
Water	x	..	..
Lubricants, waste, etc.....	x	x	..
Labor and supplies for repairs and maintenance	x	x	x
Provision for depreciation of buildings and equipment	x	x	x
Insurance and taxes.....	x	x	x

*Address delivered by B. C. Cause, C. P. A., of Haskins & Sells, before the Connecticut Valley Local Division of the Cost Association of the Paper Industry, December 12, 1921.

The provision for depreciation of water facilities would apply to dams, water ways, water wheels, etc.

Steam is apportioned on the basis of the number of thousand cubic feet generated or on the basis of the number of thousand pounds used.

Electric current is apportioned on the basis of kilowatt hours.

Water is apportioned on the basis of the number of cubic feet used or on the basis of the number of horse power hours.

It is not the intent in this paper to deal with methods of apportionment or distribution of power costs over departments, processes or machines, as that subject has been covered very fully by numerous books and articles; but, as indicated by the title of the paper, I will endeavor briefly to emphasize the importance of ascertaining the correct power costs for inclusion thereof in the detail cost of manufacturing the product.

In this connection it may be stated that there are no more urgent reasons for ascertaining the correct costs for power used in pulp and paper manufacture than there are in respect of the manufacture of many other products where power is such a necessary and important element of the cost.

Tendency to Overlook Some Factors

No one, whether executive, operator, or accountant, who is interested in the manufacture of pulp and paper, or any other product for that matter, will belittle the importance of ascertaining true costs in respect of direct labor or direct material ("furnish," as it is called in the paper industry), but there is a tendency on the part of many to overlook the equal importance of proper and intelligent distribution over the kinds or classes of goods manufactured, of the overhead charges or burden of which the cost of power usually forms a very considerable part.

Other items entering into overhead charges or burden are superintendence, factory clerks, watchmen, cleaners, repair labor and materials, insurance, and many other items, the cost of all of which cannot be applied direct to a particular kind or class of product but which nevertheless are part of the cost of manufacturing each article produced just as much as the direct labor or the direct material.

It is probably true that in the manufacture of certain kinds of goods it is difficult, and perhaps prohibitive on account of the cost, to make an exact distribution of the overhead charges, but it is also true that there are too many cases where no intelligent effort is made to distribute these charges and the only basis used is that of the ratio of the total direct labor to the total overhead charges.

Only Way to Arrive at Correct Costs

Power costs should be ascertained by taking into consideration the elements entering therein and a proper monthly distribution made, as in that way only can correct costs be arrived at. Comparisons of properly built up power costs are valuable because of the opportunity presented to detect undue fluctuations and ascertain the reason therefor. The quantity of coal consumed monthly may be checked by the weight of the paper produced, as for example, in news print paper approximately three-quarters of a pound of coal is consumed in producing one pound of paper.

Inclusion in power costs of correct amounts for depreciation of buildings and equipment, insurance and taxes is only possible where the costs or book values of power buildings and power equipment are known. This data, however, as well as similar data in respect of all other buildings and equipment, should be a matter of record either through the medium of an independent appraisal or from the original cost of the property, or both.

The necessity for having complete information regarding property values is because of the possibility of damage or destruction by

(Continued on page 26)

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POWER COSTS IN PAPER MILL ACCOUNTING

(Continued from page 24)

fire, and also because of Federal tax laws. Charges for depreciation of property and for depletion of timber lands must be taken into consideration if the taxpayer is to receive the benefits to which he is entitled under the laws, and such charges have to be supported by proof as to property values.

Uniform Cost Accounting System

It may not be out of place here to refer to the advantages to be gained from the adoption by manufacturers in the same industry of a uniform cost accounting system. Such a system, if based upon correct principles and properly applied, will go far toward eliminating ignorant and therefore unfair competition, will tend to bring the different manufacturers into closer co-operation, and eliminate feelings of distrust and fear which are all too prevalent in industries where competition is keen and a trade association does not exist or is inactive.

The Question of Inventories

As we approach the end of the calendar year, which is also with a large number of business concerns the end of their fiscal year, the question of inventories becomes an important one. In cases where perpetual book inventories are kept, too much reliance should not be placed thereon, but a complete count should be made of all stock on hand at December 31, and the book values adjusted to agree therewith. In many cases such an inventory will develop wide differences and serious errors which have been made in the book records during the year.

It is true that conscientious inventory taking is hard work if the stock is large and difficult to get at, and this brings up the question as to whether or not all business concerns in inventorying their stock on hand and closing their books at December 31, are conforming to their natural business year.

There is but one proper time for taking a complete inventory and closing the books and that date is on the completion of the natural business year, which is when the busy season is passed; when stocks of merchandise are at their lowest so that the cost and the physical and mental work of taking an inventory are reduced to a minimum; and when the financial condition of a business is at its best because of the comparatively small inventory of merchandise on hand, a reduced amount of accounts payable, and large amounts of cash and accounts receivable.

At that time employees are not under such a severe pressure and can co-operate more effectively, and the mill can be shut down in order to facilitate the taking of the inventory without the resultant loss of time and money which might be the case if many orders were waiting to be filled.

The only reference to the question of inventories contained in the Revenue Act of 1921, is Section 203, which is as follows:

"That whenever in the opinion of the Commissioner the use of inventories is necessary in order clearly to determine the income of any taxpayer, inventories shall be taken by such taxpayer upon such basis as the Commissioner, with the approval of the Secretary, may prescribe as conforming as nearly as may be to the best accounting practice in the trade or business and as most clearly reflecting the income."

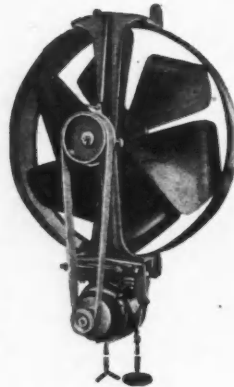
The regulations relating to the income tax under this act have not yet been promulgated. Until then Regulations 45 relating to the income tax and excess profits tax under the Revenue Act of 1918 will continue in effect, at least so far as they affect inventories.

As many of you know, a ruling was made in December, 1920, permitting taxpayers to value their inventories at December 31, 1920, at cost, or cost or market whichever was lower, regardless of their practice in prior years; provided that a disclosure of the fact and that it represented a change was brought out in the return. A

further provision prohibited future changes in the basis of valuation of inventories except by permission of the Commissioner of Internal Revenue, so that the taxpayer who used the basis of "cost or market" at December 31, 1920, as most taxpayers did—most use that basis at December 31, 1921, unless permission to change has been obtained.

New Variable Speed Fan

An illustration is presented herewith of a new variable speed fan with a constant speed motor recently put out by the Bailey Manufacturing Company, Milwaukee, Wis., among other purposes for protecting the roofs and finished products of paper mills by removing steam from the machine room.



The Bailey Junior is unique in that it is equipped with a speed controlling device that permits a variation of from 2½ per cent. to 100 per cent. of full speed without any variation in the speed of the motor, with any graduation of speeds between these extremes. This variation is accomplished by varying the belt tension by simply turning the hand wheel of the adjusting mechanism to the right, or left until the desired speed is obtained. The illustration shows the fan motor with its adjusting bracket, adjusting lever and driving belt. The motor is hinged at one end

of its base so that by adjusting the hand wheel the pulley end is moved either towards, or away from the fan pulley, thus increasing or decreasing the belt tension, thereby increasing or decreasing the ratio between the motor and the fan speeds. Aside from the convenience of having absolute control of the speed, this arrangement assures economy in current consumption, as the current consumed by a motor varies almost directly with the amount of work the motor does, and as a lower speed decreases this amount of work, it decreases the current consumption of the motor in almost the same proportion. In the ordinary direct connected fan, the motor either works at full load current all the time while in operation, or where the speed variations are brought about by electrical control, the difference in current used by the motor under part load, is dissipated in resistance coils.

The Bailey Junior is equipped with a standard constant speed motor that can be obtained anywhere at any time, thus eliminating the necessity of putting the fan out of commission while waiting for a new motor, in case of accidental damage. The special belt drive arrangement leaves the motor free to start up at full speed with practically no load, and gradually pick up, as the fan speeds up, thus eliminating the burning out of windings while starting under load in single phase motors, as well as the long pull starting current in two and three phase, and direct current motors.

The motor being located beneath the fan leaves it immune from dust and grease deposits, that raise havoc with motors of direct connected fans, where the motor is situated in the center of passage of the dust and grease laden air. This feature alone greatly lengthens the life of the motor and assures fan service that is practically free from short circuits in the motor, and their accompanying burn-out troubles.

**A Good Jobber's
Good Resolution**

for Jan. 1, 1922

**"THIS YEAR I WILL BUY
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GROCERS' BAGS
EXCLUSIVELY"**

The Lawrence line is so selected that any jobber handling Lawrence Grocers' Bags exclusively is in position to **secure and retain** the best patronage in his locality without loading his warehouse with many brands.

Improved Self-Opening and Old Style Square

GROCERS' BAGS

*May we discuss with you
our plans and your plans for 1922?*

The Lawrence Bag Company

Miamisburg

Ohio

James Lawrence, President

Tom G. Means, Vice-President

New York Trade Jottings

D. B. Morris, head of the sales department of Atterbury Brothers, spent the Christmas holiday in Portland.

* * *

"Paper Particulars," the monthly house organ of the National Paper Trade Association of the United States has made its last appearance in the December number. It is to be regretted that the N. P. T. A. Board of Directors could not see their way clear to continue this popular journal of information and comment.

* * *

Col. W. E. Haskell, vice-president of the International Paper Company, left New York Tuesday, December 27, to appear before the Senate Tariff Committee in the interests of the industry with regard to news print. R. S. Kellog, secretary of the News Print Service Bureau, left on the same date to attend the hearing.

* * *

A petition in bankruptcy was filed Wednesday, December 21, against the Nassau Bag and Paper Company, Inc., jobbers, at 598 East 135th street, by Belle Seigel, claiming \$177; Jeanette Frimarc, \$190; Lillian Zahn, \$363. It is stated that the liabilities are about \$17,000 and assets about \$5,000. Judge A. N. Hand appointed William C. Hecht, Jr., receiver, under \$2,000 bond.

* * *

The Traffic Department of the Paper Association of New York City is reported by P. J. Gaynor, manager, to be dispensing normal service in spite of the dull business conditions in general and the railroad inactivity in particular. The seasonal listlessness finds the roads in an unusually poor shape this year due to the excessive payroll burden and the complexity of railroad legislation.

* * *

Paper men from Kalamazoo, Mich., in the city at the present time are Felix Pagenstecher, president of the Bryant Paper Company; B. E. Bryant, director of the Bryant Paper Company; Allen Fox, secretary, and Arthur Pratt, president and general manager of the Allied Paper Company. George M. Seamen, president of the Seamen Paper Company, is also in New York this week on business.

* * *

Alfred Bleyer & Co., Metropolitan and Flushing avenues, Brooklyn, are sending out the following announcement on a handsome folder: "We begin the new year with our removal to the new plant in Brooklyn, N. Y. Here we are ideally equipped and located to meet the vastly expanding demand for our products. 54,000 square feet of floor space, a three-car railroad siding and all other facilities for immediate shipments in large quantities are now at your disposal. We trust this great advance in our equipment will mark a new era in the progress of our fifty-four years of mutually satisfactory and agreeable business relations."

* * *

The Strathmore Paper Company, with its five New York agents, J. E. Linde Paper Company, Henry Lindenmeyr & Sons, Miller & Wright Paper Company, M. & F. Schlosser, and the Seymore Company respectively, was responsible for the very excellent entertainment afforded Monday evening, December 19, at a dinner and meeting given at the Hotel Astor by the New York Employing Printers' Association. After dinner a brief business session was held, followed by addresses as follows: "The Munsell System of Color," by Arthur S. Allen; "Color Law and Order," by T. W. Cleland, and "The Strathmore Grammar of Color," by C. W. Dearden. A bright one-act farce entitled "You've Got a Good Eye," terminated the program and was well received by the large and representative assembly. Souvenirs were distributed.

Obituary

Frank S. Arnold

[FROM OUR REGULAR CORRESPONDENT.]

BOSTON, Mass., December 27, 1921.—Frank S. Arnold, president of the Arnold-Roberts Paper Company, 180 Congress street, died at his residence in Malden, Mass., December 18.

Mr. Arnold was born in Brooklyn, N. Y., and came to Boston when young and entered the paper business, having been one of the founders of the Arnold-Roberts Paper Company. He had lived in Malden 33 years. Mr. Arnold served on the Common Council several years ago.

Mr. Arnold was a member of the First Congregational Church,



FRANK S. ARNOLD

Malden, a past master of Converse Lodge of Masons and a member of Beauseant Commandery, Knights Templars. He was ex-president of the New England Paper Trade Association and of the Boston Paper Trade Association and was a member of the Boston City Club and of the Boston Chamber of Commerce.

Josiah H. Drummond

Josiah H. Drummond, well known in paper circles died Tuesday, December 27 from a final shock following some three months' illness occasioned by paralysis. He was 65 years of age and is survived by a widow, four sons, and one daughter. His residence was Portland, Me., where for years he held important governmental offices. He served on the governmental council and was respected and made fast friends with all with whom he came in contact.

Mr. Drummond was legal advisor to Hugh J. Chisholm, Sr., the first president of the International Paper Company, and was actively engaged in the organization of that company. He served as attorney for the Oxford Paper Company and allied interests since its inception. The sympathy of his many friends is extended to his bereaved family.

George Hall

[FROM OUR REGULAR CORRESPONDENT.]

PITTSFIELD, Mass., December 28, 1921.—George Hall, aged 58, widely known in the paper business, superintendent of the Mountain Mills Paper Company at Lee, died on Christmas Day following injuries received last Monday when he was drawn into a dryer machine at the mill. His right arm was crushed so that it had to be amputated at the shoulder. One ear was torn off and his hip dislocated.



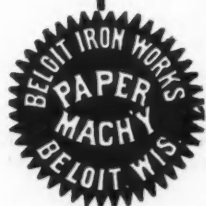
The Suction Box
Oscillator
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Ask Us
or those who use them



BELOIT IRON WORKS



THE SELECTION OF PUMPS FOR PAPER MILLS

SPECIALY WRITTEN FOR THE PAPER TRADE JOURNAL BY W. F. SCHAPHORST.

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The following article is the fifth in a series of articles to be printed in the PAPER TRADE JOURNAL on the subject of Power Plant Machinery for Paper Mills. In this series of articles it will be the aim of the author to go through the entire power plant of the paper mill and give the non-technical official a pretty good idea of what he should have in his mill. As it is, owners and officials who are responsible for the buying frequently know very little about the different types of power plant machinery on the market.

No doubt every paper mill official knows that during the past fifteen years the centrifugal pump has made tremendous headway in the paper mill field for handling fresh water, sewage, paper mill stock, and practically every liquid that requires handling.

To be sure the reciprocating pump has not been entirely displaced in the paper mill field, and probably never will be. Such a pump, for example, as the reciprocating steam actuated boiler feed pump is still being largely used in the mills and its use may as well be continued where the exhaust steam from same can be put to useful heating service. The reciprocating type is so well known, though, that in this article the writer has not shown any of such types in actual installations, that space being utilized for the types that have more lately come onto the market—the centrifugal and rotary pumps.

Prior to 10 years ago the reciprocating pumping engine held all pumping records. It was thought that to secure highest efficiency slowness of action was necessary so that the water would not be violently agitated. Most of these pumps were driven by Corliss engines, also slow moving, and also giving their highest efficiencies when operating at low speed.

Once the steam turbine got started in surpassing the Corliss engine in efficiency, however, ways and means were sought in which to correct the turbine to a centrifugal pump. The difficult point to overcome was the coupling of a high speed turbine to a comparatively low speed pump, because a steam turbine operates at its one best efficiency when running at high speed and a centrifugal pump has its definite best speed also, depending upon its design, but that speed is never as high as the speed of a steam turbine.

The mechanical device that must be given principal credit for this achievement, for making the centrifugal pump so efficient, is the double helical speed reducing gear. This gear has been perfected to such a degree that it now commonly shows a mechanical efficiency of 98½ per cent or better.

Many large steam turbine driven centrifugal pumps are therefore to be found in water works service today, one manufacturer alone having installed so many of them that the total capacity of their units per 24 hours is over 2,000,000,000 gallons of water. One of the units alone, the largest of them all, has a capacity of 110,000,000 gallons per 24 hours. For driving these pumps the manufacturer uses steam turbines, the average size being less than 1,000 horsepower each. The largest is about 2,400 horsepower. The pumps operate against heads* varying from 30 to 400 feet.

In a future article the writer will take up in more or less detail the economy of the modern steam turbine as compared with the reciprocating engine. Here, for example, is an interesting statement

*The word "head" is very commonly used in connection with pumps. The "total head" is the total number of feet against which the pump operates, including "friction head." For example, if a reservoir is to be built on a hill one hundred feet above water level, the total head would be one hundred feet plus the additional head caused by friction. Friction head depends upon the velocity at which the water is pumped and the diameter of the pipe through which the water is pumped. The amount of work done by a pump is easily computed if the total weight of water pumped is known and if the head against which the water is pumped is known. Multiplying the weight of the water in pounds by the total head in feet gives the work performed.

made by a prominent steam turbine company in its book "Ten Years Progress In Water Works Pumps."

"The turbine gains about 1 per cent in economy for each 10 degrees Fahrenheit of superheat, and about 8 per cent for an increase of vacuum from 28 to 29 inches mercury referred to a 30 inch barometer whereas the reciprocating engine receives little, if any, benefit from increase of vacuum above 28 inches."

In using the steam turbine it is possible to utilize the steam exhausted from auxiliaries whereas with reciprocating pumps this cannot be so easily done. Or, it is possible and often desirable to "bleed" steam from the steam turbine at some point between the first and final stages. For example, if steam is wanted for



FIG. 1.—TYPICAL MOTOR DRIVEN CENTRIFUGAL PUMP WITH HORIZONTALLY SPLIT PUMP CASING. (Courtesy Lea-Courtenay Co., Newark, N. J.)

heating feed water it can be "bled" out of the steam turbine before the steam enters the first vacuum stage. This is an important advantage. As a result of this and other advantages possessed by the steam-turbine-driven centrifugal pump it costs less to pump a gallon of water with this type of pump than with any other kind of steam driven pump. This is the principal reason for its amazing progress made in the last ten years.

A number of manufacturers are now building high speed motors which can be connected directly to centrifugal pumps. The electric motor possibly has had as much to do with the development and success of the centrifugal pump as has the steam turbine.

Advantages of Reciprocating Pump

The reciprocating pump, to be sure, has its own advantages, but they are few as compared with the advantages of the centrifugal pump. The four principal arguments favoring the reciprocating type are:

1—*Flexibility.*—The capacity of a reciprocating pump can be increased by simply speeding it up.

2—*Any Head.*—A reciprocating pump can pump against almost any head. It is a comparatively easy matter to design the cylinder walls heavy enough to withstand any ordinary pressure.

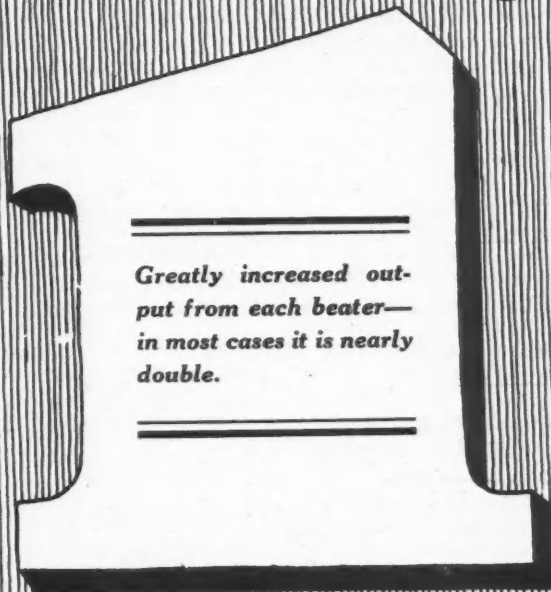
3—*Uniform Efficiency.*—Regardless of speed or head, the efficiency of the reciprocating pump does not vary greatly.

4—*High Mechanical Efficiency.*—The mechanical efficiency of reciprocating pumps, especially large pumps, is high. For example, tests on five large triple expansion vertical engine pumps equipped with cranks and fly wheels showed efficiencies of 90.8, 89.5, 89.8, 94.9, and 95.4 per cent respectively. The power required to drive these pumps varied from 600 to nearly 1,200 horsepower. Tests made

(Continued on page 32)

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The BIRD CONTINUOUS BEATER ATTACHMENT

THE SELECTION OF PUMPS FOR PAPER MILLS

(Continued from page 30)

on two horizontal high duty direct action pumps showed efficiencies of 96 per cent and 95 per cent respectively, and a vertical quadruple expansion fly wheel engine pump showed a mechanical efficiency of 93.9 per cent. The mechanical efficiency of centrifugal pumps on the other hand is seldom greater than 80 per cent.

Disadvantages

One modern objection to the reciprocating pump is that it cannot be built in large sizes. It is stated that 1,200 horsepower is about the limit for reciprocating pumps. To build larger sizes cylinder diameters would be required that are almost impossible to construct. The steam turbine or electrically driven centrifugal pump is not handicapped in this way as manufacturers would experience little difficulty in building turbine or motor sizes of 5,000 or more horsepower. Thus by using large sizes, where necessary, or where possible, the paper mill obtains excellent economy because in general the larger the steam turbine or the larger the engine the greater the steam economy. This also holds true for electric motors and transmission machinery in general.

Another disadvantage of the reciprocating pump is that the pressure is always positive. Should the discharge valve be suddenly closed the cylinder heads will be blown out or piping will burst. By suddenly closing the discharge valve of a centrifugal pump, however, a dangerous pressure is not created in the pump or piping. There is an increase in pressure within the casing and in the piping but it is only slight. Besides, when this happens, whether accidentally or purposely, the load on the steam turbine or on the motor is much reduced.

Advantages of Centrifugal Pump

In addition, we have these advantages of the centrifugal pump as compared with the reciprocating type:

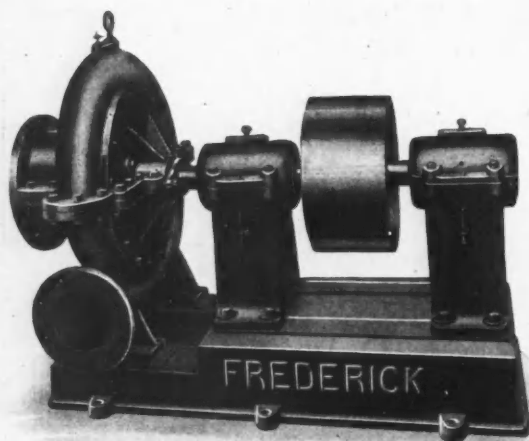


FIG. 2.—BELT DRIVEN OPEN IMPELLER TYPE CENTRIFUGAL PUMP FOR HANDLING PAPER MILL STOCK. HORIZONTALLY SPLIT CASING. (Courtesy Frederick Iron & Steel Co., Frederick, Md.)

1—*Lower First Cost.*—A motor or turbine driven centrifugal pump frequently weighs only one-tenth as much as a reciprocating pump of the same pumping capacity.

2—*Less Space.*—A motor driven or turbine driven centrifugal pump reduces the floor space required by 50 to 70 per cent as compared with a reciprocating pump of the same capacity.

3—*Smaller Building Investment.*—Motor and turbine-driven-

centrifugal pumps require a much smaller building or less floor space than the reciprocating pump, hence a smaller building investment.

4—*Less Headroom.*—Less space is required above the pump between the pump and the ceiling. Less air space to heat. Less light required. Lower buildings.

5—*Smaller Crane Investment.*—Parts are small and comparatively light, consequently smaller and less expensive cranes can be used for handling.

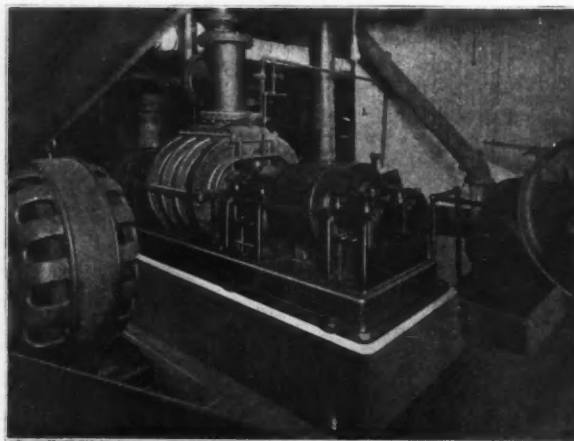


FIG. 3.—SHOWING A ROTARY VACUUM PUMP INSTALLATION. THESE PUMPS ARE USED IN CONNECTION WITH SUCTION ROLLS IN WHICH SERVICE THEY HANDLE AIR AND WATER SIMULTANEOUSLY. (Courtesy P. H. and F. M. Roots Co., Connersville, Ind.)

6—*Small Inexpensive Foundations.*—There is practically no vibration and the combined unit is comparatively light, consequently the centrifugal pump can be installed where foundations are otherwise considered soft or treacherous.

7—*Simpler.*—The centrifugal pump is much simpler. It does not contain so many valves, valve gears, cylinders, packings, pistons, piston rods, plungers or rubbing parts.

8—*No Reboring of Cylinders.*—There are no cylinders to require reboring.

9—*Few Wearing Parts.*—Only two important wearing parts—the bearings—which can be quickly replaced at any time.

10—*Lower Labor Costs.*—The operator has fewer parts to take care of. There is practically nothing to get out of order. The attendance cost in large plants is computed to be about one-half for centrifugal pumps as compared with reciprocating pumps.

11—*No Cylinder Oil.*—Cylinder oil is not required inside the steam turbine or inside the centrifugal pump. The bearings are the only parts that need lubrication.

12—*No "Slippage."*—It is estimated that in reciprocating pumps "slippage" is usually more than 3 per cent. The average slip is 3 per cent to 5 per cent. Where conditions are unfavorable we may have 10 per cent or even 15 per cent slip. In the centrifugal pump there is no slippage whatever.

13—*Accessible Parts.*—All parts of centrifugal pumps are easily reached. Where horizontal split casings are used the upper half is quickly removed and all parts become exposed.

14—*Quiet Operation.*—Because of the fact that the motion of the

(Continued on page 34)

Established 1886

Greeting

TO our many friends in the trade we extend our best wishes for a Happy and Prosperous New Year. We also take this opportunity of thanking them for their co-operation and many favors so cheerfully extended. In a year marked by so many changes in our industrial life it is good to feel that the only change between us and our many patrons has been a closer friendship, a finer good will and an adequate measure of material good to us all.

WE look forward with optimism and hopeful expectations upon the future with the firm conviction that the paper and pulp industry is fundamentally sound and that nothing but good for the industry in general and the paper trade in particular will come out of the present readjustment. In the solution of the problems involved, the services of our highly specialized organization, including all our resources and experience, are entirely at the disposal of our friends.

M. GOTTESMAN & COMPANY

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18 East 41st Street
New York, N. Y.

BRANCHES AT

Holyoke, Mass.
Kalamazoo, Mich.

THE SELECTION OF PUMPS FOR PAPER MILLS

(Continued from page 32)

principal working part is purely rotary, the centrifugal pump itself is practically noiseless. Where intermediate gears are used, however, especially poorly machined gears, installations are frequently noisy.

15—*Automatic Regulation.*—Electrically driven centrifugal pumps can be regulated automatically by means of float and electrical switches controlled by the water level. Thus when the water level is low the pump is automatically started and when the level reaches its predetermined upper limit the pump is automatically shut off.

16—*Variable Speed and Capacity.*—Sometimes it is desirable to increase pressure for a short time or to increase capacity. With the centrifugal pump this can usually be accomplished without harm resulting in any way.

17—*No Jolts or Jars.*—Because of the uniform pressure and uniform discharge there are no sudden jolts in the pipe line—there is less wear and tear.

Sometimes it may be best for a paper mill to install two centrifugal pumps—one for water or other supply and for fire service if a high pressure line is installed for fire service where the mill is located a long distance from other fire protection. These may be necessary because of the different piping required. They can be so arranged that a single steam turbine can operate both of them, or, if possible, to so arrange the piping that two similar pumps can be operated in parallel against a low head for water supply. In case of fire where high pressures are necessary, the pumps are operated in series instead of in parallel thus producing the desired pressure.

Best results are obtained from the centrifugal pump when it delivers into reservoir or stand-pipe because it can then maintain a constant head and the pump can be constantly operated at its highest efficiency.

Centrifugal pumps can be operated successfully on direct pressure systems, but not as efficiently as when delivering to a stand-pipe reservoir. At times when the demand for water is low and when

delivering into a direct pressure system it is usually best to install a smaller centrifugal pump which would be operated at its most efficient speed. In this way efficiencies are maintained at all times.

The reader must not get the notion, however, that turbine pumps are always superior to reciprocating pumps in the paper mill as that is not the case. It is true, though, that the centrifugal pump is gradually widening its application—invading fields that have heretofore been exclusively monopolized by reciprocating pumps.

The writer does not know of any instance where a uniflow engine has been used for driving a centrifugal pump either directly connected or belted. It would be a feasible arrangement and it has been and is being considered.

Driving a centrifugal pump with a belt, chain or rope drive from a Corliss, uniflow or high speed steam engine or from a water wheel, hydraulic turbine, etc. is a desirable arrangement in many cases as for instance where the pump must be placed in a position not available for locating a direct connected engine or where the speed of the pump is higher than the speed of the engine. The speed of a centrifugal pump is usually greater than the speed of the above named engines, but is lower than the economical speed of a steam turbine.

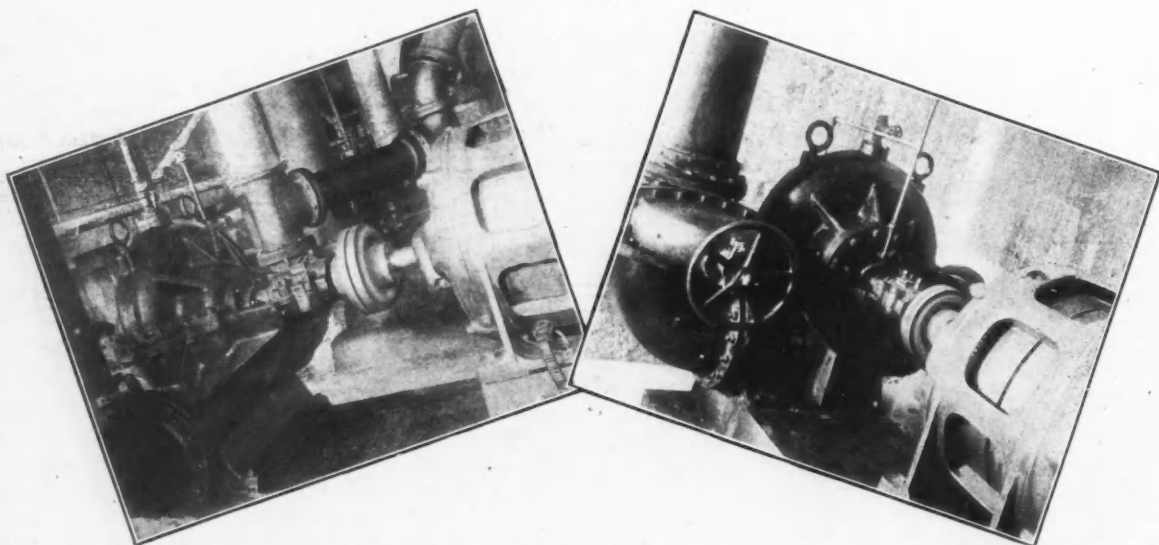
Three Methods of Lifting Water

Where water must be obtained from deep wells difficulty is sometimes encountered in efficiently lifting it into a reservoir or stand-pipe. Three methods are commonly used:

The single acting high pressure plunger pump is used. These pumps are commonly installed where the well is so deep that the water cannot be sucked from the surface. Here we have three single acting cylinders placed as low as possible in the well, below the water level if possible. If placed below the water level increased efficiency generally results.

2—*The Air Lift Pump.* Under certain conditions the air lift

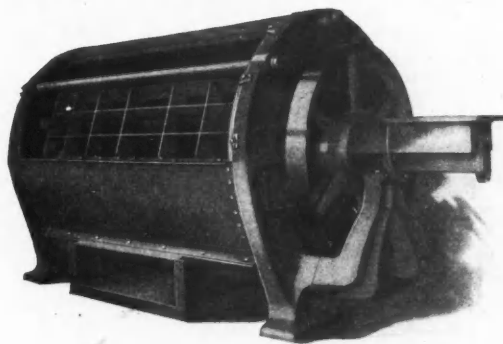
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FIGS. 4 AND 5.—TWO PHOTOGRAPHS SHOWING PART OF AN INSTALLATION OF 40 CENTRIFUGAL PUMPS AT THE ONTARIO PAPER COMPANY'S PLANT AT THOROLD, ONT. THESE PUMPS ARE USED FOR FIRE SERVICE, FRESH WATER SERVICE, AND STOCK AND BOILER FEED PUMPS. (Courtesy Morris Machine Works, Baldwinsville, N. Y.)

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THE SELECTION OF PUMPS FOR PAPER MILLS

(Continued from page 34)

pump may be considered as a possibility for pumping water out of deep wells although it is about the most inefficient pump obtainable. It has one important advantage in that it has no moving parts whatever, consisting only of a "drop pipe", the lower end of the pipe being submerged in water. Air is then compressed into the bottom of the drop pipe and air-bubbles are formed, or a mixture of air and water. The bubbles rise upward through the drop and carry the water upward and out. Where the water is dirty or where it contains harmful acids or matter in suspension

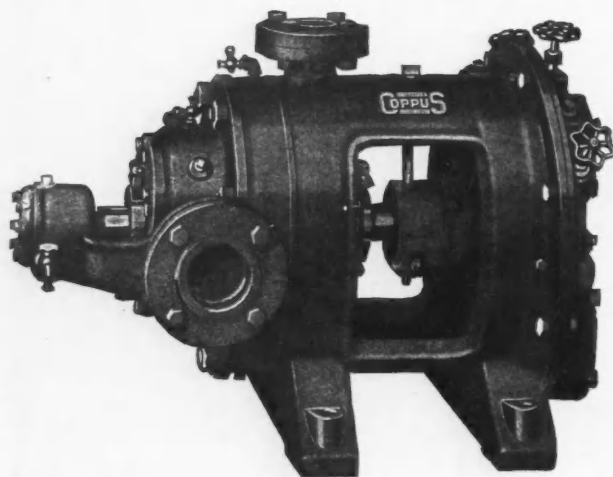


FIG. 6.—DIRECT CONNECTED TURBINE DRIVEN CENTRIFUGAL BOILER FEED PUMP. A SIMPLE TYPE THAT HAS RECENTLY BEGUN TO REPLACE THE RECIPROCATING STEAM BOILER FEED PUMP. (Courtesy Coppus Engineering & Equipment Co., Worcester, Mass.)

the air pump is to be recommended. As already stated the efficiency is low, varying from 20 to 60 per cent.

3—*The Centrifugal Pump.* This method is usually preferable because of its lower first cost, simplicity and high efficiency. The centrifugal pump which in this case has a vertical shaft, is placed at the bottom of the well, the shaft extending to the top where it is connected to an electric motor or steam turbine, or it may be driven by a quarter turn belt or rope from a steam or internal combustion engine. If the well is large enough so that the entire pumping unit can be placed at the bottom of the well so much the better. The more compact the unit, generally, the more efficient. Sometimes vertical shaft centrifugal pumps are completely submerged under the water. They are not harmed in any way by being so submerged. Also, the motor may be placed in the well at a convenient distance from the pump, far enough from the water line so that the motor will not be flooded or become wet.

It is sometimes said to be advantageous to purchase complete pumping units from one manufacturer. For instance, it is claimed that if troubles arise and the operator does not know what is at fault—the pump, the turbine, or the motor—he can go directly to the manufacturer to have the trouble remedied. It is claimed that if one manufacturer builds the turbine or motor and another the pump, it is always possible that the turbine manufacturer will lay the blame on the pump, or the pump manufacturer will blame the turbine for the trouble. They may also be a money saving involved in purchasing the entire unit from one manufacturer. Undivided responsibility, it is claimed, is an advantage. However, the writer has recently begun to doubt this undivided responsibility

claim. The manufacturer who signs the contract must usually accept the entire responsibility.

Steam turbines, electric motors, and centrifugal pumps all have "fixed characteristics." The steam turbine, for instance, has a certain best steam pressure and a certain best speed. An electric motor has a certain best speed, amperage, voltage, phase, and cycle, and the centrifugal pump has a fixed best pressure and speed. It is therefore evident that when a centrifugal pump is selected all conditions should be known in advance and complete information should be put into the hands of the manufacturer so that the correct combination of turbine and pump or motor and pump will be made. The one must be suited to the other.

The type or make of centrifugal pump is not of the most importance to the paper mill. What the paper mill needs most is the pump that will handle the necessary amount of water most economically. The duty of the paper mill official therefore is to select the pump that will ultimately handle the greatest number of gallons of water per dollar spent whether air lift, centrifugal pump, reciprocating pump, rotary pump, duplex, triplex, horizontal, vertical, Sulzer type, Rateau type, Jaeger-Kugal-Gelpke type, or any other type.

Rotary Vacuum Pumps

Rotary vacuum pumps are used in paper mill service in connection with suction rolls. In this service they are required to handle air and water simultaneously; the water acting as a seal. These units are usually arranged for bottom discharge so that the water will fall naturally from between the impellers, and the unit is not required to operate under a head of water or against a mixture of air and water. As a rule, suction roll service requires from 16" to 20" and sometimes as high as 24" vacuum, conditions varying, depending on the type of paper being produced. The so-called "volumetric efficiency" compares very favorably with reciprocating machines for this service, and it is claimed that where sealing water is used, higher efficiencies can be obtained than with the average reciprocating unit. The rotary machine is much simpler than the reciprocating unit, and can be readily adapted to practically any style of drive. There are no valves or troublesome parts of similar nature. The mechanical efficiency is very high, because there is no internal contact between the operating parts or between the operating parts and the case. These parts are all separated from each other by small and accurately gauged clearances. The only places where friction can occur, is in the bearings and in the gears. The bearings are usually of the adjustable self-oiling removable bronze sleeve type and the gears are operated in a bath of oil and are encased in an oil tight housing.

The pumping action of the rotary vacuum pump is easily understood. Two impellers mounted on parallel shafts rotate in opposite directions. The relation of the impellers to each other is accurately maintained throughout the revolution by means of timing gears, one on the end of each shaft. The shape of the impellers is such that there is a definite, accurately gauged clearance at the contact line at all times.

The principal difference between a centrifugal pump for handling fresh water and a centrifugal pump for handling pulp or paper mill stocks is that the impeller of the pulp pump is made of the "open" or "semi-open" type, with waterways correctly proportioned, of easy curvature and liberal area. At the same time the pump may operate with high efficiency though not, of course, with so high an efficiency as the fresh water type.

Things to Be Certain About

Before purchasing any pulp stock or other pump the buyer
(Continued on page 38)

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THE SELECTION OF PUMPS FOR PAPER MILLS

(Continued from page 36)

should make certain that the pump is subjected to a running test as near to actual working conditions as possible. The pump case should be subjected to hydraulic test pressure at least 50 per cent in excess of the normal operating pressure. The impellers should be designed to fulfill certain predetermined requirements such as: The so-called "head capacity curve" should be of the continuously ascending type with maximum pressure at shut off. The efficiency should be guaranteed at normal operating conditions and it should have a high average efficiency throughout the working range of the pump. It should have a so-called "power limiting characteristic" making it impossible to seriously overload the prime mover in the event of an increase in capacity such as would result from a reduction in head.

Very often manufacturers of centrifugal pumps convert standard fresh water types over to designs for special paper mill work. To do this the standard design is simply equipped with a concave arm impeller. Where pumps are used for handling sewage, paper mill stock, and other stringy material this concave design of arm impeller is almost invariably used.

Where necessary in paper mills centrifugal pumps can also be made "double acting." That is, the pump will work equally well with the shaft running in either direction. This construction enables the pump to run with little power when the discharge is closed, which is a large saving, as the pump will only deliver pulp or water as it is needed, keeping it ready under pressure in the meantime and thus making overflow or storage tanks unnecessary. This pump is usually rather expensive as regards first cost due to its heavy construction, but when it is considered that it will last almost indefinitely the first cost is practically the last.

For measuring large quantities of water flowing through paper mill or other piping there is nothing better or simpler than the Venturi meter. It does not contain any moving parts, does not change the direction of flow of the water, and does not retard the water in any way. It is practically 100 per cent perfect water meter.

The Venturi meter is based upon accurately determined scientific principles.

In writing to manufacturers for prices the more information they receive, the better. Inform them, for instance, if service is to be continuous or intermittent. How many units do you

think you will need? What will be the capacity of each unit? Against what head must the pump work? What will be the approximate suction lift, that is, about how far from the water level to the centrifugal pump shaft? What will be the approximate variation in both the suction lift and the discharge head below and above the pump shaft? State whether the water is clear or gritty. Does it contain acids? Does it contain solids in suspension? If you already have a motor that you want to use for driving a centrifugal pump, state whether direct current or alternating. Should it be direct current motor, give the voltage at the wire terminals. If it is a synchronous alternating motor name the desired power factor. Also, if alternating current give the characteristics, namely, phase, cycle and voltage. If you want to drive with kerosene, gas, or oil engines which is not likely in the average paper mill, give the altitude above sea level. State whether or not you are equipped with a condenser. If so, give the make. Give the temperature, and the amount of cooling water used. If you want to drive the pump with steam give the present boiler pressure. State whether or not you want to use exhaust steam for heating. Give the degree of superheat. And so forth. The information cannot possibly be too complete.

Paper Production in Germany

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., December 28, 1921.—An American Consul in Berlin has sent a report to the Department of Commerce stating that recently published figures on the manufacture of paper and pulp in Germany in 1920 gives the production as less than in 1913.

The production was 1,055,100 tons in 1920, as compared with 1,611,200 tons in 1913 and 1,292,850 tons in 1907. In other words, the production rose considerable from 1907 to 1913, but in 1920 was below the production in 1907. On the other hand, says the report, statistics which are available of the production during the second half of 1919 show that the production during the corresponding period of 1920 was somewhat higher than the production in 1919. The statistics for cardboard, paper with wood finish and the different kinds of paper pulp display the same general tendency for the corresponding periods.

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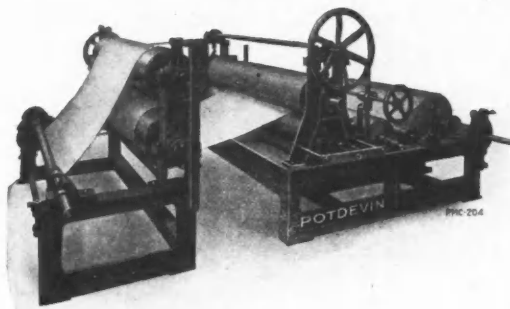
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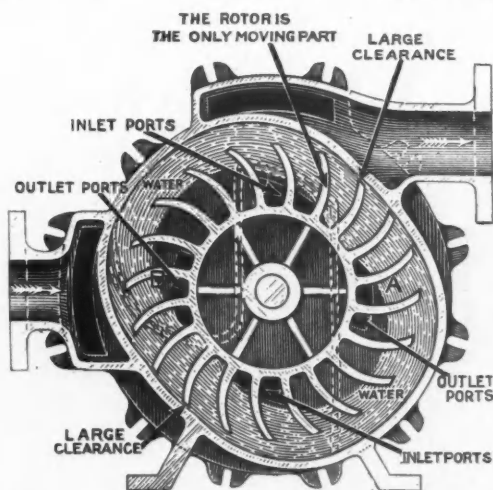
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Editorial

Vol. LXXIII New York, December 29, 1921 No. 26

FIFTIETH YEAR

The Year's Outlook

While the outlook for the new year in the paper industry is not as satisfactory as it might be, it is by no means discouraging. It is practically certain that the depressing experience of last year, when the bottom practically dropped out of the market, will not have to be gone through again. Those best acquainted with conditions, in fact, believe the situation will be just the reverse of what occurred at that time. Of course no one looks for any considerable advances, in fact in some lines it is believed that some additional downward revisions may take place, but these are not likely to be of a very disturbing character.

In general it is felt that most branches of the industry have pretty well adjusted themselves to the new condition of things and that business will expand slowly during the year along healthful lines. This impression is shared by so good an authority as Mr. Roger Babson, of Babson's Statistical Bureau, who, in a recent statement, observed that six of the great industries had already practically returned to normal and that the paper industry was rapidly approaching that condition.

Due to the chaotic condition of exchange foreign competition in paper is bound to be one of the disturbing factors throughout the year. It is practically impossible to remedy this immediately, however, and it will have to be endured as best it may. Labor for the most part has accepted the situation commendably. It apparently appreciates that under the circumstances of a falling market, downward revisions in wages are inevitable, and at present, at least, there seems little reason to anticipate serious trouble from this source during the year.

As regards the business outlook for the year in general, the situation is well summed up by the First National Bank of Boston, which says:

As the year-end approaches, an attitude of hopeful expectation toward business is clearly evident. This is not due to surface developments of the moment—for the current trade reports are not wholly favorable—but rather to a gradual recognition of the fact that certain vital fundamental conditions underlying the world's business structure have measurably improved in recent months and give promise of a more stable and absolutely essential foundation on which healthy trade relations may be built. As to the immediate present, retail trade on the whole has slackened somewhat—better for the department stores and poorer for the smaller retailers. While this slowing-up has been partly due to seasonal causes, there is noticeable a wave of disinclination to buy freely on the part of the public. A demand for still lower prices is quite evident,

influenced by a feeling of economy in some sections and dictated by sharply decreased purchasing power in the agricultural regions. In hides, leather, shoes, woolen and cotton goods, demand has lost its edge. The manufacturer, between uncertain demand and fluctuating raw material prices, has a perplexing problem, narrow profits being the rule as a result of sharper competition. Nevertheless, cotton, woolen and worsted mills are active, wool itself having improved its statistical position with attendant higher prices. Wholesale trade is much duller, affected considerably by the approaching inventory and yearly statement period. More encouraging is the improvement in the steel industry,—now at 50 per cent capacity,—which reports heavier buying and the blowing-in of idle blast furnaces. The paper trade, after a very lean period, now shows distinct betterment. That business is unsatisfactory in character and sub-normal in volume is indicated by the record of failures, which in number are the highest in six years; and by the figures of bank clearings. The first eleven months of 1921 are about 22 per cent below 1920; November showed 15 per cent under November, 1920, when poor business was widespread; and latest figures—for early December—show a decline of only 7 per cent as compared with the similar period of last year.

An examination of events and tendencies making for a restoration of normal conditions discloses a considerable list. Among the more important may be mentioned the waning of the Russian experiment, the leaders openly confessing disillusionment as to Soviet government. The shrinking of this menace is tremendously reassuring to the business world. Again, the promise of a definite settlement of the Irish question removes a conspicuous element of friction. A more tolerant attitude toward the former enemy countries and serious discussion having a modification of reparations in view bear witness to the necessity and growing willingness of all parties to put into effect a workable, businesslike program. Then, too, unemployment is dwindling and the amount of warfare and the number of men actually fighting is sharply decreasing. The accomplishments so far realized at the Washington conference spell smaller expenditures for war preparation and consequent lower taxation. So it happens that with great depression in business, a fairly buoyant feeling exists as to the future. The timid investor has regained his confidence and an active security market—with rising bond prices—reflects his judgment that general conditions are rapidly regaining stability and are becoming normal.

American Valuation Plan

Ford buys auto plant in Germany; Yale locks to be made in Hamburg, Germany; American Woolen Mills buy eight factories in Germany and Czecho-Slovakia; Germany crowded with American buyers; Krupp Gun Works in Germany employs more workers than during the war. These are some of the headlines which have appeared over recent articles in the newspapers of America.

Summed up they mean stagnation for American industry

and reduced wages for this country's thousands of workers and wage earners. Men, who gladly gave up their jobs in factories here that justice might be gained in the War with Germany, are today wondering if they will have to go back and ask Germany for employment. For over there factories are working full time and many are operating night and day.

Three very well known American manufacturing concerns are mentioned above. Each employs thousands of workers. What they have been forced to do is but the forerunner of what more will be compelled to do, whose plants in this country have been closed by competition from Germany, where labor is paid but a tenth what it is here and where currency has depreciated from about 24 cents to about one-half of one cent or more than 98 per cent as compared with the American dollar.

There is before Congress today a tariff bill, designed to provide adequate protection to the American manufacturer and wage earner. In view of the unsettled conditions abroad and the depreciated currencies, it provides that ad valorem rates of duty on imports be assessed on the American value of the article and not on the foreign value, or the foreigner's invoice, as at present.

Among numerous important associations the American Paper and Pulp Association is strongly behind the American Valuation plan.

With foreign values varying greatly, ad valorem rates of duty when applied to them set a premium on cheap labor, that is, any rates determined by Congress to afford protection against imports from Germany will result in a prohibitive duty or an embargo against similar goods made in England, France and other countries which pay wages nearer those in this country and whose standards of living are much like America's, and whose currencies have not depreciated as much as Germany's.

Importers, who are nothing more than American agents for foreign manufacturers and who give employment only to a small clerical force in this country, and retailers, who prefer to buy from the cheap labor countries because they can sell at ten times the profit made on handling American goods, are bitterly opposing the American Valuation plan. They claim that if the duty is raised on cheap foreign made goods, imports will stop and workers will have to pay more for practically everything they buy.

An interesting and perhaps appealing argument but absolutely false.

Former Secretary of the Treasury, Leslie M. Shaw, declares that this Government is losing from \$100,000,000 to \$500,000,000 a year as the result of importing frauds and undervaluations under the present law, an evil which the American valuation plan will correct. This money instead of going into the pockets of the foreign manufacturers and the importer should be turned into the coffers of the U. S. Treasury and would somewhat relieve tax burdens on the American public.

The retailer should be made to see that the welfare of his business depends on the welfare of American industry. He

does not look to the foreigner, from whom he buys, for his sales. He looks to the American wage earner and if he is out of work because of cheap labor and foreign competition he will have no money with which to buy. Factories can not operate if there is no market for the manufactured product and until American industries are given adequate protection, there is little hope for any improvement.

The tariff issue is most essential to the welfare of the country. Your president, your senators, your congressmen, elected to represent you in Washington, should be so informed.

Additional Support for Forestry Legislation

[FROM OUR REGULAR CORRESPONDENT.]

SAN FRANCISCO, Cal., December 27, 1921.—Renewed support has been given to the campaign for adequate forestry legislation by the Western Forestry and Conservation Association, which, with the American Paper and Pulp Association, has a membership in the National Forestry Program Committee, which is supporting the Snell-McCormick bill for Federal cooperation with state and private owners of forest land for the maintenance of continuous forest production. In instructing E. T. Allen, its member on the national committee, as to the attitude he shall take in the Congressional forestry hearings beginning January 9, the Western Forestry and Conservation Association adopted the following resolution:

This conference of the forest interests of the five Pacific coast forest States representing lumber and timber organizations as well as forestry agencies, unanimously approves the cooperation of Federal, State and private interests in formulating and carrying out a far-seeing and comprehensive national forest policy under the principles embodied in the Snell-McCormick bill.

We recognize both public and private responsibility for prompt and sincere steps toward the ends mentioned and urge support of this bill in its present form or as it may be modified better to secure such ends. Particularly we emphasize as of earliest importance its features for extending to all permanent forest land the adequate fire protection which must underlie all forestry effort and for the extension by purchase and exchange of public ownership of forest land.

Propaganda Against American Valuations

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., December 28, 1921.—Charges that importers, through misleading propaganda, are attempting to delay or defeat tariff legislation and to accomplish this end are centering an attack on the American Valuation plan, were made by Chairman Fordney of the Ways and Means Committee, who declared that American valuation was the logical solution of the present day economic conditions.

"Opposition to the pending tariff measure readily is traced," asserted Mr. Fordney, "not to the American producer, not to the man who deals chiefly in American made products, but to the man who produces abroad and the man whose chief interest is in bringing the product of cheap foreign labor to the American market."

Average Prices Paid by Publishers

The weighted average price of contract deliveries from domestic mills to publishers during November, 1921, f. o. b. mill, in carload lots, for standard news in rolls was \$4.194 per 100 pounds. This weighted average is based upon November deliveries of about 51,000 tons on contracts involving a total tonnage of approximately 549,000 tons of undelivered paper manufactured in the United States.

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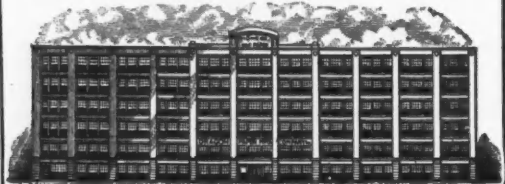
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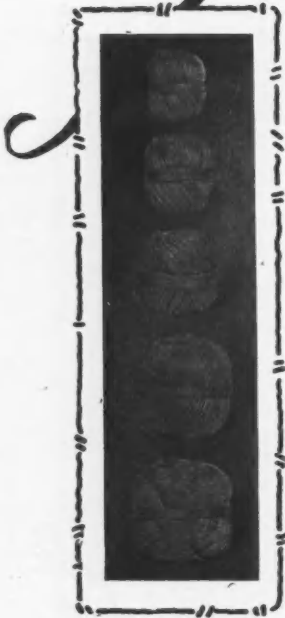
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Conducted by **W.G. MacNAUGHTON**, Secretary

BLEACHING AND RELATED PROCESSES

As Applied to Textile Fibers and Other Materials

By J. MERRITT MATTHEWS, PH. D.

While, as Doctor Matthews says in his introduction, this work has been written primarily for the textile chemist and the actual operative in the mill so that the subject has been approached more from the practical point of view than from that of the theoretical and academic chemist, there is much of the volume (which carries 649 pages and 32 chapters) that will be found of interest and value to the paper mill chemist, especially if engaged in bleaching problems or in the treatment of rags for paper. A further quotation from Doctor Matthews' preface on the purpose of the work, can be taken as applicable in a measure to the paper industry:

"While the main theme herein is that of textile bleaching and scouring, there is also included a discussion of the topic of bleaching as extended to other fields of industry. As these fields, as a rule, have not been subjected to any degree of scientific investigation or method, they can be dealt with in only a comparatively sketchy and inadequate manner. I realize these limitations, but hope that this publication may serve as an incentive towards an increased interest in these fields and that students will recognize them as interesting possibilities for fruitful research.

"As to the practical bleacher and the responsible executives of this industry, it is to be hoped that this volume will help towards inciting an interest in the systematic investigation and scientific study of actual mill processes and operations. Most bleacheries are overgrown with the moss of secrecy, prejudice and tradition, and harnessed to rule-of-thumb methods that have been evolved from primordial ancestral experience. That such experience is the basis of many useful ideas and satisfactory methods of operations is not to be gainsaid; but at the present time unless such experience is analyzed in the light of modern scientific knowledge it may come to be a retarding influence rather than a progressive one."

The first ten chapters are occupied with wool and silk, the methods for removal of impurities and the subsequent bleaching. On account of the preeminent importance of cotton as a textile fiber the thirteen chapters following are devoted to it alone. While a large portion of these chapters deals with problems relating to the textile industry only, we find ourselves in chapters XVI and XVII on familiar ground. These deal with the general theory of bleaching as well as the

handling of chloride of lime solutions. In discussing the preparation of bleaching powder solutions, Doctor Matthews says:

"The author has found that the most economical method of preparing solutions of bleaching powder is to employ a system of agitation actuated by a pump. The tank is first filled with water, the centrifugal pump is started and then the chloride of lime powder is thrown in. The circulation of the chloride of lime through the pump breaks the lumps into fine powder and serves very intimately to mix the bleaching powder with the water. The pump is run for about one-half hour, then the liquor is allowed to settle for six hours. This method of agitation gives a very rapid solution of the bleaching powder and exhausts the material more efficiently than the older methods of agitation where paddles were used. The tank is constructed of cement, and is of sufficient capacity for a drum (800 lbs.) of bleaching powder. The solution obtained in this manner will stand at about 10 to 12° Tw. (depending on the volume of the tank) which will be in the proportion of about 1½ gallons of water for each pound of bleaching powder. The volume allowed for sludge should be about 5 cubic feet for each 100 pounds of bleaching powder. Under the conditions given above there will be only about 0.7 per cent of undissolved available chlorine in the sludge. The outlet pipe for the clear bleach liquor should be arranged at a sufficient height as to allow for the proper volume of the sludge. If this is not the case the time of settling will be much prolonged. In 6 hours' time the amount of settling is about 95 per cent of what it would be in 16 hours.

"The following observations taken under actual mill conditions will illustrate this point:

Time occupied	Distance settled clear
1 hr. 36 min.	2 ft. 0 in.
1 " 12 "	1 " 0 "
2 " 16 "	0 " 6 "
11 " 0 "	0 " 3 "

It is thus seen that in 5 hours 4 minutes the liquor settled clear 3 feet 6 inches, while in the next 11 hours it only settled a further 3 inches.

"Another important factor in the efficient and rapid preparation of bleaching powder solutions is the temperature of the water employed. When the water is cold (50° to 60° F.) the rate of settling is very slow; whereas when the temperature of the water is 75° to 85° F., the rate of settling of the sludge is greatly increased. This is shown by the following tests:

Temp. of water, F.°.....	50	85
Inches settled, per hr.....	6	22
Degrees Tw. of solution.....	13	12
Cu. ft. of sludge per 100 lbs. of chemi.....	5.4	2.2

It is stated as a matter of practical observation that the water used for preparing a chloride of lime solution should be at a temperature of 75° to 85° F. The agitation or mixing should be continued for 20 minutes for all strength of liquors up to 16° Tw., as further time of agitation is simply wasted and makes the settling slower. The space allowed in the tanks for the sludge should be 5 cubic feet for each 100 pounds of bleaching powder, and unless sufficient space is allowed for the settling of the sludge a great deal of time is wasted. In washing the sludge the agitation should only be carried out for 5 minutes."

He also quotes Griffin (*Jour. Soc. Chem. Ind.*, 1904, p. 174) as follows: "A bleaching powder of 38 to 39 per cent of available chlorine will settle much better than one of lower chlorine strength. The quality of the water has an important influence on the results, as it affects the relative specific gravities of the solution and the insoluble matter. A small amount of carbon dioxide in the water will cause a much more rapid settling. Griffin finds that a bleach liquor of 6° to 7° Tw. is the most convenient to make, and this together with the first washing from the sludge will give a solution of about 4.2° Tw. Such a liquor is suitable for most purposes and requires a capacity of about 1 cu. ft. for 3.75 lbs. of good powder. Griffin recommends the following installation for preparing the solution: Two round or square concrete tanks with agitators and adjustable syphons leading to a storage tank having a capacity equal to the sum of the first two. In one tank a mixture of 6° to 7° Tw. is made up and allowed to settle; the other tank contains the sludge from a former extraction, and this is filled up with fresh water, agitated and allowed to settle. The two liquors are then drawn off in equal volumes giving in the storage tank a liquor of about 4° Tw. The sludge from the second liquor is again agitated with water and settled and this weak liquor is used to wash the strong sludge from the fresh extraction. After the second washing the sludge is discharged and the tank is ready for a fresh charge of powder."

In chapter XX a section is devoted to cotton linters and in chapter XXV bleaching paper pulp is touched upon.

While the work cannot be taken as a handbook of bleaching for the paper industry, it will be found highly instructive to the paper mill chemist. In discussing bleaching with chemicals other than the hypochlorites and often suggested, the author discusses the relative value of proposed bleaching compounds.

"As far as theoretical considerations are involved, since bleaching is really an oxidation of the organic coloring matter of the fiber, it would seem that the value of any bleaching compound would be dependent upon the amount of available oxygen to which it corresponds. The percentage of available oxygen in the four substances mostly employed in bleaching is as follows:

Chloride of lime 33 per cent x 71/16	=	7.5 per cent
Potassium Permanganate $O_2:K_2Mn_2O_8$	=	15.2 " "
Hydrogen Peroxide 10 volumes of O	=	1.4 " "
Sodium Peroxide 98 per cent pure	=	20.0 " "

"The relative cost of a pound of oxygen as given by these substances, reckoned at their commercial value (1913), would be as follows:

Bleaching Agent	Cost per 100 lbs. in cents	Percentage of available Oxygen	Cost of Oxygen lb. in cents
Chloride of Lime.....	130	7.5	17.
Potassium Permanganate	950	15.7	61.
Hydrogen Peroxide.....	430	1.4	307.
Sodium Peroxide.....	4,000	20.0	200.

"For testing the quality of bleached cotton the author goes into the subject quite thoroughly. For determining the bleaching qualities of paper pulp Klemm's method is quoted from *Wochenbl. Papierfab.*, 1909, p. 3973."

The last six chapters of the book are taken for the various chemicals used in "scouring," boiling out and bleaching of all textiles with the methods of chemical analysis and testing, together with numerous tables.

The volume is largely illustrated with cuts of machines of apparatus used in the textile industry as well as those shown for historical purposes to indicate the progress of developments.

It is concluded with a bibliography and a very comprehensive index.

Bleaching and Related Processes is published by the Chemical Catalog Company, Inc., 1 Madison avenue, New York.

An Interesting Message From "Hamilton's Dandy"

An interesting statement to come from an employer to the men in his paper mill features the second issue of the new house magazine of W. C. Hamilton & Sons, which has been christened "Hamilton's Dandy." The special page is entitled "The President's Message," and has this to say in part:

"Whenever men get together and talk they sooner or later get around to one subject. If they are salesmen, managers, or other executives, the question is "how's business?" If, like you, they are in the production end the inquiry usually is "how long are you working?" None of us like to look a hard winter in the face with no better prospect for steady work than we endured all summer. I take it, then, that you would like to know what the prospects are. In orders received, September was the best month of the year, but this was largely due to the fact that over half the tonnage was from one large order which we only get once a year. With this order out, more tonnage was received in October than in September, which means that more customers were ordering, although their orders are smaller and come oftener than last year. Up to the 18th of November our orders amounted to less in tons than for the same period in October. This is about what we would expect if we were doing a normal business as orders get less after the paper needed for the holiday is furnished. I think this means that a part of the better business in September and October was due to seasonable demand and not all of it represents improving business. The trade generally seems to think that December will be a dull month as it usually is. This dullness generally passes when the demand for paper for use in the spring months comes in, probably late in February. If they are right, we can expect no increase in working hours until after the first of the year, and we may have to face a decrease. This is at best a guess. In my own short experience I have seen this mill change from a scarcity of orders to being over-sold in less than one month. We hope it will happen again and that soon, but we are not justified in making our plans in this expectation."

SULPHITE MILLS OPERATED WITHOUT FUEL?

Apparat Aktiebolaget, of Stockholm, Sweden, represented in the U. S. A. and Canada by Pulp and Paper Mill Accessories Limited, 170 McGill Street, Montreal, Que., has been experimenting for several years with the problem of evaporating the waste sulphite liquor and utilizing the condensate as fuel. Two complete plants are now in operation in Sweden, equipped by Apparat Aktiebolaget, and a translation is printed below of the report of tests made by Mellersta & Norra Sveriges Angpanneforening, consulting steam engineers, on the equipment installed at the Storviks Sulphite Aktiebolag, Storvik, Sweden.

"Storviks Sulphite Aktiebolag, Storvik.

Dear Sirs:

Investigation of the Evaporation of Sulphite Liquor for Fuel

Requested by you to make tests on the apparatus for evaporation of waste sulphite liquor installed in your mill, and to make tests on the heating value of the fuel thus obtained, we herewith present our report of these tests, made by our Mr. Rogius, on May 10-13, 1921.

Description

The evaporation plant consists of two units, of which the first unit is intended for evaporation from 11 per cent to 30 per cent dryness, and the second unit is intended for evaporation from 30 per cent to 55 per cent dryness.

The first unit consists principally of following equipment:

2 Heaters, (surface condensers), of 232 sq. meter heating surface each,

1 Expansion Vessel,

1 Gas Washer with pump for milk of lime,

2 Centrifugal Pumps, driven with electric motors, for the circulating of the liquor in the unit.

Various pumps and apparatus for intake and discharge of liquor from the unit as well as for discharge of the condenswater.

The second unit consists of the following equipment:

1 Heater, (surface condensers), similar to above.

1 Expansion Vessel,

1 Gas Washer, similar to above,

1 Pump, geared, belt-driven, for circulation of the liquor,

1 Centrifugal Steam Compressor, driven by electric motor, for the steam from the unit,

Various apparatus etc. for the liquor and for the condenswater, similar to the first unit.

The liquor to be evaporated is taken into the expansion vessel through the feeding device, a floater which keeps the level of the liquor at constant height.

The liquor is carried from one of the chambers in the bottom of the surface condensers to a tank placed beside the unit. When the liquor has reached the proper concentration, it is drawn from this tank automatically, by means of floater valve, the function of which is regulated in simple manner by weights placed on the floater.

The circulation pumps carry the liquor through the tubes of the surface condensers three times.

The evaporation is done by the steam evaporated from the liquor in the tubes and in the expansion vessel, the pressure and temperature of which is raised from about .025 kg. per sq. centimeter, resp. 100.7 Degr. Centigrade, up to about .35 kg. per sq. centimeter, resp. 108.5 Degr. Centigrade, and carried in around the tubes. When the steam is condensed against the cooler tubes, its steam producing heat is liberated and is transmitted to the liquor through the tubes for further evaporation. The condenswater is carried away from the units through ordinary waterducts at a temperature of around 100 Degr. Centigrade, and some of it can be made use of as feed water for the boiler plant.

Two tests were made with the first unit which had been in operation about two weeks at the time of starting the first test. This test gave a result of 9.24 cub. meter liquor evaporated per hour.

The purpose of the second test was to find out the capacity of the unit when filled with fresh liquor; it will be seen from the result of this test, 11.9 cub. meter per hour, that the liquor had dissolved the solids deposited on the inside of the tubes, which, undoubtedly, were there during the first test, thus giving a higher evaporation.

The emptying out of the old liquor and filling up with new, can be done in about 45 minutes.

Tests with the First Unit

	I	II
Number of test.....	I	II
Date of test.....	May 11, '21	May 12, '21
Duration of test for measuring the condenswater	227 min, 20 sec.	300 min. 32 sec.
Duration of test for measuring the liquor	307 min. — sec. —	
Volume in cub. meter of liquor going in,	44	—
Temperature in Centigrade of the liquor going in	70	—
Per cent solids of liquor going in.....	10	10.8
Specific Gravity at 20 Degr. Centigrade of liquor going in.....	1.050	—
Cub meter per hour of liquor going in, reduced to 11% and 95 Degr. Centigrade	9.24	11.90
% solids in evaporated liquor	30.9	34.9
Cub. meter per hour of evaporated liquor discharged	2.835	—
Cub. meter per hour of evaporated liquor discharged, reduced to 30% from 11% liquor at 95 Degr. Centigrade	3.39	4.37
Kg. water evaporated during test.....	25570.5	39170.5
Kg. water evaporated per sq. meter heating surface per hour.....	14.55	16.86

Power Consumption

Compressor H. P. approximately	181.0	181.0
2 Liquor Circulating Pumps	37.1	37.1
Gas Washer	11.3	11.3
Circulating Pump for milk of lime	2.1	2.1
Pumping up the liquor	4.0	4.0
Pumping up the condenswater	4.0	4.0
H. P.	239.5	239.5
Water evaporated in Kg., per H. P. hour, total	28.18	32.66
Water evaporated per H. P. hour, compressor work	37.3	44.1
Water evaporated per H. P. hour, circulation work	181.9	211.0

Tests were also made with the second unit and following results were obtained:

Tests with the Second Unit

Date of test	May 13, '21.
Duration of test for measuring the condensation	206 min.
Duration of test for measuring the volume of liquor	302 "
Volume of liquor going in, cub. meter	11.8

Volume of liquor going in, cub. meter per hour..	2.30
Volume of liquor going in, cub. meter per hour, reduced to 30% liquor at 90 Degr. Centi- grade	2.13
Volume of liquor going in, cub. meter per hour.	2.30
Volume of liquor going in, cub. meter per hour, reduced to 30% liquor at 90 Degr. Centigrade	2.13
Volume of evaporated liquor, cub. meter	6.7
Volume of evaporated liquor, cub. meter per hour	1.34
Volume of evaporated liquor, cub. meter per hour, reduced to 55% from the 30% liquor at 90 Degr. Centigrade, as it enters	1.16
% solids in the evaporated liquor	53.6
Temperature in Centigrade of the evaporated liquor leaving the unit	90.0

Power Consumption

Compressor, approximately	47.30 H. P.
Circulating Pump	28.00 H. P.
Gas Washer	10.85 H. P.
Milk of lime circulating pump	2.10 H. P.
Pumping up the liquor	2.00 H. P.
Pumping up the condenswater	4.00 H. P.
Motor for the lime mill	4.00 H. P.
Total	98.25 H. P.
Water evaporated, kg. per H. P. hour	11.92
Water evaporated, kg. per H. P. hour, com- pressor work	24.8
Water evaporated, kg. per H. P. hour, cir- culation work	41.90

According to stipulations made by the Government of the Province of Gefleborg, such measures shall be taken with the liquor discharged from your mill, that one-half of it shall be purified or in other way eliminated from the river alongside which your mill is located.

The total quantity of liquor produced is, 4.096 cub. meter per ton pulp made. When manufacturing 26,000 tons per year, and with an estimated operating time of the evaporators of 8,400 working hours per year, this is equivalent to 12.7 cub. meter liquor per operating hour, half of which quantity shall, according to stipulation above mentioned, be purified.

From the report given above, it follows that the second unit can handle 2.13 cub. meter per hour of 30 per cent liquor, concentrated to 55 per cent, which is equivalent to 5.8 cub. meter per hour 11 per cent liquor to the first unit.

If the concentration is to be driven right up to 55 per cent dryness, the required quantity—6.35 cub. meter per hour—of liquor can not be evaporated by the second unit, which, however, will be possible if one is satisfied with a concentration of 53.5 per cent.

This lower percentage of concentration does not cause any inconvenience, as can be seen from the attached report; the heating trials reported on were conducted with liquor of a considerably lower concentration, and no difficulties whatever were encountered in burning same.

Consequently, the company can be considered to have filled the requirements stipulated by the authorities above referred to.

From the report of the *fuel test* it can be seen that the efficiency of the boiler was very good, when one considers not only the moisture content of the fuel but also the make-shift arrangements for the combustion of the liquor as well as the poor circulation in the boiler. With more suitable arrangements a still better result could undoubtedly have been reached.

The work of firing the boiler is very simple and, therefore, one fireman can look after a number of boilers.

There remains to be investigated how an installation of this size will pay for itself.

For such investigation a "heat balance" must be made up, in which consideration has been given to the manner in which the power, necessary for the operation, has been created.

In this case we have two alternatives, leaving water power out of consideration, viz.:

- (1). Power, created by condensing machinery,
- (2). Power, created by compound engines with fully utilized discharge steam.

In both cases coal with effective heat value of 6,500 heat units is thought to be used in the steam plant, and it is also thought that this plant works with a total efficiency of 80 per cent for boilers and economizer.

In a plant in which the second unit has been added sufficient to handle the entire volume of liquor at about 11 cub. meter 11 per cent original liquor per hour coming from the first unit, the power consumption would likely increase to about 370 H. P. as against 347.75 H. P. now required.

Power Consumption When Power Is Produced According to Alternative 1

Based upon the higher power consumption which can be figured at 8 kg. per H. P. hour, the total for power, expressed in kg. per hour	296
Preheating the air from 95 Degr. to 100 Degr. Centi- grade	16.5
To cover losses through radiation	7.5

Or total coal, kg. per hour

Upon the basis of the heat value of the concentrated liquor, which is 1,700 effective heat units per kg. at 53.5 per cent dryness, the quality of coal of 6,500 heat units per kg. which corresponds to 11.0 cub. meter liquor of 11 per cent dryness, can be calculated.

$$11 \times 1.052 \times 1000 \times 11 \times 1700$$

$$\text{Thus, K} = \frac{\quad}{6500 \times 53.5} = 625 \text{ kg.}$$

If the above mentioned consumption of coal is deducted for power, there remains a profit of 305 kg. coal per hour—or per 11 cub. meter—original 11 per cent liquor.

As 4.096 cub. meter liquor are obtained from each ton of pulp, the profit in fuel per ton pulp will be

$$\frac{305 \times 4.096}{11} = 113 \text{ kg. coal per ton pulp.}$$

Power Consumption When Power Is Produced According to Alternative 2

Theoretically, 632 heat units are required for each H. P. hour. Add hereto radiation and other losses, and the total of above 850 heat units per H. P. hour is required.

If, as in alternative (1), we figure with a total efficiency of the boiler plant of 80 per cent. we arrive at a coal consumption of 163 kg. per H. P. hour, or, for the total power consumption, 60.5 kg.

Add hereto, as in the first alternative, for heating of the air and for radiation, 23.7 kg., or altogether 85 kg.

The saving in this case will be 625 less 85 kg., or 540 kg. per hour or 11.0 cub. meter original 11 per cent liquor, or per ton pulp,

$$\frac{540 \times 4.096}{11} = 200 \text{ kg. coal.}$$

From a yearly output of 25,000 tons of pulp one could consequently gain a net quantity of fuel corresponding to when producing power according to alternative (1),
2,825 tons coal,
when producing power according to alternative (2),
5,000 tons coal.

If this coal is valued as low as Kr. 30.00 per ton, there will be a saving in fuel of *

*Sweden kroner par = 26.8 cents, U. S.

according to alternative (1),	Kr.	85,000.00
according to alternative (2),	Kr.	150,000.00
Operating costs—with exception for power—would amount to approximately		
2 men per tour at Kr. 4,000.00	Kr.	24,000.00
2/3 man for repairs at Kr. 4,500.00		3,000.00
Sundry material, etc.	Kr.	13,000.00

Total Kr. 40,000.00

According to alternative (1), there remains consequently Kr. 85,000.00 less Kr. 40,000.00, or Kr. 45,000.00, to cover cost for interest on the capital invested and depreciation of the plant, and according to alternative (2), Kr. 150,000.00 less Kr. 40,000.00, or Kr. 110,000.00.

If we figure 20 per cent for interest and depreciation, the cost for installation according to alternative (1), could be allowed to be Kr. 225,000.00 and according to alternative (2), Kr. 550,000.00.

According to information which we have obtained, the latter sum is quite sufficient, while the former is not.

However, the price of Kr. 30.00 per ton coal used in the above calculation, is so low that it may be questioned whether such a price can be figured on for the future.

If we figure with a price of coal of Kr. 50.00 per ton which can be considered the average price prevailing now, the calculation will be much more advantageous for the evaporation.

According to alternative (1), the value of the coal will then be

Kr. 131,500.00

and, after deduction of the operating cost

Kr. 40,000.00

the corresponding profit will be

Kr. 91,500.00

If, in accordance with the above, we figure 20 per cent interest and depreciation on the installation, with a coal price of Kr. 50.00 per ton, the installation will pay for itself even with power as per alternative (1).

Stockholm, June 15, 1921.

Mellersta & Norra Sveriges Angpanneforening,
Angtekniska Afdelningem.

The results obtained during these tests are very startling, and it is not claiming too much to say that one can now see the arrival of the day when a sulphite pulp mill, with hydro-electric power to drive the 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.

The following table gives the calculated fuel consumption in kg. of an average grade of coal per ton chemical pulp manufactured in an efficient mill at different times. The table is given to show the intense development of the fuel question in chemical pulp industry during the last twenty years.

Kg. Coal Per Ton Pulp

Sulphite—	1900	1910	1915	1920	1922
Generation of power.....	250	*200-0	.....	.....	.....
Cooking	350	325	300	290	280
Drying	300	300	270	†160	160
Sundries	100	100	80	80	160
Total	1,000	*725	650	530	500
Of this, bark.....	250	225	200	200	200
Of this, other self-produced fuel.....	.....	.....	.....	.....	‡250
Balance to buy.....	750	500	450	330	‡50
Sulphate—					
Generation of power.....	300	*250-0	.....	.....	.....
Cooking	400	350	300	290	280
Drying	300	300	270	†160	160
Evaporation	150	100	||350	350	350
Sundries	100	100	80	80	160
Total	1,250	850	1,000	880	850
Of this, self-produced fuel.....	.....	.....	||600	600	600/650
Balance to buy.....	1,250	850	400	280	250/200

* The question of power is thought solved (Hydro-electric).

† Feltless presses are introduced on the drying machines.

‡ Ventilation of the dryers is modernized.

|| Evaporation of sulphite liquor is introduced. (This increases the power consumption with about 116 kw-hours per ton pulp.)

|| A new system for regeneration of the lye is introduced.

NOTES ON THE COPYING QUALITIES OF LETTER-COPYING PAPER*

By H. MICOUR

All those who have handled letter-copying papers within the last few years have doubtless received complaints from their customers regarding the quality of the stock. The fault was generally attributed to the foreign stock, Swedish or Finnish, which had the further peculiar property, so it was claimed, of becoming self-sized on being piled for some time; and though they copied in a sort of a way when they were first received they almost completely lost their absorbency in a few months' time.

I am not prepared to say just how much truth there is to all this talk; but it is certain that a goodly portion of the stock imported since the war was not worth much. Personally, I experienced this with a batch of letter-copying paper which refused to absorb ink properly.

Finding the Cause of the Trouble

The simplest method of finding the cause of the trouble was to compare this paper with one which had given entire satisfaction, and that is what I did.

The general appearance of the two was quite different: the good paper was much more opaque than the other, which could almost have been used as tracing paper. The satisfactory paper was also more flexible and had less rattle, and it had more bulk, though the two had the same weight per square meter, which showed that the fibers were not so closely crowded and that the

paper should *a priori* have greater absorbency.

A microscopic analysis gave the following results:

Poor paper ...	Chemical balsam pulp.....	100%
Good paper ...	Hemp Rags	45%
	Cotton Rags	45%
	Chemical Balsam Pulp.....	25%

While the first sample consists exclusively of chemical wood pulp, the second contains only 25 per cent of it, the remainder being rag stock. This difference in composition is the essential point from which all others will follow, as the fibers of chemical balsam pulp have a much lower absorbency than textile fibers and especially cotton.

Certain manufacturers also use large amounts of chemical pulps made from deciduous woods, and the *Wochenblatt für Papierfabrikation* gives the following as the composition of a satisfactory letter-copying paper:

Bleached Cotton	20
Sulphate Poplar	20
Soda Birch	20
Soda Balsam	20
Tissue Paper Trimmings	10
Broke and colored Papers	10

Another very important point is the difference in the method of beating of the two pulps. A first glance gave the impression of a considerable degree of hydration. This was naturally to be expected, for the making of a sheet weighing only 16 g. per

*Translated from *Le Monsieur de la Papeterie Francaise*, 52; 647-649, October 15, 1921, by A. Papineau-Couture.

square meter requires a "wet" stock. But a closer examination showed that the satisfactory paper had probably been beaten in more than one stage. The rag stock had been hydrated to a certain extent, but not excessively, and the roll seemed to have been let down fairly early; while the wood pulp had been subjected to a milder treatment and had not been beaten so long.

Preparing the Stock

It is well known that in preparing stock for the manufacture of letter-copying paper the rags should first be subjected to a mild cooking action, carefully washed, and then beaten with sharp blades so as to have a rather short stock. If the blades are too dull and the pulp hydrates too much the paper will not have the absorbency required to reproduce the writing properly; it will be parchimentized and quite unsuitable for copying purposes. When the cotton is about three-quarters beaten, the balsam pulp is added to the beater, and after the beating is finished the pulp is put through a Jordan. This gives a homogeneous stock and a fine formation of the sheet.

The microscopical examination of the poor paper, on the other hand, showed that all the stock had been uniformly hydrated, and that none of the fibers had been given a quicker treatment. This is a serious defect, as absorbent papers (blotting papers, etc.) must be made from free stock.

In the well-made paper these two apparently contradictory requirements were met: some of the fibers were beaten long enough to give a sufficiently strong sheet that would work properly on the machine (too free a stock would stick to the couch and press rolls); while the pulp on the whole was made free enough by the addition of fibres which had not been beaten as much, so as to give a good absorbency. The fact that the other sample was composed of but one kind of pulp and was beaten in one operation made it necessary to prolong the latter sufficiently to give the required strength, and the absorbency suffered correspondingly.

Finally, we also compare the ash content of the two samples, and found 0.7 per cent and 0.67 per cent in the good and bad samples respectively. It is thus seen that neither of them was loaded, though some very good papers of this kind are sometimes loaded to a slight extent (with calcium carbonate).

It also occurred to us that the lack of absorbency might be due to a high rosin content, which would act as a natural sizing agent. In such a case the removal of the rosin might increase the absorbency of the paper, provided, of course, that the paper was not altered in any other respect. We therefore carefully dried and weighed the paper and treated it with boiling absolute alcohol for five hours, changing the solvent at hourly intervals so as to obtain as complete an extraction as possible. Each time, the alcohol was diluted with water there was a white precipitate characteristic of rosin, the amount of which decreased as the extraction proceeded; and after five hours' extraction there was merely a faint cloudiness. But in no instance was the precipitate nearly as abundant as that obtained with a sized paper.

Formation of the Precipitate

The following procedure was adopted to be able to observe more easily the formation of the precipitate. The resinous alcohol was carefully poured into a test tube about half full of water, taking care that the two layers did not mix. In about 5 minutes a distinct white resinous ring was formed at the junction of the two layers, and in about two or three hours, when the alcohol had mixed with the water, all the upper portion of the tube was cloudy, while the lower portion remained clear. This contrast shows up the rosin much more distinctly.

After washing the paper with absolute alcohol, drying it, and weighing again, the loss was found to be (duplicate determinations) 0.47 per cent and 0.34 per cent. These cannot be considered as very good checks; but the difficulties inherent to the determination of such a small amount of a constituent should not be for-

gotten. Moreover, this grade of paper absorbs atmospheric humidity extremely rapidly when it is removed from the drying oven; and in one instance a sample weighing about 1.2 g. gained at the rate of nearly 0.5 mg. a second at the start.

The above treatment probably did not extract the last traces of rosin, and by continuing to boil with alcohol until there would have been no cloud on diluting the alcohol with water the extraction would certainly have been more complete. On the other hand, any traces of grease or oil contained in the paper were also dissolved out. But at any rate a goodly portion of the rosin was removed, sufficient to make it worth while comparing the absorbency of the paper before and after treatment.

General Appearance Not Changed

The general appearance was not changed to any great extent: the opacity was the same, but the sheet had become somewhat more flexible and had less rattle. The surface was not as smooth and felt grainier to touch, and it also seemed bulkier, probably owing to the roughness of the surface. Moreover, as was to be expected, the paper which had been treated with alcohol had contracted due to two causes: first, the unevenness of the surface made the sheet appear shorter; and secondly there was the contraction which always occurs when machine-made paper has been wetted and is slowly air-dried. We determined the amount of contraction due to each of these causes by stretching and calendering the sheets, and obtained the following results:

	Good	Bad
Length Before Alcoholic Treatment...	253 mm	270 mm
Length After Alcoholic Treatment...	249.5	266
Length After Calendering	251	267.5

But the most important point was to see if the removal of the rosins by boiling in alcohol had improved the absorbency of the poor stock.

We first used the usual triangle shaped apparatus which is generally used for determining the degree of sizing of paper. We placed side by side a sheet of untreated paper and one that had been treated, and poured a ferric chloride solution on one side of the sheets and a tannin solution on the other side. The solutions were prepared according to the directions given by Herzberg in his treatise on "The Analysis and Testing of Paper," but had been diluted with twice their volume of water so as to obtain a lighter coloration which would take longer to form. The length of time taken for the color to appear and the final shade of the fully developed color were practically the same in both cases.

We next tried a test imitating the practical conditions under which the paper is used. A treated and an untreated sheet were placed side by side, moistened as evenly as possible, and covered with a sheet of paper bearing lines made with copying ink. Here, again, we could not detect much difference in the lines on the paper before and after treatment, and if anything the untreated paper showed up slightly better.

Composition and Method of Beating

We therefore conclude that the two main factors affecting the quality of this grade of paper are its *composition* and *method of beating*. Slight variations in the rosin content of the fibers apparently do not have any great effect, provided the amount of rosin is not excessive.

We therefore recommended that the buyer examine first of all the composition of the stock, and if he finds a high proportion of chemical balsam or of chemical poplar he should be on his guard if he wants to avoid a lot of trouble. The general appearance of the stock should also be examined closely, and those which are too stiff or have too much rattle should be avoided. Finally, excessive transparency generally indicates a high percentage of balsam sulphite and a degree of beating incompatible with the absorbency required of this grade of paper.

UTILIZATION OF CELLULOSE WASTE LIQUORS

By LOUIS EDGAR ANDES IN "KUNSTSTOFFE," TRANSLATED BY CLARENCE J. WEST

(Concluded from PAPER TRADE JOURNAL of September 15, 1921)

In general the fermentation of 100 grams of the sugar in the waste liquors yield about 55 per cent of anhydrous (absolute) alcohol, so that the yield of alcohol from the waste liquors is an average of 1 volume per cent. The highest yield thus far obtained is 1.5 volume per cent.

The separation of the alcohol from the fermented mash does not present any difficulty with the use of the modern distillery apparatus, but it is necessary to remove the volatile organic acids, especially formic acid, which also appear in the distillate; this is simply and easily accomplished by means of sodium hydroxide or sodium carbonate.

The resulting distillate is then separated into three fractions. The greater part of the first fraction (below 70°C) consists of acetaldehyde, with a small amount of acetone and ethers. This fraction comprises about 3 per cent of the amount of the alcohol obtained. The final fraction, which is about 1 per cent of the distillate, consists of fusel oil, made up of butyl, isobutyl and amyl alcohols.

The principal portion of the distillate can easily be obtained as 90 per cent (by volume) alcohol. It is a water-clear, colorless liquid, which has a slight odor of fusel oil and aldehyde. The amount of the fusel oil averages about 0.25 per cent and is considerably less than the amount present in alcohol from fruits. In addition, sulphite alcohol contains about 3 per cent methyl alcohol. Because of this sulphite alcohol is denatured in the process of preparation and is therefore unsuitable for many purposes.

The fermented mash differs from the original neutralized liquors only in that it no longer contains hexosans (hexoses). It is usually disposed of by pouring it into the streams.

Distillation of Liquors

Acetone may also be recovered with the alcohol. According to A. W. White and J. D. Rue, concentrated black liquor from the preparation of cellulose may be so distilled that 31 liters of alcohol and acetone are recovered per cord of wood introduced into the digester. The yield from a soft wood, such as linden, is practically the same as that from hard woods, such as beech. The calcining device is replaced by a retort, in which the liquor is distilled at about 60° F. If a liquor of 40° Bé is distilled, the distillate will contain about 4.4 volume per cent of alcohol and acetone, no acid and about 11.2 per cent tar, consisting of approximately 50 per cent phenols. According to Bassett (Chem. Met. Eng. 20,190) the best method of producing acetone seems to be the dry distillation of wood, sugar, gums, etc. with 8 parts of lime. If the mass is slowly heated to the desired temperature (about 10 hours) and the vapors are removed as quickly as possible by means of steam or carbon dioxide, even 2.5 parts of lime to 1 part of dry wood (sawdust) gives a good yield of acetone and higher ketones. Sulphite waste liquors may also be used, if they are evaporated, mixed with lime, further evaporated, ground, and heated.

Cellpitch

Sulphite liquors containing about 10 per cent dissolved solids (specific gravity 1.05) and about 0.32 per cent of free sulphurous acid, upon evaporation, yields a technically important product, in the form of a thick, sirupy liquid or a solid mass, which has been given the name "cellpitch" ("Zellpech") by Trainer. If the concentration is carried out in an iron vessel, it is necessary to first neutralize the sulphurous acid with milk of lime, but in copper vessels the concentration may be carried out on the original liquor. The addition of the milk of lime has the disadvantage that the

outlet tube is easily stopped and that the liquid or cellpitch is less suitable for certain purposes. In the works the concentration is carried out in Kestnes' apparatus. After three hours a concentration of 35° Bé is reached. If the concentrated liquor is to be further worked into cellpitch, it is transferred to steam-heated drums. In the first drum the concentration is brought to 60° Bé, while the solid cellpitch is formed in the second. The concentrated liquor (sulphite liquor) has a gravity of 35° Bé, contains about 28.9 per cent water, 14 per cent insoluble solids and 57.1 per cent soluble solids. The organic substances are water-soluble and may be separated into tannin-like and others. The solid cellpitch is a transparent substance of the appearance of colophony, completely soluble in water, is not softened by heat, but is decomposed and finally burns without smoke or odor. Chemically cellpitch has not been satisfactorily identified. The best statement probably is that it consists of the decomposition products of the lining and other substances originally present in the wood.

Composition of Cellpitch

The investigation of Thoms in Hamburg gave the following results:

	Composition	
	Original material	Calculated on ash- and water-free material
	percent	percent
Water	11.32	
Ash	15.03	
Carbon	36.21	49.17
Hydrogen	4.44	6.03
Sulphur	3.32	4.51
Nitrogen	0.43	0.58
Oxygen	29.25	39.71
Fixed Carbon	25.70	34.89
Volatile portion	47.95	65.11
Combustible	100.00	100.00
Heating value of the wood.....	31.66	

The composition and heating value resembles very closely that of wood. Cellpitch, therefore, considered as a fuel, is a wood-like compound, which possesses the property of being soluble in water.

Use of Cellpitch

The technical use of cellpitch depends first of all upon the fact that it possesses a high cementing power (adhesive power), because of which it is especially suitable for the purpose of briquetting. This property of briquetting is not confined to fuels—coal—alone but extends to the recently important briquetting of metals.

Cellpitch has the advantage over the ordinarily used coal-tar pitch as a briquetting agent in that it possesses a greater cementing capacity so that a smaller amount may be used and also that it burns without smoke and soot; furthermore the dust which results from this may be breathed without any harmful effects. On the other hand there are the disadvantages of its solubility in water, the low heat value and finally the price. This last objection is in part overcome in that less of the material is used, 5 per cent for example with fine coal, as compared with 7 to 10 per cent for coal tar pitch. If the briquets are consumed soon after their manufacture there is little disadvantage in the low heat value, the instability towards water or storage. Experiments are in progress, which have been in part successful, to either render the cellpitch

or the finished briquets stable toward water and therefore capable of storage.

Rather promising and extensive application has been made of the use of cellpitch in the briquetting of metals, especially in the briquetting of the so-called "Gichstaub" (furnace dust) which is formed in large amounts in blast furnaces and which is valuable because of its high iron content. One German firm briquets about 180 tons of this material per day, using about 4.5 per cent of cellpitch. In preparing the charges for the furnaces, about 15 per cent of these briquets are added; they favorably influence the course of the reaction, since the cellpitch is a very good reducing agent.

Cellpitch has rather a marked commercial importance. Since one may prepare a kilogram of cellpitch from 10 kilograms of waste liquors from the factories, there is sufficient waste material in Germany alone to furnish 500,000 tons of cellpitch yearly, if all the waste liquors were turned to this purpose.

Pine Oil

The "liquid rosin" or "Tall Oil" (from Tall, the Swedish name for the pine or fir), which results in the preparation of pulp, has been discussed by many writers. From these we learn that it is a rather mobile, dark colored oil (?), which does not solidify at 20°, and is easily soluble in alcohol, ether and acetone, less soluble in benzene and turpentine. Printed in thin layers on glass, it remains soft for many months; on the other hand the heavy metal salts prepared from this oil harden quickly and are soluble in benzene and turpentine. The similarity of "Tall oil" with colophony is evident from the physical and chemical constants: specific gravity at 15°C, 0.997, acid number 163, saponification number 179, iodine number, 118. Fahrion found for the product which he investigated: acid number 162.6, iodine number 141.2. The saponification number was not constant, varying with the excess and the time of action of the alkali. The molecular weight calculated from the acid number, 343.4, is too high, since rosin contains neutral substances. From further investigations he concluded that the "Tall oil" closely resembled colophony, and that it contained one or more rosin acids of the formula $C_{20}H_{30}O_2$; it must be considered as a solution of a solid in a liquid rosin acid.

There is another product which is also considered as a "liquid rosin," namely, a sticky, non-transparent dark colored mass of salve-like consistency, which is a by-product of the manufacture of sulphate pulp from coniferous woods and which finds use as a sizing agent for paper. The chemical investigation of this gave an acid number of 129.4, and a saponification number of 134. It contained 66.2 per cent of rosin acids (molecular weight, 313, iodine number, 144) 8.65 per cent of rosin soaps and a residue not determined. This thus appears to be a mixture of rosin, rosin acids and rosin soaps.

H. Wolff published the following facts about "Tall oil" in the *Farbenzeitung* for 1918: It consists of a rosin-like substance, which is liquid or viscous. The color varies between dark brown and black. Usually the oil is emulsified with some water. The product, free from water, has an acid number of 140 to 145; the iodine number is very variable. Cooked with drying substances (driers) it may be transformed into a varnish-like liquid, the consistency of which may be regulated by the addition of thinners. This "varnish substitute" dries very well, but without luster and with a dark color. The product, however, has not played a very important part, at least in the Scandinavian states, among the by-products of the cellulose industry.

K. Lorentz, writes for the *Chemisch-technische Fabrikant* for June 14, 1916, states that the liquid Swedish rosin may be used, in many instances, as a substitute for American rosin, but that it has a disagreeable odor. Lorentz states that in the manufacture of pulp this rosin swims as a soap-like mass on the so-called black liquors, and may be separated by the addition of acids. Two varieties of rosin are obtained, depending upon whether the sulphite

or sulphate process is used. The sulphite rosin is hardly to be considered such, since it contains bound sulphuric acid, a large amount of sulphur, and shows a high saponification number, is sirupy and viscous, has a sweetish-acid taste, possesses drying properties, becomes covered with a film upon exposure to the air for some time and possesses a certain amount of adhesive power. According to Lorentz, it may be used in the varnish, and sizing industries, and especially in the manufacture of wagon-grease. In his investigation of the sulphite rosin, Lorentz found that it might be bleached with chlorine or bleaching powder. The specific gravity is 0.997 at 15°C; it is easily soluble in ethyl and methyl alcohols, ether, acetone, acetic acid and ammonia, almost completely soluble in benzene and turpentine; acid number 163, saponification number, 154 to 179, ether number, 16, iodine number, 118; the liquid rosin contained: sylvin, palmitin, oleic and linolenic acids, phytosterol; it boiled at 270° C under 40mm. pressure. In this distillation vessels of copper, zinc and iron were strongly attacked. It would seem that this liquid Swedish rosin was sufficiently important and valuable to warrant an attempt to introduce it into certain substitute industries.

Another investigation of this oil has been carried out by H. Bergström. He found that the oil obtained on heating pine wood with sulphite liquor was yellow in color, quickly turning dark on the surface. A dark brown solution was obtained with warm water, from which acids precipitated a gray mass; at ordinary temperatures the oil was rather viscid. This oil was found to contain palmitic acid, probably oleic and linolenic acids as well as rosin acids. The fatty acids are probably bound to glycerol. The constants of the thick, clear, dark brown oil were: acid number, 163, saponification number, 172.9, unsaponifiable, 9.6 per cent. The molecular weight was calculated at 387. Inorganic compounds and soaps could not be found.

From the above statements it is clear that the so-called liquid rosin or "Tall oil" is far from being a uniform substance, and that it is a mixture resulting either from the original products of the wood, or by the action of alkali upon these products.

Schwalbe is of the opinion that the differences which exist among these products are due to variations in the rosin and fat content of the woods used. The wood is cooked with a liquor containing 6 per cent sodium hydroxide and 2 per cent sodium sulphide, during which process these materials are saponified and appear as the black liquor. During this process mercaptans, sulfides and other unpleasant smelling substances are formed, which cling to the rosin-fatty acid mass. In addition to the "Tall oil", there is also obtained an impure turpentine oil, called "sulphate turpentine oil", which, through repeated fractionations, may be purified somewhat. According to Schwalbe "Tall oil" is not obtained in the sulphite process, because the wood used is not sufficiently rich in rosin and fats; such woods cannot be digested by the use of acids. There results a small amount of an ethereal oil, cymens, which is formed through chemical reactions from the originally present turpentine oil.

Without doubt the results of the last five years have shown that the waste liquors of the manufacture of pulp, according to methods which must always be used, have assumed a not unimportant place in the industry, even though they have not been successfully used for all the purposes mentioned in the above discussion. It is highly important, however, that a waste product, which occurs in such large quantities, should be increasingly utilized until the greatest value is obtained from it.

An annual meeting of representatives from all branches of the Seamen Paper Company will be held at Chicago on January 4, 1922. About 100 are expected to be present. Affairs pertaining to the general interests of the Company will be discussed.

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

Wood Saw.—Can. patent No. 192,875, W. Shepherdson, Dymond, Ont., Canada, Sept. 23, 1919.—Claim allowed 1.—A. P.-C.

Logging Hook.—Can. patent No. 192,876, Omar R. Shull, Vancouver, B. C., Canada, Sept. 23, 1919.—Claims allowed 5.—A. P.-C.

Sawing Machine.—Can. patent No. 192,879, Henry Stewart, Ottawa, Ont., Canada, Sept. 23, 1919.—Claims allowed 4.—A. P.-C.

Pressed Roll for Woodpulp.—Can. patent No. 192,890, Aktiebolaget Karlstads Mekaniska Verstad, assignee of Rudolf E. Wagner, both of Karlstad, Sweden, Sept. 23, 1919.—Claims allowed 4.—A. P.-C.

Envelope.—Can. patent No. 192,949, Frank A. Godley, Palmyra, New Jersey, U. S. A., Sept. 30, 1919. Claims allowed 2.—A. P.-C.

Extensible Wrapping Paper.—Can. patent No. 193,012, The Arkell Safety Bag Company, assignee of David T. Abercrombie, both of New York, N. Y., U. S. A., Sept. 30, 1919.—Stretchable, flexible wrapping paper rendered waterproof, consisting of a plurality of layers of paper cemented together by a waterproofing substance, and having crinkles extending in one direction and corrugations or pleats extending at an angle to the crinkles. Claims allowed 7. Same as Fr. patent No. 508,293.—A. P.-C.

Manufacture of Roofing Boards.—*Pappen u. Holzstoff-Ztg.*, Nos. 44 and 45 (1920).—The modern mill should have in conjunction with board machines a special type of boiler for the production of tar, and, in addition, a drum for sorting and reducing the sand to a uniform grade. The raw board is carried on a felt through 3 or 4 press rolls in succession. Very good results have also been obtained by tarring the board on the Fourdrinier machine.—P. B.

Ryberg Machine Wire.—*Papier-Journalen*, No. 22 (Dec. 11, 1920).—The wire is a device for increasing production by reducing friction and choking, whereby the cost of cleaning with steam is eliminated, as well as marking of the sheet. The wire also operates as a drive for the rolls.—P. B.

Epoch Making Innovation in the Regulation of Machine Wires.—*Papier-Journalen*, No. 7 (May 14, 1921).—The wire is operated automatically by means of a sliding plate in connection with a spindle and a bent arm, whereby the rolls are regulated and held in a single position.—P. B.

Production of Soda Pulp with the Simultaneous Recovery of Chemical Compounds from the Waste Liquor.—*Svensk Pappers-Tid.*, No. 14 (1921).—The recovery of valuable products from the waste liquor has hitherto yielded insignificant results, because in most cases the liquor contains sulphur compounds. A new cooking process, in which sulphur is not employed, has been worked out with the result that while the quality of the pulp has not deteriorated, the recovery of useful matter has been facilitated. The new process is not more expensive than the old soda process. The quantity of waste recovered is considerably greater, reaching 100 kg. of methyl alcohol and acetone, and 100 kg. of oil per ton of pulp. The new process is also free from odor. One of its advantages is that it can be employed for the production of chemical substances when, for any reason, the mill is not turning out cellulose.—P. B.

Researches on Lignin.—*Svensk Pappers-Tid.*, No. 12 (June 30, 1921).—When sodium chloride is added to sulphite waste

liquor a precipitate is obtained. Although the reaction has been known for some time, it has not received adequate study. The precipitate first occurs when about 21 g. of salt are added to 100 g. of unconcentrated liquor. To determine the amount of solids precipitated from the liquor, liquor of known solids content is treated with salt, the mixture warmed to 70°C, and the precipitate filtered on a Gooch crucible, washed with salt solution, and dried to constant weight at 100°C. The amount of salt in the precipitate is determined by dissolving in water and titrating with decinormal silver nitrate. It is found that 26.5 per cent of the dry solids of the lye can be precipitated by means of salt. According to Klason the solids contain about 44 per cent of lignin. Since lignin, which is precipitated by salt, is virtually insoluble in dilute salt solution, it must consist, as Oman, in particular, has pointed out, of at least two substances containing sulphur. Thus, the lignin precipitated by the addition of salt is found to be alpha-lignin, and the portion in the filtrate beta-lignin. Samples of liquor from a sulphite mill proved by this method of treatment to have free lignosulphonic acid and alpha-lignin sodium sulphonate. The former was obtained by dissolving 5 g. of the precipitate in 100 cc of distilled water, and then precipitating with 50 cc of concentrated hydrochloric acid. The precipitate thus obtained is readily soluble in absolute alcohol.—P. B.

Production of Imitation Hand Made Paper.—*Pappers Travaru Industri.*, No. 2 (May 15, 1921).—Although the manufacture of this paper is not difficult, modern paper machines are not adapted to this purpose. The best grade is made on the cylinder by an Italian firm. It has a width of about 1.5 m. The pulp is conveyed through two sand tables placed opposite each other, and thence over a rust-free copper plate to the cylinder where the sheet is formed.—P. B.

Water Consumption in Board Mills.—*Pappen u. Holzstoff-Ztg.*, Nos. 16 and 20 (1921).—Fresh water is employed only for spraying the cylinder and felt. Estimates of the quantity of water used in the kollergang and ho llander are given, with lengthy practical details of manufacture.—P. B.

Sizing of Boards.—*Pappen u. Holzstoff-Ztg.*, No. 34 (July 28 1921).—The author discusses the practical difficulties of sizing paper and boards, and describes in detail the method of engine sizing.—P. B.

Problems of Heat in the Pulp Industries.—*Svensk Pappers-Tid.*, No. 8 (April 30, 1921).—The exact expenditure of steam in modern mills is traced at length. A careful comparison is made of old and new processes of cooking sulphite and sulphate pulps, of the number of calories consumed both in cooking and in the formation of by-products; similarly in drying, reducing the quantity of water in the liquor and in the pulp, all on the basis of economy.—P. B.

Saving Steam in Drying Machines.—*K. L. Thunholm.*—*Svensk Pappers-Tid.*, No. 24, 132-134 (April 15, 1921).—Of the steam consumed in the pulp and paper industries considerably more than half is employed for drying purposes. The economy of steam is therefore of great importance. Hitherto, efforts have been concentrated on reducing as far as possible the quantity of water in the pulp before drying, and proportionately the quantity of steam required. Factors in any correct estimate of cost are based first on an exact knowledge of the physics of evaporation in the presence of air, while degrees of drying of the sheet is not the only problem. Experiments on the steam consumption of a dozen machines of different types

and capacity showed great variations, reaching from 1,500 to 6500 kg. of steam per t. of dry pulp. As the consumption of steam is much greater in winter than in summer—the steam used in heating the air being 1,200 kg. in winter and 600 in summer—it was found that pre-warming the air effected a great economy. Also, the air coming in contact with the sheet should be as dry as possible. A device is described for saving steam; it consists of several elements or accumulators, supplied by the waste heat and moisture which contain practically all the calories evacuated by the paper machine. At the Orebro Paper Factory it was found that this device effected a saving of 25 per cent of steam in winter and 15-20 per cent the year round. Improvements promise a saving of 35 per cent.—P. B.

Consumption of Steam in Cooking and Drying Sulphite Pulp.—*Papier-Journalen*, No. 12 (Sept. 3, 1921).—As regards steam consumption, the cooking of strong pulp is more economical than the cooking of easy bleaching pulp, namely about 2 kg. of steam per kg. of pulp in the first case, and 2.2 kg. in the second.—P. B.

Manufacture of Wrapping Papers.—*Pappen u. Holzstoff-Ztg.*, Nos. 21 and 23 (May 26 and June 8, 1921).—A cheap and serviceable product is best made out of old papers, carefully sorted and cleaned. The process consists in preliminary treatment in the hollander followed by prolonged heating.—P. B.

Rotary Knotters of Large Capacity.—*Pappen u. Holzstoff-Ztg.*, No. 9 (March 3, 1921).—A new machine is described whereby knots and entangled fibers are removed from the pulp in drums, which rotate slowly.—P. B.

The Use of Machine Wires in Board Mills.—*Pappen u. Holzstoff-Ztg.*, No. 23 (June 9, 1921).—The author gives a detailed description of the strain and wear to which wires are subject, and of the measures essential for their efficient working.—P. B.

Modern Sulphur Burners and the Preparation of Sulphite Liquor for Pulp Mills.—*Papier-Journalen*, No. 8 (May 31, 1921).—Many practical difficulties are met in the preparation of a good sulphate-free liquor. One of these, the formation of sulphur trioxide (SO₃) in the sulphur burners, is avoided by a new system whereby oxidation in the presence of iron is reduced to a practical minimum.—P. B.

Detection of Oxcellulose.—E. Becker. *Zellstoff u. Papier*, i, 5 (1921).—The carboxyl group of oxycellulose is determined as follows: 2 g. of air dry fiber in 50-60 cc of barium hydrate solution are allowed to stand 4 hrs. in a closed vessel. The fiber is then sucked dry, washed with distilled water till the washings are free from barium, and ashed. The barium is determined in the ash as barium sulphate. The percent of barium in oxycellulose prepared by various means is given. Oxycellulose prepared by the use of bleach is very high. The method is longer than the titration method of Schwalbe and Becker.—H. E. W.

Action of Alkalies and Alkaline Earths on Textile Fibers.—Grimm. *Zellstoff u. Papier*, i, 81-87 (1921).—This is a historical resume of the literature dealing with the action of alkalies on fibers. The processes of Planche and Piette, Mierzinski, Hoyer, Hofmann, Dahleim, Klemm, Kirchner and Dalen are mentioned. Formulas for the cooking liquor in use in the industry at the present time are given.—H. E. W.

Cooking wood (by the sulphite process).—C. G. Schwalbe. *Zellstoff u. Papier*, i, 11 (1921).—The reduction of shredded wood with chlorine is effected only under 5 to 6 atmospheres pressure when 30 percent of the reagent on the weight of the wood is used. The hydrochloric acid formed must be reconverted into chlorine. The use of chlorine or chlorine dioxide in organic solvents is not economical. In the first 8 hrs. of the Mitscherlich cook the ash content of the wood rises from

0.48-1.8 percent. Lignin dissolves in the last stages of the process. After the fifth hr. the methoxyl content is one-fifth less than at the outset, and rises after the eighth hr. to its original value. Hexosans dissolve first but pentosans are very resistant. The economic use of old and fresh wood are mentioned.—H. E. W.

Preparation of Cellulose from Wood.—Muller, Ger. patent No. 339,303, Class 55b, Group 1.—*Papier-Fabr.*, xix, 786 (July 29, 1921).—A mixture of 3 percent nitric acid and 10 percent sulphuric acid solutions for 14 dys. at 20° C or a 0.5-1.0 percent solution of nitric acid at 60° C for 2 days in contact with pine wood reduces it to a lignin-free easy bleaching fiber (52 percent). The fiber is given a treatment with dilute soda solution subsequent to the acid treatment.—H. E. W.

Beater.—K. A. Thorsen, Ger. patent No. 339,232, Class 55c, Group 4. *Papier-Fabr.*, xix, 786 (July 29, 1921).—Beater in which the bed plate and roll may be pressed against each other with pressures which can be regulated.—H. E. W.

Pulp Grinding Stones.—Anon. *Papier-Fabr.*, xix, 777 (July 29, 1921).—The author mentions the German sources of stones suitable for use in pulp making, the properties of the stones and discusses the relation of quality of stone to that of the pulp they yield. The relation of the bonding agent in the stone to the nature of the liquid used in the grinding process is taken up. The advisability of producing stones artificially and particulars concerning these stones are given. The mountings for the stones and the care to be exercised in using them are mentioned.—H. E. W.

Removal of Incrustations from Condensers.—Micksch. *Papier-Fabr.*, xix, 781 (July 29, 1921).—Chemical methods of removing calcium sulphate and calcium carbonate incrustations are given. A solution of 6 l. of hydrochloric acid in 100 l. of water is allowed to stand in the tubes 10 hours. Substitutes for this solution are mentioned.—H. E. W.

Rosin Sizing.—R. Sieber. *Zellstoff u. Papier*, i, 15-19 (1921).—The author investigated the precipitating power of alum in the presence of free rosin suspension prepared by dissolving rosin in alcohol, and adding the solution to water. The precipitating power of the various salts follows the regular rule, trivalent aluminum and iron exerting stronger action than the monovalent elements. The analysis of the precipitate showed the presence of both cations and anions. The simultaneous action of several electrolytes is less than the sum of the action of each acting alone. Rosin suspensions are stable in the presence of hard water.—H. E. W. (For complete translation see *Pulp and Paper*, xix, 1051-1052, Oct. 13, 1921.)

Dryer for Paper.—Curt Bauer, Ger. patent No. 339,721, Class 55d, Group 19. *Papier-Fabr.*, xix, 880 (Aug. 19, 1921).—The paper travels over rolls in a totally enclosed housing. Warm air blows through the channels which are arranged in zig zag manner. Outlets are provided for the cool air.—H. E. W.

Tester for Bending and Breaking Qualities of Cardboard.—Kirchner, Ger. patent No. 338,298. *Papier-Fabr.*, xix, 884 (Aug. 19, 1921).—The cardboard to be tested is clamped in a hinge and the angle through which it may be bent without breaking is measured and the tension required for breaking is registered by means of a spring.—H. E. W.

Fiber from nettles.—J. Elster, Ger. patents Nos. 305,049 and 308,525, Class 29b, Group 2. *Papier-Fabr.*, xix, 821, 880 (1921).—The nettles are soaked in caustic soda to loosen the bark. The nettles are crushed to facilitate the absorption of the liquor by the stems.—H. E. W.

Safety Paper.—Poensgen and Hever, Ger. patent No. 338,333, Class 55f, *Papier Ztg.*, xlvii, 2763 (Aug. 4, 1921).—The fundamental idea is based on photographic principles and depends on the fact that the papers are sensitive to acids and erasures and that the reproduction of color is difficult.—H. E. W.



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ENGINEERING AS RELATED TO THE PULP AND PAPER INDUSTRY

By H. S. TAYLOR, CHIEF ENGINEER, H. S. TAYLOR, LIMITED, MONTREAL, QUEBEC.

In the earliest history of civilization certain lines of human endeavor were recognized as essential to the community, and as civilization began its onward march it soon became evident that a certain line of endeavor always preceded this onward march, blazing the trail of progress by its own creations. These certain lines of human endeavor remain in the same relation to progress as they were in the beginning, but today they are called professions, each profession with its many branches following its special subject more and more closely to this the day of specialization.

Of the many professions, engineering is perhaps one of the broadest, its followers being found in all parts of the globe, engaged in the many different fields of work that come within its scope. As new discoveries were made and perfected to commercial use, the three original classifications of engineering have subdivided until we now have a score of recognized branches, each branch specializing in its own field, and in addition to these universally recognized branches, the basic industries now recognize lines of engineering that are in reality made up of two or more of what we might call the standard lines for the purposes of specializing on the entire detail of their own special requirements.

The so-called pulp and paper mill engineer can be included in this latter class. Pulp and paper making is today one of the basic industries. Its mills can be found in all parts of the civilized world, and while there is an ever increasing demand for paper and its products, competition is becoming stronger and stronger, demanding constantly improved equipment and methods of operation, combined with increased volume of production. Such improvement demands that the installation be carefully planned throughout, the equipment selected and installed so that operation can be carried on with a minimum of maintenance and attending labor, and buildings so laid out and constructed that they will be efficient and permanent, and that the several departments entering into the completed unit be properly balanced that operating costs can be kept at a minimum, from the preparation of the raw product to the shipment of the finished sheet.

Important Part in Mill Development

Pulp and paper mill engineers can play a most important part in the development of a modern paper mill. The development of a complete paper mill unit, especially if it be of large production, is an extremely important undertaking. The location of the proposed development is often in yet undeveloped country where the limits of location are of wide range, water power of considerable volume must be developed, to fill the power demand, of which a considerable part must be electric energy; a steam boiler plant must be a part of the completed unit, and the paper mill itself together with ground wood and sulphite mills complete the major part of the complete unit. In addition, the handling of raw products is a most important factor, and modern equipment for conveying, sawing and preparing the wood supply, handling and conveying coal, sulphur and limestone, and the handling, storing and shipping of finished product must all be included. The investment for such a plant runs into millions of dollars, and the installation is unlike that of any other industry, the paper mill equipment itself being to a great degree special, and the many different operations each requiring its own special complement of buildings and equipment, and yet each operation must combine efficiently with its neighbor, so that the complete process may be uniform and uninterrupted throughout.

Complete Units Few

Compared with the total number of pulp and paper making plants of the industry, complete units as before described are, of

course, few. We find a groundwood mill here, a sulphite mill there, and the paper mill, or conversion plant as it might be called, in almost every section of the country. Soda and sulphate pulp mills are numerous in locations where the wood supply is favorable, and board mills are common to more thickly populated centers where their main raw product, old papers, is closely at hand. Each one of these separate mills, however, has its special problems from the time of its inception to its completion, and, for that matter, as long as it may operate. The magnitude of these problems is, in the majority of installations in proportion to their size, demanding a corresponding degree of experience and knowledge on the part of those retained to solve them.

As in any creation that is first conceived in the brain and then constructed by the body, the old saying "A good start makes a good ending" is applicable, but it is especially adaptable in an industrial installation, the layout of which is really a most important factor and may, if properly made up, insure the success of the undertaking, and in turn if hastily drawn up, through either lack of experience or knowledge, or through what is most common, lack of time, may show faults that if followed will detract from the success of the undertaking throughout its entire future. A poor layout is often discovered, but this discovery comes at such a late date that it is either necessary to proceed, knowing that what is being done is not as it should be, or requiring radical changes that add greatly to the expenditure and the date set for completion, which is often a vital factor.

Must Have Complete Knowledge

Those responsible for the layout must have to the greatest degree experience and knowledge of the completed installation. They must see clearly in their minds the completed mill in operation. They must also see clearly and allow for extensions to each department for future enlargement of the development, for it is the future of any undertaking that determines whether it be a success or a failure, and without the future requirements as well as the requirements of the immediate development in mind, a layout that proves to be a success is accidental, and those responsible for it should rest on their laurels, and take no chance of repetition.

To hold clearly in mind a completed installation especially of the magnitude of the modern paper mill unit, at the time of its inception, it can be clearly seen that training is required. This training must be made up of, first, and perhaps the most important, experience in the requirements of this special work, including a complete knowledge of each process that is to be carried out. This training must include structural knowledge for the special structures themselves, mechanical training for the special equipment and steam requirements, and electrical training for electrical demands that are becoming more and more important in the modern practice of complete electrification. In other words the one to meet such demands must be an engineer trained in those departments that are included in this special pulp and paper mill work, and in addition to his engineering training, he must be familiar with each process of operation. An engineer, with engineering training only, while he might carry out any part of the design and installation, could not put together a design that would insure efficient operation without a complete understanding of the operation itself, and the man who has specialized in this work can rightly call himself a pulp and paper "Operating Engineer."

Those responsible for the carrying out of any industrial development would be characterized as exceedingly poor executives should they fail to insure their workmen and all parts of their

(Continued on page 56)

Howard Bond



Howard Ledger

"The Paper of Many Uses"

Manufactured by

THE HOWARD PAPER COMPANY, Urbana, Ohio

FORGE LAP-WELDED

VERTICAL SEAMS HEATED WITH FURNACES AND WELDED WITH HYDRAULIC POWER

SOFT STEEL

DIGESTERS

ALL SEAMS LAP-WELDED

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CIRCUMFERENTIAL SEAMS HEATED WITH FURNACES AND HAMMER WELDED

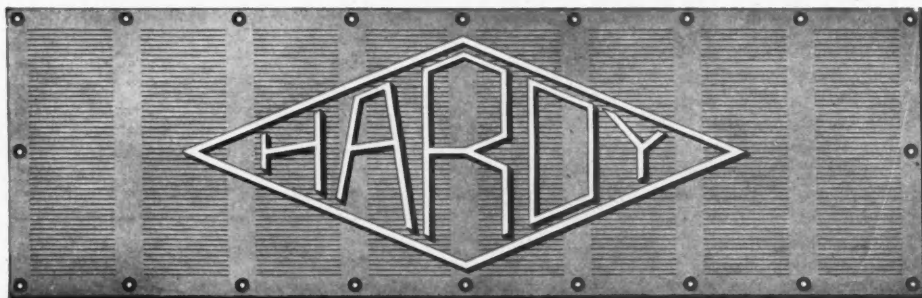
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If you judge felt values, not by what you put into the equipment, but what you get out of it—then you will specify ORR 3 stripe Endless Felts, for ORR felts will produce the lowest cost per ton. They "stand up" under severe usage. Orr durability is acknowledged everywhere. Their strength and long life are as dependable as their reliability and quality.

In the 32 grades of Felts and Jackets we can match your most exacting demands. Tell us the kind of paper you desire to make, and we will send you samples of felts that will economically serve you and help you to produce paper at lowest cost per ton.

THE ORR FELT & BLANKET COMPANY, Piqua, Ohio

WILLIAM A. HARDY & SONS COMPANY, Fitchburg, Mass., U.S.A.



ENGINEERING AS RELATED TO PULP AND PAPER INDUSTRY

(Continued from page 54)

structures during their construction and thereafter. The selection of engineers trained in their special work is just as much a form of insurance as that representing fire, workman's risk, or occupancy, for from the commencement of preliminary work such as surveys, accumulation of power data, location of railroad spurs, transmission lines, and the many other details leading up to the actual selection of site and final layout, the trained pulp and paper engineer carries the future always in mind and each act performed is subconsciously valued in terms of tons per day output of the finished plant.

Preliminary Work Important

The preliminary work while often thought of as a somewhat needless expenditure of time and money, is in reality of great importance, as it is the actual recording of the physical conditions on which depends the location of all parts of the development, the amount of power available, and characteristics of the entire power installation, the design of foundations, and many other such details. In fact in a number of instances carefully executed preliminary work has prevented extensive delays and large expenditures, by showing clearly in advance the action necessary to overcome certain abnormal conditions, that otherwise would have remained unknown until actually encountered in the progress of the work, and it is this encountering of the unusual in any undertaking, whether large or small, that plays havoc with the entire development no matter how carefully the work has been laid out. Too much preliminary work is far better than not enough, and the true paper mill engineer realizing that both his future and that of the development may depend on preparedness, is often thought either too conscientious or simply putting in time, when a certain period elapses without an actual sign of real progress.

The layout is the last step of the preliminary work, and is an assembly showing the outlines of the completed development, each structure or part thereof in relation to its neighbor, and as the greatest care is taken in the selection of the seed to insure the future of any form of life, or in the making of a pattern from which the completed work is to be fashioned, so should the greatest care be taken in the forming of the layout, as it is the seed from which the completed plant must grow, first foundations, then superstructures, then equipment and finally the completed whole. The layout is the commencement, and if in it is incorporated an arrangement that has taken into consideration all future requirements, the real detail, that is the bulk of the work as regards time and numbers engaged is greatly simplified, the many different structures being detailed, either the whole or a part at a time, this work expanding steadily until at completion the one or two layout drawings have grown into a number of finished working drawings, the actual number depending on the extent of the development. While on many of these drawings the major part of the design is one of structural problems only, there must be ever present in the mind of the engineer the primary object of the structure he is planning, viz., a part of a pulp and paper mill. The design must be first, therefore, be arranged for the most efficient installation of equipment, and operation thereof, and structural details then perfected for this arrangement.

True Realization May Be Lacking

If the design be carried out without this primary object in view the result while it may be structurally perfect, will in the majority of cases show evidence that a true realization of the purposes for which the buildings were intended was lacking. Equipment is cramped in one place and extended in another, extra labor is demanded due to special handling of product that should have been avoided, costs in one department or another are exceedingly high

due to lack of balance, power demand is either excessive or output lacking to fill a legitimate demand, and if such conditions occur it is generally found true that a considerable period was expended in putting this development into operation, with the always present feeling of dissatisfaction on the part of the owners and discouragement on the part of the operators. Such conditions are rarely found where the work is carried out by experienced pulp and paper mill engineers, as it is a part of their everyday routine to see that such conditions are avoided, and that an efficient operating installation is turned over at the completion of their work.

While careful office and detail work, both on preliminary requirements as well as on the future work, should insure a well planned installation, the actual construction of the development, if improperly carried out may go a long way to offset the most carefully prepared design, and among other requirements of the pulp and paper mill engineer must therefore be the ability to properly supervise the actual construction work. If the plans of the work are complete to the last detail, a supervising engineer without previous paper mill experience, provided his general experience is extensive, can, by following drawings closely, insure proper results. A supervising engineer, however, who has gained his experience in pulp and paper mill work is in command of the situation much more thoroughly. He knows where to do the work, and what work is to be done, to the best advantage, and has at his finger tips all the little tricks of the trade, so to speak, that go to insure a quick and accurate installation, whether it be the setting of a plate here or an anchor bolt for some piece of special equipment there, and supervision of construction on his own special installation is a necessary part of the pulp and paper mill engineer's training.

Represents An Organization

The reader will no doubt realize by this time that the pulp and paper mill engineer, as described to some extent, represents in actual practice an organization, the members of which, while being familiar with the entire requirements, specialize on one or more parts thereof, and if this organization is properly balanced, we have a unit experienced in the entire detail that has been characterized in this article as the "Paper Mill Engineer." Such an organization is equipped to handle the smallest detail as well as those required to complete a maximum development. The demand made upon it is in direct proportion to the volume of the requirements.

Engineering Not Expensive

There is no doubt that engineering costs money, and because it does cost money it is often dispensed with entirely, or only those requirements covered that are absolutely necessary. While engineering costs money, it is not expensive, in fact the nominal expenditure required is in many undertakings returned many times over through the care exercised in carrying out each part of the work in a minimum of time and of expenditure, and the commencement of operation at the time set. The plant that through delays here and there sets forward the time of completion, and through something missing here and through changes required there, must spend a much longer period than necessary in producing a salable product, finds when it is too late that there has been expended many times the fee that would have secured a competent engineer, specializing in this work, who would have carried it through to completion and turned it over as an operating unit. The cost of such engineering service is, in comparison with the investment, a very small proportion, and in these days of constantly improved methods of design and operation, no industry can afford to carry out even their small undertakings without engineering experience, specialized in its own particular industry.

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PRACTICAL QUESTIONS AND ANSWERS FOR MILL MEN

A Department for the Solution of the Troubles, Large and Small, That Are Encountered by the Workers in the Mills in the Course of Their Duties in Making Paper and Pulp — All Mill Men Are Invited to Send in Both Questions and Answers—A Free Exchange of Ideas Is Desired—By Active Co-operation This Department Can Be Made a General Clearing House for Information in Regard to Practical Paper Making.

Water Required Per Ton of Board

QUESTION No. 2550.—May I ask through the Question and Answer Department of the PAPER TRADE JOURNAL, the number of gallons of water that is required per ton of box card board and fiber packing case board as produced on a six-cylinder mould machine? Also, what amount of water is required for one six-cylinder mould machine?

ANSWER No. 2550.—B. M. Baxter, engineer and mill architect, Cleveland, Ohio, has kindly sent the following reply to the foregoing questions:

Referring to Question No. 2550 in your issue of October 6, we may, perhaps, give your correspondent some help. In the first place, the water consumption of a board mill can not be figured on a tonnage basis. This can be done so far as the beater room is concerned, but not for the machine. The amount of water required for the machine depends upon the pressure carried at the shower pipes, the number and style of the pipes and their length.

These factors will be the same for two machines with similar vat parts, but if one machine have more dryers than the other, it will make more board and consequently will use less water per ton of product. The quantity of water used can not be varied with the tonnage to any material degree since a certain pressure is needed properly to clean the felts and cylinder faces, and this pressure must be maintained to secure satisfactory operation. Nor is it practicable to use shower pipes with different sizes of holes according to the tonnage as the holes would become too small to be effective in the case of a wide machine with limited drying capacity.

The amount of water needed by a six-cylinder machine will depend upon the width of the machine. The machine will have two shower pipes for each felt and one for each mold, or ten in all. Assuming the machine to be 100 inches wide and the pressure at the shower pipes 20 pounds, the water consumption will be about 140 gallons per minute for each shower pipe having two rows of 1/16-inch holes spaced 1/4 inch apart. The total water consumption of this machine would accordingly be 1,400 gallons per minute. If the available water supply should be limited or the cost of pumping high, it would be desirable to use a well known patented shower pipe for the molds which will use about one-half less water. The jets from these showers have not enough force to clean the felts but are entirely satisfactory for the molds. The water consumption for this machine would then be 980 gallons per minute instead of 1,400 gallons per minute.

Other pressures will increase or decrease the water used in proportion to the square roots of the pressures, so that 10 pounds would use 0.7 as much water, and 40 pounds, 1/4 as much. About 100 gallons per minute should be allowed for hose streams, etc., and more if fresh water is used on stuff pump plungers, in stuff boxes, on Jordan bearings, etc.

The beater room can be supplied with white water from the machine, hence need not be taken into account unless high grade

white lined boards are made, in which case filler fiber in the white water might injure the appearance of the sheet.

The beater room requirements can be figured on the basis of the density of the stock as put down to the chests. This can be assumed at 2 1/2 per cent., or the proportion of stock to water as one to forty, and be on the safe side. Accordingly, if the production of the machine is two tons per hour, the beater room should have an available supply of 80 tons of water per hour, or about 320 gallons per minute if no white water is used.

Getting Rid of Spots on the Wire

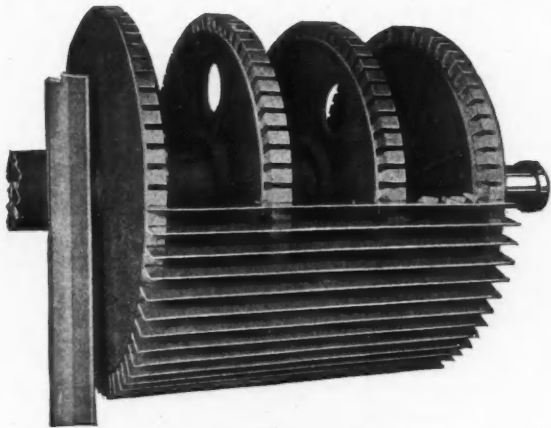
QUESTION No. 2551.—I am having trouble in having spots on the wire and would like to know some way to get rid of them while the wire is still running and not have to shut down.

ANSWER No. 2551.—The best way to get rid of the spots is to find out where the spots come from and eliminate them at the source. Another way to get rid of them is after they get on the wire. Rig up a steam shower, similar in construction to the needle shower of water, which is commonly used to cut the paper from the wire. The shower should be located on the inside of the wire under the save alls and the nozzle opening of about one-eighth of an inch. To remove the spot you simply turn on the steam to the shower. The steam pressure should be boiler pressure. Allow the steam to play on the wire where the spot is and where the spot will be hit by the steam at every revolution of the wire. A few minutes treatment by this means ought to eliminate the spot entirely.

Furnish of Various Boards

QUESTION No. 2552.—Will someone who is familiar with the following boards please give me the "furnish":—binders board, box board, chip board, combination board, fiber board, jute board, news board, pulp board, container board, container liner, and mill lined chip board.

ANSWER No. 2552.—Following are the general furnish for the above boards: *Binders Board*—Is generally made using all mixed papers and pasting the different plies together to get the desired thickness. *Box Board*—Is generally made using mixed papers and a bending liner on one side. *Chip Board*—Is generally made using all mixed papers. *Combination Board*—Is generally made using a combination of different stocks such as mixed papers, newspapers, manilla papers, etc. *Fiber Board*—Is generally made using all old newspapers. *Jute Board*—Combination of craft sulphate and cuttings from jute board. *News Board*—All old news. *Pulp Board*—All groundwood. *Container Board*—Genuine container board is made of cooked wood and sulphate pulp. Some imitations of the real article are made from old papers and colored up to look like the genuine. *Container Board*—Is made from different kinds of stock, such as sulphate pulp, No. 2, manilla, good grade of mixed papers. *Mill Lined Chip Board*—Regular chip board with a surface layer of a better grade of stock on one side. With the above the right amount of size and alum must be used.



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Use a Lockport *Cylinder Bottom* and *Top* combination for *Board* and watch your *Felt Cost*

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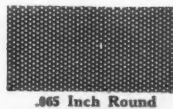
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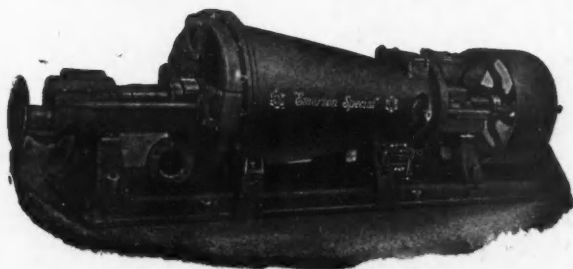
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 PERFECT CIRCULATION. NO "PADDLING."

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WRITE FOR DETAILS

STEAM JET ASH CONVEYORS IN PAPER AND PULP MILLS

By GUY S. HAMILTON, CONVEYORS CORP. OF AMERICA

Power plant executives who have visited a number of paper and pulp mills throughout the Middle West have commented upon the increasing number that are installing in their boiler plants steam jet ash conveyors. A large number of the mills in the Kalamazoo district are so equipped.

Economy an Outstanding Feature

One outstanding feature of this type of ash handling equipment is its economy. The gang of ash wheelers is absolutely eliminated. With the steam jet, the ash handling is a part of the duties of the fireman, as he can easily shovel or rake the ashes into the intakes of the conveyor as he cleans his fires.

The conveyor itself is a simple but effective affair. It consists primarily of a line of hard metal pipe, laid in a trench in the boiler room floor. Intake openings are situated before each ash pit.

In handling the conveyor the fireman opens a steam valve allowing the high pressure steam to enter the conveyor system. A cover is removed from the ash intake and the ashes are raked or shovelled into the conveyor. The jet of steam creates so powerful a suction that instantly the ashes are carried away to the discharge point.

By this system ashes can be handled practically as fast as the fireman can shovel them. An average of six or eight tons an hour is put through the ordinary steam jet conveyor. Under certain conditions it is possible to increase this tonnage materially.

King Paper Co. Get Good Results

Four or five years ago the King Paper Company, Kalamazoo, Mich., installed a steam jet conveyor of the American type manufactured by the Conveyors Corporation of America, Chicago. Previously it had employed one man on each shift to handle its ashes. With the installation of the conveyor, however, these men were eliminated.

"Our steam jet ash conveyor has been in continuous use—night and day—for a little over five years," says the purchasing agent of the company in a letter to the manufacturers, "and it certainly gives us the very best of satisfaction.

"A labor saving problem is in itself very important—especially when labor is scarce. We operate three shifts of 8 hours each and find that we have been able to save one man on each shift."

While at this writing, the problem of finding labor is not so acute as it was when the above letter was written, still the problem of cost cutting must be considered and any equipment that will cut one man from each shift must weigh strongly in the minds of thoughtful executives. And this is what happened with the installation of a steam jet conveyor at the plant of the King Paper Company.

The Bryant Paper Co.'s Experience

Take the case of the Bryant Paper Company, Kalamazoo, Mich. This company has equipped the power plants of all five of its divisions with steam jet conveyors. As a result, ash handling costs have been reduced from 75 cents a ton to 12 cents a ton.

The record of one boiler house shows that the ashes from 30 tons of coal were removed daily in 35 minutes. Those from the other boiler houses were handled in the same efficient and economical manner.

Extensively Used Now in the East

Not only are the steam jet conveyors found in the West but they are extensively used in pulp and paper mills in the East.

The results from the standpoint of economy are the same. Each user reports actual dollars and cents savings. Men have been taken off the payroll or the time of ash handling has been so cut down that it amounts to practically nothing.

Royal Paper Co. To Move

The Royal Card & Paper Company is now preparing to move into its new building at 132-4-6 West 14th street, New York City, between 6th and 7th avenues, at which address it will be ready for business on and after February 1, 1922.

The new building is practically the largest individual paper warehouse in New York, consisting of seven floors, store and basement, each 75 x 110 feet in area, making a total floor space of approximately 75,000 square feet.

This new building is modern and complete in every respect and



NEW HOME OF ROYAL CARD & PAPER CO.

will provide ample facilities for efficient and economical operation by combining all departments and present warehouses under one roof.

The firm proposes to add many new lines of papers and board, which are to be announced to the trade in a short time. Some of these lines are of the utmost importance to the paper jobbing and printing trades, and will open up fields for considerable new business which the Royal has not sought for because of the lack of space in its present quarters.

It is also proposed to add several additional motor trucks to the already splendid fleet of such vehicles.

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New York Market Review

OFFICE OF THE PAPER TRADE JOURNAL,
WEDNESDAY, DECEMBER 28, 1921.

An atmosphere of confidence prevails throughout the New York paper market, although the same is at present subject to year-end quietude. While the task of taking inventory is going on indications become more pronounced in favor of good business for 1922. The large economic problems confronting the industry are being attacked whole-heartedly and results are making their appearance daily. While French and British premiers are meeting to adjust European economic phases, government officials in the United States report that they believe the tide of depression to be completely thrust back in this country. This is not apparent at once in all quarters, but in the broadest sense is true generally in the paper trade. Deflation is well on its way to completion, with all concerned better off in spite of the rough treatment afforded by the vigor and alacrity of its progress. The law of supply and demand is gradually beginning to function again because the world is working once more and paper men see a prosperous year of steady business before them. No great rush of business is expected which could in any way rival the war boom and fluctuations are anticipated from time to time, but the majority are satisfied that the future holds much in store. With the year in retrospect much has been accomplished by the paper industry to assist in the movement of liquidation. Prices have been brought down to rock bottom and losses have been sustained cheerfully on every hand for the general good. Now in reward for the strenuous efforts made the state of affairs allows for new incentives to profits and normal business transactions once more. Better business means better wages for all and a better country in which to live, and it is for this that profits have been temporarily set aside. As in previous years, little new information about the paper trade is available at this period, but it is wholly justifiable to state that although the paper market is very quiet no concern is had for the seasonal phenomena, and to the contrary a general sentiment of optimism is readily to be perceived throughout the paper industry.

There has been no decrease in newsprint consumption and indications are that more is being used than ever. Domestic news print continues to be the most important factor in the market in spite of the foreign product which will remain a menace until adequate tariff restrictions are enacted to cope with the situation. Steps to increase protection have been taken by the American Paper and Pulp Association which has brought considerable pressure to bear to make plain its stand for a high tariff to government officials.

The book paper market is quiet although some orders are being placed and enough inquiries for 1922 contracts at hand to warrant an optimistic sentiment. The rise in price effected by some Western companies do not influence the market to any great extent since Western prices have heretofore been slightly lower than those listed by Eastern mills.

The fine paper market is spotty with only a few orders booked during the last few days. It is evident that careful estimating of stocks required will be necessary during the next months since narrow margins of profit and fluctuating prices in general demand extreme caution in buying. The general sentiment is that the last of January will see an improvement that will be gradual but certain.

Tissue remains quiet and waits on the several strikes now in progress in the garment and hat factories for a considerable amount of the impetus which is lacking at present. Orders are received spasmodically but buying is very light under the influence of the seasonal house cleaning.

The position of kraft has altered but little during the last

week. The market has been stronger than its associates and continues to hold its supremacy although the seasonal slackening has influenced it proportionately to the others. The demand is wholly normal and producers are busy keeping it supplied with mills running at capacity.

Mechanical Pulp

The mechanical pulp market is quiet as it has been for several weeks. The demand is small but since the domestic output and the amount imported are both nominal, prices hold firm. Freight rates still remain an important factor in the situation and until they come down business with distant points in mechanical wood pulp is going to be hampered.

Chemical Pulp

The chemical pulp market is listless and sales have been few for the week on account of the prevailing holiday spirit and the general tendency to keep stocks at the lowest level possible until after the first of the year. It is noticeable, however, that a firm tone underlies the market and in the near future it is expected that business will amount to a normal volume.

Old Rope and Bagging.

The consuming demand for old rope and bagging is slack but dealers continue to do some business at prices previously recorded. Sales are largely of the hand to mouth variety and necessitated by the very low stocks which have been carried for several months past. Arrivals continue in fair volume for this time of the year and there appears to be an adequate supply to meet all requirements.

Waste Paper

Business is slack in waste paper although some inquiries have been made to feel out the situation and to determine the general trend of prices for the ensuing year. Prices in most instances are down to a pre-war level and liquidation here is considered to be complete. Prices are without change.

Rags

The rag market is very dull. It appears to be exceedingly difficult to effect sales even at ridiculously low prices. There is no demand and dealers are not inclined to be encouraged by the outlook. Papers of high rag content are not in demand now and the rag business must necessarily wait until the market in them is strong again.

Twine

The twine manufacturers and dealers are optimistic since a firmer tone has been felt in the trading for the last two weeks in spite of the unusually quiet season. Business is being conducted upon an economical basis as in other lines while prices tend to fluctuate.

Rates on Paper, Rags and Old Rope

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., December 28, 1921.—The Interstate Commerce Commission has handed down a decision in I. & S. docket 1380 regarding rates on scrap paper, rags and old rope between western trunk line points. The Commissioners in their syllabus in this case say:

"Proposed increased rates, on scrap paper, rags, and old rope, in straight or mixed carloads, from certain points in northern Iowa and Southeastern Minnesota to Chicago, and Peoria, Illinois, St. Louis, Missouri, and points taking the same rates; also from Mason City, Iowa, to Mississippi crossings on traffic destined east of the Illinois-Indiana State line, found justified. Order of suspension vacated and proceedings discontinued."

Market Quotations

Paper Company Securities

New York Stock Exchange closing quotations December 27, 1921:

Stocks	BID.	ASKED.
American Writing Paper Company, pref.	25	25
International Paper Company, com.	52 3/4	53
International Paper Company, pref., stamped.	70 3/4	71 1/4
Union Bag & Paper Corporation.	69	71 1/2

Because of the unusual conditions prevailing in the various markets quotations are more or less nominal.

Paper	
F. o. b. Mill.	@ 30.00
Ledgers	10.50 @ 30.00
Bonds	9.00 @ 55.00
Writings—	
Extra Superfine	13 @ 25
Superfine	13 @ 20
Tub Sized	13 @ 16
Engine Sized	9.00 @ 15.00
News—f. o. b. Mill—	
Rolls, contract	3.50 @ —
Rolls, transit	4.00 @ 4.25
Sheets	4.00 @ 4.50
Side Runs	3.50 @ 4.00
Book, Cased—f. o. b. N. Y.—	
S. & S. C.	6.70 @ 7.50
M. F.	6.45 @ 7.25
Coated and Enamel	8.25 @ 10.25
Lithograph	8.25 @ 11.25
Tissues—f. o. b. N. Y.—	
White, No. 1	.80 @ 1.00
Colored	1.10 @ 2.25
Anti-Tarnish	.80 @ 1.00
Silver Tissue	1.50 @ 2.70
Manila	.80 @ .90
Kraft—f. o. b. Mill—	
No. 1 Domestic	6.75 @ 7.50
No. 2 Domestic	5.75 @ 6.50
Imported	6.00 @ 6.50
Screenings	2.50 @ 3.50
Manila—	
No. 1 Jute	8.50 @ 9.00
No. 2 Jute	7.75 @ 8.50
No. 1 Wood	5.00 @ 6.00
No. 2 Wood	4.50 @ 5.00
Butchers	4.90 @ 5.70
Fiber Papers—	
No. 1 Fiber	6.00 @ 6.25
No. 2 Fiber	5.25 @ 5.50
Common Bogus	1.80 @ 2.10
Sgl. Mla. Ld. Chip	50.00 @ 55.00
Wood Pulp	80.00 @ 90.00
Container	65.00 @ 70.00
Wax Paper—	
Self Sealing White	
28 and 30 lb. basis	.12 @ .13
Waxed Tissue	1.52 @ 1.80
Mechanical Pulp (Ex-Dock)	
No. 1 Imported	38.00 @ 42.00
F. o. b. Pulp Mills.	
No. 1 Domestic	32.00 @ 40.00
Chemical Pulp (Ex-Dock, Atlantic Ports.)	
Sulphite (Imported)—	
Bleached	4.25 @ 5.00
Easy Bleaching	3.25 @ 3.50
No. 1 Strong unbleached	2.75 @ 3.25
No. 2 Strong unbleached	2.50 @ 2.75
No. 1 Kraft	2.75 @ 3.00
Sulphate—	
Bleached	4.00 @ 4.50
(F. o. b. Pulp Mill.)	
Sulphite (Domestic)—	
Bleached	4.50 @ 5.25
Strong unbleached	2.75 @ 3.00
Easy Bleaching	
Sulphite	3.00 @ 3.50
News Sulphite	2.75 @ 3.00
Mitscherlich	3.25 @ 3.75
Kraft (Domestic)	2.75 @ 3.00
Soda bleached	4.00 @ 4.25
Domestic Rags	
New Prices to Mill, f. o. b. N. Y.	
Shirt Cuttings—	
New White, No. 1	1.10 @ 1.00
New White, No. 2	6.25 @ 6.75
Silesias, No. 1	6.00 @ 6.50

New Unbleached	8.75 @ 9.50
Washables	4.00 @ 4.50
Fancy	5.00 @ 5.50
Cottons—according to Grades—	
Blue Overall	5.75 @ 6.00
New Blue	5.25 @ 6.00
New Black Soft	4.00 @ 4.00
New Light Sec-onds	2.75 @ 3.00
O. D. Khaki Cuttings	3.50 @ 3.75
Corduroy	2.75 @ 3.00
New Canvas	6.00 @ 6.50
New Black Mixed	2.75 @ 3.25
Old	
White, No. 1—	
Repacked	6.00 @ 7.00
Miscellaneous	5.25 @ 5.50
White No. 2—	
Repacked	3.35 @ 3.50
Miscellaneous	2.75 @ 3.00
St. Soiled White	1.65 @ 1.75
Thirds and Blues—	
Repacked	2.00 @ 2.25
Miscellaneous	1.35 @ 1.50
Black stockings	2.00 @ 2.25
Cloth Strippings	1.15 @ 1.25
No. 1	1.10 @ 1.15
No. 2	.90 @ 1.00
No. 3	.70 @ .80
No. 4	.70 @ .80
No. 5A	.90 @ 1.00
Foreign Rags	
New Light Silesias	6.00 nominal
Light Flannellets	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	nominal
New Dark Cuttings	2.50 nominal
No. 1 White Linens	8.75 nominal
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	2.25 nominal
Ord. Light Prints	1.75 nominal
Med. Light Prints	nominal
Dutch Blue Cottons	2.10 nominal
German Blue Cottons	1.75 nominal
Ger. Blue Linens	3.00 nominal
Checks and Blues	1.50 nominal
Dark Cottons	1.15 nominal
Shoppers	1.05 nominal
French Blues	2.00 nominal
Bagging	
Prices to Mill f. o. b. N. Y.	
Gunny No. 1—	
Foreign	1.00 @ 1.10
Domestic	1.10 @ 1.20
Wool, Tares, light	1.20 @ 1.30
Wool, Tares, heavy	1.25 @ 1.40
Right Bagging	1.20 @ 1.30
No. 1 Scrap	.75 @ 1.10
Sound Bagging	.75 @ .85
Manila Rope—	
Foreign	5.00 @ 5.25
Domestic	5.25 @ 5.50
New Bu Cut.	2.50 @ 3.00
Hessian Jute Threads—	
Foreign	4.25 @ 4.50
Domestic	4.00 @ 4.25
Mixed Strings	1.10 @ 1.25
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	39 @ 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	16 @ 18
Old Waste Papers (F. o. b. New York)	
Shavings—	
Hard White, No. 1	3.75 @ 4.00

Hard White, No. 2	3.00 @ 3.25
Soft White No. 1	2.85 @ 3.05
Flat Stock—	
Stitchless	1.40 @ 1.50
Over Issue Mag.	1.40 @ 1.50
Solid Flat Book	1.20 @ 1.30
Crumpled No. 1	.90 @ 1.00
Solid Book Ledger	2.00 @ 2.25
Ledger Stock	1.65 @ 1.75
No. 1 White News	1.75 @ 1.85
New B. B. Chips	.45 @ .50
Manilas—	
New Env. Cut.	3.00 @ 3.25
New Cut No. 1	2.00 @ 2.25
Extra No. 1, Old	1.60 @ 1.70
Print	.80 @ .90
Container Board	.60 @ .70
Bogus Wrapper	.55 @ .60
Old Krafts, machine compressed	
Bales	1.70 @ 1.80
News—	
Strictly Overissue	.70 @ .75
Strictly Folded	.50 @ .55
No. 1 Mixed Paper	.35 @ .40
Common Paper	.25 @ .30

CHICAGO

[FROM OUR REGULAR CORRESPONDENT.]

Paper	
F. o. b. Mill.	@ —
All Rag Bond	40 @ —
No. 1 Rag Bond	30 @ 40
No. 2 Rag Bond	18 @ 20
Water Marked Sulphite	11 @ 15
Sulphite Bond	9 @ 12
Sulphite Ledger	14 @ 15
Superfine Writing	19 @ 25
No. 1 Fine Writing	15 @ 23
No. 2 Fine Writing	13 @ 21
No. 3 Fine Writing	9 @ 13
No. 1 M. F. Book	6 1/4 @ 7
No. 1 S. & S. C. Book	6 1/4 @ 7 1/4
Coated Book	8 1/4 @ 10 1/4
Coated Label	8 1/4 @ 10 1/4
News—Rolls, mill.	3 1/4 @ 4 1/4
News—Sheets, mill.	4 1/4 @ 5
No. 1 Manila	6 @ 6 1/2
No. 1 Fiber	5 1/2 @ —
No. 2 Manila	5 @ —
Butchers' Manila	4 3/4 @ —
No. 1 Kraft	7 1/4 @ —
No. 2 Kraft	6 3/4 @ —
Wood Tag Boards	5 @ —
Screenings	3 @ —
Boards, per ton—	
Plain Chip	35.00 @ 40.00
Solid News	40.00 @ 45.00
Manila Lined Chip	47.50 @ 55.00
Container Line—	
85 Test	55.00 @ 60.00
100 Test	62.50 @ 65.00

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 @ .15
Coated Lithograph	.10 @ .15
Label	.08 @ .15
News	.05 @ .07
No. 1 Jute Manila	.18 @ .18 1/2
Manila Sul.	.09 1/2 @ .10
Manila No. 2	.08 1/2 @ .09
No. 2 Kraft	— @ .07
No. 1 Kraft	— @ .08
Common Bogus	.02 @ .03 1/2
Straw Board	35.00 @ 45.00
News Board	40.00 @ 45.00
Chip Board	30.00 @ 35.00
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	75.00 @ 80.00
Slaters	80.00 @ 85.00
Best Tarred, 1-ply (per roll)	
	2.00 @ 2.10
Best Tarred, 2-ply (per roll)	
	1.50 @ 1.60
Best Tarred, 3-ply. 2.00 @ 2.10	
Bagging	
F. o. b. Phila.	
Gunny No. 1—	
Foreign	2.25 @ 2.50
Domestic	1.00 @ 1.25
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	3.50 @ 3.75
No. 2, Hard White	3.00 @ 3.25
No. 1 Soft White	3.00 @ 3.25
No. 2 Soft White	1.75 @ 2.00
No. 1 Mixed	1.50 @ 1.75
No. 2 Mixed	1.00 @ 1.25

(Continued on page 66)

Imports and Exports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING DECEMBER 24, 1921

SUMMARY

News Print 1,653 rolls
 Printing paper 376 rolls, 48 cs.
 Colored paper 2 bls.
 Drawing paper 4 cs.
 Hangings 1 ca., 15 bls.
 Wall paper 22 bls., 172 rolls, 1 cs.
 Surface coated paper 295 cs.
 Cigarette paper 578 cs., 10 bls.
 Wrapping paper 296 rolls, 52 bls.
 Miscellaneous paper 97 cs., 3 rolls

CIGARETTE PAPER

American Tobacco Co., La Savoie, Havre, 54 cs.
 H. H. Strauss, La Savoie, Havre, 1 cs.
 B. E. Teale, C. de Messina, Lisbon, 50 cs.
 Lloyd Royal Belge, Pioneer, Antwerp, 13 cs.
 Ezra Levy, Hog Island, Constantinople, 10 bls.
 R. J. Reynolds Tobacco Co., Sarcoux, Havre, 360 cs.
 American Tobacco Co., Sarcoux, Havre, 100 cs.

SURFACE COATED PAPER

L. A. Consmiller, Ryndam, Rotterdam, 136 cs.
 Defender Photo Supply Co., Zealand, Antwerp, 159 cs.

WALL PAPER

A. Murphy & Co., Cedric, Liverpool, 9 bls.
 A. Murphy & Co., Montana, London, 4 bls.
 W. H. S. Lloyd & Co., Montana, London, 5 bls.
 W. H. S. Lloyd & Co., Montana, London, 1 cs.
 The Prager Co., Zealand, Antwerp, 172 rolls.
 A. Murphy & Co., Menominee, London, 4 bls.

PAPERHANGINGS

W. H. S. Lloyd & Co., Menominee, London, 15 bls.
 W. H. S. Lloyd & Co., Menominee, London, 1 ca.

DRAWING PAPER

Favor Ruhl & Co., Menominee, London, 4 cs.

COLORED PAPER

Ezra Levy, Hog Island, Constantinople, 2 bls.

PRINTING PAPER

J. L. N. Smyth Co., Ryndam, Rotterdam, 48 cs.
 L. A. Consmiller, by same, 97 cs.
 Globe Shipping Co., Hansa, Hamburg, 376 rolls.

NEWS PRINT

Chemical Nat'l Bank, Hansa, Hamburg, 122 rolls.
 Yaring Paper Corp., Stavangerfjord, Kristiania, 483 rolls.
 E. C. Melby, by same, 88 rolls.
 Nat'l City Bank, by same, 312 rolls.
 M. O'Meara Co., by same, 86 rolls.
 New York Tribune, by same, 203 rolls.
 Young Publishing Co., by same, 159 rolls.
 Hudson Trading Co., Orbita, Kristiania, 78 rolls.
 Hudson Trading Co., Hansa, Kristiania, 122 rolls.

WRAPPING PAPER

J. L. N. Smyth Co., Hansa, Hamburg, 93 rolls.
 Agar Bernsson Corp., by same, 203 rolls.
 Equitable Trust Co., by same, 52 bls.

PAPER

American Shipping Co., Hansa, Hamburg, 4 cs.
 Meadows, Neyl & Co., Scythia, Liverpool, 9 cs.
 A. Murphy & Co., La Savoie, Havre, 2 cs.

Japan Paper Co., Adige, Genoa, 27 cs.
 J. & J. Scott, Pioneer, Antwerp, 3 rolls.
 Chemical Nat'l Bank, Dryden, Hamburg, 32 cs.
 L. A. Consmiller, Ryndam, Rotterdam, 10 cs.
 H. Reeve, Angel & Co., by same, 13 cs.

RAGS, BAGGINGS, ETC

D. M. Hicks, Inc., Alpine Range, Leith, 85 bls. bagging.
 Equitable Trust Co., Alpine Range, Dundee, 187 bls. paper stock.
 American Wool Stock Co., Cedric, Liverpool, 179 bls. rags.
 B. D. Kaplan & Co., by same, 69 bls. rags.
 Albion Trading Co., by same, 15 bls. rags.
 Equitable Trust Co., Delavan, Belfast, 64 bls. paper stock.
 American Express Co., by same, 411 bls. paper stock.
 W. Hughes & Co., by same, 32 bls. rags.
 Mechanics & Metals Nat'l Bank, Pioneer, Havre, 253 bls. rags.
 Goldman, Sachs & Co., by same, 608 bls. rags.
 E. J. Keller Co., by same, 124 bls. rags.
 E. J. Keller Co., by same, 43 bls. news cuttings.
 Parsons & Whittemore, by same, 84 bls. paper stock.
 Equitable Trust Co., Pioneer, Antwerp, 125 bls. rags.
 Salomon Bros. & Co., Silene, Genoa, 97 bls. cotton waste.
 E. J. Keller Co., by same, 299 bls. cotton waste.
 Italian Discount & Trust Co., by same, 74 bls. cotton waste.
 Equitable Trust Co., Silene, Marseilles, 522 bls. rags.
 Nat'l City Bank, Menominee, London, 14 bls. paper stock.
 Wilkinson Bros. & Co., Inc., Dryden, Hamburg, 408 bls. rags.
 Bankers Trust Co., by same, 532 bls. rags.
 Ladenburg, Thalmann & Co., by same, 85 bls. rags.

OLD ROPE

Brown Bros. & Co., Alpine Range, Leith, 95 coils, 60 bales.
 First Nat'l Bank of Boston, Zealand, Antwerp, 132 coils.

WOOD PULP

M. Gottesman & Co., Inc., Stavangerfjord, Kristiania, 1,800 bls. sulphite.
 F. Anderson & Co., by same, 2,700 bls. sulphite.
 E. M. Sergeant, by same, 400 bls. dry chemical.
 Hudson Trading Co., Orsova, Trieste, 2,400 bls. wood pulp.
 American Wood Pulp Corp., Ryndam, Rotterdam, 595 bls. dry wood pulp.
 Scandinavian American Trading Co., Athaulf, Skutskar, 750 bls. wood pulp.
 A. J. Pagel & Co., Inc., Athaulf, Gefle, 1,000 bls. dry sulphite.
 A. J. Pagel & Co., Inc., by same, 2,500 bls. dry sulphite.
 A. J. Pagel & Co., Inc., Athaulf, Hosum, 3,300 bls. dry sulphite.
 A. J. Pagel & Co., Inc., by same, 4,050 bls. dry sulphite.
 A. J. Pagel & Co., Inc., Athaulf, Domsjo, 1,200 bls. dry sulphite.
 Hudson Trading Co., Bradford City, 196 bls. sulphite.
 Hudson Trading Co., Orsova, 2,400 bls. wood pulp.

CASEINE

Atterbury Bros., Sougoaud, Buenos Aires, 1,000 bags, 60,000 kilos.
 T. M. Ducher & Sons, by same, 417 bags, 25,020 kilos.
 T. M. Ducher & Sons, Boswell, Buenos Aires, 834 bags, 50,040 kilos.
 Kalbleisch Corp., by same, 500 bags, 30,000 kilos.
 T. S. Todd, by same, 393 bags, 41,580 kilos.

BOSTON IMPORTS

WEEK ENDING DECEMBER 24, 1921

PAPER STOCK

American Express Co., Winifredian, Liverpool, 55 bls. rags.
 T. D. Downing Co., by same, 55 bls. rags.
 International Purchasing Co., by same, 77 coils manila rope.
 E. Butterworth & Co., Inc., Delevan, Belfast, 474 bls. paper stock.

HIDE CUTTINGS

E. F. Russ Co., Winifredian, Liverpool, 221 bls.

WOOD PULP

Poland Paper Co., Virginian, Christiania, 6,448 bls.
 J. Andersen & Co., by same, 3,090 bls.
 Nielson & Rantoul, by same, 400 bls.
 Russian Trading Co., by same, 2,005 bls.
 M. Gottesman & Co., Waltham, Svantvik, 1,000 bls.

BALTIMORE IMPORTS

WEEK ENDING DECEMBER 24, 1921

A. J. Pagel & Co., Inc., Athaulf, Gefle, 4,000 bls. sulphate pulp.
 Scandinavian American Trading Co., Athaulf, Skutskar, 4,000 bls. dry wood pulp.
 A. J. Pagel & Co., Inc., Athaulf, Hosum, 8,220 bls. sulphate pulp.
 Hudson Trading Co., Tinlia, 2,400 bls. sulphite pulp.
 Hudson Trading Co., Sturchulm, 600 bls. sulphite pulp.
 Hudson Trading Co., Callisto, 170 rolls news print.

PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 24, 1921

H. A. Pagel & Co., Inc., Athaulf, Hosum, 1,800 bls. dry sulphite pulp.
 Scandinavian American Trading Co., by same, 1,250 bls. wood pulp.
 M. Gottesman & Co., Maria, Trieste, 4,000 bls. wood pulp.
 To Montreal:
 J. R. Walker Co., Idaho, Hull, 23 bls. rags.

GALVESTON IMPORTS

WEEK ENDING DECEMBER 24, 1921

Hudson Trading Co., Transvaal, 136 rolls news print.

Paper Buyers Meet at Dayton

[FROM OUR REGULAR CORRESPONDENT.]

DAYTON, Ohio., December 26, 1921.—Seventy-five representative buyers of paper in Dayton and surrounding towns attended a meeting called by the Dayton House of the Cincinnati Cordage and Paper Company recently. The meeting was conducted at the Miami Hotel and proved a pleasant and profitable gathering as it was devoted largely to an educational talk on "Paper Making" by C. H. Barr, of the Crocker-McElwain Company, of Holyoke, Mass.

Mr. Barr, who is well known throughout the trade, was at his best and presented many valuable pointers to an assemblage, many of whom are experts in their line.

After dinner, the visitors were escorted to the printing establishment of Giele & Pflaum, where rotary presses were used in demonstrating half-tone printing on bonds. Paper buyers were given the benefit of research work of a valuable nature by Mr. Roache, representing the Crocker-McElwain Company.

The largest consumers of paper in this section of the country sent representatives, including the National Cash Register Company, the Reynolds & Reynolds Company, lithograph printers, manufacturers of tablets and ledgers, and practically every printing house in Springfield, Piqua, and surrounding towns.

A. T. Nesbitt, general manager of the Dayton House of the Cincinnati Cordage and Paper Company, arranged the meeting and was complimented on the success of the gathering.

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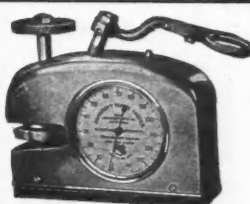
Writing, Book and Tissue Papers

PARSONS Pulp and Lumber Co.

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Office, 1897-1810 Finance Bldg.,
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Mills at
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**The Ashcroft
Paper Tester**



**The Ashcroft
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Actual necessities for all those who make, sell or purchase paper in any form. The thousands in daily use testify to their efficiency.

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119 West 40th Street New York
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Canadian Sales Agents: The Canadian Fairbanks Morse Co., Montreal and Toronto.

CALENDERS

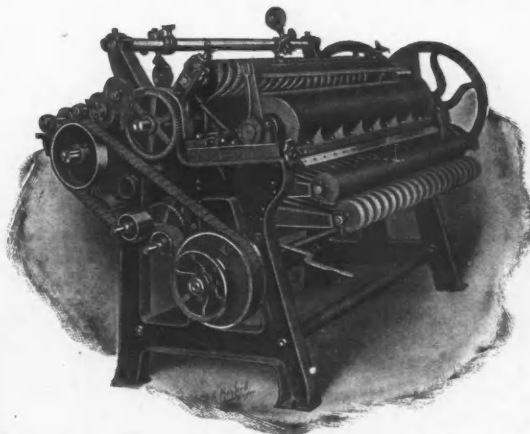
Furnished Complete, with Electric Motor Lift,
Hydraulic Lift or Ratchet Lift.
All Operated from Floor.
Grinding Machines for
Rolls of all sizes.



LOBDELL CAR WHEEL CO.
Wilmington, Del., U. S. A.

Paper Cutters

Single, Duplex and Diagonal



Cutter Knives Patent Top Slitters

HAMBLET MACHINE CO.
Lawrence, Mass.

Miscellaneous Markets

OFFICE OF THE PAPER TRADE JOURNAL,
WEDNESDAY, DECEMBER 28, 1921.

ALUM.—End of year dullness prevails in the alum market where sales are strictly of the hand-to-mouth variety. Prices are firm with ammonia alum quoted at from 3.65 to 3.75 cents a pound for the lump, 3.75 to 4.00 cents for the ground, and 4.15 to 5.25 for the powdered.

BLEACHING POWDER.—Little change is to be noted in the bleach market with the domestic selling at about 2.00 cents a pound and the imported at from 2.00 to 2.25 cents a pound spot and 1.90 to 2.00 cents a pound for shipment duty paid.

BLANC FIXE.—A few sales of blanc fixe have been made throughout the week but there may be said to be practically no demand. Blanc fixe pulp is quoted at from \$40.00 to \$50.00 a ton, depending on the grade required and powdered blanc fixe is quoted at from 3.50 to 3.75 cents a pound.

BRIMSTONE.—The sulphur market is quiet for the present although the renewal of contracts for 1922 is proceeding in sufficient volume to maintain an optimistic undertone. Domestic brimstone is quoted at from \$18.00 to \$20.00 f.o.b. New York and \$16.00 to \$18.00 a long ton at the mines.

CASEIN.—The casein market has not broken yet and prices continue firm under the influence of the very small supply now being received from foreign as well as domestic sources. The price is now at 8.25 to 8.50 cents a pound.

CAUSTIC SODA.—Improvement is looked for shortly in caustic soda and small lots are in fairly good demand now. The contract price is 3.60 cents a pound on the basis of 76 to 78 per cent.

ROSIN.—The rosin market is exhibiting a firmer tone and dealers are encouraged to believe that the peak of dullness has been passed. Grades E, F and G are all selling at around 5.60 cents a pound.

CHINA CLAY.—Indications point to much larger tonnage of china clay for the early part of 1922. Paper mills are using more than for some time and sources of supply are decidedly optimistic for 1922 business at present prices. Domestic unwashed sells at from \$6.00 to \$8.00 a net ton, domestic washed at from \$8.00 to \$10.00, and imported at \$15.00 to \$20.00. Large contract users are enjoying somewhat better prices listed but these seem to be general.

SALTCAKE.—The recovery of saltcake to its normal activity is very slow but the situation has improved some as indicated by slightly increased sales. Chrome saltcake sells at \$18.00 to \$20.00 a ton, and acid white at \$22.00 to \$23.00.

STARCH.—The demand for starch is encouraging although below normal on account of the seasonal slump. For carload quantities, freight prepaid to New York City, a 100 pound bag of starch sells at 1.83 and a barrel of the same weight at 2.11.

SATIN WHITE.—There is very little demand for satin white at present but the belief is current that paper mills will soon be asking for their normal supplies under better general conditions. Prices are unsteady at about 2.10 cents a pound.

SULPHATE OF ALUMINA.—Some sulphite of alumina is moving to those buyers whose low stocks demand refilling but on the whole the department is quiet. The commercial grade sells at from 1.40 to 1.70 cents a pound and the iron free grade at from 2.60 to 3.00.

SODA ASH.—Foreign soda ash is marketed at 1.85 to 1.95 cents a pound and the domestic at 1.90 to 2.00 cents. Demand continues slow although the market is not well supplied.

TALC.—Business in the talc market is improving slowly and the feeling throughout the trade is optimistic of the future. Talc is quoted at \$14.00 to \$18.00 a ton.

Market Quotations

(Continued from page 63)

Solid Ledger Stock. 2.00 @ 2.25	New Black Soft. .03 @ .03 1/4
Writing Paper. 1.80 @ 2.00	New Light Sec-
No. 1 Books, heavy. 1.50 @ 1.75	onds02 1/4 @ .02 1/4
No. 2 Books, light. 1.25 @ 1.50	Khaki Cuttings.03 @ .03 1/4
No. 1 New Manila. 2.75 @ 3.00	Corduroy02 @ .02 1/4
No. 1 Old Manila. 1.50 @ 1.75	New Canvas.08 @ .08 1/4
Container Manila. 1.10 @ 1.25	New Black Mixed 3.00 @ 3.25
Old Kraft. 2.50 @ 2.60	Old
Overissue News.90 @ 1.00	White, No. 1—
Old Newspaper.60 @ .70	Repacked06 @ .06 1/4
No. 1 Mixed Paper.50 @ .60	Miscellaneous04 1/4 @ .04 1/4
Common Paper.50 @ .60	White, No. 2—
Straw Board, Chip.50 @ .60	Repacked03 @ .03 1/4
Binders' Bd. Chip.50 @ .60	Miscellaneous02 1/4 @ .02 1/4
Domestic Rags—New.	
Price to Mill, f. o. b. Phila.	
Shirt Cuttings—	Thirds and Blues—
New White, No. 1 .09 @ .09 1/4	Repacked 1.85 @ 2.00
New White, No. 2 .05 1/4 @ .06	Miscellaneous 1.55 @ 1.75
Silesias, No. 1.05 1/4 @ .06	Black stockings. 1.75 @ 2.25
New unbleached.08 @ .09	Roofing Stock—
Washables03 1/4 @ .03 1/4	No. 1.90 @ 1.00
Fancy05 @ .05 1/4	No. 2.80 @ .90
Cottons—according to grades—	No. 3.70 @ .80
Blue Overall.05 @ .05 1/4	No. 4.75 @ .85
New Blue.02 1/4 @ .02 1/4	No. 5A. nominal
	B. nominal
	C. nominal

BOSTON

[FROM OUR REGULAR CORRESPONDENT.]

Paper	Wood, Vat Lined. 47.50 @ 50.00
Bonds08 1/4 @	Filled News Board. 40.00 @
Ledgers09 @	Solid News Board. 40.00 @
Writings08 1/4 @	S. Manila Chip. 52.50 @
Superfine15 @	Pat. Coated. 70.00 @ 75.00
Fine12 @	
Books, S. & S. C.06 1/4 @	Old Papers
Books, M. F.06 @	Shavings—
Books, coated09 1/4 @	No. 1 Hard White03 1/4 @
Label10 @	No. 1 Soft White02 3/4 @ .03
News, sheets. \$4.50 @	No. 1 Mixed.85 @ \$1.00
News, rolls.04 @	Ledgers & Writings02 1/4 @
Manilas—	Solid Books.01 1/4 @
No. 1 Manila. \$7.00 @	Blanks01 1/4 @
No. 1 Fibre. 8.00 @	No. 2 Books Light.60 @ .70
No. 1 Jute. 8.00 @	Folded News, over
Kraft Wrapping. 7.00 @	issues 12.00 @
Common Bogus. 3.00 @	Mixed paper.05 @
	Gunny Bagging80 @
Boards	Manila Rope05 @
(Per Ton Destination)	Comm'n Paper. 8.00 @
Chip \$35.00 @ \$40.00	Old News.08 @
News, Vat Lined. 37.50 @	Old Kraft. 1.65 @

TORONTO

[FROM OUR REGULAR CORRESPONDENT.]

Paper	Sulphite bleached. 107.50 @
(Mill Prices to Jobbers f. o. b. Mill)	Sulphate 75.00 @
Bond—	Old Waste Papers
Sulphite 13 @	(In carload lots, f. o. b. Toronto)
Light tinted 14 @	Shavings—
Dark tinted 15 1/2 @	White Env. Cut. 3.25 @
Ledgers 14 @	Soft White Book @
Writing 11 @ 15	Shavings 3.15 @
News, f. o. b. Mills—	White Bl'k News 1.85 @
Rolls (carloads). 4.00 @	Book and Ledger. @
Sheets (2 tons or over) 4.75 @	Flat Magazine and Book Stock (old) 1.15 @
Books—	Light and Crumpled Book Stock 1.00 @
No. 1 M. F. (carloads) 10.00 @	Ledgers and Writings 1.65 @
No. 2 M. F. (carloads) 9.00 @	Solid Ledgers 1.65 @
No. 3 M. F. (carloads) 8.50 @	Manilas—
No. 1 S. C. (carloads) 10.50 @	New Manila Cut. 1.85 @
No. 2 S. C. (carloads) 9.50 @	Printed Manilas. 1.00 @
No. 1 Coated and litho. 15.00 @	Kraft 2.25 @
No. 2 Coated and litho. 14.00 @	News and Scrap—
No. 3 Coated and litho. 13.25 @	Strictly Overissue90 @
Coated and litho., colored 15.25 @	Folded News70 @
Wrapping—	No. 1 Mixed Papers60 @
Grey 4.75 @	Domestic Rags—
White Wrap. 5.25 @	Price to mills, f.o.b. Toronto.
"B" Manila. 5.75 @	Per lb.
No. 1 Manila. 7.50 @	No. 1 White shirt cuttings.09 1/4 @ .10
Fibre 7.25 @	No. 2 White shirt cuttings05 1/4 @ .05 1/4
Kraft, M. F. or M. G. 8.75 @	Fancy shirt cuttings05 1/4 @ .05 1/4
	tings05 1/4 @ .05 1/4
Pulp	No. 1 Old whites04 @
(F. o. b. Mill)	Thirds and blues02 @ .02 1/4
Ground Wood \$25.00 @ \$30.00	Per cwt.
Sulphite, easy bleaching 65.00 @ 75.00	Black stockings. 2.00 @
Sulphite, news grade. 60.00 @ 65.00	Roofing stock
	No. 1. 1.25 @
	No. 2. 1.15 @
	Roofing stock
	Manila rope.04 1/4 @ .05
	No. 201 1/4 @
	Gunny bagging02 1/4 @

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FACTORY
132ND TO 133RD ST & BROOK AVE

PAPER BAGS

Sacks and Specialties

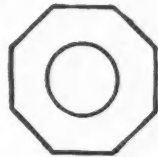
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SCHORSCH & CO.

Manufacturers

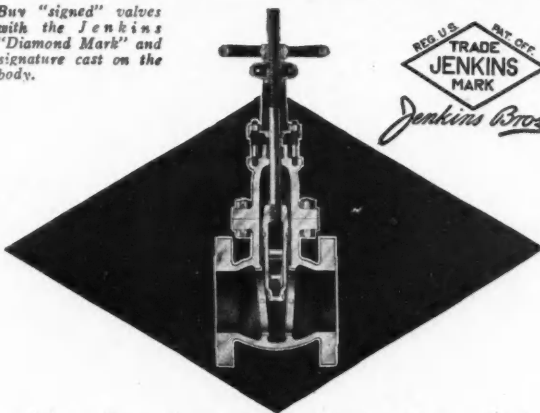
500 East 133d Street : New York

This Registered Trade Mark Octagon



on a Paper Bag Vouches for Its Good Quality

Buy "signed" valves with the Jenkins "Diamond Mark" and signature cast on the body.



Jenkins Standard Iron Body Gate Valves



Fig. 331

Figure 331 Iron Body, composition mounted, outside screw and yoke. Sizes 2 to 16 inches, suitable for 125 pounds steam and 175 pounds water. Sizes 18 to 30 inches for 100 pounds steam and 125 pounds water.

JENKINS BROS.

New York Boston Philadelphia Chicago
Montreal London Havana

FACTORIES: Bridgeport, Conn.;
Elizabeth, N. J.; Montreal, Canada.

Jenkins Valves
2367-J SINCE 1864

Yaryan Wood Rosin

For rosin which runs uniform and clean from one lot to another come to us.

Our technical service men will gladly co-operate with paper manufacturers with a view to adapting our rosin to their requirements.

The uniform quality of our dependable supply of Yaryan Wood Rosin and its freedom from foreign materials particularly recommends it to large users of rosin.

We invite correspondence on the subject.

Naval Stores Division
HERCULES POWDER CO.
Wilmington Delaware

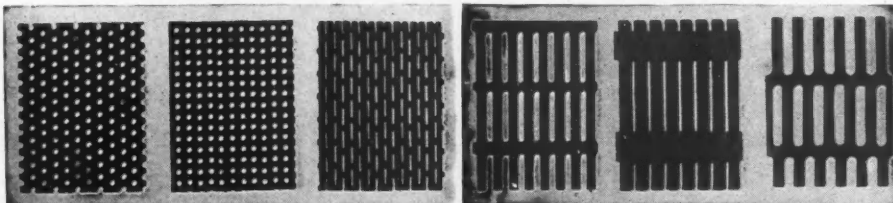
Sales { 120 Broadway, New York
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Produced Under Chemical Control

PERFORATED METALS

All sizes and shapes of Holes



All kinds and thicknesses of Metal

For Centrifugal and Rotary Screens, Drainer Bottoms, Filter Plates, Pulp Washers, etc.

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New York Office, 114 Liberty St.

WANT AND FOR SALE ADVERTISEMENTS

HELP WANTED

CLASSIFIED RATES

Minimum rate for advertisements of 25 words or less, first insertion, \$1.00.

SITUATION WANTED, 4 cents a word for first insertion and 2 cents a word for each subsequent insertion of same ad. No ad of less than 25 words accepted.

HELP AND MISCELLANEOUS WANTS, and small For Sale Ads, 4 cents a word for each and every insertion. No ads of less than 25 words accepted.

When answering advertisements, please address the Box Number given in ad.

Answers can be forwarded care Paper Trade Journal, and will be promptly forwarded without extra charge. All should be sent to the New York office, 10 East 39th street. And all should be addressed as the advertisement directs in every case and not simply to the paper.

All classified ads for the current issue must be in hand not later than Monday preceding date of publication.

WANTED—Paper Bag and Envelope Salesmen. A Specialty House having recently enlarged its Manufacturing Equipment desires the services of young aggressive salesmen. A broad field and excellent future. Experience and knowledge essential. Write in detail. Address, Box 4638, care Paper Trade Journal. tf.

WANTED—Fourdrinier Back Tender, Steady Job. Chance for Advancement. Eight Hour Shifts. Massachusetts Mill making R.ope Specialties. Address, Box 4655, care Paper Trade Journal. J-5

Boss Machine Tender Wanted

Boss Machine Tender for Canadian Kraft Mill, to take eight hour shift. Give age and experience and wages required. Address, Box 4709, care Paper Trade Journal. D-29

BOX MAKER—Experienced Square and Fancy Paper Box Maker with executive ability to purchase 25% interest in a very successful and progressive concern and become assistant manager of the business. The company is located in the leading Manufacturing City of the Country with opportunity for large expansion. Investment required \$20,000. Man of experience and ability needed more than capital. State age, experience and references. Address, Box 4697, care Paper Trade Journal. D-29

TOILET PAPER

Well known Toilet Paper Manufacturer would like a reputable representative thoroughly conversant with the business to sell Jobbing Trade in Pittsburgh and surrounding Territory. Address, Box 4717, care Paper Trade Journal. D-29

HELP WANTED

WANTED—Good, steady reliable Tyer for tying paper in finishing room. Mill located in the West. Steady work. Address, Box 4706, care Paper Trade Journal D-29

WANTED—A Technically Trained and Practical Man to act as Mechanical Engineer and Master Mechanic of Paper and Pulp Mill. Must be able executive with successful record. Only those able to qualify submit references and full information. Address, Box 4694, care Paper Trade Journal. D-29

WANTED—Sales Executive and Office Manager familiar with all grades of Paper Box Boards and Colored Specialties. To locate in Boston. One acquainted with New England and New York Trade preferred. State experience and references. Address, Box 4698, care Paper Trade Journal. tf

WANTED—Bookkeeper and Typist, for Wholesale Paper House, experience necessary. Address, Box 4707, care Paper Trade Journal. D-29

TOILET PAPER

Well known Toilet Paper manufacturer would like reputable representative thoroughly conversant with the business to sell jobbing trade in Louisiana, Alabama, and Mississippi. Address, Box 4715, care Paper Trade Journal. D-29

WANTED: COMBINER MAN—To make lay-outs and take charge of operating one 80" and 120" machine for pasting solid fibre container board. Pressman: Must be experienced in High-class solid fibre container work to assume direct charge of Printing Department, consisting of various makes of fibre-Board Presses, both flat beds and cylinder types. General Foreman: Man who is experienced in all the finishing processes of solid Fibre Container Work. Must be able to take full charge of Slitting, Cutting, Creasing and Stitching Departments. Full particulars as to experience, references, and salary expected to be covered in first letter of application. All correspondence treated confidentially. Address, Box 4708, care Paper Trade Journal. tf

WANTED—Boss Beaterman to take charge of Beaterroom making 35 to 40 Tons per day high grade Folding Box Boards. Address, Box 4710, care Paper Trade Journal. J-12

TOILET PAPER

Well known Toilet Paper Manufacturer would like a reputable representative thoroughly conversant with the business to sell Jobbing Trade in San Francisco and Pacific Coast. Address, Box 4716, care Paper Trade Journal. D-29

SITUATIONS WANTED

NEWSPRINT SALESMAN—One who has proven successful in marketing considerable foreign tonnage, desires new connection with manufacturer or distributor of news, half tone, novel, etc. Address 4693, care Paper Trade Journal. D-29

PAPER SALESMAN in New York City who can produce a large volume of business with adequate cooperation, desires connection. Drawing account on Commission basis. Correspondence invited. Address, Box 4635, care Paper Trade Journal. tf.

SUPERINTENDENT WISHES TO make a change from his present position. Have had fifteen years' experience on all grades of Boxboards, Containers, Tests, etc. Familiar with repairs, maintenance, and know how to handle men. Middle aged, married, and can give best of references. Address, Box 4435, care Paper Trade Journal. J-5

WANTED—Position by Lead Burner, contract or by the hour. 20 years' experience on all kinds of Lead Burning. Address, Box 4646, care Paper Trade Journal. D-29

BOSS—Acid Maker with ten years' experience in Swedish and American Mills desires position in U. S. A. or Canada. Can furnish best of references. Now employed. Address, Box 4658, care Paper Trade Journal. J-12

WANTED POSITION—As Beater Engineer. Experienced on all grades stock, Folding Box, Chip, News, Test, Containers, Manillas, Tissues and Book Papers. Married, steady man. Best references. Address, Box 4684, care Paper Trade Journal. D-29

EXPERT PAPER MAKER—An up-to-date practical paper maker, of wide experience on High Speed Machines, desires employment from Manufacturers having trouble in machine room. Work guaranteed at reasonable rate. Address, Box 4685, care Paper Trade Journal. J-12

SUPERINTENDENT DESIRES POSITION. Has practical experience running Cylinder, Harper, Fourdrinier, Yankee and Combination Machines on Tissue, Book, News, Fibre and Specialties, also experienced on Ground Wood and Sulphite, familiar with Repairs, Maintenance and Installations of all Machinery in connection with making of Paper from Log to Finished Paper. Past records show producing results, successful in handling help, getting best results. Am running a Mill at present very successfully but desire to make a change. Address, Box 4688, care Paper Trade Journal. D-29

SEVENTEEN YEARS' PAPER experience, particularly printer's Papers, in Sales Department, Traveling Salesman, Export Department Manager, desires connection in New York as Executive or Salesman with Mill or well known jobbers where experience and consistent effort are appreciated. Now employed; 35 years of age; married; steady; good record; best references. Address, Box 4702, care Paper Trade Journal. J-5

MACHINE TENDER wishes to make a change from his present position. Experienced on all grades of Cylinder Papers, Box Boards, Tests, and Containers. Best of references. Address, Box 4705, care Paper Trade Journal. J-5

YOUNG MAN—College education with Mill and Jobbing experience in Fine Paper Trade wants selling connection with Jobbing House, Mill Agency or Sales Representative in Middle West. Address, Box 4711, care Paper Trade Journal. D-29

WHO WANTS A LIVE COATING MILL SUPERINTENDENT—Now employed. 20 years' experience on Book, Lithograph, Glazed and Flint Papers. Nothing but a live proposition will be considered. Address, Box 4712, care Paper Trade Journal. J-19

SITUATIONS WANTED

SITUATION WANTED—Machine Designer and Draughtsman of long, varied experience, unusual ability at solving new and complex problems. Open for engagement on time basis or contract. Address, Graphic, 946 Gates Avenue, Brooklyn, N. Y. J-19

RELIABLE, INDUSTRIOUS AND COMPETENT MAN—At present employed selling shipping containers, is desirous of making a change as a Representative preferably in Minneapolis and St. Paul and adjacent Territories for some good Reliable Line and firm who can appreciate a Live Wire and compensate accordingly. Least drawing account considered, \$5,000.00 per year. Address, Box 4718, care Paper Trade Journal. J-5

POSITION WANTED as Sulphite Mill Fireman, Cook or Acid Maker. Twenty-five years' experience in Sulphite Mills. Handy and all around Sulphite Mill Man. Address, Box 4719, care Paper Trade Journal. D-29

MISCELLANEOUS

WANTED—A 7 or 9 Roll Super Calender from 34 inches to 40 inches in width. George La Monte & Son, 61 Broadway, New York. tf

WANTED

To correspond with Canadian Paper Mill who would be interested in putting in a machine for the making of folded paper towels. Address, Box 4668, care Paper Trade Journal. D-29

For Sale

- BEATERS**—6 N & W 48x48 rolls, 2 Emerson 48x48, 2' tubs.
- CUTTERS**—One 52" Sheridan, new model, 38" Guillotine.
- CALENDARS**—One Board rolls 16x50", one 7 roll open side 84".
- EXHAUSTER**—One Sturtevant.
- FANS**—3 Hunberry, 2 Perkins.
- JORDANS**—One N & W Monarch, One Emerson large size, one Horne, one N & W Pony, with extra plug.
- PULLEYS**—All sizes.
- PUMPS**—Two 6" Emerson, one 4" Centrifugal, Law Mch. Co.'s make. 1—Type 4 Gould 5" triplex water pump.
- PRESS ROLLS**—One pair brand new, one R C 18x20, one Gun Metal 18x21, one 16x75", and others.
- RAG CUTTERS**—Four No. 2 Daniels, one Perkins.
- REELS**—One 2 bowl 56", one 2 bowl 58".
- ROTARIES**—Two 7"x22".
- SLITTERS**—One 86" P & J, one 40" Kidder, one 104" B & C.
- WINDERS**—One 86" P & J, with slitters and rewinding shaft, for immediate shipment.
- SAVE-ALL**—One North.
- WET MACHINES**—5 N & W, with cutoffs, moulds 30x52", three extra cylinder moulds for these machines.

MILLS MACHINE COMPANY
Lawrence, Mass. U. S. A.

MISCELLANEOUS

WANTED—Second Hand Super Calender, five or seven rolls, 36" to 44" wide. Prefer steel and cotton or paper rolls rather than all steel. State lowest price. Address, Box 4701, care Paper Trade Journal. D-29

WANTED—1. Five Roll Calender Stack, 124" face, 12" diameter.
2. Calender Stack suitable for 44" trim Cylinder Machine.
3. Super Calender Stack, about 76" wide face.
4. Dryers—36" x 48".
5. Dryers—36" x 76".
Address, Box 4703, care Paper Trade Journal. D-29

WILL BUY—Good used Mullen Tester, small size. Address, Box 4713, care Paper Trade Journal. D-29

PRINTING PRESS RUNS WANTED—We are in position to give interesting prices on long press runs by throwing these runs to our night shift. Also in position to purchase Super at Mill Prices if required. Mail your proposition for an estimate. Glens Falls Publishing Co., Glens Falls, N. Y. New York Office, Room 412, Times Building, N. Y. J-19

FOR SALE

COAL—Moshannon and "E Seam" bituminous coals, low sulphur, low ash. Lowest freight rate east and north. Prices and freight rates will be furnished on request. Halden-Kelley Coal Company, 209 Market St., Clearfield, Pa. tf

FOR SALE—Roofing and Saturating Machines, 72"x36" wide. Chilled steel rolls. Also Painter Mixing Machine, Grinders, etc. Address Box 4310, care Paper Trade Journal. tf

FOR SALE: DRYERS—8-60"x120" Dryers with bearings. A bargain. W. V. Sullivan, Call Bldg., San Francisco. tf

FOR SALE—14 Calender Rolls, 58" face, 8" 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. tf

FOR SALE—24" x 42" McIntosh Seymour Rolling Mill Type Horizontal Steam Engine, 125 R.P.M. 635 H.P. 2-78" x 20" Horizontal Return Tubular Boilers. 150 lbs. 30 K.W. D.C. Generator 125 V. Feed Water Heater, Steam Separator, Boiler Feed Pump. Rope Sheaves and Tension Carriages for 1", 1½", and 2" Ropes, Pulleys, Shafting, Hangers, and Bearings up to 8" diameter. All of the above is as good as new and will be sold cheap, especially the Rope Sheaves which will sell for 20% the cost of new. We will be willing to grant very liberal terms to responsible parties. Walters Milling Company, 30th and Master Streets, Philadelphia, Pa. D-29

FOR SALE

- One New York Safety 5" x 8" vertical steam engine, 32" x 4½" fly wheel, Pickering Governor.
- One New York Safety 10" x 12" vertical steam engine 48" x 12" fly wheel, Pickering Governor, complete with outboard bearing.
- One bank of 13 Dryers 28" diameter, 80" face, set in two tiers, complete with top and bottom felt stretcher guides, and carrying rolls in first-class condition, with steam headers. Now in use.
- One two drum reel for 84" machine complete, now in use.
- One 10 plate, Packer screen, complete with plates, driving pulley and three extra sets of plates.
- One Pope mullen screen, 10 plates, 12" x 42".
- One 36" Holyoke Machine plater.

VALLEY PAPER COMPANY
Holyoke, Mass. D-29

FOR SALE

FOR SALE—One 64" and two 84" Hamblet Sheet Cutters, complete with Moore & White Lay-boys, necessary rolls, stands, slitters, etc. Machine now in operation. Practically as good as new. If interested, please write, wire or phone. The Fox Paper Company, Lockland, Ohio. J-12

BOX BOARD MILL FOR SALE—This mill is new, 50 Tons production per day. Located in central part of New York State. Can be bought right. Address, Box 4714, care Paper Trade Journal. tf

FOR SALE—1 Dietz Automatic Tube Machine for making Toilet and Towels Tubes 1-72" Hudson-harp Toilet and Towel Roll Converter, practically new. Windsor Locks Paper Mills Co., Windsor Locks, Connecticut. D-29

FOR SALE—Four—Fifty-Six Inch, Two—Forty-eight inch and one Four-six inch second hand Trump Water Turbines that we have replaced with larger units. May be inspected at any time. French Paper Co., Niles, Michigan.

FOR SALE

100 Inch Duplex Paper Cutter with special Attachments. One Ton Sprague Electric Hoist. Also 20 H.P. Motor with Starting Regulator. A Seybold 20th Century 74 inch Flat Cutter. All in excellent condition and as a whole an exceptional equipment for Cutting and Finishing Paper. Reasonable price to the right party. Address, Box 4627, care Paper Trade Journal. tf

REBUILT PAPER MILL MACHINERY
IN STOCK AND GUARANTEED
NOT WHERE IS AND AS IS

- Fourdrinier Paper Machine**: One 112", one 96", one 72".
- Fourdrinier Parts**: Pusey & Jones 137", 118", 112", 100".
- Press Parts for Paper Machines**: Pusey & Jones Bell Crank housing two sets 18" x 114", three sets 18" x 110", two sets 18" x 96", Black & Clawson swing arm housings with rolls.
- Dryers**: Four 48" x 111", sixteen 48" x 106", ten 48" x 68", one 84" x 67", eleven 42" x 66". Thirteen 36" x 95".
- Marshall Drives**: 6 Black & Clawson self-contained stand with friction clutch cone pulley and 7" mortise gears. Mortise gears and pinions for Pusey & Jones Marshall drives 5" to 8" face.
- Chilled Calenders**: One 66" face, five roll.
- Dillon Doctors**: For Machine Calenders 60" to 120" face.
- Slitters and Winders**: One 120" Warren, one 82" Pusey & Jones two drum, one 108", 36" Kidders. One 116" Moore & White Four Drum.
- Reels**: Pusey & Jones two drum upright 48" to 114".
- Beaters**: Six 72" x 42" Noble & Wood, two 66" x 42" Noble & Wood, equipped with three cylinder washers; one Dilts 62" x 50" iron tub, one Jones 62" x 52" seven Horne 36" x 36".
- Jordans**: One Wagg Majestic, three No. 2 Dillon Improved, one Large Horne, five Monarch, two Pope Brushing engines.
- Screens**: Three 12 plate open side Packer.
- Stuff Pumps**: Deane triplex 8" x 12", Gould triplex 8" x 10", Sandusky triplex 4" x 6".
- Revolving Sheet Cutters**: One 104" Horne, one 84" Clark, one 50" Hamblet diagonal, two 42" Finlay, four 61" Hamblet, four 61" Finlay.
- Wet Machines**: Four 72" Bagley & Sewall Hydraulic.

Frank H. Davis Company, 175 Rickhale Ave., CAMBRIDGE, 40 MASS

GIBBS-BROWER BULLETIN
PAPER MILLS FOR SALE
IN THE EAST

1. Book Paper and Specialties Mill. Fourdrinier Machine trimming 76 inches. 15 tons 24 hours. Also Ground Wood Pulp Mill. Grinders and Wet Machines. 5 tons 24 hours. Excellent water power throughout, also steam. Railroad sidings.
2. Bogus Bristol Hardware, Textile Wrappers, and Ticket Stock Mill. Three Cylinder Machine trimming 52 inches. 6 tons 24 hours. Good water power, steam and electricity. Railroad siding.
3. Toilet and Crepe Tissue Mill. Fourdrinier Machine trimming 67 inches. 5 tons 24 hours. Water and steam. Railroad siding.
4. Patent Coated, Card Middles, Container Board Mill. Two six Cylinder Machines trimming 86 and 94 inches, 100 tons 24 hours. Water and steam. Railroad siding.
5. Sheathing and Fire Work Board Mill. Three Cylinder Machine trimming 56 inches. 9 tons 24 hours. Good water power, steam and electricity. Railroad siding.

IN THE WEST

6. Container, Liner and Combination Box Board Mill. Two 5 Cylinder Machines trimming 70 and 84 inches. 45 tons 24 hours. Valuable 650 H.P. water power, also steam and electricity. Railroad sidings.
7. Straw Kraft, Butcher Fibre, Sulphite Wrapper and Car Linings Mill. Fourdrinier Machine trimming 61 inches. 12 tons 24 hours. Steam. Railroad sidings.

WE HAVE MANY OTHER MILLS TO OFFER, BUT WE CANNOT ADVERTISE THEM

GIBBS-BROWER COMPANY,
Paper and Pulp Mill Brokers,
261 Broadway New York City
 Telephone—Barclay 8020.
OUR MOTTO: "Service First."
 Chicago Office: 181 Quincy St., Chicago, Ill.

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THE WOOD'S MACHINE

Distinctive performance and intensified confidence in this machine as a Pulp Thickener, Save-All, Washer or Water Filter insure success in its building.

On the market but a few years, our installations number more than Eighty-five. Twenty-nine sold the past year.



Furnished in three sizes with either sprocket or pulley drives.

MADE BY
GLENS FALLS MACHINE WORKS
 GLENS FALLS, N. Y.

Try our Split Cams for your Flat Screens

SIMPLICITY, in cylinder and vat construction, operation automatic, and without couch roll, doctor or any complicated moving parts.

DEPENDABILITY, in its simple revolving cylinder only, with nothing to get out of order, requiring little attention, and having a patented principle of maintaining wires always clean, insuring continuous performance.

PRODUCTIVENESS, enormous, through clean wires, large screening surface, patented unique method of discharge and freedom from shut-downs.

DURABILITY, by rigid construction, ample bearing surfaces, nothing to injure wires and highest grade materials.

All these enhance its value and involve upon you the duty of investigation.

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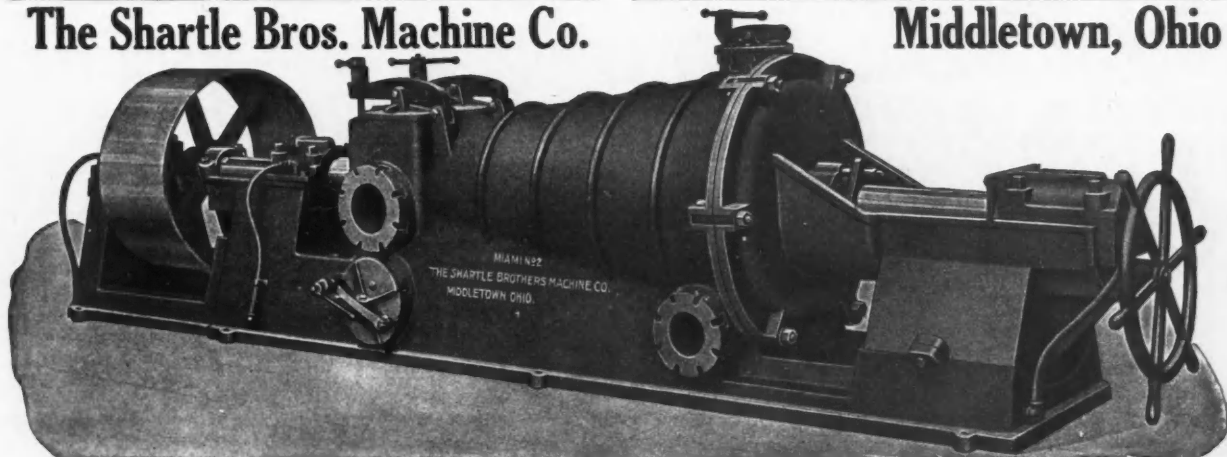
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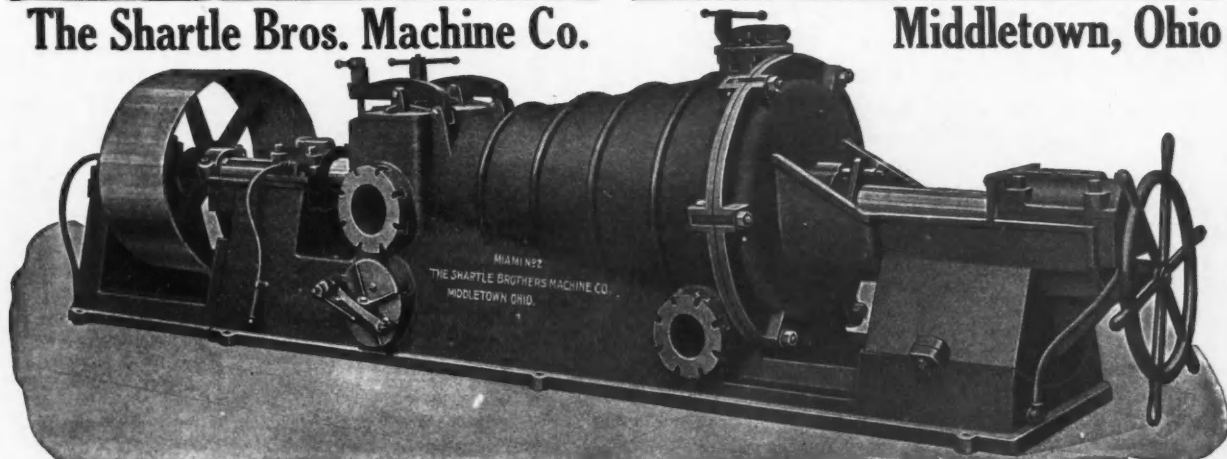
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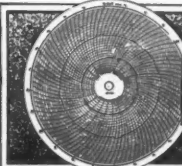
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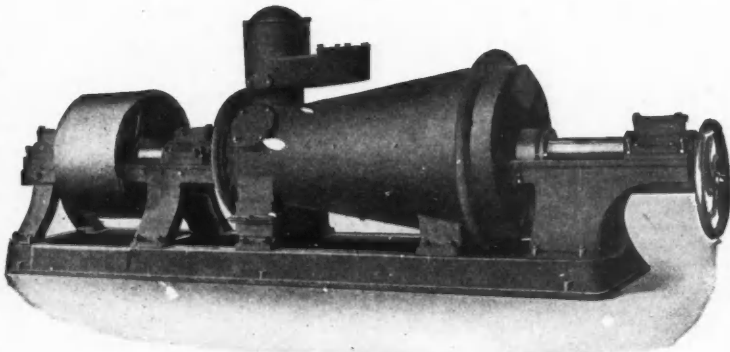
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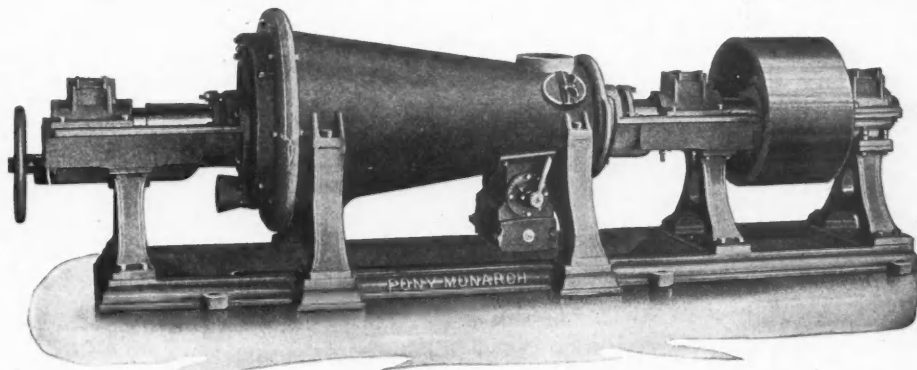
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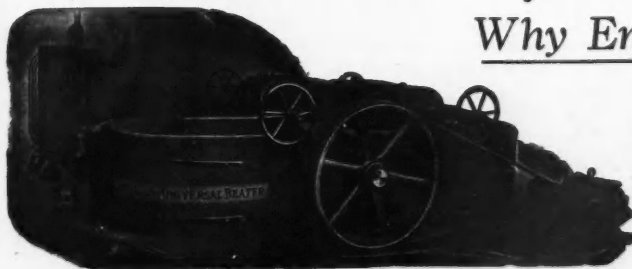


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ADDING MACHINE ROLLS. Paper Manufacturing Co. 61	CLAY. Atterbury Bros. Front Cover John W. Higman Co. 59 Paper Makers Chemical Co. 59 Western Paper Makers Chemical Co. 59 Star Clay Company 80	FURNACES (Automatic). Murphy Iron Works 72
AGALITE. Union Talc Co. 61 U. S. Talc Co. 61	COAL MINING. Empire Coal Mining Co. —	GAUGES (Pressure, Indicating and Recording). Bristol Co., The — The Foxboro Co., Inc. 73 Manning Gauge Co., Inc. —
ALUM. The Kalbfleisch Corp. 7 Pennsylvania Salt Mfg. Co. 80 Superior Chemical Co. 2 Winkler Bros., Inc. 57	COGS. N. P. Bowsher Co. 80	GUMMING AND GLUING MACHINERY. Potdevin Machine Co. 39
ARCHITECTS AND ENGINEERS. John F. Carrigan 72 George F. Drew 72 Hardy S. Ferguson 72 William T. Field 72 George F. Hardy 72 Herbert S. Kimball 72 Management Engineering and Development Co. 73 H. B. Prather 72 V. D. Simons 72 F. L. Smith 73 Stebbins Engineering Co. 72 Thomas L. Tomlines & Son 72 Vitale & Rothery 72 Joseph H. Wallace & Co. 72	COMPRESSORS (Air). The Nash Engineering Co. 39	HEATERS. Gordon Co., Inc., Robert 9
ASBESTINE PULP. International Pulp Co. Front Cover	CORDAGE. Columbian Rope Co. —	KNIVES, ETC. Bolton & Son, J. W. 9 Dowd Knife Works — Machinery Co. of America —
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BEATING ENGINES. Beloit Iron Works 29 Clafin Engineering Co. 71 Dayton Beater & Hoist Co. 75 Dillon Machine Co. 75 Dilts Machine Works, Inc. 59 Downington Mfg. Co. 78 Emerson Mfg. Co. 59 Mills Machine Co. 75 Noble & Wood Machine Co. 75 Valley Iron Works Co. —	DIE CUTTERS. Hogson & Pettis Mfg. Co. 2 Independent Die Co., Inc. —	MILL COGS. N. P. Bowsher & Co. 80
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BOILERS. Heine Boiler Co. 74	DRYER EXHAUSTS. The Nash Engineering Co. 39	PACKING. Jenkins Bros. 67
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CARBON TOOLS. Thomas L. Dickinson 73	DYE STUFFS. E. I. Du Pont de Nemours & Co. —	PAPER BAG MANUFACTURERS. Consolidated Paper Bag Co. 65 Lawrence Bag Co. 27 Schorsch & Co. 67
CASEIN. Casein Mfg. Co. 3	ELECTRIC HOISTS. Shepard Electric Crane & Hoist Co. —	PAPER BOX BOARDS. C. L. Boiteaux Co. 12
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	FELTS AND JACKETS. Albany Felt Co. 8 Appleton Woolen Mills 74 Draper Bros. Co. 74 Fitchburg Duck Mills — F. C. Huyck & Son 11 Knox Woolen Co. 3 Lockport Felt Co. 59 Orr Felt and Blanket Co. 55 Shuler, Benninghofen Co. — Waterbury Felt Co. 4 Waterbury & Sons Co., H. 73	PAPER EXPORTERS. A. M. Capen's Sons, Inc. 80 Hudson Trading Co. 2 Parsons Trading Co. Front Cover
	FILTERING SYSTEMS. Norwood Engineering Co. 61	PAPER MANUFACTURERS. American Coating Mills 5 Bayless Mfg. Co. 4 Becker Paper Corporation — Brown Company 5 Collins Mfg. Co. 12 Diamond State Fiber Co. Front Cover Eaton-Dikeman Co. 71 Fort Howard Paper Co. 5 Franklin Paper Co. — Hammermill Paper Co. — Howard Paper Co. 55 Missisquoi Pulp & Paper Co. 3 Mountain Mill Paper Co. 6 Nuera Paper Company 7 Poland Paper Co. — Sherman Paper Co. 61 Stratford Paper Co. 77 Wausau Sulphate Fibre Co. 5 West Virginia Pulp & Paper Co. 5
	FLOOR COVERINGS. L. Sonneborn & Sons —	
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	FOURDRINIER WIRES. Appleton Wire Works 80 Buchanan Bolt & Wire Co. 76 Cable Excelsior Wire Mfg. Co. 80 Cheney, Bigelow Wire Works 78 Eastwood Wire Mfg. Co. 80 Thomas E. Gleeson 57 Lindsay Wire Works — Joseph O. O'Neill Wire Works 57 The W. S. Tyler Company 57	

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PAPER AND PULP MACHINERY.	PUMPS.	SULPHITE BLEACHED AND UNBLEACHED.
Page Bagley & Sewell Co. 78 Baker Mfg. Co. 29 Beloit Iron Works 31 Bird Machine Co. 11 Black-Clawson Co. 69 Clark-Aiken Co. 78 Frank H. Davis 70 Newtown Mfg. Co. 35 Glens Falls Machine Works 35 Improved Machinery Co. 69 Mills Machine Co. 10 Sandy Hill Iron & Brass Co. 71 Shartle Bros. Machine Co. 8 Smith & Winchester Mfg. Co. Valley Iron Works Waterville Iron Works	Page Frederick Iron & Steel Co. 2 Hayton Pump & Blower Co. 6 PUMPS (Vacuum). The Nash Engineering Company 39 PRESSURE BULKERS. B. F. Perkins & Sons, Inc. 11 RAG CUTTERS. B. F. Perkins & Sons, Inc. 11 Taylor-Stiles & Co. REAM CUTTERS. Geo. T. McLaughlin Co. RECORDING INSTRUMENTS. Bristol Company 73 Foxboro Co., Inc. 73 REGISTERS. Standard Register Co. ROSIN. Hercules Powder Co. 67 ROSIN SIZE. Arabol Mfg. Co. 57 Paper Makers Chemical Co. 59 Western Paper Makers Chemical Co. ROTARY BLEACHING BOILERS. Biggs Boiler Works Co. RUBBER ROLLS. American Wringer Co. 6 SAVE ALL. Bird Machine Co. 31 SATIN WHITE. Paper Makers Chemical Co. 59 Western Paper Makers Chemical Co. 59 SCALES (Paper). Fred Baker E. J. Cady & Co. Foreign Paper Mills, Inc. 3 SCREENS. Bird Machine Co. 31 Central Mfg. Co. Wm. A. Hardy & Sons Co. 55 Union Screen Plate Co. 77 SHREDDERS (Pulp and Paper). Gruendler Patent Crusher & Pulverizer Co. SKYLIGHTS. E. Van Noorden & Co. 57 SLASHERS. Ryther & Pringle Co. SLITTERS AND REWINDERS. C. Renninghofen & Sons 73 Cameron Machine Works 61 Dietz Machine Works 10 Samuel M. Langston Co. 61 SPLICING TISSUE. Sergeant Co., E. M. 57 STEAM SPECIALTIES. Crane Co. 61 Open Coil Heater & Purifier Co. STITCHING MACHINERY. Saranac Machine Co.	Page J. Anderson & Co. 4 The Borregaard Co., Inc. Brown Company 5 Butterworth & Co., Inc., E. Front Cover Canadian Robert Dollar Co. 35 Craig-Becker Co., Inc. 38 Eastern Manufacturing Co. 35 Mead Sales Co., The Parsons Pulp & Lumber Co. 65 Price & Pierce, Ltd Front Cover Pulp & Paper Trading Co. 4 SULPHUR. Texas Gulf Sulphur Co. 6 Union Sulphur Co. 74 TANKS. W. E. Caldwell Co. 9 New England Tank & Tower Co. 74 Stearns Lumber Co. 61 TIMBER ESTIMATES. R. R. Bradley 72 P. H. Collidge 73 James W. Sewall 72 TRANSMISSION MACHINERY. H. W. Caldwell & Sons Co. 71 Reeves Pulley Co. TURBINES. S. Morgan Smith Co. TURPENTINE. Hercules Powder Co. TWINES. American Manufacturing Co. 42 VALVES. Crane Co. 61 Jenkins Bros. 67 VAPOR ABSORPTION SYSTEMS. J. O. Ross Engineering Co. VENTILATING FANS. B. F. Perkins & Sons, Inc. 11 Ross Engineering Co. VEGETABLE PARCHMENT PAPERS. Kalamazoo Vegetable Parchment Co. 53 WAXED PAPERS. Dragon Paper Mfg. Co. 42 WOOD FLOUR. Union Wood Flour Co. 61 Wood Grinders Wood Grinding Service, Inc. 13 WOOD PULP IMPORTERS. American Wood Pulp Corp. 4 J. Anderson & Co. 4 Ira L. Beebe & Co. 74 The Borregaard Co., Inc. M. Gottesman & Co. 33 Hammond, R. F. Front Cover E. J. Keller Co. 12 Lagerloef Trading Co. 14 and Front Cover Mead Sales Co., The Nilson, Rantoul & Co., Inc. 37 A. J. Pagel & Co., Inc. 25 J. F. Patton & Co., Inc. 53 Perkins-Goodwin Co. 37 Scandinavian-American Trading Co. 12

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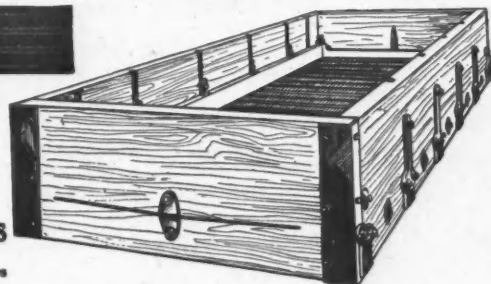
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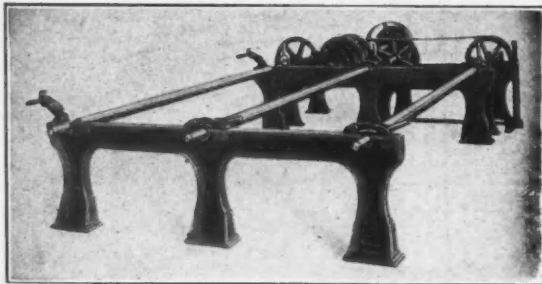
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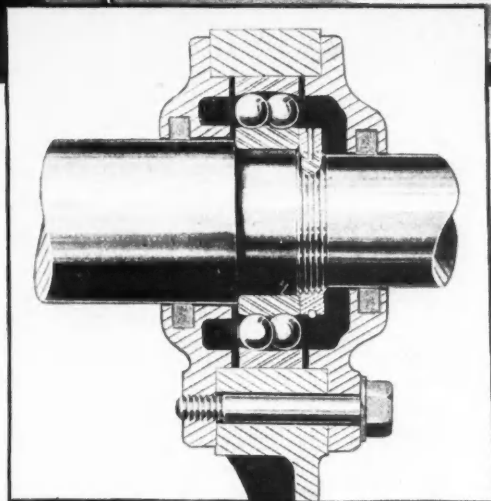
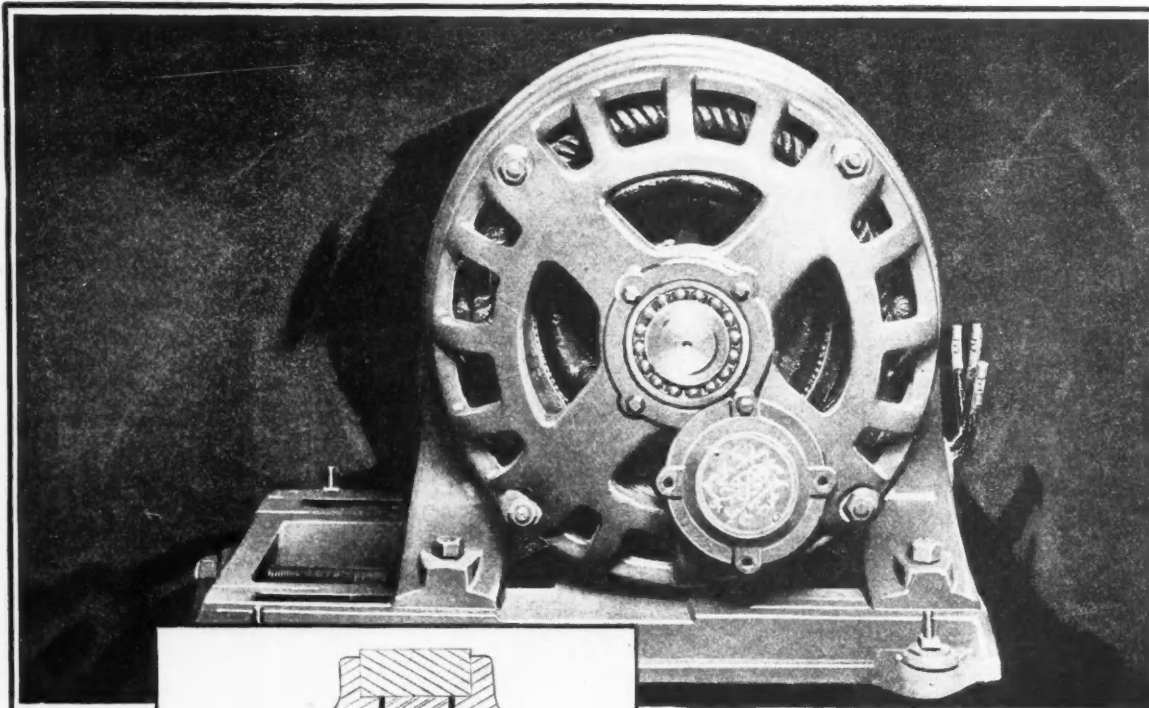
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