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THE Hartsfeld Furnace and Refining Company is issuing circulars which are intended to give the impression that they answer charges made in the ENGINEERING AND MINING JOURNAL, April 5th, under the title, "Schmiedbarenguss." We shall reply more fully in an early issue to this latest advertising dodge of CHAS. L. HARTSFELD. We see no reason to modify, unless it be to intensify, the unfavorable opinion we then expressed concerning this man and his enterprises in these pages.

A CURIOUS illustration of how "extremes meet" is shown in the proposed McKinley tariff bill now before Congress. The ultra protectionist "beneficiaries," and the ultra free traders are equally in favor of its passage, the one to enjoy the profits it will bring them, the other because they think its passage the best means of securing "free trade." The moderate protectionists and tariff reformers are those who in the interest of our manufacturing industries, and in the preservation of a necessary moderate protection, protest against the measure and desire its withdrawal or defeat.

THE PROGRAMME of the meetings and excursions of the British Iron and Steel Institute in October next, given on another page, will remind our American engineers and iron masters of the opportunity to show the distinguished visitors American hospitality. Undoubtedly this visit will have important consequences, and will be followed by closer and more and more friendly relations between the countries, and by still greater investments of British capital in this country. We hope also that the better knowledge these visitors will get of our people and country will show them the rocks on which so many British investments have been wrecked, and the means of avoiding them. Americans will vie with each other in giving a cordial welcome to the visitors, and in affording them reliable information concerning the resources and prospects of this country.

THE PROPOSED SILVER BILL.

To-day the vote is to be taken in the House of Representatives on the proposed silver bill as reported by the Republican caucus. This bill may be changed in the Senate as well as in the House, so that it is far from being passed. As it at present stands it calls for the purchase of \$4,500,000 worth of silver each month, at not above \$1 for 371½ grains, or the present coining ratio of 16 to 1, the notes issued for these purchases to be legal tender except where contracts specify otherwise, and to be redeemable in "coin;" but on the request of the holder the Treasurer may, in his discretion, redeem in silver bullion at its market value.

The Treasury shall coin such portion of the silver bullion purchased as may be necessary to provide for the redemption of these Treasury notes.

Whenever the market price of silver is \$1 for 371½ grains, any owner of silver may deposit bullion and have it coined by the Government into standard silver dollars for his benefit.

This bill, though better than some which have been proposed, is yet a dangerous one, chiefly in that it requires the Government to buy so much silver that the price must quickly reach the maximum limit allowed, and it then allows anyone to convert silver into standard silver dollars, which may be exchanged into gold until the Government has no more gold. Then, of course, while silver and gold will here have the nominal ratio of 16 to 1, and the Government is still obliged to buy at that nominal ratio, in reality we will have only silver and we will be at the mercy of the countries having the gold. We will be in the position of India, not of France or the Latin Union.

An exchange publishes the following letter from Munich to show how Germany looks upon our silver policy:

Germans have long feared the repeal of the Bland Bill and the embarrassment that it would cause to the German Treasury, which is a large holder of silver. Now their hope is that Germany may be able to use this chance to unload without too great a loss, so that with her gold standard firmly established she may be able to fish to advantage in the troubled waters of the silver countries. Now, less than ever, will Germany or England make any sacrifices for bimetallism. Why should they, when there is hope that another nation will broaden its back to bear all the common burden?

THE SOUTHERN BOOM.

A wonderful industrial development is in progress in the Southern States, especially in Virginia, Tennessee, Georgia and Alabama. New cities are being laid out with a rapidity which was never surpassed in the West, and factories of all kinds are being built, or at least projected, by the hundreds. We have no desire to delay the progress of this development, for the faster the South is built up, and the richer it becomes, the better it will be for the whole country; but we would like to curb, if we could, the exuberant imaginations of some of the newspaper writers who are exaggerating, beyond all reason, the facts upon which the "boom" is based. Here is a sample taken from the *Manufacturers' Record*, of Baltimore:

"The greatest industrial revolution which the world has ever seen has begun. This country has entered upon an era in which changes, fraught with tremendous consequences, are to occur. The center of industrial life is to be transferred from New England and Pennsylvania to the South. The controlling forces in all lines of manufacturing are gathering in the South, and not only will this section dominate these interests in America, but it is the South which will yet meet Great Britain itself in the final struggle for the mastery of the world's iron and cotton industries, and the South will win."

When the center of industrial life is transferred from New England and Pennsylvania to the South, and when Great Britain shall have succumbed in the final struggle for the mastery of the world's cotton and iron industries, what are the Yankees and the British to do for a living? Must they all leave their homes and emigrate to Cumberland Gap? And if the whole world buys its iron and its cotton from Tennessee, what can it give in exchange? For Tennessee and Alabama, according to recent glowing reports, can produce timber and wool, and glass, and tobacco, and food of all kinds, and everything that man can desire—except precious stones, and possibly tea, coffee and spices—cheaper than any other part of the world. It will have everything then to sell to the "markets of the world," but will not need to buy anything from them in exchange.

It is a curious feature of the majority of newspaper articles concerning the development of the South that they all seem to look forward

to beating the North or some other part of the world, and obtaining control of foreign markets. Not satisfied with building up the South itself, making a self-supporting population, raising all the food and making all the manufactured goods it needs for its own uses, it desires to sell its pig iron in New York, and its manufactured cotton goods in Boston and Liverpool. A study of industrial statistics of different parts of the world would show that this hope is utterly fallacious. The tendency of the times is not towards the destruction of existing centers of industry and their transfer to other points, which become controlling centers, but rather to a distribution of the manufacturing industry over a wider range, over the whole world. Existing centers continue to live, and grow while others develop. England continues to increase in iron and steel production, while the United States and Germany increase more rapidly, but no country in the world shows an actual decrease in iron and steel production during the last 10 years. Pennsylvania's iron and steel production during last year increased more than that of the whole nine Southern states put together, notwithstanding the increased pig iron product of the South and the increased steel product of Chicago. England's supremacy in iron manufacture is becoming a thing of the past, the United States being now almost her equal, but no country is likely ever to gain a like supremacy in the future, for the production will be more uniformly distributed over the world. England's insular position, her low-priced capital and labor, her stores of coal, producing coke equal to the best in Virginia, her yet unexhausted ore beds, and her ownership of vast mines in Spain, will long continue to give England an advantage over the United States in the cheap production of iron for foreign markets. There is no reason to believe that the South will ever compete with England in iron for foreign markets, unless England's stores become exhausted, or much better and more accessible deposits of ore are found in the South than those now opened. So in regard to taking the iron trade of the North. As long as Pittsburgh can get the Connellsville coke and the Lake Superior ores, so long will she continue to make Bessemer iron and steel cheaper than the South can deliver it into Pittsburgh. While Chicago retains her present ore and coke supplies she will continue to make steel rails, no matter how much the Southern steel industry may grow.

The future of the South is a grand one; possibly far beyond even the imaginations of its newspaper "boomers;" but it does not lie in the direction of controlling the "markets of the world." It does lie in the direction of building up a dense and prosperous population, which shall make use of the advantages with which nature has favored the country. With fertile soil, a magnificent climate, and vast mineral wealth, there is no reason why, on the whole southern portion of the Appalachian range, there should not exist as numerous and as wealthy a population as is found in Pennsylvania. Such a people will utilize all their resources, both agricultural and mineral, and will grow rich by producing wealth out of their own soil, not by foreign commerce. There will be no final struggle for the mastery of the world's cotton and iron industries, and the South will not win in any such struggle, but she will make her share of the cotton and iron of the world, and let other parts of the world make their share. This is surely more to be desired than commercial war, in which the victor only reaches victory through sacrifices equal almost to those of the vanquished. It is more to be desired, even by the South, that the center of industrial life should be divided and spread all over this country, as it will be, than that it should be transferred from New England and Pennsylvania to the South.

THE CENSUS OF GOLD AND SILVER MINES.

The collection of statistics of the gold and silver mines of the United States is now being pushed as rapidly as is possible under the peculiar difficulties connected with the work and the very limited amount of money appropriated by the government for this branch of the census. More than ten thousand blank schedules have been mailed to the mines whose addresses could be obtained, and returns are now being received at a rate which increases from day to day and promises already to furnish data for a more complete and accurate report of the mines than has ever before been made.

In the census of 1880 a large appropriation was made for the statistics of mines of the precious metals, and a very extensive and elaborate programme was mapped out for the collection of the same. A great number of traveling experts were employed to visit the mines, and the schedule blanks were made to include a vast amount of details which were outside of purely statistical information, such as geological and topographical data of the mines and mining districts, and technical descriptions of the character and extent of veins, lodes, mines, mills, smelting works, and reduction processes. The great extent of country to be covered, the difficulty of access to thousands of mines far removed from railroad lines, and the complexity of the information asked for in the schedule, made the task too great even for the large force of men employed and the liberal appropriation, and the final result was, therefore, exceedingly imperfect and unsatisfactory.

At the outset, the method of collecting statistics by sending blank schedules by mail was disapproved, as it was supposed to be impossible to get the schedules filled out and returned by the mine owners, and it is probable that if this method had been attempted, it would have resulted in failure, simply because the schedules themselves were so formidable in extent that but few mine owners could be expected to fill them out with any approach to accuracy or completeness.

In the census of 1890 the first limitation to the facilities for obtaining statistics of a now vastly greater industry was made in reducing the appropriation to a small fraction of that allowed in 1880, and in shortening the time limit for the completion of the work. This made it impossible to attempt the collection of all the statistics by traveling experts, and the method of collecting in part by mail was therefore adopted as a necessity.

In order to facilitate the work, the schedules for 1890 were made much more simple than those of 1880. All technical questions were stricken out, and none were asked which were not strictly statistical and necessary to make a correct comparison between the gold and silver mining industry and the mining industry of other kinds, such as coal and iron, and the other industries of the country, such as agricultural, manufacturing and commercial.

The following are the questions asked in the schedules:

Location.—Name of mine or works; location of same; name and post-office address of company, corporation, or individual operating the mine or works; also address of resident agent.

Product.—Total amount of ore produced in the year 1889 (tons of —; pounds —); total amount of ore sold or treated in 1889 (tons of, —; pounds, —); total assay value of ore sold or treated in 1889, \$—; gold, \$—; silver, \$—; where and by what process was the ore treated? bullion produced from ore treated in 1889; quantity in ounces; value, \$—; gold; silver; copper; lead; other metals.

Labor and Wages.—Average number employed; average wages per day; average number of days' work made by each class during the year.

Above ground (not including office force).—Foremen or overseers; mechanics; laborers; boys under sixteen.

Below ground (not including office force).—Foremen or overseers; miners, laborers, boys under sixteen; number of days during the year when mines were idle, and the cause.

Expenditures.—Total wages paid: total amount of wages paid during 1889; total amount paid to contractors for contract work done in 1889, not included in the above item, deducting supplies charged to them; office force at mines or works: males, females, number and wages paid; total value of supplies and materials of all kinds consumed during the year 1889; total of all other expenditures for the mines or works (including amounts paid for rent, taxes, insurance, interest, etc.); grand total of expenditures.

Value of Mining Property.—Total present actual cash value of the mine and mining plant, distributed as follows: present actual cash value of buildings at mine; present actual cash value of railroads on surface; present actual cash value of machinery of all kinds above and below ground, including pumps, engines, boilers, cars, tools, etc.; present actual cash value of underground improvements, including shafts, tunnels, drifts, tramways, etc.; present actual cash value of mine supplies of all kinds on hand December 31st, 1889; present actual cash value of the mine itself exclusive of above items; cash not reported in the foregoing items. Value of mill, smelting or other reduction works (exclusive of mining property): state character of works, whether concentrating, amalgamating, chlorinating, smelting, or other works. Present actual cash value of buildings; present actual cash value of machinery and plant of all kinds, except buildings; present actual cash value of supplies on hand December 31st, 1889; total cash value of works.

Power used in Mining.—Number and total horse power of steam boilers; number and size of cylinders of steam engines; if other power, state kind; number and horse power of motors; number of animals employed.

There need be no difficulty in filling out this schedule completely for any mines in which book accounts are kept, which includes all the important mines, producing probably 90 per cent. of the total gold and silver mined in the country, and in those smaller mines, of which there are many thousands, producing the other 10 per cent., a near enough approximation can be made, so that the total error of the statistics of all the mines will not be important.

If every mine owner would promptly fill out these schedules to the best of his ability and return them to the special agent, a very accurate and complete report would be made and published early in the fall of this year, and there is no reason why a very satisfactory report cannot be made, except for the difficulty of finding the owners or managers of all the mines, and the delay, negligence, or unwillingness of some mine owners in returning the schedules.

The work of obtaining the addresses of owners and agents of mines has taken the whole time of several clerks for the past six months. The lists of mines of several States, published in various printed reports, have been found exceedingly inaccurate. Thousands of schedules have been re-

turned by postmasters with the endorsement on the envelope: "No such mine or person known here;" others with the statement that the "mine was permanently abandoned many years ago," and others with the information that the mine has changed its name or its owners. From all available sources of information a list of about 5,000 mines was compiled in the month of March, and sections of this list were sent to newspaper editors, postmasters, county officials and others, in the several mining districts, with requests to check up the lists and report errors and corrections. Blanks for filling in lists of mines were also sent to individual mine owners with similar requests. By this means the list of mines has been more than doubled already, and returns of corrected lists are still received daily. As a sample of how inaccurate the old lists were found, a list of a dozen mines would be sent to a postmaster or mining engineer, and it would be returned with ten of the names scratched out as abandoned or changed in name or ownership, and a new list would be sent made up of new mines amounting to more than double the original number. The work of collecting names and addresses is still in progress.

On account of the inaccuracy of the lists of mines, it is highly probable that the owners or superintendents of many existing mines have not yet received copies of the schedule. If any such will send a postal card to the special agent, stating the fact of non-receipt of the schedule blank, one will be sent by return of mail.

Editors of newspapers in mining districts will do their district a service and confer a favor on the special agent if they will urge upon their readers the importance of having their mines and production fully reported. To those who have received schedule blanks and who have not yet returned them, the special agent makes an urgent request that they act promptly in filling out and mailing the schedules to him. By so doing they will contribute to the value of the census report and benefit the district in which the mine is situated.

The information received is used only in making aggregates, and therefore cannot possibly embarrass or injure the party giving it. It is, however, evidently greatly to the interest of every one engaged in the mining industry to have his district fully represented, and we especially call upon the newspapers in the several mining districts to urge upon every mine owner or manager the great importance of giving correct, full and prompt replies to the census schedule questions which are enumerated above.

A record is kept of every blank schedule sent out, and it is the intention to follow up each one which is not returned either by the mine owner or superintendent or by the postmaster as "not found." Postmasters are bound to return all mail matter which they cannot deliver to the parties to whom it is addressed, so that schedules not returned by the postmasters have presumably been delivered by them, and those delivered and not returned will be traced through sub-agents, correspondents, and census enumerators in each district. No pains will be spared to get the schedules properly filled out and returned, and the law provides severe penalties for those who decline to furnish the information called for.

The collection of the statistics by mail, though already far more successful than under the census of 1880, still requires much work by local agents who supplement and verify the returns obtained by correspondence. The thanks of the special agent are due to thousands of persons, postmasters, editors, engineers and others, who have furnished information of value, and he begs that each will make further efforts to render the record of the great industry of gold and silver mining in the census report full and creditable. All communications should be addressed to R. P. ROTHWELL, special agent, 27 Park Place, New York.

NEW PUBLICATIONS.

CYCLOPEDIA OF THE MANUFACTURES AND PRODUCTS OF THE UNITED STATES.

Something of a novelty in commercial literature is "Seeger & Guernsey's Cyclopædia of the Manufacture and Products of the United States." A book of over 1,100 pages, which though nominally not a directory is yet scarcely a "cyclopædia." Its aim, primarily, is to publish for the information of buyers and shippers a selected list of the leading manufacturers of the United States, and secondly, a list of the articles they manufacture, and which are produced in this country. In both departments the work has been done in a careful and conservative spirit. The names of manufacturers have been selected for their high standing in the commercial world, and the number of manufacturers of each article has been regulated by the relative importance of the article in the market. In this connection the cyclopædia will prove invaluable to buyers seeking information concerning particular branches of trade. The finest distinctions are made in the various divisions of manufactures, so that a buyer may easily select those who make specialties of the particular article sought.

This promises to be a highly successful and popular work. The list of articles manufactured in the United States is perhaps the most complete ever published, occupying 174 double-column pages and enumerating nearly 12,000 articles. These are divided into forty-five departments, while the list for machinery and tools has ten divisions or sub-departments.

Among other valuable information contained in this useful book is a comprehensive list of all trade papers published in the United States, which will be of service to advertisers and those desiring information concerning particular localities and industries.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.]

A Course in Determinative Mineralogy, by John Eyerman. Published by the author, Easton Pa., 1890. Pages, 19. Price, \$1.

Bilder von den Kupferkies-Lagerstätten bei Kitzbühl und den Schwefel Lagerstätten bei Swoszowice. Nach der Natur Aufgenommen von den k. k. Bergbeamten. Edited by F. M. Ritter von Friese. Published by the Minister of Agriculture, Julius Grafen Falkenhayn, Vienna, Austria, 1890. Illustrated.

Cyclopædia of the Manufactures and Products of the United States. Published by the Seeger & Guernsey Company, New York, 1890. Pages 855. Price, \$5.00.

Electricity in Modern Life. By G. W. de Tunzelmann, B. Sc. Published by Scribner & Welford, New York. 1890. Pages 272. Price \$1.25. Illustrated.

The Michigan Engineers' Annual, containing the Proceedings of the Michigan Engineering Societies for 1889. Published by F. Hodgman, Climax, Mich. Pages 184. Price, 50 cents.

GEMS AND PRECIOUS STONES.

From the review of *Public Opinion*, of Washington, in this week's issue on "Gems and Precious Stones" we take the following: "Considering how large a part of the reading public are themselves the possessors of some kind or kinds of gems or precious stones, either in the form of jewels or otherwise, it is really surprising how small a proportion of this number are able to identify even a few of the most common kinds in their natural mode of occurrence or in the dressed and commercial forms. Such common ignorance cannot be due to any lack of works on mineralogy. We have mineralogies in abundance, works written by Americans and published all the way from the first quarter of the century. That people are not educated to a knowledge of the ornaments with which we nearly all of us have more or less to do can be and is readily explained by the joint facts that it is seldom that it is taught in the public schools and that there has hitherto been no available popular illustrated work on the subject. In his travels and researches about the country, as well as in his experience as gem expert for Tiffany, Mr. Kunz must have been deeply impressed with the want of knowledge among unscientific people. It is especially for readers in general that this magnificent book is written and adapted to accomplish the greatest and widest good. The title in full is, 'Gems and Precious Stones of North America: a Popular Description of Their Occurrence, Value, History, Archæology, and of the Collections in Which They Exist; also, a chapter on Pearls and on Remarkable Foreign Gems Owned in the United States, published by the Scientific Publishing Company, New York.' Mr. Kunz's connection with the Bureau of Mineral Statistics, his relations with the geological surveys of the United States and Canada, combined with his long acquaintance with the commercial technique, have put him in possession of the vast store of information from which the present volume is taken and made him fully competent to perform the task.

"The present work is not written for scientists, and should not be criticised from the scientific standpoint. The descriptions are written so as to be understood by the average intelligent reader, though sufficiently complete to enable one to make all the tests necessary for their absolute identification. The most technical part is the chemical analyses, and these are, of course, indispensable. Following the general description of each gem or stone is given an account of its distribution in our continent, the history and methods of its exploitation, with statements of the amount and value of the product, and descriptions of the most remarkable specimens.

"While the work has a decided value to the mineralogist, geologist and connoisseur, it will be most practically useful to the jeweler, miner and prospector, as well as to all who have anything to do with precious stones or are liable to meet imitations or wrongly-labeled specimens. The book is in itself a work of art. Not only is it gotten up in luxurious styles of material and typography, and illustrated by numerous engravings, but it is further embellished with eight colored plates of gems and stones, cut and uncut, such as has never before been published in this country. It could hardly have been believed that such conscientious and real representations of the varied and beautiful reflections and refractions which such gems as sapphire, garnet, ruby, topaz and tourmaline exhibit could be printed on paper as are these well-nigh perfect ones prepared by Prang & Company."

Export Associations.—Consul David V. Burke, writing from Bahia, Brazil, urges energetic American action in stirring terms. He states that he is in receipt of frequent letters of inquiry from American manufacturers as to how South American trade can be secured. After stating that it is absolutely a waste of time and effort to send catalogues, price lists and circulars printed in English among a Portuguese-speaking people, he concludes his letter with the following practical suggestions:

"Let the manufacturers form an association for establishing houses in Bahia, Rio de Janeiro, and Pernambuco. In these houses let samples of their manufactured products be placed. Let the association put in charge of each house a thoroughly competent man, with a good salary, who understands well the Portuguese language. This done, the Portuguese or Brazilian merchant, instead of looking at a circular, a cut, or a notice of the article, can see the article itself. The manager, being established here for the purpose of trade, can keep the general manager of the association in New York informed of the requirements of the trade, the terms of credit to be given, how to put up this article, how to pack that—in short, can keep him informed of just what to do and how to do it, in order to capture the trade. Steamships should be built that will not occupy more than sixteen days between New York and Bahia or 18 or 19 days between New York and Rio de Janeiro. There should then be laid a direct cable between New York and Brazil. Banks and other things required would follow.

London International Exhibition of Mining and Metallurgy.—At the request of the Government of New South Wales, transmitted by cable, the executive council of the London International Exhibition of Mining and Metallurgy have decided to postpone the opening of the Exhibition until July 16 next.

SIR FREDERICK AUGUSTUS ABEL.

It is with great pleasure that we are able to present the readers of the ENGINEERING AND MINING JOURNAL with a likeness of that distinguished scientist whose reputation as an authority on explosives is world wide, and whose work on "Mining Accidents and their Prevention" has recently been published by the Scientific Publishing Company.

Abel was born in London in 1827, and received his earliest instruction at home. He was one of the earliest to enter the college of chemistry in London, and in 1846 was the first pupil chosen by Professor Hofman to be junior teacher and lecture-assistant. Subsequently he assisted Hofman in his brilliant series of researches in the aniline derivatives that gave to the world the coal tar colors.

In 1849 he began a course of instruction in practical chemistry for the officers in the Royal Artillery and the senior cadets in the Royal Military Academy in Woolwich; and on the retirement of Faraday in 1852 from the chair of chemistry at the Royal Military Academy, Abel was chosen to fill the vacancy.

In this capacity his advice was frequently sought by the officials in charge of the government works at the various military depots concerning the production of war material, when the experiences of the Crimean war showed the importance of constant scientific advice and assistance in maintaining an effective supply of armaments, munitions and equipments. The place of "Ordnance Chemist" was created in 1854, and the organization of that office was entrusted to Abel. His successful performance of that duty led to his promotion to the position of still greater responsibilities as "chemist to the War Department," in which capacity he continued until 1888.

During his administration, reforms were effected in the system of supplying materials to the manufacturing establishments of war munitions, and improvements introduced in the construction of works and buildings whereby the proper standards of quality were established and maintained. Likewise the supply of food, clothing, illuminants, detergents and other materials furnished to the soldiers, was made the subject of proper tests as to quality.

In addition to the foregoing he was called upon to serve on a large number of special committees appointed by the war and other departments. It was in reply to a request of such a character that he instituted those researches, concerning the safe employment of petroleum, out of which grew the present elaborate system of testing petroleum and mineral oils and the establishment of the "Abel Test" as the legal requirement in England and other countries.

He was also a member of the Royal Commissions on the preservation of the stone of the Houses of Parliament, on the causes of explosions and spontaneous combustions in coal-laden ships, on noxious vapors, and on accidents in mines. His experiments in connection with the latter, extending over several years, and bearing on the relative merits of different safety lamps and on the part played by coaldust in mine explosions, are embodied in his latest published book, "Mining Accidents and their Prevention."

In 1888 he was relieved of the duties of chemist to the Department and was appointed president of a special government Committee on Explosives, in which capacity he is at present engaged in directing important work in connection with the application of smokeless explosives.

He has held the presidency of the London Chemical Society, the Institute of Chemistry, the Society of Chemical Industry, and the Institute of Electrical Engineers, and, in addition to membership in other scientific societies both at home and abroad, he has been vice-president of the Royal Society. Last year he was chosen president of the British Association for the Advancement of Science, and will preside at its forthcoming meeting to be held at Leeds.

The Companionship of the Order of the Bath was conferred upon him in 1877, and 1883 he was knighted. The honorary degrees of D. C. L. and D. Sc. have been conferred upon him by the Universities of Oxford and Cambridge respectively.

It has been well said that "the labors of Sir Frederick Abel have been of immense value to his country," and his careful attention to detail in all his researches and multifarious duties has contributed to the perfecting of the great military and naval establishments of Great Britain.

High Water Pressure.—France claims the honor of utilizing a higher water pressure than that recently put in operation in the Chollar shaft on the Comstock lode, in Nevada. At Brignoud, two kilometers from the valley of Gresivaudad, near Grenoble, a turbine 9 feet 10 inches in diameter, was put in operation in the year 1875, utilizing a head of 1,638 feet. It is still working, and gives a force of 1,500 horse power with a flow of 300 liters of water a second.

RUBY MINING IN BURMAH.

Sir Lepel Griffin's recent visit to the Burmah ruby mines has inspired considerable interest, on account of his description of the different modes of working them, especially as he is understood to have declared that, in his opinion, the expensive and elaborate hydraulic methods are unsuited to them. It will serve a useful purpose to describe the modes of working these mines before the present company acquired them, and fortunately for this purpose there exists the authentic and copious information based on official surveys and reports. The Indian Government on annexing Upper Burmah was naturally extremely anxious to ascertain the precise value of the ruby mines, which had formed a considerable portion of the revenue of the kings of Ava and Mandalay, and accordingly made elaborate surveys.

The ruby mines, as at present defined, may be considered as limited to the four valleys of Mogok, Say Boo, Kathey and Kyatpyen, and although they cover a nominal extent of 50 square miles (10×5) the well defined areas where ruby mines are known to have been actually worked are included in a total space of less than five square miles. The remaining space, although not worked in the past, is considered likely to prove not less prolific of rubies than that part which has been already explored by the natives. Although they might be further subdivided, there were

two principal methods of native mining—one adapted to the plains and the other to the hillsides. In the former the byon, or ruby earth, lies at a depth of from 3 to 20 feet, and in the latter the operations of the natives have been restricted to the clay in the fissures of the rocks.

Fortunately, these mining operations can be carried on to the greatest advantage at different seasons of the year, the dry season being the most favorable for working the byon in the plain, and the wet, when water is more abundant, for acting on the lodes in the rocks. Working on the lodes can be carried on during the wet season with little or no interruption.

Experience has shown, strangely enough, that while common stones are abundant in the byon, the larger and more valuable have generally been discovered under greater engineering difficulties in the lodes. These have only been worked by the natives in the soft clay which fills up the fissures of the rocks, and one of the first suggestions made for the improved working of the mines was to establish a way, or working, through the rocks in proximity to some formerly productive fissure.

Should a profitable lode be reached it would be easy to sink the necessary shafts or to establish drifts. For these operations only the simplest appliances, in the shape of drills, jumpers and dynamite work by hand labor, are requisite. With sufficient water power, which is rarely deficient, compressed air machinery and diamond drills can be used. In one important point the native workmen were extremely deficient. They neither understood nor could they supply artificial ventilation, and a large number of mines have evidently been abandoned, not because they are exhausted, but because the miners were stopped by accumulations of carbonic acid or oxide gases.

In working the byon in the plain it is essential that the supply of water should be copious, continuous and well regulated. Under native management the supply was provided in open aqueducts, and these are, of course, antiquated, and will have to give place to wrought or cast iron pipes. On the supply of water depends the substitution of true hydraulic mining for the crude systems hitherto in use among the Burmese.

The success of the mining operations in the past has arisen from their simplicity, and probably it will not be very different in the future. In dealing with the byon in the valley very likely no method will work better, or prove more remunerative, than the removal of the crust of earth covering the byon, and then carrying the byon itself to the washing house, and this operation might be continued over successive plots until every inch of ruby bearing gravel had been extracted.

This mode of working the byon evidently applies to that which is nearest the surface. Much of the byon lies at a depth which can only be made accessible by regular mining operations; but it is desirable from every point of view that the productiveness of these mines should be made evident without avoidable delay.

Profits of the Suez Canal.—M. de Lesseps presided at the Suez Canal meeting at Paris on the 4th inst. The annual report announced that the profits for 1889 amounted to 37,212,925 francs. The net dividend was 85 francs per share. The receipts from the night traffic amounted to 71 per cent. of the total, against 46 per cent. in 1888. The average duration of transit has been diminished by four hours. The report asked a vote of confidence in the Council on the tariff question. Charles de Lesseps announced that the dividend for 1890 would be 91 francs, without rebate. The report was adopted by a vote of 1,244 to 200.



SIR FREDERICK AUGUSTUS ABEL.

PYROMETERS AND PYROMETRIC DATA.

Written for the Engineering and Mining Journal by Henry M. Howe.

Some important additions to our means of measuring high temperatures have lately been brought forward. For scientific purposes Le Chatelier's thermo-electric pyrometer, a platinum and platino-rhodium couple, is extremely convenient, and with its aid Osmond has reached results of great importance. For technical purposes Professor Seger's "normal" clay pyramids and Mesuré and Noel's pyrometric telescope should find extended application.

In Le Chatelier's arrangement* a couple is formed by welding together a wire of pure cast platinum and one of platinum containing 10 per cent. of rhodium. This couple is placed in the furnace or other hot place whose temperature is to be measured. The ends of the two wires are soldered to copper conductors, leading to a galvanometer with a mirror, whence a spot of light is thrown on a scale. As the temperature rises, the thermo-electric force developed by the platinum-platino-rhodium couple varies, swinging the mirror of the galvanometer, and causing the spot of light to travel along the scale.

The scale may be graduated, *i. e.*, the absolute temperatures corresponding to different deflections of the spot of light may be determined by means of a platinum or other ball by the method of mixtures: by heating the couple successively to the boiling points of different substances, such as water, chloride of ammonia, mercury, sulphur and selenium, and the melting points of others, such as sulphate of potash and gold, or otherwise.

The indications of this instrument are extremely rapid and continuous, as in the case of Siemens' electric pyrometer. The couple, placed in a furnace, may give continuous reports in the office at any distance, and these may be self-recording, or the temperatures of a number of furnaces may be learnt at the office at intervals by connecting one couple after another with the galvanometer.

Professor Seger uses a series of slender triangular fire-clay pyramids, about 3 inches high and 1/4 inch wide at the base, and each a little less fusible

raised, being higher in case of a rapid than in that of a slow rise of temperature.

As a method of determining the softening-point, Seger's pyrometer should be of greater value for ceramic than for metallurgical purposes, except in so far as the metallurgist cares to test his refractory materials.

The temperature of useful softness for a metallurgical slag is not that at which the apex of a pyramid made of it will bend over and touch the furnace hearth, but that at which it is so liquid that it separates from matte or metal readily by gravity; not that of incipient softening, but that of nearly complete liquidity. Now the difference between these points is not only very considerable, but very different for different silicates, far greater, for instance, for earthy and silicious than for ferruginous ones.

Mr. Paul Gredt† has lately determined the softening-points of 31 alumina-lime and alumina-lime-magnesia singulo-silicates, by means of Professor Seger's pyramids, and with surprisingly harmonious results, which are summed up in tables I. and II., and shown graphically in Figs. 1 and 2.

The determinations were made by heating pyramids of the several silicates, together with Seger's normal pyramids, in a porcelain kiln at the Royal Porcelain Works, near Berlin. These kilns are slowly heated up to a maximum temperature, which sometimes reaches 1,700 degrees C., each burning lasting a day. The temperature of the kilns is controlled by Seger's pyramids, and to that end a conical peep-hole is provided in one wall of each kiln. Thus Mr. Gredt had unusually favorable opportunities.

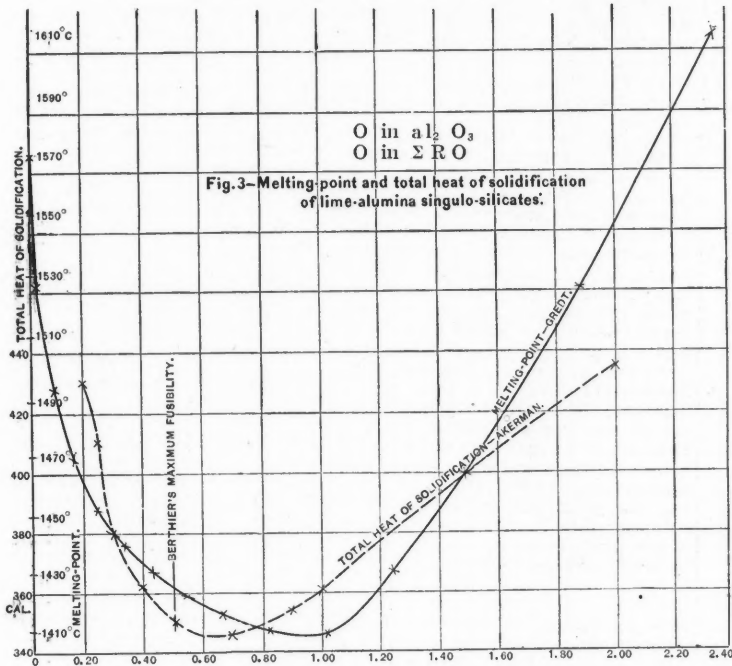


Fig. 3—Melting-point and total heat of solidification of lime-alumina singulo-silicates.

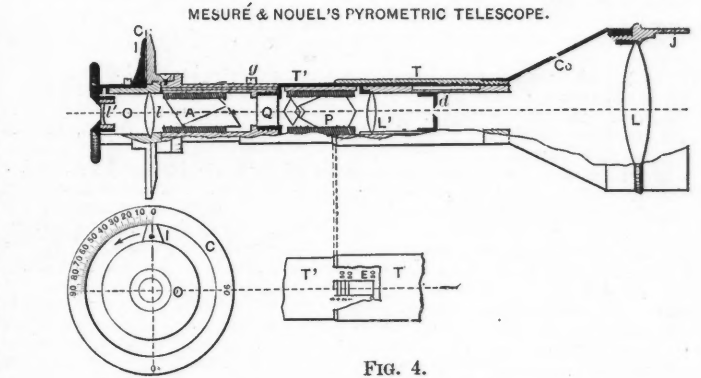
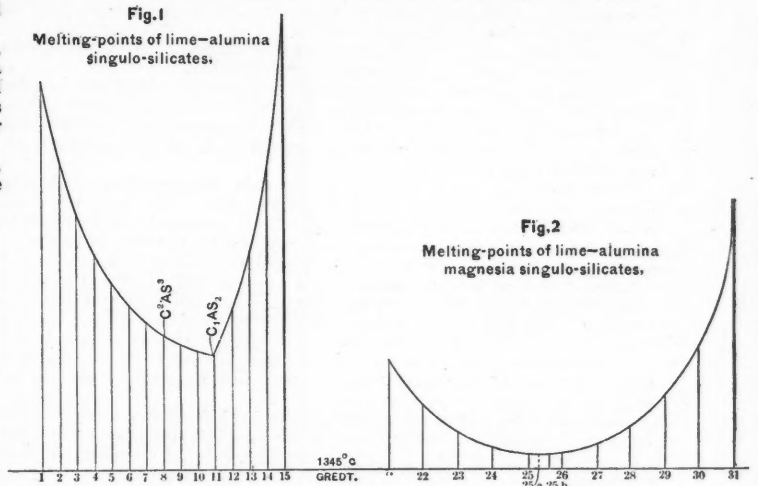


FIG. 4.

than the next; these he calls "normal pyramids" ("normal-kegel"). When the series is placed in a furnace whose temperature is gradually raised, one after another will bend over as its range of plasticity is reached; and the temperature at which it has bent, or "wept," so far that its apex touches the hearth of the furnace or other level surface on which it is standing, is selected as a point on Seger's scale. These points may be accurately determined by some absolute method, or they may merely serve to give comparative results. Unfortunately, these pyramids afford no indications when the temperature is stationary or falling.

Conversely, the melting or rather softening point of other substances, *e. g.* slags, may be determined by like means. We moisten the pulverized slags, mix each with a little dextrin, mould it into a pyramid like the normal ones, dry, gradually heat slag and normal pyramids side by side, and note the order in which their apexes bend over and touch the hearth. The upper and thin part of the pyramid will heat so much faster than the thick base that the apex of each will usually bend and reach the hearth before the latter has exercised any important fluxing action on the base.

This method then gives two distinct things: a pyrometric scale, and a means of determining the softening point of substances studied.

As a pyrometer the pyramids are certainly simple and cheap, and if the conditions of their preparation are rigidly fixed, they should easily afford very valuable indications for technical purposes. They are sold by dealers in chemical ware.

But one fears that their results, while trustworthy, will hardly be accurate enough for scientific purposes, unless an inconveniently great number of pyramids be used. The points on the scale must be far apart, and interpolation must be difficult. Further, as the bending over is rather slow, the temperature at which the apex of the pyramid reaches the hearth should depend on how fast the temperature of the furnace is

The most important deductions from these results are as follows:

| TABLE I. MELTING POINT OF LIME-ALUMINA SINGULO-SILICATES. | | | | | TABLE II. MELTING POINT OF LIME-ALUMINA-MAGNESIA SINGULO-SILICATES. | | | | | | |
|---|---------|----------|--------|----------------|---|---------|---------|----------|-----------|--------|----------------|
| Number. | Silica. | Alumina. | Lime. | Melting point. | R = O in Al ₂ O ₃ / O in CaO | Number. | Silica. | Alumina. | Magnesia. | Lime. | Melting point. |
| 1 | 1,8762 | — | 3,4965 | 1570 | 0 | 11 | 1,8762 | 1,0707 | — | 1,7483 | 1410 |
| 2 | " | 0,1071 | 3,3217 | 1526 | .05 | 12 | " | " | 0,1249 | 1,5734 | 1378 |
| 3 | " | 0,2141 | 3,1469 | 1492 | .11 | 13 | " | " | 0,2497 | 1,3986 | 1365 |
| 4 | " | 0,3212 | 2,9720 | 1468 | .18 | 14 | " | " | 0,3746 | 1,2238 | 1357 |
| 5 | " | 0,4283 | 2,7972 | 1451 | .25 | 15 | " | " | 0,4994 | 1,0490 | 1352 |
| 6 | " | 0,5353 | 2,6224 | 1439 | .34 | 16 | " | " | 0,5410 | 0,9097 | 1351 |
| 7 | " | 0,6424 | 2,4476 | 1430 | .44 | 17 | " | " | 0,5826 | 0,8224 | 1350 |
| 8 | " | 0,7495 | 2,2727 | 1422 | .55 | 18 | " | " | 0,6243 | 0,8741 | 1352 |
| 9 | " | 0,8565 | 2,0979 | 1417 | .68 | 19 | " | " | 0,7491 | 0,6993 | 1359 |
| 10 | " | 0,9639 | 1,9231 | 1412 | .83 | 20 | " | " | 0,8740 | 0,5245 | 1368 |
| 11 | " | 1,0707 | 1,7483 | 1410 | 1.02 | 21 | " | " | 0,9988 | 0,3497 | 1381 |
| 12 | " | 1,1777 | 1,5734 | 1430 | 1.24 | 22 | " | " | 1,1237 | 0,1748 | 1410 |
| 13 | " | 1,2848 | 1,3986 | 1468 | 1.52 | 23 | " | " | 1,2485 | — | 1497 |
| 14 | " | 1,3918 | 1,2238 | 1526 | 1.89 | 24 | " | " | | | |
| 15 | " | 1,4989 | 1,0490 | 1613 | 2.37 | 25 | " | " | | | |
| 16 | " | 1,6060 | 0,8741 | | | 26 | " | " | | | |
| 17 | " | 1,7130 | 0,6993 | | | 27 | " | " | | | |
| 18 | " | 1,8201 | 0,5245 | | | 28 | " | " | | | |
| 19 | " | 1,9272 | 0,3497 | | | 29 | " | " | | | |
| 20 | " | 2,0342 | 0,1748 | | | 30 | " | " | | | |
| 21 | " | 2,1413 | — | | | 31 | " | " | | | |

* Journal de Physique, 2d Ser., Vol. VI., January, 1887; Genie Civil, March 5th 1887.

† Stahl und Eisen, IX., p. 756, 1889.

Among the singulo-silicates of lime with alumina (calling alumina always a base), the most fusible, No. 11, is of the following composition:

| | |
|--------------|--------|
| Silica..... | 40 |
| Alumina..... | 22.8 |
| Lime..... | 37.2 |
| | 100.00 |

and corresponds to the formula $3\text{CaO}, \text{Al}_2\text{O}_3, 3\text{SiO}_2 = \text{CAS}_2$.

If, keeping the ratio of lime to alumina the same as in this silicate, we add magnesia to it, simultaneously adding enough silica to give us still singulo-silicates, the melting point descends gradually, reaching a minimum when the magnesia reaches 13 per cent., the composition then being:

| | |
|---------------|--------|
| Silica..... | 42.05 |
| Alumina..... | 25.92 |
| Lime..... | 20.90 |
| Magnesia..... | 13.06 |
| | 100.00 |

This, then, is apparently the most fusible singulo-silicate of lime with alumina and magnesia.

When we consider that the differences between the melting points of neighboring silicates are here as low as 8 degrees, 5 degrees, and even 1 degree C., and that the melting points of the normal pyramids, *i. e.*, the points in our scale, are here 29 degrees apart, so that these intermediate readings must be arrived at by interpolations, it is certainly most surprising that Mr. Gredt's curve should be extremely smooth. An error of two or three degrees would have distorted it considerably.

These results are very acceptable, as we have urgently needed more information as to the melting points of our slags. It is well, however, to compare them with those obtained by earlier observers, and see how closely they tally. To that end I have prepared Fig. 3, which compares Akerman's* and Gredt's results.

They are not, it is true, very closely comparable. Akerman's give the total heat evolved when the molten slag cools from its melting point to 0 degrees C., or the total heat of solidification, which is presumably very nearly the same as the heat required to melt it, if, indeed, the two be not identical. Gredt, on the other hand, gives temperatures, not calories, and, moreover, temperatures appreciably below the melting point. Now, the total heat of solidification is a function not only of the melting point, but of two other variables, the specific heat and the latent heat of solidification. Nevertheless, we should expect a rough correspondence between their results, for the heat needed to melt a slag should increase as its melting point rises, though not necessarily in the same ratio.

In studying the effect of the varying ratios between the bases, where, as in this case, the oxygen-ratio of base to acid is fixed (in the present case being 1 : 1, *i. e.*, that of singulo-silicate), it is convenient to express the composition of the slag by the ratio between the oxygen in the alumina and that in the protoxide bases.

$$R = \frac{\text{O in Al}_2\text{O}_3}{\text{O in } \Sigma \text{RO}}$$

And I have adopted this ratio for the abscissae in Fig. 3.

Comparing now the two curves in Fig. 3, we find that, while they have the same general shape, their minima correspond to widely different compositions, Gredt's minimum being reached when $R = 1$, Akerman's when $R = 0.60$.

This might be referred to variations in specific heat and in latent heat of solidification, were it not that Berthier[†] found that the ratio of greatest fusibility for lime-alumina silicates was $R = 0.50$, corresponding to the formulæ $\text{C}_2\text{AS}_3 = 12\text{CaO}, \text{Al}_2\text{O}_3, 9\text{SiO}_2$. This result, considering the difference between their modes of experimenting, agrees well with Akerman's, and tends to freshen the illustrious French metallurgist's laurels.

This discrepancy, however, is rather of scientific than practical importance, for Akerman's and Gredt's results agree in showing that the melting point and the total heat of solidification are nearly constant through the range between $R = 0.50$ and $R = 1.00$. According to Gredt, the melting point changes 15 degrees or one per cent. According to Akerman, the total heat of solidification changes 12 calories, or 3.4 per cent. in this range. In this view, then, Gredt's results are of real value in practically confirming Akerman's, while enabling us to interpret Berthier's statements more intelligently.

Mesuré and Nouel's pyrometric telescope gives us an immediate determination of the temperature of incandescent bodies, and is, therefore, much better adapted to cases where a great number of observations are to be made, and at short intervals, than Seger's. Such cases arise in the careful heating of steel. The little telescope, carried in the pocket or hung from the neck, can be used by foreman or heater at any moment.

It is based on the fact that a plate of quartz, cut at right angles to the axis rotates the plane of polarization of polarized light to a degree nearly inversely proportional to the square of the length of the waves; and further on the fact that while a body at dull redness merely emits red light, as the temperature rises, the orange, yellow, green and blue waves successively appear.

If, now, such a plate of quartz is placed between two Nicol prisms at right angles, "a ray of monochromatic light which passes the first, or polarizer, and is watched through the second, or analyzer, is not extinguished as it was before interposing the quartz. Part of the light passes the analyzer, and, to again extinguish it, we must turn one of the Nicols a certain angle," depending on the length of the waves of light, and hence on the temperature of the incandescent object which emits this light. Hence the angle through which we must turn the analyzer to extinguish the light is a measure of the temperature of the object observed.

*Om värmebehoven för olika masugnslaggers smältning, Stockholm, 1886. Akerman's slags had also a trifling quantity of magnesia and iron-oxide, but not enough to invalidate the present comparison.

† *Traité des Essais*, I, pp. 397 et seq. It is true that Berthier enunciates this simply as a general law for alumina-lime silicates, and does not state expressly that it applies closely to their singulo-silicates in particular. But, as he says it immediately after describing his experiments with the alumina-lime singulo-silicates C_2AS_3 , CAS_2 , CA_2S , and CA_3S , in which $R = 0.5, 1, 2$ and 3 , there can be no doubt that he held that $R = 5$ corresponded to greater fusibility than $R = 1$.

In Fig. 4 A is the analyzer; C is a graduated disc, fixed to the setting of the polarizer; d is a diaphragm; I is an index, fixed to the setting of the analyzer; L is the objective, whose distance from the diaphragm may be varied; O is the eye-piece; P is the polarizer, and Q is the quartz prism.

The instrument made by Ducretet, 75 Rue Claude Bernard, Paris, is made of two sizes, costing \$20 and \$25, respectively to which may be added \$6 for a tripod.

AMERICAN TRADE PROSPECTS IN THE AMAZON VALLEY.

Mr. Courtenay De Kalb, mining engineer, has just returned to New York from a mining tour along the Amazon Valley. His primary object was, of course, mining, but incidentally he learned much concerning the habits and requirements of the Brazilians and Peruvians which will be of interest to those manufacturers and shippers who are concerned in South American trade.

Mr. DeKalb sailed to Para, and from that point went by the Amazon steamboat service, stopping at several points along the journey, occupying nearly six months on the trip. He branched off into the river Huallaga and followed that stream up as far as the steamers went—to Yurimaguas, afterwards returning to the Amazon and following it about 250 miles in a canoe, up to the Andes. Since Mr. James Orton (author of "Andes and Amazon") made a trip to Yurimaguas in 1869 Mr. De Kalb is believed to be the only one to make a trip along the Amazon Valley. His observations concerning American trade and possibilities for its expansion were more particularly directed to the western end of his journey—that is, Western Brazil and Peru. He found here American flour selling at from \$20 to \$22.40 per barrel, and kerosene oil, in gallon cans, at \$1.60. These two articles will convey some idea of the profit which can be made on American goods in a market where they are preferred to the goods of other countries. Axes, adzes, knives, machetes, shovels and darts as American make were found in abundance. But they were only of one make, that of a firm in Hartford, Conn., which has so energetically pushed its trade that the natives (including the Indians, who use the darts as spear-heads) will buy no other. English and German agents have tried in vain to oust the American, and, utterly failing, have taken to pirating the trade-mark, and by this means have introduced their cheaper goods here and there.

Blue and white drilling is purchased largely for clothing and other purposes. American soap sells for \$3.20 per 15 kilos, or about 10 cents a pound. Florida-water is in general use for toilet purposes. Candles sell for \$1.92 for a six-pound box. Gilt, or brass buttons for shirts are in great demand, and anything novel in this direction realizes a good price. Winchester and Remington rifles are the only ones used. The Peruvians have practically abandoned their native word for rifle, and use the words "winchester" or "remington" as common nouns. The ammunition used comes all from this country. Preserved fruits and preserved meats are in great demand, as are castor oil, magnesia cakes, and many American proprietary medicines. American sewing-machines are alone used, which also applies to sewing-machine oil. One make of machine holds the market at one time, then another. But rarely do two makes of sewing machines sell simultaneously.

"It was a rare thing," said Mr. DeKalb, "to find an Indian hut, even hundreds of miles away from centers or villages, without its sewing machine. The natives might have no clothes worth mentioning to sew, but the machine they must have. It is a matter of pride with them. Even where there is the crudest and poorest, if any furniture, there will be found the American sewing machine in all its glory. I came across several instances where new machines had been purchased because the old ones had got a little out of repair. They never think of having them repaired or of buying duplicate parts, and it is apparently not the business of the selling agents to urge them to do so. These machines are paid for in labor, rubber or other produce." Sewing machines sell at from \$48 to \$64 each, so they are sold much cheaper for export than to home buyers. The other articles imported from the United States are bi-carbonate of soda (for baking powder), irons (for laundry work), lanterns, cane-seated chairs, nails, padlocks, all kinds of paper, and lard. Baltimore people control the East Peruvian supply of lard and flour at present.

The importations from Europe are many, and the number could be reduced without the expenditure of much energy by Americans. Fire-works are largely used for celebrations and a good price is obtained. The tin-ware trade is monopolized by England. English shoes sell at from \$4.80 to \$8 a pair, and none but European slippers sell there. European clothing sells readily; half-cotton pantaloons sell at \$3.20 and all-cotton overalls at \$1.60 a pair. Hats (straw and felt), dress goods and fancy articles in enormous quantities, rugs, etc., all come from Europe. No American house seems to have made a bid for that trade. English pickles hold the fort unassailed, as does English ink.

In iron ware the English control the market, and obtain prices which would yield a profit to American manufacturers. No American corrugated galvanized iron is found there, and a great deal is used. French stills are used in the distillation of cachaça, which is their strong drink, made from the sugar cane. This is bottled in demijohns imported from Holland—the regular squat Dutch demijohn. This latter trade alone is very large, and much of it could probably be diverted to this country by exporting such liquids as Florida-water in American demijohns. The sugar is prepared in trapiches, or mills, which come from England. It is a common complaint against them that they are heavy, clumsy and easily breakable.

The climate in Peru is very humid. Bread will not keep there, and, consequently, crackers are very largely consumed. Several American firms have made bids for that trade, but, as common with American shippers, they neglected to pack their goods to suit the requirements or climate of the destination of the merchandise. One consignment of crackers was found to be full of weevils when opened in the presence of Mr. DeKalb. The American manufacturer would not believe it; insisted that some competitors had tampered with the cases, and finally abandoned the idea of building up a trade with Peru. Peek & Frean, the English cracker manufacturers, have devised a small tin box, with a thin sheet-lead inside cover, and captured the entire trade; and a very profitable trade it is. All the condensed milk used in East Peru now comes from Europe.

There is at this time an excellent opportunity for establishing a trade in cheap grade American watches, rubber goods, candies, and cement for artificial stone. England and France have hitherto monopolized the supply of candy, but their system of packing results in the partial destruction of, or injury to, the sweets by the Peruvian climate, and the European goods are losing ground. At present marble is largely used for buildings in Pará and Manaus, and is very costly, generally imported from Portugal. A good cement for artificial stone would probably sell at a price which might realize a fortune for an American speculative enough to establish the trade.

A fortune awaits the piano manufacturer, who will devise some piano which will stand the climate and carriage. About 125 miles beyond the last steamboat landing Mr. De Kalb found a piano of American make in the residence of a Peruvian gentleman which had cost him about \$1,600. The instrument had warped and the joints had parted so that it was almost useless. In this connection one of this traveler's experiences may illustrate what chance an ordinary American-made piano would stand in Peru. He was presented by an Indian with one of the musical instruments largely used in Peru—pan-pipes, made of reeds and bound together with vegetable fibre. It retained its form as long as he remained in Peru, but upon being exposed to the New York atmosphere for a few days it shrank up and dropped apart.

THE AUSTRALIAN SHEEP SHEARING MACHINE.

Many attempts to perfect a mechanical device which would lighten the work for the shearer, prevent the wool from being injured by second

through the hollow casing of the body and escapes over the cutter, keeping the fleece well before the points of the comb, enabling the shearer to watch the operation, and at the same time keeping the machine cool while in his hands.

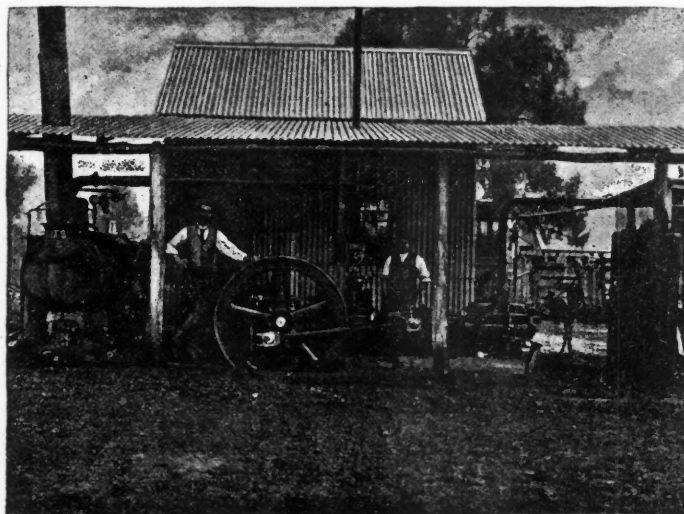
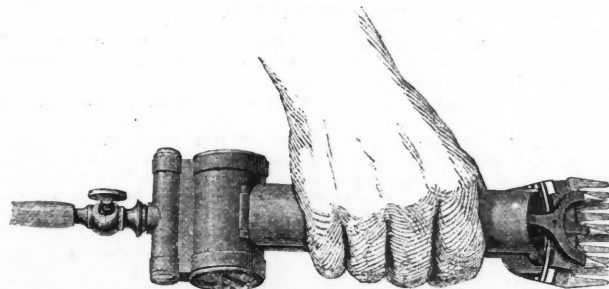
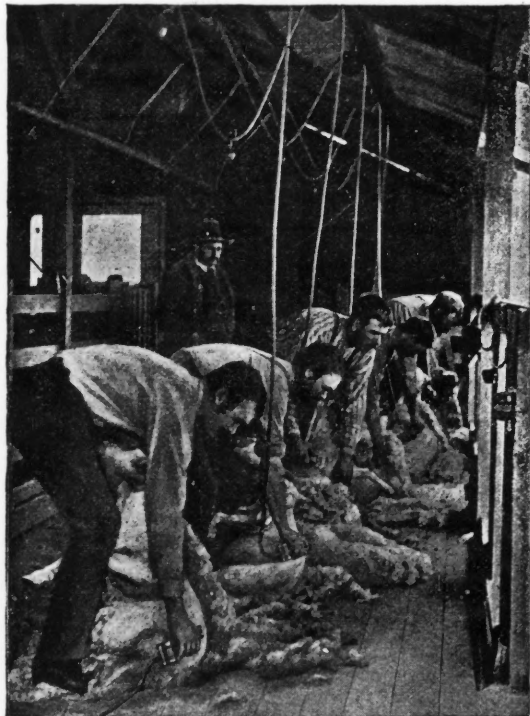
The inconvenience of the heat and the disadvantage of the friction which causes the heat and increases the wear and tear, involving cost of repairs and fear of delay at shearing time, are thus obviated. The simplicity of the construction dispenses with the necessity of skilled labor in setting up, adjusting or running the machine. As no pulleys or cog wheels are required it can be worked in any building with no strain to this.

The use of this machine reduces the time of shearing from an average of 70 sheep by hand to about 100 per day of ten hours. At Barsham, in Australia, three men shored 334 sheep with this machine in ten hours, the third day they ever handled the machines. Furthermore, the "Australian Shearer" saves about three-quarters of a pound of fleece wool per sheep, a profit of about 16 cents, and as the wool is worth one cent a pound more when cut in this way, as it is longer and more uniform in length, than by hand shearing, this would, with an average yield per sheep of about eight pounds of wool, bring the total profit by the use of this method up to 24 cents per sheep.

Another point in favor of this invention is that by its use the animals are never mutilated.

A complete plant erected, guaranteed to shear 500,000 sheep in three months, costs about \$12,500.

In Australia, the foremost country for sheep raising in the world, this machine has been introduced, and is being used on a large scale. A single company, the Australian Shearing Company, Sydney, N. S. W., with a



AUSTRALIAN SHEEP SHEARING MACHINE.

cuts, and guarantee the next fleece to be even in length, or "wool topped," have in the past twenty years been made. But it was only when the "Australian Shearer" lately made its appearance that the wool-growers and shearers gave the land shearing entirely up. It is patented in the United States, Great Britain, New South Wales, Victoria, New Zealand, Queensland, Tasmania, Cape Colony, Natal, the Orange republic, the Argentine republic, Brazil, France, Germany, Russia and Austro-Hungary. The device is exceedingly simple and easy to handle. It is composed of eight pieces: The body of the shearer, the oscillating fork, the piston, the valve, the comb, the cutter, the piston covers and the tightening ratchet. The valve is entirely balanced. The motion of the machine similar to that of a rock drill, is given by the piston. The fork is centered on a half-round bearing, the cup of which forms an oil receptacle, so that the bearing is all the time working in a bath of oil, reducing the friction. The pressure-nut, which regulates the pressure of the cutter on the comb, is inside of the body of the machine, so that it cannot interfere with or tear the fleece during work. As the machine has no perceptible vibration, as can be proved by laying it down on the floor while running at full speed, the wrist of the operator is not subjected to any strain. The weight of the machine is 2 pounds 2 ounces, and this being counterbalanced, the shearer has neither strain nor weight to overcome. The motive power is air under a pressure of about 40 pounds to the square inch, which is conveyed to the machine through a rubber tube 1/4 inch in diameter. The absence of joints and complications, as shown in the accompanying cuts, permits the shearer to work in any position he desires. The machine makes 6,000 oscillations per minute, but does not run hot, as the exhausted compressed air passes

paid up capital of \$500,000, has recently received nine Ingersoll-Sergeant air compressors from the Ingersoll-Sergeant Rock Drill Company, New York, and ordered 1,500 shearers from the establishment of Rochet & Co., Paris, France, which is equipped with machine tools from Brown & Sharpe, Providence, R. I.

The Occurrence of Gold in France.—Few of our readers are aware that France is to be placed in the list of gold producing countries, for, although Caesar speaks of it as *Gallia aurifera*, it has only lately come into notice that a region in the department of the Ardeche has produced nuggets of gold of varying size. A specimen was picked up some time ago by a peasant, who carelessly threw it away, without appreciating its value. It was lately rediscovered by another peasant, who showed it to a local jeweler, and by whom it was finally sent to Paris for examination.

The nugget consists of 98 per cent. pure gold, is about 3.8 inches in length, and weighs something over one pound, which would make its actual value about \$300, although as a mineralogical curiosity it is doubtless worth much more.

Since the discovery of this nugget has been made public, it has been learned that in past years several other lumps of gold have been picked up in the same region, all of which were much smaller, and were not preserved, but sold to the local jewelers and at once melted up. The country in which the gold has been found is mountainous, and contains numerous veins of pyrites, argentiferous galena, and many other minerals. The principal formation seems to be a mica schist, called by the natives *bleste*.

THE "AUTOMATIC" TYPEWRITER.

A new typewriting machine has lately been perfected and patented, for which the Automatic Typewriter Company, of this city, makes some rather large claims. The machine in question is partly the work of Mr. Henry Abbott, who, with others, has been working on it during two years, the purpose being to reduce the weight and bulk, simplify the mechanism and obtain greater speed and several other advantages over the other typewriters in use. Whether all these improvements will be permanently secured, remains to be seen. In the matter of size the saving is considerable, the machine being only 11½ inches across the front, 8½ inches wide, 4 inches high, and the weight 10 pounds. It can be used on a desk, table or even on a chair, and can be put away like a book. The arrangement of the keyboard will be seen in the accompanying illustration.



AUTOMATIC TYPEWRITER.

The type and bars are made of one piece of metal, and are so arranged in connection with an automatic gauge that each letter, like printer's type, has a space proportionate to its face appearance on paper. Thus the unsightliness of many of the older specimens of typewriting is avoided.

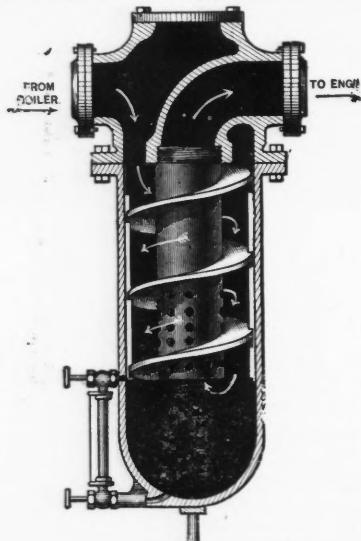
Instead of the type being some 15 to 18 inches from the key, as in some other machines, in the automatic it is much less, and the type bars, instead of being about four and a half inches long, are only two and one-sixteenth inches. Each bar slides between two pairs of guides, and rocks over a fulcrum, is held rigidly in position, and cannot get out of alignment with wear.

The inventors claim that the Automatic is capable of greater speed than other typewriters.

No type ribbon is used on this machine, but the type always rests on an inked pad, and strikes the paper directly, producing a sharp and clear impression.

TO SEPARATE WATER FROM STEAM.

Every engineer has had his own experience with water in the cylinder of his engine, or steam end of the pump, and a large number could tell of the serious accidents and delays occasioned by the cylinder head blowing out or cracking, necessitating an entire stoppage of works till the broken part could be replaced. In addition to the damage from accidents, water in the cylinder means loss of power, constant strain on the piston and rings, and is a great detriment in many ways. In mining sections, where the steam is carried a long distance to the pumps, and in the use of steam-hammers, and in fact wherever the pipes are exposed and condensation takes place, trouble occurs, either in the manner above named or in causing a snapping, cracking noise in the pipes.



CENTRIFUGAL SEPARATOR.

To obviate this difficulty Messrs. Hines & Robertson have patented a centrifugal separator which, it is claimed, frees the steam from much of the moisture and sends it into the engine comparatively dry. The steam on entering the separator is forced round the centrifugal pipe in such a way that the moisture thrown to the periphery runs down the sides and is let off through a suitable valve, where its quantity can be recorded, and the dry steam passes up through the center pipe to the engine.

According to last accounts the exports of asphaltum from Trinidad during the last official half year amounted to 32,460 tons, the greater part of which came to the United States

OPINIONS TO THE POINT ON OUR EXPORT TRADE.

If it wanted anything more than current statistics to demonstrate that in the South American, South African, Australian and other foreign markets the trade of the United States is small out of all proportion, the reports of the various American consuls and agents abroad would furnish it. They are almost unanimous in lamenting the insignificance of our export trade, in stating the various causes, and in suggesting remedies. But it is an unfortunate fact that a consular opinion, while it may carry weight with the Statistical Bureau and the State Department, does not obtain much consideration at the hands of men who have been engaged in the business of exporting. The reason is stated by practical men in a series of interviews secured by a reporter of the ENGINEERING AND MINING JOURNAL, together with their views on other matters in this connection.

Mr. J. M. Motley, of the firm of Thornton N. Motley & Company, who export railway, steamship, and contractors' tools and supplies, is an enthusiastic believer in the future of American export business. He has visited the chief foreign markets and speaks from experience.

"Yes," said he when questioned, "compared with the export trade of England, Germany and France, just where American trade should lead, it follows. We are simply nowhere where we should be first. The reasons are various, easily stated and the trouble easily remedied. In the first place, we do not seek the trade as we should: manufacturers are indifferent, and when we do secure some trade, we so neglect it that it is easy for others to drive our merchandise out. One of the principal reasons given me when I was in South America, was that the packing of American goods was so negligently done that they were often worthless when they arrived out. That complaint is universal. Whole lines of goods are utterly ruined by careless packing, and that is the end of American trade in that particular case.

"The next reason is the lack of proper shipping facilities; we can never compete with Europe while we have to ship through Europe and pay the difference, which amounts to a pretty big discrimination against us. I am a subsidy man, and so is our firm, all through, though we are divided in politics. Then the general indifference of manufacturers to the export trade is a serious detriment. If they happen to have surplus stock, they export it; if not, they say they have all they can attend to with supplying the domestic demand. When I was in Yucatan, a merchant complained that they could not depend upon the uniformity of quality of American goods, and the indifference of the manufacturers is the reason. While, on the other hand, the European manufacturers make their goods especially for that market. They are getting the trade, and they will keep it, unless the American manufacturers make up to the importance of the occasion. When I was afterward in England, I came across a manufacturer who, while he was busy with his domestic trade, was yet willing and anxious to make and forward several thousand dollars' worth of samples to secure that very trade. In Europe they will go any length to secure the South American trade which Americans are indifferent about.

"When I came up from Mexico I brought with me a sample machete, and I appealed to several cutlery manufacturers to make and furnish me with samples, believing I could secure the trade. They were utterly indifferent and declined to venture. An Englishman who was in Mexico at the same time heard of it, went home, and soon had a line of samples landed in Mexico, and, what is more, made them exactly as they wanted them. Another detriment is that our consular service is, as a rule, very bad; generally speaking the administration changes just as a consul is becoming useful, and another is appointed who knows nothing about what is wanted by us here. In Japan and other points in the East, where the German, English and French representatives are particularly instructed by their governments to do everything in their power to forward the trade interests of their respective countries, the American representative is instructed to hold aloof from all commercial affairs. The inevitable result follows.

"The lack of the proper banking facilities is another serious detriment to us; we have to do all that business through England or France: when one is doing business on a very close margin to secure trade, to be called upon to pay about three-quarters of one per cent. for these European banking facilities is a very serious consideration.

"It is perhaps superfluous to discuss the question of the tariff here. We all know how our tariff is injuring our trade with Central and South America. We put up a barrier against their produce and they, to a certain extent, retaliate on us. The President of a Pennsylvania steel mill told me that he could produce one of the outputs of his mill for export for \$7 a ton less than at present if a certain ore or material, not produced here, were admitted free.

"I find that where American manufacturers go into the business in earnest and devote their energies to it they are successful. There is a firm of cutlery manufacturers in Hartford that has done this, and the result is that in certain of the South American countries the people will buy scarcely any other cutlery than theirs, which has led several English and German manufacturers to imitate their trade mark, and so effect sales."

Mr. L. A. Sussdorff, of L. A. Sussdorff & Co., shippers of naval stores and machinery, said: "I believe the Pan-American scheme which Secretary Blaine is now urging, to establish a universal American banking system will, to a great extent, assist those in the United States who desire to trade with the countries comprising Central and South America. As it is now England is getting the best of us, both in exchange and shipping, the two things which affect trade most. If a trader wants to visit certain parts of the South, he must go to England, or take his chances by a sailing vessel from this port. Subsidies must be fought with subsidies, and while I do not believe in too much 'pap,' I think something ought to be done to help us compete with the cheap-labor countries of Europe which drive us out of the markets with whips supplied by their governments.

"The mere possibility of the passage of the McKinley bill has so hurt our tin and copper trade in Mexico and Cuba as almost to shut us out. We can manufacture copper cheaper here than anywhere else, but the Sheet Copper Trust effectually kills our Cuban and Mexican trade in manufactured copper and hands it over to European countries. We cannot compete with European copper manufacturers while we have to pay the high prices the trust insists upon. If the manufacturers of pipe and boiler flues would take the trouble to examine the prices demanded in Mexico and Cuba by English manufacturers, they would conclude that it would require a very little reduction to enable them to compete suc-

cessfully for that trade. We have, too, the advantage of the shorter distance. The recent spurt in Cuban trade means nothing," Mr. Sussdorff concluded. "The fact is that in a short time the Cuban import tariff will be raised 25 per cent. all round, and a few shippers are taking advantage of the present rates to get in all the goods they can."

A State street gentleman, who describes himself as a "Manufacturers' Agent for Export," stipulated before expressing his opinion that his name should not be used.

"The reason is," he explained, "that while the present condition of our export trade is in great part due to the indifference of our manufacturers, there are some notable exceptions. I represent several of these, and should not like them to think I was including them in a sweeping denunciation."

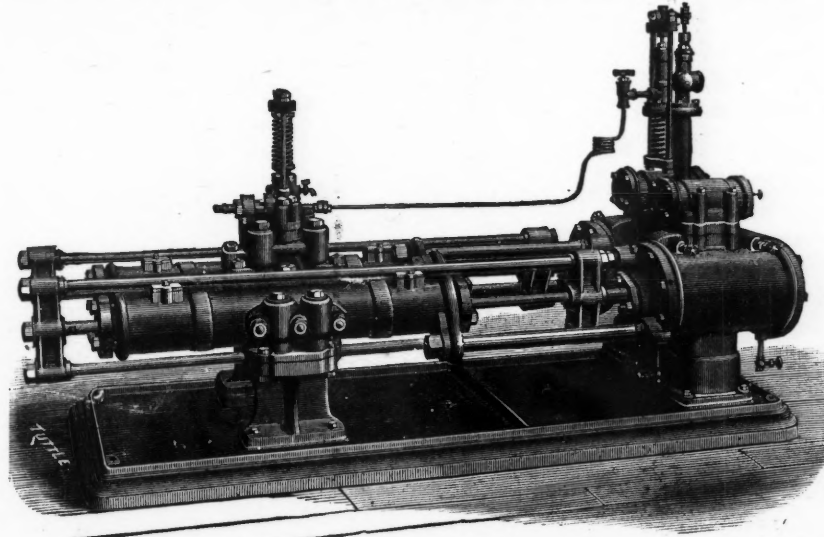
"The high tariff, in my opinion, has as much to do with the comparative stagnation of our export trade as anything else. So has the indifference of the manufacturers. They do not seem to care to foster the trade. This is known in Central and South America, and if the people there can get similar goods from England, Spain or Germany they will take them in preference to American. They complain everywhere that Americans will not pack the goods suitably. Some two months ago I asked a New York carriage firm to ship seven expensive carriages to South America, providing they would pack them in a certain manner. They do not seem inclined to take the trouble. If the carriages were satisfactory that trade there would be secured, but I fear the order will never be filled. I think the lack of unity among shippers, and the cut-throat competition prevailing has much to do with the mischief. It has led to a lack of confidence in us abroad, because, the moment a price for an article is established, some one comes along and goes still lower. Thus foreign importers fear American shippers. And, then again, English and Germans ship goods on six months' time. American shippers insist on 30 days for manufactured articles and cash for others. American manu-

THE HALL PRESSURE PUMP.

This comparatively new pressure pump has attained very rapidly a place in the foremost rank for mining and other purposes. Among the uses in which it is widely adopted, is for working cotton seed oil presses. The steam pressure pump exerts a hydraulic power up to a fixed amount, and the pressure regulator attached to the discharge main operates the steam throttle valve automatically, so as to close the same when the required pressure is reached on the presses containing the seed. A pressure of about 3,000 to 4,000 pounds is usually brought to bear for this purpose. A 10 by 14 by 12-inch pump, like the one illustrated herewith, will operate four large presses of 12 boxes each, as fully described in the ENGINEERING AND MINING JOURNAL, May 21st.

The pump itself is so simple and strong in construction that its liability to breakage and derangement is reduced to a minimum in this very trying and important service. Probably there is nothing in connection with the business in which reliability and effectiveness are so essential as in the continuous working of these pressure pumps. It is known that the time is comparatively short for the opportunity of handling the seed before it deteriorates; one day's stoppage of a mill from a breakdown will often cause a loss of several hundred dollars. There being no mechanical movements, tappet motion, levers or any slack motion about the Hall pump, it cannot be injured by the rapid motion at the first stages of compression when the pressure is light, and when the great strain is brought to bear at the last, the positive full double stroke of the two pistons produces a continuous steady power that is most desirable.

While the pump has only had a few years' trial and test in this special work, it has been sufficient to place it in the lead with those who have had the opportunity of working them in many of the largest mills in the country. The calls for them each season have been greater than the capacity of the pump works to supply. This season the demand can



HALL STEAM PUMP COMPANY'S PRESSURE PUMP.

facturers should learn that it pays to make some concessions to secure South American trade. Once secured it can legitimately be made very profitable."

Mr. White, President of the New York Fire Proof Paint Company: "Your questions indicate that you are familiar with the main causes of the present condition of our export business, as well as the remedies. I will only say that, as a large exporter, I am a strong advocate of our government doing the same as European governments do to foster trade abroad, that is give subsidies that will make it worth while for steamship people to carry American produce direct at a moderate rate, instead of our having to send it to Europe before it can reach its port of destination. If we had the benefit of free raw material, it would assist the American manufacturers as much as good shipping facilities. We want both, and our export trade will never occupy its proper place until we have them."

Mr. William E. Peck, general commission merchant, said: "The whole mischief is in our high tariff on raw material. Of course, we want better shipping facilities, and we want banking facilities with foreign countries. But once the tariff on raw materials were removed we should get the foreign trade, and then ships and banks would follow as naturally as the supply always follows the demand in commerce. Subsidies would not be a remedy, nor would the international banking system. You cannot cure an organic disease by local application. The remedy must be applied to the system. Take New England as an example. All her fine ports are empty. Subsidies would not fill them; but free raw material might in time. Protection stimulates a deadly home competition and excludes us from foreign competition."

"In many lines we can and do produce in this country at a cost only 5 to 10 per cent. higher than in Europe. These goods, many of them specialties, are sold so close, that that small difference is enough to keep the American product in America. If that is the purpose of the tariff it is a great success. In manufactures of copper and iron this is especially the case, and free raw material and the breaking up of the sheet copper combination would enable us to overcome the difficulty. We ought to have at least 75 per cent. of the South American trade, and we will have it if ever the tariff is abolished. From my own experience in South America I can say that, free trade or no free trade, we shall never make proper headway there until we do as other foreign manufacturers do, and establish branch or importing houses there, and supply them with goods from here, leaving them to find the trade."

be more fully met by the great increase in productive capacity that has been recently added to the works of the company at Pittsburgh, Pa.

As a mining pump, the Hall has won its way by thorough efficiency, simplicity and reliability. Its very ingenious valve movement (illustrated December 7, 1889, in the ENGINEERING AND MINING JOURNAL), which gives a positive action, avoids the difficulties so exasperating in some other direct acting pumps, and its general efficiency has won it many friends at the mines.

The company is now manufacturing a special alkali pump intended for pumping ammonia; it uses an indurated fiber valve which is unaffected by acids or alkalis, and we understand the working barrel is also made of acid proof material. Such a pump would have saved much loss at the Anaconda mine where, as a special report on another page states, no less than 30 pumps were quickly placed *hors de combat* by the acid and copper in the water.

AGRICULTURE AND IMPLEMENTS IN AUSTRALIA.

The very considerable falling off in the production of wheat in New South Wales and in Victoria is a fact of no little importance to wheat growers and agricultural implement makers in this country. The demand for wheat for consumption should be more, while the demand for agricultural implements should proportionately decrease, unless a counterbalancing demand springs up in other branches of agriculture.

The following brief table will explain the exact state of the case up to the completion of the last reports to the home government:

| | Wheat. | | Barley. | Rye. |
|-----------|----------|-----------|---------|--------|
| | Acreage. | Bushels. | | |
| 1877..... | 145,608 | 2,391,979 | 134,158 | 22,277 |
| 1887..... | 337,730 | 5,868,844 | 132,949 | 17,784 |
| 1889..... | 304,803 | 1,450,503 | 36,760 | 5,982 |

The imports of wheat, or the equivalent, flour, into New South Wales has increased from 2,075,054 bushels in 1877 to 4,266,087 in the last returns.

The colony of Victoria shows decreases, chiefly caused by drought. It is an interesting feature in the agriculture of New South Wales that the production of maize and tobacco has steadily increased, while the others have decreased. Maize increased from 3,879,537 bushels in 1877 to

just 5,000,000 bushels in 1889, and tobacco jumped from 2,440 hundred-weights to 55,478. As soon as the Victorian statistics on these two articles are completed, it is expected that (allowing that other countries, such as Russia, will capture some portion of the wheat supply to Australia) America's loss in the tobacco trade will fully equal her gain in the wheat trade.

Those manufacturers and shippers in the United States who are looking to establishing or increasing dealings in agricultural implements with South Australia, will get an exact idea of what is required there by the subjoined statement of the number of agricultural implements in use, furnished by the Government statisticians of New South Wales :

| Description. | No. | Description. | No. | Description. | No. |
|---------------------|--------|----------------------|--------|------------------------|-------|
| Bone mills | 132 | Hay-m'king m'chines | 177 | Winnow'g m'chines | 3,211 |
| Carts | 52,624 | Hay rakes (horse) .. | 3,253 | Strippers | 2,680 |
| Chaff cutters | 10,528 | Threshing machines.. | 726 | Stump extractors.... | 2,368 |
| Cheese presses..... | 1,289 | Wine presses | 384 | Wool presses | 2,364 |
| Cheese-making ma- | | Mowing machines.... | 4,283 | Wool washing | 185 |
| chines..... | 302 | Sheep-washing ma- | | Steam engines..... | 985 |
| Corn crushers..... | 2,619 | chines..... | 52 | Reapers..... | 1,503 |
| Corn shellers..... | 7,375 | Stills..... | 68 | Reapers and binders. | 1,112 |
| Harrows..... | 30,391 | Turnip cutters..... | 118 | Hay-cutti'g m'chines | 449 |
| Hay-presses | 1,133 | Plows | 41,961 | Seed sowers a'd drills | 310 |

The value of these implements is given as \$8,516,375, or about \$8.50 per acre of land under cultivation.

Under existing circumstances, with the prospect of a more or less shifting trade in the future with Australia, the following statement by Consul G. W. Griffin will be of value to American manufacturers and shippers :

"American mowers and reapers are preferred to those of English manufacture, but it is said that the latter are sold at a lower price and are much stronger, and are, consequently, less liable to get out of order. There can be no doubt but that the English and colonial machines are of heavier weight than the American, and possibly can stand rougher usage, but they are clumsy and very difficult to handle; besides, their additional weight is no indication of great strength or durability. The American machines are unquestionably of lighter and more graceful construction than the English, and require to be handled in a different way. A large dealer in agricultural implements states that the colonial farmer, being unaccustomed to American machines and implements, treats them precisely in the same way as the English ones, and that the former will not stand such rough usage as the latter, but those who understand how to use them are enabled to do much better and more work with them than with the English machines.

"Threshir g-machines of English make are popular here, for the reason that the grain does not have to be run through a fanning-mill; but they are twice as heavy as the American ones, and will not do the work so easily and rapidly.

"The Australian farmer, as a rule, prefers plows with iron handles and beams. The English plows make a very deep furrow, and when deep furrowing is required, as is usually the case in the dry, stiff soil in Australia, light plows that only skim the surface are altogether useless. American manufacturers desirous of introducing their plows here should endeavor to have them made to suit the views of the farmers who have to use them. In regard to American cultivators and harrows, there is little or no objection to them, especially for the cultivation of corn or maize. Corn is likely to become the principal grain crop of New South Wales. At the last harvest, which was one of the worst in the colony, the yield of maize declined very little from that of the previous year; moreover, the farmers are finding out that their corn has been injured by deep cultivation at certain stages of growth with the English harrows."

GERMAN THOMAS IRON AS A STRUCTURAL MATERIAL.*

Of the total production of coke pig iron in Germany in 1888 of 4,229,484 metric tons, only 1,253,308 tons were converted into Thomas steel, which mainly went into the construction of vessels. The soft kinds of steel are most conveniently and cheaply made in the Thomas converter without strong recarburization by means of ferromanganese, owing to the high price and its tendency to attack the converter linings. Thomas pig iron made in the following places contains :

| | In the Mosel District. | Ilse. | Peine. | Hörde. | Kladno. |
|------------------|------------------------|-------|-----------|------------|-----------|
| Carbon | 3.00-3.50 | 3.22 | 3.38 | 3.00-3.50 | 3.50 |
| Phosphorus | 2.00-2.25 | 2.92 | 2.72 | up to 3.00 | 2.40-2.60 |
| Manganese..... | 1.50-2.00 | 2.38 | 2.00-2.50 | 2.00-2.50 | 0.40 |
| Silicium | 0.35-0.40 | 0.11 | 0.18 | up to 0.5 | 0.10-0.20 |
| Sulphur..... | | 0.05 | 0.06 | 0.1 | 0.02-0.05 |

At Hörde the iron is tapped from the blast furnace in vessels holding 10 tons, into which iron from other furnaces can be drawn for the sake of mixing, and then it is carried to the converter, which is two kilometers distant. After a blast of about 10 minutes until the disappearance of the carbon line, the bath contains, when only two-thirds of the lime has been added, 0.07 C, 1.7 to 2 P and 0.2 to 0.3 Mn. The last one-third of the lime is added when the spectrum lines have disappeared and the blast has been kept up about three minutes more, and when the slag, which is very fluid because of the small quantity of lime and contains 24 to 30 per cent. phosphoric acid and 5 to 6 per cent. iron, has been removed. Then the bath contains still 0.30 to .4 per cent. phosphorus, but only 0.05 C, 0.15 to 0.2 Mn and 0.06 S, when again the slag is removed and 1 1/2 per cent. of ferromanganese added. The finished metal has a strength of 38 to 40 kilograms and contains 0.15 to 0.18 carbon, 0.4 to 0.5 Mn, 0.06 to 0.07 P, and 0.04 S.

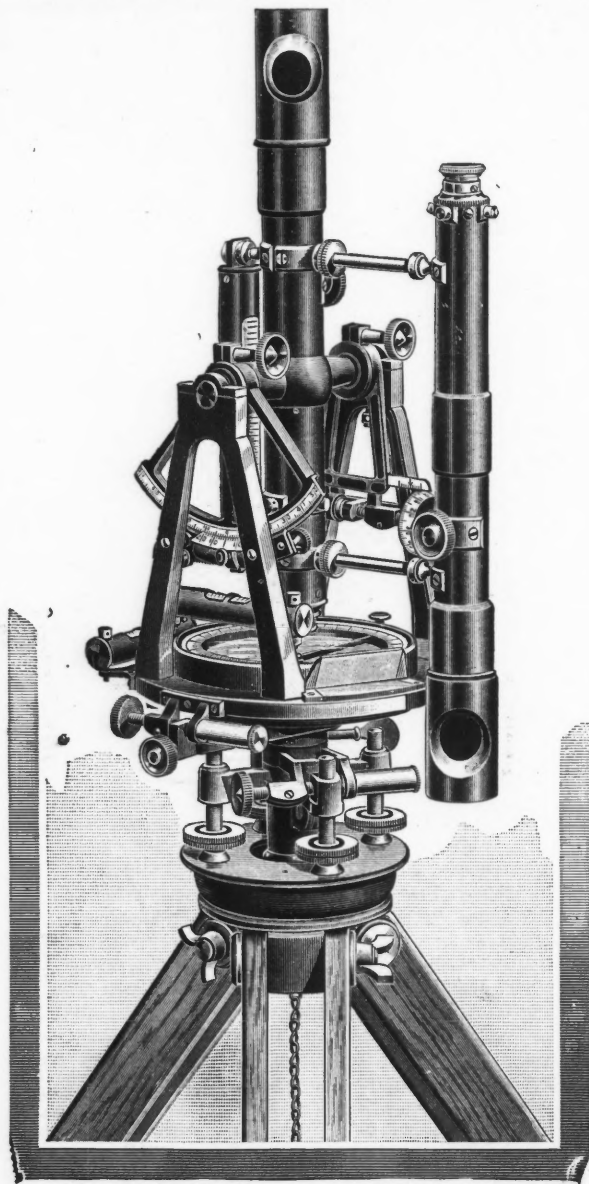
At Peine the pig iron in the cupola furnace is 10 tons and contains at the beginning of the blast in the converter 3.38 C, 2.72 P, 0.64 Mn, 0.18 S; and 0.055 S; after 7 to 8 minutes, blowing, when lime is added, the decarburization closes and the dephosphorization begins. The whole blast

*Abstract from a paper by Mehrtens in *Berg und Huettenmaennische Zeitg.*

lasts 10 to 11 minutes, and the metal has the same tensile strength as above and contains about 0.16 C, 0.54 Mn, 0.06 P, 0.015 Si and 0.026 S, with 0.073 oxygen.

THE BRANDIS ENGINEER'S TRANSIT.

The engraving below represents a new Brandis instrument, adapted for surface as well as underground surveying. It is constructed entirely of gun-metal and phosphor bronze, ribbed and braced throughout in order to insure lightness and strength. It is made in three different sizes, diameter, or graduated circle, 6 1/4, 5 1/4 and 4 1/4 inches. The former two are suitable for extensive triangulations and read to either 20 seconds or 30 seconds by opposite double verniers, placed at an angle of 30 degrees from the line of sight of the telescope. The vernier openings are screened by a milk glass refractor, projecting at a certain angle, and of sufficient width to throw a mild subdued light over the graduated surfaces observed through the openings. Upon the regular telescope, and in vertical line with same, is mounted a second telescope, which will permit the observer to look up or down a shaft in perfect verticality.



THE BRANDIS TRANSIT.

The second telescope of course revolves clear of the horizontal plate. There is the usual shade for illuminating the cross wires.

The vertical arc, with an adjustable vernier, is graduated into 20-minute spaces, and the vernier reads each way to single minutes. There is also a gradienter attachment reading accurately one foot of rod at 100 feet distance on the telescope clamp, which serves at the same time for leveling. Stadia wires to cover the same distances are also placed on the diaphragm as in other instruments of this class.

The tangent screws have on their opposite end a double tube, in which is placed a strong spiral spring of German silver to take up any lost motion, and the clamps so arranged that a small fraction of a turn will secure them in their place.

This instrument, which shows several other ingenious devices which add to its value, is the invention and production of the Brandis Manufacturing Company, New York.

Coal Production of Belgium in 1889.—The coal production in Belgium amounted in 1889 to 19,810,118 (metric) tons against a total in 1888 of 19,218,421 tons.

THE EUROPEAN IRON INDUSTRY IN 1889.

An interesting review of the iron industry of the continent of Europe in 1889 is published in *Iron* of May 2d, from which we glean the following:

The iron industries passed through a most satisfactory year on the whole, the most favored countries being Austria and Germany, with Belgium and France following. In Austria, notwithstanding high prices of raw materials, production, prices of finished products, and profits, all increased as compared with 1888, which was a satisfactory year. The prospects for the future are very hopeful.

In Belgium there was an increase in the output of nearly all descriptions of iron and steel. The imports increased 42,000 tons and the exports 74,000 tons. There was an abnormal scarcity of pig iron, leading to large importations, and prices increased from 50 to 100 per cent. High prices still rule, but the present quietness must soon lead to a change.

The year 1889 was a memorable one for France. At the exhibition she showed some of the best successes yet attained by metallurgical and engineering science. Prices advanced between 35 and 40 per cent. between December, 1888, and December, 1889. An extraordinary rise took place in fuel, average coal rising from 5 francs per ton to 15 francs.

In Germany the commercial success surpassed the anticipations, being unparalleled since 1872-'73. The demand far exceeded the supply, notwithstanding that prices rose from month to month. The great strike of miners resulted in an increase of wages and a shortening of the hours of labor, thus enhancing the cost of production. The foreign trade showed some decline, but it had very little effect on the prosperity of the trade.

In Luxemburg the trade enjoyed undiminished prosperity during the year. The make of pig iron was 561,733 tons against 523,776 tons in 1888.

The following figures of production of pig iron are given:

| | 1887. | 1888. | 1889. |
|----------------------|-----------|-----------|-----------|
| | Tons. | Tons. | Tons. |
| Austria-Hungary..... | 703,530 | 790,227 | 816,156 |
| Belgium..... | ..... | 826,580 | 847,260 |
| France..... | 1,567,622 | 1,683,349 | 1,722,480 |
| Germany..... | 4,023,953 | 4,337,121 | 4,524,759 |

From official statistics of Germany for five years we take the following figures, which show a remarkable growth in the iron industry of that country:

| | 1885. | 1886. | 1887. | 1888. | 1889. |
|--|-----------|-----------|-----------|-----------|-----------|
| | Tons. | Tons. | Tons. | Tons. | Tons. |
| Forge pig..... | 1,885,793 | 1,590,722 | 1,756,067 | 1,898,125 | 1,906,808 |
| Bessemer and Thomas pig and spiegel-eisen..... | 1,300,170 | 1,494,419 | 1,732,484 | 1,794,803 | 1,965,396 |
| Foundry, pig..... | 486,816 | 429,891 | 521,524 | 638,293 | 638,891 |
| Scrap iron..... | 14,646 | 13,556 | 14,878 | 15,897 | 13,664 |
| Totals..... | 3,687,425 | 3,528,588 | 4,023,953 | 4,337,121 | 4,524,759 |

The production of Thomas and Bessemer pig, not separated in the above, is stated by the *Verein Deutscher Eisen-und Stahlindustrieller* to have been:

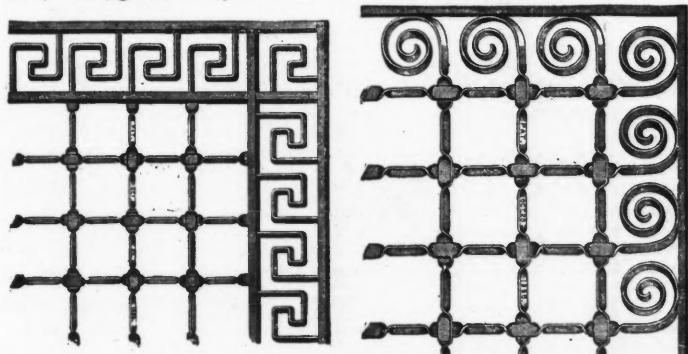
| | 1885. | 1886. | 1887. | 1888. | 1889. |
|---------------|---------|---------|-----------|-----------|-----------|
| | Tons. | Tons. | Tons. | Tons. | Tons. |
| Bessemer..... | 472,500 | 426,428 | 432,090 | 395,878 | 405,490 |
| Thomas..... | 668,100 | 835,178 | 1,076,140 | 1,253,308 | 1,402,444 |

Thomas slag has gradually since 1884 become a matter of great importance for manurial purposes; prices have been raised from 31 marks per ton in 1887 to 51 marks at the end of 1889, 17 per cent. of phosphoric acid being the standard. Exports were partially made at much lower prices, down to 20 marks, in the same way as it often occurs in the iron trade. The consumption of Thomas slag-meal in Germany is now at least 400,000 tons. In the manufacture of tin plates, iron has been almost entirely superseded by Thomas steel.

THE EVOLUTION OF WIRE WORK.

When, some thirty or forty years ago, the workers in wire succeeded in introducing their contrivances into banks, offices and commercial institutions to a small extent the "bird cages," as they were called, attracted much attention. The partitions, which were plain and of simple pattern, and really composed of wire, have since then evolved into ornate and artistic forms, composed mostly of brass strips which in many instances are from 1/4 to 3/4 in. wide. The plain iron wire has now been relegated mostly to the sides and backs of express wagons, garden fences, trellis work and as fences or barriers in offices where cost is an object or abuse and destruction are to be expected.

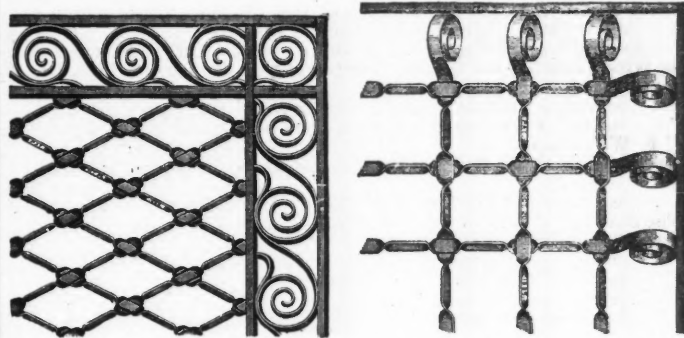
So-called wirework is now generally recognized as an essential and important fixture in the equipment of all large offices. It provides protection and permits ventilation. The term wirework, however, does not adequately convey to the mind the strength embodied in a web of round or flat wires, interwoven into patterns, such as those illustrated below, crimped to preserve the uniformity of the meshes, and the ends inserted into strong grooved frames in such a manner that the whole is a barrier which, while light and graceful, is as strong or stronger than heavy cast iron, wood, glass, or any other material employed.



Both iron and brass are employed in the elaborate designs now seen in all the large offices in the United States and Europe. Brass seems, however, to be generally preferred, as it produces a more imposing effect though the oxide coated iron work ("Bower-Barffed") is also very effective.

Artistic skill of the highest order has, of late years, been engaged in contriving new and elegant designs. The effect of this is seen in most of the larger institutions, where the cost of an imposing appearance is a secondary consideration.

The sudden popularity of American-made wire-work screens for offices, churches, household and other purposes in South America, South Africa, Australasia and in other distant countries is not surprising. It meets all the requirements of hot climates, where the free circulation of air and the admission of light, are essential, and it affords also a pleasing effect on the eye. To such an extent has this development of the old wire-work gone that hundreds of patents have been granted for processes of and mechanisms for manufacture. As it stands to-day, it is practically a new industry built up on the old one of iron wire-work. Dozens of factories are occupied in the work, and



many artists are vying with each other in evolving new, quaint, and beautiful or curious designs, to the oddity of which there is no limit, and in which consistency is not sought. In the store of Howard & Morse, 45 Fulton street, may be seen a curious example of this fact in the shape of a mosaic screen, made of dozens of different patterns and makes.

The accompanying illustrations represent Messrs. Howard & Morse's four newest patterns, which in brightly polished brass present a very attractive appearance. The growing favor with which this class of office furniture is received in other countries, as well as in America, is shown by the fact that two of the largest of the South American and Australian shipping firms are now placing large orders for a number of entire equipments for those countries. In South America especially the more ornate class of brass work is rapidly taking the place of wood-work about the houses and grounds. Its advantage is that the hot climate does not affect it as it does wood, and it adds a graceful charm to the appearance of structures where strong colors predominate.

SOCIETIES.

MASTER CAR-BUILDERS.

The annual convention of master car-builders and superintendents of motive power of all the American railroads will be held at old Point Comfort, commencing on Monday next. The sessions of the first week will be devoted to matters pertaining to railway cars, and the sessions of the second week to locomotive engines. During the convention a daily journal of the proceedings will be published.

ENGINEERING ASSOCIATION OF THE SOUTHWEST.

The next regular meeting of this association will be held at Nashville, Tenn., on Thursday evening, June 12th, at eight o'clock. The programme of the evening will include the following papers:

"Coke Making in the Western Kentucky Coal Field," by Mr. John B. Atkinson, of Earlington, Ky.

"The Foundations of the Georgia Pacific Railroad Bridge over the Yazoo River, Miss.," by Mr. A. V. Gude, of Atlanta, Ga.

"The Measurement of the Discharge of the Tennessee and Cumberland Rivers," by Mr. C. A. Turrell, Nashville, Tenn.

Mr. Wm. Pierson Judson, Mem. Am. Soc. C. E., of Oswego, N. Y., has recently published a paper on "The Niagara Ship Canal," a copy of which he will send to any member of this association on receipt of request and address.

THE IRON AND STEEL INSTITUTE OF GREAT BRITAIN.

At the invitation of the American Institute of Mining Engineers, cordially supported by the American Iron and Steel Association, the American Society of Civil Engineers, the American Society of Mechanical Engineers and the United States Association of Charcoal Iron Workers, the Iron and Steel Institute of Great Britain has decided to hold its fall meeting in the United States. An invitation has also been extended to the Verein Deutscher Eisenhüttenleute. The foreign guests will arrive here, in different steamers, toward the close of September. Many of them will attend the New York meeting of the American Institute of Mining Engineers on September 29 and 30. The first technical session of the Iron and Steel Institute and the formal reception of the visitors will be held on Wednesday, October 1. During the stay in New York the statue of the distinguished engineer, Alexander L. Holley, will be unveiled.

The visitors will then travel through the country. The following places will be visited on the dates given: October 4 and 6, Philadelphia; 7, Lebanon and Harrisburg; 8, Johnstown and Altoona; 9, 10, 11, 12 and 13, Pittsburgh (here two International sessions will be held: a list of technical papers by the most distinguished American and foreign engineers is now being prepared); 14, Chicago.

At Chicago the party will divide into two groups; one, the Northern (I), going to Lake Superior, and the other to the South (II). Northern Trip, I.—October 15, Chapin Mine and plant; 16, Gogebic Iron Range; 17 and 18, Lake Superior Copper Mines, from Houghton; 20 and 21, Mines of Marquette Range; 22, Sault Ste. Marie Canal and locks; 23, en route to Niagara; 24, Niagara Falls; 25, New York. Those of this party who desire will be conveyed to Washington and return.

Southern Trip II.—Leave Chicago Tuesday night, October 14, arrive at Birmingham, Ala., late Wednesday, 16 and 17, Birmingham, Ala.;

18, Shelby, Ala., and Anniston, Ala.; 19, Lookout Mountain; 20, Chattanooga; 21, Middlesborough, Ky., and Knoxville, Tenn.; 22, The Pocahontas Coal Field; 23, Roanoke, Va.; 24, Luray Cave; 25 and 26, Washington; 27, New York.

Those of this party who so desire will be conveyed to Niagara Falls, returning to New York, October 29.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

The annual convention of 1890 will be held at Cresson, Pa., beginning Thursday morning, June 26th. Sessions of the Convention for professional discussion and one for the transaction of business will be held. The President of the Society, William P. Shinn, Esq., will deliver the annual address at one of the sessions of the convention.

A number of interesting papers and discussions will be presented at the convention, as also the reports of the various committees.

The following papers, not yet published in *Transactions*, are also to be discussed: Tunnel Surveying on Division 6, New Croton Aqueduct, F. W. Watkins; A New Geographical Solution of the Problem, what position a train of concentrated loads must have in order to cause the greatest stress in any given part of a Bridge Truss or Girder, Henry T. Eddy; Causes of Trade Winds, Franz A. Velschow; Observations on the Forth Bridge, Dr. Charles E. Emery.

The following new papers will be presented at the convention:

"On a method of taking cross-sections of deep rock cuts by Triangulation," F. W. Watkins.

"On the Littoral Movements of Inlets along the Coast of New Jersey," Lewis M. Haupt.

"The Designing and Erection of the Oakley Arch," J. Foster Crowell.

"The Stability of Loaded Masonry Arches," A. S. C. Wurtele.

"Irrigation in India," Herbert M. Wilson.

"Construction and Maintenance of Track," Julien A. Hall.

"Electric Street Railways," O. H. Landreth.

"The Ventilation of Tunnels," N. W. Eayrs.

"Inland Sewage Disposal with special reference to the East Orange, N. J., Works," Carrol Ph. Bassett.

The Board of Direction invites professional papers and communications on subjects of engineering interest from all members of the society. Members are requested to contribute selections from their note books and similar records of experience referring to engineering practice. Discussion is requested upon any of the above subjects by members who cannot attend the convention. The secretary will be glad to present such if forwarded to him previous to the convention. It is desirable that papers offered for presentation be sent to the secretary not later than June 20th, so that proper attention may be given the subjects presented.

It is expected that reports will be presented by the Special Committees on Revision of the Constitution, on Uniform Standard Time, On the Compressive Strength of Cements and the Compression of Mortars and Settlement Masonry, On Uniform Methods of Testing Materials used in Metallic Structures, On Standard Rail Sections and these subjects discussed.

A meeting of the Committee on Standard Rail Sections will be held at the Hotel Headquarters on the evening of June 25th.

A New Use for Aluminum.—Fruit packers have experienced trouble through the effect of acids upon the galvanized wire shelves on which the fruit is dried. It has been suggested to use cloth made of pure aluminum wire, upon which fruit acids have no effect. Large steamers of aluminum are now being made for fruit evaporation, and it is stated that Crosse & Blackwell, of London, are using aluminum dishes for cooking fruit and making jellies.

Gems and Precious Stones.—The *Illustrated American* of New York, in its issue of June 7th, says: "A very handsome book, interesting and valuable withal, is George Frederick Kunz's 'Gems and Precious Stones of North America' (Scientific Publishing Company, New York), which gives a popular description of the various kinds of gems that are to be found in the United States, Canada, and Mexico, the comparative frequency of their occurrence, their value, history and archæology, and an account of the collections which contain them at present; the whole supplemented by a chapter on pearls and on remarkable foreign gems owned in the United States. Mr. Kunz is an expert on the subject, and he writes from full information.

"The colored illustrations deserve unstinted praise. They are beautifully done and are representations of the finest specimens of the several gems that have as yet been discovered on this continent."

Preservation of Iron Against Oxidation.—The Meritens process for preventing the oxidation of iron consists in placing the object near the anode in a bath of distilled water at 80 degrees C, a plate of copper acting as cathode. The electrolysis forms a layer of magnetic oxide Fe_3O_4 , which preserves the iron against all further oxidation. Peroxide of lead can also be used; it gives a black, very adhesive deposit by the electrolysis of an alkaline solution of litharge. According to *La Lumière Electrique*, an analogous process, invented by Mr. Haswell, has recently been patented in Vienna. Iron or steel is plunged as an anode in a bath containing from 05 to 5 per cent. of chloride or sulphate of manganese, and from 5 to 20 per cent. of nitrate of ammonia. The bath is electrized cold with carbon cathodes. The feeble currents of from 0.1 to 0.2a, cover the iron with a deposit of peroxide of manganese, which adheres well, and is not subject to further oxidation.

Saving of Waste Pickle.—Experiments have been made recently in England, with a view to recovering the waste "pickle" from galvanizing works. The waste liquor is boiled down to dryness and the solid residue heated to redness. Oxide of iron remains in the furnace, while free hydrochloric acid distils off, is condensed, and can be used over again *ad infinitum*. At the works of Walker Brothers, Walsall and Netherton, the process has been in successful operation for six months, and has been proved on a large scale to do away with the wastepickle, and even to yield a clear profit after paying all working expenses. The ferrous chloride and the waste liquor are heated in a reverberatory furnace. The distilled acid is condensed in a tall stack, and the oxide of iron is raked out of the furnace in the state commonly known as "blue hilly," and is of use in "fettling" puddling furnaces. The furnaces work three months without stoppage, and they use only 4 cwt. of fuel to completely treat one ton of waste liquor.

Statement of Prospective Earnings in Case the Panama Canal is Completed.—The special Panama Canal Commission has prepared a fresh report on the prospective earnings of the canal in case it is completed. In this the annual cost of maintenance is placed at 5,500,000 francs. The expenses of administration are placed at 1,800,000 francs annually, and the cost of transit is estimated at 10,000,000 francs annually. The income for the first four years is estimated at 51,250,000 francs. This is calculated on an average annual tonnage for that period of 4,100,000 tons, and the proposed rate of charge per ton is 12½ francs. The commission estimates that after the first four years there would be an annual increase in the tonnage of 250,000 tons, until a maximum tonnage of 6,000,000 should be reached. After the canal has been in operation twelve years, the annual net receipts, all expenses being deducted, are estimated at 67,000,000 francs. This amount would be distributed between the present and future shareholders in accordance with the terms of a contract to be concluded between the old company and the new.

Electrical Coal Digger.—The electrical machine for mining coal, invented by Peter Arp, and owned by Mr. Arp and Robert A. Jackson, a mine owner, is in successful operation at Mr. Jackson's mine at Powelton, Pa. The plant consists of a seven-horse power automatic engine. To the engine is belted a seven-horse power generator. From the generator the wires are run through the mine to the coal cutter, located about a mile from the mouth. This machine is operated by a small motor, which is built in the machine. This consists of an iron frame 24 inches high, 8 feet 6 inches long and 36 inches wide. Below are nine auger shaped drills. Between each drill is a steel cutter bar, which cuts the coal left between the holes drilled by the augers. Under and hanging to the cutter bars are several rows of scrapers, which hang loosely and pull all the coal back as fast as it is cut. The height of the cut is about four inches. The machine can make two cuts 3 feet wide and 5 feet deep in 5 minutes, it is shoved along the breast by the aid of a couple of bars. It weighs nearly 1,200 pounds. The machine can be raised or lowered to cut any part of the vein, sulphur, bony, slate or any other hard substances.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent Office:

PATENTS GRANTED TUESDAY, JUNE 3D, 1890.

| | | |
|----------|--|---|
| 429,112. | Filter. | Junius A. Bowden, Detroit, Mich. |
| 429,122. | Car-Coupling. | Albert B. Evenden, Watertown, N. Y. |
| 429,133. | Spark Arrester. | Langford C. Mahie, Richmond, Va. |
| 429,146. | Roller Crushing Mill. | Miner G. Mosher, Wichita, Kan. |
| 429,153. | Apparatus for the transmission of power. | Edwin E. Porter, Canal Fulton, Ohio. |
| 429,154. | Machinery for separating ore. | Robert H. Richards, Boston, Mass. |
| 429,157. | Anti-Friction Alloy. | Samuel Singley, New York, N. Y. |
| 429,175. | Compound tubular shafting. | George H. Ogilvy, New York, N. Y. |
| 429,180. | Car-Coupling. | John T. Falpey, Richmond, Me., Assignor of one-half to Charles H. T. J. Southard, same place. |
| 429,194. | Car-Coupling. | James Hughes, Bridgeport, Conn. |
| 429,200. | Device for Charging Furnaces. | John M. Pagnoul, Bridgeton, N. J. |
| 429,205. | Fuel Oil Burner. | Charles O. Wilder, South Bend, Ind. |
| 429,225. | Process of Treating Slag. | St. George T. C. Bryan, Birmingham, Ala. |
| 429,226. | Method of Treating Slag. | St. George T. C. Bryan, Birmingham, Ala. |
| 429,252. | Steam Boiler. | George E. Tregurtha, Malden, Mass. |
| 429,271. | Apparatus for Measuring and Carbureting Air or Gas. | Francis H. Hambleton, Baltimore, Md. |
| 429,309. | Apparatus for the Manufacture of Gas. | Malcolm S. Greenough, Edward C. Jones, and Walter R. Addicks, Boston, Mass. |
| 429,324. | Combined Metal-Working Machine. | Hiram B. Sevey, Vienna, Me. |
| 429,331. | Expansion Gear for Rolls. | Joseph N. Wise, Norwalk, Ohio. |
| 429,337. | Converter Ladle. | Simon C. Collin, Bridgeport, Pa. |
| 429,381. | Adjustable scraper for rolling mills. | John Harvey, Brooklyn, N. Y. |
| 429,386. | Process of separating metallic impurities from graphite. | Myron W. Parrish, Detroit, Mich., Assignor to the Graphite Electric Company, same place, and John Hutchinson, Jackson, Mich. |
| 429,411. | Pump. | Roscoe Bean, Springfield, O., Assignor to the Mast, Foss & Company same place. |
| 429,417. | Apparatus for recovering soda. | Hugh Burgess, Ardmore, Pa. |
| 429,425. | Rolling mill. | Fred H. Daniels, Worcester, Mass. |
| 429,439. | Timber structure for mines. | George J. Goodhue, Chicago, Ill. |
| 429,442. | Roller punch. | Alexander Hamill, Baltimore, Md. |
| 429,446. | Friction-Clutch. | Louis J. Hirt, Boston, Mass., Assignor to Harry W. Hill, Cleveland, Ohio. |
| 429,450. | Hoisting apparatus. | Charles W. Hunt, West New Brighton, N. Y. |
| 429,459. | Apparatus for decolorizing, filtering, &c., liquids. | Basilide Lavigne, New Orleans, La. |
| 429,561. | Electric Soldering Iron. | Charles E. Carpenter, Minneapolis, Minn., assignor by direct and mesne assignments to the Carpenter-Nevins Electro-Heating Company, same place. |
| 429,681. | Apparatus for covering wire with plastic material. | Dubois D. Parmelee, New York, N. Y., assignor to the Okonite Company, same place. |
| 429,583. | Electrical converter. | Gustav Pfannkuche, Cleveland, Ohio. |

DIVIDENDS PAID BY MINING COMPANIES DURING MAY AND SINCE JANUARY 1ST, 1890.

| NAME OF COMPANY. | Paid in May. | Paid since Jan. 1st. | NAME OF COMPANY. | Paid in May. | Paid since Jan. 1st. |
|---------------------------|--------------|----------------------|----------------------------|--------------|----------------------|
| Alice, Mont. | \$25,000 | \$25,000 | Horn Silver, Utah. | | 50,000 |
| Atlantic, Mich. | | 60,000 | Idaho, Colo. | 7,750 | 7,750 |
| Aspen, Colo. | 20,000 | 60,000 | Iron Mountain, Mont. | | \$25,000 |
| Badger Ontario. | | 37,500 | Kearsarge, Mich. | | 100,000 |
| Bangkok-Cora Belle, Colo. | | 3,000 | Little Chief, Colo. | | 10,000 |
| Boston & Mont., Mont. | 100,000 | 400,000 | Little Rule, Colo. | | 30,000 |
| Caledonia, Dak. | 8,000 | 10,000 | Mammoth, Utah. | \$40,000 | 160,000 |
| Calliope, Cal. | | 40,000 | Matchless, Colo. | | 2,500 |
| Calmont & Hecla, Mich. | 500,000 | 1,000,000 | Metropolitan, Mich. | | \$250,000 |
| Candelaria Con., Mex. | | 30,000 | Montana Ltd., Mont. | | 100,844 |
| Central, Mich. | | 20,000 | Napa, Cal. | | 30,000 |
| Champion, Cal. | | 10,000 | New Guston, Colo. | | 50,000 |
| Coeur d'Alene, Mich. | | 20,000 | Ontario, Utah. | 75,000 | 375,000 |
| Cortez, Nev. | | 60,000 | Oro, Colo. | 40,000 | 80,000 |
| Cons. Cal. & Va., Nev. | | 162,000 | Osceola, Mich. | | 50,000 |
| Cumberland, Mont. | | 15,000 | Parrot, Mont. | 18,000 | 72,000 |
| Daly, Utah. | 37,500 | 187,500 | Poorman, Colo. | | 2,000 |
| Derbec Blue Gravel, Cal. | | 10,000 | Puzzler, Col. | | 5,000 |
| Don Enrique, Mex. | | 3,000 | Quicksilver Pref., Cal. | 64,369 50 | 128,739 |
| Franklin, Mich. | | 80,000 | Reed & National, Colo. | 5,000 | 10,000 |
| Granite Mountain, Mont. | | 400,000 | Quincy, Mich. | | 120,000 |
| Hecla Cons., Mont. | | 15,000 | Republic, Mich. | | 100,000 |
| Homestake, Dak. | 12,500 | 62,500 | Silver Mg. of L. V., N. M. | | 50,000 |
| | | | Tamarack, Mich. | | 240,000 |

* Part of this dividend was paid in January.

PERSONALS.

Mr. David M. Ford has removed his office from Houghton to Ishpeming, Mich.

MM. Secretan, Laveissiere and Hentsch, of Paris, France, have appealed from the sentences passed against them on account of the questionable operations of the copper syndicate.

It is announced that Captain Lewis Lewis, F. G. S., has been engaged by the Shah of Persia and the Persian Bank Corporation to take charge of a staff of geologists and mineralogists to explore Persia, with a view to ascertain the mineral deposits of that empire.

Dr. R. J. Gatling, of Hartford, Conn., desires to contradict the report recently sent from Cincinnati to the effect that A. T. Perrine, who died at that place on the 2d inst., was the inventor of the Gatling gun. Dr. Gatling himself invented the gun, and his patent letters on file in Washington are evidence of the fact.

M. Wyse, according to a cablegram from Paris, dated the 1st inst., has sailed from Southampton on a mission connected with the Panama Canal. M. Mouchicour, the liquidator of the Panama Canal Company, instructed M. Wyse, after visiting the canal works at Colon, to proceed to Carthagena and Bogota to negotiate with the Colombian government for a prolongation of the canal concession. It is expected that M. Wyse will return to Paris in the autumn.

OBITUARY.

Francis C. Lowthorp, Fellow of the American Society of Civil Engineers, died on the 1st inst. at Trenton, N. J.

D. Brainerd Spooner, the inventor of the Spooner water meter, died suddenly at the City Hospital, at Boston, Mass., on the 1st inst. Mr. Spooner was born in Belchertown, Mass., in November, 1820. In early life he was at the Springfield Armory, and then established himself in the photographic business in that city, being the first man in the State outside of Boston to become a professional photographer. In 1850 he removed to Syracuse, N. Y. It was in 1850 that he conceived the idea of a water meter, and in 1870 he completed it. In 1880 he came to Boston and sought to have his invention adopted there, but without success. Mr. Spooner also invented the telemeter.

D. B. Lienau, mining engineer, died very unexpectedly on Monday last, in the 34th year of his age, while in the employ of the Penrhyn Slate Company at Middle Granville, Washington Co., N. Y. He had been with the above company but a few months, previous to which he held the position of superintendent of the Blue Bird Mill, of Butte, Mont. Mr. Lienau was in charge of this silver mill for about two years, and filled the position with much credit to himself, his honest, faithful services being thoroughly appreciated by his employers. He retired from the service of the Blue Bird Mining Company, Limited, last November, when work was suspended, owing to litigation. Mr. Lienau was educated in Freiberg, Germany, and since then has resided in the Western States, following his profession, and leaves many friends to mourn his loss in California, Colorado, Missouri, Montana, New Jersey and New York. He was devoted to his work and even sacrificed his health in its pursuit, and the cause of his death is in part attributable to lead poisoning contracted in the discharge of his duties some five years ago. His remains were interred in Greenwood Cemetery. He was a member of the American Institute of Mining Engineers.

ITEMS FOR EXPORTERS.

All steamers and sailing vessels hereafter entering the port of Pernambuco must pay a tax of 10 cents per ton on the net tonnage.

The Italian Consul-General at London, England, states that an international competition of agricultural sowing machines will be held at Foggia next fall. The competition begins on October 20th, and will remain open till the end of November.

American exports to Chili decreased nearly four per cent. last year, as compared with the preceding year. In the same time England gained about 20, Germany 21, and France nearly 12½ per cent. Chili's exports were nearly \$13,000,000 more than her imports.

A Pittsburgh mill recently shipped 5,000 tons of steel rails to Mexico. They were entered at Piedras Negras, and are the first steel rails imported from this country. There are not wanting satisfactory indications that this country would get its share of the Mexican boom in railroad matters if any inducements were offered Mexico in the form of free entry for her ores and other raw products into the United States.

The Ingersoll Sergeant Rock Drill Company, of New York, which three years ago equipped the Zancudo mines in the Andes, United States of Colombia, with a plant of mining machinery, including everything between the water and the mines, has just received a duplicate order for a similar equipment for a neighboring mine.

The only really American house in the island of Jamaica is a shoe concern at Kingston. The proprietor reports doing a good business, and sends encouraging words to American exporters generally. The outlook for American goods is promising, but great care in what goods are sent, and how they should be sent, is essential. Nearly every branch of American export trade could easily be established there by appropriate measures.

The Argentine Republic takes kindly to American carriages, despite a keen European competition. During the last two years 1,500 specially designed phaetons were shipped from New York by William E. Peck, and another order for 50 has just been received. The prices paid were satisfactory enough to encourage the continuance of the trade. The people in the Argentine Republic prefer American goods, and will buy them if the cost is not appreciably higher than the cost of European goods.

The New York Fire Proof Paint Company, of New York, reports that business is reviving in Hayti, and that the echoes of the late difficulties are getting so faint as to interfere very little with business. Transactions with American manufacturers are increasing, and credit is fairly good. The company was just on the point of shipping a large order to Port-au-Paix when an ENGINEERING AND MINING JOURNAL reporter called. "Let me say that I find your paper," said Mr. White, president of the company, "the best I ever had anything to do with for reaching both domestic and South American and Australian consumers."

Both exporters and importers who have occasion to use the New York Custom House and ascend to its top story many times a day, have requested the Secretary of the Treasury to order the construction of four elevators at a cost of \$10,000 each. The petition was denied. Then the petitioners prayed for one elevator, but were informed that Uncle Sam was too poor to pay for a common accommodation of the very people who provide him with the chief part of his revenue. Perhaps it is supposed that no votes will be gained by this expenditure. The petitioners should have said that unless they get the elevators they will, in '92, vote the Democratic ticket.

As an example of what can be done in the exporting business with determination and enterprise, the recent experience of Mr. William E. Peck, commission merchant, of Cedar street, New York, is worth noting. He opened a branch house in London as an experiment and had the market watched closely. The result of this was that during a few months London bought from Pennsylvania mills \$10,000 worth of manufactures of cotton, such as underwear, etc. This was at a time, too, when America was importing largely of similar goods from England. Mr. Peck has also sold in London large amounts of spool silk, silk handkerchiefs, machinery specialties, etc., and expects to get ahead of the British by watching their needs and prices.

The practical usefulness of the earthquake has been generally questioned, but that it has its advantages is becoming apparent. Manila, which is more than ordinarily blessed with seismic uprisings, proposes to build its churches of iron in order to enable them to be as durable, at least, as the creeds they shelter. A Belgian company has just arranged with the Recallete Brothers, at Manila, to erect there an iron church weighing 1,600 tons, at the following rates: cast-iron, \$48.25 per ton, ornamental cast-iron, \$116.15 per ton, wrought iron, \$60.80 per ton, f. o. b. at Antwerp. The total cost of the iron work is \$280,000, gold. To this sum \$70,000 must be added for interior and other decorations. It is generally believed that the old wooden and stone religious structures which are often shaken during earthquakes, are doomed to go, and that iron buildings will succeed them. There are plenty of opportunities for adventurous American iron manufacturers in the Philippine Islands, but they will have some lively competition.

PACKING FOR EXPORT.—The manufacturer who fails to pack his goods according to the requirements of the various markets will find himself working to a great disadvantage notwithstanding the superiority of his productions. The English and German manufacturers have, in many cases, resident agents or representatives abroad who inform the manufacturer not only what goods are required, but how to pack them.

Packing goods for "Foreign Trade" is as important a factor in the establishment of "Export Trade" as the manufacture of articles adapted to the markets. It is simply part of the business.

The foreign buyers should give full instructions how goods are to be packed when forwarding an order, and not begrudge the few cents extra for cases, crates, etc. The manufacturer in many cases, having sold his goods at the lowest possible

price "for export," is ground down in cost of packing and packages, to such an extent as sometimes to be tempted to pack them too cheaply and so endanger the safety of the goods.

INDUSTRIAL NOTES.

The Beattie Zinc Works, at Fall River, Mass., have run off the last of the raw material on hand, and now the place is entirely shut down.

The Ashland Coal and Iron Railway Company has established a quarterly dividend of one (1) per cent. Principal office is at Ashland, Ky.

Preparations are being made to start the Duluth, Minn., Iron and Steel Company's smelter. The machinery is being tested and ore bins built.

A blast furnace is to be erected at Covington, Va., to work the ores of the Rich Patch Iron Company, whose lands are located near that place.

The Etna Manufacturing Company's plant, Bellaire, Pa., has been finally sold to Wm. Zinram, one of the directors of the old company, for \$18,100.

The Minnesota Iron Car Company, of Duluth, Minn., has received the contract for building 50 flat cars and 10 box cars for the Duluth and Winnipeg road.

At the recent annual meeting of the directors of the Spiral Weld Tube Works, East Orange, N. J., the capital of the company was increased to \$1,000,000.

The Litofuge Manufacturing Company, of New York, has just published a little pamphlet which contains useful and interesting information about all kinds of boilers.

The Continental Tube Works, of Frankstown Pa., after an idleness of three years, are about to resume work. Electric street railway poles are to be manufactured there.

Suits are being brought against the original stockholders of the Etna Iron Works of Ironton, O., under the liability clause of the Ohio laws for corporations. The works will soon be sold at public sale.

The Ashland Fire Brick Works, Ashland, Ky., have declared a cash dividend of 20 per cent. and a stock dividend of 200 per cent. The capacity of the works will be doubled within the next twelve months.

The Sullivan Iron Company, of Duluth, Minn., with a capital stock of \$50,000, as also the Burnheimer Wire Company, of Minneapolis, with a capital stock of \$20,000, have filed articles of incorporation.

The Bellaire Nail Company, Bellaire, O., will, during the summer, add a new hot blast stove to the three that already form a part of the blast furnace equipment, and another blowing engine will be added.

The old Excelsior charcoal iron furnace, at Ishpeming, Mich., of the Carp River Iron Company, Marquette, is being repaired. The furnace was built in 1872 and rebuilt in 1879, but has been idle for several years.

At the Bookwalter Experimental Works, Cleveland, O., new appliances are being prepared which will permit the metal to be poured directly from the converter into the molds without teeming it in pots. The slag is separated by an ingenious device.

The American Wheel Company, of Chicago, Ill., has purchased White's Wheel Works, of Fort Wayne, Ind. It is one of the largest wheel factories in the State. The same trust also controls N. G. Olds & Sons' works, of Fort Wayne, and now operates 14 plants.

The Allegheny, Pa., Bessemer Steel Works, at Duquesne, Pa., in May turned out 15,000 tons of steel rails. During the month the mill was idle but 36 hours for repairs. The Duquesne plant has doubled its capacity since it was put in operation not quite three years ago.

At a stockholders meeting of the Ashland Metallic Paint Company, Ashland, Ky., D. D. Geiger was elected president and treasurer and L. B. Furgeson, secretary. The machinery is all in position and the actual manufacture of iron-clad paint will be commenced in June. The capital is \$20,000.

The works of the Simonds Rolling Machine Company, at Fitchburg, Mass., are to be enlarged, and new machinery is to be put in. Twelve new large rolling machines are in course of construction, including one for making steel projectiles for the Government, 40,000 of these have been so far ordered.

Edwin L. Tillinghast, proprietor of the Eureka Iron Foundry of New Bedford, Mass., has gone into insolvency. The firm has only been in operation a few months. Tillinghast, previous to starting the foundry, was a bookkeeper for Edmund

Grinnell, proprietor of the New Bedford Iron Foundry.

Amendatory articles of incorporation were filed last Friday, by which the authorized capital of the McCosh Iron and Steel Company, of Burlington, Ia., is increased from the present limit of \$200,000 to \$500,000. This large addition to its stock is rendered necessary by the extensive additions now being made by the company. The company now employs close to 300 hands. The additions being made will nearly double this force.

The Thomas Furnace Company, of Niles, O., has blown out its furnace, and the present furnace will not be put in operation again. A new and larger stack, 17x75 feet, will be put up in its stead, the old stack being 16x71 feet, having been built in 1870 and enlarged in 1883. The new furnace will probably be put in operation by the 1st of September, and will have a capacity of 200 tons daily. The Leechburg Foundry and Machine Company, of Pittsburg, has the contract for all the cast iron work.

The United States Supreme Court has affirmed the judgment of the Circuit Court in the case of the creditors, representing claims amounting to \$1,800,000, against the iron plant of Brown, Bonnell & Co., Youngstown, O., and issued a mandate ordering the sale of the mills, furnaces and properties of the company to pay the creditors. The entire plant has been run by Receiver Fayette Brown for nearly seven years without interruption, except those caused by breakages. The failure of Herbert C. Ayer caused the property to pass into the hands of the receiver.

The Spiral Weld Tube Company, of New York, is out with a useful little pamphlet which treats of spiral welded tubes generally and in detail. Its various contributors are prominent authorities on the several branches of the subject of which they treat, as will be seen by their names: James C. Bayles, Dr. Rossiter W. Raymond, Ph. D., E. M., James A. Burden, C. E., M. E., Edward W. Coit, Prof. R. H. Thurston, Ph. D., C. E., M. E., Henry R. Towne, M. E., C. E., George Burnham, Jr., C. E., S. T. Wellman, M. E., E. M., S. W. Baldwin, M. E., A. C. Walworth, M. E., John A. Price, M. E., and W. S. Mallory.

The Pelton Water Wheel Company, of San Francisco, Cal., has published a very handsome book, the artistic typography of which, together with a mass of general and useful information, almost removes it from the region of catalogues. Besides many drawings of entire water wheels and their adjuncts, which are accompanied by suitable letter-press descriptions, there is an exhaustive treatment of the iron hydraulic pipe and how to use and lay it, tables for calculating the horse-power of water, tables of miter inch measurements, weir dam measurement, tank measurement, and other matters of interest to all concerned in engineering.

The annual convention of the Amalgamated Association of Iron and Steel workers was opened at Pittsburg, Pa., on the 3rd inst., with 260 delegates from all parts of the country. The session was taken up almost entirely with perfecting the organization and nothing of interest transpired. The most important matter to be considered, as usual, will be the adoption of a new scale of wages. The provisions of the new scale, which will probably not be presented to the convention for several days, are guarded with great secrecy by the members of the Wages Committee. It is known that many changes will be made in the scale, and the most important of these is the advance to be asked for in boiling. This was not decided upon by the Wages Committee individually. A member of the committee said that an expression had been secured from every subordinate lodge, and the committee was compelled to be governed by the wishes of the majority. If the scale as reported to the convention is adopted \$6 will be asked for boiling on a 2-cent card and \$7.25 on a 3-cent card, with 50 cents extra a ton for boiling half pig-iron and half pot-metal and stove-plate. Other extras will be charged, ranging from 25 cents to \$1, for castings and runners over seventy-five pounds to the piece. There will be more "extras" in the scale this year than usual, owing to the admission of laborers and common mill hands, who must be provided for. There will also be a demand for an advance in all departments of steel mills. The men at Pittsburg want a 10 per cent. advance all around in every department. They will ask for this, and will compromise the matter on the adoption of a sliding scale to be governed during the year by the price of steel. Many of the manufacturers are already slacking up in anticipation of trouble. The convention will be in session ten days or two weeks.

(From our Special Southern Correspondent.)

The Whigham (Ga.) Manufacturing Company is arranging to build an oil mill and guano factory, also a side track for the same as soon as the survey is completed. Orders for machinery are to be placed very soon.

The Americus (Ga.) Manufacturing and Improvement Company, whose capital stock is now \$100,000, proposes to increase it to \$1,000,000, all of

which is to be used for building up Americus manufacturing enterprises.

The Salisbury (N. C.) Land and Improvement Company has recently been organized with a capital stock of \$200,000. The object of the company is to buy and sell real estate and to erect buildings and make improvements on the same for manufacturing and other purposes.

To the manufacturing industries at Rome, Ga., are to be added very soon an 80-ton charcoal furnace, a coke furnace, car wheel works, car works, acid phosphate works, a wire mill, a fire clay works, and woolen factory. All under the direction of the Rome Land Company.

W. H. Smith, of Wilmington, N. C., has organized a syndicate for the purpose of quarrying brownstone at Sanford, N. C. The necessary machinery is to be purchased immediately, and the quarry opened on a large scale. This brownstone is now being used in the erection of the public building at Wilmington, and the present facilities for quarrying it are insufficient.

CONTRACTING NOTES.

The Nicaragua Canal Construction Company has signed a contract for dredging the harbor and bar at Greytown at a depth of 20 feet for the purpose of opening the harbor for vessels carrying machinery and plant for the canal work. The construction of a pier at Greytown, already 600 feet long, is progressing favorably.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services. We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering. These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

- 859. Fruit and vegetable cans. North Carolina.
- 860. Engines, boilers, etc., for fertilizer works. Georgia.
- 861. Second-hand horse cars in good order. Texas.
- 862. Boilers, engines, pumps, lead pipe, etc., for water works. Georgia.
- 863. All the machinery necessary to run a first-class canning factory. South Carolina.
- 864. Shingle mill, lath mill, and edger. Georgia.
- 865. One lathe, 20 to 30 inches face plate; one drill press, 2 to 3 feet table, and one small planer. North Carolina.
- 866. Sixteen-pound rails for three miles of 24-inch gauge track. Louisiana.
- 867. Electric light plant of 600-light capacity [incandescent] not including power. Texas.
- 868. Machinery to bore oil wells. West Virginia.
- 869. Galvanized corrugated roofing. Texas.
- 870. Prices on pump boring tools to make wooden tubing from round or square timbers. Alabama.
- 871. Complete outfit for a 10-ton ice plant. Tennessee.
- 872. Machinery for a cotton mill. Arkansas.
- 873. Prices on open kettle canning outfit, closed outfit for oyster factory, cans, labels, solder, kettle, and packing boxes. North Carolina.
- 874. Estimates on foundry, buggy and wagon manufacturing machinery. Alabama.
- 875. Equipment and 30-pound steel rails for two miles of logging road. Virginia.
- 876. Engine for saw mill. Alabama.
- 877. Complete canning outfit. Texas.
- 878. Steam plant for power, electric plant, ties, iron T rails and all supplies required for an electrical suburban railroad. District Columbia.
- 879. 60 or 75 H. P. engine and boiler to match, 10 ton cupola, shafting, hangers, pulleys, etc. Virginia.
- 880. One 10-foot boring and turning mill, lathes, planers, milling machines, radial drills, etc. Pennsylvania.
- 881. Correspondence with parties with whom we could sublet about 19,000 cubic yards of dredg-

ing, and with parties who have dredging machines to sell. Tennessee.

882. Estimates on machinery for sawing out and preparing shuttle blocks from dogwood. Machinery to be run by water power or steam. Virginia.

883. Automatic engine, return tubular boiler, live rollers, slab conveyor, dry kiln, heavy flooring machine, light locomotive and steel rails. Georgia.

884. Correspondence with the manufacturers of machinery for making butter dishes (wood) fruit baskets, berry boxes, etc. New York.

885. Ice machine with a capacity of 8 to 10 tons per day. North Carolina.

886. Machinery for steam laundry, canning factory and steam cracker bakery. South Carolina.

887. Heating furnace to heat from 1,500 to 2,000 railroad car links per day for welding, and head bars, 15 or 16 feet long, for bending. Alabama.

888. Bids for sinking an artesian well 750 feet, for building a brick tower 100 feet high, with a tank on top 20 x 25 feet, and for engine, boiler, pumps, pipes, etc., sufficient to elevate water to the tank at the rate of 50 to 100 gallons per minute. Georgia.

889. Rock crusher complete, capacity 100 yards per day. Also a mill for grinding sandstone, capacity about 100 yards per day. Tennessee.

AMERICAN GOODS WANTED ABROAD.

838. Addresses of manufacturers of steam plows. Cuba.

847. Prices of sugar machinery, coffee hullers, cleaners, polishers and street sprinklers. Venezuela.

853. Catalogues of machinery and plant suitable for dredging beaches and river beds for gold, together with the appliances (tables, etc.) for saving the gold. England.

854. Catalogues, circulars, etc., of manufacturers of machinery for mining and silver-reduction works. Mexico.

855. Pitchforks, rakes and threshing machines. Prices on large quantities delivered in France.

GENERAL MINING NEWS.

The Pittsburg district of the United Mine Workers met on the 30th inst., and discussed the dead-work scale. No action was taken.

President Hugh McLaughlin stated after the meeting that the operators are wrong in saying the miners broke faith in presenting the scale. He said that it was the custom to have a dead-work scale besides the regular one, and that there certainly was an understanding on the subject to that effect at the Columbus convention. It is likely that the dead-work scale will be fruitful in trouble, as both parties are holding out on their side of the case. Concerning the eight-hour movement among the coal miners President McLaughlin said: "The miners in this district are clamoring for eight hours. The United Mine Workers have given the matter into the hands of President Gompers, of the Federation of Labor, and as soon as the miners are in proper condition the movement will undoubtedly be made. There is just one thing that deters us at present. To start the eight-hour movement, it is necessary that a certain percentage of men in each district should be organized. In some districts we are perfectly united, but in others not so well. We have been working hard at organizing, however, and feel confident of ultimate success. Eight hours a day under ground is enough for any man. We have endorsed the eight-hour movement and will not go back on our word."

CANON CITY, SALIDA & PACIFIC RAILROAD COMPANY.—Articles of incorporation were filed by this company at Denver, Colo., on the 31st ult. The object of this company is to build a railroad from Canon City to some point on the slope of the Pacific Ocean such as subsequent surveys and examinations shall prove to be most profitable and feasible. The present terminals of the railroad are Canon City and Salida, Colo.

CALIFORNIA.

THE TRINITY RIVER TUNNEL COMPANY.—This company is engaged in a similar enterprise to the Big Bend tunnel scheme in Butte County, Cal. An 800-foot tunnel has been driven through a mountain around which Trinity River winds. The circuit the river makes in rounding the mountain is about two miles and a half, and by turning the current into the tunnel the bed of the river is exposed for the entire distance above noted. The company has also built a ditch and flume 6 feet wide and 4 feet deep a distance of 4 miles, which affords a tremendous pressure for hydraulicing. At the head of the ditch the company has an extensive sawmill for its own use, timbering the tunnel alone making it absolutely necessary. A monster dam has been thrown across the stream, by which to turn the river through the tunnel. The river was forced off its course temporarily some time ago, and the exposed channel below the dam prospected big, sufficient at least to warrant the company in prosecuting its work through a very stormy winter.

MONO COUNTY.

(From our Special Correspondent.)

BODIE, May 28.
BODIE TUNNEL MINING COMPANY.—Mr. Ryan, a Virginia man, has been appointed superintendent of this mine.

LAKE MONO HYDRAULIC.—This mine, in Jordan District, seems to be a London incorporation, and, according to the London *Financial News*, its stock was recently selling at the rate of \$300,000 for the mine. The mining must all be done in London, for there has not been a man employed on the property (not even a keeper) for over six years.

STANDARD CONSOLIDATED MINING COMPANY.—This company has begun active operations.

SISKIYOU COUNTY.

"The Klamath river miners are making preparations for reopening their claims," says the *Yreka Journal*, "and will be ready to put in wing and head dams as soon as the stream is low enough to permit. All the companies, excepting the old Kanaka and Centennial companies, will commence work on the claims next month so as to reach bed rock in the channel some time in July. The Centennial claim is such a deep one that it would be impossible to get in before September, but the Phil Mott Co.'s claims, further down the river, will be opened, also the two claims of Chinese companies in the same vicinity. The McConnell claim at the mouth of Hamburg creek, and other claims above Honolulu, clear up to the C. & O. R. R. crossing, will be opened, with good chances of success, as the freshets of the past winter have cleaned out the stream to afford much easier working of the river bed than heretofore."

COLORADO.

CLEAR CREEK COUNTY.

BAY STATE MINING COMPANY.—The case of this company against James Trevellion, in which the plaintiffs seek to recover possession of the Bay State tunnel mill site, situated in Upper Union mining district, and also sue for \$1,000 damages for unlawful detention of the same on the part of the defendant, was set for trial in the United States District Court at Georgetown last week. A variance, however, was found in the pleadings, the jury, which had been impanelled on the previous evening, was withdrawn, and the case held over until next term.

(From our Special Correspondent.)

BUNKER HILL MINING COMPANY.—A hoisting plant has just been erected on this prospect to carry the shaft down and find if possible a part of the ore body exposed in the Lamartine.

PAY ROCK CONSOLIDATED MINING COMPANY.—Work is progressing steadily at the mine both in the Ashby tunnel and in the lode. Mr. Frank Graham has charge of the concentrating mill this season.

SALISBURY MINING AND MILLING COMPANY.—This company has just started its new mill, which has been in course of erection during the last seven or eight months. The machinery was furnished by the Hendey and Meyer Engineering Company of Denver; consists of Blake crusher, two sets Cornish rolls, three sizing trommels, four three-compartment jigs, 10 stamps for recrushing jig tailings, and Hendey's concentrators for handling the pulp from stamps. The stamps are supplied with coppers, for amalgamating free gold. The construction is such that there is no elevating of ore except to pass it through the first screen. The motive power is steam.

TWO SISTERS AND NATIVE AMERICAN.—The litigation between these two mines has been or is about to be settled by compromise. The two properties are essentially one mine, and the respective owners are now doing the most sensible and profitable thing in consolidating their interests, so as to work both under one management.

GUNNISON COUNTY.

FOREST QUEEN MINING COMPANY.—This company has decided to re-build the shaft house and replace the hoisting machinery. Some three years ago all the machinery and buildings were burned, and since that time no sinking has been done on the mine. The greatest depth on the mine is in the neighborhood of 300 feet, and when the machinery is in readiness, sinking will commence.

PITKIN COUNTY.

PARK-REGENT MINING COMPANY.—The suit of this company against the J. C. Johnson for trespass of the latter property on the territory of the former was concluded recently, the jury bringing in a verdict for \$10,650 for the plaintiff. This case grew out of the Johnson having gone beyond the north end line of its territory and extracting a lot of mineral from the Park-Regent's ground. The gross value of the ore taken was estimated by the Park-Regent owners at \$41,000, but the Johnson people claimed that it had not netted them more than \$11,000. All efforts to compromise proved unavailing, and it was finally left to the courts to decide how much the trespassing company should pay. The Johnson management did not deny having taken the ore or having received the proceeds of it, the only question being as to the amount they should turn over in settlement of the claim.

SAN JUAN COUNTY.

The mining suit of Wheeler vs. Denn, which was on trial at Laramie, Wyo., terminated on the 27th ult., the jury being unable to

agree. The suit involves \$52,000 and concerns the Veta Madre silver mine, near Silverton. The mine was sold to Wheeler, and he claimed that a confidence game was played upon him and asked for \$20,000 damages and the annulment of notes amounting to over \$30,000. The case has already been tried in Denver twice, but the demand then was to have the sale set aside, and the suit availed nothing, for the reason that a previous suit for damages had been started. The suit was instituted at Laramie because 200 head of horses in part payment for the transfer were placed in the custody of M. C. Brown, an attorney at Laramie. There is a prospect that the whole affair may be submitted to Judge Ganley for final determination, irrespective of the jury's decision.

GEORGIA.

(From our Special Correspondent.)

LUMPKIN COUNTY.

CAPPS.—Mr. V. Moose and J. L. Wallace are now making preparations to work this property with a giant, in connection with the one at the Ivy.

DAHLONEGA COMPANY, LIMITED.—Capt. A. B. Linderman has completed the Singleton ditch, which, upon trial, gives a good flow of water. The Cane Creek ditch is also being cleaned and retressed.

LAWRENCE.—A five stamp battery of this mine is now crushing ore from the Findley for test purposes. The Findley mill of 40 stamps is rapidly being put in repair with a view to sinking the shaft and testing the sulphurette ores of the main lode.

YAHOOOLA.—Mr. W. S. Ward, foreman of this property, has opened up a fine vein of gold bearing quartz, which is said to be the best one hitherto discovered on the place. This is one of the Hand properties under the management of Capt. H. G. Ingersoll.

IDAHO.

ALTURAS COUNTY.

IDAHOAN.—In this mine, situated between Hailcy and Bullion, an eight-foot body of galena has been lately discovered in the lower workings. It will now be opened for working on a large scale. Many of the other Wood River mines are reported to be improving with deep development.

NEZ PERCES COUNTY.

MOSCOW MINING & MILLING COMPANY.—This company has been prospecting for over a year in Howard Gulch, seven miles northeast of Moscow, but until recently had found nothing in the form of a ledge that would be of value. The ledge just discovered is said to be seven feet wide and free milling. The quartz taken out is reported to be rich.

SHOSHONE COUNTY.

(From our Special Correspondent.)

CŒUR D'ALENE SILVER LEAD MINING COMPANY.—The directors of this company were disappointed in their expectation of declaring a dividend this month. The snow fall in the Cœur d'Alene was very heavy this past winter, and a few weeks since some very hot days and a chinook melted the snow so rapidly that it caused a washout and cut off the company's supplies for 15 days, during which time its concentrator was idle. The ore mined by the company is classed as first when it runs over 60 per cent. lead. Most of the first class shipped runs from 65 to 69 per cent. lead and 40 ounces silver. The concentrates which are derived from the second class ore run about 55 to 57 per cent. lead and 30 ounces silver. The company is slowly sinking its shaft from the 300 to the 400-foot levels. At 360 feet it cross-cut about 12 feet to the vein and found two feet of solid first class, and about two feet of good second class. The shares, which are nearly all held in Butte and Helena, dropped from a dollar to 93 cents, the non-payment of the expected dividend having a depressing effect.

The season is generally backward. In Cœur d'Alene they have had high water, which has interfered some with transportation this spring.

There was great excitement at Murray on Sunday, when the new strike near Sullivan was made public. S. W. Darling and Geo. P. Carter, locaters and owners of the Barton claim, three and a half miles east of Murray, on the south side of Prichard Creek, after long and persistent work, struck a body of ore that proves beyond a doubt, it is said, that the North side will become as noted for its silver and lead ores as the camps on the South fork. The ledge has been uncovered for over 1,500 feet, is from two to ten feet in width on the surface, and is extremely rich in carbonates, galena, crystallized lead and silver. Experts claim that the ore will go over 40 per cent. in lead and very high in silver. This discovery in connection with that of George Chapman on the Forsaken group (which, by the way, is a parallel one and shows the same ores) demonstrates the fact that there is a silver and lead belt crossing Prichard Creek.

Several mining men from the South Fork have visited the new strike, and they one and all express unqualified admiration at its richness and magnitude.

Mr. John A. Finch, of Gem, said: "It is an immense thing, and insures a railroad up the North Fork; in fact, I have seen no better surface showing in the Cœur d'Alenes, unless perhaps the Bunker Hill & Sullivan."

A rich strike has also been made in the Nellie, about one mile from the Osburn. Messrs. Alger and Knight were running an upraise from No. 4 tunnel and uncovered a body of ore 25 inches wide and heavily charged with native silver, so much so in fact that the surface of the specimens seen by us were literally covered with it. The ore is chiefly gray copper, and assays up into the thousands.

Daniel Trullinger and Alexander Dunphy have been engaged since last August in developing the Father lode, Denver district, located a quarter of a mile south of West Sunset creek, on the divide between Nine Mile and Beaver creek. The mine is opened by two tunnels, the first driven to a distance of 180 feet. No. 2 has reached 140 feet. Tunnel No. 1 shows a continuous body of ore for 140 feet. In tunnel No. 2, 150 feet below, the vein was struck on May 1st. Trullinger and Dunphy have purchased one-fourth interest in the property from the original owners, Henry Lamb and Henry Drought, and have 150 tons of good shipping ore on the dump. Work will continue uninterruptedly in the future, and regular shipments of ore will commence about July 1st.

POORMAN MINING COMPANY.—This company of Burke, Lalande District, has paid its sixth dividend. The mine is being worked to the 300-foot level, and the shaft is being sunk another 100 feet. The company has contracted for all its output up to next fall, amounting to about 14,000 tons. The working expenses, including mining and concentrating, are estimated at \$20 per ton of ore and concentrates, which leaves a net profit to the owners of \$25 per ton.

WASHINGTON COUNTY.

From a letter of a correspondent of the Idaho *Statesman*, at Weiser, we take the following: Quite a movement is taking place in mining circles. The Mineral City camp has had a good road built from the bridge below Weiser. The State of Oregon contributed \$10,000 to the road. The trip can be made to Mineral in about four hours.

The steamboat is now nearly completed, and will make a trip every other day during six months in the year. An expenditure of a few thousand dollars to take the boulders out of the shallow places in the Snake river, from the bridge down to Seven Devils, will make the navigation good the year round. Ores can then be shipped cheaply and profitably from all the mines, Mineral, Ruthburg and Seven Devils. Idaho will, next season, put in, an application for an appropriation for the improvement of the navigation of Snake River. Statchood advantages will be felt at once and on this point.

The new boat will have staterooms and passenger saloons, furnishing lodgings and meals on the trip. This steamboat on the Snake River to the Seven Devils mining camp means a saving of \$20 per ton in carrying copper ores. Copper has been packed to Weiser for \$60 per ton, railroad freight to smelter, \$25 per ton, railroad, and profit per ton \$60. It will hereafter be steamboat freight \$10 per ton, therefore a lower grade ore can be shipped and \$60 per ton profit made, or, if high grade ore is still shipped, the profit will be \$80 per ton. Some of the mines of the district are bonded until July 1st. In our issue of May 17th we referred to the copper mines of the Seven Devil district.

KANSAS.

A special report shows that during the week ending May 31st the output of ore from the mining district of Galena and Empire City was: Rough ore milled, 2,714,820; zinc ore pounds sold, 1,276,000; lead ore pounds sold, 540,000. The sales aggregated total value, \$25,450; total value of output, \$29,640.

MICHIGAN.

COPPER MINES.

(From our Special Correspondent.)

HANCOCK, June 4.

It has been stated that Thos. F. Mason, president of the Quiney Mining Company, has decided to explore section 5 and S. W. ¼ of section 4, town 55, range 33, during the coming season. The land lies on the copper range, north and east of the Peninsula Mining Company's property. On his recent visit to this district Mr. Mason inspected the Pewabic lode at its openings on the Peninsula property. He is quoted as saying that he considered the showing made very promising.

ATLANTIC MINING COMPANY.—This company made an output of 209 tons, 330 lbs. for the month of May. The April output was 184 tons 485 lbs., while that of March was 210 tons 30 lbs.

CALUMET & HECLA MINING COMPANY.—The output of this company for the week ending June 2d was 782 tons 1,815 pounds. The May output of the company weighed up 3,733 tons 995 pounds, against 3,543 tons 1,435 pounds for the month previous. The total product since January 1st has been 16,587 tons 995 pounds. The company has ordered five Brush dynamos which are to furnish power to run certain of the deep pumps of the mine. The plant is to be located in the old Calumet gear-house, where the surface machinery of the two main engines, No. 3 Calumet and No. 1 Hecla, were located before their use was discarded. The introduction of electricity by this company for the purpose of furnishing power is more of an experiment, and if it proves successful will be followed

by the establishment of an extensive plant for the purpose of furnishing power for drills, pumps, and underground tramping. It is understood that other lake mining companies await the results of the experiment with much interest, and with an idea if successful to put in similar plants. The company has started the foundation of No. 8 south Hecla shaft house. No. 6 has been completed; No. 7 is in the process of construction.

COPPER FALLS MINING COMPANY started up its stamp mill last week. At the present price of copper the mine can be made to pay.

FRANKLIN MINING COMPANY.—This company produced 202 tons 580 pounds of mineral in May against 208 tons 1,380 pounds during April. The product since January 1, 1890, has been 1,014 tons 1,900 pounds.

ISLE ROYAL LAND CORPORATION, LIMITED.—The company of English capitalists, which owns the greater part of the island of Isle Royal, has just started operations on its property. This company commenced last season to explore the island for copper deposits by cross-cutting the surface. Considerable time was necessarily spent at the beginning in establishing camps, cutting trails through the dense forests, and re-establishing the stations of the government survey made 45 years ago. After this preliminary work was executed, a number of lodges were opened, and a good showing of copper made in several of the openings. The company considered these developments of sufficient moment to warrant a resumption of operations on a much bigger scale this season. A systematic exploration has been commenced and will be continued until the company has a fair idea what its property is worth. Some mining may be carried on this season.

KEARSARGE MINING COMPANY.—Explorations on this property were started last week. At the present writing the drift is being penetrated. It is the purpose to crosscut the Calumet conglomerate at different points. This lode was opened several years ago on the property, making a lean showing, the investigations, however, being exceedingly limited in extent.

MICHIPICOTEN COPPER PROPERTY—Hon. T. B. Dunstan, of Hancock, has just returned from Michipicoten Island, where he went as an expert to examine the copper lodes which have been opened on that property. The island is owned by Jos. Cozens, of the Canadian government, and is 17 by 7 miles in extent, and is crossed, so far as is known, by two belts of copper, an amygdaloid and a conglomerate. This latter, Mr. Dunstan says, makes a showing which will warrant exploration. The deposits are supposed to be a continuation of the Isle Royale formation, inasmuch as they dip to the south. Our informant was of the opinion that some money would be spent in exploring the property during the present season.

PENINSULA MINING COMPANY.—This company makes a small showing for the month of May on account of the strike among its employes. The output was 58 tons 1,825 pounds against 70 tons 730 pounds for the month preceding. The appearance of the openings which this company is making on the Pewabic Amygdaloid, which passes through its property, continues to be encouraging. This lode is the same as that from which the Quincy, Pewabic and Franklin have taken their millions. It is but about three miles north of these properties, and on the same side of the supposed fault in the formation. A shaft is being sunk which it is understood will be carried down for a considerable distance. It has been decided to sink No. 1 shaft in the conglomerate to the ninth level. If the mine is properly opened up it will become a dividend paying property. A meeting of the shareholders of this company will be held on July 1st at the offices, 80 Broadway, New York, for the election of a new Board of Directors. It is understood, and stated authoritatively that on that occasion the number of shares will be increased from 40,000 to 80,000, and the stock will be made assessable. Other important matters in connection with the future policy of the management of the mines will also be submitted for the action of the meeting.

QUINCY MINING COMPANY.—The Quincy is constructing a large addition to its rock house for the purpose of making room for a steam hammer. This machine is something entirely different from anything which has been used to clean mass copper. It consists of a 10-inch steam cylinder having an 18½ inch stroke and working a 400-pound shoe within a shallow mortar. Forty per cent. of the Quincy's production consists of mass copper. These masses vary in size, most of them being small and widely disseminated through the rock. These latter rapidly fill up the mortar of a head of Ball stamps, necessitating frequent stoppages for cleaning. When the new mill, with its equipment of two head of Ball stamps, was started, it was found expedient to sort out this rock; the old stamp mill was restarted for the purpose of treating it. When this steam hammer is in use it will obviate the necessity of running the old mill. It is probable, however, that this old mill will be run through the summer, providing sufficient rock can be supplied. A foundation is being laid at the new mill for a third head of Ball stamps. The different parts, including a solid base, have been ordered, and as soon as delivered will be set up.

ST. MARY'S MINERAL LAND CANAL COMPANY.—Your correspondent has it from inside sources that the St. Mary's Mineral Land Canal Company has decided to thoroughly explore certain of its lands located in the copper range in Ontonagon County during the present season. It is believed that well directed exploration on this section of the range would be productive of gratifying results. A vast tract of mineral land lying within the copper belt is practically unexplored, and it is believed by many to be the dwelling place of a second Calumet & Hecla.

TAMARACK MINING COMPANY.—This company started hoisting operations at No. 1 shaft, Monday, after an enforced idleness of six weeks, caused by the burning of the hoisting plant. The output of this mine was little or nothing during the month of May. We have it from inside sources, that in the future the output will be materially increased over previous showings—probably about 250 tons a month. It will be easy for the mine to do this, inasmuch as it has an additional shaft (No. 2) in operation, while a fourth head of stamps at the mill is ready for use. Additional pumping facilities are being added to the mill, and it is stated that a fifth head of stamps will be put in before 1891 rolls around.

TECUMSEH MINING COMPANY.—Johnson Vivian, of the Franklin, Huron and Centennial Mining properties, has been placed in charge of the Tecumseh property with instructions to re-open its old workings. An assessment of \$2 a share, now half payable, the remainder due October 1st, has been levied to prosecute this work. The property lies in a long, narrow stretch along the mineral range, joining the Osceola on the south. It is to be described as follows: S. E. ¼ of S. E. of Sec. 27, the N. ½ of the N. E. ¼, and the E. ½ of the N. W. ¼ and the S. W. ¼ of the N. W. ¼ of Sec. 34, and S. ½ of the N. ½ of Sec. 33, and the S. ½ of the N. E. ¼ of Sec. 32, all in town, 56 range 16. The drift, which covers the property at a uniform depth of about 70 feet, renders exploration difficult. The company was organized in March, 1880, and during the same year it opened both the conglomerate and amygdaloid belts on the property. The causes which were instrumental in closing many of the mines of the district, caused a suspension of operations at the Tecumseh. Under the present favorable outlook for the future the property can be considered bright.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, June 2d.

The output for the two weeks ending the 31st ult., though large, would have been still more so but for the heavy rain storm which, on the 30th and 31st ult., flooded many localities.

The sales from the different districts are as follows: Joplin mines, 2,175,089 pounds zinc ore and 336,433 lead; value, \$36,239.

Webb City mines, 2,165,495 lbs. zinc ore and 123,405 lead; value \$31,220.

Carterville mines, 811,740 lbs. zinc and 100,392 lead; value \$12,916.

Zincite mines, 579,180 lbs. zinc ore; value, \$7,606.

Lehigh mines, 287,500 lbs. zinc ore; value, \$3,737.

Oronogo mines, 60,630 lbs. zinc ore, silicate 34,600, lead 8,630; value \$1,118.

Cartilage Mines, 259,500 pounds zinc ore; value, \$3,733.

Galena, Kans., Mines, 1,976,460 pounds zinc ore and 500,000 lead; value, \$42,710.

All districts, total sales, \$139,279.

The price of zinc ore was during the last week stationary, but lead rose to \$23.50 per thousand. The most important event of last week was the arrival of the Commercial Club excursionists of Kansas City, on Tuesday. They were met at the depot by a committee from the Joplin Club, and escorted in carriages to the Business Men's Club, where an informal reception was held. No regular programme for the sight-seeing in the following days was carried out. Some of the visitors were driven to the mines, others to the Picher White Lead Works and Empire Company's Zinc Smelters. Nearly all the excursionists, however, visited the lead and zinc mines on the Empire.

Allen and Diamond mines southwest of the city. Capt. Holibaugh, the mining expert, and Chas. Stadler, assisted by J. C. Steely, were instrumental in taking an instantaneous photograph of the sight seers as a souvenir of the Commercial Club's first visit to the lead and zinc mines of Joplin. Afterwards the visitors were driven to Gulf Depot where the train took them to Neosho over the Kansas City, Ft. Smith and Southern road. John McElhaney, Lee D. Bell and other citizens, of Neosho, had come upon the morning train to escort them down.

In Neosho, the most picturesque town of Southwest Missouri and 18 miles from Joplin, the visitors were, after refreshments, taken to the government fish hatchery and afterwards to the Neosho Club rooms, where Dr. Woods, president of the Scarritt Institute, delivered a witty address of welcome.

President Faxton replied on behalf of the Commercial Club and addresses were made by Colonel Bullene, Colonel Warder and others. On the arrival back to Joplin President Faxton called the Commercial Club to order and offered resolutions, which were adopted unanimously, expressing the

thanks of the Commercial Club of Kansas City to the citizens of Joplin, for the hospitality and courtesy shown the club on this occasion.

The guests left for Webb City to inspect the great mines, where they, despite the short stay, were convinced of the fact that Southwest Missouri is an exceedingly rich mining district.

Holibaugh & Van Ness, mining engineers, have just completed a map of the Joplin mining district. Mr. Holibaugh has worked for over one year securing data for this excellent map.

One large four-deck kiln, to be used for roasting the low-grade refractory Colorado ore at the Picher White Lead Works, has been completed and work commenced on two more.

THE CAVE SPRINGS MINING COMPANY.—This company, composed of Phil Pfening, O. H. Picher and M. E. Brinkerhoff, operates on a tract of land, about three miles west of the city, where recent development has opened up some of the largest bodies of zinc ore ever seen in this district.

THE DIAMOND COMPANY.—This company is putting in more machinery at its crusher plant, and has in week before last, though it only worked the mines three days, turned out 92,860 lbs. zinc ore and 25,820 lead.

Huble & Puckett have opened up a large body of lead from which they produced 42,000 week before last.

THE RUBEY MINING COMPANY.—This company, two miles south of the city, is putting up an extensive new steam plant of machinery, the estimated cost of which is \$10,000. It has not been running full force in the mines the past week. The shaft, which is being sunk, has pushed through 40 feet of schist, and now has favorable indications of zinc ore and water.

THE VICTOR MINES.—These mines produced and sold from January 11th to May 10 h, 1890, \$13,519.90 worth of zinc ore. The operating expenses all told amounted to \$4,900, leaving a net profit for the four months of \$8,619. At this rate the annual profits would amount to \$25,860.

MONTANA.

DEER LODGE COUNTY.

BI-METALLIC MINING COMPANY.—At the regular annual meeting of the stockholders of this company, held at Granite recently, the old trustees and board of directors were re-elected. The west drift on this property, No. 5, continues to show good width, carrying a small pay streak on north wall averaging 100 ounces. West drift, No. 6, shows 3½ feet of 50 to 65-ounce ore, and the pay streak in No. 7 continues to hold its own.

CHAMPION MINING COMPANY.—The shaft on the Champion, Oro Fino district, is being sunk to the 500 foot level, the deepest workings in the district, and its progress, says the *Helena Journal*, is being watched with considerable interest. A depth of 430 feet has recently been reached, the working being in lead matter carrying a small quantity of good ore. This is not the main lead, however, as that will not be reached until a crosscut is run from the 500 foot level. Some difficulty is experienced from the heavy flow of water that has recently come in, but, notwithstanding this, progress is being made at the rate of thirty inches a day, three shifts being employed in the work. The Champion mill at Deer Lodge is turning out bullion at the rate of about \$7,000 per week.

JEFFERSON COUNTY.

GOLD DUST MINING COMPANY.—Mr. W. G. Gooding is the authority for the assertion that this company, which was organized about a year ago under the Connecticut laws (see *ENGINEERING AND MINING JOURNAL* for November 30th and December 21st, 1889), is about to be reorganized under the laws of Montana. The original capital was 1,200 shares of \$25 each, which is to be replaced by a capital of 500,000 shares. Four hundred thousand shares are to be used to replace the stock of the old company, and 100,000 will be placed in the treasury, to be used for development purposes. Out of the 100,000 shares of treasury stock, 50,000 will be placed on the market at 25 cents per share, for the purpose of buying hoisting machinery.

LEWIS AND CLARKE COUNTY.

IRON MOUNTAIN MINING COMPANY.—At a meeting of this company held at Helena last week, the following board of trustees was elected: R. S. Hale, Samuel Word, A. M. Holter, Charles Kauffman, C. L. Dahler, M. E. Downs and Frank Hall. The officers subsequently elected were: President, R. S. Hale; vice-president, Samuel Word; treasurer, C. L. Dahler; secretary, Robert A. Luke. The superintendent's report showed the property to be in good condition, with plenty of ore ready for shipment. The Helena and Lexington Company, though not now in operation, have contracted for the entire output of the mine for a stated period, and ore shipping will commence as soon as the roads, which are still covered with snow, are open.

MEAGHER COUNTY.

BELT MOUNTAIN MINING COMPANY.—At a recent meeting of stockholders of this company in Great Falls, the following directors were elected for the ensuing year: George W. Taylor, Frank A. Dowd, John C. Lilly, W. S. Wetzel and Joseph Lessard. Subsequently the directors elected James F. Lewis, president; Frank A. Dowd, vice-

president; Geo. W. Taylor, secretary; F. C. Roosevelt, treasurer. The property of the company embraces ten of the oldest claims in the Barker district, including the Cumberland, Jumbo, Daisy and Red Cloud, which have been developed sufficiently to demonstrate their value. Active operations will soon begin.

HIDDEN TREASURE.—This mine of Castle has been stocked for \$2,500,000. This mine was bonded by A. M. Essler in the early excitement of that camp for \$30,000 and as he failed to get an extension of time from the owners, who could not agree among themselves, he did not take the property. Since then the ownership of the mine has narrowed down to Louis Heilman, Chas. Mayn and A. M. Henry, of White Sulphur; Louis Rotwit, of Helena, and T. E. Collins, of Great Falls. From the White Sulphur Springs *Husbandman*, we learn that the Hidden Treasure lead, as cross-cut, shows a large vein of carbonates and iron between well defined walls of porphyry and dolomite, the carbonates assaying \$10 in gold, from 49 to 50 ounces in silver and from 50 to 60 per cent. lead, and 20 tons of this ore worked in the Castle smelter last year netted \$45 per ton. The mine is on the line of the Cumberland, Great Eastern, Yellowstone, Alice and Judge, and about the centre of the mineral producing belt. The property is being surveyed for patent, and development work has also begun.

PARK COUNTY.

LIVINGSTON AND COOKE MINING COMPANY.—This company has been incorporated by J. C. Vilas, S. Deutsch, T. H. Smith, Jas. McNaughton, M. A. Peterson, and A. J. Campbell. The capital stock is \$1,000,000 in 500,000 shares at \$2 each. Operations will be in and around Cooke City, and offices at Livingston.

SILVER BOW COUNTY.

AMY AND SILVERSMITH MINING COMPANY.—The Supreme Court on the 22d ult. rendered a decision in the case of J. A. Murray et al. vs. this company. The defendant had followed up its lead into plaintiffs' ground, and the latter brought suit for \$80,000. The lower court decided in favor of the plaintiff, but the Supreme Court reversed this, holding that the defendant has a right to follow a dip vein within its own lines, even though it goes into the ground of other parties. The same question is also involved in a number of other cases now before the Montana courts, notably that of the St. Louis Mining and Milling Company vs. The Drum Lummon. The case will be appealed to the United States Supreme Court.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—This company is pushing work at its new smelter at Great Falls. It intends erecting two concentrators of a capacity of 250 tons of crude ore daily. One concentrator will be fitted up with crushers and rolls, while the other will have a Ball steam stamp for crushing the ore. It also proposes to erect fifteen Brickner roasting cylinders. The present intention is to erect only reverberatory furnaces for producing matte. Presumably the plant here will be sufficient to treat the coarse first-class ores that are washed in open piles. It seems a somewhat strange policy of the company to haul its low grade ore so great a distance to concentrate it. Of course, water is a great desideratum in concentrating, but the freight and handling of the raw ore will cost as much as the whole process of handling and concentrating costs some of the other companies here. If lack of water were the only reason the company had for moving its plant from Butte, it could have found an abundance within a very few miles of the mines.

(From our Special Correspondent.)

BUTTE CITY, May 19.

A new idea is being applied in one of the Butte smelters to roasting in Bruekner cylinders. It consists of a water-jacketed pipe that extends through the whole length of the cylinder. Air is forced through the pipe, which has several small pipes tapped into it against the burning ore. The result is very satisfactory, the sulphur burning off as completely in 16 hours as before in 24 hours. The cost per ton for roasting is thus largely reduced. The patentee is a Mr. E. M. Clark, of this city, and he certainly has a patent that promises to prove profitable both to himself and those who use it.

ANACONDA COMPANY.—This company is using its best efforts to pump out the two mines that were flooded for the purpose of extinguishing the fire, and are causing the water to lower at the rate of 10 feet in 24 hours. The water that is pumped out is very thoroughly impregnated with copper. The action of the fire, then the steam, which was forced into the mines through the pipes of the air compressors, and afterwards the water, which was pumped into the upper levels and allowed to filter down through the ground, have together been very active in forming soluble sulphate of copper. The water from the mines runs down through a gulch, and this gulch, like all gulches unhappy enough to be in the neighborhood of Butte, is a resting place for all manner of old pots and pans, of all sizes and denominations. These old pots and pans are getting perfectly rotten from the copper in the water depositing on them. It seems strange that the company does not take some steps toward saving this copper. It will be several weeks yet before the mines can be entirely pumped

out. So far the ground seems in good condition, but as the water goes down the probabilities are that much ground will cave. The Anaconda smelter is running, so far as can be learned, to its full capacity. After the fire in the Anaconda and St. Lawrence mines, the men thrown out of employment at these mines were transferred to others belonging to the company. These other mines were pushed hard to keep up a sufficient supply of ore for the smelter. After the water is pumped out of the Anaconda and St. Lawrence, and they again become producers, the men will be gradually taken off the other mines, so that no great difference will occur in the output of copper from the smelter. The chief difference in output will arise from the fact that the producing mines now are argentiferous, and it takes more charges to produce the same amount of copper in the matte. The Anaconda and St. Lawrence produce ores carrying little or no silver, and where it is possible to smelt eight or ten charges of copper ore in twenty-four hours, it is not probable that more than six or seven charges of argentiferous ore would be smelted in the same time. The company, at present, is producing about 2,750 tons of fine copper monthly; with the Anaconda and St. Lawrence mines producing as much ore as formerly, the amount of fine copper produced is not likely to increase more than 10 or 15 per cent.

Later letter dated MAY 26, 1890.

ANACONDA COMPANY.—The work of pumping the water out of the St. Lawrence and Anaconda mines has been seriously interfered with owing to the amount of copper and acid in solution in the water. The water pipes and pumps soon became eaten out, and all the pumps, about 30, that were got ready and were being used to pump the water out of the shafts are practically useless. A steel tank has been made, to hold 700 gallons, which runs up and down in the shaft, and they hope to get out the water by this means.

It is probable that they will fall back upon wooden tanks if the steel tanks are found to wear out too quickly. The turn sheets, rails, and, in fact, all iron exposed in the mines have been completely eaten up by the copper and acid. It seems to us that it would be good policy on the part of the company to buy scrap iron and throw down the shaft and delay operations for a short time. The amount of iron required to take up the copper in solution would be hard to calculate, as probably so long as the water is in the mine more or less copper is going into solution.

BUTTE AND BOSTON MINING COMPANY.—This company is getting another blast furnace ready for operation. We believe the intention is to throw aside the one that has been in use during the past year as soon as the new one is ready. Two 8½x18½ feet Bruekner cylinders are being erected. The total calcining capacity when these are completed, will be two O'Hara furnaces and two Bruekner cylinders. The smelting plant consists at present of one blast furnace erected last year, and two reverberatory furnaces. Of the latter only one has been used; one reverberatory and one blast furnace having been found sufficient to smelt all the ore the mines were producing. The company is erecting new hoisting works on the "Belle of Butte" mine. The mine yields no copper, and the ore is used in the company's mill. The Gray Rock mine yields a copper-silver ore, but of so refractory a character that the company is unable to smelt it. Four or five hundred tons of this ore were taken to the smelter and roasted in piles several months ago, and are still there. This leaves the "Silver Bow" mine as the only copper producer the company has at the present time. About 100 tons of ore are raised daily, most of it being concentrating ore; the first-class ore appears to come in streaks or bunches. For a few days 15 or 20 tons of first-class ore may be hoisted daily, and then for another few days hardly any at all is obtained. The first-class ore is taken to the smelter and used as soon as mined, so as to keep the furnaces going. It would seem to us better policy on the part of the company to smelt its calcined ore in the two reverberatories for a month or two, and allow the first-class ore to accumulate and be roasted in piles while the blast furnace is closed down. While coarse ore can be roasted in piles for 50 cents per ton, the fine ore cannot be calcined at less than \$2 per ton, and we doubt if the company can calcine even at that figure. If there were a supply of pile roasted ore for the blast furnace, a large quantity of green concentrates could be used. As it is now, the concentrates have to be calcined in order to bring up the grade of matte, which the green coarse first-class ore would otherwise tend to keep low. We estimate the output of the company at not more than 350,000 pounds fine copper monthly. The silver contents of the matte is too low to be commercially valuable. In view of the amount of construction work going on, it appears to us that the company's record as a non-dividend payer will be kept up for some considerable time. It is stated that it is intended to erect a 300-ton concentrating plant, and that it is expected it will be located near the smelter. The present concentrator the company is leasing has barely sufficient water to run, and is only about 100 tons capacity. If a larger plant is erected the water question will require serious consideration.

PARROT COPPER COMPANY.—This company has erected two new converters, somewhat large

than those in use before. Including the matte this company handles for the Boston and Montana Company and for the Butte Reduction Works the capacity of its plant is likely to enable it to turn out two million pounds of fine copper monthly in the shape of pigs running about 98 per cent. copper and one per cent. silver.

NEVADA.

(From an Occasional Correspondent.)

ESMERALDA COUNTY.

In Aurora two English companies, the Esmeralda Con. and the Humbolt Electric Power, are operating with encouraging prospects. They are both under the management of R. K. Coleord, former y of the Syndicate mines, in Bodie, Cal. Aurora was once a booming camp, with several large mills.

LAUDER COUNTY.

An antimony mine has been located in the Toiyabe Mountains, 15 miles from the Nevada Central Railroad. The vein is said to be wide and carries a large per cent. of metal. The owner found the mine 27 years ago and thought it was silver, but when he learned that the metal was not silver he dropped the location in disgust. Antimony being in demand now the ore is worth about \$30 a ton loaded on the cars and the owner is glad to take up his location again.

STOREY COUNTY—COMSTOCK LODGE.

ANDES MINING COMPANY.—In San Francisco, May 28th, Judge Coffey heard the petition of this company and Moyle & Holling, to make an order revoking a former order allowing \$250 a month out of the estate of the late Michael Landers to his widow, Amy Landers. The petitioners set forth that in April, 1886, before the death of Michael Landers, they had sued him and others in the Superior Court to recover a large sum of money, their complaint in that case setting forth that between the 9th of July, 1882, and the 2d of June, 1884 Landers, while President and Treasurer of the Andes Company, had appropriated funds of the company aggregating over \$160,000; that with the money he had bought real estate in San Francisco and erected \$60,000 worth of improvements thereon; that the case went to the Supreme Court, which declared that the cause of action was not barred by the statute of limitation; that the case was still pending and was sure to be decided on the merits in favor of the plaintiffs; that the Landers estate was appraised at \$120,000, and that the \$11,000 thus far drawn by the widow for the family allowance and the \$2,900 she had paid her lawyer came from property acquired in the manner stated.

POTOSI MINING COMPANY.—Superintendent Hamilton states that the average assay value of the ore in the bottom of the winze below the 930 level, in the Potosi mine, is \$25. The assays taken across the winze bottom ranged from \$4 to \$50 per ton. A hoist engine is to be immediately set up at the top of this winze, which is down a lift over 130 feet on the incline. As soon as the winze is down 100 feet vertically, about 150 feet on the incline, a station will be opened and the ore followed north and south. At the same time sinking the winze will be pushed as rapidly as practicable. No work is being done on the 1,200 level of the Potosi or at any point below the 930 level except in the winze.

PENNSYLVANIA.

COAL.

The perhaps largest coal sale ever made in Indiana County has been consummated by Theodore Pantell and H. E. Giuter. The land was sold to a party of capitalists from New York, and embraces 18,000 acres of coal in the Punxsutawney basin. The price paid, it is said, was \$50 an acre for the coal alone, and land was purchased in fee simple at from \$60 to \$75 per acre, aggregating about \$1,000,000.

PHILADELPHIA AND READING COAL AND IRON COMPANY.—This company's Monitor colliery at Ashland has resumed operations after five months' idleness.

ROBERT MORRIS LAND AND COAL COMPANY.—An answer has been filed in the United States Circuit Court at Pittsburg in the suit of the Robert Morris Land and Coal Company, of New York, against the Philadelphia & Reading Coal and Iron Company. [See the ENGINEERING AND MINING JOURNAL, August 3d, 1889.] The answer denies the allegation that the complainant is owner of any part of the land in dispute, but says the fee simple is in the defendant. The amount of coal being mined by the defendant company on the property, which is in the Pennsylvania anthracite region, is 1,220,000 tons per year. The defendant denies that the assets of the company are mortgaged for more than they are worth, and asserts that the assets exceed all the liabilities of the company and all claims against it. It is denied that the defendant has any information of the intent of the defendant company and the Philadelphia & Reading Railroad Company to form a trust, and says it has no intention of entering into any such combination or trust as charged in the bill. The lands involved are valued at \$20,000,000.

STANTON.—The fire bosses at this mine, in Wilkesbarre, have reported the mine so full of gas as to be dangerous. Work has been suspended for the present.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to May 30th, were as follows:

| | 1890. | 1889. |
|-------------------|-------------|-------------|
| | Gals. | Gals. |
| From Boston | 1,216,610 | 1,698,441 |
| Philadelphia..... | 51,554,640 | 51,719,302 |
| Baltimore..... | 3,557,543 | 1,277,883 |
| Perth Amboy..... | 4,994,743 | 8,427,592 |
| New York..... | 152,318,669 | 159,999,890 |
| Total | 213,642,205 | 223,033,078 |

FOREST OIL COMPANY.—The Standard Oil Company has purchased this company, it is said, for \$1,600,000 and a promise to take the remaining \$400,000 stock above par. The Forest Oil Company started ten years ago with a capital of \$100,000, and has steadily increased its capital stock. It has 50,000 acres of producing territory, and its receipts in the last ten years have been \$4,630,000. It also owned a controlling interest in the Washington Oil Company and the United Gas Trust.

SOUTH DAKOTA.
LAWRENCE COUNTY.

The first clean-up at the Deadwood chlorination works was completed May 28th, and consisted of about 800 pounds of ore, having an assay value of about \$7.50 a pound; total value of clean-up, \$6,000, or \$2,000 more than anticipated by any one connected with the company or works. Total tons run, 360, of an average assay value of \$19. Tailings assay only \$2 in gold, which tallies with the salvage of about \$17 a ton. Ore run was exclusively for Golden Reward, which company has 1,500 tons at the works. The sulphides will be sent to the Omaha or Aurora smelter. Hereafter, clean-ups will be delivered in bullion.

Operations up to the present time have been largely experimental, and materially impeded by defective filters. Various devices were tried, with poor success, until Mr. John E. Rothwell took charge of the chlorination works. He has introduced a number of important improvements in the arrangement of machinery and in the details of treating the ore whereby time, labor and money are saved. The company has decided to put in another barrel, increasing the capacity of the plant to 60 tons a day.

CORA.—This mine, situated in the Galena district, has yielded well from the surface, says the Deadwood Times, in galena and carbonate ores, the bulk of which, shipped to Omaha and Aurora, returned from \$100 to \$500 a ton. The property is the most extensively developed in the district, the main tunnel, over 500 feet in length, and numerous crosscuts are said to be all in ore. Recently the tunnel broke into a body of black sulphurets mixed with galena and iron, which is said to be the richest of any ore heretofore found in the district.

UTAH.
JUAB COUNTY.

TREASURE CONSOLIDATED GOLD AND SILVER MINING COMPANY.—This company is making preparations to put a large force of men at work on its property soon. The company owns four claims adjoining the Millar mine, and has over 950 feet of work done on one mine alone, with ore in sight; but it is not the intention to work the ore in sight at present; the main tunnel will be run in 300 feet further to tap the main ore body, and for this purpose alone stock is being sold. These mines are said to have shipped ore every season.

WASHINGTON.
SPOKANE COUNTY.

(From Our Special Correspondent.)

The Northern Pacific Reduction Works, of Spokane Falls, in its circular setting forth the advantages it offers as an inducement, states that it owns no mines, but intends to buy its ores. This appears to us a decided drawback to the company as an investment. If the Great Falls, and the Helena, Mont., smelters had their own mines to fall back on they would not have had to close their works for want of ore. We fear that the Spokane smelter, if erected, will find that it is not so easy to buy custom ores at a price low enough to make a profit. If the company puts up an extensive plant and finds in a few months that it has no ore to smelt, we do not think the promoters need have much cause for surprise.

WEST VIRGINIA.

According to the Pittsburgh Chronicle-Telegraph, Alexander McBean, a wealthy Scot from Glasgow, has purchased a tract of 50,000 acres of land in Wyoming and McDowell counties. He proposes to establish McBean City, and to open the coal and iron mines of his lands, and to fully develop their resources and establish various industries.

FOREIGN MINING NEWS.

INDIA.

THE BENGAL IRON AND STEEL COMPANY (LIMITED).—The iron works owned by this company at Burrakur, are a few miles distant from the junction of the East Indian and Bengal-Nagpur railways, where, according to Indian Engineering, arrangements have been made for the production of 30,000 tons of pig iron per annum from the ironstone and coal found in close proximity to the property. In the foundry, preparations have been made for turning out cast iron water pipes,

sleepers and other railway materials in very large quantities, the molding being accomplished by hydraulic machines of the latest pattern, at rates which will render European competition difficult. The output of these works will not be confined to pig iron and casting, but the production of wrought iron and steel, and its manufacture into beams and bars will be commenced, and eventually the rolling of rails, girders, joists and all sections of iron and steel in common use on railways and for building purposes.

MEXICO.
SONORA.

The Nogales Herald is informed that the Baranca coal fields of Santa Clara have been bonded for six months for the sum of \$200,000 net gold. Of this amount \$10,000 cash has been paid in New York on account to the owners, N. Graff & Co. The parties who have the bond are perfecting an organized company to construct a railroad from Guaymas to the coal fields. They expect to commence work on the railroad within six months. The road will pass through a section of country rich in mines of gold, silver and copper, that only needs cheap transportation to have them opened on a large scale.

NOVA SCOTIA.

GOLD.

(From our Special Correspondent.)

The following return shows approximately the amounts of quartz crushed and gold extracted in the different mines this year up to the end of April:

| Locality. | Tons crushed. | Ounces gold. |
|------------------------------|---------------|--------------|
| Salmon River..... | 2,250 | 718 |
| Oldham..... | 376 | 442 |
| Caribou and Moose River..... | 2,490 | 411 |
| Nuracke..... | 961 | 645 |
| Lake Cateha..... | 658 | 421 |
| Whiteburn..... | 433 | 380 |
| Fifteen-Mile Stream..... | 463 | 307 |
| Stormont..... | 738 | 397 |
| Tanger..... | 83 | 32 |
| Brookfield..... | 1,316 | 821 |
| Renfew..... | 275 | 103 |
| Leipsigabe..... | 27 | 34 |
| Wine Harbor..... | 158 | 69 |
| Randon..... | 285 | 272 |
| Montagu..... | 333 | 731 |
| Malaga..... | 1,361 | 863 |
| Gold River..... | 100 | 40 |
| Total..... | 12,307 | 6,676 |

POLAND.

Several new coal beds have been discovered in the Government of Piotrkow in the course of the last few months, all in the district of Bendzin, except one in the district of Olkns: but they will not be worked until all the necessary administrative formalities have been gone through. As yet, little is known beyond the fact that the coal is there, but as there are already numerous coal mines in that part of Poland, the discovery now announced may eventually considerably increase the coal supply of Poland, upon which the prosperity of the country materially depends.

MEETINGS.

Bunker Hill Mining Company, at Central City, S. Dak., June 24th, at 2 P. M.
Collingwood Mining Company, at Deadwood, S. Dak., June 10th, at 2 P. M.
Darboj Mining Company, at Central City, S. Dak., June 17th, at 3 P. M.
Florence Gold and Silver Mining Company, at Central City, S. Dak., June 17th, at 2 P. M.
Rubicon Mining Company, at Deadwood, S. Dak., June 10th, at 2 P. M.
Steward Mining Company, at the office of A. D. Clark, Buffalo Gap, S. Dak., June 10th, at 2 P. M.

ASSESSMENTS.

| COMPANY. | No. | When levied. | D't'nt' in office. | Day of Sale. | Am't per share. |
|------------------------------------|-----|--------------|--------------------|--------------|-----------------|
| Aeme, Cal..... | 10 | Mar. 20 | May 15 | June 9 | .03 |
| Aztec, Mich..... | ... | May 10 | June 10 | June 25 | 10 |
| Beleber, Nev..... | 39 | Apr. 29 | June 3 | June 24 | .50 |
| Bst & Beleber..... | 46 | May 13 | June 17 | July 8 | .25 |
| Bodie, Cal..... | 16 | May 21 | June 25 | July 16 | .25 |
| Challenge Con., Nev..... | 6 | May 14 | June 17 | July 8 | .50 |
| Confidence..... | 16 | May 10 | June 13 | July 2 | .75 |
| Con. Imperial, Nev..... | 27 | Apr. 17 | May 22 | June 11 | .65 |
| Con. New York..... | 3 | May 22 | June 28 | July 17 | .15 |
| Del Monte, Nev..... | 3 | Apr. 16 | May 22 | June 13 | .20 |
| Found Treasure..... | 6 | May 22 | June 26 | July 18 | .25 |
| Gold Hill, Cal..... | 9 | Apr. 17 | May 24 | June 10 | .25 |
| Gould & Curry, Nev..... | 64 | Apr. 28 | June 3 | June 26 | .30 |
| Guasucaran & Cal., C. A..... | 1 | Apr. 2 | June 3 | June 24 | 10 00 |
| Hartshorn, S. Dak..... | 5 | May 24 | June 30 | July 19 | .004 |
| Holmes, Nev..... | 12 | May 19 | June 24 | July 15 | .25 |
| Mexican, Nev..... | ... | May 13 | June 18 | July 9 | .25 |
| Morning Star, Ariz..... | 1 | Apr. 30 | June 5 | June 25 | .02 |
| N. Commonwealth, Nev..... | 3 | Apr. 16 | May 21 | June 12 | .25 |
| Occidental Con. Nev..... | 6 | Apr. 28 | June 6 | June 30 | .25 |
| Oro Cache, Dak..... | 2 | May 2 | June 5 | June 21 | .004 |
| Sea-bury-Calkins Con., S. Dak..... | 12 | Apr. 5 | May 19 | June 9 | .30 |
| Seg. B. & Mides, Nev..... | 6 | May 5 | June 9 | June 30 | 1.75 |
| Sierra Iron, Cal..... | 7 | Apr. 17 | May 29 | June 23 | .20 |
| Sierra Nevada..... | 97 | May 10 | June 12 | July 2 | .50 |
| Silver Hill, Nev..... | 26 | Apr. 14 | May 20 | June 11 | .25 |
| Teresa, Mex..... | 1 | May 9 | June 13 | June 30 | .10 |

DIVIDENDS.

Aspen Mining and Smelting Company, dividend No. 13, of 10 cents per share, \$20,000 payable June 16 at No. 54 Wall street, New York. Transfer books close June 13th and re-open June 17th.
Caledonia Gold Mining Company, dividend No. 19, of .08 (eight cents) per share, \$8,000 payable June 16 at the office of Laidlaw & Co., No. 14 Wall street, New York. Transfer books close June 9th.

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 657 and 658

NEW YORK, Friday evening, June 6.

"Dull, duller, duller!" The superlative degree of this adjective is the only epithet which will properly characterize the state of the market in mining stocks during the early part of the week. The mining side of the Consolidated Stock and Petroleum Exchange was in a deplorably inactive state, the delightful fluctuations of railroad shares, and the sugar trust proving too attractive to afford "honest" mining transactions the ghost of a chance.

The feature of the week has been that nothing of the slightest importance has transpired. The sameness of the situation at the Mining Exchange is becoming appalling, and when we think of the coming dog-days with their enervating heat and the lassitude that is bound to ensue therefrom among brokers, the prospect promises everything but a "boom." Yet the persistent faith among mining men concerning the benefits to accrue from the passage of the Silver Bill now before Congress tends to cast a rather rosy tint on the situation.

It is confidently asserted by those in whom the wish is father to the thought that the bill will pass the House of Representatives during the coming week. We are not so sure about that, and, anyway, it must also meet with the approval of the Senate and of the President before any steps, based on its passage, should be taken. Inasmuch as dealers in mining shares in this city do not see any feasible plan whereby the former interest in mining among investors could be revived, it is, after all, natural that they should seize, as eagerly as a drowning man will clutch at a straw, something which on its face bears indications of future prosperity in silver mines.

If the Windom Bill will only bring one-half of what our brokers expect, an era of great and general prosperity will be felt. We do not wish to blight any one's hopes, nor do we desire to appear pessimistic in the matter, but if the promoters of wild-cat schemes think that they will strike a bonanza when the much-expected and very much belated boom does come, they are mistaken. The public has had its eye-teeth cut, and we must confess that the operation has been rather roughly performed. A burnt child dreads the fire, and the public will open its pocket and lend its assistance only when firmly convinced of the genuineness of the "boom" and of the mine. Let brokers warn their customers against worthless stocks.

Only the combined efforts of honest men on the Exchange can revive an interest in mining, and the first step is to clear out the wildcats and provide rules and requirements that will prevent their resurrection.

Minnesota Iron Company turns up this week with 600 shares sold at \$83@84.50.

We note no sales of the copper stocks. Alice is one of the few stocks which excite any interest. Sales aggregating 2,400 shares at \$2.30 @ \$2.55 are reported. Moulton was let alone this week, it being the second of its inactive period.

Almost one-half of the total number of shares sold belong to Phoenix, of Arizona, which disposed of 22,300 shares. The stock started at \$1.35, declined to \$1.10, but closed firm at \$1.45. It is understood that the management of the company is to receive the accession of a very desirable element calculated to inspire increased confidence in the genuineness of the enterprise. Advices from Mr. Bradstreet under date of the 28th ult. say that he has enlarged the mill. The concentrating machinery is now in operation and the foundations have been laid for the new stamps, which will be working within a fortnight, making the capacity of the mill 30 stamps.

The remarks which we regularly make about the Comstocks will apply this week. Consolidated California & Virginia opened at \$4.65, declined to \$4.50, and closed at \$4.75 with 550 shares disposed of. There was a solitary sale of Crown Point at \$2.60, and another of Gould & Curry at \$1.80, an advance in the latter of 20 cents over last week. Hale & Norcross at \$2.60. Yellow Jacket at \$3.15 and Utah at \$1 show sales of 100 shares each. Alta was dealt in lightly at \$1.30. Chollar was traded in at \$3.10@3.55. Consolidated Imperial shows a slight advance at 55 cents. Comstock Tunnel, which opened at 20 cents, was sold at the close at 18 cents, with a record of 4,000 shares. It is said that news from San Francisco says the old stockholders who brought the law suit against the company, with which careful readers of this paper are well acquainted, do not stand any chance of winning. Despite these rumors the stock found no trouble in declining.

Julia advanced steadily during the week, closing at 45 cents, or last week's price. Mexican was quiet at \$3.25@ \$3.40. Potosi at \$5.88.

The only dealings in the Tuscaraora was in Belle Isle, which declined from 60 to 50 cents.

Comstock Tunnel shows sale at from 18 to 20 cents.

Horn Silver continues one of the favorites. It showed a declining tendency, but it nevertheless ruled strong. The number of shares sold was 5,550. The stock opened at \$3.70 and declined through the week, closing at \$3.50. Ontario was slightly dealt in at \$44@ \$44.50.

In the Colorado stocks, Monitor was traded in at 3 cents. Iron Silver shows a solitary sale at \$2.10. Leadville Consolidated did the same at 10 cents. There have been sundry rumors afloat about a strike in Little Chief. It is said that the lease at present on the property has not much longer to run, and that the company will itself work the property. These rumors appear unfounded for nobody knows anything definite. The Aspen Mining and Smelting Company has declared its regular monthly dividend of 10 cents per share.

Some pressure seems to have been withdrawn from Brunswick Consolidated, which is on the descending plane. Starting at \$2.10, it declined steadily, finally closing at \$1.20. "Sales" are still put down on the official lists, and the reports would show the uninitiated that 7,800 shares had been disposed of.

Plymouth shows no transactions this week. There are now 40 stamps running at the mine.

Quicksilver, both preferred and common, were in demand during the week, the former selling at \$38.50@ \$42, and the latter at \$7.38@ \$8.

Bodie consolidated was quiet at 50 cents. Standard shows sales of 2,200 shares.

Astoria was dealt in to the extent of 1,700 shares at four cents. Sutter Creek was steady at \$1.50.

Bonanza King was neglected at 20 cents.

El Cristo declined to 98 cents, but since succeeded in closing at \$1.05. Santiago was neglected by its promoters, but 500 shares sold at 50@51 cents.

San Sebastian excited surprise by selling 900 shares at 20@25 cents. Nobody could state any plausible reason for the reappearance of this long absent stock. At the office of the company we were told that the company, as stated by us in a previous issue, has been leased for a term of five years, with an option to the lessee of another five years. A royalty is paid to the company, and we were given to understand that the terms were advantageous to the company.

Boston June 5.

(From our Special Correspondent.)

Since our last letter the market for copper shares has been fairly active, and prices generally are a shade under the highest points reached. At the same time, there is a very firm undertone to the whole list, and a few orders to buy carry prices up again with very little effort.

The position of the ingot copper market is such that the stocks of the dividend-paying mines, with the encouraging outlook for the future, cannot be forced down by any amount of manipulation, and efforts of that kind are generally followed by higher prices than ever. The reports from the mines are all of a favorable character, and indicate that the work of producing copper is being pushed with great energy, and the result will be seen later on in enhanced values all round. In Calumet and Hecla the dealings have been very light, showing a slight decline since last week; sales at \$314 to \$310, recovering to \$312. Tamarack sold early at \$196 and advanced to \$200, with later sales at \$197.

Quincy touched its highest point for the year, viz., \$110, receding to \$100.

Boston & Montana advanced from \$64 to \$66 1/2, but lost the advance, selling to-day at \$63 1/2.

Butte & Boston has been quite freely dealt in the past week, and advanced from \$24 1/2 to \$26 1/2, declining again to \$25 1/2. The reports from this mine are all of a very encouraging character, and it is believed by many that under the management of the new treasurer it will be a second Boston & Montana.

Franklin has ruled quite steady selling up to \$22 1/2 in the early dealings, but losing \$1 1/2 of the advance to \$21 to-day.

Kearsarge and Centennial have been rather inclined to lower prices, especially the former which declined to \$20, while the latter had a little spurt up to \$40, but lost it again and is selling at \$38. Both of these stocks will do to buy on every decline.

Osceola sold at \$40 and declined to 37 1/2 at the latest sale.

Atlantic found buyers at \$23 1/2, but the latest sales were at \$22 1/2.

Allouez declined to \$6 1/2 as the lowest point, with an advance to-day to \$6 3/4.

Huron, after the rapid rise of last week to \$8 1/2, was weak and declined to-day to \$4 1/2. The advance was too much for it, and realizing orders accounts for the break.

National has ruled very quiet, declining to \$3, at which price it is wanted and very little offered.

Central sold at \$20@ \$21, and Copper Falls at \$9 1/2.

Bonanza declined from \$1 1/2 to \$1.10. Santa Fe declined from \$1 1/2, at which it sold last week, to 80c. to-day, recovering to 90c. The reports regard-

ing the mine and its outlook are rather conflicting, and the anxious buyers of last week have been desirous of unloading, hence the decline.

Arnold seems to be fast becoming a favorite for a cheap stock, and all offered at about \$1 is freely taken.

Among the low-priced stocks, Native seems to be in demand, selling at 25c.@30c. Only a short time ago the stock went begging, at 5c.@6c. per share.

Pontiac is one of the cheapest stocks on the list, at 52 1/2c.

Mesnard, also a favorite, sold at \$1 to \$1 1/2, and is a good purchase for a rise.

Hungarian, one of the best of the small producers, sold at 50c. (assessment 25c. paid.) This company has levied the assessment for the purpose of opening the mine, and is regarded as a very promising property.

The silver stocks have been very dull; Catalpa sold at 40c. and Dunkirk 60c.; Napa guleksilver sold at \$5.75. A dividend of 10c. per share is announced.—3 P. M. The market this afternoon was inclined to weakness, with Boston and Montana down to \$62.75 and Franklin to \$19.25. The directors of the Franklin have decided to pass the July dividend, in order to be in strong financial condition to make a contest for the Pewabic property. It is reported that the Quincy directors have placed their 10,000 treasury shares in the hands of Mr. T. H. Mason, who is said to be the largest holder of Pewabic stock.

By Telegraph.—Calumet & Hecla, \$313; Tamarack, \$198 1/2; Quincy, \$100; Osceola, \$39; Centennial, \$37; Kearsarge, \$21 1/2; Franklin, \$19 1/2; Butte and Boston, \$25 1/2.

Denver.

(From our Special Correspondent.)

Nothing startling has transpired since the date of my last letter. There were only four working days last week, and, as a result, trading was light in the aggregate. Some changes in the rules of the Clearing House have been made which has had the effect of throwing things into a chaotic condition for the time being. The majority of the brokers have not as yet become familiar with the modus operandi of the Clearing House, and until they familiarize themselves with its workings they will not be likely to engage in very active business.

Those brokers who two weeks ago vigorously opposed the establishment of a Clearing House are now enthusiastically in favor of it, as they have been convinced that the Exchange is in need of such an institution and will be benefitted by it, if it is properly conducted.

The daily transactions since the introduction of the Clearing House have averaged over 30,000 shares, which is certainly an excellent showing and contradicts the assertions so frequently made that all the business done on the floor was "Wash."

It is quite apparent that the board of directors is determined that the Exchange shall be run on strict business principles, and those who refuse to comply with the new order of things will have to take the other alternative. A great deal depends upon the success of this Exchange, more perhaps than a great many people imagine, and it behooves every mining man in Colorado to extend to it his hearty support.

President Taylor is pushing matters with all possible energy and dispatch.

The outlook is very encouraging. Bates-Hunter has done remarkably well during the week and is at present one of the strongest stocks on the market. Some good ore has been taken out of the mine recently and as a result the stock has become popular. There has been a sharp movement in Cash Gold, an advance of about five cents being scored in five days. A good deal of this stock is being bought up for investment as there is a possibility of the mine becoming a dividend payer before the summer is over.

Calliope has been more active than usual, but the value of the stock does not increase as much as holders would like. It has ranged between 43 and 46 all week.

The return of President Taylor put new life into May Mazepa and that popular stock is now soaring upward at a lively pace. This is Mr. Taylor's pet stock and it is safe to state that he will never let it go backwards. It is said that the "May" will pay its first dividend some time next month.

Reed-National is doing nicely and is gradually working its way to par. There is but little of the stock on the market.

The stocks known as "Prospects," with few exceptions, are in a lifeless condition, and are being sadly neglected.

Ironclad-Gas and Oil-Emmons and Morning Glim are the exceptions. The first named retains its popularity for the reason that it is being well supported. There have been no wide changes in prices, but there is always a market for the stock, and holders can sell at all times. Advances were received from the mine on Saturday that the men had struck pay-ore, and the stock is likely to develop great activity the coming week.

Gas and oil stock has been active, and several good sized blocks have been bought in by the company's broker. The directors of the company are confident of striking oil very soon. Morning Glim gives evidence of becoming one of the most lively stocks on the market. It is another of President Taylor's properties and he will not allow it to

drag. Emmons is very firm, but the stock is scarce and but little of it has changed hands of late.

Potosi, which is considered one of the most promising properties on the board has not as yet recovered from the terrible pounding it received three weeks ago. It is selling at 20 cents. About the rest of the "Prospects," there is not information of sufficient moment to report. Little Rule and Oro will pay their regular monthly dividends on Monday, June 2, and Reed-National pays one the following day. Oro pays a dividend of 20 cents per share. The stock is quoted at \$7.25.

Prices and sales during the week ending May 31st, 1890:

Table with columns: Company, Opening, H., L., Closing, S. Lists various mining companies and their stock prices.

PROSPECTS.

Table with columns: Company, Opening, H., L., Closing, S. Lists prospecting companies and their stock prices.

Total for the week... 150,200. Buyer 30 days... Seller 60 days... Seller 30 days... Askd. b Bid.

Kansas City. June 7.

Table with columns: Company, Opening, H., L., Closing, Sales. Lists mining companies in Kansas City and their stock prices.

Total... 81,400. Bid. Askd. Buyer 30. Seller 30.

Minneapolis. June 3d.

Table with columns: Company, Bid, Askd. Lists mining companies in Minneapolis and their stock prices.

* Actual sales.

Lake Superior Iron and Gold Stocks.

(Special Report by David M. Ford, Houghton, Mich.)

Iron Stocks.—The prices of these stocks have a declining tendency, which is directly opposite to what it should be.

Gold Stocks.—These stocks have been dull, with prices nominal and small sales.

Considerable excitement prevails owing to the disclosures made in regard to the stealing of Michigan Mine ore by the miners. Several persons have already been arrested, among whom are two men—father and son—who were just leaving for Europe with ore and dust in their possession to the amount of \$5,000.

The new management of this mine has taken

hold of the property, and will run it on business principles. It cannot be denied that under the old regime things were not conducted exactly as they should have been, but as to who is responsible for the shortcomings there is a diversity of opinion.

Mr. David M. Ford, managing director for the company, has a brick weighing one and six-tenths of a pound, avoirdupois. This was smelted from the amalgam secured from 66 tons of rock in the first 12 days of the month of May, and is of gold '835 fine. The value of the brick, as determined by assays, is \$403.35, of which \$3.93 is silver.

The mill has been closed down indefinitely, as the new management wishes to develop the property sufficiently to supply mill rock for a good sized mill before treating any more rock. The force of miners will be increased, and the deep shaft, which is at present 92 feet down, will be put down another hundred feet. A new shaft will be sunk, and the drift to the east from the 50-foot level continued.

Mr. Thomas Trevitch has succeeded Capt. R. Trevarthen as mining captain at this mine. Mr. Trevitch has been in charge of the Peninsula mine for the past year.

IRON MINING STOCKS.

| Name of company. | Par value. | Bid. | Asked. |
|-----------------------------|------------|---------|---------|
| Ashland Iron Co. | \$25.00 | \$55.00 | \$65.00 |
| Aurora Iron Co. | 25.00 | 7.50 | 8.00 |
| Champion Iron Co. | 25.00 | 90.00 | 95.00 |
| Chandler Iron Co. | 25.00 | 37.00 | 38.00 |
| Chapin Iron Mining Co. | 25.00 | 30.00 | 33.00 |
| Chicago & Minn. Ore Co. | 100.00 | 110.00 | 115.00 |
| Cleveland Iron Co. | 25.00 | 18.00 | 18.50 |
| Germania | 25.00 | 11.50 | 12.00 |
| Jackson Iron Co. | 25.00 | 110.00 | |
| Lake Superior Iron Co. | 25.00 | 67.00 | 68.50 |
| Milwaukee Iron Co. | 25.00 | 6.50 | 6.50 |
| Minnesota Iron Co. | 100.00 | 83.50 | 85.00 |
| Montreal Iron Co. | 25.00 | 9.00 | 10.50 |
| Norrie (Metropolitan) | 25.00 | 70.00 | 75.00 |
| Odanah Iron Co. | 25.00 | 20.00 | 22.00 |
| Pittsburg Lake Anrelino Co. | 25.00 | 170.00 | 175.00 |
| Republic Iron Co. | 25.00 | 43.00 | 43.50 |

GOLD MINING STOCKS.

| Name of Company. | Par value. | Lowest. | High. |
|-----------------------------|------------|---------|-------|
| Gold Lake M. Co. | | | |
| Grayling Gold & Silver Co. | \$25.00 | | |
| Michigan Gold Co. | 25.00 | \$1.25 | 1.50 |
| Peninsula Gold & Silver Co. | 25.00 | | |
| Ropes Gold & Silver Co. | 25.00 | 2.25 | 2.50 |

* Actual sales were made at these prices.

PIPE LINE CERTIFICATES.

[Special Report by Messrs. Watson & Gibson.]

In the petroleum market prices have had a general downward tendency with occasional upward spurts, but which have been of short duration. The monthly field reports show a decrease of 21 in the number of wells completed and an increase of 451 barrels in new production in May. The development work on May 31st was 65 rigs and wells less than April 30th, 1890. A reduction of ten points in the price of refined petroleum was one of the causes that led to the weakness in the price of certificates and if the selling pressure should be continued, the market is likely to record still lower figures. The feature of the week was the announcement that the Standard Trust Company had purchased several of the largest producing oil companies in the Pennsylvania territory, and among them were the Anchor, the Union, the Forest and the Washington oil companies, which practically include all the largest corporations of this character in the State, and which gives to the Standard practical control of the producing in this territory.

NEW YORK STOCK EXCHANGE.

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|-------------|----------|----------|---------|----------|---------|
| May 31..... | 29 1/2 | 30 | 29 | 29 | 31,000 |
| June 2..... | 29 1/2 | 30 1/2 | 29 | 29 | 30,000 |
| 3..... | 28 3/4 | 29 1/2 | 28 | 28 | 51,000 |
| 4..... | 27 | 27 3/4 | 25 1/2 | 25 3/4 | 89,000 |
| 5..... | 25 1/2 | 27 | 25 1/2 | 27 | 148,000 |
| 6..... | 26 1/2 | 27 1/2 | 26 1/2 | 26 1/2 | 79,000 |

Total sales in barrels..... 528,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|-------------|----------|----------|---------|----------|---------|
| May 31..... | 89 1/2 | 89 1/2 | 89 | 89 1/2 | 27,000 |
| June 2..... | 91 | 90 1/2 | 89 1/2 | 89 1/2 | 276,000 |
| 3..... | 89 3/4 | 89 3/4 | 87 | 88 | 122,000 |
| 4..... | 87 3/4 | 87 3/4 | 86 1/2 | 86 1/2 | 110,000 |
| 5..... | 86 1/2 | 85 3/4 | 85 3/4 | 85 3/4 | 132,000 |
| 6..... | 88 3/4 | 88 3/4 | 87 1/2 | 87 1/2 | 17,000 |

Total sales in barrels..... 734,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 6.

Statistics.

Mr. John H. Jones, chief of the Bureau of Anthracite Coal Statistics, furnishes us the following statement of shipments of anthracite coal (approximated) for the week ending May 31st, 1890, compared with the same period last year:

| Regions. | May 31, 1890. | June 1, 1889. | Difference. |
|--------------------------|---------------|---------------|--------------|
| Wyoming Region. Tons | 356,477 | 358,690 | Dec. 2,183 |
| Lehigh Region. " | 98,124 | 119,869 | Dec. 21,745 |
| Schuylkill Region. " | 197,710 | 185,016 | Inc. 12,694 |
| Total..... | 652,311 | 663,545 | Dec. 11,234 |
| Total for year to date.. | 11,888,421 | 12,240,682 | Dec. 352,261 |

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending May 31st, and year from January 1st, in tons of 2,000 lbs.: Week, 93,508 tons; year, 2,291,531 tons; to corresponding date in 1889, 1,867,829.

PRODUCTION OF BITUMINOUS COAL for week ending May 31st and year from January 1st:

| EASTERN AND NORTHERN SHIPMENTS. | | 1890. | | 1889. | |
|---------------------------------|---------|-----------|-----------|-----------|-------|
| Tons of 2,240 lbs. | Week. | Year. | Year. | Year. | Year. |
| Phila. & Erie R.R. | 3,225 | 52,634 | 33,386 | 33,386 | |
| Cumberland, Md. | 81,700 | 1,586,758 | 1,191,018 | 1,191,018 | |
| Barclay, Pa. | 43,507 | 59,213 | 46,513 | 46,513 | |
| Broad Top, Pa. | 19,765 | 324,247 | 158,370 | 158,370 | |
| Clearfield, Pa. | 56,406 | 1,663,114 | 1,222,328 | 1,222,328 | |
| Allegheny, Pa. | 23,779 | 573,558 | 371,063 | 371,063 | |
| Beach Creek, Pa. | 35,598 | 809,809 | 529,577 | 529,577 | |
| Pocahontas Flat Top. | 34,805 | 826,235 | 602,890 | 602,890 | |
| Kanawha, W. Va. | 144,700 | 874,135 | 628,513 | 628,513 | |
| Total..... | 294,024 | 6,660,793 | 4,783,718 | 4,783,718 | |

WESTERN SHIPMENTS

| | | | |
|-------------------|---------|-----------|-----------|
| Pittsburg, Pa. | 11,910 | 383,255 | 244,385 |
| Westmoreland, Pa. | 4,906 | 678,446 | 595,754 |
| Monongahela, Pa. | 11,631 | 141,737 | 92,627 |
| Total..... | 29,447 | 1,205,438 | 932,766 |
| Grand total..... | 323,471 | 7,866,231 | 5,716,484 |
| Estimated. | | | |

Anthracite.

The actual commencement of summer, in conjunction with the rise in prices, has considerably dulled the market. New transactions are comparatively few, and stocks are said to be increasing. Very few orders have been placed at the new prices, nor is any material change in this respect expected till toward the end of next week, by which time most of the old contracts will have been filled. The market may be said to be in good shape considering the dullness, and the absence of new transactions now and under these circumstances simply indicates a brisk fall trade, when coal will be 40 or 50 cents a ton higher than now. If two-thirds of the annual output is kept for a market extending over only one-third of the year, it is not unlikely that there will be some scrambling about September. The present output, based on the consumption of the past two years, is comparatively small, though it looks large compared with the output for April and May. It is, however, a question of averages. Coal operators are confident that three warm winters will not come consecutively, and that as we have had two of them, a cold winter is now due, and higher prices are justified by this expectation. Still, overproduction on the chance of the law of averages keeping to the line, will be liable to lead to some embarrassment and a weak market.

Prices remain the same as last week: Stove, \$3.75; Chestnut and egg, \$3.50; Broken, \$3.35.

Bituminous.

The soft coal market is active. Several causes, each significant in itself, have contributed to a considerable movement. Carrying coal to Newcastle may be nearer accomplishment than the irony of the saying would imply. A lot of Alabama coal is said to be on fire at Pensacola. It was stored in yards to be shipped to Central and South America. That is one rather significant circumstance. Another is that some 6,000 tons of Cardiff coal is on fire in Havana. And a third circumstance is that the Cardiff coal, which has on more than one occasion shown a tendency to spontaneous combustion, has gone up to 16s. f.o.b. in England. The result of these three circumstances is that considerable bituminous coal is being shipped, from this port, and from Philadelphia also, it is said, to Havana and other southern ports which have hitherto taken nothing but Cardiff coal.

The increased cost of English coal has brought its price so near ours that several operators figured some time ago on European contracts. One of these came within a trifle of securing a large contract for supplying an important consumer in France. There has also been a nibble from a Mediterranean source and another from South America. The condition of the English market, however, is such as to presage lower prices, and therefore more difficult competition on our part.

All the mines are shipping as much as possible and holders are firm at current quotations refusing to shade prices at all. There is a confident feeling that the market will hold up through the year. Freight is unaccountably stiff, and boats in the lower ports rather scarce, though, generally speaking, there are plenty to be had. Cars are rather scarce on the Baltimore & Ohio, and freer on the Pennsylvania Railroad.

Prices: At Baltimore, \$2.40@2.50 f. o. b.; Philadelphia, \$2.50@2.60 f. o. b.; in New York Harbor, \$3.25 f. o. b.; alongside, \$3.50.

Boston.

Anthracite jobbers have to content themselves with the fact that the general market is in good shape—much better, in fact, than for a long time. But there is no business here to make them cheerful. As is usually the case after an advance, those who thought it was all bluff will not buy now, and others are well supplied. Indeed, there are large supplies of coal on hand, and the market needs a demand from consumers to stimulate the inquiry at wholesale. The companies are quite firm at new f. o. b. prices, which means that they are content to do no business at present. Quite a lot of undelivered orders have been cancelled, however, and, regardless of price, the market may fairly be said to be firmer. The individual shippers cannot cancel orders with as much freedom as the companies, and they are busy, many of them, on May and even April orders, and have but little coal to sell at present.

The bituminous market is in a very quiet condition. A large amount is coming forward, and it is now a question of freight rather than contracts which engages the activities of shippers.

Freights are about as last week. Vessels are more plenty at New York than for some days, and 80 cents is an outside figure; \$1.00@1.05 continues to rule at Philadelphia, and \$1.30@1.35 at Baltimore.

The retail trade is quiet so far as orders go, but dealers are disturbed about the combination. It looks more and more as if speedy dissolution of the snug little combine was at hand. On soft coal the combination is broken by common consent. Prices have gone off from \$4.20 gradually to \$3.87 delivered, and now one dealer is offering soft coal at \$3.75. This is meeting Pocahontas' competition with a vengeance. Dealers generally do not want the combine broken, as far as hard coal is concerned, but unless two or three of the largest dealers are able to agree better, cut prices will rule openly as soon as trade starts up.

The receipts at this port for the week have been:

| Anthracite (tons)..... | For the week | | For the year | |
|------------------------|--------------|--------|--------------|---------|
| | 1890. | 1889. | 1890. | 1889. |
| Anthracite (tons)..... | 32,978 | 34,697 | 465,682 | 405,091 |
| Bituminous " | 18,001 | 24,045 | 343,270 | 375,995 |
| Total..... | 50,979 | 58,742 | 808,952 | 780,686 |

Buffalo.

(From our Special Correspondent.)

The anthracite coal trade quiet and schedule rates without any change.

Bituminous coal firm at previous quotations; business not quite so brisk, as many manufacturers and others had laid in stocks anticipating a shortage through the labor troubles, and as a consequence present requirements are supplied.

The Department of Education here has advertised for bids for grate, egg, chestnut and stove anthracite coal for one year from July 1st, 1890. Quantity not stated, only "necessary amount." Bids to be opened on Saturday next.

The important bituminous coal contract for the New York Central and Hudson River Coal Company, aggregating 1,300,000 tons, has been allotted. Buffalo concerns interested are as follows: Thomas Loomis & Co., 25,000 tons; Frank Williams & Co., 60,000 tons; H. R. Wick & Co., 25,000 tons; J. M. Drill, 40,000 tons, and the Fairmount Coal & Iron Company, 200,000 tons. The other contractors were: Fall Brook Coal Company, 500,000 tons; Berwyn White Mining Company, 300,000 tons, and the New York & Cleveland Gas Coal Company, 150,000 tons.

Our dockmen are speculating over the timber work that is going up like the Eiffel Tower on the farther side of Hefford's dock. It is to be used for handling coal, and will have an elevator "leg," or a novelty in elevating, something like a grain elevator "leg." The wise men predict failure, but others consider it may prove successful. Father Time, as usual, will decide the problem.

The labor question among the owners of the Pennsylvania coal mines and their workmen seems to have been partially settled, and no doubt a full and satisfactory understanding will be arrived at before many days have elapsed.

The Lehigh Valley company started and continued for over two years to make Gladstone, Mich., an important receiving port for its coal going into the northwest. Docks were built, and extensive improvements made; these have been sold to the "Soo" Railroad Company, and the Lehigh has withdrawn its shipments, intending in the future to send its coal to West Superior.

Some of the large coal shipping concerns are endeavoring to contract for season figures for big lots of coal to Milwaukee and Lake Superior ports, but vessel owners, as a rule, do not care to entertain propositions of that kind.

Every branch of our lake marine business is dull. There is so large an amount of new tonnage coming out from the various shipbuilding yards at the lake ports that the prospects for a profitable season's trade is becoming "small by degrees and beautifully less," for our freights are very low, and boats that are not controlled by the big combines run at a loss and must of a necessity soon be tied up. Coal freights, hence, may be quoted steady at unchanged figures.

The shipments of coal hence by lake from May 28th to June 4th, both days inclusive, aggregated 70,020 net tons, namely, 32,500 to Chicago, 12,000 to Milwaukee, 9,300 to Duluth, 2,050 to Toledo, 9,210 to Superior, 1,350 to Racine, 1,270 to Detroit, 540 to Marine City, 1,430 to Saginaw, 100 to Charlevoix and 150 to Bay City; total thus far this season 361,270 net tons. The rates of freight were 60c. to Chicago, 50c. to Milwaukee and Sault Ste. Marie, 30c. to Toledo and Detroit, 40c. to Saginaw, 35c. to Duluth, 55c. to Racine, 35c. to Superior and on contract, 30c. to Bay City and 30c. to Marine City.

Coal receipts by canal for fourth week in May, 283 net tons; shipments, none.

Break in Erie canal near Utica repaired last Monday.

Statistical.—Receipts and shipments of coal by railroads at Buffalo not reported. Receipts by lake this season none. Shipments by lake for month of May, 230,880 net tons, as compared with 254,710 tons in 1889, 341,390 tons in 1888, and 240,080 tons in 1887; for season to June 1st, 354,010 net tons, as compared with 390,570 tons in 1889, 399,320 tons in 1888, and 349,570 tons in 1887. The receipts of coal by canal this season to June 1st, 967 net tons, as compared with 3,102 tons in 1889, 1,176 tons in 1888, and 955 tons in 1887; the shipments to June 1st, 222

net tons, as compared with 843 tons in 1889, 711 tons in 1888, and 600 tons in 1887.

The coal shipped by lake from this port from the opening of navigation to June 4 inclusive, was distributed as follows:

Table with columns: Buffalo to, Net tons, Buffalo to, Net tons. Lists various locations like Chicago, Milwaukee, Toledo, Racine, Green Bay, Saginaw, Kenosha, Detroit, Washburn, Duluth.

Pittsburg.

(From our Special Correspondent.)

Coal trade moves along slowly without showing any change. There is very little work done at the mines; workmen are scarce and not very anxious to work.

Table with columns: Per 100 bushels, 3d pool, Per 100 bushels, 4th pool. Lists nominal rates in pools.

Connellsville Coke.—The situation is at present very favorable; trade continues healthy, a perceptible improvement being noticeable.

The Frick, McClure and Cochran Coke companies are making five days. The Hosteller, Cambria and W. J. Rainy will run six days.

Shipments for the week, 7,120 cars, exceeding the previous week by 500 cars. Shipments to points west of Pittsburg, increase of 200 cars;

Current rates: Furnace f.o.b. at ovens, \$2.15 foundry, \$2.45; crushed, \$2.65.

Freights: To Pittsburg, 70c.; Mahoning and Shengango valleys, \$1.35; Cleveland, O., \$1.70; Buffalo, N. Y., \$2.25; Cincinnati, O., \$2.65; Louisville, Ky., \$3.20; St. Louis, Mo., \$3.35; East St. Louis, \$3.20; Chicago, Ill., \$2.75.

FREIGHTS.

From Philadelphia to: Beverly, \$1.10 Boston, \$1.05; Cambridgeport, \$1.15; Lynn, \$1.15; Newbern, \$0.90; New York, \$0.90; Portland, \$1.05; Quincy, Pt., \$1.10; Washington, \$1.85; Wilmington, \$1.00.

From New York to: Albany \$1.35; Bangor, \$1.85; Bath, \$1.85; Beverly, \$1.85; Boston, \$1.80; Bristol, \$1.75; Bridgeport, \$1.80; Brooklyn, \$1.80; Cambridge, \$1.80; Cambridgeport, \$1.80; Charlestown, \$1.80; Chelsea, \$1.80; Com. Pt., \$1.85; East Boston, \$1.80; East Cambridge, \$1.85; East Greenwich, \$1.75; Fall River, \$1.75; Gardner, \$1.00; Gloucester, \$1.85; Lynn, \$1.85; Marblehead, \$1.85; Medford, \$1.85; New Bedford, \$1.75; Newburyport, \$1.85; New Haven, \$1.80; New London, \$1.75; Newport, \$1.70; Norwich, \$1.70; Norwalk, \$1.80; Pawtucket, \$1.80; Portland, \$1.80; Portsmouth, N. H., \$1.90; Ryeport, \$1.85; Salem, \$1.80; Troy, \$1.85; Wareham, \$1.80.

From Baltimore to: Bath, \$1.30; Boston, Mass., \$1.30; Brooklyn, \$1.15; Charleston, \$1.70; Fall River, \$1.20; Galveston, \$3.00; New Bedford, \$1.20; New Haven, \$1.20; New London, \$1.20; New York, N. Y., \$1.10; Portland, \$1.30; Portsmouth, N. H., \$1.30; Providence, \$1.20; Quincy Pt., \$1.40; Salem, Mass., \$1.30; Savannah, \$1.90; Somerset, \$1.25; Williamsburg, N. Y., \$1.15.

*And discharging. †Alongside. ‡And towage. §Flat.

METAL MARKET.

NEW YORK, Friday Evening, June 6, Prices of silver per ounce troy.

Table with columns: May, Sterling, Lond'n, N. Y., June, Sterling, Lond'n, N. Y. Shows silver prices for May and June.

* 1.01 1/4 @ 1/4 † 46 3/4 @ 47 1/4 ‡ 1.02 @ 1/4 § 102 1/4 @ 3 1/4 || 104 @ 1/4

The prospect of the speedy passage by the House of the Caucus Silver Bill has stimulated the advance in the price of silver.

The United States Assay Office, at New York, reports total receipts of silver for the week to be 50,000 ounces.

No more silver will be received on deposit until July 1.

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

Table with columns: Price, Sales. Lists silver bullion certificate prices for May 31, June 2, 3, 4, 5, 6.

Total sales.....1,310,000

Coinage at the Mints of the United States.

The following statement shows the coinage executed at the mints of the United States during May:

Table with columns: Denomination, Pieces, Value. Lists coinage for Total gold, Standard dollars, Dimes, Total silver, Five cents, One cent, Total minor, and Total coinage.

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its rate for discount, and it remained at 3 per cent. During the week the bank lost £165,000 bullion, but the proportion of its reserve to its liabilities was raised from 41.94 to 42.67 per cent., against a reduction from 42.50 to 40.77 per cent. in the same week last year, when its rate for discount was 2 1/2 per cent.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

Table with columns: Bid, Asked. Lists various coins like Trade dollars, Mexican dollars, Peruvian soles, English silver, Five francs, Victoria sovereigns, etc.

Copper.—The tone of the market is exceedingly firm and indications all favor a continuance of this feeling for some time to come. The previously good consumptive demand is, if anything, on the increase, and it now appears that owing to the heavy orders placed by consumers during the past few weeks, more especially for Lake brands, the producing companies have very little indeed to place on the open market for prompt or June shipment, and are consequently very reluctant sellers at even 15 1/2, and some are unwilling to sell any more at that figure.

The cable advices received from Europe early in the week reported a decrease of 50,000 tons in the statistics of visible supplies for the second half of May, which, with the previously reported decrease of 3,300 tons for the first half, makes the total decrease for May 8,300 tons. No doubt this great reduction in stocks is mainly owing to large recent sales of furnace material, but it indicates at any rate a very satisfactory rate of consumption throughout the whole world.

The exports of copper during the past week were as follows: To Havre, Copper Lbs., 1,121 bars, 363,726 \$41,859. To La Normandie, Copper matte, Lbs., 250 25.

Tin.—The market is slowly but steadily improving and prices are gradually rising. It is quite apparent that the quantity of tin on the spot and available for June delivery is very limited, and all recent arrivals have been shipped immediately to consumers. To-day sales were made at \$21.40 for spot and June and that price has since been refused for large quantities, and we must now quote spot at 21 1/2, June at 21 1/2, July at 21 1/2, August at 21 1/2.

The London market has also exhibited an improving tendency from day to day with a large amount of business taking place. The latest closing quotations are £95 10s. @ £95 12s. 6d. spot and £95 7s. 6d. @ £95 10s. three months, from which it would appear that in London also there is a scarcity of spot supplies. Offerings from the East are also comparatively small at present quotations, holders apparently looking for higher prices in connection with the Exchange.

Lead has been dull, and we hear of very little business. Consequently quotations are more or less nominal at 4.25 to 4.35.

The St. Louis Lead Market.—Messrs. John Wahl & Co. telegraph us as follows: "Lead presents no novelty. Offerings, whilst not large, appear to be sufficient to supply current requirements. Neither sellers nor buyers show any anxiety to trade to any extent in deferred deliveries, and are

satisfied to let the future take care of itself. Sales will probably aggregate 500 tons at 4 1/2 c. @ 4 1/4 c.

Spelter.—The strength reported last week continues unabated, and for near delivery very little of the metal can be procured, as producers seem to be entirely sold out for prompt and early shipments and we also understand that some contracts have been made for future deliveries at very high prices. It seems certain that no surplus production is taking place, as everything is shipped off to consumers from the works as soon as smelted. We quote now \$5.55 @ \$5.60.

Antimony remains very firm, with Cookson's at 24 1/2 @ 25 and Hallet's at 20 1/4 @ 20 1/2; but owing to dearth of available supplies small lots of the latter brand have been sold at prices even higher than these quotations.

Quicksilver.—Due to the small production, this metal continues to show an upward tendency, especially noticeable in New York quotations. We quote this week London £10 10s. and New York \$55 per flask.

Nickel.—Nickel is still rather scarce. It is quiet at 75c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 6.

The depression of the last five months seems to be disappearing and encouraging reports are again heard from the principal markets. There has been no advance in prices of any consequence, but there is a firmer feeling along the whole line. Producers have plenty of orders on their hooks, and are cautious about accepting orders for future delivery at present rates. There is now a fair prospect that the large production of last year will be exceeded, and that the trade has a season of prosperity ahead. The splendid condition of the mills and their enormous producing capacity is likely to prevent anything like a "boom" or serious advance in prices.

It is important to note in this connection that the increased demand for iron and steel does not arise from any spasmodic activity in railroad building, which, in times past, has been a controlling cause of the ups and downs of the iron trade, but that it results from a steady increase in the use of iron over the whole country for constructive purposes in general. Statistics show that, notwithstanding the complete substitution of steel for iron for rails, and the nearly complete substitution for nails, and boiler and ship plates and other uses, the consumption of puddled iron is still on the increase. This indicates an extremely wide distribution and large consumption of puddled iron for a vast variety of small products, and the general prosperity of all iron-using industries. As the condition of the iron trade is generally considered an index of the general business condition of the country, the present outlook is for a prosperous year, and the inflation policy involved in the proposed silver and pension and public works legislation may even bring very high prices, to be followed later by liquidation.

Recent English advices show an increasing weakness in the foreign iron market, and in view of the fact that there has not been enough advance on this side to encourage importations, it does not seem probable that the firm condition of the market here will have any influence in checking the decline abroad.

Pig Iron.—The easier feeling in this market reported in our last issue continues, and although thus far it has brought about no great change in demand, yet the prevailing feeling is that the next month will see a decided improvement. Dealers here are already on the qui vive for any development, and the hopeful feelings they have entertained during the past two weeks remain unabated.

The scarcity of Southern No. 1 Foundry iron is at last reported, and the Southern furnaces do not appear in the least anxious to market their product. A report appeared in print this week to the effect that the Tennessee Coal, Iron and Railroad Company had lately sold 18,000 tons of No. 1 and No. 2 Foundry iron from their Emsley furnaces for June delivery. Dealers of considerable prominence in this market are inclined to doubt this report. One gentleman, who was recently in Emsley City, declares that the statement should be taken cum grano salis.

The week has seen neither an improvement in prices nor an increase in the volume of business. Sales of any consequence have not occurred. Quotations remain pretty much as reported in this column for some time past. Northern iron, No. 1 X foundry, \$18; No. 2, \$17; Southern, No. 1, \$16.75 @ \$17.50; No. 2, \$16 @ \$16.50.

Scotch Pig.—There is very little Scotch iron coming in just now. We hear of no sales during the past week. Quotations remain nominally \$19 @ \$19.25 for Eglinton, \$20 @ \$21 for Dalmington and \$24.50 @ \$25 for Coltness.

Steel Rails.—Actual orders for rails continue very scarce. The reports of higher prices and better business are based on nothing more substantial than the fact that certain mills, having booked sufficient orders to keep them going for several months to come, quote high prices and report good business. Quotations may be set down at \$30 @ \$31 per ton at eastern mills.

Spiegeleisen and Ferromanganese.—For 20% spiegeleisen quotations are \$31.50@32, and for 80% ferromanganese, \$77@80.

Merchant Steel.—The good business in merchant goes on. Buyers are willing to pay the prices asked, and dealers show no inclination to raise their quotations...

Tubes and Pipe.—The usual amount of business is being transacted. The strike at the National Tube Works, McKeesport, Pa., forced that mill to remain idle for two weeks...

Structural Iron and Steel.—There is a fair amount of building going on, and orders from large buildings about to be erected will soon be placed on the market.

Rail Fastenings.—Little or nothing doing in fastenings. We quote spikes, 2.05c.; angle plates, 1.90c.; bolts and square nuts, 2.70c., and hex. nuts, 2.2c.

Cleveland. June 6.

(From our Special Correspondent.)

By Telegraph.—The ore market is firm at unchanged rates. Some large inquiries, aggregating 200,000 or 300,000 tons, have come in during the past week.

SPECULAR AND MAGNETIC ORES.

Table with 2 columns: Ore type (Bessemer, Non-Bessemer) and Price range (\$6.50-\$7.25, 6.00-6.25, etc.)

SOFT HEMATITES DRIED AT 212.

Table with 2 columns: Ore type (Bessemer, Non-Bessemer) and Price range (\$5.25-\$6.00, 3.90-5.00, etc.)

Above prices are delivered on docks at Lake Erie ports.

Louisville. June 3.

(Special report by HALL BROS. & Co.)

The week under review has produced more liberal inquiry for iron for short and long delivery. Buyers seem of the opinion that prices have about reached bottom...

No. 2 foundry can be bought at \$11.50 on cars furnace, while we have heard of some offerings at \$11. There have been some sales of No. 2 foundry on the basis of \$11.90 cash at furnace...

Hot Blast Foundry Irons.

Table with 2 columns: Iron type (Southern Coke No. 1, 2, 3, Mahoning Valley, etc.) and Price range (14.75-15.00, 14.00-14.50, etc.)

Forge Irons.

Table with 2 columns: Iron type (Neutral Coke, Cold short, Mottled) and Price range (13.00-13.50, 13.00-13.25, etc.)

Car Wheel and Malleable Irons.

Table with 2 columns: Iron type (Southern standard brands, other brands, Lake Superior) and Price range (22.00-23.00, 18.00-19.00, etc.)

Philadelphia. June 5.

(From our Special Correspondent.)

Pig Iron.—Despite a good many reports to the contrary, concerning a hardening tendency in prices and improving demand, the rank and file of buyers in Eastern Pennsylvania and New Jersey have been providing themselves with summer iron in a moderate way...

character will be done next week. Several negotiations are now in hand, involving sales of about 20,000 tons in all. Quotations for forge are \$15.50 @ \$17; No. 2 foundry, \$17; No. 1, \$18@19.

Foreign Material.—Spiegeleisen is quoted at \$30.50 to \$31.50, and brokers are quite confident of effecting large sales at an early date.

Muck Bars.—Muck bars are quoted at \$23 to \$28.50 at mill; buyers are prepared to place large orders, as soon as their views are accepted; they are willing to pay about \$27.50.

Merchant Iron.—A good deal of medium iron has been selling at 1.80; refined ranges from 1.85 to 1.90. The country mills have been picking up a good deal of business of a small kind this week.

Sheet Iron.—All of the sheet iron manufacturers report an excellent demand, at full prices, for both sheet and galvanized iron.

Skelp Iron.—Grooved skelp is selling at 1.75, and sheared at 1.95. Sales during the past three or four days foot up 4,000 tons.

Wrought Iron Pipe.—Manufacturers of pipes and tubes report an excellent run of orders; some negotiations are now pending for heavy deliveries to be made in August and September.

Plate and Tank.—The steady run of orders is sufficient to keep mills running full time, but recent inquiries for large lots have developed the fact that manufacturers are willing to shade prices.

Steel Rails.—All of the mills are doing a fair business in steel rails, and there is very sharp competition between Eastern and Western mills for some large orders which are now on the market.

Old Rails.—Old rails would sell in large lots, could they be had. But there are three buyers for every lot, and the effect is to keep prices very strong.

Scrap.—Very little is doing in scrap. No. 1 has been called for by buyers at \$21.50. Best machinery is quoted at \$16; wrought turnings, \$17; car wheels, \$18.

Pittsburg. June 5.

(From our Special Correspondent.)

Raw Iron and Steel.—We report a firm and active market, with prices of certain descriptions still advancing, the principal inquiry being for the better grades. The Bessemer sales were liberal, at prices very near the \$20 line...

From the Shenango and Mahoning valleys the report comes that Bessemer and Gray forge are held at pretty steep prices. Three of the furnaces, whose daily output was 400 tons, have shut down for repairs...

The general outlook is highly pleasing; buyers are in the market for round lots extending until September, and willing to pay fair prices.

About prices: Scrap material advanced; old iron rails scarce, higher; muck bar commands good prices; blooms, slabs, billets and rail ends command an advance; steel rails continue in good demand...

Scrap Material.

Table with 2 columns: Scrap type (300 Tons Mixed Steel, 300 Tons Crucible Steel, etc.) and Price (20.00 cash, 28.50 cash, etc.)

Coal and Coke Smelted Lake Ore.

Table with 2 columns: Coal/Coke type (3,500 Tons Grey Forge, 3,000 Tons Bessemer, etc.) and Price (\$15.50 cash, 19.00 cash, etc.)

Coke Native Ore.

Table with 2 columns: Coke type (500 Tons Grey Forge, 300 Tons Mill Iron, etc.) and Price (15.25 cash, 15.25 cash, etc.)

Muck Bar.

Table with 2 columns: Muck Bar type (1,000 Tons Neutral, July, 1,000 Tons Neutral, June, etc.) and Price (29.00 cash, 25.50 cash, etc.)

Steel Slabs and Billets.

Table with 2 columns: Steel type (3,000 Tons Billets, 1,500 Tons Billets and Slabs, etc.) and Price (30.00 cash, 29.75 cash, etc.)

Steel Wire Rods.

Table with 2 columns: Steel type (600 Tons American Fives) and Price (40.75 cash)

Steel Bloom Ends.

Table with 2 columns: Steel type (1,000 Tons Bloom Ends, July-Aug, 1,000 Tons Bloom Ends) and Price (22.00 cash, 21.25 cash)

Ferro-Manganese.

Table with 2 columns: Ferro-Manganese type (150 Tons 80 per cent, Baltimore, 100 Tons 80 per cent, New York) and Price (76.00 cash, 76.00 cash)

Spiegel.

Table with 2 columns: Spiegel type (75 Tons 10-12 per cent, f. o. b. New York, 50 Tons 20 per cent, f. o. b. New York) and Price (28.00 cash, 30.75 cash)

Old Iron Rails.

Table with 2 columns: Old Iron Rails type (500 Tons American Ts, 500 Tons American Ts) and Price (25.00 cash, 25.50 cash)

Prices.

Table with 2 columns: Material type (Coke or Bituminous Pig, Foundry No. 1, etc.) and Price (\$30.75@seaboard, 28.75@29.50, etc.)

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, June 6.

The market for alkalis is dull but improving. Reports from Liverpool point toward a stiffening in prices, which is yet the case here.

There is little caustic soda here, and considerable inquiry in carload lots. This article has advanced on the other side. Quotations here are for the 60% variety, \$2.75; 70% to 74%, \$2.52 1/2 @ \$2.57 1/4; 76% to 77%, \$2.52 1/2 @ \$2.55.

Caustic soda ash is at 1.42 @ 1.45c. Carbonate soda ash, 48 per cent., 1.50 @ 1.62 1/2 c.; 58 per cent., 1.42 1/2 @ 1.55c.

Bleach is quiet at 1.27 1/2 @ 1.30c. Sal Soda is in good demand. Prices range from .95 @ 1.05c., according to brand and quantity.

Acids.—There is nothing of any interest in this market, a marked contrast to the excitement and the feeling of unsettlement that prevailed in it a few months ago.

There is not quite as much doing at present in sulphuric and only a moderate amount in muriatic and nitric. We continue our quotations, as they will be found to cover every case.

Acid, per 100 pounds in New York and vicinity: Acetic, \$1.75 @ \$2.25; muriatic, 18-degree, 80c. @ \$1.25; muriatic, 20-degree, 90c. @ 1.50; muriatic, 22-degree, 90c. @ \$1.75; nitric, 36-degree, \$2.75 @ \$3.50; nitric, 40-degree, \$3.25 @ \$4.50; nitric, 42-degree, \$3.75 @ \$4.75; sulphuric, 60-degree, 70 @ 80c., and sulphuric, 66-degree, 85c. @ \$1.

Fertilizing Chemicals.—This market is quiet just now. The only time sales occur is when some particular article is offered cheap. The stocks are not heavy and this fact aids in preventing a depreciation in values.

Prices have fallen off slightly in some cases and

gained a little in others. We quote high grade dried blood \$1.90@1.95. For the low grade the price is \$1.80@1.85. Azotite, \$1.90@1.95. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, \$19@20 per ton, and low grade 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, \$18@18.50. Fish scrap, \$20.50@21 per ton. f.o.b. factory. Sulphate of ammonia at \$3.00@3.10 per cwt. Concentrated tankage, \$1.80@1.85. Refuse, bone black, guaranteed 70 per cent. phosphate, \$18@18.50 per ton. Dissolved bone-black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, \$20@23; ground, \$25@26.

Charleston rock, undried, \$5.75 per ton; kiln-dried, \$6.50@7 per ton, both f. o. b. vessels at the mines. Freight by sail from Charleston to New York, \$2.25@2.50 per ton. Charleston rock, ground \$11.50@12, ex vessel at New York.

Quotations are for 48 to 52 per cent. sulphate of potash, \$1.12 1/2 per 100 pounds for shipments from date; high grade manure salts, basis 90 per cent. sulphate of potash, \$2.37 1/2 per 100 pounds.

Muriate of Potash.—Over 2,000 tons of muriate have been received since our last report, and all this quantity has gone into consumption. Prices and the prevailing feeling in this market are unchanged; \$1.77 1/2@1.85 are the quotations.

Kainit.—There has been no change in prices, but there is inquiry for kainit all the time, and dealers say that an advance is not at all improbable since the available supply has been greatly reduced of late. Quotations are \$9.50@9.75.

Nitrate of Soda.—Nitrate is rather weak at \$1.70 on the spot, and \$1.72 1/2@1.75 ex-store.

Mr. F. B. Nichols sends us the following interesting statistics issued under date of the 2d inst.:

Table with columns for 1890, 1889, 1888. Rows include Stocks in store and afloat in Atlantic ports, Arrivals, Previously reported, Stocks with dealers in store and afloat here, Deliveries fortnight ending June 2, Total deliveries to June 2.

"Notwithstanding a consumption that exceeds the highest previous year by nearly 35 per cent., and a stock in warehouse of less than 20,000 bags in the hands of dealers, the price has slowly sagged under the pressure of prospective supply, and stuff that cost 1.80 and upwards has sold down to 1.67. The detention of two vessels, one abandoned, had no power to check the decline. This is all spot and near-by business, and has no relation to futures in Valparaiso. There, the market is sustained by a firm position of the producers, which will probably result in another syndicate, and a strong tone of the freight market. The European business has been favorable, and maintains the present basis of production. Our list to arrive is accurate as to charters, but not as

to destination. Some business has been done in a large way for forward at 1.72 1/2, but buyers are timid in view of the home market. The arrivals were 'Independence' at Boston, 'Adele Lubker' at Philadelphia, 'Baldur' at Baltimore, 'Mikado' and 'Aurega' at this port."

Brimstone.—Brimstone on the spot is difficult to obtain at the present moment. Prices continue to exhibit an upward tendency, and buyers are still obstinately holding off in the expectation of lower figures. \$21.75@22 for best unmixed seconds, and \$20.75@21.25 for thirds for shipment are the quotations.

NOTES OF THE WEEK.

Two thousand bags of sulphur and a quantity of drums of caustic were destroyed by the fire which broke out on the 2d inst. on the White Star Line's freight steamer Runic, which was to have sailed for New York on the following day.

Liverpool.

May 23.

(From Geo. G. Blackwell's Report.)

Minerals.—Our market has continued to rule fairly steady during the past week. Manganese: Arrivals practically nil; prices firm, without alteration. Magnesite: No arrivals except a cargo at an outport, which has been sold very low, and sales, especially for forward delivery, are in the hands of buyers. Raw ground, \$8 10s., and calcined ground, \$10@11. Bauxite (Irish Hill brand): The production is scarcely able to keep pace with the demand; prices, therefore, are very steady. Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine; French Chalk: Arrivals comparatively small; prices firm, i. e., 95@100s. medium, 105@110s. superfine. Barytes (carbonate) easy; selected crystal lump easier at \$6; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, \$6; and selected crystal ground, \$8. Sulphate: Improvement continues; prices firm; best lump, 35s. 6d.; good medium, 30s.; medium, 25s. 6d.@27s. 6d.; common, 18s. 6d.@20s.; ground best white, G. G. B. brand, 65s.; common, 45s.; grey, 32s. 6d.@40s. Pumicestone quiet; ground at \$10 and specially selected lump, finest quality, \$13. Iron ore somewhat easier. Bilbao and Santander, 9s.@10s. 6d. f.o.b.; Irish, 11s.@12s. 6d.; Cumberland easier, 14s.@18s. Purple ore quiet. Spanish manganese: Best brands are still scarce on spot; prices firm. No. 1 lumps quoted at \$5 10s.@46, and smalls \$5@5 10s. Fuller's earth steady; 45s.@50s. for best blue and yellow; fine impalpable ground, \$7. Scheelite, wolfram, tungstate of soda and tungstate metal in fair request. Chrome metal, 5s. 6d. per pound. Tungsten alloys, 2s. per pound. Chrome ore steadier, prices unaltered. Antimony ore and metal have further advanced. Uranium oxide, 24@25s. Asbestos continues scarce, bringing increased prices. Potter's lead ore continues firm; smalls, \$14@15; selected lump, \$16@17. Calamine: Best qualities scarce—60@80s. Strontia steady; sulphate (celestine) steady, 16s. 6d.@17s. Carbonate (native), \$15@16; powdered (manufactured), \$11@12. Limespar: English manufactured, old G. G. B. brand in demand, and brings full prices; 50s. for ground English. Felspar, 40s.@50s.; fluorspar, 20s.@26. Bog ore in demand, firm at 22s.@25s. Plumbago steady; Spanish, \$6; best Ceylon lump at last quotations; Italian and Bohemian, \$4@12 per

ton; founders, \$5@16; Blackwell's "Mineraline," \$10. French sand, in cargoes, continues scarce on spot—20s@22s. 6d. Ferro-manganese and silicon spiegel easier. Chrome iron, 20 per cent., \$24@25. Ground mica, \$50. China clay freely offering—common, 18s. 6d.; good medium, 22s. 6d.@25s.; best 30s.@35s. (at Runcorn). Irish moss, although more is offering, prices are firm at \$12@14.

[Special report by Messrs. J. P. Brunner & Co.]

May 23.

There is not much actual business passing at the moment, owing to the Whitsuntide holidays, but at the same time makers are well sold and prices generally are steady.

Soda Ash.—A fair inquiry for special brands, but not much actual business, makers being well sold, and in some cases are unable to deliver promptly. We quote caustic ash 13-16d. to 1 1/2 d., carb ash 1 1/2 d. to 1 3/4 d. Soda crystals.—With warmer weather are rather firmer at \$3 to \$3 2s. 6d. per ton. Caustic Soda.—A good business done at the end of last week, and advanced prices paid, since which there has been little moving, owing to the holidays. The market is firm, as most makers are quite cleared out for prompt delivery. Nearest values to-day for June are as follows: 60 per cent., \$7 5s. to \$7 10s. 70 per cent., \$8 5s. to \$8 7s. 6d. 74 per cent. \$8 12s. 6d. to \$8 15s. 76 per cent. \$10 5s. Bleaching powder shows no improvement and \$5 2s. 6d. to \$5 5s. per ton, are nearest spot quotations. Chlorate of potash inquired for and steady at 4 1/2 d. to 4 3/4 d. Bicarb soda in small compass, and firmly held for \$5 15s. per ton and upward, for one cwt. kegs according to brand and quantity, with usual allowances for larger packages. Sulphate of ammonia in fair request @ \$11 5s. to \$11 7s. 6d. per ton for good grey 24 per cent. f.o.b. Liverpool.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, June 6.

Brick.—There is a steady accumulation of brick on account of overproduction, and the supply exceeds the demand by from 3,000,000 to 5,000,000 bricks. Brick-makers during the past year have had the advantage of the building of the Aqueduct and various public improvements, which have consumed an enormous quantity of brick. The makers found it necessary to increase their manufacturing facilities and the capacity of their yards. Now these buildings have ceased to use their product, manufacturers still seek to market their goods. This they are unable to do, although thus far 1890 has been a good year for building and bids fair to excel 1889. There are rumors to the effect that after July 4, there will be brick machinery idle. The glut will then be relieved. Quotations are: Haverstraw, \$5.00@6.00 per M.; Uprivers, \$4.50@5.50; Jerseys, \$4.00@5.00, and pales, \$2.50@3.00.

Lime.—The Knox County Lime Association, at the meeting on Tuesday, decided to stop all shipments of lime for an indefinite time, probably about two weeks. Although not much lime has come in for several weeks past, yet the demand has been so small that it accumulated. There is some lime on the way, but after the few vessels come in there will be no arrivals till the market warrants it. Quotations are: For Rockland common, \$1 per barrel; Rockland finishing, \$1.20; St. John, common and finishing, 90@95c.; Glens Falls, common and finishing, 85c.@\$1.10.

IMPORTS AND EXPORTS OF METALS AT NEW YORK MAY 24 TO MAY 31 AND FROM JANUARY 1.

Large table with columns for Imports and Exports. Sub-sections include Spelter, Pig Lead, Tin, Scrap Iron, Steel Blooms, Billets, and Slabs, Bar Iron, Old Rails, and Copper. Rows list various companies and their respective quantities and values.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS, DIVIDENDS, and NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS. Lists various mining companies and their financial details.

g. Gold, s. Silver, l. Lead, c. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividend days, and the Terra \$5,000. ¶ Previous to the consolidation in Aug. 1884, the California had paid \$31,320,000 in dividends, and the Con. Virginia, \$240,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, Aug. 1888, the Copper Queen had paid \$1,860,000 in dividends. †† 1,000,000

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, May 31, June 2, June 3, June 4, June 5, June 6, Sales, and Name and Location of Company for non-dividend-paying mines. Includes companies like Adams Colo., Alice, Mont., Argenta, Nev., etc.

*Ex dividend, †Dealt in at the New York Stock Ex. Unlisted securities ‡Assessment unpaid. Dividend shares sold, 18,950. Non-dividend shares sold, 49,600. Total, New York, 68,550.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, May 29, May 31, June 2, June 3, June 4, June 5, June 6, Sales, and Name of Company. Includes companies like Atanona, Mich., Podde, Cal., Bonanza Developm't, etc.

Boston: Dividend shares sold, 37,388. Non-dividend shares sold, 76,532. Total Boston, 113,920.

COAL STOCKS.

Table with columns for Name of Company, Par val. of sh'rs., May 31, June 2, June 3, June 4, June 5, June 6, Sales. Includes companies like American Coal, Cambria Iron, Cameron Coal & Iron Co., etc.

**Sales in New York, 73,366; in Philadelphia, 46,065. Total sales, 221,928.

San Francisco Mining Stock Quotations.

Table with columns for Company, May 29, May 31, June 2, June 3, June 4, June 5. Includes companies like Alpha, Alta, Belcher, Best & Bel., etc.

STOCK MARKET QUOTATIONS.

Baltimore, Md.

Table with columns: COMPANY, Bid, Asked, L. H., L. H. listing various coal and mining companies.

Birmingham, Ala.

Table with columns: COMPANY, Bid, Asked, L. H., L. H. listing various mining and industrial companies.

Pittsburg, Pa.

Table with columns: COMPANY, B., A. Closing listing various gas and coal companies.

St. Louis, June 4.

Table with columns: COMPANY, Bid, Asked listing various mining and industrial companies.

Table listing various mining companies and their stock prices, including Golden Era, Golden King, etc.

Trust Stocks, June 6.

Table listing various trust stocks and their prices.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

Foreign Quotations, London.

Table with columns: COMPANY, Highest, Lower listing various international companies.

Paris.

Table with columns: Belmez, Spain, Callao, Venez., etc. listing prices in Paris.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Table listing various chemicals and minerals with their current prices.

Table listing various types of talc and their prices.

THE RARER METALS.

Table listing various rare metals and their prices.

BUILDING MATERIAL.

Table listing various building materials and their prices.

THE ENGINEERING AND MINING JOURNAL will thank

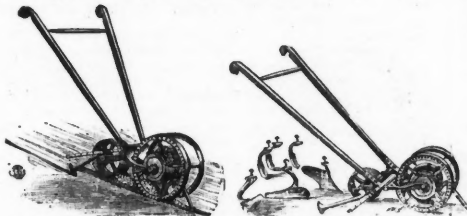
any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.

**NEW YORK PRICES CURRENT.
JUNE 7, 1890.**

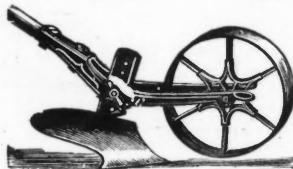
Discounts are for Export Only.

In the interest of the extension of the markets for American manufactures the ENGINEERING AND MINING JOURNAL has secured the services of gentlemen thoroughly acquainted with the export trade and with foreign markets, and it offers its services to foreign buyers who may desire information concerning any article whatever of American manufacture. No charge will be made for these services, either directly or indirectly through commissions on goods purchased. The proprietors of the ENGINEERING AND MINING JOURNAL are neither commission merchants nor exporters, but they have many sources of information, both at home and in foreign countries, and place these at the service of manufacturers and exporters here and of importers and consumers in other countries. The name and address of the manufacturers of goods quoted in this list can be obtained from us.

Agricultural Implements.



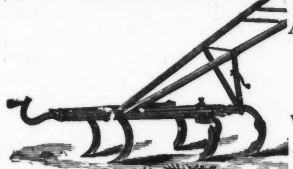
"Planet, Jr." No. 2 Seed Drill, \$9. Dis. 30%.
Combined Drill Cultivator Rake, Plow, etc., \$12. Dis. 30%.



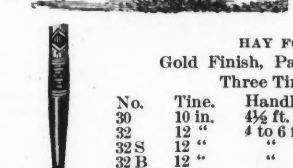
"Fire Fly" single-wheel Hoe, Cultivator and Plow, \$5.



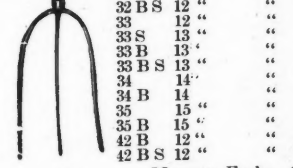
"Fire Fly" Hand Plow, \$2.50.
30% discount, f.o.b. New York.



All Steel Horse Hoe and Cultivator combined, with wheel, \$6 75-100 net.



All Steel Plain Cultivator.
With wheel, \$4.50; without wheel, 60c.



HAY FORKS.
Gold Finish, Patent Overcaps.
Three Tine Forks.

| No. | Tine. | Handles. | Per doz. |
|--------|--------|------------|---------------------|
| 30 | 10 in. | 4 1/2 ft. | Boy's \$7.75 |
| 32 | 12 " | 4 to 6 ft. | Strapped..... 9.00 |
| 32 S | 12 " | " | Bent..... 9.50 |
| 32 B | 12 " | " | Bent & St'pd 11.00 |
| 33 | 12 " | " | Bent..... 9.50 |
| 33 S | 13 " | " | Strapped..... 11.00 |
| 33 B | 13 " | " | Bent..... 10.00 |
| 33 B S | 13 " | " | Bent & St'pd 11.50 |
| 34 | 14 " | " | Bent..... 10.25 |
| 34 B | 14 " | " | Bent..... 10.75 |
| 35 | 15 " | " | Bent..... 11.25 |
| 35 B | 15 " | " | Bent..... 11.75 |
| 42 B | 12 " | " | Bent..... 12.50 |
| 42 B S | 12 " | " | Bent & St'pd 14.00 |



Manure Forks, Solid Steel Shanks, Gold Bronze Finish, Patent Overcaps.
No. 44, oval, 4 tine, 12 in. tine, 4 ft. handle, plain ferrules, \$12.50 per doz.
No. 44 S, oval, 4 tine, 12 in. tine, 4 ft. handle, strapped ferrules, \$14.
No. 44 1/2, oval, 4 tine, 12 in. tine, 4 1/2 ft. handle, plain ferrules, \$12.50.
No. 44 1/2 S, oval, 4 tine, 12 ft. tine, 4 1/2 ft. handle, strapped ferrules, \$14.
No. 54, oval, 5 tine, 13 in. tine, 4 ft. handle, plain ferrules, \$19.50.
No. 54 S, oval, 5 tine, 13 in. tine, 4 ft. handle, strapped ferrules, \$21.
No. 64, oval, 6 tine, 13 in. tine, 4 ft. handle, plain ferrules, \$22.50.
No. 64 S, oval, 6 tine, 13 in. tine, 4 ft. handle, strapped ferrules, \$24.



PLOWS.
Reversible Oncoenta Clipper.
16. Oncoenta Clipper, Reversible, Iron beam Cutter..... \$14
" Oncoenta Clipper, Reversible, Iron Wheel and Cutter..... 15
18. Oncoenta Clipper, Reversible, Iron Beam Cutter..... 15
" Oncoenta Clipper, Reversible, Iron Beam, Wheel and Cutter..... 16
17. Hard Metal Reversible, Iron Beam Cutter..... 17

17. Hard Metal, Reversible, Iron Beam, Wheel and Jointer..... 17
19. Hard Metal, Reversible, Wood Beam Cutter..... 16
20. Steel Mould Board, Reversible, Wood Beam Cutter and Cutter..... 16
Iron Beam Plows.
Two-horse Sod and Stony Land.... 8.50 plain.
Curtis's Sod Two horse..... 11.50
" " " " " " 13.00 cutter.
" " " " " " 14.25 wheel & cutter.
Subsoil Plows.
Two-horse 9.50 Draft Rod.
" " " " " " 11.00 Wheel and Draft Rod.
Hitcheock's Potato Digger and Shovel Plow.
Improved adjustable handle shovel plow..... 7.00
Hitcheock's Potato Digger..... 8.00
" " " " " and shovel plow..... 10.50
Dis. 30%.

HOES.
Ely Standard Socket, all Gold Bronze Neck, full Pol'd, C. S. Blade.
Field, 7 x 5 in., selected handles. \$9.00
" 7 1/2 x 4 1/2 " " " " 9.00
" 8 1/4 x 4 1/2 " " " " 9.00
" 8 x 5 " " " " 9.00
Washington County Pattern, spring handles..... 10.00
Rhode Island, 7 to 9 in., spr'g handles 9.00
" " " " 9 1/2 in. 9.25
" " " " 10 " 9.50
Meadow, 9 x 4 in., poplar handles..... 9.00
Meadow, 9 1/2 x 3 1/2 in., poplar handles..... 9.25
Meadow, 10 x 3 1/2 in., poplar handles..... 9.50
Broom Corn, 7 1/2 x 4 1/2 in., poplar handles..... 9.00
Popular Handles in Meadow Socket Hoes, unless otherwise ordered.



RAKES.
The S. R. N. Improved.
22 Teeth Rake, \$32.00
26 " " 34.00
25% dis.



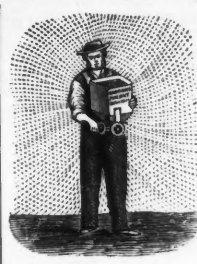
Chieftain Lock Lever
No. 1..... \$30.00
No. 2..... 30.00
No. 5..... 29.00
Iron wheels, \$2 extra.
With Pole, Double Tree and Neck Yoke, \$2 extra.
22 cubic feet packed, 400 lbs. gro., 225 lbs. net.

Golden Farmer Self-Dumping Rake, \$37.00; 22 cu. ft., 430 lbs. gro., 250 lbs. net.
Chieftain Hay Tedders, \$59.00; 700 lbs. gro., 450 lbs. net.
Potato Diggers, \$7.00; 100 lbs. gro., 60 lbs. net; dis. 40% f.o.b. ship New York or Boston.

RAKES (GARDEN).
Braced steel garden rakes. Per doz
8 teeth..... \$8.00
10 "..... 9.00
12 "..... 10.00
14 "..... 11.00
16 "..... 12.00
Braced malleable garden rakes.
10 teeth..... \$5.50
12 "..... 6.00
14 "..... 6.50
16 "..... 7.00
Ten-Teeth Malleable Garden. Steel Garden.
Plain. Braced. Plain. Braced.
10-Teeth..... \$5.50 \$6.00 \$9.00 \$10.50
12 "..... 6.00 6.50 10.00 11.50
14 "..... 6.50 7.00 11.00 12.50
16 "..... 7.00 7.50 12.00 13.50
Dis. 70 and 5%.

Cast steel garden rakes. Per doz.
10 teeth, polished, tapering bar, tempered rake..... \$9.00
12 " " " " " " 10.00
14 " " " " " " 11.00
16 " " " " " " 12.00
Cast steel lawn rakes.
12 teeth, polished, tapering bar, tempered rake..... \$10.00
14 teeth polished tapering bar, tempered rake..... 11.00
16 teeth polished tapering bar, tempered rake..... 12.00
18 teeth polished tapering bar, tempered rake..... 13.00
Dis. 70% from Standard Association list.
Prices made where XX handles, etc., are rounded

SCYTHES (GRASS).
Waldron's pattern, oiled..... \$3.50
Silver steel, painted..... 3.50
Western dutchman, bronzed and painted..... 9.00
Clipper, polished web..... 9.00
Fine cutlery steel, full polished..... 10.00
All steel, full polished..... 11.00
Grain Scythes.
Waldron's pattern, oiled..... 11.25
Silver steel, painted..... 11.25
Clover, oiled..... 11.25
Clipper, bronzed and painted..... 11.50
Lawn Scythes.
Clipper, bronzed and painted..... 9.00
Dis. 40 and 10%.



SOWER, BROADCAST SEED.
Per dozen..... \$36 f.o.b.
Gross wt., 110 pounds per dozen
Net wt., 75 pounds per dozen.

Anvils.
"Eagle anvils.
Weight about Weight about
No. 000..... 1/2 lb. \$1.00 No. 4..... 40 lbs..... \$4.25
" 00..... 4 " 1.70 " 5..... 50 " 5.05
" 0..... 10 " 2.20 " 6..... 60 " 5.50
" 1..... 15 " 2.75 " 7..... 70 " 6.00
" 2..... 20 " 3.00 " 8..... 80 " 7.00
" 3..... 30 " 3.75 " 9..... 90 " 8.00
Anvils weighing 100 to 800 lbs., 10 cts. per lb. Discount 20 and 10 %.

Arms and Ammunition.
Wood Powder.
Kegs, 25 lbs. 3/4 kegs. 1 1/2 lbs. cans,
Trap for first quality arms only..... \$19.50 5.00 .85
A, for large bore.....
C, for general use.....
D, fine for small bore and rifles..... 17.00 4.35 .75
E, very fine for small bore rifles and gallery shooting.....
Discount. Per cent.

Bullet Breech Caps..... per lb. 1.60
Conical Bullet Caps..... " 1.75
Discount. Per cent.
Rim Fire Cartridges..... 60 10
Military Rim Fire Cartridges..... 15 10
Central Fire Pistol and Rifle Cartridges..... 40 10
Central Fire Metallic Cartridges for Target and Sporting Rifles..... 30 10
Military Cartridges, Central Fire..... 30 10
Lefauchaux Cartridges..... 60 10



Gatling Cartridges..... Special
Primed Shells and Bullets..... 25 10
Friction Cannon Primers..... 20 10
Primers..... 10
Percussion Caps, F. C..... per M. 33c
U. M. C..... 42 1/2c
Musket..... 45c
Brass Shot Shells, U. M. C., 1st qual..... 60 10
Club brand..... 65 10



Paper Shot Shells.
14, 16 and 20 ga. First quality, 30, 10 and 10 per cent; 4, 8, 10 and 12 ga., First quality, 25, 10 and 10 per cent.
14, 16 and 20 ga. Club brand, 30, 10 and 10 per cent.
10 and 12 ga. Club brand, 33 1/2, 10 and 10 per cent.
Gun Wads, 20 and 5 per cent.

RIFLES.
Colts' Lightning Magazine.



Discount 10 per cent
40 / 60 and 45 / 60 calibre octagon barrel... 10 lbs. \$15.38
" " " round " " 9 1/2 " 14.25
" " " carbine " " 9 " 14.25
32, 38, and 44 calibres, octagon " " 7 1/4 " 13.50
" " " round " " 6 3/4 " 12.38
" " " carbine " " 6 3/4 " 12.38
" " " baby carbine..... 5 1/4 " 12.38
22 calibre, rim fire, octagon barrel..... 15.38
" " round..... 14.25
Remington Light (Baby) carbines, 44 cal. nick. \$7.50.

MARLIN RIFLE, MODEL, 1889.
The best in the market, embodying all latest improvements.

38 and 44 calibres, using the same cartridges as Winchester rifles of the respective sizes.
ctagon barrel, 24 inch, 6 1/2 lbs..... \$19.50
" " " " " " 25 " 21.50
" " " " " " 28 " 23.50
Round " " " " " " 24 " 18.50
Carbine " " " " " " 20 " 17.50
Discount, 25, 10 and 10%.



REVOLVERS.
S & W.
32, Single Action, 3, 3 1/2 in., \$8.00.
32, Double Action, 3, 3 1/2 in., \$9.35.
32, Safety Hammerless, 3, 3 1/2 in., \$11.00.
33, Single Action, 3 1/4 in., \$9.40; 33, Single Action, 4 in., \$9.65; 33, Single Action, 5 in., \$10.00; 33, Double Action, 3 1/4 in., \$10.40; 33, Double Action, 4 in., \$10.65; 33, Double Action, 5 in., \$11.00; 33, Safety Hammerless, 3 1/4 in., \$12.00; 33, Safety Hammerless, 4 in., \$12.25; 33, Safety Hammerless, 5 in., \$12.50; 34, Single Action, 4 in., \$11.50; 44, Single Action, 5 in., \$11.75; 44, Single Action, 6, 6 1/4

in., \$12.00; 44, Double Action, 4 in., \$12.50; 44, Double Action, 5 in., \$12.75; 44, Double Action, 6 1/2 in., \$13.00; 44, Double Action Favorite, 5 in., \$12.75.



Colts. Discount, 10 per cent from following prices.

Double Action Army, 44 and 45 calibre, 4 1/4, 5 1/4, 7 1/4 inch bbl., \$13.00. Double Action, 41 calibre, 2 1/4 to 6 inch bbl., \$11.20. Single " Army, 45 calibre, 4 1/4, 5 1/4, and 7 1/4 inch bbl., \$12.00. Single Action Army, 44 calibre, "Frontier," 4 1/4, 5 1/4, and 7 1/4 inch bbl., \$12.00. New Line, 41 calibre, blued or nickled, \$4.00. Old Model, 22 calibre, by the hundred, half or full plate, \$1.50. Colt Deringer, 41 calibre, per pair half or full plate, 5.50.

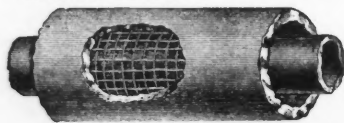


American Bull Dog

Double Action 32, 38 and 44 calibre, 2 1/4 inch barrel, \$1.60; Double Action 32, 38 and 44 calibre, 4 1/2 inch barrel, \$1.85; Double Action 32, 38 and 44 calibre, 6 inch barrel, \$2.10.

F. & W. British Bull Dog revolvers, 32 and 38 calibre 2 1/4 inch bbl., \$1.80. F. & W. Automatic revolver, 32 and 38 calibre, 3 1/4 inch bbl., \$5.50. H. & H. Automatic revolver, 32 and 38 calibre, 3 1/4 inch bbl., \$4.75. Defender revolvers, Single Action, 22, wood handle, 65. " " " " 32, rubber " 70. " " " " 32, wood " 85. " " " " 32, rubber " 90. Remington Army revolver, Single Action, 44 cal., frontier cartridge, 5 1/4 inch barrel, \$6.50. Remington Army revolver, Single Action, 44 cal., frontier cartridge, 7 1/4 inch barrel, \$6.00. Remington Double Deringers, 41 cal., rim fire, \$4.05. National Deringers, 41 calibre, per pair, half or full plate, \$4.00. New House, 41 or 38 calibre, blued or nickled, \$5.00. " Police, 38 calibre, 6 in., " 7.00. " " 38 " 4 1/2 in., " 7.00.

Asbestos Goods.



Patent air-space coverings. Per sq. ft., 25c. Discount, 20%.



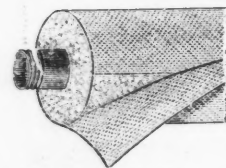
Wick packing, per pound, 40c. Discount, 25%.



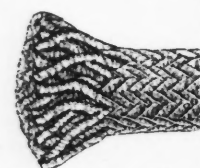
Boiler coverings. Sq. ft. 40c. Sectional. Disc., 20%.



Tube cleaner, "The National." Per inch, \$1. Discount, 50%.



Firefelt for heater pipes. Per sq. ft., \$2. Discount, 25%.



Piston Packing. Per pound, 40c. Discount, 25%.

Asbestos fibre for filtering... per lb. 30c. disc 15% " Cord and Sewing " " \$1.25 " 15% Twine " " " 4.00 " 25% Asbestos cloth, 36 inches wide.. per yard 2.00 " 25% " cement for boilers... per bbl. 4.00 " 25% " sheathing... per lb. .18 " 25% " building felt... " .14 " 25% " hair felt for hot and cold water pipes... per sq. ft. .10 " 25% Asbestos mill board... per lb. .18 " 25% " soldering blocks... per doz. 6.25 " 25%

Assay Furnace.



Hydro-Carbon Blow-Pipe Assay Furnace. No. 2, Muffle Furnace taking C Battersea Muffle 8x4 1/2 x 3 in. \$10.00. No. 3, taking F Muffle, 10x6x4 in. 15.00. No. 1, Crucible Furnace, taking Battersea, U or Colorado B Crucible, 4 in. dia. 5 1/2 deep. 4.00. No. 2, taking Battersea E, round, 5 in. dia., 6 1/2 deep. 5.00.

Blow-Pipe No. 1, with half gallon tank, made of plain, strong sheet metal. 18.00. Blow-Pipe No. 2, with half gallon tank, made entirely of seamless brass. 23.00. Blow-Pipe No. 3, with one gallon tank, otherwise same as No. 2. 26.00. Blow-Pipe No. 1, Muffle Furnace No. 2, and Crucible Furnace No. 1. 32.00. Blow-Pipe No. 2, Muffle Furnace No. 2, and Crucible Furnace No. 1. 37.00.

Axes, etc. Axes, Handled.

Table with columns: Brands, Collins, Sharp, Pecks. Dis., % 10 10 10 10. 3 1/4 @ 4 1/2 lbs. \$10.75 \$15.00 9.50. 4 1/4 @ 5 1/4 lbs. 11.00 15.50 9.50. 4 1/4 @ 6 lbs. 11.50 16.00 10.00. 5 @ 7 lbs. 12.50 17.50 11.00.

Table with columns: Brands, Hurd, Ideal, Blair, Free-man. Dis., % 10 10 10 10. 3 1/4 @ 4 1/2 lbs. \$8.50 \$11.00 \$8.00 \$6.50. 4 1/4 @ 5 1/4 lbs. 8.50 11.00 8.00 7.00. 4 1/4 @ 6 lbs. 8.75 11.25 8.25 7.00. 5 @ 7 lbs. 9.00 11.50 8.50 7.50.

Table with columns: Brands, Collins, Hurd, Sharp, Pecks. Dis., % 10 10 10 10. Three-quarter axe \$8.00 \$13.50 \$13.50 \$13.50. Boys' axe, No. 2. 8.00 13.50 13.50 13.50. Half axe. 7.00 12.50 12.50 13.00. Quarter axe. 6.50 10.00 10.00 11.00.

Table with columns: Brands, Collins, Hurd, Free-man. Dis., % 10 10 10 10. Three-quarter axe \$13.50 \$13.50 \$7.50. Boys' axe, No. 2. 13.50 13.50 7.50. Half axe. 12.50 12.50 6.50. Quarter axe. 12.00 12.00 6.00.



AXE PATTERN. Both patterns, same price. HUNTER'S.

Table with columns: Collins, Hurd, Sharp, Pecks, Sim-mons, Hurd. Dis., % 10 10 10 10 10 10. Dozen. \$6.00 \$10.00 \$9.00 \$9.00 \$9.00 \$10.00.



SHINGLING. SHINGLING. CLAW.

Table with columns: Brands, Collins, Sharp, Pecks, Mann, Hurd. Dis., % 10 10 10 10 10 10. No. 1 Doz. \$4.75 \$8.00 \$8.00 \$8.00 \$8.00. No. 2 " 5.25 8.50 8.50 8.50 8.50. No. 3 " 5.75 9.00 9.00 9.00 9.00.



LATHING. LATHING. BROAD.

Table with columns: Brands, Collins, Sharp, Pecks, Blair. Dis., % 10 10 10 10 10. No. 1 Doz. \$4.75 \$6.75 \$8.00 \$8.00. No. 2 " 5.25 7.50 8.50 8.50. No. 3 " 5.75 8.25 9.00 9.00.

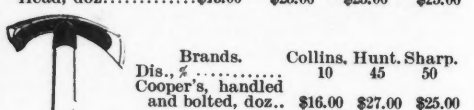
Table with columns: Brands, Collins, Hunt, Sharp, Pecks. Dis., % 10 10 10 10 10. Dozen. \$20.00 \$30.00 \$29.00 \$32.00.



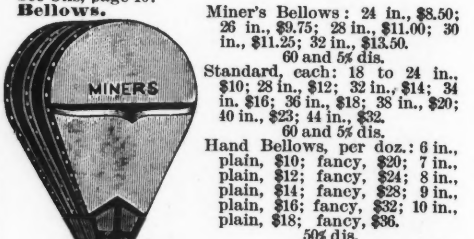
YANKEE OR OHIO. PENNSYLVANIA. NEW ORLEANS. Brands. Collins. Hunt. Sharp. Pecks. Hurd. Dis., % 10 45 50 45 60, 10 50 50, 5. Dozen. \$19.00 \$32.00 \$32.00 \$32.00 \$32.00 \$32.00. Handled, extra, \$4.



Table with columns: RAILROAD. SQUARE HEAD. SHIP CARPENTER'S. Brands. Collins. Hunt. Sharp. Pecks. Hurd. Dis., % 10 45 50 50 50, 50. Rail'd, heavy, doz. \$14.00 \$26.00 \$26.00 \$26.00 \$26.00. Flat head " 15.00 24.00 24.00 24.00 24.00.



Axle Grease. Frazer's (2-lb. tins), per gross. \$18.00. 2-lb. wooden boxes. \$12.00. Discount, 25 and 5 %. Dixon's Everlasting, boxes 1 lb., per doz. \$1.20. 2 lbs., " 2.00.



See Oils, page 10. Bellows. Miner's Bellows: 24 in., \$8.50; 26 in., \$9.75; 28 in., \$11.00; 30 in., \$11.25; 32 in., \$13.50. Standard, each: 18 to 24 in., \$10; 28 in., \$12; 32 in., \$14; 34 in., \$16; 36 in., \$18; 38 in., \$20; 40 in., \$23; 44 in., \$32. 60 and 55 dia. Hand Bellows, per doz.: 6 in., plain, \$10; fancy, \$20; 7 in., plain, \$12; fancy, \$24; 8 in., plain, \$14; fancy, \$28; 9 in., plain, \$16; fancy, \$32; 10 in., plain, \$18; fancy, \$36. 50% dia.

Belting. LEATHER BELTS. Standard Manufacturers List. Single belts per foot.

Table with columns: Width, 1 inch, 1 1/4, 1 3/4, 2, 2 1/4, 2 3/4, 3, 3 1/2, 4, 4 1/2, 5, 5 1/2. Width, 6 inch, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19. 20 inch, 21, 22, 23, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60.

Double belts twice the price of single. Dis. single and double belts, cemented, 50 and 5%. Dis. single and double belts, riveted and cemented, 50 and 5%. Dis. single belts, cemented and lacesewn, water proofed, 50%. Dis. double belts, cemented and lacesewn, water proofed, 45%. See Rubber Belting, page 7. See Link Belting, page 9.

Brick Machinery.



Clay Working Machines.

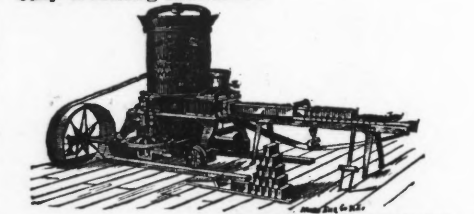


Table with columns: No. 10 D brick machine, No. 10 S, No. 4, No. 7 S, No. 6 S, No. 2 E. H. P. No. brick per day. 50,000, 30,000, 40,000, 20,000, 15,000, 6,000. Compl'te. \$1,500, 1,200, 1,100, 650, 575, 3,360.

Brushes. PAINT BRUSHES.

Table with columns: No. 6, 4, 2, 0, 3-0, 5-0, 7-0. Dis. X. \$1.15 \$1.80 \$2.50 \$3.15 \$4.00 \$5.25 \$6.75 254. Atlantic. 1.25 2.15 3.80 5.25 7.00 10.00 13.00 254. Standard 1.60 2.60 4.00 6.00 8.00 11.00 16.00 254.

VARNISH OVAL.

| | | | | | | | |
|-----------|--------|--------|--------|--------|--------|--------|------------|
| No. 6. | 4. | 2. | 0. | 3-0. | 5-0. | 7-0. | Dis. |
| Globe.... | \$1.15 | \$1.80 | \$2.50 | \$3.25 | \$4.00 | \$6.00 | \$8.00 25% |
| Crown.... | 1.25 | 2.00 | 2.75 | 4.00 | 5.25 | 7.00 | 10.00 25% |

VARNISH FLAT.

| | | | | | |
|--------|--------|--------|--------|--------|------------|
| No. 1. | 1½. | 2. | 2½. | 3. | Dis. |
| X.... | \$0.48 | \$0.72 | \$0.96 | \$1.20 | \$1.40 25% |

SASH BRUSH.

| | | | | | |
|--------|--------|--------|--------|--------|------------|
| No. 1. | 3. | 5. | 7. | 9. | Dis. |
| X.... | \$0.25 | \$0.40 | \$0.60 | \$0.85 | \$1.20 25% |
| XX.... | 0.40 | 0.75 | 1.10 | 1.40 | 2.00 25% |

WHITE-WASH.

| | | | |
|-----------|--------|--------|------------|
| No. 6. | 7. | 8. | Dis. |
| Brown.... | \$1.25 | \$1.60 | \$2.00 25% |
| Pure..... | 2.40 | 4.00 | 6.00 25% |

SHOE.

| | | | | | |
|------|---------|------------|------|------|------|
| 8. | 9. | Per gross. | 15. | 28. | Dis. |
| \$10 | \$11.50 | \$12.50 | \$15 | \$18 | 25% |

No. 23.

| | | | | |
|----------------------|---------|---------|---------|---------|
| Per gross dis., 25%. | 27. | 32. | 29. | 35. |
| \$11.50 | \$20.00 | \$24.00 | \$28.00 | \$31.00 |

HORSE.

Patent.

| | | | | |
|-----------------------|---------|---------|---------|---------|
| Per gross, dis., 25%. | \$18.00 | \$20.00 | \$24.00 | \$30.00 |
|-----------------------|---------|---------|---------|---------|

Wood back ... \$12 \$15 \$13 \$24

Leather back ... \$21 \$31.50 \$42 \$54

SCRUB.

Patent.

| | | | | |
|-----------------------|---------|---------|---------|---------|
| Per gross, dis., 25%. | \$10.00 | \$12.00 | \$16.00 | \$18.00 |
|-----------------------|---------|---------|---------|---------|

SHAVING.

| | | | | | |
|----------------------|--------|--------|--------|--------|--------|
| Per doz., dis., 25%. | \$0.36 | \$0.60 | \$1.00 | \$1.50 | \$2.50 |
|----------------------|--------|--------|--------|--------|--------|

COUNTER.

| | | | | |
|----------------------|--------|--------|--------|--------|
| Per doz., dis., 25%. | \$2.00 | \$3.00 | \$4.00 | \$5.00 |
|----------------------|--------|--------|--------|--------|

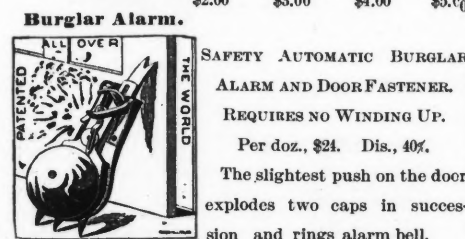
Burglar Alarm.

SAFETY AUTOMATIC BURGLAR ALARM AND DOOR FASTENER.

REQUIRES NO WINDING UP.

Per doz., \$24. Dis., 40%.

The slightest push on the door explodes two caps in succession and rings alarm bell.



Carriages, Etc.

Windsor Surrey.

| | |
|------------------------|--------|
| Open, | \$150. |
| Canopy top, | \$180. |
| Leather extension top, | \$210 |
| Pole or shafts, | |

Cut under Surrey.

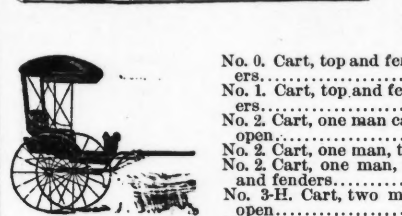
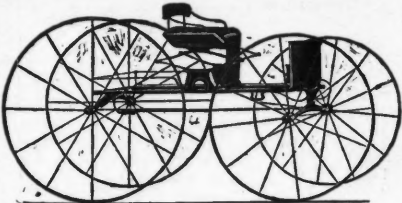
| | |
|------------------------|--------|
| Canopy top, | \$185. |
| Leather extension top, | \$220 |

Brewster Spring.

| | |
|--------------|--------|
| Open, | \$65. |
| Rubber top, | \$80. |
| Leather top, | \$110. |

Runabout,

| |
|-------|
| \$65. |
|-------|



and fenders.

No. 6. Cart, two men, top and fenders..... 90

No. 7. Two man combination cart..... 110

Narrow track 4 feet 8 inches.

Discount 33 1/2 per cent. off.

Crucibles.

Battersea Crucibles, Triangular.

| No. | Height. Inches. | Width. Inches. | Crucibles. Per doz. | Covers. Per doz. |
|--------|-----------------|----------------|---------------------|------------------|
| S..... | 4 1/2 | 4 1/2 | \$1.00 | \$0.50 |
| T..... | 4 | 3 3/4 | 0.80 | 0.50 |
| U..... | 3 3/4 | 3 3/4 | 0.60 | 0.40 |
| V..... | 3 3/4 | 2 3/4 | 0.45 | 0.40 |
| W..... | 2 3/4 | 2 3/4 | 0.35 | 0.30 |
| X..... | 2 1/2 | 2 1/2 | 0.30 | 0.30 |
| Y..... | 2 1/2 | 2 1/2 | 0.25 | 0.30 |
| Z..... | 1 3/4 | 1 3/4 | 0.20 | 0.30 |

Battersea Muffles, any size, made to order. See illustration in advertisement.

| No. | Long. Inches. | Wide. Inches. | High. Inches. | Price. Each. |
|--------|---------------|---------------|---------------|--------------|
| A..... | 7 | 3 1/2 | 2 1/2 | \$.60 |
| B..... | 7 1/2 | 4 1/2 | 2 3/4 | .75 |
| C..... | 8 | 4 3/4 | 3 | .85 |
| D..... | 8 1/2 | 5 | 3 1/4 | 1.00 |
| E..... | 9 | 5 1/2 | 3 3/4 | 1.15 |
| F..... | 10 | 6 | 4 | 1.25 |
| G..... | 11 | 6 1/2 | 4 1/2 | 1.40 |
| H..... | 10 1/2 | 5 1/4 | 3 3/4 | 1.00 |
| J..... | 12 | 6 | 4 | 1.25 |
| K..... | 14 | 8 | 5 | 1.75 |
| L..... | 15 | 9 | 6 | 2.00 |

Export discount 15 %.

Cutlery.

KNIVES-TABLE.

Japanned iron handles, \$10.70 per gross pairs.

| Cocobola handles. | Ebony handles. | Bone handles. | gross pairs. |
|-------------------|----------------|---------------|--------------|
| 10.70 | 12.00 | 15.35 | |

| | | | |
|-------|-------|-------|------------------|
| 14.70 | 16.00 | 18.70 | “ “ medium size. |
| 17.35 | 18.70 | 24.00 | “ “ full size. |

| | | | |
|-------|-------|-------|----------------|
| 17.35 | 18.70 | 21.35 | “ “ medium. |
| 20.00 | 21.35 | 26.70 | “ “ full size. |

| | | | |
|-------|-------|-------|-----|
| 22.70 | 24.00 | 29.35 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------------------|----------------|---------------|--------------|
| 27.35 | 28.70 | 36.00 | “ “ |
| Cocobola handles. | Ebony handles. | Bone handles. | gross pairs. |

| | | | |
|-------|-------|-------|-----|
| 28.00 | 29.35 | 38.00 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------|-------|-------|-----|
| 28.65 | 30.00 | 38.00 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------|-------|-------|-----|
| 23.65 | 30.00 | 38.00 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------|-------|-------|--------------|
| 32.00 | 33.35 | 38.00 | gross pairs. |
|-------|-------|-------|--------------|

| | | | |
|-------|-------|-------|-----|
| 34.70 | 36.00 | 48.00 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------|-------|-------|-----|
| 33.35 | 34.70 | 46.70 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------|-------|-------|-----|
| 37.35 | 38.70 | 50.70 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------|-------|-------|-----|
| 40.00 | 41.35 | 53.35 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------|-------|-------|-----|
| 40.00 | 41.35 | 53.35 | “ “ |
|-------|-------|-------|-----|

| | | | |
|-------|-------|-------|-----|
| 40.00 | 41.35 | 53.35 | “ “ |
|-------|-------|-------|-----|

Hard rubber handles, 5.75 per dozen pairs.

Solid bone handles, 4.80 per dozen pairs.

Celluloid handles, 7.35 per dozen pairs.

Forks are made to match all above patterns, with either three or four prongs.

Discount 25 %.

BUTCHERS'-COCOBOLA HANDLES.

| 4 and 1/2 in. | 5 in. | 5 1/2 in. | 6 in. | 6 1/2 in. | 7 in. | 8 in. | 9 in. | 10 in. | 12 in. |
|---------------|-------|-----------|-------|-----------|-------|-------|-------|--------|--------|
| 1.15 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 |

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 1.40 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
|------|------|------|------|------|------|------|------|------|------|

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 1.15 | 1.20 | 1.30 | 1.40 | 1.70 | 1.90 | 2.35 | 3.00 | 3.70 | 5.35 |
|------|------|------|------|------|------|------|------|------|------|

| | | | | | | | | |
|------|------|------|------|------|------|------|------|------|
| 1.45 | 1.60 | 1.70 | 2.00 | 2.35 | 2.80 | 3.25 | 4.00 | 6.00 |
|------|------|------|------|------|------|------|------|------|

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 2.00 | 2.15 | 2.30 | 2.35 | 2.70 | 3.00 | 3.50 | 4.25 | 5.00 | 7.50 |
|------|------|------|------|------|------|------|------|------|------|

| | | | | | | | | |
|------|------|------|------|------|------|------|------|------|
| 2.45 | 2.70 | 2.95 | 3.15 | 3.45 | 3.70 | 4.35 | 5.00 | 6.00 |
|------|------|------|------|------|------|------|------|------|

| | | | | | | | | |
|------|------|------|------|------|------|------|------|------|
| 2.10 | 2.20 | 2.35 | 2.50 | 2.80 | 3.40 | 4.35 | 5.30 | 6.85 |
|------|------|------|------|------|------|------|------|------|

| | | | | | | | | |
|------|------|------|------|------|------|------|------|-------|
| 3.49 | 3.55 | 3.70 | 4.10 | 4.60 | 5.30 | 7.00 | 8.75 | 11.00 |
|------|------|------|------|------|------|------|------|-------|

| | | | | | | | | |
|------|------|------|------|------|------|------|------|-------|
| 4.10 | 4.25 | 4.40 | 4.80 | 5.30 | 6.00 | 7.75 | 9.50 | 12.50 |
|------|------|------|------|------|------|------|------|-------|

| | | | | | | | |
|------|------|------|------|------|------|------|-------|
| 2.00 | 2.15 | 2.35 | 2.35 | 2.70 | 3.00 | 3.50 | |
|------|------|------|------|------|------|------|-------|

Discount 25 and 10 %.

HUNTING-EBONY HANDLES.

5 1/2 in. 6 in. 6 1/2 in. 7 in. 8 in. 9 in. 10 in.

Per Dozen.

| | | | | | | | |
|------|------|------|------|------|------|------|------|
| 2.90 | 2.20 | 2.35 | 2.75 | 3.00 | 3.60 | 4.30 | 5.25 |
|------|------|------|------|------|------|------|------|

| | | | | | | | |
|------|------|------|------|------|------|------|------|
| 2.10 | 2.20 | 2.35 | 2.75 | 3.00 | 3.60 | 4.30 | 5.25 |
|------|------|------|------|------|------|------|------|

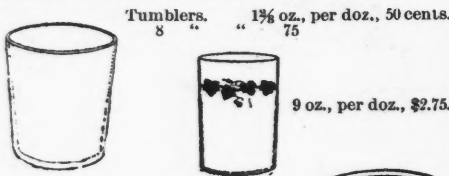
| | | | | | | | |
|------|------|------|------|------|------|------|------|
| 2.55 | 2.70 | 3.00 | 3.30 | 3.55 | 4.00 | 5.00 | 6.00 |
|------|------|------|------|------|------|------|------|

Discount, 25 and 10 %.

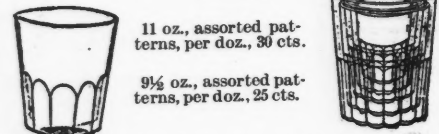
Per Dozen.



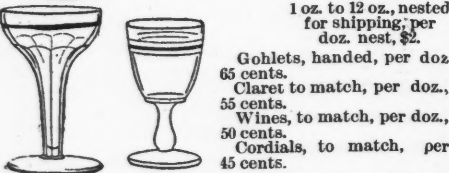
Candlesticks, per doz., \$2.00. Glass Slipper for Flowers, per doz., 50 cents; slipper and tray, per doz., \$1. Jam Jar and Cover, 1 qt., per doz., \$2.50; ½ gal., per doz., \$3.25; ¼ gal., per doz., \$4.; 1 gal., per doz., \$5.; 1½ gals., \$9.; 2 gals., per doz., \$12. Pocket Flask, 1 pint, \$1.



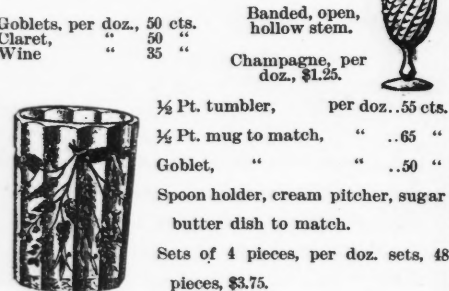
Tumblers, 8 " 1 ½ oz., per doz., 50 cents. 75 " 9 oz., per doz., \$2.75.



11 oz., assorted patterns, per doz., 30 cts. 9 ½ oz., assorted patterns, per doz., 25 cts.

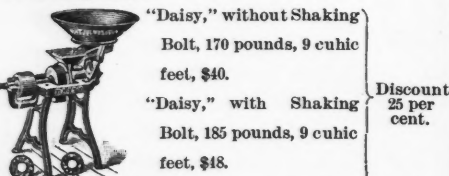


1 oz. to 12 oz., nested for shipping, per doz. nest, \$2. Goblets, handed, per doz 65 cents. Claret to match, per doz., 55 cents. Wines, to match, per doz., 50 cents. Cordials, to match, per 45 cents.



Goblets, per doz., 50 cts. Claret, " 50 " Wine " 35 " Banded, open, hollow stem. Champagne, per doz., \$1.25. ½ Pt. tumbler, per doz., .55 cts. ½ Pt. mug to match, " .65 " Goblet, " " .50 " Spoon holder, cream pitcher, sugar butter dish to match. Sets of 4 pieces, per doz. sets, 48 pieces, \$3.75.

Grinding Mills.



"Daisy," without Shaking Bolt, 170 pounds, 9 cubic feet, \$40. "Daisy," with Shaking Bolt, 185 pounds, 9 cubic feet, \$48. Discount 25 per cent.

"The Union Mill."

| Diameter of Buhr Stones | Size of Pulleys | |
|-------------------------|-----------------|---------|
| | Diam. | Face. |
| 12 in. | 8 in. | 6 ¼ in. |
| 16 " | 9 " | 7 ½ " |

| Horse Power | Capacity in B'sh's | Speed | With-out Bolt | With Bolt | Sack-ing Elevator, Extra | Extra Metal Buhrs |
|-------------|--------------------|--------------|---------------|-----------|--------------------------|-------------------|
| 8 to 10 | 12 to 30 | 1200 to 1500 | \$90.00 | \$105.00 | \$15.00 | \$1.20 pair |
| 10 to 15 | 20 to 50 | 1000 to 1600 | 160.00 | 178.00 | 17.50 | 1.50 " |



Hand Carts No. 0 42 wheel, in. tread, 1 in. axle-box 48x23x10 deep, \$10.50. No. 1, 36 wheel, 1 in. tread, ¾ in. axle, box 40x23x10 deep, \$9.00. No. 2, 30 wheel, ¾ in. tread, ¾ in. axle, box 32x20x9 deep, \$8.25. With Wagon-Seat Spring. No. 6, same sizes as

| No. | Same sizes as | No. | Price |
|------------------------------------|---------------|-------|---------|
| No. 0 | | No. 1 | \$12.00 |
| " 7, same sizes as | No. 1 | No. 2 | 10.50 |
| " 8, " " " | No. 2 | No. 3 | 9.75 |
| With Third Wheel, Without Springs. | | | |
| No. 3, same sizes as | No. 1 | No. 4 | \$12.00 |
| " 4, " " " | No. 1 | No. 5 | 10.50 |
| " 5, " " " | No. 2 | No. 6 | 9.50 |

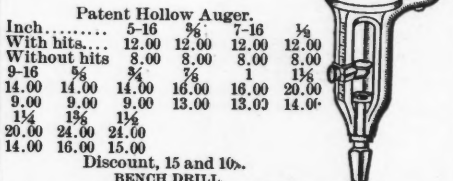
Hardware Specialties.

AUGERS.



Patent Adjustable Hollow. Cuts from ¼ to 1 ¼, pivoted jaws, graduated scale to 1-16ths, per doz., \$60.00.

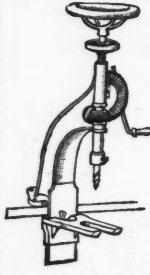
Discount, 15 and 10%.



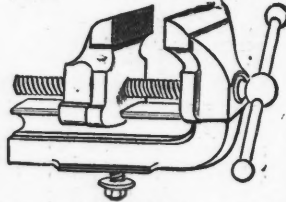
| Inch. | 5-16 | ¾ | 7-16 | 1 ¼ |
|----------------|-------|-------|-------|-------|
| With hits..... | 12.00 | 12.00 | 12.00 | 12.00 |
| Without hits | 8.00 | 8.00 | 8.00 | 8.00 |
| 9-16 | 5 ½ | ¾ | 1 | 1 ½ |
| 14.00 | 14.00 | 16.00 | 18.00 | 20.00 |
| 9.00 | 9.00 | 9.00 | 13.00 | 13.00 |
| 1 ¼ | 1 ¾ | 1 ½ | | |
| 20.00 | 24.00 | 24.00 | | |
| 14.00 | 16.00 | 15.00 | | |

Discount, 15 and 10%.

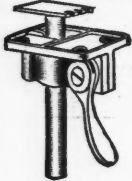
BENCH DRILL.



Adjustable bed plate. 2 ½ high drills to ¼ in. hole, 3 ¾ run of screw. List price, each, \$10.00. Net, " " 3.75.



Bench Vise, Steel Jaws, 3 ¾ in., opens 3 in.; weight, 12 lbs.; list price, each, \$4.00; net price, each, \$1.60.

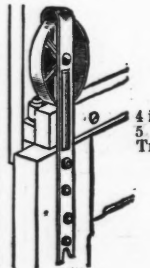


BENCH HOOK. Patent, adjustable and reversible. List \$9 dozen, ½ dozen in box. Discount, 20 and 10%.



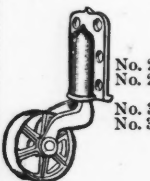
BLACKSMITH'S TONGS.

Swivel Jaw. No. 1, 16 in., per doz., \$10.00. " 2, 18 " " " " " " 10.00. Dis., 20%.



BARN DOOR HANGER.

4 in., per doz. pairs, \$12.00. 5 " " " " " 14.40. Track, per foot, .08. One dozen pairs in case. Dis., 50%.



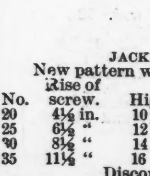
CASTERS.

Swivel Store Truck. No. 20, japanned, 4 in. wheel, each, .55. No. 25, " " " 5 " " " .75. Noiseless turned wheel. No. 30, japanned, 4 in. wheel, each, 1.30. No. 35, " " " 5 " " " 1.60. Discount, 25%.



CLOTHES REEL.

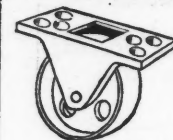
Extra heavy, gray iron, japanned. List per doz., \$15.00. Net " " " 7.00.



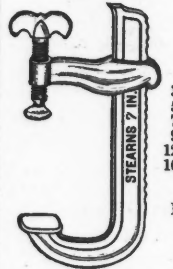
JACK SCREWS.

| No. | Rise of screw. | High. | Diameter. | Price. |
|-----|----------------|--------|-----------|--------|
| 20 | 4 ½ in. | 10 in. | 2 in. | \$4.50 |
| 25 | 6 ½ " | 12 " | 2 " | 5.25 |
| 30 | 8 ½ " | 14 " | 2 " | 5.75 |
| 35 | 11 ½ " | 16 " | 2 " | 6.50 |

Discount, 40%.



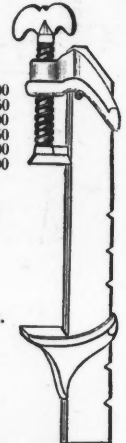
Store Truck, stationary. No. 50, 5-inch wheel, 1 ¼ inch wide each, \$1.05. No. 60, 5-inch, extra heavy, 1 ¼ inch wide, each \$1.50. Discount, 25%.



SCREW CLAMPS.

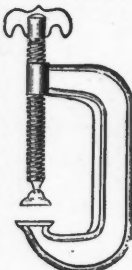
Adjustable. 3 in., per doz., \$4.00. 5 " " " " " 6.50. 7 " " " " " " 9.00. 9 " " " " " " 10.50. 12 " " " " " " 15.00. 16 " " " " " " 20.00.

½ doz. in box. Discount, 20 and 10%.



CLAMPS.

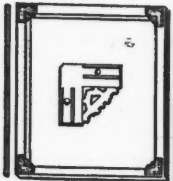
New Door Frame. 3 ft. long, per doz., \$8 list; \$5 per doz. net.



Malleable Iron Screw Clamps.

| 3 in. | Per Doz. | 7 in. | Per Doz. |
|-------|----------|--------|----------|
| 3 in. | \$7.00 | 7 in. | \$20.00 |
| 4 " " | 10.00 | 8 " " | 25.00 |
| 5 " " | 12.00 | 9 " " | 27.50 |
| 6 " " | 16.00 | 10 " " | 30.00 |

3, 4, 5, 6 in., ½ doz. in box. Dis., 70%.



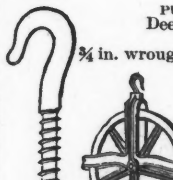
WINDOW SCREEN FRAMES.

Patent Japanned Corners. No. 25, 36 by 36 corners and screws, without bead, per doz., \$2.50. No. 25, 36 by 36 corners and screws, with bead, per doz., \$2.90. No. 35, 42 by 42 corners and screws, without bead, per doz., \$2.90. No. 35, 42 by 42 corners and screws, with bead, per doz., \$3.30. Black satin stain, sticks ¼ by 1 in. Dis., 20 %.



PULLEYS.

Side, No. 45, Japanned. Inches... 1 1 ½ 2 2 ½ 3 4 5. Per doz. .50 1.00 1.60 2.40 3.50 9.00 15.00. 2 inch and under, 2 dozen in box; 2 ½, 3 and 4, 1 dozen in box; 5 inch, ½ dozen in box. Discount, 50%.



PULLEY HOOK (New Floor).

Deep cut thread, forged point. ¾ in. wrought iron, 8 in. long, list, \$1.90 per doz. net, " " " 1.00.



WELL WHEEL.

New pattern. Japanned. In. 8 10 12 14 16. Pr.d. 7.00 9.50 12.50 20.00 30.00. Discount, 70%.



HAY FORK PULLEY.

New pattern.

No. 15, 5 in. iron wheel, per doz., \$4.50. 25, 5 in. wood " " " " 4.50. 66, 6 in. " " " " " 6.00. 4 dozen in case, 8 dozen in barrel. No. 15, per dozen, \$2 net.



SHEAVES.

Turned and polished iron wheels, round corners, brass pin, one set in box. 2 ½ inch, \$1.50. 3 " " " " " 1.60. 4 " " " " " " 2.00. 5 " " " " " " 2.60. Discount, 50%.



SINKS.

All 6 inch deep. 14 x 20 in., \$1.50. 18 x 30 in., \$2.50. 15 x 25 in., 1.75. 18 x 32 in., 3.00. 15 x 27 in., 2.00. 18 x 36 in., 3.00. 16 x 24 in., 1.80. 20 x 30 in., 3.00. 16 x 28 in., 2.10. 20 x 36 in., 3.70. 17 x 30 in., 2.25. 20 x 40 in., 4.00. 18 x 24 in., 2.10. Discount, 60%.



SPOKE POINTERS.
 No. 1, points 1 1/4 in. diameter. Per doz. \$9.00
 No. 2, points 2 1/4 in. diameter. \$15.00
 Discount, 15 and 10%.
 1/2 dozen in box.



WISE.
 (Bench Vise, Steel Jaws.)
 3 1/4 in. opens 5 in., weight 12 lbs.
 List price, each, \$4.00
 Net " " " 1.60

Silent Saw Vise.
 No. 10, 10 in. jaw, per doz. \$15.00
 Dis., 33 1/4%

| No. | per dz. | gr. | per No. | per dz. | gr. | lbs |
|----------------|---------|-----|---------|---------|-----|------|
| 1 Amateur vise | \$2.25 | | 70 | | | 80 |
| 2 Anvil | | | 200 | | | 220 |
| 3 | 3.75 | | 142 | | | 1425 |
| 4 | 11.25 | | 615 | | | 5.25 |
| 5 | 18.00 | | 1,350 | | | 85 |
| 6 | 24.00 | | 1,675 | | | |

Spot cash discount, 33, 20 and 2, f.o.b.
 Nos. 1, 1 1/2, 2 and 2 1/4 are packed in dozens; Nos. 3 and 3 1/2 in half dozens; Nos. 4, 4 1/2 and 10 in quarter dozens, and No. 20 singly. Each hand vise is put up in neat box and packed in half dozen lots.
 1 Hinge pipe vise, 0 to 2 in. pipe..... Each \$10.00
 2 " " " 0 to 4 in. pipe..... 20.00
 1 Malleable pipe vise, 0 to 2 in. pipe..... 8.00
 1 Combination pipe and bench vise, 0 to 2 in. pipe... 16.00
 Discount, 50%.



WRENCHES.
 Coes' Knife Handle Wrenches.

| Size. | # doz. | Size. | # doz. | Size. | # doz. |
|--------|--------|---------|--------|---------|--------|
| 6 inch | \$9.00 | 10 " | 12.00 | 15 inch | 24.00 |
| 8 " | 10.00 | 12 " | 14.00 | 18 " | 30.00 |
| | | 21 inch | 36.00 | | |

| Size. | # doz. | Size. | # doz. | Size. | # doz. |
|--------|---------|---------|--------|---------|--------|
| 4 inch | \$10.00 | 10 inch | 14.00 | 18 inch | 32.00 |
| 6 " | 10.00 | 12 " | 16.00 | 21 " | 38.00 |
| 8 " | 11.00 | 15 " | 26.00 | | |

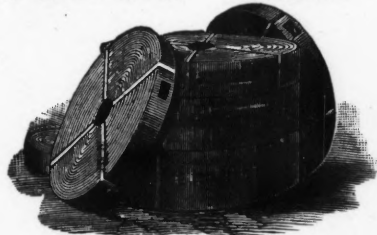
Discount, 55, 10, 7 1/2 and 3%.
 Coes' Mechanical Screw Wrenches, same list, less 55, 10, 7 1/2 and 3%.

Ice Machines (Family).

No. 1, Ice machine, ice and ice cream molds, 1 lb. ice, \$15.00.
 No. 2, Ice machine, ice and ice cream molds, 1 1/2 lbs. ice, \$20.00.
 No. 3, Ice machine, ice and ice cream molds, 1 carafe 1 bottle holder, 2 lbs. ice, \$26.50.
 No. 4, Ice machine, ice and ice cream molds, 2 carafe 1 bottle holder, 4 lbs. ice, \$33.00.
 No. 5, Ice machine, ice and ice cream molds, 3 carafe 1 bottle holder, 6 lbs. ice, \$40.00.
 No. 6, Ice machine, ice and ice cream molds, 4 carafe 1 bottle holder, 9 lbs. ice, \$46.50.

India Rubber Goods.

MECHANICAL.



RUBBER BELTING.

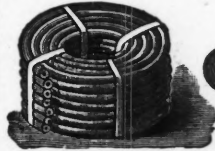
| Inches. | 2 ply per foot. | 3 ply per foot. | 4 ply per foot. | 5 ply per foot. | 6 ply per foot. |
|---------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1 | \$0.07 | | | | |
| 1 1/4 | 0.09 | | | | |
| 1 1/2 | 0.11 | | | | |
| 2 | 0.15 | \$0.17 | \$0.21 | | |
| 2 1/4 | 0.18 | 0.22 | 0.26 | | |
| 3 | 0.22 | 0.26 | 0.31 | | |
| 3 1/4 | 0.26 | 0.30 | 0.37 | | |
| 4 | 0.30 | 0.34 | 0.42 | | |
| 4 1/4 | 0.33 | 0.39 | 0.47 | | |
| 5 | 0.36 | 0.43 | 0.52 | | |
| 6 | 0.43 | 0.52 | 0.62 | | |
| 7 | 0.51 | 0.60 | 0.73 | | |
| 8 | 0.59 | 0.70 | 0.84 | \$1.05 | \$1.25 |
| 9 | 0.67 | 0.80 | 0.95 | 1.18 | 1.42 |
| 10 | 0.75 | 0.90 | 1.07 | 1.33 | 1.60 |
| 11 | 0.83 | 1.00 | 1.18 | 1.47 | 1.77 |
| 12 | 0.91 | 1.08 | 1.30 | 1.62 | 1.95 |
| 13 | 1.00 | 1.18 | 1.42 | 1.77 | 2.13 |
| 14 | 1.08 | 1.28 | 1.54 | 1.92 | 2.31 |
| 15 | 1.16 | 1.38 | 1.66 | 2.07 | 2.49 |
| 16 | 1.25 | 1.50 | 1.78 | 2.22 | 2.67 |
| 18 | 1.41 | 1.70 | 2.02 | 2.52 | 3.03 |
| 20 | 1.58 | 1.90 | 2.26 | 2.82 | 3.39 |
| 22 | 1.76 | 2.12 | 2.52 | 3.15 | 3.74 |
| 24 | 1.96 | 2.36 | 2.80 | 3.50 | 4.20 |
| 26 | 2.18 | 2.60 | 3.08 | 3.85 | 4.62 |
| 28 | 2.42 | 2.84 | 3.36 | 4.20 | 5.04 |

| | | | |
|----|------|------|-------|
| 30 | 3.64 | 4.55 | 5.46 |
| 32 | 3.92 | 4.90 | 5.88 |
| 34 | 4.20 | 5.25 | 6.30 |
| 36 | 4.48 | 5.60 | 6.72 |
| 38 | 4.76 | 5.95 | 7.14 |
| 40 | 5.04 | 6.30 | 7.56 |
| 42 | 5.32 | 6.65 | 7.98 |
| 44 | 5.60 | 7.00 | 8.40 |
| 46 | 5.88 | 7.35 | 8.82 |
| 48 | 6.16 | 7.70 | 9.24 |
| 50 | 6.44 | 8.05 | 9.66 |
| 52 | 6.72 | 8.40 | 10.08 |

Dis. Reliance, 60 and 5. Dis. Royal, 60, 10 and 10. Dis. Manhattan, 70 and 5. See Leather Belting, page 3; Link Belting, page 9.

PACKING.

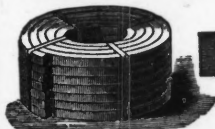
Piston Packing.



Round Piston Packing
 Per lb. 85c.
 Discount, 60, 10 and 5 per cent.



Square Piston Packing.
 Price same as above.
 Round and square piston packing is made in lengths of twelve or twenty-four feet.



Square Piston Packing.
 Rubber back, per pound \$1. Discount 60 per cent. Best only.
 Square piston packing rubber back is made in lengths of twenty feet.



Steam Packing.
 Cloth Insertion, Rubber Outside.
 Cloth Insertion, Cloth on one or both sides.
 Thickness. 1-Ply. 2-Ply. 3-Ply. 4-Ply.
 1-64 inch..... 70 cts.
 1-32 "..... 65 cts.
 1-16 "..... 60 cts. 63 cts. 66 cts.
 3-32 "..... 55 cts. 58 cts. 61 cts.
 1-8 "..... 55 cts. 55 cts. 58 cts. 61 cts.
 3-16 "..... 55 cts. 55 cts. 58 cts. 61 cts.
 1-4 "..... 55 cts. 55 cts. 55 cts. 55 cts.
 One-ply of cloth to every 1-16 inch thickness.
 Three cents per pound additional will be charged for each extra ply of cloth. Each cloth, whether insertion or on outside, to count as one ply.
 All cloth insertion or plain packing is one yard wide, and any length desired.
 Wire insertion packing, all thicknesses, per lb., 50 cents.
 Discounts: Reliance, 70 & 10; Royal, 60, 10 & 10; Manhattan, 60 per cent.
 See Packing, page 10.

HOSE.



Improved "Smooth Bore" Rubber Suction Hose.
 On spiral flat or round tinned steel wire.
 Int. Diam. Per ft.
 2 inch..... \$2.60
 2 1/2 "..... 3.50
 3 "..... 4.00
 3 1/2 "..... 5.50

| In. Diam. | Per ft. | Per. Diam. | Per ft. |
|------------|---------|------------|---------|
| 4 1/2 inch | 6.50 | 7 inch | \$13.50 |
| 5 " | 7.50 | 7 1/2 " | 15.00 |
| 5 1/2 " | 8.50 | 8 " | 16.50 |
| 6 " | 9.50 | 9 " | 19.50 |
| 6 1/2 " | 10.50 | 10 " | 22.50 |
| | 12.00 | 12 " | 27.50 |

Suction hose discount: Reliance, 60 and 10%; Royal, 60, 10 and 5%; Manhattan, 70 and 5%.
SUCTION HOSE.
 On spiral brass or iron wire
 Int. Diam. Per ft.
 1/2-inch..... \$.77
 1 "..... 1.00
 1 1/4 "..... 1.25
 1 1/2 "..... 1.65
 1 3/4 "..... 2.10
 2 "..... 2.50



RUBBER HOSE.

| Conducting Hose—Two-ply. | | Conducting Hose—Two-ply. | |
|--------------------------|---------|--------------------------|---------|
| Int. diam. | Per ft. | Int. diam. | Per ft. |
| 1/2 in. | \$0.20 | 2 in. | \$0.66 |
| 3/4 in. | 25 | 2 1/4 in. | 75 |
| 1 in. | 33 | 2 1/2 in. | 83 |
| 1 1/4 in. | 42 | 3 in. | 92 |
| 1 1/2 in. | 50 | 3 1/2 in. | 99 |
| 1 3/4 in. | 58 | 4 in. | 132 |

HYDRANT HOSE—THREE-PLY.
 1/2 in..... \$0.25 2 1/2 in..... \$1.00
 3/4 in..... 30 3 in..... 1.10
 1 in..... 40 3 1/2 in..... 1.20
 1 1/4 in..... 60 4 in..... 1.40

Discount—Reliance, 60; Royal, 70; Manhattan, 70 and 10 per cent.

GASKETS AND RINGS.

Fibrous.
 1/2 inch thick, or less, per lb..... \$0.90
 5-32 inch thick, and upwards, per lb..... \$0.80
 Cloth Insertion.
 1-16 inch thick, or less, per lb..... \$1.25
 3-32 inch thick, and upwards, per lb..... \$1.00
 There is one ply of cloth to every 1-16 in thickness.
 Five cents per pound additional for each extra ply of cloth.
 Dis., 60, 10 and 5%.

CORRUGATED RUBBER MATTING.
 Rolls 1 yard wide, 30 yards long, cut to any size required.

Indurated Fibre Ware.

SPITTOONS.
 16 in. dia., 8 in. high..... Doz. \$24.00
 12 1/2 in. dia., 5 1/2 in. high..... 10.80
 9 in. dia., 5 in. high..... 7.80

WASH TUBS.
 No. 0, 23 in..... 1/2 12 27.00
 Nos. 0, 1, 2 and 3, nested..... 1 in. 3 1/2 22.50
 No. 1, 21 in..... 1/2 10 1/2 24.00
 No. 2, 19 1/2 in..... 1/2 9 21.00
 No. 3, 18 1/2 in..... 1/2 9 18.00
 Nos. 1, 2, and 3, nested..... 1/2 9 1/2 21.00

CHAMBER PAILS.
 12 in. dia., 9 in. deep, 3 gal..... 16.00

WATER COOLERS.
 3 gal..... Doz. \$32.00
 4 "..... 40.00
 5 "..... 44.00
 6 "..... 48.00
 8 "..... 64.00
 10 "..... 80.00
 12 "..... 96.00
 15 "..... 120.00

WATER COOLERS AND FILTERS.
 4 gal..... Doz. \$96.00
 5 "..... 108.00
 6 "..... 120.00
 8 "..... 144.00
 10 "..... 192.00
 15 "..... 288.00

Dis. on all 25 and 20%.

Pails.
 No. of doz. in crate. Cubic feet. Price per doz.

Ladies' or Weaver's pails, 6 qt..... 1 2 1/2 \$5.35
 Half or buggy pails, 6 qt..... 1 2 1/2 4.80
 Star pails (standard plain), 12 qt., stenciled "for fire only" without extra charge..... 1 3 1/2 6.00
 Deck or Mason's pails (same size as Star, but heavier, with heavy wire ball)..... 1 4 6.60
 Railroad or fire pails, 14 qt. (also stenciled "fire" without extra charge)..... 1 1/2 3 1/2 7.80
 Fire pails, round bottoms..... 1 4 7.80
 Milk pails, 14 qt..... 1 4 7.80
 Stable pails, flush bottom, heavy wire ball, 14 qt..... 1 4 7.80
 Stable pails, 16 qt., same as above..... 1 1/2 3 1/2 8.40
 " " " " 18 " " " " 1 1/2 3 1/2 10.70
 " " " " 20 " " " " 1 1/2 3 1/2 12.00
 Covers for fire or star pails..... 1 3.35

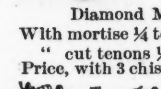
KEELERS.
 A—20 in. 7 in. deep..... Doz. 16.20
 B—19 " " " " " " " " 15.00
 C—18 1/2 " " " " " " " " 14.00
 1—17 1/4 " " " " " " " " 13.20
 2—16 1/4 " 6 in. " " " " " " 12.00
 3—13 1/2 " 5 in. " " " " " " 10.20
 4—12 " 4 in. " " " " " " 9.00

MILK OR VEGETABLE PANS.
 13 1/2 in. dia 3 1/4 in. deep, 6 quarts, \$3.60 per doz.

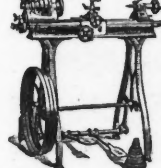
WASH BASINS.
 12 1/2 in..... Doz. \$4.80
 12 in..... 4.20
 11 1/2 in..... 3.60



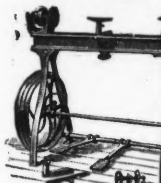
Paragon Self Feed Rip Saw.
Two changes of speed; three changes of feed.
Price, with one 10 in. saw, \$50.00
Dis., 20%.



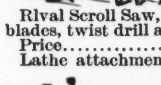
Diamond Mortising Machine.
With mortise 1/4 to 1 in. wide, 3 in. deep.
" cut tenons 1/4 to 3/4 thick, 3 in. wide.
Price, with 3 chisels \$25.00
Dis., 20%.



The "Star" Lathe.
Swings 9 x 25 in., back geared screw cutting.
Feeds in or out, right or left. Ad justable Tail Stock for Tapers.
Price.....\$75.00
Dis., 15%.



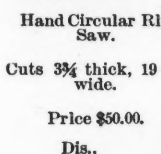
The Crown Lathe.
Swings 10 x 36 in.
Price, boxed..... \$45.00
Compound slide rest... 15.00
Countershaft 10.00
Dis., 20%.



Rival Scroll Saw, with six extra saw blades, twist drill and wrench.
Price.....\$10.00
Lathe attachment.....\$3.00
Dis., 25%.



The Challenge Scroll Saw, for shell, bone wood, or metal.
Nickel Plated, with six extra saws, twist drill and wrench.
Boxed.....\$20.00
With lathe attachment.....\$5.00
Dis., 25%.



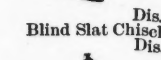
Hand Circular Rip Saw.
Cuts 3 3/4 thick, 19 in. wide.
Price \$50.00.
Dis.,



Scroll and Circular saw Combined. Combined Machines.
Combined circular scroll saw and boring attachment—2 circular saws, 12 assorted scroll saws, boring attachment, and self-centering drill chuck.....\$50.00
Combined circular and scroll saws—2 circular and 12 scroll saws..... 40.00
Circular saw—1 extra rip and 1 cross-cut saw..... 35.00
Scroll saw—12 assorted scroll saws..... 32.00
Counter shaft for steam power..... 10.00
Dis., 35%.



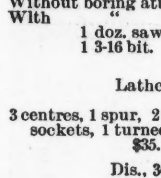
Foot Power Former.
\$20.00; Knives extra, \$1.00 each.
Dis., 35%.



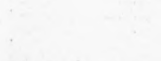
Blind Slat Chisels, 3 set bits, \$5.00.
Dis., 20%.



Tenoning Machine.
Price, \$25.
Dis., 35%.



Velocipede Scroll Saw.
Without boring attachment.....\$20.00
With 1 doz. saw blades, } Included. Dis., 35%.
1 3-16 bit.



Lathe.
3 centres, 1 spur, 2 tool rests and sockets, 1 turned face-plate, \$35.
Dis., 30%.



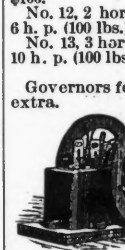
Lathe.
One turned face-plate, two pointed and one spur center, two rests, with sockets and plate for hand tools, slide rest-wrench, belting, etc., \$40.
Dis., 25%.



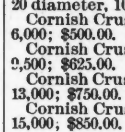
Meat Cutters.
American. Enterprise.
1 2 3 4 10 12 22 32 42
each, \$5.00 7.00 10.00 25.00 | each, \$3.00 2.50 4.00 6.00 15.00
Dis., 25%.



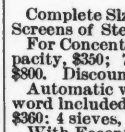
Motors (Water).
Size No. 8, for Sewing Machines, etc., \$18 each.
No. 9, 1/2 horse-power (30 lbs. pressure), 1/2 h. p. (50 lbs.), 1/2 h. p. (100 lbs.), 3/4 h. p. (150 lbs.), 1 h. p. (200 lbs.), \$30.
No. 10, 1/2 horse-power (30 lbs. pressure), 1/2 h. p. (50 lbs.), 1 h. p. (100 lbs.), 1 1/2 h. p. (150 lbs.), 2 h. p. (200 lbs.), \$50.
No. 10 1/2, 1/2 horse-power (30 lbs. pressure), 1 h. p. (50 lbs.), 1 1/2 h. p. (100 lbs.), 3 h. p. (150 lbs.), 4 h. p. (200 lbs.), \$75.
No. 11, 1 horse-power (30 lbs. pressure), 1 1/2 h. p. (50 lbs.), 3 h. p. (100 lbs.), 4 1/2 h. p. (150 lbs.), 6 h. p. (200 lbs.), \$100.
No. 12, 2 horse-power (30 lbs. pressure), 3 h. p. (50 lbs.), 6 h. p. (100 lbs.), 9 h. p. (150 lbs.), 12 h. p. (200 lbs.), \$175.
No. 13, 3 horse-power (30 lbs. pressure), 5 h. p. (50 lbs.), 10 h. p. (100 lbs.), 15 h. p. (150 lbs.), 20 h. p. (200 lbs.), \$285.
Dis., 40%.



Governors for 11 and 12, \$25 extra; for No. 13, \$35 extra.
Concentrating Machinery.
Blake Improved Crusher: 10x7, weight 7,500; \$410.00.
Blake Improved Crusher: 15x9, weight 9,000; \$580.00.
Discount 25%.



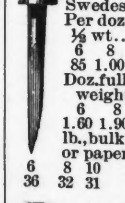
Cornish Crushing Rollers:
20 diameter, 10 face, weight 5,400; \$450.00.
Cornish Crushing Rollers: 20 diameter, 14 face, weight 6,000; \$500.00.
Cornish Crushing Rollers: 22 diameter, 14 face, weight 2,500; \$625.00.
Cornish Crushing Rollers: 27 diameter, 14 face, weight 13,000; \$750.00.
Cornish Crushing Rollers: 30 diameter, 14 face, weight 15,000; \$850.00.
Discount 25%.



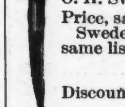
Complete Sizing Arrangement, consisting of Revolving Screens of Steel Sheet and Hydraulic Classifier.
For Concentrator, 25 tons capacity, \$250; 50 tons capacity, \$350; 75 tons capacity, \$450; 100 tons capacity, \$500. Discount, 10 per cent.



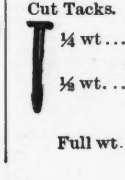
Automatic working Jig Machines, all complete, woodwork included, with slidemotion: 2 sieves, \$3.0; 3 sieves, \$3.60; 4 sieves, \$4.50.
With Eccentric Motion, all complete, woodwork included: 1 sieves, \$200; 2 sieves, \$270; 3 sieves, \$320; 4 sieves, \$330.
Automatic working Double Jig Machines, all complete, woodwork included: 4 sieves, \$210; 6 sieves, \$335; 8 sieves, \$425. Discount, 25 per cent.
Single Rittinger Percussion Tables, all the iron parts, \$350; Double Rittinger Percussion Tables, all the iron parts, \$500. Discount, 10 per cent.
Improved Rotary Tables, all the iron parts and pipes, \$200. Discount, 25 per cent.



Nails and Tacks.
Swedes. Tacks.
Per doz. 1/2 3/4 1 1 1/2 2 2 1/2 3
1/2 wt. 35 40 46 50 55 60 65 75
6 8 10 12 14 16 18 20 24 oz.
85 1.00 1.20 1.40 1.60 1.75 1.85 2.15 2.55
Doz. full 1/2 3/4 1 1 1/2 2 2 1/2 3 4
weight 60 70 80 90 1.00 1.10 1.20 1.40
6 8 10 12 14 16 18 20 24 oz.
1.60 1.90 2.30 2.70 3.10 3.40 3.80 4.20 5.00
lb., bulk 1/2 3/4 1 1 1/2 2 2 1/2 3 4
or paper 1.60 1.25 1.00 .80 .65 .58 52 46
6 8 10 12 14 16 18 20 24
36 32 31 30 29 28 28 28 28
Discount, 67 1/2, 10 and 2%.



O. H. Swedes.
Price, same as Swedes.
Swedes steel tacks same list price as iron.
Discounts, 72 1/2, 10 and 2%.



Upholsterers.
Price, same as Swedes.
Cut Tacks. Price per dozen ounces.
1/4 wt. 1 1 1/2 2 2 1/2 3 4 6 8 10
12 14 16 18 20 24 30 36 45 50 55
60 70 80 90 1.00
1/2 wt. 1 1 1/2 2 2 1/2 3 4 6 8 10
45 50 55 60 65 70 80 95
12 14 16 18 20
1.10 1.25 1.40 1.55 1.70
Full wt. 1 1 1/2 2 2 1/2 3 4 6 8
80 90 90 1.00 1.10 1.20 1.30 1.50

| | | | | | | |
|--------------------------|------|------|------|------|------|----|
| | 10 | 12 | 14 | 16 | 18 | 20 |
| 1.80 | 2.10 | 2.40 | 2.70 | 3.00 | 3.30 | |
| Discount, 70, 10 and 2%. | | | | | | |

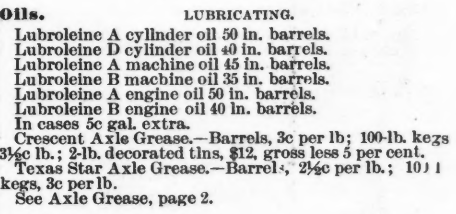
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|---|-----|------|------|------|------|------|------|------|------|------|
| Carpet Tacks, flat and oval heads. | | | | | | | | | | |
| Blued, doz. | oz. | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 1/4 wt. | | 35 | 40 | 45 | 50 | 55 | 65 | 75 | 85 | 95 |
| | | 22 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| | | 1.05 | 1.15 | 1.25 | 1.35 | 1.45 | 1.55 | 1.65 | 1.75 | 1.85 |
| 1/2 wt. | | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| | | 65 | 70 | 80 | 95 | 1.10 | 1.25 | 1.40 | | |
| | | 18 | 20 | 22 | 24 | | | | | |
| | | 1.55 | 1.70 | 1.85 | 2.00 | | | | | |
| Tinned, doz. 1/4 wt. | | 4 | 6 | 8 | 10 | 12 | 14 | 16 | | |
| | | 50 | 55 | 60 | 75 | 85 | 1.00 | 1.10 | | |
| | | 18 | 20 | 22 | 24 | | | | | |
| | | 1.20 | 1.35 | 1.45 | 1.60 | | | | | |
| Tinned, doz. 1/2 wt. | | 4 | 6 | 8 | 10 | 12 | 14 | | | |
| | | 95 | 1.05 | 1.15 | 1.40 | 1.60 | 1.85 | | | |
| | | 16 | 18 | 20 | 22 | 24 | | | | |
| | | 2.10 | 2.35 | 2.60 | 2.85 | 3.10 | | | | |
| Discount, 72 1/2, 10 and 2%. | | | | | | | | | | |

| | | | | | | | | |
|--------------------------|-----|-------|-----|---------|---------|-----|-----|----|
| Finishing Nails. | | | | | | | | |
| Inch. | 3/4 | 3/4-8 | 4-8 | 4 1/2-8 | 5 1/4-8 | 6-8 | 7-8 | 1 |
| Per lb. | 43 | 40 | 32 | 28 | 26 | 24 | 22 | 20 |
| | | | | | | | | 18 |
| 1 1/2 and larger. | | | | | | | | |
| | | | | | | | | 16 |
| | | | | | | | | 19 |
| Discount, 60, 10 and 2%. | | | | | | | | |

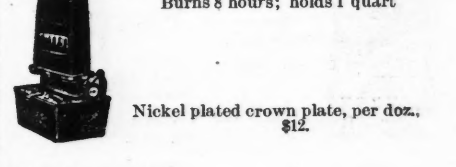
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|---|-----|-------|-----|---------|---------|-----|-----|----|
| Chair Nails. | | | | | | | | |
| Doz. 1/2 wt.; doz. full wt.; pound B. or P. | | | | | | | | |
| Inch. | 3/4 | 3/4-8 | 4-8 | 4 1/2-8 | 5 1/4-8 | 6-8 | 7-8 | 1 |
| Per lb. | 51 | 43 | 35 | 31 | 29 | 27 | 25 | 23 |
| | | | | | | | | 21 |
| | | | | | | | | 19 |
| Discount, 60, 10 and 2%. | | | | | | | | |

| | | | |
|---------------------------------|----------------|------------------|------|
| Common and patent brads. | | | |
| Price per doz. | Price per doz. | Price per lb. in | |
| 1/2 wt. | full wt. | papers or bulk. | |
| 2-8..... | .50 | 1.00 | 1.25 |
| 3-8..... | .60 | 1.20 | .80 |
| 4-8..... | .65 | 1.30 | .58 |
| 5-8..... | .72 | 1.44 | .48 |
| 6-8..... | .80 | 1.60 | .36 |
| 7-8..... | .90 | 1.80 | .30 |
| 1..... | 1.00 | 2.00 | .26 |
| 1 1/4..... | 1.12 | 2.24 | .25 |
| 1 1/2..... | 1.26 | 2.52 | .24 |
| 1 3/4..... | 1.82 | 3.64 | .22 |
| 1 7/8..... | 2.25 | 4.50 | .20 |
| 2..... | 2.43 | 4.86 | .18 |
| Dis., 60, 10 and 2%. | | | |

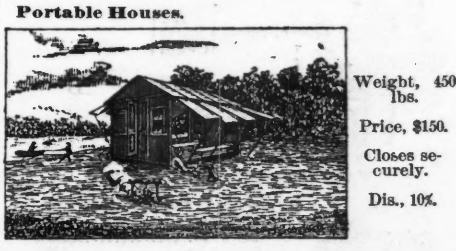
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|---|--|--|--|
| LUBRICATING. | | | |
| Lubroleine A cylinder oil 50 in. barrels. | | | |
| Lubroleine D cylinder oil 40 in. barrels. | | | |
| Lubroleine A machine oil 45 in. barrels. | | | |
| Lubroleine B machine oil 35 in. barrels. | | | |
| Lubroleine A engine oil 50 in. barrels. | | | |
| Lubroleine B engine oil 40 in. barrels. | | | |
| In cases 5c gal. extra. | | | |
| Crescent Axle Grease—Barrels, 3c per lb; 100-lb kegs 3 1/2c per lb; 2-lb. decorated tins, \$12, gross less 5 per cent. | | | |
| Texas Star Axle Grease.—Barrels, 2 1/4c per lb.; 100 lb kegs, 3c per lb. | | | |
| See Axle Grease, page 2. | | | |



Oil Stoves.
Burns 8 hours; holds 1 quart.
Nickel plated crown plate, per doz., \$12.



Packing.
Eureka, 75c. per lb. Dis., 40%.
Soapstone—Standard, 8c. per lb.
XX, 11c. per lb.
Crown—No. 1, 23c. per lb.
No. 2, 26c. per lb.
Climax, 9c. per lb. Net.
SELDEN'S PATENT.
For Steam, Air, Water and Ammonia.
With Rubber Core, 60 cents per lb.
Dis., 25 and 50%.
With canvas core, 50 cents per lb.
Dis., 30 and 5%.
See Rubber Packing, page 7.

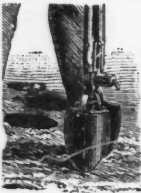


Portable Houses.
Weight, 450 lbs.
Price, \$150.
Closes securely.
Dis., 10%.



No. 10.—26 x 33 ft. including veranda and rear extension. Main part, 19 x 26 ft. \$500.00

Post Hole Diggers.



Little Giant..... \$36.00 doz 11 cu ft.
Hercules..... 30.00 " " " "
New Champion.... 20.00 " " " "
Scheidler..... 36.00 " " " "
Dis. 40% f.o.h. New York or Boston.



Press.

Combined press for cutting, forming,
homing and seaming.

Particulars of flat front presses, includ-
ing beds, slides, bolsters, plates, etc.

Prices are net, delivered on steamers in
New York, including insurance, etc.

Table with 5 columns: Nominal size of press, Price, Weight, Greatest diameter, etc.

Printers' Sundries.

Wood rules, 12 cents per yard.
Wood rules, on end wood, 15 cents per foot.

EUREKA STAND.

12 full cases.

Price without cases.....\$12.00
Boxing and cartage..... 1.25

SHOOTING STICKS.



GAUGE PINS—ALL SIZES.
Brass, 40c. doz. Steel, 60c. doz.
Wire, 25c. doz. Golden, 40c. doz.

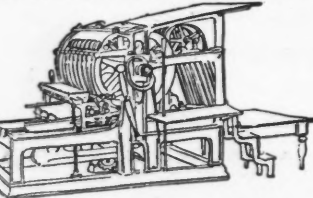
MITRE BOXES.

Regular size, 2 in., 50c. each.
Extra size, 3 1/2 in., 75c. each.

LEAD CUTTER.



Curtis' Lead Cutter\$2.00
PROOF PRESS, "OUR OWN."
9 x 32, complete, with Brayer\$28.00



THE "LIBERTY" CYLINDER PRESS.

For Newspaper and Job Printing.

Table with 2 columns: Bed, Form, Price.



THE "LIBERTY" JOB PRINTING PRESS.

Table with 2 columns: No., Price.

Two sizes built extra strong for boxmakers, emboss-
ing, etc.
No. 3a—11 x 17.....\$375
4—13 x 19..... 425

Fountains, either size, \$25 extra, if ordered with press.
Steam fixtures, either size, \$15 extra.

THE AMERICAN CARD AND BILL HEAD PRESS.

Table with 2 columns: No. x Size, Price.



THE "LIBERTY" PAPER CUTTER.

Cuts 30 inches.....\$140.00
Extra knife..... 18.80
Dis., 12% and 5%.



THE "LIBERTY" IMPOSING TABLES.

Table with 2 columns: Marble top, Slate Top, Price.

Dis., 12% and 5%.
Kelsey & Co.,



The Eagle Card and
Paper Cutter, 24 1/4 inch.
\$12 each, \$100 per doz.

THE "LIBERTY" TYPE CABINETS.

Table with 4 columns: Number of cases, Flat, Gal., Price.

Table with 4 columns: Number of cases, Flat, Gal., Price.

Table with 4 columns: Number of cases, Flat, Gal., Price.

*Furnished with galley top and extra drawer for copy.
Dis., 20 and 5%.

THE "LIBERTY" CASE STANDS AND RACKS.

Table with 2 columns: Single, Double, Price.

Table with 2 columns: Double, with racks, Price.

Table with 4 columns: Inches, Price, Back and Sides.

THE "LIBERTY" GALLEYS.

Table with 2 columns: Single, Double, Price.

SMOOTH LINED NEWS GALLEYS.

Table with 4 columns: Single col., Double col., Price.

SCREW GALLEYS.

Table with 4 columns: Single column, Double column, Price.

SMOOTH LINED JOB GALLEYS.

Table with 6 columns: Size, Unlined, Full-lined, Price.

These have a rule laid out on one of the rims, divided
into quarter inches, by which to set advertisements.
Cost of ruling extra, 25 cents.

MAILING GALLEYS.

Zinc bottom, 50 cents; brass bottom, 90 cents. Brass
closed both ends, \$3.

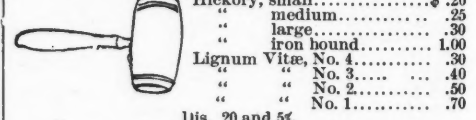


Table with 2 columns: Name, Measurements.

Cabinet case sides extend 1 1/2 to 3 inches. In ordering
cabinet cases, state whether high or low fonts are
wanted.

THE "LIBERTY" STEEL SHOOTING STICKS.

Bright, \$1 each.
Nickelplated, \$1.25 each.
Dis., 40%.



STANDARD METAL FURNITURE.

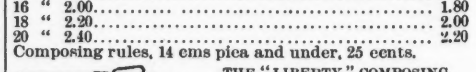
25c. a pound.
In fonts of 25, 50, 75 and 100 lbs.
Dis., 15%.

THE "LIBERTY" MALLET.

Hickory, small.....\$.20
" medium......25
" large......30
" iron bound.....1.00
Lignum Vitae, No. 4......30
" No. 3......40
" No. 2......50
" No. 1......70
Dis., 20 and 5%.

THE "LIBERTY" PLANERS AND PROOF PLANERS.

Midget planer.....10c.
Small Maple.....20c.
Large.....25c.
Midget h'ked with leather.....10c.
Proof planer, faced with cloth, 50c.
Dis., 40%.



COMPOSING STICKS.

GROVER'S PATENT AND UNION.
Screw or News.

Table with 2 columns: Size, Price.

Composing rules, 14 cms pica and under, 25 cents.

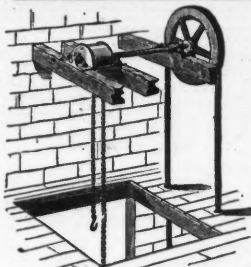
THE "LIBERTY" COMPOSING STICKS.

Table with 2 columns: Grover, Steel, Price.

6-in., Steel.....\$1.00
8 " ".....1.20
10 " ".....1.40
12 " ".....1.60
14 " ".....1.80
16 " ".....2.00
18 " ".....2.20
20 " ".....2.40

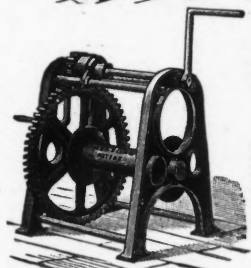
WESTON DIRECT.

Table with 2 columns: Size, Price.



DOUBLE LIFT HOISTS FOR HATCHWAYS, ETC.

| | |
|---------------|---------|
| 500 lbs. | \$25.00 |
| 1000 " | 50.00 |
| 1500 " | 65.00 |
| 2000 " | 80.00 |
| 500 " | 30.00 |



WESTON CRAB SAFETY BRAKE, HANDLES CAN NOT FLY BACK.

| | | |
|----------|-------|---------|
| 21 | Each. | \$35.00 |
| 22 | | 45.00 |
| 23 | | 65.00 |
| 25 | | 100.00 |

Pumps.

Prices on all pumps include cylinders.

| No. | Dia. | Cyl. | Suction. | Cap. | Stroke. | Iron. | Brass. |
|-----|-------|-------|-----------|------|---------|--------|--------|
| 0 | 2 in. | 1 in. | 1-15 gal. | 1-15 | 3.50 | ..... | ..... |
| 1 | 2 1/2 | 1 1/4 | 1-12 | 1-12 | 4.00 | \$6.00 | ..... |
| 2 | 3 | 1 1/2 | 1-11 | 1-11 | 4.50 | 7.00 | ..... |
| 3 | 3 1/2 | 1 3/4 | 1-10 | 1-10 | 5.00 | 8.00 | ..... |
| 4 | 4 | 2 | 1-6 | 1-6 | 5.50 | 10.00 | ..... |
| 5 | 4 1/2 | 2 1/2 | 1-5 | 1-5 | 6.50 | 14.00 | ..... |
| 6 | 5 | 3 | 1-4 | 1-4 | 8.00 | 18.00 | ..... |
| 7 | 6 | 4 | 1-3 | 1-3 | 12.00 | 20.00 | ..... |

Standard and Cylinder for 1 1/4 in. Iron Pipe, \$16.00. Dis., 55%.

No. 6 1/2, standard and cylinder, 1 1/4 in. pipe, \$13.00.
 No. 7 1/2, standard and cylinder, 1 1/4 in. pipe, \$15.00.
 No. 8 1/2, standard and cylinder, 1 1/2 in. pipe, \$18.00.
 With hose and discharge pipe, add \$3.00 to list price.

Dis., 55%.
 No. 1, diam. cyl., 2 1/2 in.; cap. stroke 1-8 gal.; size pipe, 1 1/2 in. Price, iron, \$12.50; brass cyl., \$17.50.
 No. 2, diam. cyl., 3 in.; cap. stroke, 1-6 gal.; size pipe, 1 3/4 in. Price, iron, \$14.50; brass cyl., \$18.50.
 No. 3, diam. cyl., 4 in.; cap. stroke, 2-5 gal.; size pipe, 1 1/2 or 2 in. Price, iron, \$23.50; brass cyl., \$34.50.

Dis., 55%.
 No. 1, diam. cyl., 3 in.; suction, 1 1/4 in. cap. stroke, 3-10 gal. Price, iron, \$28.00; brass cyl., \$58.00.
 No. 2, diam. cyl., 4 in.; suction, 1 1/2 in.; cap. stroke, 1-2 gal. Price, iron, \$32.00; brass cyl., \$60.00.
 No. 3, diam. cyl., 5 in.; suction, 2 in.; cap. stroke, 6-7 gal. Price, iron, \$35.00; brass cyl., \$90.00.
 No. 4, diam. cyl., 6 in.; suction, 2 1/2 in.; cap. stroke, 1-5 gal. Price, iron, \$45.00; brass cyl., \$120.00.

| No. | Diam. cyl. | Cap. stroke. | Stroke. | Pip. | Price. |
|---------|------------|--------------|---------|-------|---------|
| 00..... | 2 in. | 1-11 gal. | 7 in. | 1 in. | \$21.50 |
| 1..... | 2 1/2 | 1-7 " " | 7 " " | 1 1/4 | 23.00 |
| 2..... | 3 | 1-5 " " | 7 " " | 1 1/2 | 25.25 |
| 3..... | 3 1/2 | 1-3 " " | 7 " " | 1 3/4 | 27.25 |
| 4..... | 4 | 1-2 " " | 7 " " | 2 | 30.50 |
| 5..... | 4 1/2 | 1-2 " " | 7 " " | 2 | 37.50 |
| 6..... | 5 | 8-10 " " | 10 " " | 2 1/2 | 44.00 |
| 7..... | 5 1/2 | 8-10 " " | 10 " " | 2 1/2 | 47.00 |
| 8..... | 6 | 1-5 " " | 10 " " | 3 | 50.00 |

Dis., 40%.
 With Tight and Loose Pulleys.
 No. 1, cap. per rev., 1-6 gal.; size of pipe, 1 1/2 in.; price, iron, \$20; bronze, \$45.
 No. 2, cap. per rev., 1-5 gal.; size of pipe, 1 3/4 in.; price, iron, \$31; bronze, \$55.
 No. 4, cap. per rev., 1-3 gal.; size of pipe, 2 in.; price, iron, \$48; bronze, \$75.

Pulleys on Nos. 1 and 2 are 8 in. diam., 2 1/2 in. face; on No. 4, 12 in. diam., 3 1/2 in. face.
 Balance wheels for above pumps, \$1, \$2, and \$3, according to size.
 Dis., 45%.
 No. 2, 1/2 to 2 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive, 1/2 in.; discharge, 3/4 in.; price, \$9.
 No. 3, 1 to 4 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive, 1 in.; discharge, 1 1/2 in.; price, \$11.

No. 4, 2 to 8 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive 1 1/2 in.; discharge 1/2 in.; price \$14.
 No. 5, 3 to 14 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive 2 in.; discharge 1 in.; price \$22.
 No. 6, 4 to 25 gal. per min.; length of drive pipe, 30 to 40 ft.; calibre of pipes, drive, 2 1/2 in.; discharge, 1 1/4 in.; price, \$40.
 No. 7, 8 to 60 gals. per min.; length of drive pipe, 30 to 40 ft.; calibre of pipes, drive, 4 in.; discharge, 2 in.; price, \$75.
 No. 8, 12 to 120 gal. per min.; length of drive pipe, 30 to 50 ft.; calibre of pipes, drive, 6 in.; discharge, 2 1/2 in.; price, \$125.

Railroad Dumping Cars and Carts.



| Cars. | Gauge. | Cap. | Net | Cap. | Net | Cap. | Net |
|-------------------------|-----------|---------|------|---------|------|---------|------|
| Side Dumping | 24" | 1 c. y. | \$55 | 2 c. y. | \$65 | 3 c. y. | \$75 |
| End Revolving | " | " | 55 | " | 65 | " | 75 |
| Bottom | " | " | 70 | " | 80 | " | 90 |
| Tunnel | " | " | 50 | " | 65 | " | 75 |
| Mine | " | " | 55 | " | 60 | " | 70 |
| Plantation | 30" | " | 43 | " | " | " | " |
| Logging | 36" | " | 170 | " | " | " | " |
| Hand | 4' 3 1/2" | " | 185 | " | " | " | " |
| Push | 4' 3 1/2" | " | 45 | " | " | " | " |
| R.R. Construction | 4' 3 1/2" | " | 40 | " | " | " | " |
| Carts | 4' 3 1/2" | " | 65 | " | " | " | " |
| Plantation and Railroad | " | " | 45 | " | " | " | " |
| Wagons | " | " | 75 | " | " | " | " |
| McEwen Patent Dumping | " | " | 175 | " | 200 | " | " |

*These cars built of any gauge from 18" to 56 1/2" and of any capacity from 1/2 to 6 cu. yd.

Rat Traps.



1 doz. in box.
 1 gross in case.
 \$30 per gross.
 Dis. 50 and -0%.

Refrigerators.
 Indurated Fibre and Stoneware-Lined.

| No. | High. | Wide. | No. 75, 85. | Deep. | Price. |
|---------|--------|--------|-------------|--------|---------|
| 35..... | 46 1/4 | 28 1/2 | 20 1/4 | 23 1/2 | \$20.00 |
| 75..... | 44 1/4 | 33 1/4 | 23 1/4 | 23 1/4 | 28.00 |
| 85..... | 47 1/4 | 38 | 23 1/4 | 23 1/4 | 34.00 |

| No. | High. | Wide. | Deep. | Price. |
|--------|-------|-------|-------|---------|
| 2..... | 41 | 46 | 26 | \$36.00 |
| 6..... | 84 | 46 | 26 | 60.00 |

Mirror 16 by 18 in. Dis., 30 and 5%.

Roofing.
 CORRUGATED IRON.
 2 1/2 inch corrugations.

| Gauge. | Per square |
|--------------------------|------------|
| No. 18, painted red..... | \$9.10 |
| No. 20, " " | 7.60 |
| No. 22, " " | 6.50 |
| No. 24, " " | 5.35 |
| No. 26, " " | 4.65 |
| No. 27, " " | 4.85 |
| No. 28, " " | 4.90 |
| No. 18, galvanized..... | 13.30 |
| No. 20, " " | 10.60 |
| No. 22, " " | 9.10 |
| No. 24, " " | 7.45 |

| | |
|-------------------------|------|
| No. 26, galvanized..... | 7.05 |
| No. 27, " " | 6.95 |
| No. 28, " " | 6.75 |

Dis., 10% F. o. b. N. Y.

Slate.
 F. o. b. New York. Stowage allowed.
 Purple and Green, per 100 feet sq..... \$4.50
 Dark blue, per 100 feet sq..... 4.1:
 Sizes, 24 x 12 = 115 to sq., 650 lbs. weight.
 Sizes, 20 x 10 = 170 to sq., 650 lbs. weight.

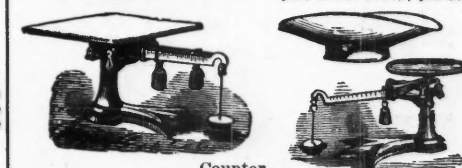
Sash Chains.
 No. A. "Giant" metal, 15c. pr. ft., wts. not over 125 lbs.
 No. 1. "Giant" metal, 12c. pr. ft., wts. not over 75 lbs.
 No. 2. "Giant" metal, 10c. pr. ft., wts. not over 40 lbs.
 No. 0. "Giant" metal, 8c. pr. ft., wts. not over 25 lbs.
 No. 1. Red metal, 10c. pr. ft., wts. not over 40 lbs.
 No. 2. Red metal, 8c. pr. ft., wts. not over 30 lbs.
 No. 0. Red metal, 6c. pr. ft., wts. not over 15 lbs.
 No. 1. Steel, 8c. pr. ft., wts. not over 30 lbs.
 No. 2. Steel, 6c. pr. ft., wts. not over 30 lbs.
 No. 0. Steel, 4c. pr. ft., wts. not over 15 lbs.
 No. 1. Steel, black enameled, 9c. pr. ft., wts. not over 75 lbs.
 No. 2. Steel, black enameled, 7c. pr. ft., wts. not over 30 lbs.
 No. 0. Steel, black enameled, 5c. pr. ft., wts. not over 15 lbs.
 Fastenings for hanging a window of 2 sashes for Nos. 1 and 2 chains, consisting of 4 hooks, 4 rings, 4 sash irons, a set, 18c. per set.
 Fastenings for hanging a window of 2 sashes for No. 0 chains, 14c. per set.
 Dis. on "Giant" metal chain..... 40 10 10%
 " Red metal chain..... 40 10 10%
 " Steel..... 40 10 10%
 " Fastenings..... 40 10 10%

Scales.—Discount on all scales 50 and 10 per cent.
 Postal scales:
 No. 1, capacity 1/2 to 9 oz. \$3.00.
 No. 2, capacity 1/2 to 12 oz. \$4.00.
 No. 3, capacity 1/2 to 34 oz. \$6.00.
 No. 4, capacity 1/2 oz. to 4 lbs., \$8.00.

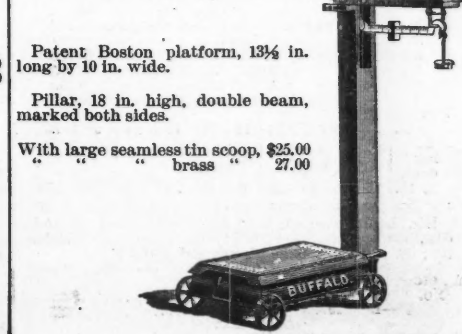


Butter Trip Scales, slab, weights and scoop.
 No. 7, 1/2 oz. to 10 lbs., 10 in. slab, without side beam \$10.50
 " 8 " " 20 lbs., 12 in. " " " 11.50
 " 8 " " 20 lbs., 12 in. " without " 12.50
 " 8 " " 20 lbs., 12 in. " " " 13.50

Tea Scales—All Seamless Scoops.
 Capacity. Scoop. Capacity. Scoop.
 1/2 oz. to 10 lbs. Tin .. \$8.00 1/4 oz. to 10 lbs. Brass .. 9.00
 Capacity. Scoop. Capacity. Scoop.
 1-16 oz. to 8 lbs. Tin .. \$10.00 1-16 oz. to 8 lbs. Brass. \$11.00
 Even balance trip scales, seamless scoop, with weights.
 No. 1, capacity 1/2 oz. to 2 lbs., tin scoop, \$5.50; brass scoop, \$6.50.
 No. 2, capacity 1/4 oz. to 4 lbs., tin scoop, \$6.50; brass scoop, \$7.50.
 No. 2 1/2, capacity 1/4 oz. to 18 lbs., tin scoop, \$11; brass scoop, \$12.50.



Counter.
 Capacity. Scoop. Capacity. Scoop.
 1/2 oz. to 36 lbs. Tin .. \$10.00 1/2 oz. to 36 lbs. Brass.. \$12.00
 Capacity. Scoop. Capacity. Scoop.
 1/2 oz. to 62 lbs. Tin .. \$12.00 1/2 oz. to 62 lbs. Brass. \$14.00
 Meat or Butter Scales, with Slab.
 1/2 oz. to 62 lbs., with Single Beam..... \$14.00
 " Double "



Patent Boston platform, 13 1/2 in. long by 10 in. wide.
 Pillar, 18 in. high, double beam, marked both sides.
 With large seamless tin scoop, \$25.00
 brass " 27.00

Platform scales - Without Wheels. Table with columns for No., Capacity, Platform, Price.

With Wheels and Drop Lever. Table with columns for No., Capacity, Platform, Price.

Shears. The Patent "Eureka". Images of shears and text describing their use and pricing.

Steel Wire Mats. Table listing different sizes and prices for galvanized steel wire mats.

Screws. Table listing various screw sizes, diameters, and prices.

SQUARE CAP SCREWS. Table listing square cap screw sizes and prices.

MILLED HE. Table listing milled head collar screws and their specifications.

Table listing various screw diameters, lengths, and prices under the heading 'Diameter of Collar Diameter of Screw'.

Fillister, Bevel Head, Button Head. Images of different screw heads and their corresponding diameters.

Table listing screw diameters and lengths for different screw types.

Head on Bevel and Button Head Screws, 1-16 larger in diameter than above specifications.

Soups (French). Table listing various soup types and their prices per dozen.

Terms cases. Discounts: 5% for lots of 10 cases, 10% for lots of 25 cases, 15% for lots of 50 cases.

Spades and Shovels. Images and descriptions of various spades and shovels.

Table listing different spade and shovel models and their prices.

Table listing various shovel and spade models and their prices.

Image of a patent solid corrugated cast steel scoop.

Table listing different scoop models and their prices.

Image of a ditching spade.

Table listing different ditching spade models and their prices.

Stamp Head Shoes and Dies. Images and descriptions of stamp head shoes and dies.

Table listing different stamp head shoe and die models and their prices.

Table listing different stencil ink colors and their prices.

Image of a stencil ink product.

Table listing different stencil ink combinations and their prices.

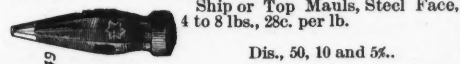
Tools. Images and descriptions of various tools like chisels and mill picks.



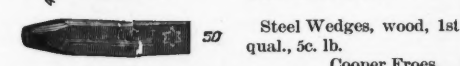
Stone Axes, Cast Steel. All sizes, 50c. per lb. Dis., 70 and 10%.



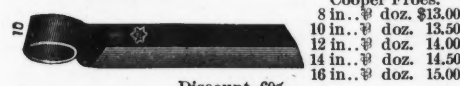
Five lbs. and over, 40c.; with teeth, 45c.; 3 to 5 lbs., 45c.; with teeth, 50c.; under 3 lbs., 50c.; with teeth, 55c. Nos. 40 and 41, spalling or stone hammer, 5 lbs. and ver. 36c.; 3 to 5 lbs., 40c.; under 3 lbs., 45c. per lb. Nos. 40 and 41, spalling hammers, 9 to 20 lbs., steel face, per lb., 17c. Dis., 70 and 10%.



Ship or Top Mauls, Steel Face, 4 to 8 lbs., 28c. per lb. Dis., 50, 10 and 5%.



Steel Wedges, wood, 1st qual., 5c. lb.



Cooper Froes. 8 in. doz. \$13.00 10 in. doz. 13.50 12 in. doz. 14.00 14 in. doz. 14.50 16 in. doz. 15.00

Discount, 60%. Vise. 60 days, 2% 10 days.

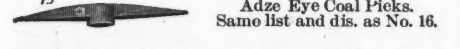


No. 1. Solid Box Vises. Each. No. 25, 3 3/4 in. Jaw \$12.00 " 30, 3 1/2 " " 11.00 " 35, 3 1/2 " " 10.00 " 40, 4 " " 10.50 " 45, 4 1/4 " " 11.00 " 50, 4 1/4 " " 11.50 " 55, 4 1/2 " " 12.00 " 60, 4 1/2 " " 13.00 " 65, 4 3/4 " " 14.00 " 70, 5 " " 15.00 " 75, 5 " " 16.00 " 80, 5 1/4 " " 17.50 " 85, 5 1/4 " " 18.50 " 90, 5 1/2 " " 20.00 " 95, 5 3/4 " " 21.00 " 100, 6 " " 22.00 " 105, 6 " " 23.00 " 110, 6 1/4 " " 24.00 " 115, 6 1/4 " " 25.00 " 120, 6 1/2 " " 26.00 " 125, 6 1/2 " " 27.50 " 130, 6 3/4 " " 29.00

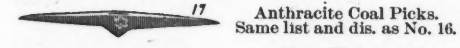
Table with 3 columns: Jaw size, Price per jaw, Price per dozen. Includes items like No. 135, 6 3/4 in. Jaw, No. 140, 7 in. Jaw, etc.

Dis., 60 and 10%.

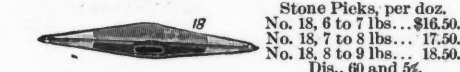
MINERS.



Adze Eye Coal Picks. Same list and dis. as No. 16.



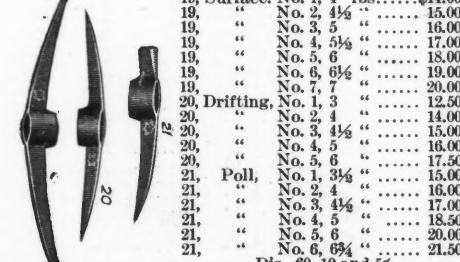
Anthracite Coal Picks. Same list and dis. as No. 16.



Stone Picks, per doz. No. 18, 6 to 7 lbs., \$16.50. No. 18, 7 to 8 lbs., 17.50. No. 18, 8 to 9 lbs., 18.50. Dis., 60 and 5%.

Table listing Coal Picks with columns for No., Weight, Price per doz., and Price per doz. Includes items like No. 16, 2 lbs., No. 16, 2 1/2 lbs., etc.

Packages charged at cost. Dis., 60%.

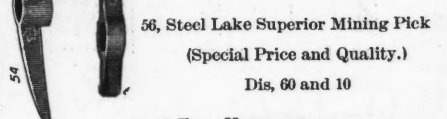


Adze Eye Miners Peks—Surface, Drifting and Poll. No. 19, Surface, No. 1, 4 lbs., \$14.00. No. 19, " No. 2, 4 1/2 " 15.00. No. 19, " No. 3, 5 " 16.00. No. 19, " No. 4, 5 1/2 " 17.00. No. 19, " No. 5, 6 " 18.00. No. 19, " No. 6, 6 1/2 " 19.00. No. 19, " No. 7, 7 " 20.00. No. 20, Drifting, No. 1, 3 " 12.50. No. 20, " No. 2, 4 " 14.00. No. 20, " No. 3, 4 1/2 " 15.00. No. 20, " No. 4, 5 " 16.00. No. 20, " No. 5, 6 " 17.50. No. 21, Poll, No. 1, 3 1/4 " 15.00. No. 21, " No. 2, 4 " 16.00. No. 21, " No. 3, 4 1/2 " 17.00. No. 21, " No. 4, 5 " 18.50. No. 21, " No. 5, 6 " 20.00. No. 21, " No. 6, 6 3/4 " 21.50. Dis., 60, 10 and 5%.



Tamping Picks. Adze eye, 6 to 7 lbs., per doz., \$17. Adze eye, 7 to 8 lbs., per doz., \$18. Adze eye, 8 to 9 lbs., per doz., \$19. Hunt eye, 6 to 7 lbs., per doz., \$17. Hunt eye, 7 to 8 lbs., per doz., \$18. Hunt eye, 8 to 9 lbs., per doz., \$19. Dis., 60 and 10%.

Table listing Ore Picks with columns for No., Description, and Price per doz. Includes items like No. 54, Adze Eye, 5 to 6 lbs., No. 54, " 6 to 7 " " " \$13.00, No. 54, " to 8 " " " \$14.00.



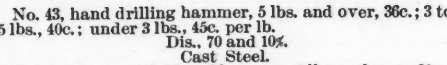
Steel Lake Superior Mining Pick (Special Price and Quality.) Dis., 60 and 10%

Steel Face Hammers.

No. 43, hand drilling hammers, 2 to 5 lbs.; No. 45, napping hammers, 2 to 5 lbs.; No. 39, mason hammers, 3 to 8 lbs.; No. 42, smiths' hand hammers, 2 to 5 lbs.; No. 44, smiths' striking hammers, 2 to 5 lbs., all steel face, per lb., 26c. Dis., 70 and 10%.

Steel Face Sledges.

No. 34, Smiths' sledges, 6 to 30 lbs., steel face, 17c. per lb. No. 35, Stone sledges, 6 to 30 lbs., steel face, 17c. per lb. No. 36, Striking sledges, 6 to 30 lbs., steel face, 17c. per lb. No. 37, Coal sledges, 5 to 10 lbs., steel face, 18c. per lb. Cast Steel Sledges. No. 34, Blacksmiths' sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb. No. 35, Stone sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb. No. 36, Striking sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb. No. 37, Coal sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.



No. 43, hand drilling hammer, 5 lbs. and over, 36c.; 3 to 5 lbs., 40c.; under 3 lbs., 45c. per lb. Dis., 70 and 10%. Cast Steel. No. 42, blacksmiths' hand hammer, 5 lbs. and over 30c.; 3 to 5 lbs., 34c.; under 3 lbs., 45c. per lb. No. 44, drilling or striking hammer, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb. No. 45, napping hammer, 5 lbs. and over, 30c.; 3 to 5 lbs., 35c.; under 3 lbs., 45c. per lb. Dis., 70 and 10%.

RAILROADS. Railway Track Punch



Round Point. 15c. lb., net. Track Wrench. 7 3/4 c. lb., net.



Rail Fork. 9c. lb., net.



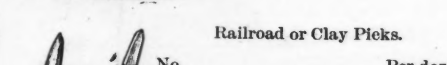
Crow Bars, Wedge Points, 3 3/4 c. lb., net. Pinch Point, 3 1/2 c. lb., net.



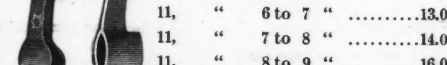
65 Tamping Bar, 6c. lb., net.



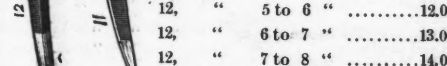
66 Claw Bar, 7c. lb., net.



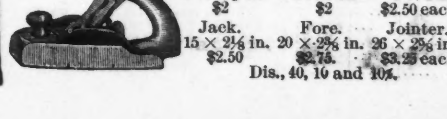
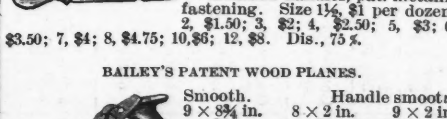
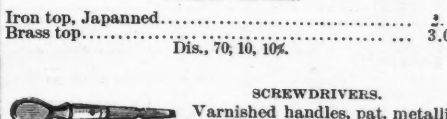
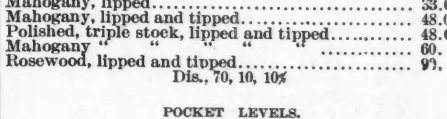
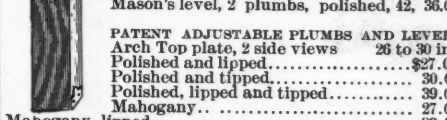
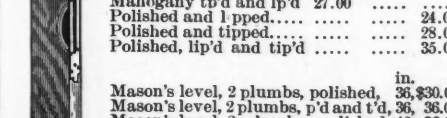
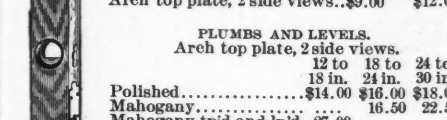
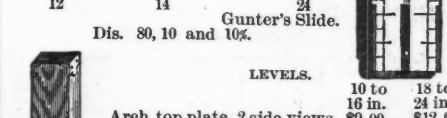
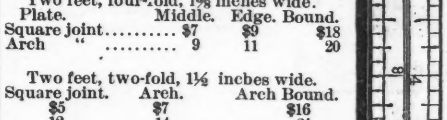
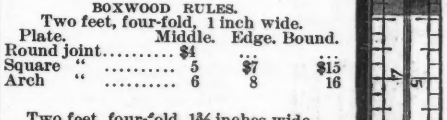
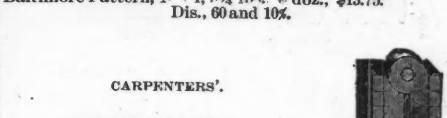
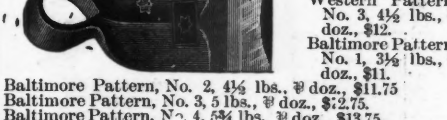
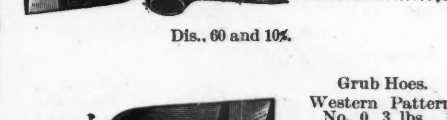
Railroad Spike Mauls 6 to 16 lbs., Steel Face 18c. lb. Dis., 50, 10, and 5%.



Steel Track Chisel, 15c. per lb., net.



Railroad or Clay Picks. No. 11, Adze eye, 4 to 5 lbs., \$11.00. No. 11, " 5 to 6 " 12.00. No. 11, " 6 to 7 " 13.00. No. 11, " 7 to 8 " 14.00. No. 11, " 8 to 9 " 16.00. No. 11, " 9 to 10 " 18.00. No. 12, Hunt eye, 4 to 5 " 11.00. No. 12, " 5 to 6 " 12.00. No. 12, " 6 to 7 " 13.00. No. 12, " 7 to 8 " 14.00. Dis., 60 and 10%.



Mattocks—Price per doz. 2, Adze Eye, Long Cutter, 6 lbs., \$16.00. 3, Adze Eye, Short Cutter, 5 1/2 lbs., \$15.50. 2, Adze Eye, Long Cutter, Light, \$15.00. 3, Adze Eye, Short Cutter, Light, \$15.00. 4, Hunt Eye, Long Cutter, 6 lbs., \$16.00. 5, Hunt Eye, Short Cutter, 5 1/2 lbs., \$15.50.

Adze Eye Pick Mattocks.....\$16.

Hunt Eye Pick Mattocks.....\$16

Grub Hoes. Western Pattern, No. 0, 3 lbs., doz., \$10.50. Western Pattern, No. 1, 3 1/2 lbs., doz., \$11. Western Pattern, No. 2, 4 lbs., doz., \$11.50. Western Pattern, No. 3, 4 1/2 lbs., doz., \$12. Baltimore Pattern, No. 1, 3 1/2 lbs., doz., \$11.

CARPENTERS' BOXWOOD RULES.

Table listing carpenter's boxwood rules with columns for Plate, Middle, Edge, Bound, Round joint, Square, Arch, and prices.

Two feet, two-fold, 1 1/2 inches wide. Square joint.....\$7 Middle.....\$9 Edge.....\$18 Arch.....9 11 20

Two feet, four-fold, 1 3/4 inches wide. Plate.....\$5 Middle.....\$7 Edge.....\$16 Arch.....12 14 24

Two feet, two-fold, 1 1/2 inches wide. Square joint.....\$7 Middle.....\$9 Edge.....\$18 Arch.....9 11 20

Two feet, four-fold, 1 3/4 inches wide. Plate.....\$5 Middle.....\$7 Edge.....\$16 Arch.....12 14 24

Two feet, two-fold, 1 1/2 inches wide. Square joint.....\$7 Middle.....\$9 Edge.....\$18 Arch.....9 11 20

Two feet, four-fold, 1 3/4 inches wide. Plate.....\$5 Middle.....\$7 Edge.....\$16 Arch.....12 14 24

Two feet, two-fold, 1 1/2 inches wide. Square joint.....\$7 Middle.....\$9 Edge.....\$18 Arch.....9 11 20

Two feet, four-fold, 1 3/4 inches wide. Plate.....\$5 Middle.....\$7 Edge.....\$16 Arch.....12 14 24

Two feet, two-fold, 1 1/2 inches wide. Square joint.....\$7 Middle.....\$9 Edge.....\$18 Arch.....9 11 20

Two feet, four-fold, 1 3/4 inches wide. Plate.....\$5 Middle.....\$7 Edge.....\$16 Arch.....12 14 24

Two feet, two-fold, 1 1/2 inches wide. Square joint.....\$7 Middle.....\$9 Edge.....\$18 Arch.....9 11 20



LEVELS. Arch top plate, 2 side views.....\$9.00 10 to 18 in. 12 to 24 in. 16 in. 24 in. \$12.00

PLUMBS AND LEVELS. Arch top plate, 2 side views. Polished.....\$14.00 18 in. 24 in. 30 in. Mahogany.....16.50 18.50 22.50 Mahogany tip'd and lip'd 27.00 Polished and lipped..... 24.00 Polished and tipped..... 28.00 Polished, lip'd and tip'd..... 35.00

Mason's level, 2 plumbs, polished, 36, \$30.00 Mason's level, 2 plumbs, p'd and t'd, 36, 36.00 Mason's level, 2 plumbs, polished, 42, 36.00

PATENT ADJUSTABLE PLUMBS AND LEVEL. Arch Top plate, 2 side views 26 to 30 in. Polished and lipped.....\$27.00 Polished and tipped..... 30.00 Polished, lipped and tipped..... 39.00 Mahogany..... 27.00 Mahogany, lipped..... 33.00 Mahogany, lipped and tipped..... 48.00 Polished, triple stock, lipped and tipped..... 48.00 Mahogany..... 60. Rosewood, lipped and tipped..... 91. Dis., 70, 10, 10%

POCKET LEVELS. Iron top, Japanned..... 3.00 Brass top..... 3.00 Dis., 70, 10, 10%.

SCREWDRIVERS. Varnished handles, pat. metallic fastening. Size 1 1/4, \$1 per dozen; 2, \$1.50; 3, \$2; 4, \$2.50; 5, \$3; 6, \$3.50; 7, \$4; 8, \$4.75; 10, \$6; 12, \$8. Dis., 75%.

BAILEY'S PATENT WOOD PLANES. Smooth. Handle smoothn. 9 x 3 1/4 in. 8 x 2 in. 9 x 2 in. \$2 \$2.50 each Jack. Fore. Jointer. 15 x 2 1/4 in. 20 x 2 3/4 in. 26 x 2 3/4 in. \$2.50 \$2.75 \$3.25 each Dis., 40, 10 and 10%.

