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Mexican ores. The decision of the Secretary of the Treasury subsequently disposed of this question against Dr. RAYMOND'S views; now the question is as to the policy of Congress passing a law which shall exclude the ores, and Dr. RAYMOND'S well-known views on this point were then and are now, in favor of the free admission of ores, and are practically those advocated by the *Times* and by the *ENGINEERING AND MINING JOURNAL*.

MANUFACTURERS and shippers who do an exporting business with South America on the passive principle that what South America is offered South Americans must take, should pause a moment and give consideration to one or two very patent facts. American exports to South America last year were considerably less than one-half the sum total of American imports from South America. In juxtaposition with this should be placed the fact that Great Britain exported to South America nearly forty million dollars' worth of goods more than she imported from the same countries. And Germany is rapidly approaching that stage where she will divide the trade with Great Britain, at least in many quarters, if not in all.

South America is advancing with giant strides. The several republics are just awaking to the fact that they are important factors in the world's commerce. At every turn in their business affairs they are met by energetic Englishmen and Germans, who are seeking their trade on liberal terms. They will manufacture any kind of goods in any kind of manner, shape, or description at almost any kind of price. They are willing to make small sacrifices to secure a foothold. And against all this the American manufacturer and exporter compete by circulars or price lists—rigid, unaccommodating, C. O. D. rules. The few exceptions have reaped golden harvests.

The remedy is no farther to seek than the reason. American manufacturers and exporters must invade the Southern markets and drum up trade if they want it. They must adapt themselves to local requirements and tastes, respect local customs, and fight the British competitor with better goods at prices which will be acceptable.

EXCLUDING ORES IS BUILDING UP FOREIGN INDUSTRIES WITH AMERICAN CAPITAL.

A recent number of the *Diario Oficial*, of the City of Mexico, publishes the terms of an important contract between the Mexican Government and Mr. L. H. Rouzer, as representing Mr. Robert S. Towne, of Kansas City. Mr. Towne may be considered to represent in this matter the Mexican Ore Company, already well known in Mexico for its large transactions as an ore buyer, and its considerable mining interests, which are operated with American energy and intelligence.

The contract is for the establishment of five different smelting works, two of 200 tons daily capacity each, two of 150 each, and one of 50. For each works established the concessionaires have the right to a "mineral zone concession" of 30 x 20 kilometers in extent. Work is to be commenced on the first smelting plant within six months from date of publication of contract and to be completed within two years. Within each two years thereafter another must be constructed so that within ten years the five establishments will be in running order. Within this period there must be spent \$1,000,000 on these plants, \$250,000 each on the two largest, \$200,000 each on the next two, and \$100,000 on the last, these amounts, of course, including the cost of building roads, quarters, offices, machinery, etc.

All machinery, material and tools imported for the use of the company, will be free of duties, Federal, State or municipal, and all furnace products exported, such as matte or base bullion, will be free also of all duties.

A smelting capacity of 750 tons a day in the hands of people who thoroughly understand their business is a valuable gain for Mexico and a serious loss to the United States.

THE REPORT OF THE DIRECTOR OF THE MINT.

Elsewhere we print an abstract of the report of the Director of the Mint on the production of gold and silver in the United States in 1889. This report shows a very considerable increase in the domestic production of silver, amounting to 4,000,000 ounces, the total being 50,000,000 ounces, while of gold the production is almost stationary.

In addition to our domestic production of silver, that imported in ores from Mexico amounted to 7,000,000 ounces, and in bars, mostly from Mexico, about 5,000,000 ounces. The consumption of silver in the arts amounted to \$8,766,000 coining value, or 6,000,000 ounces, and of gold \$16,697,000, or about one-half our entire production of the latter metal. The injury, not only to mining but to the whole country, by the stoppage of hydraulic operations in California, has been incalculable. The country has lost more already than would have purchased and condemned all the lands in California that are or can possibly be affected by the *débris*. It is certainly an outrage that an industry so important to the whole country should be prohibited by law.

One of the most important statements in the report is that our net loss of gold by export over import last year amounted to \$33,886,753, or more

THE Mount Bischoff Tin Mine, for the half-year ending December 30th 1889, paid dividends amounting to £40,500 on a capital of £29,600, equal to 137 per cent. for six months, or 274 per cent. per annum.

The Harney Peak, Dakota, tin mines are capitalized at \$15,000,000 (£3,000,000), have been prospecting and "booming" for several years and have not yet earned a dollar of profit or put a ton of tin on the market. Any one can see which of these examples benefits the mining industry the most.

OUR valued contemporary, the *New York Times*, is clearly mistaken in supposing that Dr. RAYMOND'S article on the lead-ore question, in our columns last week, when compared with his article of last September, indicates a change of position on his part. On both occasions Dr. RAYMOND opposed both the earlier and the later Treasury rulings; on both occasions he protested against the classification of lead ores according to their silver value; and on both occasions he declared himself in favor of reducing or removing the duty on all lead ores. The conditions have changed. In September last the burning question was as to the classification, for tariff purposes, of the Mexican silver-lead ores, and Dr. RAYMOND'S views which did not coincide with the editorial position taken by the *ENGINEERING AND MINING JOURNAL*, would, if adopted, have excluded the

than the entire production of our mines. Of silver our exports exceeded our imports by \$14,788,666.

The world's production of gold in 1889 is estimated to have been about \$118,800,000. Our production was nearly 28 per cent. of the whole, while our silver production, including that from imported ores, was 45 per cent. of the world's output.

The report gives interesting figures of circulation of gold, silver and paper per capita in different countries. When the full report comes to hand we shall, no doubt, be able to deduce important lessons from the statistics it furnishes. The prompt collection and publication of these valuable statistics is highly creditable to Mr. E. O. Leach, the Director of the Mint.

ALEXANDER LYMAN HOLLEY.

The New York Times, of April 24th, made a reference to the late Alexander L. Holley, which seems to show a sad obliviousness to the merits of one of America's greatest engineers. It summed up his claims to fame and a statue in Central Park as follows:

"It is satisfactory to know that the bust of the late Alexander Holley is cordially commended, by the aesthetic authorities that have been consulted, as worthy of a place in the Central Park on its merits as a work of art. It is to be wished that, besides the artistic scrutiny to which such monuments are subjected, there might be an investigation of the claims of the subject of the monument to such commemoration. The *advocatus diaboli* might often have something pertinent to say on this score. Mr. Holley was an accomplished engineer, who did much, we believe, to cheapen and facilitate the process of the manufacture of steel. This technical achievement would have to be explained to the great majority of visitors to the park, and it is doubtful whether the fame that is founded upon it is general enough to justify a monument in a public park. It is, of course, a question of degree. There would be no doubt of the propriety of a public monument to an inventor of the rank of Watt, or Fulton, or Morse, whose fame is by no means confined to his own profession, and whose work is known to everybody. The time is coming, however, if it has not come already, when sites for statues in the Park will be too scarce to be assigned to effigies from which the general public will derive its first knowledge that the originals of them have existed."

The memorial bust of HOLLEY has been accepted, not for the Central Park specially, but for such a site in some one of the parks as may be found most suitable; and if the desire of the colleagues and admirers of that great engineer have any weight, the memorial will stand in one of the squares most frequented by the public, which ought to know the names of its foremost benefactors. But wherever it may be placed, the merits of its subject are a sufficient justification.

In its earlier days the Times gained great credit for its brilliant scientific treatment of the important problems of naval architecture, screw-propellers, railway construction and practice, ordnance, armor and fortifications, and other branches of engineering. On all these topics its editorials were written, we believe, by ALEXANDER L. HOLLEY, its scientific editor; and in addition to these, his contributions over the signature of "TUBAL CAIN" made both the writer and the journal which appreciated him, famous on both sides of the ocean.

HOLLEY, whom JOHN ERICSSON called "the brightest ornament of American engineering," was known and honored by the entire engineering profession of two worlds, and probably did more than any other engineer of his day to bring about that union of science and practice which has placed American engineering in steel metallurgy, in rolling-mill practice and in mechanical engineering far in advance of that of any European country, and has thrown a glory not only upon the entire American profession of engineering, but has brought credit upon the whole nation. This is the HOLLEY whose achievements the engineers of two continents have sought to commemorate and keep fresh in the minds of his countrymen whom his labors and his life so greatly benefitted and honored, and it seems to us that the Times, which was more closely identified with his fame than any other paper in this country, should have been the very first to advocate the most public recognition of his merits.

Surely the Times does not contend that an engineer is not as worthy of such recognition as a soldier or a statesman; or that our children shall be taught by object lessons in bronze that in order to earn monumental renown they must either kill or be killed, or run for office; or that the millions of people who travel in safety or trade with profit because HOLLEY "did much" to cheapen steel, should not be taught, if they do not know, that such a man once existed, and deserved, by such an achievement, the thanks of all men.

THE EFFECT OF THE TARIFF ON RAW MATERIALS.

The proposed lead ore tariff, and, in fact, the entire bill now before Congress, is meeting with great opposition. Nearly every paper in the country, except the ultra-partisan press, opposes it, each in the interest with which the paper may be most familiar. In the department of general industry and in the interest of the wage-earning classes throughout the country the proposed increase in duties would be a very injurious measure, for it would, by increasing the cost of manufacture, close nearly all foreign markets to our goods, and, by increasing prices, would tend to restrict consumption of manufactures here. It would, therefore, on the one hand, lessen the demand for labor, and consequently would tend to lower wages, and on the other hand it would increase the cost of living

The wage-earners are those most affected by it, and they would be injured very seriously.

The condition of affairs most beneficial to the wage-earners is when the demand for labor exceeds the supply—as was the case last year in free trade Great Britain, where wages in many occupations went up above our rates here—and when the cost of living is a minimum. No country or industry ever yet increased its prosperity by increasing the cost of production. On the contrary, prosperity, or in other words, full and remunerative occupation for its inhabitants, is found when it can produce things cheaper than its neighbors, and can consequently find a ready market for its products.

The advocates of the exclusion of foreign lead ores claim that the price of lead will be advanced to 4½ or 5 cents a pound, and that this will benefit the country. On the contrary, it will increase the cost of smelting dry ores, and would, therefore, directly injure the smelters and the silver and gold miners, who are many times more numerous than the lead miners. It would restrict consumption of lead, and, therefore, lessen employment in manufacturing articles composed more or less of lead. It would increase the cost of the many articles, such as paint, in which lead is a large ingredient and which the wage-earning classes must buy.

It would benefit the owners of a small number of lead mines and of a few railroads carrying their freights. The copper miners of Lake Superior have been much better off in recent years with copper at from 10 to 13 cents a pound than they were when copper was 20 to 25 cents a pound. The consumption has increased, there is steady work, wages are fully as high and the cost of living is much less. Reduction in the cost of smelting, in the cost of machinery and supplies, and in transportation are more important to the miner than an advance in the price of lead, and they come from low prices and large consumption. It is better to make \$1 a ton on 100 tons than \$2 a ton on 25 tons.

In continuation of the letters published last week, the following expresses the views of one of our most prominent and experienced smelters:

"While I believe that a law admitting all lead ores free would swamp the country with lead, and would, by seriously reducing the market price, make it utterly impossible for many of the Western lead-silver mines to remain in operation, it cannot be denied that since the Windom ruling, which regulated the manner of importation, a great deal less foreign lead has come into the country than before these regulations were published, and far from flooding our markets, the effect has been to curtail the lead-ore supply for the smelters so that there is virtually not enough to keep all the lead smelters of the West running at their full capacity. You are aware, of course, that the supply of lead-silver ores of our own country has steadily diminished during 1889, and up to the present time, that the conditions affecting the lead-smelting problem are, in other words, very different from what they were in the early spring of 1889. The fact is that, were it not for the surplus of lead accumulated in 1888, when the importation of lead-silver ores was virtually unrestricted, we would be short of lead now, and the price would no doubt be up to the importation price. Besides the Coeur d'Alene country there is no large lead-silver ore producing district in the country that I am aware of, Leadville having vanished as a large producer and its former abundance of carbonate ores having given place to a very small supply of sulphides low in lead. The only mine, which is still producing carbonates moderately will have its supply exhausted by the end of the year.

The effect of this scarcity of lead-silver ores has been, that such ores command prices in the market far above their actual value. In other words, the smelters have to treat them at a large loss, and the miner gets prices for them, as if the market price of lead were considerably above four and a quarter cents.

Now I hold that it is neither fair, nor sound policy for the nation to allow one industry to live on the life-blood of the others. The smelters can still survive, with the small amount of lead coming into the country, while the Windom rulings allow to enter, but they could not survive if this lead were taken away too, and the price of our own lead-ores were thereby still further enhanced, unless they should cover themselves by raising the smelting charges for silver, or dry ores.

Under these circumstances it seems to me wisest, to let well enough alone, *i. e.*, to leave the law as it stands, or, if a duty must be put on, to fix it so, that the silver lead-ores, which are fairly rich in silver, say containing from 30 to 40 ounces per ton, can bear the burden and can still come to us, while the lead-ores low in silver (which is by far the larger class), would be kept out.

You understand from the above that I look at this question, not from any 'free trade' or 'protection' principles, but simply from the standpoint of a manufacturer, who wishes to keep his works in operation and his laborers employed, without doing any injury either to our lead mines or our silver mines. In fact, as you well know, our company is largely interested in lead-silver mines itself."

A second writes as follows:

"The ores we get from Mexico are principally silver or 'dry' ores, some carrying a small percentage of lead, which under the present tariff comes in free. We do not object to the present tariff therefore. If the proposed tariff on all lead is adopted I fear it will drive all the ore containing any lead from Mexican ports to Germany, where a good deal goes even now.

Another well-known smelter writes:

"It was decided by the directors of our company that they should advocate a free entry of Mexican lead ores. The introduction of Mexican lead ores from a smelting standpoint was very desirable, but from a mining and general commercial standpoint, I do not consider it such."

PROPOSED INCREASE OF DUTY ON TINNED PLATE.

The new tariff bill has been reported, and it is said to be the intention of the managers to push it through the House. They expect no serious opposition in the Senate, and hope, therefore, that it will become a law early in June.

There are some very important modifications in the schedule which it comes within our province to discuss, as directly or indirectly they affect mining interests, even in the West. Foremost among these is the proposed increase of duty on tinned plate, which it is intended shall exclude the foreign article entirely from our market, and give the increased duty, which the people must pay, to the steel workers of Pittsburg and Chicago.

The state of the tinned plate trade is simply this: We are, by far, the largest consumers of tinned plate, because we are the largest consumers of tin-canned goods. Our Rocky Mountain population depends for its food and petroleum on canned goods, and our Eastern population is yearly consuming more and more of both meats and vegetables thus packed at

the localities and periods of greatest and cheapest production for consumption in the season and places of scarcity.

In 1888 Great Britain exported 7,821,120 cwt., in boxes of 112 pounds, of tinned plate, of which we took from her 5,847,180 cwt. On this we, the consumers of tinned goods, paid a duty amounting to \$6,800,000. But this \$6,800,000 is not found to be a bonus sufficient to induce our steel workers to divert their plant from the more profitable uses to the making of plate for tinning, and they therefore demand and are given a further bonus of as much more. The present duty increases the cost of tinned plate 1.08 cents per pound. The proposed duty will enhance its cost 2.16 cents per pound. At present a box of 112 pounds I. C. 14-20 coke tinned plate, containing 108 pounds of plate, costs in England 12 shillings and 9 pence, and here, with freight, shipping charges and seller's commission added, it should cost \$3.12. The present duty brings this cost up to \$4.20, and if the McKinley Tariff Bill passes, it will cost \$5.28 per box.

The weight of tinned plate, including loss, entering a quart tin can is about $\frac{1}{10}$ of a pound, and the duty therefore will be on the tin alone over eight-tenths of a cent per can; but before it reaches the consumer the increased cost will be at least one cent.

As tinned goods are even more necessary to large sections of the people than coffee, and there is found to be no fiscal reason for extracting any revenue from coffee, the material for manufacturing tinned goods should be free. As, however, in the interests of the iron and steel makers a duty is imposed, and they do not find one cent, enough, another is added; and the consumer is called on to pay one cent per can on 600,000,000 cans, or \$6,000,000 more, less a rebate on exported manufactured tinware made from imported plate. If the public meekly submits, it will be a wonder if the steel plate manufacturers do not next session wheedle another two or three millions from their victims on some frivolous plea or other; for as specious an excuse for further extortion can be found in the future as has beguiled the public in the past. But, argue as they may, the result is that every poor family throughout the length and breadth of the land is compelled to contribute to what has been not unaptly called "*The Home Mission for the benefit of Beggar Millionaires.*"

It is difficult to discuss the subject calmly, so undisguised is the extortion, and so utterly hypocritical the pretense that it is made in the interest of the working classes. If the tinned plate now imported be made in this country, considering how ingeniously and rapidly our iron and steel men are using machinery in lieu of manual labor, 5,000 men will, perhaps, be employed in its manufacture, and many of these doubtless will be skilled tin-platers, who, tempted by the hope of higher wages, will leave their occupation abroad, to swell the ranks of our native workmen. And it is for the benefit of these 5,000 that at least 5,000,000, and most of these the poorer, unskilled workmen, are to be forced to contribute their pittance, or deprive themselves of the only cheap source of vegetable diet during the winter months.

Of course, of the 600,000,000 cans made in this country some are exported, but by far the larger number are consumed at home. We use the word consumed advisedly, for although they are not eaten with their contents, they, as well as the food they hold, pass out of service. There have been many more patents issued at Washington for removing the tin from tinned plate than for applying it, but no method can be economically employed for recovering the valuable coating from the scattered cans which, especially in the West, strew the ground everywhere, and mark the presence of men, present or departed, as unmistakably as FRIDAY'S foot-prints on the sea shore. It is only the vehicle for conveying the food from the producer to the consumer, and yet it sometimes is of more value than its contents. The tinned plate and solder composing a quart can, if the present bill passes, plus the labor, will be worth about three cents. The wholesale price of certain grades of tomatoes, with the canner's profits, transportation and wholesale dealer's remuneration added, is only 75 cents per dozen.

The benevolence of our legislators and our iron masters is not, however, sectional, or even national, but universal in its aim and operations. It is protecting home industry for the purpose of benefitting home labor, but as the foreign workman is not everywhere, and especially in benighted Britain, similarly placed, we would be false to our principles, did we not strive to make life worth living to them also. We cannot interfere to raise their wages, but we can, out of our superfluity, provide them with the necessaries of life so much more cheaply than we offer them even to our own operatives, that the disparity between our prosperity and their poverty shall be, as far as in us lies, eliminated. One method of carrying out this charitable purpose the McKinley bill practices by increasing the rebate on imported tinned plate, when exported in manufactured goods, from 90 to 99 per cent. In this way the needy foreign operative will be able to buy our farm and oil products at considerably less than our own workmen. The censorious and uncharitable hint is that this is done in order to place the Standard Oil Company, which exports so much of its petroleum in tin cans, on a par with its competitors abroad. But it would be unbecoming to question the motives of so august a corporation as the Standard Oil Company or to impugn the selfishness of our iron and steel manufacturers.

THE PROPOSED RAILROAD IN THE YELLOWSTONE NATIONAL PARK.

By Our Special Contributor.

In order to secure the most important uses of the Yellowstone National Park, namely, the preservation of timber around the headwaters of great river-systems, and the preservation of large game, such as elk and mountain bison, from extinction, it is important that the boundaries of the reservation on the south should be enlarged and better defined. The additional area would cover important forest breeding-grounds of game now liable to wanton destruction, and not valuable for any industrial purpose, while for the better definition of the tract with reference to natural boundaries would permit a more effective guardianship and the prevention of trespass.

A bill has passed the Senate which provides for this desirable change, and which ought to pass the House. But the Public Lands Committee of the latter body has attached an amendment to the bill, granting the right of way through the northern part of the park for fifty or sixty miles to the Montana Mineral Railway Company, which proposes to build a line from Cinnabar to Cooke City.

This railroad scheme is a useful one; and, so far as I am aware, the only one by which the mining district around Cooke City can be reached. *The Evening Post*, in a recent article, says: "A railway might be constructed to reach these mines from the northeast without touching the park, if the indications of mineral wealth were sufficient to warrant the outlay." I suppose a railway could be constructed anywhere on such a condition. But in this case the facts are that the mining district is promising enough to warrant any reasonable outlay, and the engineers of the Northern Pacific Railroad have carefully surveyed the practicable routes from the northeast, and their estimates of cost have been such as to cause that company to abandon its seriously conceived plan of entering from that direction. It would be bad engineering, bad political economy and bad policy toward the people of Montana to prevent the railroad from taking the route which nature indicates.

Now, is this prevention necessary? The northern boundary of the park can be so changed, without detriment to its integrity, beauty or usefulness, as to leave the railroad outside of it. The locality to be traversed is many miles away from the geysers, the lake or the cañon and falls of the Yellowstone. It is not visited by tourists, and (I think, but am not quite sure) it is not a principal haunt of the larger game.

I understand that those best qualified to judge, such as Mr. Hague, the geologist in charge of the Park, would not object to such a rectification of the northern boundary.

But the amendment gives a right of way through the Park—and this is a very different matter. Restoring a strip of territory to the general public domain would give all railroads a chance to cross it, under the operation of general laws; but letting one road cross a reservation is granting a monopoly. Moreover, the right to build and operate the road naturally carries with it the right to erect stations, maintain corps of engineers and workmen, camps of construction and repair, and herds of draught animals within the Park. The difficulties which might thus be entailed on the administration of the Park are easily imagined.

In short, the railroad ought to be built; the necessary territory can easily, I think, be spared from the north end of the reservation; but if I am mistaken, and this cannot be done, then the right of way across any corner of the Park should be surrounded with the most stringent conditions, prohibiting everything but simple through transit. It is, however, hardly necessary to consider this alternative. I feel sure the requisite change of the northern boundary is entirely feasible, and I hope, therefore, that the interest of the people of the United States in the National Park and the interest of the miners of Cooke City in the development of their mines by the aid of railway communication, will be reconciled in that way.

R. W. R.

THE DUTY ON PYRITES.

By Our Special Contributor.

The position I have hitherto maintained as to lead ores—namely, that their importation free of duty would be desirable, but that arbitrary distinctions of classification, admitting one class of lead ores free and leaving other classes subject to duty, on grounds of the value of the silver associated with the lead in the ore, are wrong in principle—finds a partial illustration also in the provisions of the McKinley bill concerning nickel, iron ore and pyrites.

Nickel, its oxide, and all alloys in which it is the chief component, are dutiable under Section 204 of the bill at 15 cents a pound. But under the preceding section, nickel in matte, or other crude form not ready for consumption in the arts, is to be admitted at three cents a pound. It is understood that this provision is intended to encourage the importation of the nickeliferous mattes from Canada, and the establishment of an extensive industry in their further treatment. In my judgment, it will have that effect, and is therefore to be approved. Nor does it seem likely that the maintenance of the duty of 15 cents on the metal itself will prevent a considerable lowering of price to consumers. For the Canadian product is notoriously beyond the present world's consumption.

But the persons, it is said, whose arguments, before the committee which framed this bill, secured this praise-worthy feature, obtained by similar arguments a modification of the duty on pyrites, so that Section 729 includes on the free list, besides crude sulphur, "sulphur-ore, as pyrites, or sulphuret of iron in its natural state, containing in excess of 25 per cent. sulphur (except on the copper therein contained)."

The parenthetic exception was conceded to the copper-producers; but the effect of the section upon the iron-ore interest appears to have been overlooked. In point of fact, it will have no special effect on the nickel industry; for it is almost certain that nickel will come in as matte only. Nothing can be more profitable to the Sudbury mine-owners than the cheap, crude, matte-smelting which they now carry on upon an enormous scale.

What Section 729 would permit would be the importation of Rio Tinto and Newfoundland pyrites as iron ores, free of duty. It is equivalent to putting on the free list all iron ores requiring to be roasted before further

treatment in the manufacture of iron, provided this roasting is profitable for sulphur. The proprietors of these pyritic ores can afford to sell them at a nominal price for the sulphur they contain, or perhaps even to give it away to whoever will extract it in the United States, leaving a very rich and pure iron ore, free from phosphorus. Of course, the miners of American pyrites, the residuum of which is too silicious for profitable use in the same way, will be driven out of the market.

I understand the present situation to be (under the duty of 75 cents a ton on pyrites), that American pyrites containing 45 per cent. of sulphur is sold at 10 cents per unit of sulphur, or \$4.50 per ton at this port. The residuum, which weighs 70 per cent. of the original weight of the pyrites, is not now sold as an iron ore; but may, perhaps, be worth \$2.50 per ton for that purpose. On the other hand, the Newfoundland pyrites containing 50 per cent. of sulphur produces 72 per cent. of residuum, carrying 60 per cent. of iron, and worth to iron manufacturers, say, \$6 per ton, or \$4.32 per ton of pyrites. After paying the duty of 75 cents, therefore, this material is worth \$3.57, and the sulphur in the ore can be sold at 4 cents per unit or even lower. The cost of mining and freight to New York is believed to be nearly the same in both cases. Still, the American producers manage to live at present, but say that they could not stand the further strain of the reduction of the duty. The foreign material competes victoriously with them by virtue of its value as an iron ore.

Now, I would have all iron ores admitted free of duty. But while iron ores pay a duty of 75 cents per ton, I do not think it fair to take that duty from iron-ores which happen to be also sulphur-bearing, to an extent which renders the roasting of them a profitable operation by itself. Why should not the sulphury Bessemer ores of Cuba, which also have to be roasted, be free of duty likewise? They are far less dangerous competitors for native ores, because the roasting of them does not pay a profit, but is a dead expense.

That the bearing of this question was scarcely appreciated by the Committee, appears from Section 133 of the bill, the section relating to iron ore, which fixes the duty on iron ore, and "also the dross or residuum from burnt pyrites," at 75 cents per ton. In the next sentence, it fixes the same duty on pyrites with certain reservations as to the dutiable copper contained in it: but then follow several provisos, one of which, corresponding with Section 729, countermands the duty on pyrites "containing in excess of 25 per cent. of sulphur." But this exception covers all the pyritic sulphur ore imported or likely to be imported, and therefore entirely nullifies the preceding clause, making the duty on "sulphur ore or pyrites, etc.," 75 cents per ton. That is to say, all pyrites shall pay this duty, except such as is worth importing. That shall be free!

R. W. R.

THE IRRIGATION-SURVEYS.

By Our Special Contributor.

In my reference to this subject last week there was no full discussion either of the present state of the controversy at Washington or of the merits of the underlying questions involved. Both aspects of the subject ought to be further explained for the information of engineers; and with this purpose I make some additional observations, repeating, however, the assurance that no imputation upon Director Powell's sincerity and good faith is intended or involved.

1. The Congressional situation is briefly this: The majority report of the Senate Committee on Irrigation charges that the funds heretofore appropriated for irrigation-surveys have been partly directed to another object. The specific appropriations made last year included \$200,000 for topographic surveys, and \$250,000 "for the purpose of investigating the extent to which the arid region of the United States can be redeemed by irrigation, and the segregation of the irrigable lands in such arid regions, and for the selection of sites for reservoirs and other hydraulic works necessary for the storage and utilization of water for irrigation, and the prevention of floods and overflows, and for estimating the cost of the same, and for making the necessary maps." (The italics are mine.)

The expense of the general topographical work in the arid region had been previously paid out of the appropriation for topographical surveys. But last year the two appropriations made, as above described, were applied as follows:

All work in the arid region was paid for out of the irrigation-appropriation, of which \$120,000 was devoted to the continuance of topographical surveys, and \$110,000 to the special hydrographical and engineering work connected directly with the irrigation problem. This left, out of the \$250,000 appropriated, a reserve of \$20,000 for contingencies and emergencies in either branch. The \$120,000 thus saved on the account of topographical work was applied to the extension of such work in the Central and Eastern States. The charge of the Senate Committee is, that this distribution of funds violated the well-known rule of disbursement, forbidding the transfer of money to a purpose already explicitly provided for, from a fund destined for another purpose. Such a transfer is obviously unlawful, unless it is either expressly authorized or necessarily implied in the terms of the law.

2. Major Powell declares that the topographical work in the arid region is necessarily implied in the clause "and for making the necessary maps," and, moreover, that he explained his plan fully to the Committees on Appropriations, declaring that it would be necessary to apply in preliminary topographical work the greater part of the \$250,000 appropriated for the irrigation-problem. This establishes his good faith in the matter, but leaves the real question to be determined on different grounds—namely, the question whether the topographical surveys and the resulting maps are really a necessary part of the irrigation inquiry, as it is described in the law. This is an engineering question, on which it is quite possible for men to differ, with mutual respect for one another's sincerity, though perhaps not for one another's judgment.

3. What is the method of this topographical work? A primary and secondary triangulation is projected on a plane table sheet, which is then carried over the country at the rate of about 20 miles a day. Distances are taken by counting the revolutions of a wagon-wheel, and checked by means of the triangulation points. Elevations are determined partly by the aneroid barometer, partly by vertical angles, checked on railroad lines. The appearance of the country is roughly sketched in the field, and the contour curves are put in afterwards. Each topographer is ex-

pected to cover in the field about 1,000 square miles per month, and the cost of the work is reported to be about \$3 per square mile. The resulting maps are on a scale of two miles to the inch, with contours at vertical distances of 20 feet in the open valleys, 50 feet in the foot-hills, and 100 feet in the mountains. They are probably as good as could be expected for the cost, and quite good enough for general uses. But they cannot possibly furnish the basis for such engineering work as the irrigation problem requires. That work must be patiently done with transit and level. It must result in accurate estimates of water supply, cost of dams, reservoirs, and canals and effective results. To base it in any degree upon the work of gentlemen with a good eye for scenery, interpolating their views into a triangulated outline, would be to make it nothing better than a general recommendation that somebody should make a real survey. So far as I can learn the actual engineering and hydrographic work, on which \$110,000 was spent last year, did not require the topographical maps at two miles to the inch. It is not easy to see what could be furnished on one square inch of such a map that would essentially help an engineer in studying the location, construction and cost of two miles of canal, or the laying out of a reservoir, or the irrigation of many square miles of arid land. Estimates of cost in particular require a detailed examination, foot by foot, of the difficulties of the ground. Estimates of grade cannot be safely made on the indications of the aneroid. Estimates of the supply and head of water must be the result of detailed local observations and measurements.

4. Granting, then, that Major Powell has done only that which he thought right and necessary, and of his intention to do which he gave frank notice: granting that the rough plane-table surveys are desirable and beneficial, and good enough for general purposes, it still seems to me clear that Congress should appropriate for each work what it may deem a proper amount of money, and that the appropriation for each should be devoted to its own object exclusively.

5. Moreover, if either is to be delayed for the sake of the other, the topographical work can wait with less injury to the public interest than the special inquiry into irrigation. The whole justification of the latter lies in the fact that it affects intimately the administration of the public lands. The segregation of irrigable lands, reservoir sites, etc., is a part of the scheme. In other words, the United States Government, being the owner of large areas which may thus be made valuable, is inquiring into their capacity and relations, and is desirous, pending such inquiry, not to sell or give away pieces of land, the owners of which might afterwards hinder great possible improvements. In justice to homestead settlers and other pioneers, this inquiry should be pushed with all practicable speed.

On the other hand, the general topographical survey, particularly of the lands which do not belong to the United States at all, but to the citizens of the several States, is not a matter requiring haste. It is a good thing to be done, perhaps (though this is not beyond all doubt as to wisdom and constitutionality) it is a good thing for the Federal government to do, or to help the States in doing, but at all events it is neither so clearly pertinent to the functions of that government nor so imperatively immediate in its effect upon the national interests as is the examination of the resources and possibilities of the public domain.

R. W. R.

NEW PUBLICATIONS.

ANNUAL REPORT of the Chief of Ordnance, U. S. A., for the fiscal year ended June 30, 1889. Government Printing Office, Washington, 1890. Cloth, 8vo, 397 pp., illustrated.

The receipts for the fiscal year reported on were \$6,281,822, including \$5,699,148 appropriated during the year, and the balance on hand to the credit of the bureau, after deducting expenses and outstanding accounts, was \$4,340,444.

The work of the Ordnance Bureau of the Army, according to the report, seems to have been somewhat slow, and in accordance with regulation traditions, it has been not only conservative, but ultra-conservative. General Benét begins with the customary administrative report, detailing the financial business of the bureau, the procuring of supplies, the clerical force, the national armory, and the various arsenal returns. The chief interest in the report consists, as usual, in the technical appendices. Comments are made on the steel forgings for the 8-, 10- and 12-inch rifles for shore fortifications, on the hooped 12-inch mortars, on machine tools for boring and finishing, on tests of guns made, and on the ordered pneumatic dynamite guns.

Most of the work of the bureau, besides the regular routine equipment of troops, appears to have been in the direction of experiment. In this line we may say that the bureau is fairly abreast of the times—indeed, it may be ahead of them. Our ordnance officials, navy as well as army, can claim to be fully as well posted as the general staff of any foreign power, and if ever we get into a serious dispute with a well equipped European state, and if that country will be considerate enough to give us a year's warning, we could probably make a good showing in offensive or defensive warfare.

The report begins with the statements of the fabrication, purchase and stocks on hand of various ordnance supplies. Then follow (appendices 10 and 11) the accounts of the trials of the Rubin and Schulhof repeating arms, both of 7.5 millimeters caliber, and both of which excel our Springfield in rapidity, accuracy and general usefulness, but are deficient in endurance. An interesting competition between the new model Smith & Wesson safety hammerless pistol and the double-action Colt is given. The Smith & Wesson beat the Colt in all the trials for accuracy and speed, but broke down in the dust and rust trials. As regards all these arms, for military use, it is an open question whether the arm is not too good for the man. When we consider the material of which an army is made up, in our as well as in foreign service, the clumsy thumb-fingering and carelessness of the many as contrasted with the expert performance of the few, we see how sensible the decision of our ordnance officers is in adhering to a simple type of arm which no stupidity of our German and Irish recruits can disable. The tests, however, show that a smaller caliber rifle, with proportionately a stronger powder charge, would be an improvement. The recoil of the Springfield is excessive, and its trajectory is by no means so flat as that of the modern rifles, thus narrowing its danger zone; but, on the whole, it is a good gun for the service. It is a question also whether the move in favor of magazine guns, now universal

abroad, may not prove wrong when the test of actual experience in warfare is applied. The problem will be to supply the line of battle with ammunition, and the danger will be in the harmless expenditure of cartridges under the excitement of an action. If a man can carry, at best, only 200 cartridges, he will, when using the magazine, fire off his supply in a few minutes. The critical point in strategy would then be a dependence upon the ammunition carriers.

The Ordnance Bureau has completed specimen types for the limbers, caissons, forge and battery wagons for the 3-20-inch field guns, all of which are far more complicated than in the old muzzle-loading system, and require the addition of an expert machinist to each section for making repairs and keeping the *matériel* in working order.

The forgings for the large steel rifles are being delivered in accordance with contracts. All of these guns are on the built-up system, which, though the best available at present, is doomed to an inevitable supersession at no very distant day. If we are to experiment, why not spend a little money in this direction? When cast-iron guns were standard, ours (built on the Rodman system) were by far the best; why not then should we not evolve a good cast-steel gun, in a single casting, for at least shore fortifications, where extra weight would not be objectionable? So far attempts in this line have been more or less failures; and the partial successes attained have not been such as to inspire a gun's crew with confidence in their arm.

The appendices showing the improvements and enlargements of the different arsenals and factories are satisfactory, and demonstrate the cautiousness and economy which prevail in the Ordnance Bureau. Still, they all show our utter unpreparedness for war, and however nice and exact our routine methods may be, when the trial comes—as it is sure to come—the inefficiency of the present system will be laid bare.

A very interesting point is raised by General Benét in regard to the question of reduction of caliber for small arms. The tendency has been this way in all foreign armies, few now being supplied with rifles of .40 caliber, most of them with guns rated in the .30's, and some with rifles of less than .30 caliber, but all having a great weight of lead, or steel cased lead, and of powder charge. General Benét thinks that the question hinges on smokeless powder. No powder is absolutely smokeless, and all "smokeless" powders seem to be defective in keeping properties. The General says: "In the absence of a suitable small arms powder, there has been no substantial progress in the matter of a small caliber rifle beyond what has been heretofore reported except in the negative gain resulting in the apparent abandonment, or tendency that way, abroad of all powders but the so-called smokeless. This change, involving the return to a *grained* powder, is, if permanent, an appreciable gain for all in the economy and efficiency of the product used in the manufacture of small-arm cartridges, and may have been brought about as much from the difficulty of obtaining uniform and satisfactory results in the way of velocities and pressures with the compressed powders as from the more valuable properties of the smokeless. No American has yet submitted for trial" [and here is a suggestive opening] "a smokeless powder, and experiment with compressed powders has shown the same eccentricity as was developed abroad, tending to destroy confidence in the final production of a serviceable compressed powder cartridge. All effort, official and otherwise, to date, to obtain a smokeless powder, has been abortive, and American powder makers and chemists have not yet awakened to the lucrative opportunity presented to them. There is reason to believe, from an application made to an officer of the department more than ten years ago, that smokeless powders originated, like many other inventions, in America, only to be brought to the attention of the world in foreign countries, although in this instance the person concerned met with encouragement—encouragement of which he did not avail himself. In view of the present status of the powder question it is not deemed expedient to produce a small caliber rifle for compressed powder cartridges. Such a rifle, however excellent in itself, would be inferior to foreign arms using smokeless powders, and, consequently, unsatisfactory to the army and the country at large. It is believed, however, that all the elements entering into the problem, except the powder, are ready for use the moment this powder is obtained. A .30 caliber rod-bayonet Springfield rifle has been made, and a rod-bayonet .30 caliber magazine arm is now in progress of construction in anticipation of the final acquisition of the much needed powder, so that no time may be lost in presenting for trial both single-loading and magazine small caliber rifles."

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents

Chemical Reaction in the Blast Furnace.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I have read with some interest Mr. Elbers' articles on the indirect action of carbon in all (?) iron and steel making processes, and, especially, his last article, in your issue of February 22d.

Now, though I am not yet prepared to say that I endorse Mr. Elbers' views, I should like to know whether he can harmonize his theory that CO is the carburizer under all circumstances with some of the peculiar phenomena of more recent inventions, such as the Darby filtering process.

Your obedient servant,

HOT SHORT.

NEW YORK, April 14th, 1890.

Matte Smelting for Silver.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Referring to Mr. Bartlett's letter in your issue of March 29th, just received, I wish your readers to understand that I am not claiming to be an original discoverer in the matters there referred to. My object in writing is to help along this discussion, in so far as my poor abilities and (perhaps?) still poorer opportunities for acquisition of knowledge will permit.

In regard to the use of small quantities of lead, the only "point" aimed at in my former article was to bring that metal into the theoretical scheme. It has long been used, as has also the "excess" of sulphur; but the true reasons for the necessity for the latter, in production of a clean

slag, had not, so far as I knew, been made public, and had, I believe, been kept secret. I knew naught of Mr. Bartlett's work in this line, except the contents of his former communication.

In insisting on the absolute necessity for such an "excess" of sulphur, I meant to be understood as implying that this excess should be sufficient for the purpose.

The amount of this necessary excess of sulphur will depend upon the manner of fusion and the conditions of fineness and porosity of the charge. In the reverberatory furnace the whole charge should not be mixed, but the raw pyritous portion should be placed in a layer near the bottom of the charge, and, to save sulphur, should be in that position where it will be the last portion to be heated previous to the beginning of fusion. It need not be finely crushed, which the rest of the charge should be—thus just reversing Mr. Bartlett's practice—and, with proper care, despite the "oxidizing flame," the excess of sulphur may, I believe, be pretty economically utilized.

This iron matte smelting is especially adapted for use at the mines, or near them, on ores which will not pay for long-distance shipments. In such localities, fuel suitable for reverberatory work is often cheap, while coke for the water jacket costs much money. This may turn the balance frequently in favor of the reverberatory, until some one makes a shaft furnace to burn cheap fuel economically. This last solution is not a hopeless one, as I trust will eventually be shown. Of course, radical changes in construction and operation will be necessary.

In blast furnace smelting the loss of sulphur will necessarily be great because the charge must be in lumps, of which the sulphur vapor can have access to the outside or surface only. Consequently, since the time for action is short, a large part of this vaporized sulphur will be apt to go up the chimney, carrying off, also, a small portion of the fuel in combination as a bisulphide. In the use of pyritic fines, as Mr. Bartlett proposes, the small particles will sift down through the charge before fusion, and the sulphur distilled from them will have to retrace the main ore body to make its escape; thus giving a better chance for the sulphurization of the metallic contents. The use of fines in this way is, however, at a disadvantage from the fact that there are always fines from the general stock in excess of what can be conveniently carried in the furnace. If the considerable pyritous portion of the charge must be crushed finely, as Mr. Bartlett insists, then there must be also a bricking plant for other fines, or much waste.

The reason for insisting on a thorough mixture of this fine portion with the charge is not, to me, apparent, for the fines will, inevitably, separate to a great degree, and sift down in the usual manner.

The crucible assay question seems irrelevant, since sulphurization is by a gas and not by a liquid; but even then, I believe that reliable results may be obtained "by dumping the ores and fluxes," or fluxes and ores, "one on top of another;" provided they be placed, intelligently, in proper order and even strata.

I will offer some further notes soon.

CHAS. F. TORRANCE.

DAYTON, Columbia County, Washington, April 5, 1890.

GEMS AND PRECIOUS STONES.

The interest in Mr. Geo. F. Kunz's work grows, and we publish the following opinions on this beautiful book:

Dr. R. W. Raymond writes:

"The Scientific Publishing Company has earned the hearty praise and thanks of book-lovers by the publication in such faultless style of the valuable work of Mr. Kunz on the gems and precious stones of this country. As students of this subject are well aware, the information found in most treatises is compiled or extracted from earlier books; and, as a consequence, is often vague or untrustworthy, or out of date. An entirely fresh and original contribution from a distinguished authority is a grateful novelty, as well as a valuable boon to the student and the *connoisseur*. It is proper that a treatise so closely connected with art as well as science should appear in a form so beautiful; but there is some danger that the admiration excited by the magnificent typography and illustrations of this book will divert attention from the interest and importance of its contents.

Mr. Clarence Cook the editor of the *Studio*, the leading art journal in New York, in the issue of April 26th, says:

"We have received from the Scientific Publishing Company, of New York, a copy of 'Precious and Ornamental Stones of North America,' by Mr. George F. Kunz, of which we can only say at this moment that the book is a notable contribution to our knowledge of the material riches of this continent, and that merely as a piece of bookmaking it does great credit to all who have had a hand in it. The chromo-lithographic plates made for the work by Messrs. L. Prang & Co. are remarkably fine specimens of the art, brought to such perfection by this firm that nowhere in the world is work done of equal quality. As for Mr. Kunz's text, there can be nothing but praise, and his work may be cordially recommended, not only to those whose interest in the subject is confined to its scientific side, but to those who look to a book for entertainment; for here is a world of interesting facts about precious stones and their relations to mineralogy and archaeology, narrated in a straightforward, clear and lively style that can make the dinner-hour and bedtime forgotten."

The New York *Sun*, in a long review of the work in its issue of April 27th, says:

"A valuable book upon a fascinating subject has been prepared by Mr. George Frederick Kunz, under the title of 'Gems and Precious Stones of North America' (the Scientific Publishing Company). It is a work both popular and scientific. It is arranged in a manner serviceable for study and reference, and is full of information calculated to interest as well as to instruct the general reader. The artistic labor expended upon the preparation of the book is deserving of high praise. It is an exceedingly handsome volume, fine in material, beautiful in typography and illustration. A series of lithographic plates, representing to us in their natural colors a number of celebrated American gems, are the work of L. Prang & Co., of Boston. They are exquisite in accuracy and finish, and deserve, doubtless, to be called, as Mr. Kunz calls them, the finest work of the kind ever published. The reader will find complete and finished information in Mr. Kunz's book. It is authoritative and captivating literature upon the subject of which it treats."

THE ACCIDENT TO THE CITY OF PARIS.

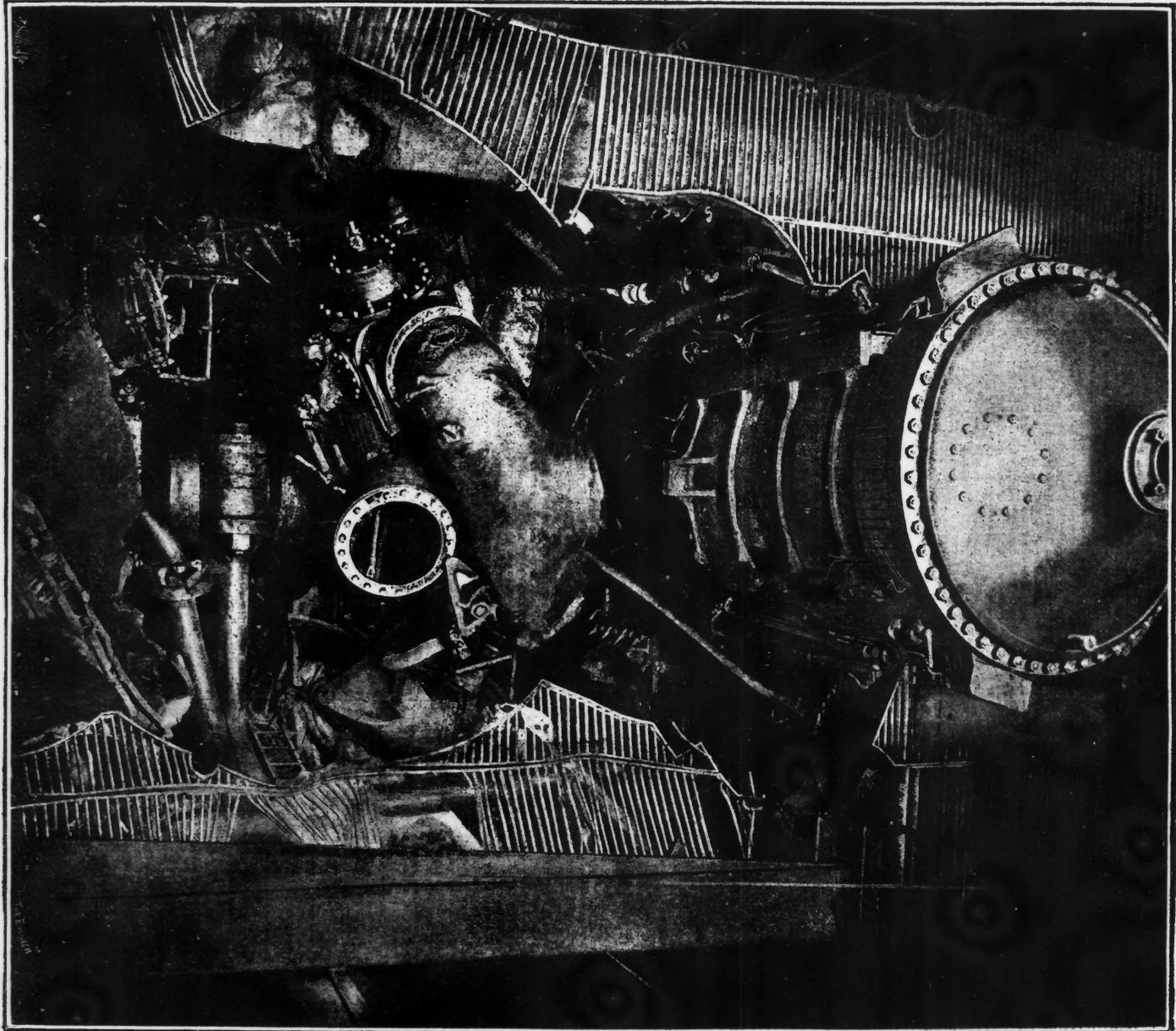
Many descriptions and illustrations have been published from time to time of the engines of the "City of Paris," in their original condition before the recent accident, and now we are indebted to our contemporary *The Engineer* for a most vivid representation of the interior of the starboard engine room taken from photographs as the ship lay under the 100-ton crane at Birkenhead, before any of the debris had been removed.

The "City of Paris" is propelled by twin screws driven by triple-expansion engines, indicating collectively about 18,000 horse power. The cylinders are 45 in. + 74 in. + 113 in. x 5 ft. The boiler pressure is 150 pounds, and the engines make about 85 revolutions per minute. The surface condensers are horizontal cylinders, lying rather high up in the wing. The air pumps are worked by back levers in the usual way; the circulating water is supplied by Gwynne's centrifugal pumps.

The three engines are distinct from each other. The high-pressure cylinder has a single piston valve, the intermediate cylinder has two, and

is a small water-tight door, which can be closed at a moment's notice. On the upper platform is the main stop valve. There are three platforms, the upper one giving access to the tail rods and their stuffing boxes; the middle one at the level of the link motion and the crank platform, where are situated all the starting and reversing levers.

At half past 5 on the evening of Tuesday, the 25th of March, the "City of Paris" was about 216 miles from the coast of Ireland, running at full speed. There were in each engine-room at the time three men, one on each platform. The man on the top platform felt the tail rod of the low-pressure engine and then went forward. He had not gone five steps when the whole low-pressure engine fell to pieces. In a few seconds this great engine, standing about 45 ft. high, was a heap of scrap. We examined the engine room carefully before anything had been removed, and the result of that examination was to show that everything that could be broken had been broken, and what could not be broken was bent, or twisted, or distorted. The intermediate and high-pressure engines are quite intact to all appearance. Portions of the rubbing



STARBOARD ENGINE ROOM OF THE "CITY OF PARIS" AFTER ACCIDENT.

the low-pressure cylinder four. Each cylinder is supported on two A frames, each frame a single steel casting weighing six tons, or 12 tons for each engine. On the cylinder are cast flats, or rubbing faces. Longitudinal tie rods brace the three cylinders together, but not too rigidly to prevent each engine taking its own stresses. Tie rods also brace the two engines together, these rods passing through the intermediate bulkhead. All the cylinders have coned top covers. The rise of the cover is the same in all, so that the inclination in the high-pressure cylinder cover is much steeper than the rise in the intermediate, and that again is steeper than the low-pressure cover. The coning is used to suit the shape of the pistons, which are made conical for strength. They are of solid cast steel, fitted with Peck's packing—that is to say, a set of rigid segments are screwed in, and between these a single spring packing ring not more than 1½ inches wide. The piston rods are 12 inches in diameter, of mild steel. The tail rods are 7 inches in diameter. A collar is provided on the piston rod, and to this the piston is fixed by round-headed bolts. The thrust block is in the engine room. Just behind the after bulkhead is the dynamo room, and in this bulkhead

face on the intermediate cylinder have been broken away, but so far as we could see there was nothing to prevent the engines working. The low-pressure cylinder was cast in one with its four valve boxes, the weight of the rough casting being about 45 tons. This cylinder is in fragments. (Going out to the end of what remains of the tottering upper platform, we had before us a great chasm, and at the bottom of the chasm an enormous heap of scrap iron. Nothing so complete in the way of a breakdown has ever before been seen. The explosion of a great shell might work such havoc in an ironclad. It is difficult in the face of such total destruction to form any theory as to what gave way first.

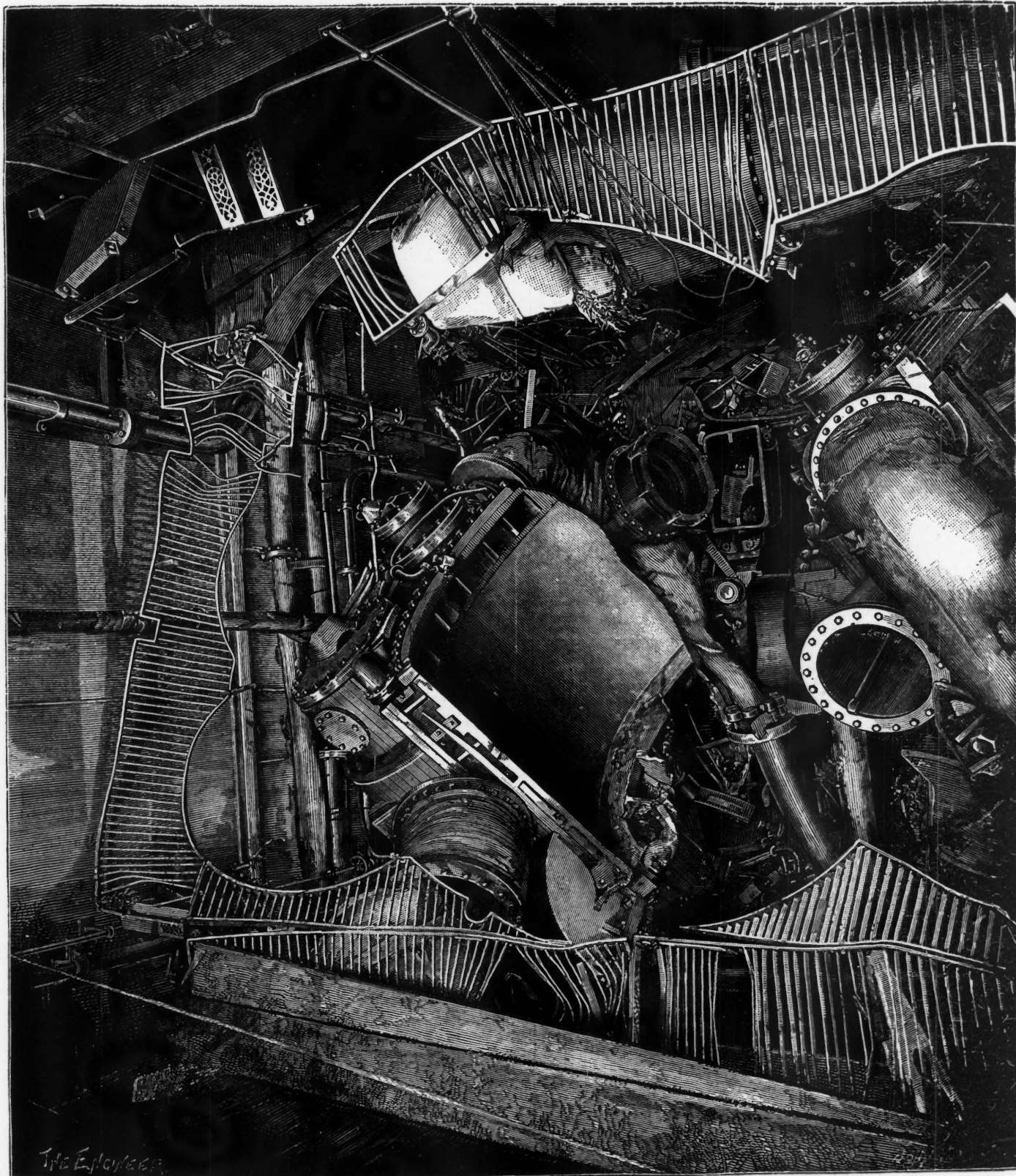
Descending to the crank platform, and crawling under and climbing over the heap of fragments, we find some curious things. The top cylinder cover seems to be at the bottom of everything. The A frames have apparently disappeared bodily. The connecting-rod is still coupled to the crank pin; the big end intact, but the rod, about 14 inches in diameter in the middle, is bent. The piston rod and crosshead are still coupled to the connecting rod, and lie folded back. The tail rod is bent like a bit of wire nearly in a semicircle. One side of the condenser has been torn out.

The tubes are all displaced, and a good many of them flattened until they are not thicker than the blade of a breakfast knife. The air pump levers are literally rolled up like bits of ribbon. On the side of a part of the cylinder is a great crack, but the metal holds still together in a way to demonstrate toughness in no ordinary degree. We are puzzled to imagine how it has been possible that material so excellent should have

horseshoes were torn out of the thrust block and scattered over the engine room.

The smashing of the condenser was followed by an enormous rush of water into the engine room.

The condenser lies low in the ship, considerably under the water line. It is supplied by Gwynne's centrifugal pumps, drawing water through a



STARBOARD ENGINE ROOM OF THE "CITY OF PARIS" AFTER ACCIDENT.

been so completely destroyed. There is not a broken bar or bolt that does not show that it has only given way as the result of the utmost violence.

But the ruin is not confined to the engine room; the great screw shaft 21 inches in diameter, and over 100 feet long, has been ripped up out of its bearing from one end of the screw tunnel to the other, and then dropped back again. All the cap bolts are smashed, and a great rent is torn in the bulkhead where the shaft passed through it. The one-half inch steel plate has been bent and buckled like a bit of paper. All the

copper pipe nearly two feet in diameter. The pumps and the condenser were wrecked, and the water, of course, rushed in like a cataract through the broken pipes. At the time of the accident there were three men in the engine room, one on each platform. The man on the lower platform was standing close to the after end of the condenser, and had a miraculous escape, one of the largest portions of the cylinder very nearly catching him in its fall. He fled for his life past the condenser. If he had remained he would have been drowned. He had no time to close the Kingston valve, even if he could have got at it under the *débris*. This

then, accounts for the flooding of the starboard engine room. The tail rod of the low-pressure engine was driven through the bulkhead between the two engine rooms, tolerably high up, making a nearly circular hole about a foot in diameter. A heavy longitudinal shelf piece lying some eight or ten feet above the crank platform strengthens the bulkhead. Just under this a large, ragged rent was torn, by what it is impossible to say. An attempt was made to stop both these holes with mattresses, held up with shores; but these did no good. It was almost impossible to get at the hole under the shelf piece, and it was the worst of the two. The engineers did all they could, but they were ultimately driven out of the port engine-room by the rising water. The screw shaft was ripped up out of its bearings from end to end, and then it dropped again; but in the lifting it tore up the after bulkhead and left a large aperture, through which the water rushed, filling the dynamo-room and screw alley. Not a drop of water got into the boiler-room.

The rush of steam into the engine-room was, for a moment, tremendous, but the instant the engines stopped no more steam could escape save that which might leak past the slide valves and pistons of the high-pressure and the intermediate-pressure cylinders. The engineers rushed into the engine-room and screwed down the top stop valve with commendable courage and promptitude.

When the vessel was taken into the graving dock, the water being pumped out of the dock, it was at once seen that something was wrong with the starboard propeller shaft. The propeller itself was uninjured, the three blades not being even bent, but it was seen to have been shifted somewhat aft of its normal position. It became necessary to strip off the casing in order to make a proper examination, and Messrs. Laird Brothers, in whose hands the work had been placed, proceeded with the operation. Upon the casing being cast adrift, the whole of the outer lengths of shafting, with the propeller attached, fell into the bottom of the dock, one blade cutting deeply into the timber of the dock bottom, while another was curled up like a leaf. It was evident that the cylindrical part of the casting could not be intact on its bottom side, or the shaft would not be released. There was, however, no occasion for any fracture to occur here throughout, and it was found that the bottom part of the casting was worn through for nearly the whole of its length, and much reduced in thickness where not worn through. The metal liner, 1 inch thick, together with its end flanges, was also worn through, and was lying in the bottom of the dock. The brass sleeve of the propeller shaft had entirely disappeared with the exception of two rings, presumably the collars at the end. The propeller shaft itself was practically undamaged, but the metal studs which attached the sleeve to the shaft were worn down level with the shaft, and the shaft was slightly worn also.

This wearing away and consequent dropping of the end of the outer shafting was apparently the primary cause of the whole mischief. It is impossible to see what had taken place in the starboard engine-room of the "City of Paris" and not conclude that she is an enormously strong and safe ship. Nothing so bad ever occurred in an engine room before. It is impossible, indeed, to imagine that anything worse can ever take place; yet the skins of the ship were uninjured. Not a single rivet has been started in the hull. Not a life was lost; no one was hurt, save one engineer slightly scalded. The ship has borne a test of absolutely unexampled severity, and she has come through the trial to perfection.

Our engravings give a good idea of the appearance of the engine-room. They have both been taken from above, the camera being pointed down the engine-room skylight, so that the orifice is seen in plan as it would appear to any one looking down through the skylight. With a little trouble, various portions may be recognized. The most prominent thing is the apex part of the cylinder, with two valve-boxes attached; this lay partly propped up against the after bulkhead. Near the bottom of the engraving are seen the crank and the big end. The connecting rod is bent, and doubled back on it is seen the piston rod, with the collar to which the piston was bolted. The tail rod is bent nearly to a semi-circle, and lies under the fragment of the cylinder. The A frames were broken off short at the bed-plate, and are found under the heap of scrap.

The second engraving is taken from a somewhat different point of view. Instead of the camera being directed vertically downward, it was used from one end of the skylight, and thus the line of sight is, though slightly inclined, more horizontal than is the case with the other engraving.

PRODUCTION OF THE PRECIOUS METALS, 1889.

Edward O. Leech, the Director of the Mint, has submitted to Congress a report on the Production of the Precious Metals for the calendar year 1889.

PRODUCT OF THE UNITED STATES.

The gold product of the United States was 1,587,000 fine ounces of the value of \$32,800,000, against \$33,000,000 in the preceding calendar year. Of the gold product of the United States \$31,959,047 was deposited at the mints for coining and manufacture into bars.

The silver product of our own mines for the calendar year 1889 was approximately 50,000,000 fine ounces of the commercial value of \$46,750,000, and of the coining value of \$64,646,464, against an estimated product for the calendar year 1888 of 45,783,632 fine ounces of the commercial value of \$43,020,000, and of the coining value of \$59,195,000, an increase over 1888 of about 4,216,368 fine ounces of the commercial value of \$3,730,000.

In addition to the silver product of our own mines about 7,000,000 ounces of silver were extracted from lead ores imported into the United States and smelted in this country, and over 5,000,000 ounces from base silver bars imported, principally from Mexico, making the total product of our mines, smelters and refineries about 62,000,000 fine ounces of silver.

Of this amount the government purchased for coining 27,125,357 ounces; there were used in the arts about 6,000,000 ounces; there were exported to Hong Kong, Japan and the East Indies about 9,000,000 ounces, and there were shipped to London, for sale, about 20,000,000 ounces.

Colorado still maintains first rank among producing States with an aggregate product of gold and silver of over \$24,000,000. Montana stand

next with a product of \$22,894,000. California produced \$14,034,000, of which \$13,000,000 were gold, being about 2/3 of the total gold product of the United States. Utah shows a largely increased product, notably in silver. Idaho and New Mexico report an increased product, and Arizona and Nevada a reduced product in 1889. The gold product of Dakota (South) increased from \$3,600,000 in 1888 to \$2,900,000 in 1889. Oregon and Washington both report increased products, the former having produced \$1,200,000 in gold. The States of the Appalachian Range show a slightly increased product of gold over 1888.

DEPOSITS AT THE MINTS AND COINAGE.

The total value of the gold deposited at the mints during the calendar year was \$48,908,072, of which \$42,599,206 were new deposits and \$6,308,866 re-deposits.

The total deposits and purchases of silver aggregated 36,297,564 standard ounces of the coining value of \$42,237,165, of which 36,074,212 standard ounces of the coining value of \$41,977,265 consisted of new deposits.

The coining of the mints for the calendar year 1889 was as follows:

	Pieces.	Value.
Gold.....	1,338,012	\$21,413,931.00
Silver dollars.....	34,651,811	34,651,811.00
Subsidiary silver coins.....	8,378,811	844,872.15
Minor coins.....	64,772,283	1,233,408.49
Total.....	109,140,917	\$58,194,022.64

In addition to the coining gold and silver bars were manufactured at the mints and assay offices as follows:

Gold.....	\$22,349,752.28
Silver.....	6,222,751.09
Total.....	\$28,572,503.37

Gold bars were exchanged for gold coin, free of charge, of the value of \$26,913,753.55.

The quantity of silver purchased for the silver dollar coining was 27,125,357 fine ounces, costing \$25,379,510, an average cost of \$0.9356 per ounce fine. The amount of silver offered the Treasury Department for sale during the year aggregated 47,965,700 fine ounces.

The total amount of silver purchased for the coining of the silver dollar from March 1st, 1878, to December 31st, 1889, was 271,632,503 fine ounces, costing \$291,470,956, an average cost of \$1.0613 per ounce fine. The coining of silver dollars for the same period was 349,938,001 pieces. At the average cost of silver for the whole period the cost value of the silver dollar is 82 cents.

COURSE OF SILVER.

The average price of silver in London during the calendar year was \$0.935 per fine ounce, and the average price of fine bars of silver in New York during the same period was \$0.936. The highest price reached during the year was 44 1/2 pence and the lowest price was 41 1/2 pence.

The shipments of silver to India during the year aggregated \$40,000,000 and the amount realized from the sales of India council bills about \$77,000,000.

EXPORTS OF GOLD AND SILVER.

The net loss of gold and silver to the United States by excess of exports over imports of the precious metals is as follows:

Gold.....	\$33,886,753
Silver.....	14,788,666
Total.....	53,675,419

INDUSTRIAL USE OF GOLD AND SILVER.

The amount of gold and silver used in the industrial arts during the calendar year 1889 in the United States was:

Gold.....	\$16,697,000
Silver (coining value).....	8,766,000
Total.....	\$25,463,000

The amount of domestic bullion used in the arts was:

Gold.....	\$9,686,827
Silver (coining value).....	7,297,933
Total.....	\$16,984,760

STOCK OF MONEY.

The total metallic stock of the United States is estimated to have been on January 1, 1890, as follows:

Gold coin and bullion.....	\$689,275,007
Silver coin and bullion.....	438,388,624
Total.....	\$1,127,663,631

The following table exhibits the amount of money in circulation per capita in the United States (exclusive of the amount in the Treasury), and the total stock of gold, silver and paper money in the three principal countries of Europe:

STATEMENT OF THE ESTIMATED AMOUNT OF GOLD, SILVER AND NOTES IN CIRCULATION IN THE UNITED KINGDOM, FRANCE, GERMANY AND UNITED STATES.

Countries.	Population.	Gold.	Silver.	Notes outstanding.	Total metallic and paper.	Per capita.			
						Gold.	Silver.	Paper.	Total.
France.....	38,250,000	900,000,000	700,000,000	594,000,000	2,194,000,000	23.53	18.30	15.53	57.36
United Kingdom.....	38,165,000	550,000,000	100,000,000	190,000,000	840,000,000	14.41	2.62	4.98	22.01
Germany.....	48,000,000	500,000,000	215,000,000	275,000,000	990,000,000	10.42	4.48	5.73	20.63
United States ...	64,000,000	375,607,112	116,298,802	938,728,545	1,430,634,459	5.87	1.82	14.67	22.36

WORLD'S COINAGE.

The coining of the world for the calendar years 1887, 1888 and 1889 was as follows:

Calendar years.	Gold.	Silver coining value.
1887.....	\$124,092,465	\$163,411,397
1888.....	134,827,740	134,922,344
1889.....	168,038,874	133,658,181

PRODUCT OF GOLD AND SILVER IN THE WORLD.

The production of gold and silver in the world during the calendar year

1889 was approximately: Gold, \$118,800,000; silver, 125,830,000 fine ounces; commercial value, \$117,651,000; coining value, \$163,690,000; against a product in 1888 of: Gold, \$109,900,000; silver, 109,911,000 fine ounces; commercial value, \$108,316,000; coining value, \$142,107,500.

Of the increase in the gold product about \$3,520,000 were from the mines of Australia; about \$4,200,000 from South Africa; and about \$1,000,000 from British India.

Of the increase in the silver product about 11,000,000 fine ounces were from the mines of Mexico; 4,000,000 ounces from our own mines and about 1,000,000 ounces from lead ores produced in Australia.

The report is replete with valuable statistics on the production, coinage and movement of the precious metals throughout the world.

BELGIAN AND GERMAN COAL MINE STATISTICS.

By Geo. G. Andre, F. G. S., M. E., etc.

The Belgian coal miners seem resolved on killing their goose to get at her golden eggs more rapidly. The conditions of trade are just now exceptionally favorable to the Belgian coal mining industry. In consequence of the recent strikes in Germany and England, the foreign demand for Belgian coal is unusually heavy. German consumers are compelled to buy largely of Belgian coal, and many of the Danish customers of English coal have been placing orders with Belgian producers. This foreign business would for a time compensate the loss of trade at home, due to the slack business of the iron markets, occasioned by the high prices of coal, which have resulted from the concessions made to the demands of the men for higher wages. But the possibility of continuing this export trade is likely to be destroyed by renewed action on the part of the men for yet further concessions. Much discontent is being manifested in the Charleroi district. At several pits the men have asked for a 15 per cent. rise in wages, and

76,190 tons in the same month of last year. Both Westphalian and English coal is now being offered at slightly lower prices at Hamburg.

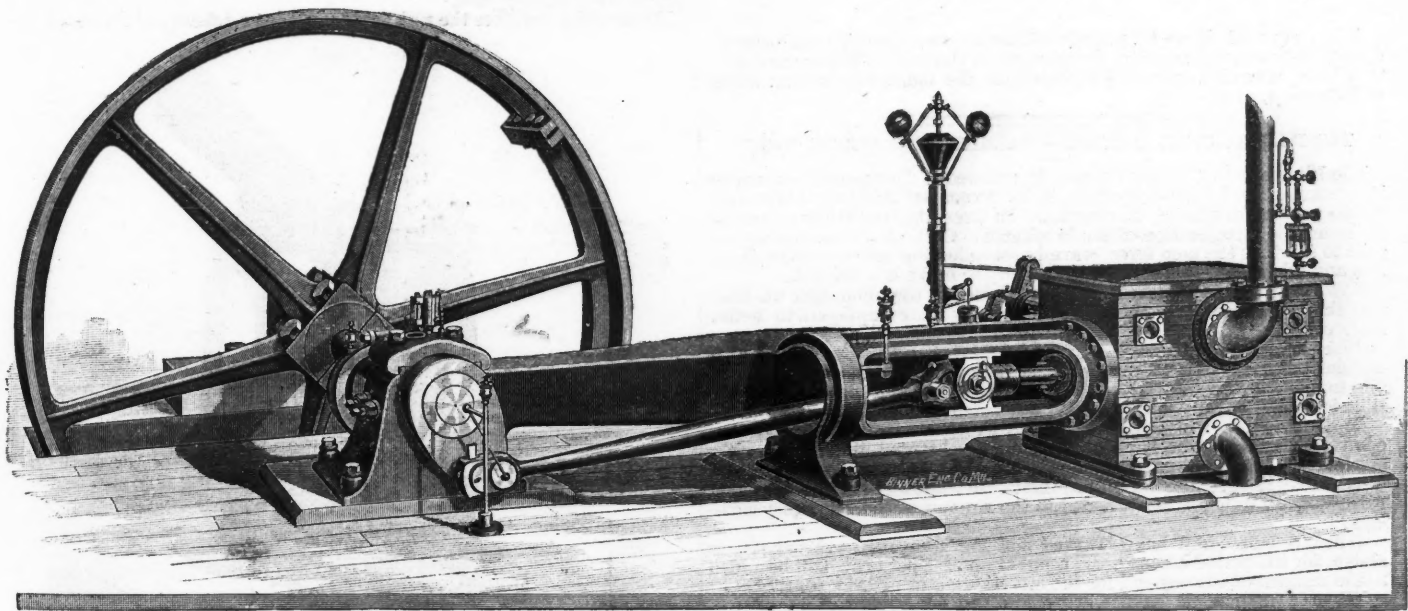
The foreign coal trade of Germany shows considerable changes relatively to last year. The imports show a large increase. The quantities received in the first two months of the year, compared with those for the corresponding period of 1889, are as follows: Coal, 501,522 (497,092) tons, of which 328,495 tons were from England; lignite, 900,615 (641,673) tons, the whole from Austria-Hungary; coke, 78,203 (42,517) tons, of which 66,636 tons from Belgium; and briquettes, 10,315 (4,037) tons, of which 5,995 tons from Belgium and 4,272 tons from Austria-Hungary. The exports show but little change. They were, for the periods in question, coal, 1,518,831 (1,432,175) tons; coke, 135,269 (143,868) tons; lignite, 1,909 (1,560) tons; and briquettes, 16,196 (17,533) tons. The quantity exported to Holland amounted to 459,504 tons of coal and 12,428 tons of coke.

There is still much discontent manifested among the coal miners of the Saint Etienne district in France, and partial strikes are of frequent occurrence. The fact of the markets showing a declining tendency is, however, strong evidence of a belief that no general disturbance will take place. Hitherto the French colliers have shown better judgment than their neighbors.—*Colliery Guardian*.

THE NORDBERG CORLISS ENGINE.

We illustrate herewith a new Corliss engine, designed by Mr. Bruno Nordberg, which seems to us to possess some valuable features. The aim was to be secure greater strength, rigidity and durability of wearing parts.

The frame is of the girder pattern, cast in one piece with the main bearing and slide. It is box-shaped and hollow, the iron being distributed where needed to resist the strain brought upon the frame by the operation of the engine, and to secure perfect rigidity and alignment under all



NORDBERG CORLISS ENGINE.

threaten to strike in the event of their demand being refused. This discontent is being, as usual, fomented by the Socialist, to whom industrial peace is above all things distasteful. It is difficult to understand the action of the men in a case like this, and equally difficult to find a justification for it. Some months ago wages were, it is true, low relatively to those paid in other countries. But lately they have been increased 80 to 100 per cent. In the year 1888 the average rate for all hands was from 2½ to 2 fr. (2s. to 2s. 6d.) a day. Now the average is 5 fr. (4s.) a day at the least. Thus there can be no longer question of starvation. It would be interesting to learn what the ironworkers, who are now put on short time in consequence of the high cost of fuel, think of this latest demand of the miners.

Official statistics have just been published in Germany showing the advance in the rate of miners' wages in the year 1889. From these we learn that the coal mining district of Upper Silesia, the average number of shifts worked in the first quarter of the year was 70, and the average wages per shift were 1.84 marks, while in the third quarter there were 74 shifts, for which the average was 2.13 marks. Taking the same periods, we find: In Lower Silesia, 77 shifts at 2.07 marks, and 80 shifts at 2.31 marks; in the lignite mining district of Halle, 71 shifts at 2.25 marks, and 76 at 2.42 marks; in the Dortmund district, 79 shifts at 2.78 marks, and 81 shifts at 3.17 marks; in the fiscal coal mining district of Bonn, 72 shifts at 2.91 marks, and 77 shifts at 3.41 marks; in the district of Aix-la-Chapelle, 75 shifts at 2.58 marks, and 79 shifts at 2.79 marks. These figures show everywhere a considerable increase. But it is to be remembered that since the close of 1889 a further large advance has taken place all around. The value of the mark may be taken as 1s.

The high price of German coal is beginning to tell on the trade in Westphalian coal to Hamburg and its neighborhood—a circumstance favorable to the trade in English coal to those parts. In spite of the advantages afforded by the new wharfs, the consignments of Westphalian produce in the month of March amounted to only 69,730 tons, against

circumstances. The foot under the main bearing is considerably wider than the length of the bearing and is provided for four foundation bolts. The slides are tied together at the front end by a cast ring which is an integral part of the frame. The lower side of the ring forms a foot, which is bolted to the foundation.

In designing the cylinder, which is patented, the object kept in view was to increase the inlet valve area and at the same time reduce the clearance. The diameter of the inlet valves is not more, and in some cases is less, than in the same sized engines of other manufacture. The clearance in the valve cavities is a great deal less than in those commonly made. That of the exhaust valve is reduced nearly one-half, this result being obtained by its location and peculiar construction. The external valve gear presents a great many radical improvements. It is operated by an eccentric on the engine shaft, communicating the motion through a carrier arm and hook rod to main or wrist lever, from which the motion is transmitted to the four valves.

Another feature of the Nordberg Corliss valve motion is that the setting of the valves can be adjusted without changing the length of the valve rods, that is, without disturbing the motion by changing the angles through which the valves are intended to move; and the range of cut-off is increased.

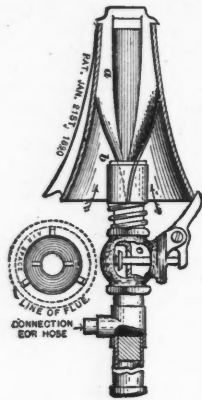
The construction of this valve gear is such as to permit the addition of a full stroke cut-off at slight additional expense.

The connecting rod is recently patented, being entirely new. Both ends are solid and provided with most secure and convenient devices for adjusting the boxes. The crank pin boxes are brass, lined with genuine babbitt metal. The crosshead pin boxes are made of hard phosphor bronze.

The Wilkin Manufacturing Co., of Milwaukee, Wis., are the sole manufacturers of the Nordberg Corliss engines, and they are prepared to furnish them of all sizes up to 2,000 horse power, single, compound and triple expansion, and with or without jet or surface condensers.

HURRICANE FLUE CLEANER.

Mr. Peter Smith, a New York engineer, has recently patented a new flue cleaner, which has been named the "Hurricane." The principle of the contrivance is to force a jet of steam, together with air sucked in, in a linear and rotary direction into the boiler flue. The steam enters where indicated in the engraving as "connection for hose," and from that reaches the valve *c*. The valve is shut until the nozzle is inserted into the boiler flue, when pressure forces up the lever and admits the steam, causing a rotary motion of the spiral tongue *a*. The linear motion is obtained by the suction of air into the open mouth *b*.



HURRICANE FLUE CLEANER.

A pressure of 40 to 60 pounds of steam, in conjunction with the air drawn in, removes any dirt or sediment in the flues. The apparatus is now being manufactured, and is placed on the market by Messrs. Hines & Robertson, of this city.

THE ILLINOIS STEEL COMPANY—PREMIUMS FOR STEADY WORK.

The Illinois Steel Company seems determined to be on good terms with its workmen, and to do everything in its power to avoid the labor difficulties now unfortunately so common. In December we had the pleasure to record the inauguration of the Workmen's Club at Joliet, and we are glad to say that the men have warmly seconded the efforts of the directors and other stockholders of the company to make it a success.

Now, the following address has been issued to the men, and we trust that they will appreciate this second effort by their employers to better their condition.

"For the purpose of rewarding faithful service and encouraging a high standard of merit in work performed at their Joliet plant, and with a desire to increase the interest of their employes in their daily duties, the Illinois Steel Company will quarterly pay premiums as follows:

To all employes who have not at any time, nor in any way, left the company's service; who have not temporarily absented themselves without leave; who have not been discharged or suspended for cause, and who have neither struck nor quit by their own voluntary act, the following percentages will hereafter be added to the amount of their monthly earnings:

When a man shall have worked for the company continuously, as above, for the period of one year, a premium of 1 per cent. will be added to the amount of his pay-roll for the last six months of said year.

When a man shall have worked for the company continuously, as above, for a period of one and one-half years, a premium at the rate of $1\frac{1}{2}$ per cent. will be added to the amount of his pay-roll for the last six months of said period.

For two years a premium at the rate of 2 per cent. will be added on the last six months.

For two and one-half years a premium at the rate of $2\frac{1}{2}$ per cent. will be added on the last six months, and so on at the rate of $\frac{1}{2}$ of 1 per cent. for each additional six months of continuous work, up to five years, when the premium will amount to 5 per cent. After that time the percentage of premium will not be increased, but will continue to be paid at the rate of 5 per cent. to men who comply with the foregoing rules.

Whenever a man leaves the company's service and re-enters it, his percentage will only be reckoned from the first day of the month following the date he resumes work for the company.

No premium will be paid until a man has been in the company's service continuously for one year.

The works are assumed to have commenced operations on July 1, 1889, and percentages will date from that time to such men as shall be entitled to the same. Payments at the rate of one per cent. will begin in July, 1890, on the pay-roll of the first six months of 1890. Payments thereafter will be made quarterly, namely, in October, January, April and July of each year.

Men entering the company's service after July 1, 1889, will be considered, under this arrangement, as entering as of the first of the month following the commencement of their service. Premiums will be paid, however, to those entitled only at the above-named quarterly periods, with the necessary proportionate increase for the first quarterly payment.

Cessation of employment for any of the causes set forth herein shall forfeit all premiums unpaid at the time of such cessation.

All men who consider themselves entitled to a premium as stated herein, and desire to avail themselves of this system, will submit their claims to their respective foremen for determination on or before July 10, 1890, and quarterly thereafter.

Premiums will only be paid to men who apply to have their names put on the list.

These percentages are in no sense to be regarded as wages, but as a

reward from the company for competent, zealous, faithful and continuous service, and the company reserves the right to discontinue the system at any time should its results prove unsatisfactory.

This system shall apply to all employes at the Joliet plant except such officers as shall be specially notified to the contrary.

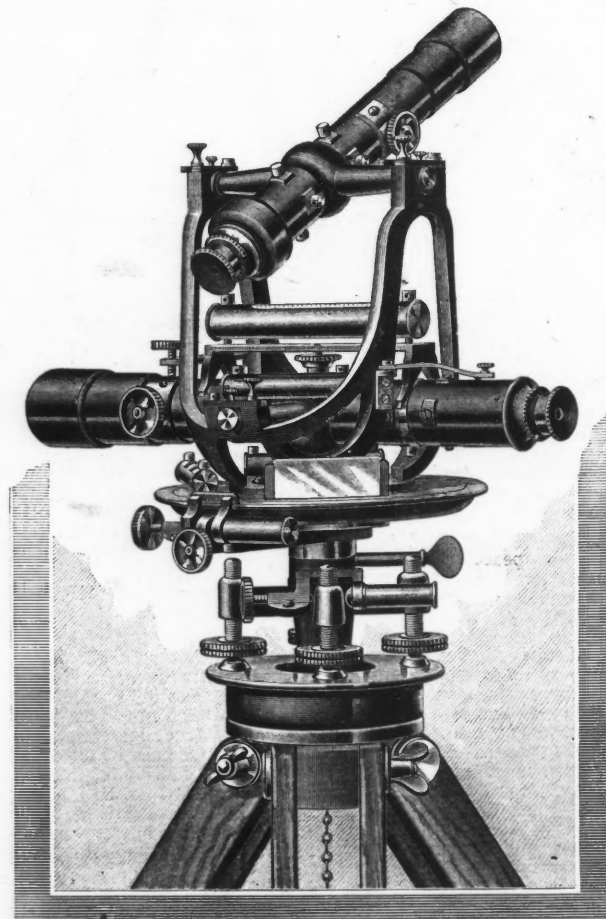
JAY C. MORSE, President.
H. S. SMITH, Manager.
C. PETTIGREW, Superintendent."

THE IMPROVED BRANDIS CITY TRANSIT.

In this instrument, which we illustrate, some new and important features have been introduced. The circular compass between the standards has been left out, in order to be able to cast the latter in one piece, thus considerably increasing their strength and rigidity. Again, the distance between the bearings of the lower telescope has been lengthened, whereby the working exactitude of the latter is greatly improved. The upper telescope can be reversed through the standards as well as over the bearings, which greatly simplifies the process of laying out right angles. This arrangement has been accomplished by heightening the standards and shortening the telescope. The first was unobjectionable on account of the standards being in one piece, and therefore extremely strong and rigid; the second involved a certain change of the functions of the two telescopes. Contrary to the former constructions, in this instrument the lower telescope is the longer and more powerful one, and is therefore the one that is used for levelling purposes, as will be described further below.

Finally, the one double vernier of the instrument is located so that the sighting through the telescope and the reading of the angle can be done without the observer changing his position. The second vernier has only a short graduation, merely for the purpose of enabling the maker to "centre" the instrument. This operation is carried out with such exactitude that there is practically no difference between the readings of the two verniers, and that therefore during actual use the first mentioned vernier only need be read.

For leveling purposes the right angle or lower telescope is used exclu-



BRANDIS IMPROVED CITY TRANSIT.

sively; the same rests in wyes directly over the horizontal plate, and carries a small spirit level for ordinary work, while a long and sensitive striding level fitting on the telescope is used for fine work. The leveling attachment, which formerly was a separate piece, and therefore easily lost or mislaid, here is firmly connected with the instrument, and consists of a flat German silver spring and an arm, through which passes a micrometer screw. The spring is attached to one standard, the arm to the other, and both are arranged so that one can be swung over one end of the telescope and the other over its other end. When they are brought into this position the telescope can easily be leveled up by means of the micrometer screw, which presses on one of its ends, while the spring presses on the other. When no leveling is to be done, then the attachments are shifted back and out of the way, and the lower telescope now

swings freely in its bearings, and small hard rubber screws in the covers over the wyes furnish the necessary friction to hold the telescope.

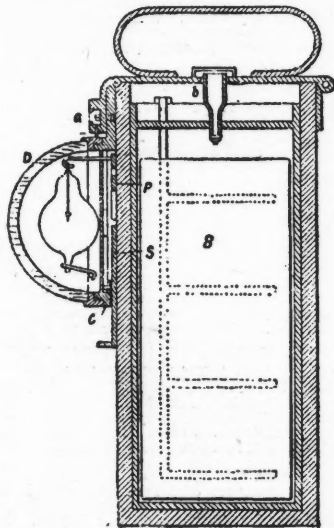
In order to compensate for the absence of the circular compass, a rectangular box compass is furnished, which can be attached to the telescope in the same way as the striding level.

The instrument is made by the Brandis Manufacturing Company, of this city.

BRISTOL'S PORTABLE ELECTRIC LAMP.

We illustrate a neatly arranged portable electric lamp, devised by Mr. L. Bristol, the description and cut of which we borrow from our contemporary *The Electrician*. The lamp is particularly applicable for use in dangerous situations, such, for example, as coal mines, powder mills and magazines, chemical laboratories, etc. The current is provided by an accumulator inclosed within a polished wood box, on the face of which, for the above purposes, the lamp is fixed within a strong glass dome *D*, and backed by a reflector. The box has a metal lid with a projecting lug, which covers one of the charging terminals, so that when the lid is closed the battery cannot be short circuited. The lid also carries a lock *a*, by which it can be secured; a pin on this lock fixes the glass dome against being unscrewed. The holders of the glow lamp are attached the one to the positive terminal *P* of the battery, and the other to an independent plate, between which and the negative terminal of the battery circuit is made and broken by the spring sliding switch *S* passing through a groove behind the plate *C*.

The battery plates *B* are of special construction, designed to give them such a degree of self-cohesiveness and rigidity that no additional metallic support is required. There is mixed with the active material a suitable



proportion of fibrous substance, and the whole is made into a paste. This is cast in molds, a conductor being inserted in each plate to aid the flow of the current. The plates are then gently pressed and dried. A hollow plug, *b*, is provided for the escape of the gas given off during charging.

The following are some data with regard to these lamps:

Candle-power.	Hours of light.	Weight. lb. oz.	Height. in.
1 1/2	10	3 6	5 1/2
1 1/4	15	5 4	6 1/2
1	5	1 12	4

This lamp is a decided advance in portable electric lamps, being so much lighter than its predecessors that it is portable in more than in name.

THE OCCURRENCE OF AMORPHOUS SULPHIDE OF ZINC NEAR GALENA, MO.

Written for the Engineering and Mining Journal by Malvern W. Hes and J. Dawson Hawkins.

During a recent visit to the southwestern portion of Missouri, we met with a very rare and interesting mineral. Through the kindness of Mr. O. H. Pilcher, I obtained a sample of a white, soft, pulverulent material, which was packed in an ordinary fruit can.

Mr. Pilcher informed me that this material occurred in one or two localities in the immediate vicinity and that it had been pronounced sulphide of zinc.

This material had undoubtedly contained much mine water, and had practically dried out in the can. The small sample was taken to Denver and placed in the hands of Mr. Hawkins, who has very carefully analyzed the product, obtaining the following results:

There was 5.19 per cent. gangue matter, which was composed entirely of native sulphide of iron and silica. This gangue matter was then separately analyzed, showing the following results: Silica, 1.49 per cent.; metallic iron, 1.79 per cent.; sulphur, 1.91 per cent.

The main portion of the material was composed of zinc and sulphur, and the total analysis can be stated as follows: Silica, 1.49 per cent.; metallic iron, 1.79 per cent.; metallic zinc, 64.17 per cent.; free S. .082 per cent.; sulphur (total), 32.86 per cent.; total, 100.31 per cent.

The specific gravity was 4.1.

After determining that this material was unquestionably sulphide of zinc, we communicated with Mr. F. L. Clerc, of Webb City, Mo, and through his kindness we are enabled to give the readers the following information.

This material was originally found at a depth of about 80 feet on the Moll Reserve, of about one acre, in the built-up portion of the town of Galena, but it has been traced on to the land of the Galena Company.

Mr. Clerc says the best description he has found of it is as follows: "It

is found in the bottom of two drifts, one 80 feet long and the other 60 feet long, which branch from the shaft and are 50 feet apart where most widely separated. The thickness of the deposit, as shown by digging down, and by testing with a drill, is said to average three feet. Some one has estimated that there are 17,000 cubic feet of it exposed.

"No attempt has been made to mine it, as it is thought some special use can be found for it, which will make it more valuable than for use as a spelter ore. It has been explored by drifting over the top of it."

Should any of your readers be further interested in this subject, we refer them to Mr. A. C. Spring, of Joplin, Mo.

This sulphide of zinc was unquestionably formed by the action of sulphureted water coming in contact with an aqueous solution of sulphate of zinc. In confirmation of this statement it may be said that we have succeeded in extracting free sulphur from this interesting product.

The method used was the extraction of the material with chemically pure di-sulphide of carbon, and evaporation of this solution to dryness, sustaining at a temperature of slightly below 100 degrees C., and oxidizing the residual sulphate with nitric acid and potassium chlorate. In order to insure that the sulphur obtained was not due to any accidental impurities in the reagents employed, a blank test was conducted alongside of the original analysis, and which showed no sulphur whatever. The percentage of free sulphur was .082.

SUMMARY OF THE MINERAL PRODUCTION OF CANADA IN 1889.

We are indebted to the courtesy of Mr. Alfred R. C. Selwyn, Director of the Geological and Natural History Survey of Canada, for the preliminary statistical table of the mineral production of Canada for 1889. This is not the final statement, the returns not being quite complete, and is, therefore, subject to revision.

Name of Product.	Quantity, (a)	Value, (b)
Antimony.....	tons 55	\$1,100
Asbestos.....	" 6,014	424,350
*Bricks.....	thousands 190,724	1,232,067
*Building stone.....	cu. yds 310,582	839,105
Cement.....	bbis. 90,474	85,790
Charcoal.....	bush. 1,428,800	83,573
Coal.....	tons 2,719,469	5,570,742
Coke (c).....	" 54,539	155,043
Copper (d).....	lbs. 6,810,952	885,424
Feldspar.....	tons 510	5,100
Fertilizers.....	" 775	26,606
Fire Clay.....	" 400	4,800
Flag Stones.....	sq. ft. 14,000	1,400
*Glass.....	" 150,000	150,000
Gold (e).....	ozs. 61,799	1,116,145
Granite.....	tons 12,535	78,024
Graphite.....	" 220	1,630
Grindstones.....	" 3,385	30,163
*Gypsum (f).....	" 206,201	193,658
*Iron.....	" 58,783	2,210,062
Iron Ore.....	" 84,181	151,640
Lead.....	lbs. 164,000	5,863
*Lime.....	bush. 2,278,678	265,208
Limestone, for flux.....	tons 22,122	21,909
Manganese Ore (g).....	" 1,447	31,814
Marble and Serpentine.....	" 980	980
Mineral Paints.....	" 794	15,282
Mineral Water.....	galls. 404,600	37,360
*Miscellaneous Clay Products.....	" 704,800	239,385
Petroleum (h).....	bbis. 30,540	678,978
*Phosphate.....	tons 25,921	312,182
Pig Iron.....	" 499,859	499,859
Platinum.....	ozs. 1,000	4,500
Pyrites.....	tons 68,047	306,212
*Salt.....	" 24,716	110,367
Sand and Gravel (exports).....	" 451,195	69,506
Silver.....	ozs. 378,675	343,844
Slate.....	tons 6,935	119,190
Soapstone.....	" 195	1,020
Steel.....	lbs. 26,333	917,822
Sulphuric Acid.....	lbs. 10,998,713	148,482
*Tiles.....	thousands 10,286	130,871
Estimated value of mineral products not returned (principally nickel, iron, mica and structural materials).....		1,933,752
Total.....		\$19,500,000

* Some returns yet to be received.

(a) Quantity marketed, except when otherwise specified. The tons are of 2,000 pounds.

(b) Market value, less charges of transport from point of production.

(c) Oven coke; all the production of N. S.

(d) Copper contents of Canadian ores at 13 cents per pound at the mine.

(e) Nova Scotia gold is calculated at \$19.50 per ounce, and that from British Columbia at \$17.00.

(f) Production of New Brunswick and Ontario, plus Nova Scotia exports.

(g) New Brunswick production, plus Nova Scotia exports.

(h) These figures are calculated from the inspection returns at 100 gallons crude for 38 gallons refined oil, and are computed at 95 1/2 cents per barrel of 35 imperial gallons. The barrel of refined oil inspected was assumed to be 42 imperial gallons.

Advance in Russian Duties.—The Russian Government has decided to advance very materially the duties on certain goods of foreign origin—agricultural implements among others. This is done to stop imports and to induce manufacturers from abroad to put up in Russian territory factories capable of supplying the home market until Russians can manufacture the goods they use without foreign assistance. Several plants have already been erected by European manufacturers, but there still exists a vast opening in that direction.

The German Slate Pencil Industry.—The Thuringian slate pencil penetrate to the most remote parts of the world. For a number of year the industry has been in a very depressed condition. The price paid to the working people for making the pencils is 60 pfgs. (15 cents) per 1,000, and to earn sufficient wages they are forced to work day and night and to turn out as many pencils as possible. In this way an enormous overproduction has gradually been brought about, making things still worse for the working people. Previously, the Steinhach pencil makers had a contract for five years with Messrs. Mohr & Loehrs, in accordance with which they received from that firm 1 mark (25 cents) per 1,000 pencils, and al-

though the number to be produced was restricted, it assured to the men a weekly wage of 18 marks (\$4.50). The contract was broken by all the pencil makers without any sufficient reason at the end of the fourth year, not with the object of selling the pencils dearer, but of selling them 20 pfgs. (5 cents) cheaper to other firms. The men desired to produce as many pencils as possible, and although they received 20 pfgs. less per thousand, through the increased quantity they were enabled to earn considerably more. It is less than two years since the unrestricted production commenced, and already the state of things in the industry has become so precarious that the State has been appealed to for assistance. The annual consumption of the whole world is 400,000,000 pencils; in Steinach and the neighborhood the production, when unrestricted, reaches nearly 600,000,000. As the *Saalfeld Kreisblatt* remarks, the calamity might have been avoided had the Meiningen Government and the pencil-makers availed themselves of the remedy offered to them in 1888. It is stated that at that time Messrs. Mohr & Loehrs desired to lease the State pencil mines for ten years, and to employ the pencil-makers at a guaranteed weekly wage of 18 marks, but the pencil-makers refused, notwithstanding that they would have been rent free and assured against accidents and sickness, which is not the case now. Naturally the firm named would have been careful to bring down the production to a level with the consumption, and overproduction and price reductions would have been avoided. Eventually Messrs. Mohr & Loehrs gave up their business at Steinach, removing to their property at Döschnitz, where slate pencil beds of the best quality are available, and where they built a factory with a 60 horse-power steam-engine. By the aid of machines they have constructed, a block of slate can be simultaneously cut into ten plates and this again divided into ten sticks and pressed through. The cost of producing pencils is much below 50 pfgs., be the pencils long or short, thick or thin, and every block can be used, even if fractured. As, in the first place, this factory will turn out 2,000,000 pencils weekly the competition thereby occasioned will render the position of the pencil-makers much worse. It is, for the rest, hardly likely that Messrs. Mohr & Loehrs will ever be induced to buy the slate mines and it is no more probable that they will make any arrangement with the pencil-makers. There is, therefore, no prospect of the distress among the men soon passing away.—*Kuhlou.*

BOOKS RECEIVED.

- A Century of Electricity.* Vol. I. By T. C. Mendenhall, Superintendent U. S. Coast and Geodetic Survey, Washington, D. C. Published by Houghton, Mifflin & Co., New York and Boston. 1890. Pages 243. Price, \$1.25.
- California State Mining Bureau; Ninth Annual Report for the year ending December, 1889.* By William Ireland, Jr., State Mineralogist. Printed by the State, Sacramento, Cal., 1890.
- Inspector of Mines and Deputy Inspector of Mines Report for Montana for the Six Months ending November 30th, 1889.* By G. C. Swallow, Inspector, and J. B. Trevarthen, Deputy Inspector. Published by the Journal Publishing Company, Helena, Mont., 1890. Pages, 125.
- The South's Redemption from Poverty to Prosperity.* By Richard H. Edmonds. Published by The Manufacturers' Record Co., Baltimore, Md. 1890. Pages 63. Price 25 cents.
- Third Annual Report of the Inter-State Commerce Commission, December, 1889.* Printed by the Government, Washington, D. C., 1889.

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, APRIL 22D, 1890.
- 425,970. Upright Tubular Boiler. John Baird, New York, N. Y.
 - 425,973. Journal Bearing. Sumner A. Bemis, Springfield, Mass.
 - 425,976. Car Coupling. Azalia Bowron, Chicago, Ill.
 - 425,977. Apparatus for Manufacturing Water Gas. Charles E. Burdell, New York, N. Y.
 - 425,986. Steam Generator. Lucius D. Copeland, Camden, N. J., Assignor to the Northrup Manufacturing Company.
 - 425,989. Friction Clutch. Oliver Crosby, St. Paul, Minn.
 - 426,002. Steam Pump. Robert Everett, Brooklyn, N. Y.
 - 426,010. Instrument for transferring Measurements according to or system into another system. Heinrich Hagemann, Berlin, Germany.
 - 426,019. Boiler Cleaner. Frank W. Hornish, Mattoon, Ill., Assignor to the Mechanical Boiler Cleaner and Manufacturing Company, same place.
 - 426,038. Furnace. Samuel J. Miles, Chicago, Ill.
 - 426,040. Injector Oil-Burner. Joseph B. Moore, Reading, Pa.
 - 426,045. Shift for coal etc. Thomas McCarty, Pittsburg, Pa.
 - 426,050. Railway Rail Support. Moses W. Oliver, Lawrence, Mass.
 - 426,064. Machine for Making Bessemer Converter Nozzles. Calvin W. Vaughn, Cuyahoga Falls, O., Assignor to the Turner, Vaughn & Taylor Company, same place.
 - 426,107. Car-Coupling. Hiram A. Case, Troy, Pa., Assignor of one-half to George E. Bradford, same place.
 - 426,108. 426,109. 426,110. Safety Device for Dynamoes. Ernest P. Clark, New York, N. Y., Assignor to the Clark Electric Company, same place.
 - 426,129. Apparatus for Clearing Railway Tracks. Henry H. Kryger, Minneapolis, Minn., Assignor of one-half to Thomas J. Canney, same place.
 - 426,130. Apparatus for Removing Snow from Railway Tracks. Henry H. Kryger, Minneapolis, Minn., Assignor of one-half to Thomas J. Canney, same place.
 - 426,141. 426,142. Process of Manufacturing Salt. Cassius C. Peck, New York, N. Y.
 - 426,144. Pressure Recorder for Air-Brakes. Charles A. Schroyer, Chicago, Ill.
 - 426,153. Hydrocarbon Burner. Lasso Chander, St. Petersburg, Russia.
 - 426,169. Irrigating Apparatus. Edward C. Chapman, Leadville, Assignor of one-half to Louis Greenwald, Lake County, Colo.
 - 426,173. Apparatus for distillation of mineral ores and like products. James Dewar, Cambridge, County of Cambridge, and Boverton Redwood, Finchley, County of Middlesex, England.
 - 426,182. Car-Coupling. Henry F. Hemm, Kendall, Ill.
 - 426,184. Mercury Pump. Frederick B. Hill, London, England, Assignor of three-fourths to James Sinclair, same place.
 - 426,197. Underground Conduit. James F. Munsie, Chicago, Ill., Assignor to Thomas L. Coles, New York, N. Y.
 - 426,202. Insulating Compound. James F. Munsie, Chicago, Ill., Assignor to Thomas L. Coles, New York, N. Y.
 - 426,245. Ore-Feeder. Lee D. Craig, San Francisco, Cal.
 - 426,252. Compound Engine. Arthur H. Eddy, Hartford, Conn.
 - 426,253. Water Wheel. Samuel B. Goff, Camden, N. J.
 - 426,264. Water Wheel or Motor. Samuel B. Goff, Camden, N. J.
 - 426,285. Hydraulic Propeller. Alfred de Kunwald, Neuilly-on-the-Seine, France.
 - 426,297. Gas Engine. Julius Meiss, Philadelphia, Pa.
 - 426,299. Method of Propelling Vessels. John S. Morton, New York, N. Y.
 - 426,319. Railway Tie. John Porter, Eldora, Iowa.

- 426,336. Car Brake. Thomas S. Shenston, Brantford, Ont.
- 426,371. Hydrocarbon Burner. John Fearst, Bayonne, N. J.
- 426,385. Railway Car. Charles W. Jones, Johnsonville, Miss.
- 426,415. Car Coupling. George Mock, Springfield, Ky., Assignor of one-fourth to John W. Lewis, same place.
- 426,417. Pump Operation Apparatus. James W. Packard, New York, N. Y.
- 426,437. Electric Heater. Charles W. Drew and Edward R. Francis, Minneapolis Minn.
- 426,439. Machine for Corrugating Tubing. John F. Fife, Medford, Mass., Assignor to the Wainwright Manufacturing Company, of Massachusetts.
- 426,458. Railroad Tie. George E. Marvin, Boston, Mass.
- 426,461. Furnace door opener. George F. Moors, Owensborough, Ky.
- 426,465. Condenser for Furnace Fumes. Robert F. Nennering, Newark, N. J.
- 426,470. Pug-Mill. Julius Reichelt, Fort Madison, Iowa.
- 426,476. Pump. Washington G. Stitt, Allegheny, Pa.
- 426,488. Conveyor. Hans Birkholz, Milwaukee, Wis., Assignor to Edward P. Allis & Co.; Margaret W. Allis, William W. Allis, Edward P. Allis, Jr., Charles Allis and Edwin Reynolds, all of Milwaukee, Wis., executors of Edward P. Allis, deceased, sole member of the firm of Edward P. Allis & Co.
- 426,502. Calipers or Dividers. Thomas Isaac, Sacramento, Cal.
- 426,505. Machine for flanging boiler-heads. Fredrick L. Kollberg, Chicago, Ill., Assignor to Joseph Bee, same place.
- 426,511. Steam-Pump and Motor. Fred. C. Olin, Buffalo, N. Y., assignor of one-half to Danforth & Clark, same place.
- 426,515. Hose Coupling. Lewis Rice, Indianapolis, Ind.
- 426,516. Pop Safety Valve. Edward B. Robinson, Somerville, Mass.
- 426,526. Machine for Finishing Tubes. John C. Cram, Lowell, Mass.
- 426,531. Elevator and Hoist. Adam Gross, Milwaukee, Wis.
- 426,553. Rotary Steam-Engine. George H. Weston, Boston, Mass.
- 426,556. Rotary Furnace for Heating Blanks. James H. Bullard, Springfield, Mass.
- 426,565. Unlatching Device for Car-Coupling. Samuel J. Harrington, Binghamton, N. Y.
- 426,567. Friction Clutch. Gabriel Leverich, South Orange, N. J.
- 426,568. Pillow Block. Gabriel Leverich, South Orange, N. J.
- 426,567. Coal Drilling Machine. Martin Hardsog, Ottumwa, Iowa.
- 426,600. Apparatus for opening and closing grabs, buckets, etc., John H. Morgan, Liverpool, County of Lancaster, England.
- 426,611. Pneumatic fuel-feeding apparatus. William E. Allington, East Saginaw, Mich.
- 426,612. Steam-Engine. Albert Ball, Claremont, N. H., Assignor to the Sullivan Machine Company, same place.
- 426,613. Tool for raising drill rods. Albert Ball, Claremont, N. H., Assignor to the Sullivan Machine Company, same place.
- 426,614. Steam Generator. John E. T. Bartlett, New York, N. Y.
- 426,618. Coal Mining Machine. Martin Hardsog, Ottumwa, Iowa.
- 426,626. Car-Coupling. Paul S. N. Peterson, Utica, N. Y.
- 426,637. Metallic Railway Tie. Theodore R. Dunning, Middleton, N. Y.
- 426,640. Elastic key for holding Rock Drills. George M. Githens, Brooklyn, N. Y.
- 426,648. Means for cleaning ashes from Flues. Geo. H. Sellers, Ridley Park, Pa., assignor to the Edge Moore Iron Company, of Delaware.
- 426,650. Electric Engine. Robert W. Thompson, Cleveland, Ohio, assignor of one-eighth to George W. Tibbetts and James C. O'Neil, both of same place.
- 426,652. Method of Manufacturing Axles. Henry Aiken, Pittsburg, Pa.
- 426,653. Apparatus for the Manufacture of Axles. Henry Aiken, Pittsburg, Pa.
- 426,681. Dredging Machine. William B. Pless, San Francisco, Assignor of one-half to Roswell C. Sargent, San Joaquin, Cal.
- 426,701. Anti-Friction Bearing. Seely W. Ashmead, St. Louis, Mo., Assignor of one-third to Thomas B. Crews and Thomas M. O'Shea, same place.
- 426,702. Slag Escape for Tuyeres. John C. Bansenmer and Edwin L. Davies, Great Falls, Mont., Assignors of one-third to Charles E. Beers, Salt Lake City, Utah.
- 426,708. Electric Railway Car. John A. Brill, Philadelphia, Pa.
- 426,710. Die for Making Rock Drills. John Cahill, Tarrytown, N. Y.
- 426,713. Hydrocarbon Burner. Charles M. Collins, South Bend, assignor of one-half to the Dodge Manufacturing Company, Mishawaka, Ind.
- 426,762. Hydraulic Cylinder Lubricator. James H. Brookmire, St. Louis, Mo.
- 426,763. Tub or Bucket for Hoisting and Conveying Machines. Alexander E. Brown, Cleveland, Ohio.
- 426,786. Car Coupling. Richard J. Edwards, Galena, Ill.
- 426,788. Apparatus for producing sheets of metal by electro-deposition. Moses G. Farmer, Eliot, Me.
- 426,789. Electrolytic Apparatus for forming copper ingots. Moses G. Farmer, Eliot, Me.
- 426,795. Automatic Boiler Cleaner. George R. Ford, Grand Rapids, Mich.
- 426,820. Glass melting pot. Edward Kaye, Water Cure, Pa.
- 426,821. Concentrator. Edward Z. Kidd, Deadwood, S. D., Assignor to himself and Scire P. Romans, same place.
- 426,838. 426,839. Vertical Boiler. Edward J. Moore, Philadelphia, Pa.
- 426,846. Hydraulic Dredging. John MacFarlane, Washington, D. C., Assignor of two-thirds to George J. Bessler and Henry Wax, both of same place.
- 426,848. Apparatus for discharging or throwing excavated or other material. Fernan Nouailhac-Ploch, Paris, France.
- 426,877. Portable Railway. Edgar L. Stream, New Orleans, La.
- 426,880. Steam Separator. Walter A. Taylor, New Orleans, La.
- 426,884. Tubular Well. Miciah Walker, Port Huron, Mich.
- 426,886. Self-Oiling Car Axle. Albert A. Weber, Sacramento, Cal.
- 426,897. Welding Compound. Charles Wrigley, Chicago, Ill.
- 426,912. Flue-Cleaning Rod. Thomas R. Butman, Chicago, Ill.
- 426,915. Car-Coupling. Neil F. Campbell, McDade, Texas.
- 426,971. Electrical Fuse. Hugo Firman, Cleveland, Ohio, assignor to the United States Mine Supplies Company.
- 427,007. Car-Coupling. Henry Nichols, Mount Meridian, Ind., assignor of three-fourths to Joseph W. Ruark, Emerson E. Ruark and Andrew J. Bird, all of same place.
- 427,013. Miner's Lamp. Henry J. Richards, Wilkes-Barre, Pa., assignor of one-half to Charles H. Gardner, same place.
- 427,017. Railway Joint. John Speicher, Jersey City, N. J., assignor to the Continuous Rail Joint Company of America, of New Jersey.

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

NAME OF COMPANY.	Paid in April.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in April.	Paid since Jan. 1st.
Atlantic, Mich.....		\$60,000	Iron Mountain, Mont.....		\$25,000
Aspen, Colo.....	\$20,000	40,000	Kearsarge, Mich.....		100,000
Badger Ontario.....		37,500	Little Chief, Colo.....		10,000
Bangor-Cora Belle, Colo.....	3,000	3,000	Little Rule, Colo.....	\$10,000	30,000
Boston & Mont., Mont.....	100,000	300,000	Mammoth, Utah.....	40,000	120,000
California, Dak.....	8,000	8,000	Matchless, Colo.....		2,500
Calliope, Cal.....	10,000	40,000	Metropolitan, Mich.....	\$250,000	\$250,000
Calumet & Hecla, Mich.....		500,000	Montana Ltd., Mont.....	40,178	100,844
Candelaria Con., Mex.....	30,000	30,000	Napa, Cal.....		30,000
Central, Mich.....		20,000	New Guston, Colo.....	50,000	50,000
Coeur d'Alene, Mich.....	20,000	20,000	Ontario, Utah.....	75,000	300,000
Cons. Cal. & Va., Nev.....	54,000	162,000	Oro, Colo.....	40,000	80,000
Cumberland, Mont.....		15,000	Osceola, Mich.....		50,000
Daly, Utah.....	37,500	150,000	Parrot, Mont.....		54,000
Don Enrique, Mex.....		3,000	Poorman, Colo.....	2,000	2,000
Franklin, Mich.....		80,000	Puzzler, Col.....		64,370
Granite Mountain, Mont.....		400,000	Quicksilver Pref., Cal.....		120,000
Hecla Cons., Mont.....	15,000	15,000	Quincy, Mich.....		100,000
Homestake, Dak.....	12,500	50,000	Republic, Mich.....		50,000
Horn Silver, Utah.....		50,000	Silver Mfg. of L. V., N. M.....	25,000	50,000
			Tamarack, Mich.....	120,000	240,000

* Part of this dividend was paid in January.

PERSONALS.

Mr. C. C. Vermeule and Mr. J. R. Bien, civil and mining engineers, New York, under the firm name of Vermeule & Bien, dissolved partnership May 1st.

Mr. Karl Sporck has been appointed resident engineer in charge of construction work of the lines of the Kansas City, Fort Scott and Memphis Railroad Company north and west of Springfield.

The British and European patent agency, of which Mr. Frederick W. Barker is the manager, has opened an office at 252 Broadway, New York. This agency will obtain European patents through its London house, and has at its offices here competent draughtsmen for furnishing drawings, etc.

A complete set of the Transactions of the American Institute of Mining Engineers, Vols. I to XVII., inclusive, bound in half-morocco; also a complete, bound set of *Van Nostrand's Engineering Magazine*, Vols. I to XXXV., inclusive, are offered for sale by the estate of an engineer. Parties wishing to purchase should address the ENGINEERING AND MINING JOURNAL.

A number of officers and men employed by the Nicaragua Canal Construction Company departed for Greytown on the 30th inst. on the steamer "Hondo." Among them were Chief Surgeon J. Edward Stubbert, Assistant Surgeons Menocal and Archer, Second Assistant Engineer Holcombe, Mr. Harris, Superintendent of Railway Construction; Contractor Treat and 15 engineers and telegraph operators.

Manufacturers of mining and other machinery have of late been addressed by a number of young men who are about to emigrate to various points in South America, and who desire to represent New York firms there. If the applicants will forward particulars to the ENGINEERING AND MINING JOURNAL, doubtless they will hear from several of the firms who desire to have representatives in localities likely to become markets for their goods.

Mr. Stanley's forthcoming book is in the hands of his publishers. It is hoped that the work will be ready about the end of May; it will be in two volumes, and so far as can be estimated, it will run to a thousand pages. The book will contain three important new maps, showing the course pursued by the great traveller and his companions, and giving the results of their explorations in the heart of the Dark Continent. There will be about one hundred and fifty illustrations, and those of the greatest interest have been entrusted to M. Riou, the well-known French artist, who is himself thoroughly conversant with the characteristics of African scenery, and is equally at home in the delineation of the manners, customs and fierce forays of the native races.

OBITUARY.

Caleb C. Bedell, for seven years a member of the New York Consolidated Stock and Petroleum Exchange, died on the 2d inst.

SOCIETIES.

ASSOCIATION OF THE AMERICAN WORKS SUPERINTENDENTS.

The annual convention of this association will be held in Chicago, Ill., on the 20th of May, at the Grand Pacific Hotel.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

The annual convention of this Society will be held at Cresson, Pa., on the line of the Pennsylvania Railroad, on the western slope of the Allegheny Mountains. Cresson is between Altoona and Johnstown. There is a very large hotel managed under the direction of the railroad company. Arrangements are in progress as to all details, which will soon be announced. The date will be near the end of June; the exact date will also be announced.

Members are invited to contribute papers or discussions on papers already published. A concise abstract of any paper to be presented should be sent to the secretary not later than May 31st. This will make discussion more probable, as a copy of the abstract will be sent to members who may be expected to contribute discussion.

THE FRANKLIN INSTITUTE.

At the last meeting of the chemical section of the Franklin Institute, Prof. E. P. Smith read two interesting papers, the first of which was entitled "Oxidations by Means of the Electric Current," and the second "On the Compound C_2Cl_2 ." Both papers were referred for publication in the *Journal of the Institute*.

In connection with the use of the electric current in determining and separating metals, it occurred to the author that the oxidizing power of the current might be utilized to convert sulphur and other elements into higher oxides, thus securing them in forms susceptible of ready determination. Chalcopyrite was placed in a nickel crucible, containing fused potassium hydroxide. In connection with the positive pole of a battery, a heavy platinum wire from the negative pole was introduced just under the surface of the

fused mass. The current was continued for ten minutes, when the contents of the crucible were dissolved out, filtered from insoluble oxides, acidified with hydrochloric acid, and treated with barium chloride, when it was found that all the sulphur contained in the mineral was precipitated as barium sulphate. Comparative experiments, using the above method, and also that of oxidizing with nitric acid, gave with the former method 32.35 per cent. sulphur in a specimen of chalcopyrite, and with the latter method 32.54 per cent. sulphur. The strength of the current used was one ampere.

Chromite treated in the same way as chalcopyrite yielded a little more than 53 per cent. Cr_2O_3 in a specimen which an older method of determination had shown to contain 54 per cent. Cr_2O_3 .

Further experiments in this line are in progress. The second paper, by Dr. Smith and Dr. H. F. Keller, called attention to a remarkable compound of carbon and chlorine, first produced by Dr. Smith, in 1876, by the exhaustive action of chlorine on toluene exposed to sunlight, first at the boiling point and then in the cold. Analysis showed 21.41 per cent. carbon and 78.6 per cent. chlorine. The substance was crystallized from chloroform, yielding crystals measuring one-half inch in length and one-fourth inch in breadth and apparently orthorhombic.

Crystals of this compound originally melting at 152 to 153 degrees C. were preserved for 12 years, and at the end of that time no visible alteration had taken place, but on taking the melting point this was found to have changed to 101 degrees C., at which it remained constant after recrystallization from pure chloroform. On heating a portion of the substance in a test tube hydrochloric acid was evolved; a combustion gave 22.8 per cent. carbon and 2.2 per cent. hydrogen. Work is now going on to prepare the chloride again, and to determine its vapor density, as well as to study some of its derivatives. The authors wish to reserve this field of investigation for the present.

AMERICAN INSTITUTE OF MINING ENGINEERS.

The 57th meeting of the Institute will be held in the city of New York, beginning Monday evening, September 29th, 1890, and continuing on Tuesday and Wednesday of that week. While the members of the Iron and Steel Institute of Great Britain and other foreign guests, as well as the members of American engineering societies, are cordially invited to take part in this meeting, it is probable that the principal party of visitors from abroad will not arrive until toward its close. The meeting of the Iron and Steel Institute of Great Britain is expected to begin in New York city on Thursday morning, October 2d, and to close on Saturday, after which the visitors will become the guests of the General Reception Committee, representing the technical societies and allied trades of the country, and will be conveyed to various points of interest. The details of the proposed excursions and entertainments will be published hereafter. It is possible to announce at present only the fact that, at some time during the week following the New York meetings, there will be held, at Pittsburgh, Pa., two supplementary international sessions.

Members desiring to present papers at the autumn meeting are notified that the complete manuscript, together with all drawings, should be in the hands of the secretary by August 1st. An earnest attempt will be made to have the papers printed and ready for distribution before the meeting.

INDUSTRIAL NOTES.

The trade in engineering and surveying instruments reports encouraging business with Brazil, Chili and South Africa.

The Phoenix Iron Works Company has moved its New York headquarters from 16 Dey street to 15 Courtlandt street.

Henry R. Worthington, the famous pump manufacturer, of New York, has established an agency at Melbourne, Australia.

The large Worthington engine which pumped all the water for the Paris Exposition, has been sold to a mining company at Antofagasta, Chili.

The Cambria Iron Company lockout at the Wheeler & Morrell Coke plant, at Connellsville, Pa., has been settled, and work has been resumed.

The faculty of the Imperial College of Tokio, Japan, recently ordered sets of mining and surveying instruments from the Brandis Manufacturing Company.

The American Well Works, of Aurora, Ill., have opened a branch house at 113 Elm street, Dallas, Tex., where they will keep a full stock of supplies and standard machines for their very large and constantly increasing Southern trade.

A Courtlandt street firm, advertisers in the ENGINEERING AND MINING JOURNAL, recently received an order for a machine from a resident on the Island of Tenerife. This is such a rare event in connection with that part of the world that it is worth recording.

A furnace at the Edgar Thomson Steel Works, at Braddock, Pa., exploded on the morning of the

20th inst. Four Hungarians were seriously burned, one of them being fatally injured, it is thought. The cause of the accident is not known. The loss will be quite heavy.

According to a member of the Rand Drill Company, if the demand for rock-drilling and air-compressing machinery is any criterion of the increasing volume of mining operations, Australia is at present running ahead of South America and even of South Africa.

The building of portable houses is becoming quite an important industry in Sweden and Norway. They are said to be handsome, useful and very cheap, and have found buyers in a number of different countries. A cargo of them was recently sent from Gothenburg in Sweden, to Buenos Ayres.

A controlling interest in the Kentucky Iron, Coal and Manufacturing Company has been purchased by the Ashland Improvement Company, and the following have been elected directors: D. D. Geiger, president; W. M. Beckner, W. Houshell, John F. Hager, John Russell, John H. Talhut.

What is known as the Manhattan Hardware Works property in Reading, Pa., which has been idle for several years, was sold by Francis A. Zales, assignee, to Walter S. Davis and Charles W. Wilhelm, both of Reading. There are 14 acres of land connected with the plant. The purchasers will improve the works by enlarging it for the manufacture of bolts, nuts, etc., on an extensive scale.

The Norton Iron Works, Ashland, Ky., held the annual meeting of stockholders on the 23d of April. Nine directors were elected: W. Z. Grimstead, D. E. Stark, G. Gano, J. H. Rogers, John Dickson, W. Houshell, E. C. Means, John Russell and C. H. Green. The officers elected were: C. H. Green, president; E. C. Means, vice-president; John Russell, treasurer, and J. K. Pollock, secretary. The usual 3 per cent. dividend was declared.

The Walker Manufacturing Company, of Cleveland, O., is at present engaged in building a large cut spur gear, of 192 teeth, 30 feet 6 1/2 inch pitch diameter; 30-inch face, 6-inch pitch; bore 27 inches; weighing 60 tons; which is now erected in its pit lathe. As this is an unusually large piece of work, the company extends to its friends an invitation to call and see the same at its works any hour from 7 A. M. to 10 P. M., and any day during the next four weeks.

Messrs. Hines & Robertson who control the Eureka and other rubber packings, have issued a circular warning the trade and purchasers in foreign countries against "that mean cuss" who is imitating their goods and trade-mark in distant markets. They complain that the "cuss" or "cusses" in question is, or are, foisting an inferior article at a low price on unsuspecting buyers, and actually pirating the trade-mark "where they dare."

Mr. James Clayton, of the Clayton Air Compressor Works of New York, has just shipped several air compressors to the Transvaal and Australia. His advices inform him that American machinery is gaining in favor with those concerned in mining and engineering. These works have several complete mining and tunneling plants for South America and Australia in process of construction. Mr. Clayton states that his export in 1889 was double that of 1888.

In South America, and more especially in Brazil, the American iron and brass screen work is rapidly gaining in public estimation. New York firms are constantly exporting iron piazza screens and rails, which are rapidly replacing the wooden contrivances round the houses. Commercial institutions, too, are adopting the artistic brass screens and office fences which have been in vogue for some years here. The Southern taste in these matters is a little more for florid designs than in more Northern latitudes.

The Waugh Nait Mill, of Belleville, Ill., the Valley Steel Works of the same place, and the Tudor Iron Works of East St. Louis, Mo., have been consolidated under the name of the Valley Iron and Steel Works. The Western Nait Mill of Belleville is now controlled by the Valley Company, so that all four plants will be under one control. The capital of the new company is said to be \$450,000. Eight hundred men will be employed in East St. Louis and 700 in Belleville. All the plants will be operated to their full capacity.

There is a growing demand for pumping engines in Cuba, Mexico and Chili. The American make is generally preferred, but English and German manufacturers are supplying inferior pumps at such low prices that American competition is all uphill. In Cuba two New York firms are successfully competing with the European manufacturers, even at thirty per cent. higher prices. "When we can come down to European prices," said a prominent maker, "America will control the South American market."

Much of the shipping of American machinery to both South Africa and South America is done via Liverpool rather than direct from American ports.

Some heavy machinery was shipped by a prominent firm last week to South Africa via Liverpool, and the freight for the entire journey in a British vessel was just \$2 per ton more than the freight for the same from Chicago, the point of origin, to New York. The long way round by Liverpool to South America is also preferred, unless time is of more importance than the difference between American and British freight charges.

Several hoisting engines have recently been shipped to the Transvaal by the Lidgerwood Manufacturing Company, of New York. "Hoisting engines will never boom in Mexico and southern countries," said Mr. Pierce, of the company, "until their people reach a higher condition. The hoisting machine is an evidence of civilization. The more primitive and uncivilized the people, the cruder their methods of hoisting everything. In most of the South American countries manual labor is still used. It is only where Northern blood and enterprise have established themselves that machinery finds a market."

A New York firm has just had built and shipped to Hiogo, Japan, a plant for the manufacture of camphor from the plants and wood fibre. The plant, which is composed of stills, engines, boilers, and other pieces, weighs 55 tons and cost about \$75,000. The commercial camphor is now manufactured altogether in this country. The native wood fibres containing the gum are shipped here and distilled. The shipment to this country is attended with a great deal of cost. The freight is \$20 per ton, and in each ton the fibre and water amount to 75 per cent. Of the 25 per cent. of camphor in the wood at the time of shipment half evaporates during its transportation, leaving not over 12½ per cent. of the drug. To avoid the expense of the shipping of so large a bulk, and to prevent the waste by evaporation, it is proposed to transfer the manufacture of the article to places in Japan near where the camphor wood is obtained. About one-fourth of the camphor used comes from Japan.

(From our Special Southern Correspondent.)

A development company is said to have been organized at Rome, Ga., for the general development of the city. Negotiations have been made for a furnace for smelting manganese, and a plant for the manufacture of dynamo and other electrical apparatus. Messrs. Colyar & Lysterly, of Chattanooga, are now erecting a 50-ton charcoal iron furnace on the land donated by the Rome Land Company.

Another ice factory is now being added to the many in the South. The one in question is at Cordele, Ga., and is expected to be in operation inside of a week.

Work upon the Americus Iron Works and Machine Shops has commenced, and is now in active operation.

The American Valve Company has located at Rome, Ga., with a capital stock of \$300,000. All patterns of valves will be manufactured, and branch offices are to be established in both northern and southern cities.

The Pittsburg Development Company has established a new iron manufacturing town in Virginia, named Carnegie City. The first day's sales of town lots aggregated \$150,000.

Demmens & Harding, of Asheville, N. C., were awarded the contract for building the new post office at Asheville, on the 24th of April.

A company, with a capital of \$150,000, has been organized to build a standard gauge railroad (in Asheville, N. C.), from the Western North Carolina depot, up Southside and Valley street, across College and Woodfin, down the valley of the branch crossing North Main, to Pearson's Bridge on the French Broad. The length of this line is to be about five miles. A depot for freight distribution will be located on Valley street. The company charter has been granted by the State Legislature.

It is reported that the Richmond & Danville Railroad Company has decided to locate its new shops at Birmingham, Ala., and that the site has been chosen.

About a week ago Chester County, S. C., voted to donate \$150,000 toward building the proposed new railroad from Asheville, N. C. to Chester, S. C., by way of Gaffney City, which has also voted \$24,000 to the new road. Buncombe County, N. C., is to vote very soon on the question of giving \$200,000.

The Cape Fear Coaling and Contracting Company has been organized with a capital stock of \$100,000. The object of the corporation is to establish a coaling station at Southport, N. C., and to contract for the building of wharves, to operate steamboats, wrecking boats, dredges, etc.

CONTRACTING NOTES.

"The Piedmont Land & Improvement Company have contracted with Messrs. Gordon, Strobel & Laureau, Limited, of Philadelphia, for a complete 60-ton charcoal blast furnace, to be built at Piedmont, Ala. This will be followed in the near future by a 125-ton coke furnace, to be built by the same firm. The first furnace will be completed by January of 1891. Piedmont has an abundance of ore, timber for charcoal and good coking coal in very close proximity."

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.

784. Minerals: antimony and manganese ores corundum, emery, very white talc, very black white, red or yellow clays, or any choice ores, minerals or clay. Pennsylvania.

785. Flour mill machinery: rolls, bolts, cleaning machinery and water-wheel. Tennessee.

786. Wood-working machinery: bucking machines, spoke, hub and handle machinery. Alabama.

787. Prices of flour mill machinery, roller process, capacity 25 or 50 bbls. per day; also grist mill for corn. Tennessee.

788. Engine to supplement water power to the extent of 60 horse power. North Carolina.

789. Electric light plant of 150 incandescent lights. North Carolina.

790. Quotations on engineering and surveying instruments. Tennessee.

791. Wood-working machinery for wagon factory. Alabama.

792. Estimates on material for water works, gas works and electric light and power plant. Tennessee.

793. Machinery for manufacturing flour, corn meal, etc. Also cooper supplies. Kentucky.

794. Two engines: One 16 by 24 inches, and one 12 by 24 inches. Also shafting, belting, etc., Georgia.

795. Flour bolt. Arkansas.

796. 1,000 feet of ¾-inch wire rope for ferry. Alabama.

799. Dynamo and fixtures for electric plant for mill 32x50 feet. Maryland.

800. Wood-working machinery, planer and matcher, molder, band saw, scroll saw, rip and cross-cut sawing machine, pattern maker's lathe, automatic variety lathe, post boring machine and shaper. Alabama.

801. Iron tools, engine lathe, 18 inch by 16 inch bed; planer, 24 inches by 24 inches by 7 feet; drill press, 20 inches; speed lathe, 3½ foot bed; patent drill, and a complete set of hand tools for a small machine shop. Alabama.

802. Addresses of manufacturers of hydraulic presses and stone crushing machines. Connecticut.

803. Heavy pony mill 24 foot carriage, and 52 inch circular saw, all complete for saw mill. Mississippi.

804. Quotations on ice machinery with a capacity of from one to ten tons daily. North Carolina.

805. Pump for fire purposes, prices on 3-inch and 4-inch iron pipe, board ripping machine. North Carolina.

806. Manufacturers' catalogues illustrating faucets, valves or cocks to be connected to oil pipes with an orifice about as large as an ordinary pin. Texas.

807. A portable stone crusher and steam road roller suitable to use in building macadamized roads. New York.

808. Catalogues and prices of dynamos, etc., suitable for a small lighting plant to be run in connection with a machine shop. Alabama.

809. Estimates on ice machinery. Virginia.

810. Heavy planer, molder and matcher combined. Virginia.

811. Shingle machinery to attach to a saw-mill. Tennessee.

812. Grain elevator. Texas.

813. Electrical machinery for lighting and transmission of power. Texas.

814. Machinery for canning factory. South Carolina.

AMERICAN GOODS WANTED ABROAD.

774. Japanned or nickel music stands for military band; prices per dozen. Malta.

797. Catalogues, price lists, etc., of portable hand rock drills. Mexico.

798. Catalogues, price lists, etc., of the most improved American tools for mechanical and mining purposes. France.

GENERAL MINING NEWS.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—The directors' meetings were held on the 29th and 30th ult. without accomplishing anything. The question of Gen. Alger's succession in the board is exciting some controversy. General Thomas admits that he has been invited to become a director. The following figures are taken from the company's report for 1889, just submitted:

Balance from previous year.....	\$1,251,300
Profits for 1890.....	\$792,408
Loss on Cowan division and Chicago real estate.....	12,463
Net profits.....	\$779,945
Surplus.....	\$2,031,245

ARIZONA.

PIMA COUNTY.

GRANITE HILLS MINING COMPANY.—This company has been incorporated in St. Louis, with J. R. Peacock as president; George R. Bittman, secretary and treasurer; J. D. Burgess, superintendent. These mines are eight miles north from the Mammoth, and include the Little Pard, Granite Hill, Bessie Weir, Black Jack, Old Dock, Little Johnny, Di Vernon, Rob Roy, Undine and Lenora mines. Capt. J. D. Burgess has been at work on these mines for the last month with a force of eight men, building roads and opening up the mines. Every place where work has been done shows favorable prospects. The ores are copper-silver, and while they are not exceedingly rich, they consist of large bodies of fair grade, which can be worked profitably.

ARKANSAS.

MARION COUNTY.

(From an Occasional Correspondent.)

YELLEVILLE, April 21, 1890.

NEW SOUTH MINING COMPANY.—Specimens of the average ore being mined by this company on section 1, T. 19 N. R., 17 W., are of great beauty. Blue crystallized pear-shaped ore is found of remarkable purity for zinc. Assays are said to run 84 per cent. A great deal of work is being done on the Bonanza group of mines on Cow Creek, section 10, T. 17 N. R., 14 W. Shafts in numerous places are being sunk to develop the outcrops.

SHONEY CONSOLIDATED MINING AND MANUFACTURING COMPANY.—This company, of St. Louis, Mo., has taken out on Jimmy Creek, sec. 23, T. 20 N. R. 16 W., over 15 carloads of lead and zinc ore, more or less combined. John T. Dysart is working on the lost Jack mines, sec. 12, T. 18 W., K. 16 W., and giving employment to quite a force of miners. Heavy options are getting more like business when such developments are being made in so many different places. The outlook is very encouraging to one who has seen the place so nearly deserted last summer.

CALIFORNIA.

The annual report of William Ireland, Jr., State Mineralogist, for the year 1889 has been issued.

During the past year nearly one thousand specimens were submitted to the State Mining Bureau for determination, and the senders have, in most cases, been notified of the results of the examinations. The museum of the bureau has been enriched by the addition of over fifteen hundred specimens.

The accounts of the trustees are reported as follows: Receipts—Balance on hand October 1st, 1889, less a difference of \$444.20 between the amount reported and collected by the License Department, \$19,203.01; paid the Mining Bureau fund, \$6,845.05; appropriation, \$50,000. Total—\$76,048.06. The disbursements were \$27,174.44, including \$3,000 as salary for the State Mineralogist, \$3,000 for rent, \$6,360 for pay of employes, \$6,624 for pay of geological assistants, \$4,731.24 for traveling expenses, and \$762 for postage. The balance on hand October 1st, 1889, was \$47,873.62.

The State Mineralogist also reports that the value of the gold, silver, copper, and lead turned out in the Pacific States and Territories the past year amounted to \$120,000,000, the total value of all the mineral products having been \$538,000,000. There are at present about thirty thousand men engaged in the various branches of mining in California.

AMADOR COUNTY.

AMADOR GOLD MINE.—About twenty miners have started to work, operating three machines, preparing to open stopes in this gold mine. It is understood that the force will be increased soon. The work now being done is with the view of getting the mill started at the earliest possible moment. The rock breaker is not yet on the ground on account of the bad roads.

HARDENBURGH.—The hoisting works at this mine have been completed and pipe connections made, and everything is said to be in running order. The work of draining the shaft is progressing satisfactorily.

INYO COUNTY.

It is reported that the borax deposits at Death Valley, Inyo County, owned by W. T. Coleman, have been sold to San Francisco parties for \$400,000.

COLORADO.

COLORADO FUEL COMPANY.—The company invites proposals to be sent to the Atlantic Trust Company, the trustees of the general mortgage sinking fund gold bonds of this company of Denver, at No. 39 William street, New York, on or before June 1st next, for the sale of twenty of these bonds being as nearly as possible one-thirtieth of all such bonds which have been issued previous to this date, the sales to take effect and the bonds to be delivered and paid for July 1st.

ASPEN COUNTY.

SMUGGLER.—The opening up of the big body of lead ore in this mine is reported.

The Smuggler property is one of the oldest properties in this section, and has produced some fine ore and some extensive bodies of low grade ore have been opened up in the lower workings. These ores were so refractory, however, that but little money was made from them. The richest ore ever taken from the property was that produced when under lease to Messrs. Clark & Denman several years ago. They started what is now known as the upper tunnel, about 200 feet up the hill, north from the shaft, and about 100 feet north of where the big body of lead is now showing. They ran this tunnel in about 300 feet through many windings and tapped a rich chimney of ore which made their fortunes. The main shaft on this property is sunk to a depth of 100 feet, and levels were run north and south from it, the latter being run out on the face of the hill and used for drainage purposes. The management will immediately begin operations for the thorough exploration of the new discovery. Shafts will be sunk in different parts of the exposed strip and the depth of the ore found.

BOULDER COUNTY.

The sampling works at Boulder were sold recently at a sheriff's sale for \$1,800, V. A. Clark, William Morris, G. F. Cowan and W. D. Northup being the purchasers.

CHAFFEE COUNTY.

SILVER HORN MINING AND MILLING COMPANY.—This company was incorporated on the 9th inst. with a capital of \$500,000, non-assessable. The following are the officers and directors: President, A. J. Vivian; vice-president, W. N. Nicholls; treasurer, John S. Fillmore; secretary, Dr. J. Ross Van Allen. W. A. Ross, Prof. LeRoy Moore, and E. C. Morey, directors. Mr. E. C. Morey was appointed general manager, and will have full charge of the working of the property.

CLEAR CREEK COUNTY.

(From our Special Correspondent.)

BURRELL GOLD SYNDICATE.—This company is steadily sinking on its property. Several men are at work under lease, with good prospects of making something.

CENTENNIAL.—The main shaft is about 500 feet deep and still going down. The developments thus far show a great deal of ore, the most of which, under present facilities, is too low grade to be profitable, but too good to abandon. We hope for a successful outcome, as the owners are plucky and the management intelligent. The Burrell and Centennial are doubtless on the same vein.

GEORGETOWN, SILVER CREEK & CHICAGO LAKES RAILWAY.—The preliminary survey of this road has been completed to the Lamartine Mine, which is as far as it is proposed to build this year; the remainder to be completed when business will warrant it. This is to be a tramway similar to the one in operation in Gilpin County, except that it will be 30-inch gauge instead of 24-inch. From Georgetown to Silver Creek, where the Joe Reynolds, Two Sisters and other mines are located, the distance is about six miles; the elevation above Georgetown, 500 feet.

From Silver Creek to Lamartine the direct distance is not more than 1½ miles; but the elevation is something like 1,300 feet, requiring about seven miles of track. The maximum grade is 4½ per cent., but there is very little of it greater than four per cent. It is the purpose of the promoters of this enterprise to furnish cheap transportation to a number of valuable mines which can now be reached only by steep and tedious wagon roads. The line between Silver Creek and Lamartine passes very near the Blue Ridge, Capitol, Oneida and Falcon mines, while it is but a few hundred feet above the Freeland. The officers are men of energy and means, who are noted for making a success of what they take hold of.

MOUNT McCLELLAN MINING COMPANY.—The formation of this company and its purchase of what are known as the Stevens mines were carried out so quietly that people here were surprised at the announcement. The purchase price is said to be \$250,000. This property is located about 2½ miles from Gray's Peak, on a lateral spur from the main range, at an altitude something over 12,000 feet, and about one mile distant from the Atlantic-Pacific tunnel. The principal lodes in this group have been worked with somewhat varying success for at least 15 years, but during the last few years, under the systematic management of Mr. Griffin, they have become steady and profitable producers. The ore is chiefly heavy lead (galena), carrying a varying percentage of silver. Located on one of the most rugged mountain sides in this county,

the mines were accessible only by trails and tramways until the completion, about one year ago, of a tunnel 1,000 feet long, which is easily reached by a wagon road. Mr. Griffin, we understand, continues in the management.

GUNNISON COUNTY.

MAY-MAZEPPA MINING COMPANY.—It is reported that at a depth of 90 feet the shaft near the old May workings has penetrated a body of rich ore.

RAGGED MOUNTAIN PLACER MINING COMPANY.—This company has suspended operations on its property, and reports are to the effect that some difficulty exists between the management.

LAKE COUNTY.

BIG CHIEF.—A body of talc intermixed with native silver very similar to that found in the Maid of Erin has been struck in this mine. The pumping of the Castle View shaft drained the territory of the Big Chief so that they were enabled to follow the dip of the ore chute to a greater depth than has been heretofore practicable. The owners of the Big Chief, Breene & McComb, are also lessees of the east end of the Catalpa, and are shipping some good ore from that property.

LA PLATA COUNTY.

There are three new roads to be constructed at Durango, says the Denver Architect and Contractor, the coming season, the Rio Grande Southern, the Rio Grande & Utah Railroad, and the Durango, Rico & Northern.

The Rio Grande Southern, which is to connect Durango and Dallas, via Rico, is under contract to Carlisle & Weitbric, well known in railroad circles. Mr. T. H. Wigglesworth is surveyor and Mr. P. Campbell is foreman.

Mr. Campbell's camp is situated for the time being on Lightner Creek, about two miles from Durango. Quite a large camp has been established, and supplies and tools are already in Durango.

The Rio Grande & Utah Railroad is to connect Algodones, N. M., with Durango, thus forming a Southern outlet for Durango, so that all danger from snow blockades will be prevented in the future. This route is being surveyed at the present time. There is no doubt but that the road will be built in the near future.

The Durango, Rico & Northern road was surveyed last summer, and the stockholders state it will be built as soon as the snow permits, this being very deep over some parts of the road. This will be a shorter route to Rico than the Rio Grande Southern. This road would prove of immense value to Durango, as it would bring the ores from around Rico to Durango to be smelted. This company is composed mostly of Durango citizens. B. N. Freeman, of the Colorado State Bank, is president; T. F. Barhour, secretary, and F. Basler is chief engineer.

PITKIN COUNTY.

HUNTER PARK MINING COMPANY.—Developments are expected in the shaft of this company. This shaft has now reached a depth of 600 feet, and is still in the silicious shale. It is thought that the blue lime will soon be reached, which is probably about 30 feet thick at that point. The flow of surface water has necessitated a No. 6 Cameron pump being placed on the property. A station has been cut 475 feet down the shaft, and all the water will be collected there.

FLORIDA.

MARION COUNTY.

A press dispatch from Baltimore states that Mr. Angus Cameron, representing a syndicate of English capitalists, recently negotiated for the purchase of 1,000 acres of valuable phosphate lands for the syndicate.

The lands are on the Savannah, Florida & Western Railroad, and operations for mining the phosphate will be begun in about two months. The capital stock of the organization is \$1,500,000.

GEORGIA.

(From our Special Correspondent.)

CHEROKEE COUNTY.

FRANKLIN.—This mine is in a prosperous condition. Its bullion for the past two months is considerably more than for a similar previous period; 976 fine is nothing unusual for its gold.

GEORGIANA GOLD MINE.—This new property has recently been tested with a view to working, by New Orleans parties, and, having been found satisfactory, a mill has been erected. The machinery is of the Huntington pattern and gives good results. The ore now being worked is from the north vein, though good ore is said to exist in all the veins.

LUMPKIN COUNTY.

Great importance is attached to the recent visit of a party of northern and western capitalists to the mining industries of this section; among the prominent men constituting the party may be mentioned George H. Gould. They were very favorably impressed with the Hand properties, under the management of Capt. H. G. Ingersoll, which now operate 140 stamps. It is thought that the object is to try deep mining in this locality.

BRIAR PATCH.—Messrs. Miller & Howell, of Auraria, have purchased this mine, and have commenced work on it; it is a placer deposit and is considered to be a good investment, as it is not a

untried property but has yielded thousands of pennyweights.

CALHOUN.—The English syndicate that bought the Lockhart, Singleton and Ivy mine has purchased this mine. One hundred stamps are expected to be running in a short time; 10 stamps are now being added to the Singleton.

FINDLEY.—A St. Louis company has purchased this property, and it is said that it will be vigorously worked. Some work has already been done, and the superintendent, Mr. Smith, reports the finding of a very large vein running about \$20 per ton. The history of this property indicates that low grade ore is to be expected with occasional rich pockets.

TURKEY HILL.—Work on the 11-foot vein on this property is soon to commence; in the fifties this was one of the producers of the county.

MARION COUNTY.

A high grade of iron ore is said to have been found in this county, and a "special" to the Atlanta Constitution says that a sample of it submitted to an Atlanta chemist gave the following analysis:

	Per cent.
Metallic iron	65.
Silica	5.
Phosphorus	.32

POLK COUNTY.

GEORGIA & ALABAMA MINING COMPANY.—This company operates one of the largest iron mining enterprises in the south, and is limited only by the difficulties of transportation to its markets—Anniston, Birmingham, Atlanta, Chattanooga, South Pittsburg, and other Southern iron centers.

The officers of the company are, S. E. Noble, of Anniston, Ala., president; Col. J. K. Barton, of Cedartown, Ga., vice-president, and Frank Fitch, secretary. They operate under contract of about 150,000 tons per year, and consequently do not reduce the ore on their premises. The property consists of 4,000 acres of the best iron land (for both quantity and quality) in the State, and is near Cedartown, Ga., in the brown ore belt.

Analyses of the ores from the different banks average as follows:

	Per cent.
The Cedartown ore bank:	
Metallic iron	52.
Silica	.70
Phosphorus	.012
The Fish Creek ore bank:	
Metallic iron	54.
Silica	.80
Phosphorus	.080
The Tecumseh, or Prior's Station, ore bank:	
Metallic iron	50.
Silica	.100
Phosphorus	.016
The Rock Run ore bank:	
Metallic iron	55.
Silica	.50
Phosphorus	.040

The banks now in operation are the two Cedartowns, the Fish Creek, and the Tecumseh, at each of which are washers having a capacity of 300 tons per day. These washers are of the most improved type, having automatic appliances for handling the different grades of ore. An inexhaustible supply of water is obtained from the Cedar Creek by force pumps; everything is run by steam power, and the ore is conveyed to the washers in cars, tracks running into the banks from the washers. The transportation facilities are: A branch road from Cedartown to the E. & W. R. R. of Alabama another branch road from Fish Creek to the C. R. & C. R. R., and the Tecumseh bank is on the E. T., V. & G. R. R., at Priors Station. The delivery is much impeded by the lack of steady supply cars; it is hoped that the rebuilding of the E. & W. R. R. to standard gauge will obviate this difficulty in the future.

The quality of iron obtained from this ore is said to be very superior and it is in much demand in Anniston and Attalla, Ala., for the manufacture of car wheels.

ILLINOIS.

PEORIA COUNTY.

About 1,000 coal miners went on strike on the 30th ult. for 85 cents a ton. They have been receiving 72½ cents per ton.

INDIANA.

CLAY COUNTY.

The miners in this county decided on the 1st inst. not to return to work until a wage scale is agreed upon.

MICHIGAN.

COPPER MINES.

ATLANTIC COPPER MINING COMPANY.—Reports from Hancock dated the 30th ult., stated that the timber men and day laborers of this copper mine were on strike. They have been getting about \$40 a month, and demanded \$1.75 a day. Mr. Norton, the agent, who is in New York, has notified the men, it is said, that he will comply with their demands, but the men refuse to resume work until he returns.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, April 28.

The sales of ore for the week ending the 26th is an increase over the previous week. The entire

output of the district is estimated at \$65,000 to \$70,000.

The price of zinc ore advanced from \$1 to \$1.50 per ton, and lead 50c. per thousand.

The general feeling among operators is that the market will grow stronger, and they are content to retain a portion of their productions at the prices which ruled last December. The following are the sales from the camps as far as reported:

Joplin mines, 1,082,800 pounds zinc ore and 150,650 lead; value, \$16,073.

Webb City mines, 972,310 pounds zinc ore and 51,950 lead; value, \$12,051.

Cartersville mines, 738,830 pounds zinc ore and 57,370 lead; value, \$10,900.

Zincite mines, 423,481 pounds zinc ore; value, \$8,206.

Galena, Kan., mines, 2,000,000 zinc ore and 200,000 lead; value, \$26,200.

All districts, total value, \$59,885.

JOPLIN DISTRICT.—W. M. King, of Denver, Colo., and Judge O. N. Hilton, of Michigan, have purchased the Oasis mine, and are negotiating for others. These gentlemen, experienced mine operators from the West, have looked the lead and zinc resources over carefully, and express themselves as surprised at their magnitude.

The Bay State miners on the Oswego land turned in 34,680 pounds zinc ore and 2,100 pounds lead during the week.

Mr. J. Arnil has opened up a good lead property just west of the city of Joplin at a depth of 25 feet.

The Diamond mines of A. H. Frye, southwest of the town, are opening up some very large bodies of lead and zinc ore. Mr. Frye has just put in crusher and rolls, so that he can now handle the disseminated ore.

The Snyder Bros. are opening up a fine property adjoining the Diamond mines and have just completed some substantial surface improvements.

Mr. J. Price Wetherell, vice-president of the Empire Zinc Company, left for Philadelphia, Saturday evening, after a visit of several weeks in Joplin.

The Thacker Mining Company, on Turkey Creek, has about 40,000 pounds zinc ore in bins.

The Brush mines on the Grumby land turned in 9,000 pounds lead during the week.

MONTANA.

DEER LODGE COUNTY.

MOUNTAIN LION MINING COMPANY.—The reorganization of this company has been accomplished. Of the 400,000 shares outstanding, 391,000 were represented, and on the motion that the company be reorganized on an assessable basis there was not a dissenting vote. The St. Louis interests were fully represented and acted in entire harmony with the local stockholders. It was further determined to change the name of the corporation to the Lion Mining Company, the word mountain being dropped. The remaining unsold treasury stock, amounting to 100,000 shares, was canceled, so that the company's stock now aggregates but 400,000 shares, representing by this retirement an increase in value of one-fifth. An assessment of two cents per share was levied, which will be sufficient to carry on work at the mine for the present. It is not anticipated that any radical change will be made in the plan of development. The directors are: James H. Mills, J. N. Fox, George S. Miller, James B. McMaster, William Coleman, C. E. Gable, Conrad Kohrs and E. D. Holland. At a subsequent meeting of the board of directors the old officers were re-elected as follows: President, James H. Mills; vice-president, J. N. Fox; secretary, George S. Miller; treasurer, James B. McMaster.

JEFFERSON COUNTY.

HIAWATHA MINING COMPANY.—The vein of the Hiawatha mine, three miles from Basin, is between 4 and 5 feet wide. There are two pay streaks, one of 3 inches on one wall and another of about 14 inches on the other wall. There is some difference in the quality of the ore in the two streaks, that of the larger one being of a higher grade than the smaller. Besides a perpendicular shaft 85 feet deep, a cross-cut and tunnel combined has been driven in on the ledge a distance of 238 feet. It is the intention of the company to connect this tunnel with the shaft 100 feet from the surface, but in order to do this the tunnel will have to be driven about 70 feet farther and the shaft sunk 15 feet deeper, after which either a new shaft will be sunk on the vein, or else the old one will be continued.

MADISON COUNTY.

During the past year the following sales of mining properties have been made in and around Pony: Eling & Morris to Pony Gold Mining Company, fifteen leads, consideration \$500,000. Olds & Hickman; Golconda lode, to eastern company, \$160,000. Col. J. H. Johnson, to New York capitalists, Revenue group, \$400,000. Major N. J. Isdell, Jefferson Bar placer, to Michigan company, \$50,000. McKitrick & Wood, Gilded Age, to St. Louis syndicate, \$50,000.

SILVER BOW COUNTY.

SILVER ARROW MINING COMPANY.—The stock certificates of this company have been made out, and are now in the hands of the secretary, J. H. Hibbard, ready for delivery. The company was

incorporated about March 1 by S. T. Hauser, W. A. Chessman, E. W. Knight, E. W. Beattie, H. Barbour, J. W. Hathaway, J. S. Harris, J. H. Hibbard, R. C. Wallace, W. H. Clark and G. A. Southmayd. Its possessions consist of the Silver Arrow lode and mill site, a patented claim situated about ten miles from Butte, in Sunrise gulch. The property is developed by two tunnels, 200 and 250 feet in length, respectively, and a 40 foot shaft. The showing of ore, both in quantity and quality, is good, and the company expects to ship ore this season. The property adjoins the Ruby and Kit Carson. One hundred thousand shares are reserved for treasury stock, but they will not be placed on the market at present, as the company has ample working capital in its treasury.

SOUTHERN CROSS.—The 10-stamp mill now crushing ore belongs to Salton Cameron, who has a contract to crush the company's ore until June 1. As the time for the expiration of this contract is drawing nigh, the directors of the company are now figuring on the erection of a 20-stamp mill. One of their tests was made at the Old Lexington 10-stamp mill in this city a few weeks ago, and proved very satisfactory to the company, a larger percentage of the gold being saved by the pan process in use at the Lexington than by Mr. Cameron's plate process. Says the Butte Miner, the only obstacle now in the way of building the mill is a lack of funds, the stock being quoted at so low a figure that the directors are loth to part with that now in the treasury at such a sacrifice. This will be done, however, in a short time, as the company realizes that other machinery, save that now in use, is necessary to successfully treat the ore. The shaft on the Southern Cross is 250 feet deep, and two levels have been run 200 and 175 feet respectively west of the shaft, the former at a depth of 150 and the latter from the bottom. The vein in both of these levels is strong, being 30 feet in width in the lower level about 80 feet from the shaft.

NEVADA.

DOUGLAS COUNTY.

The Lyon County Times says: It is reported that a rich strike of gold rock has been made near Wellington Station in this county. The ledge of ore is said to be about seven feet in width, and assays have been made that are said to go as high as \$600 per ton. Many locations have been made and there is considerable excitement over the discovery. The ground in which the find was made is in Douglas county, close to the Lyon county line.

STOREY COUNTY—COMSTOCK LODE.

QUARTERLY YIELD OF THE COMSTOCK.—According to the sworn statement of superintendents filed with the Assessor of Storey County, Nev., the yield of the Comstock mines for the quarter ending March 31st, 1890, was as follows:

	Tons of ore.	Bullion produced.	Average per ton.	Cost of production.	Net yield.
Challenge....	330	\$5,024.10	\$15.50	\$11,195.15	\$6,171.15
Confidence....	191	2,891.89	15.14	11,128.23	3,204.34
Con. Cal. & Va.	25,930	469,574.99	18.10	378,416.40	91,158.60
Con. Imperial	212	2,217.60	15.18	21,381.45	18,566.35
Crown Point	7,059	81,402.95	11.50	93,634.45	12,241.50
Hale & Norc's	5,839	67,668.98	11.90	104,359.77	36,690.79
Justice.....	2,217	40,163.56	17.91	43,153.57	2,972.01
Overman.....	1,670	22,597.19	13.53	17,914.22	4,682.97
Savage.....	3,605	53,999.62	14.97	51,526.37	2,466.25
Yellow Jacket	4,570	65,795.76	18.16	80,718.68	14,922.92

*Cost of production above yield.
Bullion tax on production; Con. Cal. & Va., \$1,557.93; Overman, \$234.14; Yellow Jacket, \$123.31.

NEW JERSEY.

SOMERSET COUNTY.

A vein of hematite iron ore, it is reported, has been discovered near Peapack. Many years ago a small quantity of the mineral was found on another part of the same farm, but the supply was exhausted. A company has been formed which will take possession of the ground and open it up.

NEW YORK.

SCHUYLER COUNTY.

Samples of rock taken from the farm of Caleb Hayes in Orange were recently sent to H. C. Nelson, the assayer of the Chicago Smelting Works, and the assay returned shows \$60 silver and \$2 gold to the ton of rock, but no lead or copper. A stock company is to be organized, and work begun at once on the mine.

NORTH CAROLINA.

MECKLENBURG COUNTY.

(From our Special Correspondent.)

CHARLOTTE, April 21.

Mr. A. T. V. Smith is developing the Chinquepin Hill property; the shaft is being put down and levels driven. The lead bearing east has yielded some very high grade brown ore, and it is expected that more of the same kind will be found in cross-cutting. Machinery will be erected as soon as there is sufficient ore in sight to justify it.

BALTIMORE & NORTH CAROLINA (RAY) MINING COMPANY.—This property has been developing for the last year or two; recently, however, they milled their dump and closed down. Whether permanently or not is not stated.

HENDERSON.—Mr. Rollins is still sinking the engine shaft, and the mill is being overhauled. A very promising body of sulphures, ranging in thickness from one to four feet, was opened up at a depth of 60 feet in one of the smaller shafts; nothing is being done on this now, however, as the plant is not adapted to the treatment or concentration of such ores.

BOWAN COUNTY.

STONE MOUNTAIN GRANITE COMPANY.—This company, recently organized at Salisbury for the purpose of working its quarries, seven miles from town, is making good headway in placing its stock among home capitalists. This is a good indication of success. It is estimated that a profit of \$3 per ton can be realized on shipping it to Northern markets, and that an output of 50,000 tons per year will be made.

STANLY COUNTY.

STANLY FREEHOLD MINES.—Capt. Judd writes me that in consequence of the prosperous condition of their company work underground is to be resumed. The Upeast shaft, now 120 feet deep, is to be put down to 250, and then a thorough test of it will be made. "We expect at no very distant date to erect a thoroughly efficient mill to treat not only the ore we obtain in hydraulicking, but that which we are certain to obtain when we sink the before-mentioned shaft."

OHIO.

PERRY COUNTY.

NEW YORK AND PERRY COAL AND IRON COMPANY.—The injunctions which were secured several months ago against this company and its officers—George A. Blood, president; Francis P. Perkins, treasurer; and Charles C. Allen, trustee—in two suits, one known as the "stock suit" and the other as a "bond suit," begun by Robert Lewis, William B. Bishop, Anna L. Bishop, and Amos Tenny, on behalf of themselves and other stockholders, were vacated on the 29th ult., by Judge Andrews in Supreme Court Chambers, New York, who gave a decision sustaining the action of the officers of the company. It was charged in one suit that the majority of the trustees in 1887 increased the stock of the company from \$1,500,000 to \$3,000,000 (see ENGINEERING AND MINING JOURNAL for June 25th, 1887, page 498), issuing the increased number of shares to purchase 600 acres of property in this county, in which they had an interest, and whereby they profited considerably. In this suit an accounting of these moneys was demanded. The officers declared that the increase of the stock was with the approval of the stockholders, its object being to pay for the land purchased and to raise money for improvements, which would save a rental of \$70,000 per year. In accordance with this scheme the plan was carried out. Stockholders holding over 23,000 of the 30,000 shares declined to join in this action, and requested that it be withdrawn. Judge Andrews says that the suing parties are irresponsible, and have given an undertaking of only \$1,000, while the defendants are men of means and able to respond to any recovery, and their allegations are not contradicted.

The "bond suit" was brought to cancel a mortgage given to the Farmers' Loan and Trust Company, on February 29th, 1888, to secure \$2,000,000 in bonds, and the temporary injunction granted restrained the issue of the bonds. It was claimed that two-thirds of the holders of the stock did not approve of this issue, but the trustees denied this and showed that 23,945 of the holders of shares out of the 30,000 were in favor of it. Consequently the judge takes the same step in this case and vacates the temporary injunction. There was filed in the office of the County Clerk in New York on the 29th ult., the consent of over two-thirds of the bondholders of stock of the Coal and Iron Company—holders of 20,373 shares—to the execution of a mortgage for \$600,000 to the Farmers' Loan and Trust Company as security for the issue of bonds to that amount, payable in thirty years, at six per cent. This is done for the purpose of wiping out the company's floating indebtedness, and in order to further develop its properties and the erection of ovens, bridges and cars, and for making repairs.

PENNSYLVANIA.

DELAWARE, SUSQUEHANNA AND SCHUYLKILL RAILROAD COMPANY.—This railroad, mentioned in our previous issue, and which has been chartered by Eckley B. Cox to run from Driftor 30 miles westward, will connect with the Pennsylvania, Reading, Jersey Central and Lehigh Valley Railroads and the proposed Lehigh and Eastern, and will enable Mr. Cox to ship his coal by whatever route he pleases, instead of almost entirely by the Lehigh Valley, as now. Work is to be begun on it soon.

COAL.

H. C. FRICK COKE COMPANY.—This company has just completed and put into operation a system of wire rope haulage in the Leisegang No. 2 mine. The system is several miles in length, and

will enable the pitmen to get their coal to the bottom of the shaft as fast as the engines can hoist it. A similar wire rope haulage is being placed in Leisenring No. 1 mine, and will be completed shortly. Immense storage reservoirs for water are also being constructed at each of the three Leisenring plants. The plant of new engines being put in at the Trotter works were built by the Dixon Manufacturing Company of Scranton. They are 24 x 48 first motion engines. A general overhauling of the Trotter plant is in progress during its enforced idleness. Forty old ovens at the Davidson works of the company will be rebuilt this summer.

LEHIGH AND WILNESBARRE COAL COMPANY.—One hundred and twenty-five sterling mortgage bonds of this company for \$200 each have been drawn, and will be paid, with maturing coupons, on and after May 1st, on which date all interest thereon will cease. Bonds numbered as follows will be paid at the company's office, New York:

5,169	5,305	5,626	5,630	5,635	7,783	7,785
7,789	7,833	7,859	7,876	7,881	7,908	7,923
7,929	7,936	7,985	7,987	8,011	8,014	8,015
8,041	8,061	8,075	8,082	8,104	8,139	8,143
8,164	8,183	8,179	8,186	8,193	8,238	8,255
8,284	8,279	8,288	8,296	8,325	8,326	8,338
8,359	8,363	8,401	8,414	8,416	8,421	8,431
8,455	8,456	8,464	8,506	8,518	8,530	

The remaining 70 bonds, issued in London, will be paid at the office of the fiscal agents of the company, Messrs. L. Thompson, T. Bonar & Co., London.

MIDDLE CREEK COAL COMPANY.—Puck Mountain colliery, at Puck Mountain, and Middle Lehigh colliery, at New Boston, suspended operations on the 26th ult. for an indefinite period. Both mines are operated by this company.

OIL.
Exports of refined, crude, and naphtha from the following ports, from January 1st to April 25th, were as follows:

	1890.	1889.
	Gals.	Gals.
From Boston	724,099	1,009,003
Philadelphia	32,476,506	39,042,335
Baltimore	2,439,002	7,083
Perth Amboy	3,522,331	6,112,985
New York	112,615,135	126,507,651
Total exports	151,777,133	172,679,057

SOUTH CAROLINA.

(From our Special Correspondent.)

MAGNETIC IRON COMPANY.—This company, of Spartanburg, York, and Union counties, owns a tract of about 8,000 acres. It was formerly worked with charcoal furnaces until the brown ore was used up, when, there being no transportation facilities for obtaining coke, the works were closed down. Recently, however, a Birmingham syndicate has purchased 600 acres for the sum of \$32,000, and it is extremely probable that operations will be resumed; the building of the projected railroad will result probably in the opening up of this whole region again. It is reported that the above syndicate has also purchased a mill site on the Broad River near Cherokee Ford, for which they paid \$7,000.

SOUTH DAKOTA.
LAWRENCE COUNTY.

ALBE MINING COMPANY.—The new shaft on this property in Carbonate is now down 115 feet and will be sunk 10 feet more; a drift will then be run to tap the ore which is supposed to exist westerly from the shaft in some of the old workings. The new shaft is 4 by 6 in the clear and timbered all the way down with two-inch planks. The company is practically a close corporation, the stock being held by a few individuals. The greater portion of the ore taken from the old workings has been shipped, the balance treated at the Iron Hill smelter. The proceeds of the ore have been used in developing the property.

IRON HILL MINING COMPANY.—At a meeting of the directors of this company, held on the 25th ult., Robt. Graham was elected as director in the board, in the position made vacant by the death of John Guld. An assessment No. 17 of three cents per share has been levied.

SPANISH R. MINING COMPANY.—The new board of directors have visited the property of the company, in Carbonate, put W. C. Lindley in charge, and stopped all work until such time as the books and affairs of the company are put in shape. The probability is that upon resumption of work Vice-President Harry Gregg will assume charge as superintendent.

PENNINGTON COUNTY.

GORMAN MINING COMPANY.—Judge Nowlin has rendered judgment in the case of this company vs. John A. Alexander and others. The court held that the original location of the Lady of the Hills was valid; that the original locator sold to Thomas Gorman, who was an alien; that Gorman being an alien, could not take or transfer property during his alienage; that when he sold it to the Gorman Mining Company (see ENGINEERING AND MINING JOURNAL, May 21st, 1887,) before declaring his intention to become a citizen, the company to which he sold took nothing; that the adverse location was made by employes of the Gorman Mining Company on the 8th day of November, 1887; that such location was invalid, but that the inception of such location

was on the 3d day of December, 1887, when the certificates were recorded in the office of the register of deeds; that because of the alienage of Thomas Gorman such location was valid, and the decision must be in favor of the defendants; that they are entitled to a patent. It is understood that the plaintiffs will appeal to the Supreme Court, and the case will undoubtedly be one of the most important on the subject of alienage in the legal history of the country.

LUCKY BOY CLAIMS.—G. G. Smith on the 18th ult. purchased a one-half interest in these claims, adjoining the King Solomon lode at Tigerville, it is said, for \$50,000.

UTAH.

JUAB COUNTY.

BULLION, BECK AND CALIFORNIA MANUFACTURING COMPANY.—This company closed a contract for a hoist plant to cost \$85,000, which will sink the shaft, now 600 feet deep, to the 2,000 level. In our issue of the 19th ult., we referred to the difficulties of this company.

VIRGINIA.

(From our Special Correspondent.)

It is said that the Pocahontas coal mines are to be opened up on a still larger scale. The coke produced there is of a very high grade. The Richmond Dispatch, in a recent article on the subject, says: "The increased demand for the Pocahontas Flat-Top coke is unprecedented in the history of any new coke field. The demands of the Southern furnaces in Tennessee, Alabama and Georgia are now about 50 cars per day and increasing, which, with the requirements of the furnaces at Shenandoah City (formerly Milnes), Lynchburg, Roanoke, Pulaski and Ivanhoe, keep the ovens in our coke fields all busy; and to meet the requirements of furnaces now being built along the lines of the Norfolk & Western and Shenandoah Valley railroads, and the increased demands from the South, about 2,000 additional ovens are to be built during the year 1890."

HALIFAX COUNTY.

The Lynchburg & Durham Railroad is progressing rapidly; tracklaying goes on at the rate of a half a mile a day. In a cut of this road about six miles south of South Boston a small vein of coal was struck, which was followed some distance until there has developed, it is said, a vein 10 feet thick.

WASHINGTON.

(From an Occasional Correspondent.)

Under the head of "Mining News" in the JOURNAL one always finds the mining States and Territories alphabetically arranged, commencing with Arizona and ending with Wyoming and the foreign countries, while poor Washington is frequently left out, though it is a mining country and has vast deposits of coal and iron, and thousands of gold, silver, lead and copper mines located, but undeveloped, with few exceptions. The Colville country, and that portion of British Columbia contiguous is especially rich in mineral, but the country about Colville has had a set back, and will have another soon unless the JOURNAL comes to the rescue. It has done good work heretofore in strangling stock schemes of the feline species.

The first set-back was about four years ago. Parties from Spokane Falls and this place built a gold mill 10 miles from here, with the intention of making a stock deal out of it. One of the leading parties got scared and drew out, and the scheme died, but not until the mill was finished. There never was a dollar's worth of gold in the property that could be taken out without costing 10 dollars, and they knew it. The idle mill has been a great "bugbear" to investors, and has kept capital out of the country.

Two years ago a smelter was built here in Colville with a great flourish of trumpets. The manager claimed that it was backed by Mackay and Jones, of "Bonanza" fame. When it started up it was found that the stock was not built right, and was overhauled and started again, but failed to make a success, and after a spasmodic effort closed down indefinitely. About a year ago the stock of the "Mutual Smelting and Mining Company" was listed on the Consolidated Stock and Petroleum Exchange, and the president of the company, one J. S. Moore, and the directors apparently concluded to exploit the streets of New York.

The market value of this company's property, according to the JOURNAL's stock quotations, is about \$160,000; the smelting plant would not sell under the hammer for \$20,000. Of course, it requires considerable capital to buy ore, fuel, flux, etc., but the stockholders will find in the end that they hold worthless certificates, and poor Colville will suffer again. Mr. Benjamin Moore, son of the president, is manager. He is very modest, and claims to know nothing about the business he manages. They are now buying ore and will be obliged to make some sort of a showing in order to keep up the stock deal. But the end will be disastrous for Colville, "a dead smelter," and a quiet camp, because the streets of New York have been mined at our expense.

WYOMING.

An English syndicate is said to be offering options and purchasing outright large blocks of oil lands in the Shoshone oil basin.

FOREIGN MINING NEWS.

CANADA.

NOVA SCOTIA.—ANNAPOLIS COUNTY.
(From our Special Correspondent.)

At Torbrook, a bed of red hematite, four feet thick, running from 55 to 60 per cent. of iron, and low in phosphorus has been found. It is being opened by the Londonderry Iron Company, and it is expected will be utilized at their furnaces, as a mixture with their lemonite ore.

At Walton, on the Bay of Fundy, preparations are being made for opening a quarry of red marbled limestone, yielding a beautiful building material, and susceptible of a high polish. It is said that a contract has been made for a considerable amount of this stone to be used in the interior decoration of the World Building in New York. It is owned locally, and is reported as capable of yielding a large amount of stone.

COLCHESTER COUNTY.

Some excitement has been aroused by the discovery at Brookfield of a lower carboniferous conglomerate resting on the gold bearing slates and carrying free gold in the layers next the slate. The conglomerate is compact, and at its junction with the older rocks a layer of gravel with sand ore which carries free gold. This ancient alluvium extends for many miles, and should any lucky find show an old river bed or channel it may prove very valuable.

The decision of the Canadian Parliament to admit for three years free of duty all mining machinery which is not made in the Dominion at the time of its importation will prove of service to the silver mines and to the projected steel works of Pictou, and to mines requiring certain forms of concentrators, rock drills, ore breakers, etc. Wire rope is made in Canada, your writer is informed but he is not aware that it has come into any extended use at the mines. Nearly all the machinery used in the free gold quartz veins of Nova Scotia is made locally.

PROVINCE OF ONTARIO.

PORT ARTHUR, April 2

BADGER SILVER MINING COMPANY.—The force at this mine has gradually been increased since the mill started up about two months ago. They are treating 25 tons daily, and expect to equal the output of their summer of 1889 during the current year.

BEAVER MINING & MILLING Co.—The diamond drill is now sinking at the junction of the Beaver and North Bluff mines, with very encouraging results. Stopping is being carried on in the mine very actively. The force of men is being increased in the stopes in anticipation of starting the mill shortly. It is now nearly in readiness, and when it commences the Beaver is expected to eclipse its record of 1887.

LONE PINE.—This lode is in the same formation as the foregoing mines. It is owned by Mr. R. R. Paulinson, and is about to be developed. Although but little sinking has been done on this location, it yields from 6 to 26 ounces of silver to the ton of 2,000 pounds. The location is well timbered, and with its facilities for mining and transport, together with its water privileges, may be considered one of the most eligible locations in the district. Iron Willie promises to astound the community by announcing the location of an entirely new kind of mineral in this district within a few days.

MINK MOUNTAIN.—This lode is bonded to an American company for \$200,000. It was located and owned by the late T. H. Halbert, M. E. Remarkably rich specimens of native silver and zinc blende were taken out of the test pits on this lode.

SILVER-BLUFF.—This mine, which is owned by Oliver Danuall, is situated west of the Sterling mine.

SILVER GLANCE.—This property is located on the Mink Mountain range west of Whitefish Lake, and immediately adjoins the "Muck Mountain" and "Silver Fox." Testing has been done along the course of the vein, which outcrops for half a mile across the property, and samples taken from the different pits have given assays from \$125 to \$1275 per ton of 2,000 pounds. This property is reported sold to a French and Belgian syndicate.

STAR.—Capt. Roberts' party of miners have been very successful in their winter operations. They have developed a strong well defined vein carrying native silver, argentite and blende assaying from \$150 to \$750 per ton. The vein showed a width of 18 inches on the surface, and at a depth of 50 feet had increased to 8½ feet with a pay streak of 14 inches, like the Badger mine. The Star promises to prove a paying property from the beginning. The new government wagon road, for which a grant has been given, will run from White Fish Lake along the base of Mink Mountain to Round Lake, and will afford ample facilities for transporting supplies from the railway to the several properties mentioned above, and will enable their owners to work them systematically and economically, which could not be done under the old order of things, as the cost of putting in machinery and supplies was altogether out of proportion to the returns.

STERLING.—This mine is situated on the Little Whitefish River and is under the management of Capt. Peter Giroux; the shaft is now down 55 feet.

and like the surrounding mines of the Silver mountain district, is in the Animikie slates, and although only in its infancy as far as development is concerned, carries considerable native silver and zinc blende, with some galena.

SHUNIAH WEACHU.—Everything is progressing very satisfactorily here. No. 3 shaft has attained a depth of 630 feet. Stopping is being steadily carried on in the rich body of ore reported in my last, between No. 3 and No. 4 shaft. Everything over 100 ounces is barreled for shipment to Liverpool, England, and the lower grade is being stored on the dump. They have now considerably over 3,000 tons of mill rock mined.

THE SILVER KING OF THUNDER BAY.—No active development work has ever been done on this property. Test pits have been sunk along the course of the vein and in every instance have exposed native silver, argentite, and black blendes, some specimens equaling the famous Badger ore.

WEST END MINING COMPANY.—The affairs of this company are in excellent shape; their force of men is not large, but they are turning out some very rich ore, taken principally from the deep winze. They have 15 tons of very high grade ore ready for shipment to Denver.

MEXICO.

Tracklaying on the railroad from Deming into Mexico is about to be commenced. The grade is completed to the Mexican line, and material and tools are arriving in Deming, N. Mex. This road will open a rich mining region in Mexico, and it is expected that the road will be in operation to Las Palomas, Mex., by June 1st. The line of this road passes near the Tres Hermanas mining district, which is only a few miles on this side of the Mexican line. But little work has been done in the Tres Hermanas mines in the past two or three years, but with railroad facilities for shipping ore there will be a decided improvement there.

DIVIDENDS.

Caledonia Gold Mining Company, Dividend No. 18, of 8 cents per share or \$8,000, payable May 15th, at the office of Messrs. Laidlaw & Co., 14 Wall street, New York, and at the office of the company in San Francisco, Cal.

Osecola Consolidated Mining Company, dividend No. 27, of \$1 per share, or \$50,000, payable June 2d, at Room 20, No. 246 Washington street, Boston, Mass., to stockholders of record, May 7th. Transfer books close May 8th and reopen May 14th.

Tennessee Coal, Iron and Railroad Company, the coupons on the bonds of the Pratt Coal and Iron Company and on the outstanding consolidated bonds of the Tenn., C. I. & R. Co., due May 1st, will be paid at the Mechanics' National Bank, No. 37 Wall street, New York.

ASSESSMENTS.

COMPANY.	No.	When levied.	Due in office.	Day of Sale.	Ann't per share.
Acme, Cal.	10	Mar. 20	May 15	June 9	.03
Alabama, Nev.	1	Mar. 18	Apr. 22	May 13	.08
Alpha, Nev.	4	Apr. 5	May 12	June 3	.25
Andes, Nev.	36	Apr. 10	May 14	June 3	.25
Bailey, Nev.	1	Mar. 18	Apr. 22	May 13	.08
Confidence, Nev.	15	Mar. 12	Apr. 6	May 7	.75
Con. Imperial, Nev.	27	Apr. 17	May 22	June 11	.05
Del Monte, Nev.	3	Apr. 16	May 22	June 13	.20
Gold Hill, Cal.	9	Apr. 17	May 24	June 10	.25
Haje & Norcross, Nev.	95	Apr. 9	May 14	June 5	.50
Hartford, Nev.	7	Apr. 8	May 15	June 6	.02
Holmes, Nev.	11	Mar. 12	Apr. 17	May 8	.25
Humboldt.	1	Mar. 18	Apr. 22	May 13	.08
Imperial, S. Dak.	4	Apr. 5	May 8	May 24	.00134
Iron Hill, S. Dak.	17	Apr. 19	May 21	June 7	.03
Navajo.	20	Apr. 8	May 15	June 6	.15
North B. Isle.	17	Apr. 8	May 14	June 5	.20
N. Commonwealth, Nev.	3	Apr. 16	May 21	June 12	.25
North Occidental.	2	Mar. 31	May 5	May 26	.06
Ophir.	56	Apr. 2	May 6	May 26	.50
Peerless.	14	Mar. 28	May 6	May 27	.10
Potosi, Cal.	34	Mar. 27	Apr. 30	May 21	.50
Quaker, Cal.	18	Mar. 8	Apr. 15	May 5	.20
Seabury-Calkins Con., S. Dak.	12	Apr. 5	May 19	June 9	.00134
Sierra Iron, Cal.	7	Apr. 17	May 29	June 23	1.75
Silver Hill, Nev.	26	Apr. 14	May 20	June 11	.20
Standard Con., Cal.	2	Mar. 4	Apr. 16	May 19	.25
Utah Con., Nev.	9	Mar. 11	Apr. 17	May 5	.25

MEETINGS.

Church Gold Mining Company, at No. 303 California street, San Francisco, Cal., May 5th, at 1.30 P. M.

Consolidated Imperial Mining Company, at room 3, No. 329 Pine street, San Francisco, Cal., May 7th, at 1 P. M.

Delaware & Hudson Canal Company, at No. 21 Cortlandt street, New York, May 13th, at 12 o'clock noon.

Glendon Iron Company, at Boston, Mass., May 7th, at 11 A. M.

Grand View Mining and Smelting Company, at No. 29 Wall street, New York, May 5th, at 11 A. M.

Justice Mining Company, at Room 3 Hayward's Building, 419 California street, San Francisco, Cal., May 5th, at 1 P. M.

Live Oak Drift Gravel Mining Company, at Room 24, No. 328 Montgomery Street, San Francisco, Cal., May 15th, at 2 P. M.

May Flower Gravel Mining Company, at Room 24, No. 328 Montgomery Street, San Francisco, Cal., May 13th, at 1 P. M.

Minnesota Iron Company, at the office of the company, in Duluth, Minn., June 9th, at 10 A. M.

Morgan Mining Company, at Room B, No. 230 Montgomery Street, San Francisco, Cal., May 3d, at 11.30 A. M.

Utah and Montana Machinery Company, at Nos. 21 and 23 Fremont Street, San Francisco, Cal., May 6th, at 1 P. M.

MINING STOCKS.

For complete quotations of shares listed in New York Boston, San Francisco, Baltimore, Denver, Kansas City, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 512 and 513.

NEW YORK, Friday Evening, May 2.

"Unchanged, unchanged!" is the lament of dealers in mining stocks when asked concerning the condition of the market. It will puzzle many why we report from week to week that no change worthy of mention occurs in the market; it is only the truth. A week or two ago the sanguine brokers were enthusiastic over the advance in silver. A casual observer would have thought from the conversation of these gentlemen that the passage of the Silver bill was an assured thing, and that it would go into effect almost immediately. The decline in the "white metal," although the price is yet very high, has caused a reaction in the minds of some brokers, and those who, a week ago, were the most hopeful are to day, comparatively speaking, in the slough of despair. These gentlemen are brusque almost to rudeness when any one ventures to ask them whether their prophecy has been fulfilled. To them we recommend patience. They should console themselves with the thought that better days may come.

A daily newspaper published what it purported to be a proposition of Mr. J. A. Macpherson, chairman of the Committee on Mining Securities, to the effect that the mines now on the list should be reclassified and divided into "mines" and "prospects." Upon an interview Mr. Macpherson stated that the report was not true. He has not offered any such resolution, but he says that the committee is contemplating some plan whereby some of the existing troubles may be adjusted. The committee will proceed with great care, and will consult all members.

It is said that the great objection to an immediate classification, such as that stated above, is that many mines now listed as such would be injured by being relegated to the rear by listing them as prospects. Also that it would be difficult to determine which are the prospects. It would be more difficult to decide which are mines. A prominent member said that the committee did not wish to have any law suits on its hands.

The delicacy of the motives of the committee may be very praiseworthy. Nevertheless, every man on the floor to-day knows that many of the mines on the list are actually worthless. They are not even "prospects," for there is no prospect whatever of their ever being on a paying basis. They are veritable holes in the ground, or pure "wild cats," with the open pockets of a few "Napoleons of Finance" at the lower ends, ready to swallow the money which an absurdly gullible public appears sometimes willing to throw away.

There is but little doubt that these self-same "cats" have been and are the bane of the Mining Exchange, and will continue to prove *bêtes noires* so long as steps to relieve the situation are not taken. The members of the Committee on Mining Securities are gentlemen of undoubted integrity. They should have and no doubt they really have the best interests of the exchange at heart. Let them devise some plan and "take the bull by the horns," or rather take the cats by the tail and clear this Augean stable as a preliminary to creating an abiding interest in legitimate mining.

In our last issue we mentioned that the Alice Mining Company, of Montana, had declared a dividend of 8 1/4 cents. Somehow the printer's "cat" swallowed the words Alice Mining Company, and the statement as made read that the Silver King had declared this dividend. The stock of the Alice company has been very active during the week, some 6,200 shares changing hands, the price advanced from \$1.80 to \$2.30, selling at from \$2.10 to \$2.25 to-day. We cannot recollect the time that Alice has been so active as during the present week, and this is probably due to the announcement of a dividend.

There is nothing doing in Wall Street Mining and Milling Company. The stock is very quiet at from 50@60c.

Minnesota Iron Company, which was quoted on the list last week, shows no transactions this week.

Of the copper stocks, some 25 shares of Calumet & Hecla changed hands, and advanced in this market from \$27.25 to \$28.75. Boston & Montana also showed an upward tendency, and went from \$48.35 to \$40.25. Franklin shows a sale of \$69.39. Kearsarge declined from \$13.13 to \$12.88. Quincy shows one transaction at \$89.25; Tamarack one at \$173.38.

Horn Silver is still a favorite stock, and though the price shows but little variation, ruling at from \$2.75 to \$3, the stock was daily dealt in, and the transactions amounted to 3,150 shares. The grand old Ontario, strange to say, declined a dollar, going from \$45 to \$44. Stormont, so rarely dealt in, shows a transaction of 500 shares at 5 cents.

Kingston & Pembroke is quoted at 70 cents.

The only interesting item in the Black Hills stock is the announcement of a dividend of 8 cents a share by the Caledonia Mining Company. This fact, however, did not have any effect on the stock, which was quiet at \$2.25. Deadwood Terra shows a transaction of \$1.50.

Brunswick continues to be carried to higher figures by its manipulators, and this week they managed to advance the price of their stock from \$1.05 to \$1.50, the transactions amounting to 9,200 shares. As we predicted the price has gone up, but the real stockholders have no show in the matter, being prohibited by the pool arrangement to deal in their stock, and the insiders have the market entirely to themselves.

Plymouth Consolidated shows one solitary transaction at \$1.40.

Quicksilver Preferred continues to hold its own, and the price ruled at \$37.88@39. Common declined from \$7.75 to \$7.25. Bodie Consolidated was neglected at 70 cents. Mono at 38 and 40 cents. Standard shows no business. Sutter Creek continues to drag along at \$1.55 and \$1.60. Astoria at 5 cents. There is nothing doing at El Cristo, and the price of the stock went from \$1.45 to \$1.25. Rappahannock was dealt in at '06 cents, and Mutual Smelting & Mining at from \$1.60 to \$1.70.

The interest in Colorado stocks has cooled down. Leadville Consolidated was quoted at 13@15c.; Little Chief at 34@36c. Freeland continued steady at \$1; Robinson Consolidated at 40@50c.; Ward Consolidated at 20c. There was considerable inquiry for Chrysolite, and prices ranged from 24 to 25c. Iron Silver shows a transaction at \$2.15; Monitor at 3c.

The Tuscaroras remain neglected. North Belle Isle sold at from \$1.10 to 1.15; Navajo at 33c., and Belle Isle at 45c.

But little business is reported in the Comstocks. Consolidated California & Virginia was quiet at from \$4.90 to \$5. Crown Point at from \$2.85 to \$2.95. Belcher at from \$2.45 to \$2.50. Gould & Curry declined from \$1.90 to \$1.75. Savage was firm at \$2.10. Sierra Nevada went from \$2.40 to \$2.45. Yellow Jacket \$2.85. Alpha sold at from \$1.35 to \$1.60, assessment unpaid. Alta at from \$1.30 to \$1.35. Andes, 75c. Best & Belcher, \$8 25. Chollar was on the downward move and went from \$3.40 to \$3.10. Consolidated Imperial from 50 to 40c. Exchequer, \$1. Julia at 40@45c. Mexican at \$3.50. Occidental has levied an assessment of 25c. The price was firm at from \$1.20 to \$1.30. Overman sold at from \$1.85 to \$1.60. Potosi at \$3.70. Scorpion, at 40c. Union Consolidated at \$2.50. Utah, at \$1@1.05.

Comstock Tunnel showed a declining tendency; going from \$22 to \$15. The Bonds sold at \$53. Acting under legal advice, the board of trustees of the Comstock Tunnel Company, last Wednesday, decided to postpone to Nov. 1, 1880, the payment of interest on the income bonds. The bond provides that an entire year's interest can be paid on the coupon of that date. Mr. Horace H. Thayer, the secretary, states that the company has in its treasury about \$75,000 cash, but which is not earnings of the first six months; and the sum of \$110,000 is due from the various Comstock Mining Companies for royalties since Oct. 1, 1889, which has not yet been paid. The trustees are constrained to postpone this interest payment, amounting to about \$42,000, by reason of a clause in the mortgage providing that interest can be paid only from net income actually received during the preceding six months.

Negotiations for a settlement of existing differences between the Tunnel Company and the Comstock Mining Companies have been in progress at San Francisco during the past two months between the President of the Tunnel Company on the one side, and the attorneys and representatives of the mining companies on the other, and it is expected that these conferences will result in a satisfactory settlement shortly.

Phoenix, of Arizona, has been the feature of the week's sales, aggregating 41,830 shares at 85c. to \$1. To-day on the last call the stock sold at \$1, thus justifying our prophecy that we would see a rise. We are reliably informed that a well known and prominent member of the Stock Exchange sent his own expert to examine the mine and to report on the property.

The report of the mining engineer corroborates all the statements of the officers of the company. Mr. Bradstreet telegraphs that through improvements in the method of mining he has been able to reduce the working force 30 per cent. He states that it is not a "penury wise pound foolish" policy, but that he has succeeded in decreasing expenses without impairing the earnings. He reports, we quote *verbatim*, the mine opening up splendidly. We understand that the erection of a 100-stamp mill is being proposed.

Boston. May 1.

(From our Special Correspondent.)

The market for copper stocks continues on the up grade, and prices this week have reached the

highest point so far for the year. The position of ingot copper is such that much higher prices will have to be paid for the metal, as the consumption exceeds the production, and the available supply is growing less every day.

Calumet & Hecla has steadily advanced from \$270 to \$285, with more demand for the stock than for a long time. It is rapidly approaching the \$300 mark predicted for it not long since.

Tamarack has recovered from the scare occasioned by the fire last week, and has sold up to \$174. The last instalment of the subscription on the 10,000 shares of Tamarack stock is payable June 1st, and the new stock will be delivered shortly thereafter.

Quincy advanced from \$88 1/2 to \$91 1/2, and although the price to-day is lower than the highest price of last week, we still look to see it sell at \$100 before the month is out.

Boston & Montana has ruled active and strong through the week, advancing to \$49 1/2, and is good for much higher figures.

Osceola has attracted a good deal of attention, and large orders from the lake and New York to buy the stock has put it up from \$29 1/2 to \$33 1/2. A dividend of \$1 per share has been declared, payable June 2.

The Transcript says the accident at the Tamarack whereby production of copper will be suspended for about a month, will result in an increased output from the Osceola, which is susceptible of such an increase by reason of extension of openings and material improvement of the mine in every way this year.

Franklin is more inquired for, and has advanced from \$15 to \$16 1/2.

Kearsarge has ruled more quiet than usual, but is held firm at \$12 1/2, an advance of \$1 per share for the week.

Atlantic is stronger on the increased output, and advanced from \$14 1/2 to \$16 1/2 with good orders in it at the highest price.

Centennial sold off to \$23 1/2 and up again to \$25. The market for this stock is somewhat disappointing to its friends, although all the reports from the mine are of a highly favorable character.

Butte & Boston has been very dull this week at \$14 1/2 @ \$14 3/4.

Allouez sold at \$4 @ 3/4, with very little doing in it.

Huron has shown a fair degree of activity and sold up from \$3 1/2 @ \$3 3/4. National sold at \$2, a decline of 1/2. Ridge sold at \$1. Bonanza, 75 @ 85c. Arnold at 40c., and Central at \$10.

Santa Fe recovered from the extreme depression last week and advanced to 50c. We hear nothing new in regard to the prospects of the mine pending the investigation which is now going on.

It is stated that some of the largest stockholders have contributed \$10,000 for the purpose of further prospecting. If satisfactory results are reached, work will be resumed at the mines. A majority of the bondholders have agreed not to foreclose until after June, 1891.

Silver stocks have been neglected this week, scarcely anything doing in them at the board.

By telegraph.—Osceola, \$34; Boston and Montana, \$50; Atlantic, \$17; Franklin, \$10 1/2; Kearsarge, \$12 1/2; Calumet and Hecla, \$285; Tamarack, \$173 bid; Quincy, \$93; Centennial, \$25. One per cent. was bid to call 1,000 shares Centennial at \$40 this year.

Denver. April 28.

(From our Special Correspondent.)

At the annual election of the Colorado Mining Stock Exchange, held on Saturday, April 26th, the following gentlemen were elected directors for the ensuing year: Chas. E. Taylor, Geo. F. Batchelder, George O. Keeler, Frank A. Miller, Isaac E. Blake, M. E. Smith, Dennis Sheedy, Joseph E. Bates, Oney Carstarphen, Chas. N. Perkins, W. R. Everett, H. B. Gillespie, H. A. W. Tahor.

Of the above gentlemen, seven served on the old board, and were entitled to a re-election. The entire 13 members of the new board are well and favorably known throughout the State. The result of the election gives great satisfaction, and the general opinion is that the gentlemen selected to preside over the destinies of the exchange for the next year will infuse new life into it, and put it on such a solid foundation as will insure its permanency. It would hardly be fair to criticize the old board. They made some mistakes, but they were due chiefly to inexperience, a majority of its members having never been connected with an institution of this kind before; in fact, few of them had ever been on the floor of an exchange. Under the circumstances, therefore, it is only just to say that they did remark-

ably well, and their efforts are appreciated by everybody. Such mistakes as have been made will be rectified at once, and the standing of the men chosen as their successors is sufficient assurance that the exchange will hereafter be conducted on first-class business principles. The first important step to be taken will be the establishment of a clearing house, which will be in operation about the middle of next month, and from thence on there will be no fictitious sales made, or worthless checks issued. The investing and speculative public must have some assurance that a broker is responsible before they place their money in his hands; and it is the duty of the new board to insist on every broker furnishing first-class references to his financial standing before allowing him to do business on the floor. If some protection is not extended to the public, outside money will never come in, and that is what is needed at the present time. This exchange has a splendid future before it if properly managed. It has the location and the mines to back it up, and if the new board fulfills present expectations, good results will be accomplished in the next few months.

The members of the new board are too well known to need an introduction. Mr. Batchelder has been the president of the exchange since it has been established and is financially interested in many mines in Lake County. He is a gentleman who has done much toward building up the exchange. George O. Keeler is known as the "Old Hutch" of the exchange, and is a very active man among the brokers. Oney Carstarphen has for several years been surveyor-general of Colorado, and is the secretary of the exchange, and has filled his office very satisfactorily. Frank A. Miller is the secretary of the Eminons Company and is a well-known financier. M. E. Smith, superintendent of the Denver Mint, is too well known to need an introduction. Dennis Sheedy, the president of the Globe Smelting and Refining Company and of the Colorado National Bank, is one of the foremost men in the mining interests of Colorado. H. L. Gillespie is one of the prominent mining men of Aspen, and has taken an active interest in building up the exchange. He is also interested in many of the mines of Pitkin County.

Senator Tahor was the only man on the regular ticket who was elected yesterday. The senator has many friends, who made a good fight for him, and who think his name will add much to the strength of the institution.

Colonel Charles E. Taylor, as every one knows, has been one of the wheel horses of the exchange, and his money and influence has at all times been ready to aid the exchange. He is connected with some of the best mines in the State, and his purse is always open to any legitimate enterprise that will benefit the State. He has been the vice-president of this exchange, and was one of the prime movers in the organization of the Kansas City exchange.

W. R. Everett is one of the solid business men of Denver, and will, in many ways, increase the standing of the exchange.

Col. Charles E. Perkins is so well known on the Denver and Kansas City exchanges that his name has become a guarantee to any mining stock which he represents. Joe E. Bates is an ex-mayor of Denver, and he has always been identified with the mining industry.

I. E. Blake is another wealthy Colorado mining man and has done much to advance the industry.

Prices and sales during the week ending April 28th.

Table with columns: Company, Opening, H., L., Clos., Sales. Lists various mining companies and their stock prices and sales volumes.

PROSPECTS.

Table with columns: Company, Opening, H., L., Clos., Sales. Lists mining companies and their stock prices and sales volumes.

Total for the week..... 285,100

*Buyer \$0, †Buyer 60, ‡Seller 60, §Seller 30, a Asked, b Bid.

Minneapolis. April 30.

(From our Special Correspondent)

Mining matters in general are looking up in these parts; cash buyers seem to be getting around slowly; some considerable flyers have been indulged in on the Minneapolis Exchange, and from none of these have there been heard any complaint of losses. The Montana gold and silver regions, as also the Gogebic, Vermilion and Menominee ranges are beginning to look to Minneapolis for the listing of their stocks. In the matter of general manufacturing these twin cities are bestirring themselves toward the securing of reputable plants. The Lewis Manufacturing Company, metal workers, of Minneapolis, was recently sold to Messrs. F. E. Barrett and P. W. Leffler, practical men of this place, who have organized the Novelty Brass Works, First avenue, North and Second street. Vigorous efforts are being put forth toward the establishment of iron smelters in Minneapolis.

Table with columns: Company, Bid, Asked. Lists various mining companies and their stock prices.

Lake Superior Gold and Iron Stocks.

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

Gold Stocks.—There is very little change to report in the prices of these stocks during the past week; in fact, the market appears to be at a standstill. At the gold mines the going off of the snow has filled the shallow shafts and also stopped active work. The men at work have been mainly put upon the surface, and cannot accomplish much until the water subsides, when it is expected that active work will be resumed in the various mines, and that there will be a good body of men at work exploring other properties for the precious metals.

Iron Stocks.—There is no change in the price of stocks in the iron district. Active work is in progress at all the shipping mines and also on a large number of mines that are not shippers, but may become so before the end of the season. Navigation opened a week or ten days before the mines were ready. Fleets of ore carriers started in and beat their way through the ice at the St. Marie's river, and through the ice in White Fish Bay west of the Sault, and reached the ore-shipping docks before the mines were really ready for them. Much of the ore being frozen together retarded the mines in getting their ore to the docks; however, they are pushing matters with great vigor and many cargoes have already gone forward. The demand for iron has slackened somewhat and sales are not quite as active as they were in the earlier part of the season, but holders anticipate no trouble in getting good prices before the season is over. This little setback is undoubtedly a good thing for all parties concerned, as it will tend to bring business back to a legitimate basis and stop what might have developed into a boom, which might eventually have resulted disastrously to all concerned.

IRON MINING STOCKS.

Table with columns: Name of company, Par value, Bid, Asked. Lists iron mining companies and their stock prices.

GOLD MINING STOCKS.

Table with columns: Name of Company, Par value, Lowest, High. Lists gold mining companies and their stock prices.

Kansas City.		April 29	
Company.	Opening.	H.	L.
Argonaut.....	15	17	15
Brownlow.....	41	41	41
Bates-Hunter.....	22	23 1/2	21 1/2
Big Six.....	19	19	19
Diamond B.....	14	14	14
Hard Money.....	14	14	14
Clay County.....	38	38	38
Little Nugget.....	1.12	1.12	1.12
Little Rule.....	51	51	51
May Mazepa.....	1.20	1.20	1.20
Monte Christo.....	14	14	13 1/2
Mimiqua Zinc M. Co.....	26 1/2	26 1/2	26 1/2
Morning Glim.....	50	51	40
Pay Rock.....	7	7 1/4	7
Potosi.....	32	32	32
Iron Clad.....	24	24	24
King Jack.....	75	75	75
Pelican.....	26 1/2	26 1/2	26
Cash.....	20	21	20

* Buyer 30.

PIPE LINE CERTIFICATES.

(Special Report by Messrs. Watson & Gibson.)
 The petroleum market this week has hardly been more active than heretofore, but the little business done was at improving prices. The price of Lima (Ohio) oil has been forced up by the competition of independent buyers to 37 1/2 cents. We expect to see outside speculation take hold of Pennsylvania oil dealt in on the exchanges and force it up to near \$1.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
April 26.....	84 1/2	84 1/2	84 1/2	84 1/2	39,000
28.....	84 1/2	84 1/2	84 1/2	84 1/2	80,000
29.....	84 1/2	84 1/2	84 1/2	84 1/2	42,000
30.....	84 1/2	84 1/2	84 1/2	84 1/2	39,000
May 1.....	84 1/2	86	84 1/2	85 1/2	102,000
May 2.....	85 1/2	86 1/2	85 1/2	85 1/2	71,000

Total sales in barrels..... 373,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
April 26.....	84 1/2	84 1/2	84	84 1/2	14,000
28.....	84 1/2	85 1/2	84 1/2	84 1/2	60,000
29.....	85	85 1/2	84 1/2	84 1/2	72,000
30.....	84 1/2	84 1/2	84 1/2	84 1/2	61,000
May 1.....	84 1/2	85 1/2	84 1/2	85 1/2	254,000
May 2.....	86	86 1/2	85 1/2	85 1/2	352,000

Total sales in barrels..... 693,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 2.
 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 April 26th, 1890, compared with the same period last year:

Regions.	April 26, 1890.	April 27, 1889.	Difference.
Wyoming Region-Tons	308,888	315,968	Dec. 7,100
Lehigh Region .. "	126,409	119,505	Inc. 6,904
Schuylkill Region. "	200,903	193,318	Inc. 7,585
Total.....	636,200	629,191	Inc. 7,009
Total for year to date..	8,540,256	8,985,383	Dec. 445,127

PRODUCTION OF BITUMINOUS COAL for week ending April 26th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

Tons of 2,240 lbs.	Week 1890.	Year 1889.	Year 1890.
Phila. & Erie R.R.....	2,502	39,479	38,004
Cumberland, Md.....	73,743	1,199,930	935,400
Barclay, Pa.....	2,589	45,679	41,503
Broad Top, Pa.....	10,589	176,732	135,258
Clearfield, Pa.....	77,798	1,293,647	976,241
Allegheny, Pa.....	19,911	457,024	310,576
Beach Creek, Pa.....	38,192	620,331	439,030
Pocahontas Flat Top.....	40,676	596,351	488,615
Kanawha, W. Va.....	43,741	680,810	502,050
Total.....	309,739	5,116,012	3,852,667

* Week ending April 21.

WESTERN SHIPMENTS.

Pittsburg, Pa.....	30,160	302,958	197,434
Westmoreland, Pa.....	34,442	581,014	486,141
Monongahela, Pa.....	10,168	82,701	64,006
Total.....	64,770	966,673	747,581

Grand total..... 374,509 6,082,685 4,600,248

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending April 26th, and year from January 1st, in tons of 2,000 lbs.: Week, 94,875 tons; year, 1,797,725 tons; to corresponding date in 1889, 1,455,354.

Anthracite.

After so long a period of depression and declining prices, it is very satisfactory to find a complete change in the situation. There has been a great improvement in the market during the past two weeks, and more particularly during the past week. The demand has increased, and there has been a good, stiff advance in prices, and it is understood that the advance has been made all along the line, and a better feeling everywhere. The Lehigh Valley Company are reported to be asking \$3.80 for broken, \$3.90 for egg, \$3.80 for stove, \$3.05 for chestnut, less the usual 15 cents commission to the commission men. This is quite an advance for them. Cox Bros. have advanced their prices 25 cents a ton on the average. Fine

coal—pea and buckwheat—is a trifle weaker. Some dealers think it is possible that there may be a slight reduction from those prices. Orders are plenty and books full enough for five or six weeks, without taking any others.

Standard prices are as follows: F. o. b. New York Harbor, \$3.40 for broken and egg, \$3.50 for stove, \$3.25 for chestnut, net. The market is in a much better condition. There is little doubt that the companies will be able to hold present prices. The demand for anthracite in the East is very good, but the scarcity of vessels is marked.

The following figures of the total production of coal during the first three months of this year will show that only the Delaware & Hudson and the Erie largely exceeded their quotas, while the Delaware, Lackawanna & Western and the Pennsylvania Coal Co.s shipped less than their allowance.

	Production three months end. Mch. 31.	Allotment three months end. Mch. 31.	Excess or deficiency.
Reading.....	1,326,111	1,297,800	E. 28,311
Lehigh Valley.....	1,178,316	1,138,200	E. 40,116
Jersey Central.....	989,271	958,800	E. 30,471
Del. & L. W.....	822,075	932,400	D. 110,325
Del. & Hud.....	803,621	639,000	E. 164,621
Penn. R. R.....	696,751	627,000	E. 69,751
Penn. Coal Co.....	174,022	290,400	D. 116,377
Erie.....	254,322	116,400	E. 137,922
Totals.....	6,244,492	6,000,000	E. 244,492

The restriction of output for the month of April was closely adhered to, and it is estimated that stocks at tidewater are now nearly 150,000 tons less than at the first of April, or not more than 900,000 tons altogether. It is said that the Delaware-Lackawanna offered to take the entire stocks of the market.

Now that the trade has been re-established upon a firm, substantial basis, it is not unpleasant to contemplate the way in which the companies have stuck together. So rapidly did stocks accumulate during the winter and prices decline, that it would not have been much of a surprise to any one familiar with the trade had a war in prices been declared and other such weaknesses manifested. The companies, however, never once ceased to act in harmony, though they undoubtedly made many mistakes and there was some heavy cutting of prices.

The schedule of prices as agreed upon for free burning coal at New York, net f. o. b. is as follows: Broken and egg, \$3.35; stove, \$3.50, and chestnut, \$3.25, and most of the companies claim they are taking no orders except at these prices.

Bituminous.

No change during the week is to be noted in this branch of the coal industry. The low prices of anthracite which have ruled during the past winter have somewhat interfered with the bituminous trade, although many of the regions show an increased tonnage. Quite a large transient trade is doing at prices which are nearly always favorable to the buyer. Coastwise freights are, if anything, a shade higher, particularly at Baltimore, where vessels are reported scarce. We quote them as follows: Baltimore to Boston \$1.10@1.15; Philadelphia, \$1@1.05, and New York, 70@75c. The supply of cars is reported good, and no difficulty is experienced in getting any number required.

Henry E. Hart, a coal merchant doing business at Nos. 31 and 33 Broadway, made an assignment on the 30th ult. to Thomas A. Bronson, with a preference of \$2,000 to John E. Berwind for money loaned.

Boston.

[From our Special Correspondent.]

The Boston coal market is quite active. A very large amount of business has been booked for May delivery, and nearly every one is busy getting coal along. The anthracite market is, if anything, a trifle firmer than it has been. Less stove coal is selling at \$3.50 than formerly, and \$3.65 f. o. b. at New York is being asked by some of the largest shippers. The Philadelphia & Reading people are seemingly indifferent to new business, and are very unyielding in their rates. Altogether considered, the anthracite market is in very fair shape—rather better than was generally anticipated a month ago. The big buying early in April has set the market on a good foundation. It is believed by many of the best judges that lowest prices have been passed for this season.

The bituminous branch of the market is marked only by the recent activity in Cumberland coal. By the reduction of tolls on the Baltimore & Ohio R. R., the Cumberland coal people have been able to do some business, and if they have not secured as good a line of contracts as last year, they have certainly obtained a very fair amount of business. The nominal price of Cumberland coal has been \$2.40 f. o. b. at Baltimore, and it is understood that a considerable tonnage has been placed on that basis. Some large blocks have, however, been sold as low as \$2.25. The outlook is for a season not unlike that just past on Cumberland coal. Vessels are not plenty, but there are more vessels at Baltimore now than there is coal to load them, and unless rail transportation conditions change Cumberland coal will be rather slow of delivery and very far from being a drug in the market. The Amoskeag mills are reported to have contracted for 50,000 tons Cum-

berland coal within a short time. Clearfield coal is well sold up, as is also New River and Pocahontas coal. F. o. b. rates continue at about \$2.25@ \$2.35. Lower figures are reported, but not definitely.

The freight situation is stronger, quoting 75@80 cents at New York; \$1@1.10 at Philadelphia, and \$1.20 at Baltimore. A large cargo of 2,000 tons came here this week from New York at 57 1/2 c., but it was an exceptional occurrence. The vessel wanted to come east and was of deep draft, and could only go to certain places. It was, nevertheless, a good thing for the firm who chartered the vessel.

The retail trade is quiet. The question of the hour is the status of the combination. The old officers have been elected, but the troublesome question as to whether there shall be a good-sized money fine has not been settled. It is believed that all will agree to the fine, and that the combination will hold. Nearly every one is desirous that it should hold, both in retail and jobbing circles. The matter will probably be settled in another week.

The receipts of coal at this port for the week have been as follows:

	For the week 1890.	1889.	Since Jan. 1, 1890.	1889.
Anthracite (tons).....	39,859	27,608	330,506	285,867
Bituminous.....	27,886	26,629	297,993	266,302
Total.....	67,745	54,237	628,499	552,169

Buffalo.

May 1.

(From our Special Correspondent.)

There is little or nothing to report in the local anthracite coal trade. Demand light.

Bituminous coal firm at advanced rates to make up for the enhanced cost of freights from the mines. If the wages of the miners are increased a further rise in quotations may be expected. In anticipation of the latter many orders have been received, and the stocks on hand are beginning to accumulate at the yards.

Coke quiet, at the nominal quotations of \$4.75 for Connellsville and \$4 for Reynoldsville per 2,000 pounds on track in car lots.

Bids were opened on Tuesday last by the Buffalo Water Commissioners for 3,000 net tons of anthracite, and to be delivered at their pumping station, as follows: The Delaware, Lackawanna & Western, \$3.48; Albright & Smith, \$3.67; Henry E. Smith & Co., \$3.50, and the Lehigh Valley, for 4,000 tons of Henry Mines coal, \$3.60. Yesterday the Delaware, Lackawanna & Western, per Mr. J. J. McWilliams was awarded the contract.

The Consumers Gas Company, of Toronto, Can., advertised for bids for 25,000 tons of screened Youghiogheny or Westmoreland lump gas coal; also 1,000 tons of canal coal, and to-morrow is the day for opening the same. The coal is to be delivered by vessel on wharf at Toronto, or on cars at Suspension or International Bridges, between May 15th and November 15th, 1890.

The Legislature has authorized the expenditure of \$500,000 on the Erie, Oswego and other canals of the state in enlargement of locks, repairs, etc.

The story that the Hillsdale Coal and Iron Company had been sold by Goodyear Brothers for \$750,000 is contradicted. "They may have leased their lands," says a dealer, "to parties interested in the Erie railroad, as their yards and trestles in this city have been lately."

One of the bidders for the 800 tons of anthracite coal needed for Fort Porter, in this city, cut the Exchange prices on egg 25c. per net ton: What the outcome will be, or the fate of such bidder, remains to be recorded in the future.

The low-down freights for grain have caused trouble and an advance in quotations for the up tonnage of coal. For several days nearly all vessels left for Chicago and Milwaukee light in preference to taking on coal at 40c. per net ton. The closing figures show an advance of 20c. to Chicago and 10c. to Milwaukee, with a strong feeling among vessel owners.

The shipments of coal hence by lake from April 24th to 30th, both days inclusive, aggregated 33,740 net tons; namely, 15,840 to Chicago, 5,550 to Milwaukee, 4,980 to Superior, 1,300 to Green Bay, 680 to Toledo, 1,500 to Racine, 2,200 to Washburn, 700 to Gladstone, and 600 to Detroit; total thus far this season, 122,930 net tons, as compared with 112,650 in 1889.

The rates of freight the past week were 40@60c. to Chicago, 40@50c. to Milwaukee, 35c. to Washburn, Superior and Duluth, 50c. to Racine, 30c. to Toledo and Detroit, and 40c. to Saginaw.

Chicago.

April 30.

(From our Special Correspondent.)

A meeting of miners and operators was held in the Chicago Coal Exchange on Monday last; 34 delegates represented the former, and among those present was John B. Rae, President and Master Workman of the United Mine Workers of America. All the coal districts of this State, north from Duquoin, sent delegates, while the operators present represented only the Northern and middle districts. The object of this convention was to arbitrate upon the existing differences in order to avert, if possible, another strike and its attendant distress. The miners claim that there should be a uniform higher scale of wages paid throughout the State, allowing such differences as might be demanded by local circumstances while the operators declare it to be impossible to

them to pay any advance on account of the great existing competition, and the market for the output of the section represented being too limited to enable them to mine coal, save at a loss, if the scale of wages be increased. They also claim that Indiana and Ohio coals are forcing Northern Illinois coals out of the market, and that the only remaining outlets for them is in the small local trade and in the Northwest. Southern operators pay less for mining, and are able to deliver their product into East St. Louis at a lower figure than it costs Northern operators to place it upon cars at their mines. Also, the through rates for transportation to the Northwest are precisely the same, rendering competition impossible. They further say that as coal is now 15 cents per ton below last year's prices, any further reduction of profit would leave none at all, and that it was agreed that the operators should continue to pay the same wages as last year. Steps were taken looking to the permanent organization of the convention and to adopt a mode of procedure. Debate brought out the fact that Northern operators would not pledge themselves to any scale of wages, unless the Southern operators were present at the convention, and an adjournment was taken until to-day, in order to enable them to be present.

On cars f.o.b. Chicago: egg, \$4.75; stove, range and chestnut, \$5; Lehigh lump, \$7.

Bituminous, per ton of 2,000 pounds: Green & Sullivan Co. (Ind.), shaft, \$2.25@2.40; Jackson Hill, \$3.25; ditto shaft, \$3.25; Hoeking Valley, \$3; Ohio Central, \$3; Erie, Briar Hill, \$4.10@4.20; Indiana Block, \$2.35; Youghioheny, \$3.25; Sunday Creek, \$2.90; Connellsville coke, \$5.20; ditto crushed, \$5.40.

The demand for bituminous is largely increased by the prospective labor troubles. Railroad companies are buying largely. For the present our quotations remain as above, pending future events.

At the last regular monthly meeting of the members of the Chicago Coal Exchange, price cards were issued for May, which fix the retail prices for anthracite at but \$1 per ton above the wholesale or yard prices, thus giving the dealer 50 cents for cartage and only 50 cents per ton for his additional expenses and profits. A circular address says: "We have had two poor years in the coal trade, and at the meeting of the Exchange at which these prices were fixed it was the unanimous sentiment of those present that every effort be made to make the market a successful one for the coming season. In order to do this it will be necessary for every member to adhere to the prices made."

Prices made are: Egg, \$5.75; small egg, range and chestnut, \$6.

Pittsburg. May 1.
(From our Special Correspondent.)

Coal Trade.—Since our last report there has been a rise in the Allegheny, Monongahela and Ohio rivers and the shipments to the lower ports will reach 5,450,000 bushels. Several works in the lower pools have closed and will probably remain so for some time, as the supply in the lower markets is abundant. The rise enabled boats on the way up to reach port with empties.

The nominal prices are:

Per 100 bushels.	Per 100 bushels
1st pool.....\$4.75	3d pool.....\$3.90
2d pool.....1.50	4th pool.....3.25

Railroad coal, \$5.00@5.50.

Connellsville Coke.—Trade moves along steadily with a fair shipping demand. The number of ovens closed will reach about 3,000. Coke makers must talk, even if they have to talk "strike." Output shows 13,600 active ovens, but opinions do not agree in regard to the number of idle ones. Production, 111,000 tons, against 109,535 tons previous week. Shipments for week, 6,402 cars against 6,145 previous week; increase, 257 cars.

Current rate: Furnace f. o. b. cars at works, \$2.15; Foundries, \$2.45; Crushed, \$2.65. Freight show no change. Pittsburg, 70c.; Mahoney and Shenango Valley, \$1.35; St. Louis, \$3.05; Chicago, \$2.75; Cleveland, \$1.70; Cincinnati, \$2.65; Louisville, \$3.20.

FREIGHTS.

From Baltimore to: Boston, Mass., 1.20@1.25; Charleston, 70@75; Fall River, 1.15; Galveston, 2.90; New Bedford, 1.15; New Haven, 1.15; New London, 1.15; New York, N. Y., 1.10; Portland, 1.20@1.25; Portsmouth, N. H., 1.20; Providence, 1.15; Richmond, .70; Salem, Mass., 1.20@1.25; Savannah, 90@95; Williamsburg, N. Y., 1.10@1.15.

From Philadelphia to: Boston, 1.00; E. Boston, 1.00@1.20; New York, 1.00; Norfolk, Va., .50; Portsmouth, N. H., *1.10. Salem, *.95.

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

METAL MARKET.

NEW YORK, Friday Evening, May 2.

Prices of silver per ounce troy.

Apr	Sterling Exch'ge.	London Pence.	N. Y. Cts.	Apr	Sterling Exch'ge.	London Pence.	N. Y. Cts.
26	4.86	48	1.05½	30	4.86	48 9-16	1.01½
				May			
28	4.36	48	1.05	1	4.86	48 9-16	1.01½
29	4.86	48	1.05	2	4.86	46¾	1.01½

Council bills advanced $\frac{1}{2}$ on Wednesday allotment, with a decrease of 5 lacs for next week's allotment.

The fall in the rate of interest from 12 to 8 per cent. in India, as well as the cessation of demand for silver for India shipment, have tended to depress prices in London.

The lack of harmony among the silver advocates in Congress, with a bare possibility of no legislation this session, tended to stop speculative buying in our own market this week, and proved the sensitiveness of silver prices at present. With a stronger prospect for action at Washington next week the market here closes stronger again.

The New York prices quoted above are the equivalent of London commercial prices. The New York prices this week have ranged from one to two cents higher, actual sales of bullion being made as high as 106.

The United States Assay Office at New York reports total receipts of silver for the week to be 300,000 ounces.

Assistant Secretary Tichnor has informed the United States Consul at Paso del Norte, Mexico, that in case of ores composed of silver, gold and lead, where the silver and gold together are of chief value, but where the lead is more valuable than either of the others separately, the ore would be dutiable under the provision for lead ores, the term "chief value" of an article or substance composed of three materials meaning greater than either of the others and not greater than their aggregate.

SILVER BULLION CERTIFICATES.

NEW YORK STOCK EXCHANGE.

	H.	L.	Sales.
April 26.....	107	106¾	30,000
April 28.....	106¾	106	205,000
April 29.....	106¾	104	91,000
April 30.....	104	102½	240,000
May 1.....	104	103	210,000
May 2.....	104½	104	105,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.		
April 26.....	106¼	100,000
Total sales.....		1,031,000

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 £228,000 bullion, and the proportion of its reserve to its liabilities was reduced from 44.45 to 41.03 per cent., against a decline from 42.36 to 39 per cent. in the same week of last year, when its rate for discount was 2½ per cent. The bank on the 1st inst. lost £30,000 bullion on balance. The weekly statement of the Bank of France shows gains of 2,875,000 francs gold and 1,275,000 francs silver.

Domestic and Foreign Coin.

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

	Bid.	Asked
Trade dollars.....	\$.80	\$.82
Mexican dollars.....	.79	.85
Peruvian soles and Chilean pesos.....	7 and Nom.	Nom'al.
English silver.....	4.86	4.90
Five francs.....	.94	.95
Victoria sovereigns.....	4.86	4.90
Twenty francs.....	3.86	3.90
Shipping marks.....	4.74	4.78
Spanish doubloons.....	15.55	15.70
Spanish 25 pesetas.....	4.80	4.85
Mexican doubloons.....	15.55	15.70
Mexican 20 pesos.....	19.50	19.60
Ten guilders.....	3.86	4.00
Bar silver.....	104	105

Copper.—A very firm feeling has characterized the copper market during the whole of this week. The incident which very naturally attracted the most attention has been a further sale on behalf of the banker holders of seven to eight million pounds of Lake ingots, which sale clears out about the entire available stocks. In view of the fact that this copper (although ostensibly held for higher prices than 14c.) always exerted a threatening influence on the stability of market values, the news that it had at last been disposed of immediately produced a very good effect, and values are now more firmly established than for a considerable time past, and Lake brands are very firm at 14½c. While it must be evident these large sales on behalf of the banker holders will leave comparatively few manufacturers still in the market for their supplies of Lake ingots, and very little demand for ingots for some time to come, and that the orders going to the producing companies will consequently be almost entirely limited to cakes and wire bars, it is a most encouraging fact that the current demand for these kinds is so very satisfactory that comparatively little stock is likely to be accumulated on their hands. Under the circumstances it is to be hoped that no outside influences of a speculative nature (of which some signs have appeared during the last few days) will now be able to manipulate market values, which for some time past have remained so remarkably steady that the consumers generally have become to some extent confident of the course of prices for some time to come, and extended their operations accordingly with satisfactory results to all parties properly concerned. For Lake descriptions the

present prices seem high enough, and violent fluctuations in either direction could only result in shaking confidence and curtailing bona fide business.

Outside brands have not felt the same benefit as Lake sorts, but the feeling in general is slightly firmer. We quote Arizona at 13½, and casting brands at 12½c.

The London market for Chili Bars and G. M. B. copper opened firm on Monday morning at £49 2s. 6d. to £49 5s. spot, and £49 7s. 6d. to £49 10s. three months, and this firm tendency has continued throughout the whole of the week with very slight fluctuations, the closing quotations received by cable to-day being £49 5s. to 49 7s. 6d. spot, and £49 10s. to £49 12s. 6d. three months. Cable advices just to hand also report a decrease in the statistics of the visible supplies for the second half of April of 1,700 tons. With regard to the European markets for refined and manufactured copper, latest advices are more favorable again, and we have now to quote English Tough £52 10s. to £53, Best Selected £54@£54 10s., strong sheets £60@£60 10s., India sheets £56@57 and yellow metal 5¼@6d. per pound.

The exports of copper matte from New York during the past week were as follows:

To Liverpool.....	Copper Matte.	Lbs.	
S. S. Berlin.....	222 Bbls.	224,246	\$10,000
To Hamburg.....			
S. S. Bohemia.....	1,072 Bags.	121,494	\$10,000

Tin.—Opening firm on Monday morning, and market shortly afterward became dull and lifeless, in sympathy with easier quotations from London and the fluctuations in silver, which has not been so buoyant as in the previous week. The business done has been very limited, but it is not at all unlikely that we may witness a very strong market shortly, as supplies are becoming exhausted and shipments from the other side have been exceedingly small during the last few weeks. Unless, therefore, shipments from abroad very shortly resume larger proportions, scarcity of the metal on this side must have a strengthening influence on values. We quote spot at 20'30; May at 20'30; June at 20'25.

In London prices opened firm on Monday at £93 12s. 6d. to @93 15s. spot, and £94 5s. to £94 10s. futures, but dullness then intervened and prices have since gradually declined, until the closing quotations to-day received by cable are at the lowest figures of the week, viz.: £91 5s. to £91 7s. 6d. spot, and £91 17s. 6d. to £92 for futures.

The statistics for the month of April show an improvement, with a decrease of 200 tons.

Lead.—The market has displayed great strength and a few hundred tons changed hands at from 4'07½ to 4'10. At the latter figure, however, offerings became more plentiful and the closing is not quite so strong at 4'10. The firmer tone is in sympathy with more hopeful news in general and not in connection with any action in the Mexican ore question. The European markets are also stronger and the latest London quotations are English, £13 5s., and Spanish, £13.

The St. Louis Lead Market.—Messrs. John Wahl & Co. telegraph us as follows: "The market is very strong, at some advance over last week's quotations. Nothing can be purchased below 3'85. Quotations are nominally 3'85 for common and 3'87½ for corroding lead."

The Chicago Lead Market.—Messrs. Everett & Post telegraph us as follows: "Lead continues to advance. Early in the week the metal was not saleable at 3'85 cents, but latterly the market is much stronger, with sales at the close of 100 tons at 3'92 cents. Transactions during the week foot up 400 tons, partly for eastern shipment. Refined lead is very scarce, 4 cents being asked."

Spelter is also rather firmer on a rise in ores in the West. We quote 5'15 to 5'20.

The latest London prices are £21 10s. for ordinals and £21 15s. for specials.

Antimony remains very firm, with great scarcity in spot supplies. We quote Hallett's at 10½c., Cookson's at 26c.

Nickel.—We continue to report an unchanged situation in this metal. Quotations remain 70@75c., according to quantity.

Quicksilver.—An advance in prices is the feature in quicksilver, which otherwise continues pretty much as previously reported. Quotations are £10 for London and \$50@50.50 for New York.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 2.

Pig Iron.—Another week has passed without bringing the much-desired improvement in this market. There is nothing new to report; indeed, anything that would indicate a change would now be welcomed as the first step toward the "boom." The disposition to sell at any price, so noticeable, especially among Southern men, a few weeks ago, has decreased, though our Philadelphia reports say a good deal of Southern iron is offered there.

Southern producers, it is reported, have sold enormous quantities in the West, notably in Cincinnati, and this has dulled the sharp edge of their competition against the Northern people.

We hear of no sales worthy of mention as having occurred within the week. On the whole the present situation shows no change from that reported in these columns for some time past. We report the following quotations: Southern, No. 1, \$16.75@17.50; No. 2, \$16.25@16.50; Northern No. 1 Foundry, \$18@19, and No. 2, \$17@18.

Scotch Pig Iron.—There seems to be a better inquiry for some brands, notably for Coltness and Eglinton, and some sales are reported. We quote for these, Coltness, \$25.25@25.50, and \$19.25@19.50 for Eglinton.

Steel Rails.—While there has been more inquiry for rails this week, yet buyers still continue to show a disinclination to place large orders on this market. At present negotiations are pending between a Southern road and an Eastern mill. It is rumored that the sale, if consummated, will be at a low figure. A Pittsburg mill sold 16,000 tons about ten days ago to the Northern Pacific after some sharp figuring. Interested parties in this bargain seem unwilling to state the price.

While rails are nominally quoted at \$33, we are assured that an offer of \$32 would in all probability be accepted; mill men themselves admit that \$33 is a rather high price.

Spiegeleisen and Ferromanganese.—Quotations in 20 per cent. Spiegeleisen are nominally \$31.50@32, and nothing of moment is to be reported. The market is rather unsettled. In 80 per cent. ferromanganese transactions have been very light, owing to the fact that buyers are well supplied. We quote for forward delivery \$81@82, and for immediate shipments, \$85.

Merchant Steel.—On the whole, dealers report an improvement in this market, the amount of business transacted during April exceeding the amount done in March. Prices remain as stated last week. Quotations are, for best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¼c.; open-hearth machinery, 2¼c.; open-hearth spring, 3¼c.; tire steel, 2¼c.; toe calks, 2¼c.

Tubes and Pipes.—At the meeting of the Association which took place this week, members expressed themselves as satisfied with the condition of the trade, and it was decided to maintain the same prices that have been ruling for some time. There is a good demand, and in this branch of the iron market there is no complaint. The ruling discounts on car lots are 47½ per cent. on butt, black; 40 on galvanized; 60 on lap, black, and 47½ on lap, galvanized; 45 on 1¼-inch boilers; 50 for 2 to 4-inch, and 52½ on larger than 4-inch; casing, all sizes, 50 per cent.

Structural Iron and Steel.—There is a decided improvement in this market, and manufacturers who a short time since were rather despondent, are again busy. Prices show but little quotable change, if anything being a little lower. Quotations are about as follows: Universal plates, 2-25; bridge plates, 2-20@2-25; angles, 2-15@2-20; tees, 2-05; beams, 3-10.

Rail Fastenings.—Despite the cutting in prices that manufacturers in fastenings appear willing to make whenever it is necessary to do so in order to get a good order, there is hardly anything doing in the matter of actual business. From our quotations it will be seen that prices are lower. We quote spikes 2-05c., angle plates 1-90c., bolts and square nuts 2-70c. and hex. nuts 2-95c.

Chicago. April 30.

[From our Special Correspondent.]

In the Chicago iron market we note a week of greater activity. As predicted, bottom prices may be said to have been reached. Large sales of Southern irons have been consummated at an advance over last week's quotations. Several large sales in Ohio soft irons are also reported. Buyers are realizing the fact that in many cases they have delayed purchases too long, and are now figuring on large lots, consequently the market is firm and active. The outlook is good, and dealers are feeling more confident. In addition to this the market is assuming a speculative tone, and such buyers of course have a tendency to hull the market. Lake Superior charcoal irons are firm.

Pig Iron.—We quote to-day for cash per ton f.o.b. Chicago: For No. 1 and 2 Lake Superior charcoal, No. 3 for carwheels, and No. 4 and 5 for malleable \$21@21.50; Lake Superior coke, Bessemer, \$20@21; No. 1 Lake Superior coke, Bay View, \$17; No. 2, \$16.50; No. 3, \$16; Southern coke, No. 1, \$16@16.50; No. 2, \$15.50@16; No. 3, \$15@15.50; Southern charcoal, \$19@19.50; Standard Southern car wheels, \$24.50@25; Ohio softeners, Hanging Rock, \$18.50@19.50; Jackson County, \$18@18.50; Hanging Rock, cold blast, \$26@28; warm blast, \$23@25.

No. 1 Scotch, according to brands, \$25@26; American Scotch, \$20@21; Bay View Scotch No. 1, \$17; No. 2, \$16.50; Chicago Scotch No. 1, \$17.50; Emma, \$19@19.50; Black Band Hubbard Scotch, \$20.50; Hazelton, \$20.50; Soft silvery, \$18; Wells ton No. 1, \$19.50; No. 2, \$19.25; Hamilton No. 1, \$18; Norton No. 1, \$17.50@18; Zanesville No. 1, \$18.

Bar Iron.—The fair inquiry for this material noted last week continues. Valley mills continue

to quote \$1.65 half extra. The mills anticipate a "strike;" in case one should take place the price will be most likely advanced. Local mills continue to ask, \$1.85@1.90, for half extras, and \$1.80 for car lots. These prices are held firm.

Structural Iron.—The demand is fair for car lots f.o.b. Chicago. We continue to quote: Angles, iron and steel, \$2.40@2.50; Universal plates, \$2.55; sheared plates, \$2.60; tees, \$3; beams and channels, \$3.70.

Black Sheet Iron.—The demand is increasing. Mills are quoting for No. 27, \$2.90@3.10; jobbing prices are, for No. 27, \$3.50; Nos. 25 and 28, \$3.40, and No. 24, \$3.30.

Galvanized Sheet Iron.—A good business is being done under the existing strong demand. As noted last week, concessions as to prices are out of the question. Dealers have to contend with inferior brands, which more or less affect this market. Discounts for both cheap and standard brands remain at 60 and 60 and 5 per cent. on Juniata, and 62½ per cent. on charcoal from store, jobbing lots 50 and 10 per cent., according to quality.

Merchant Steel.—Under a fair demand quotations remain unchanged in this market. Figures are for tool steel, \$7.75@8; specials, \$12@25; open-hearth machinery, \$3; Bessemer machinery, \$2.50@2.60; open-hearth spring, \$2.60@2.65; tire, \$2.50@2.60; toe calk, \$2.70@2.80; crucible sheet, \$7@10; crucible spring, \$3.75.

Plates, Tubes, etc.—The good demand reported last week continues, prices unchanged as yet. We quote: Tank iron, \$2.70; tank steel, \$2.90; heavy sheets, No. 10 to 14, \$2.90@3; steel sheets, Nos. 10 to 14, \$3.25@3.50; shell iron, \$3@3.25; flange iron, \$4@4.25; flange steel, \$3.50; shell steel, \$3.25; boiler rivets, \$4@4.25; fire-box iron and steel, \$4.75@5.50; boiler tubes, 4½ in. and larger, 52½ per cent.; 2 to 4 in., 50 per cent.; 1½ in. and smaller, 45 per cent.

Nails.—A satisfactory business is being done in cut steel nails. Prices at mills were stronger at \$2@2.05 f. o. b. For wire nails a heavy demand still exists. We quote them at \$2.40 for large lots. The Nail Association meets May 1st, and will consider a new schedule for May.

Louisville. April 29.

(Special report by HALL BROS. & Co.)

The same general features that characterized the market at the time of our last report have followed up to the close of the week under review, with the exception of an occasional round order reported at figures almost as low as prevailed a few weeks since, though there seems apparently no good reason for it, as liberal trading has been made on a much higher basis. Inquiries are numerous, and for good-sized quantities for varying deliveries, though the disposition of the buyer is to place orders through the year, while on the other hand furnaces, as a rule, are averse to making such extended contracts, and in some cases have refused orders for delivery through the balance of 1890 at advanced offers over figures asked.

Hot Blast Foundry Irons.

Southern Coke No. 1.....	\$15.25@15.50.
" No. 2.....	14.75@ 15.00.
" No. 3.....	14.00@ 14.50.
Mahoning Valley, Lake ore mixture.....	18.00@ 19.00.
Southern Charcoal No. 1.....	17.50@ 18.00.
" No. 2.....	17.00@ 17.50.
Missouri " No. 1.....	18.50@ 19.00.
" No. 2.....	18.00@ 18.50.

Forge Irons.

Neutral Coke.....	13.50@ 14.00.
Cold Short.....	13.25@ 13.50.
Mottled.....	12.75@ 13.00.

Car Wheel and Malleable Irons.

Southern (standard brands).....	22.50@ 23.00.
(other brands).....	19.00@ 20.00.
Lake Superior.....	22.50@ 23.00.

Pittsburg. May 1.

(From our Special Correspondent.)

Raw Iron and Steel.—The market is still waiting for that improvement in prices, and it is to be regretted that predictions have, so far, not been realized. The volume of business has been restricted, being confined principally to outside lots, as several large sellers here have withdrawn their iron from the market. As one large dealer remarked: "There is more money in keeping iron than selling at present prices, hence we have no sales to report." The week past has not been materially different from several that have preceded it, as regards trade. There seems to be more disposition to do business, and less disposition to cut prices, although some grades show a little weakness yet, and probably will continue to do so until they are in line with other articles that had a quicker fall in price. The most conspicuous feature of the market at this time is the irregularity. While for the most part the changes have been in the direction of a better condition of trade, still there have been equally marked changes of a depressing character. On the whole, the market shows an improvement. There are more liberal inquiries on the part of purchasers, and makers of the better grades show no disposition to make concessions in order to effect sales. The present condition of pig iron offers every condition necessary for increased activity upon a slight upward turn of the market. There are no large stocks anywhere to speak of. The production and consump-

tion are very near to each other, the small surplus being principally in the mill and foundry yards. On the subject of Bessemer pig, the views of leading dealers are very wide apart, and any figures that can be given are merely nominal, the difference being fully one dollar per ton.

The present condition of Bessemer pig is not so much due to inactivity, but arises from the fact that many furnaces are busy on old contracts, and consumers who placed these contracts have provided for their needs for some time in advance. The furnaces are nearing the end of their last year's ore contracts, and when they shall begin upon the new supply it is probable there will be a material change in prices of Bessemer pig, as both superior and foreign ores are considerably above the figures of last year, and wages are higher. The shipment of the new supply of superior ore has already begun, and when the furnaces shall start up on this they will not be likely to make any of their product at the figures of the old contracts which they are now finishing up.

Coal and Coke Smelted Lake Ore.

2,000 Tons Bessemer, May and June.....	18.00 cash.
1,500 Tons Bessemer, May.....	17.50 cash.
1,000 Tons Grey Forge.....	15.25 cash.
1,000 Tons Bessemer.....	17.75 cash.
1,000 Tons Grey Forge.....	15.25 cash.
1,000 Tons Grey Forge.....	15.50 cash.
750 Tons Bessemer.....	17.75 cash.
500 Tons Grey Forge.....	15.50 cash.
500 Tons Grey Forge.....	15.00 cash.
500 Tons off Bessemer.....	16.00 cash.
500 Tons off Bessemer.....	17.00 cash.
500 Tons Grey Forge.....	15.50 cash.
460 Tons off Bessemer.....	17.00 cash.
300 Tons Mottled.....	14.50 cash.
100 Tons No. 1 Foundry.....	17.50 cash.
100 Tons No. 2 Foundry.....	16.75 cash.

Coke, Native Ore.

500 Tons Grey Forge.....	15.25 cash.
400 Tons Mottled Southern.....	14.50 cash.
50 Tons No. 2 Foundry all ore.....	18.00 cash.
50 Tons Silvery.....	17.50 cash.
50 Tons Silvery Extra.....	20.00 cash.

Charcoal.

100 Tons No. 2 Foundry.....	22.75 cash.
75 Tons No. 2 Foundry.....	23.25 cash.
100 Tons Cold Blast.....	22.75 cash.
50 Tons Cold Blast.....	29.25 cash.

Muck Bar.

1,000 Tons Neutral, May.....	27.00 cash.
1,000 Tons Neutral.....	27.00 cash.
1,000 Tons Neutral.....	27.00 cash.

Steel Slabs and Billets.

2,000 Tons Slabs and Billets, Wheeling.....	25.75 cash.
500 Tons Billets.....	28.00 cash.
300 Tons Billets, Wheeling.....	27.25 cash.

Steel Wire Rods.

500 Tons American Fives.....	49.00 cash.
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Steel Bloom Ends.

300 Tons Bloom Ends.....	20.00 cash.
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Ferro-Manganese.

75 Tons 80 per cent., June and July, f.o.b., Baltimore.....	81.00 cash.
50 Tons 80 per cent., June, f.o.b. Baltimore.....	81.50 cash.
20 Tons 80 per cent., spot, seaboard.....	80.09 cash.

Spiegel.

1,000 Tons 20 per cent., seaboard, May.....	31.00 cash.
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Old Iron and Steel Rails.

500 Tons Old Steel Rails.....	22.00 cash.
350 Tons American Ts.....	23.50 cash.

Scrap Material.

300 Tons Crucible Steel.....	Net 28.00 cash.
150 Tons No. 1 W. Scrap.....	Net 20.50 cash.
150 Tons Leaf Steel.....	Net 21.00 cash.
100 Tons Iron axles.....	Net 28.00 cash.
100 Tons Cast Borings.....	Gross 12.00 cash.

Prices.

Coke or Bituminous Pig—	20% Spiegel at seaboard.....	\$31.00@32.00
Foundry No. 1.....	\$17.50@17.75	
Foundry No. 2.....	16.75@17.00	
Gray F. No. 3.....	15.50@15.75	
No. 4.....	15.00@	
White.....	14.50@14.75	
Mottled.....	14.50@14.75	
Silvery.....	18.25@20.00	
Bessemer.....	17.50@18.00	
Low Phos.....	25.00@25.50	
Charcoal Pig—		
Foundry No. 1.....	23.50@24.50	
Foundry No. 2.....	22.00@22.75	
Cold-Blast.....	25.00@26.00	
Warm-Blast.....	24.00@25.00	
10 + 12% Spiegel 30.00@		
Muck-Bar.....	27.00@27.50	
Steel Blooms.....	27.50@	
Steel Slabs.....	27.50@	
Steel Cr'p Ends.....	20.50@21.00	
Steel Bl. Ends.....	20.00@21.00	
Ferro-Man., 80%, seaboard.....	81.50@82.00	
Steel Billets.....	27.50@	
Old Iron Rails.....	23.50@24.00	
Old Steel Rails.....	21.50@	
No. 1 W. Scrap.....	20.00@20.50	
No. 2 W. Scrap.....	17.50@	
Steel Rails.....	34.00@35.00	
" light sec.....	34.00@37.00	
Bar Iron, nom.....	1.85@ 1.90	
Iron Nails.....	2.00	
Steel Nails.....	2.00	
Wire Nails.....	@ 2.50	

Philadelphia.

(From our Special Correspondent.)

Pig Iron.—Pig iron quotations continue as they have been for some weeks past, at \$16, \$17 and \$18, respectively, for standard brands, but a good many brands have been selling below, and some above these prices. The conditions have altered very little; in fact, it may be safely stated that there is no decided change in the market, as compared with six days ago. A few large buyers have covered since Monday, but many decline to do so. Makers are not willing to extend the concessions which have been asked of them, especially for summer and fall delivery, as they are of the opinion that in a short time prices will improve, although their reasons for this belief have but little weight with buyers. Several good sized lots of Southern iron have been taken in this market at 50c. to \$1 per ton under the above quoted figures. Large lots are now offered here, Southern makers being very anxious to extend their business in this market. Bessemer iron is very dull; quotations, \$20@20.50 at furnace.

Foreign Material.—Brokers in foreign material expected this week to dispose of several large hocks, for summer delivery, but as yet have not

done so. Quotations are \$32 for 20 per cent spiegel, and \$82 for ferro-manganese.

Steel Billets.—A few small sales have just been made for 30 days delivery, but a good deal of business has been refused, as the offers of buyers were too low. Quotations, \$30.50@31.50.

Muck Bars.—Muck bars are selling in small lots at \$28.50@29 at mill. To-day two or three offers were made for large lots at \$28, but the business has not yet been closed.

Merchant Bar.—Quotations for merchant iron range from 1.70 to 1.95. Business has not improved as was so confidently predicted last week. Taking the business through the State as a whole, there is no special fault to be found, except that it is presented in a hand-to-mouth way. Best refined bars are bringing 1.95, but a very good make of iron has sold in 100 ton lots at 1.85.

Skelp Iron.—Buyers of skelp iron are willing to place orders for the summer, provided they can do so at 1.75 and 2c. Manufacturers are not willing to accept much of the business being offered.

Wrought-Iron Pipes and Tubes.—The demand for wrought-iron pipes and tubes continues quite active, and all mills are running full, with an abundance of business in hand.

Sheet Iron.—Every indication in the sheet-iron trade points to a still larger business this summer than last; prices are very firm, and all mills are well supplied with orders for all kinds.

Plate and Tank.—Small orders are the rule at present. Two or three large orders are offered on the market, but at prices which manufacturers are not willing to accept just now. Quotations are: For heavy plates, 2c. to 2.10c.; tank, 2.10c.; bridge plate, 2.20c. for iron. There is a good deal of steel plate wanted, but offers made are a little under the lowest quotations which makers have signified a willingness to accept.

Structural Iron.—A good deal of business has been secured this week, on a basis of 2.10c. for bridge plates and angles; tees, 2.60c., beams and channels, 3.10c.

Nails.—Nails are moving quite freely, but at very low prices. Quotations to-day, \$1.90 to \$2.

Steel Rails.—Quotations to-day are \$33 to \$33.50, but this drop, which was expected to result in the placing of large orders, only seemed to have encouraged buyers in their demands for even lower quotations. There are several large lots wanted at Pennsylvania mills, and it is claimed by buyers that quotations will be down to \$32.50 within 10 days.

Old Rails.—Quotations are nominally \$23.50@ \$24 at tide water.

Scrap.—The demand for scrap has fallen off, as there is very little desirable material in yards. Brokers are offering future deliveries at fair prices: No. 1 wrought is quoted at \$22@22.50. There are several calls for old car wheels and fish plates, but none on hand.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, May 2.

Heavy Chemicals.—"Very quiet," is the only description that can be applied to the present state of the trade in heavy chemicals. Buyers still appear unwilling to purchase heavily, and they will take merely enough to keep them going. There was some business in caustic soda, al-

though not in large lots; buyers evidently anticipating lower prices. We quote: 60 per cent., 2.82@2.87 1/2 cents; 70-74 per cent., 2.67 1/2@2.75 cents, and 76 per cent., 2.70@2.80 cents.

There is more inquiry for both brands of carbonated soda ash. Spot quotations are, for 48 per cent., \$1.55@1.60, and 58 per cent., \$1.60@1.62. There is scarcely any caustic soda ash here. Nominal quotations are about 1 1/2c. per pound.

There is not much business being transacted in sal soda, which is quoted at 1c. Large buyers all filled up before the dock strikes, and they are not placing any orders on the market.

Bleaching powder is quoted at from 1.40@1.50, according to brand. Sales at lower prices are reported, but it was chiefly to protect nearby arrivals that these took place.

Acids.—It seems the general opinion that business in the acid market shows an encouraging improvement. The natural result of the opening of navigation and of activity in manufactures of which acid is a factor has been to stimulate the trade. Prices are somewhat unsettled, manufacturers appearing to be willing to offer buyers satisfactory terms.

Fertilizing Chemicals.—The tone of the market in fertilizers is firmer. Dealers, while admitting that business is very quiet just now, are all inclined to look forward to a good trade during the latter part of the year. The trade this year has not been worse than during 1889, for though fertilizer men have lost in some places they have gained in others. A few hand-to-mouth purchases are reported this week. On the whole prices remain unchanged.

We quote high grade dried blood \$1.90@1.95. For the low grade the price is \$1.80@1.85. Azotine, \$1.95@2. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, \$20@21 per ton, and low grade 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, \$18.50. Fish scrap, \$20.50@21 per ton. f.o.b. factory. Sulphate of ammonia at \$3.10@3.12 1/2 per cwt. Concentrated tankage, \$1.90@2. Refuse, bone black, guaranteed 70 per cent. phosphate, \$18 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, underground, \$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 50 per cent. sulphate of potash, \$2.37 1/2 per 100 pounds for shipments from date; high grade manure salts, basis 90 per cent. sulphate of potash, \$2.36 1/2 per 100 pounds. There is very little on the spot.

Kainit.—The spring trade is over and kainit is correspondingly quiet, quotations being \$9.50@ \$9.75.

Muriate of Potash.—About 500 tons arrived during the week, and the market is well supplied. There are no features of interest to report and prices remain as quoted last week, 1.77 1/2@1.85, according to quantity.

Nitrate of Soda.—Nitrate is easier this week. Sales are reported to have been at \$1.72 1/2@1.75.

Brimstone.—There has been very little actual business in brimstone this week. The market is a little stiffer, and quotations are \$19.75 for best un-mixed seconds to arrive, and \$19.25 for thirds.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, May 2.

Bricks.—A great many bricks—old stocks—are coming forward, but as the demand does not require the increased supply the market may be said to be glutted. Buyers seem afraid to do much business, on account of the disquieting rumors of labor difficulties. Now that May-day has passed without demonstrations to warrant the serious apprehensions previously entertained the market next week will probably be brisker. It is estimated by prominent dealers that the supplies here exceed the demand by fully five times, and transactions have been very light this week. We quote Haverstraw, seconds, \$6.75@ \$7.50; Jerseys, nominally, \$5, and pales, \$2.50@ \$3.25. Best grades of Haverstraw bricks have been dealt in more than any other kind, and quotations in these are \$7@7.50.

Lime.—The above remarks as to the feeling of buyers of bricks can be applied to dealers in lime, the rumors of impending strikes having cast a shadow over the building material market. The Maine Lime Association has decided not to manufacture any more finishing lime, as the supply of this brand is sufficient to last for some time to come. We repeat our last week's quotations, as prices, being fixed by the Association, are unchanged. For Rockland common, \$1 per barrel; Rockland finishing, \$1.20; St. John, common and finishing, 90@95c.; Glen Falls, common and finishing, 85c.@\$1.11.

NOTES OF THE WEEK.

On the whole, May-day passed off more quietly than was expected.

The following strikes are reported: About 1,800 carpenters in Boston for the eight-hour day. About 100 firms, not members of the Master Builders' Association, have granted their men eight hours.

About 2,000 carpenters in Detroit, Mich. It is thought the contractors will grant the demands, and that work will be generally resumed in a short time.

All the carpenters in Knoxville, Tenn., for eight hours' work and ten hours' pay.

The master carpenters in Haverhill, Mass., have all signed an agreement granting nine hours as a day's work at the old pay of \$15 per week.

The carpenters in Omaha, Neb., have decided to await the issue of the strike in Chicago.

At Johnstown, Pa., the carpenters, bricklayers and stone masons went out for nine hours and an increase in wages.

All the journeymen stone cutters in Montpelier, Vt., struck recently. A disagreement between the manufacturers and tool sharpeners in prices caused the strike.

The granite cutters in Millstone Point, Niantic, Groton, and New London, Conn., for the nine-hour day with no reduction in pay.

Bricklayers, stone cutters, and masons in Ottawa, for nine hours' work and ten hours' pay.

At Scottsdale, Jeannette, Greensburg and Brad-dock, Pa., carpenters and joiners for eight hours or an increase in wages.

The stone cutters in Norwich, Conn., in response to orders from the union to which they belong. They have no dispute with their employers.

The Chicago carpenters' strike seems no nearer a settlement, and the situation in that city is reported to be growing serious.

The strike of the Philadelphia carpenters instead of nearing an end is, on the contrary, spreading.

IMPORTS AND EXPORTS OF METALS AT NEW YORK APRIL 19 TO APRIL 26 AND FROM JANUARY 1.

Table with multiple columns listing metal imports and exports, including items like Spelter, Pig Lead, Tin, Steel Blooms, Billets, and Slabs, and various companies and their respective quantities and values.

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table containing two columns: 'DIVIDEND-PAYING MINES' and 'NON-DIVIDEND PAYING MINES'. Each column lists mine names, locations, capital stock, shares, assessments, and dividends. The table is organized into two main sections with detailed sub-headers for each category.

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 dividends, and the Terra \$75,000. ¶ Previous to the consolidation in Aug., 1884, the California had paid \$21,520,000 in dividends, and the Con. Virginia \$200,000. †† Previous to the consolidation in Aug., 1884, the California had paid \$21,520,000 in dividends, and the Con. Virginia \$200,000.

NEW YORK MINING STOCKS QUOTATIONS.

Table with columns for 'DIVIDEND-PAYING MINES' and 'NON-DIVIDEND-PAYING MINES'. Each section lists company names and stock prices for various dates from April 25 to May 1, 1890. Includes a summary row at the bottom: '*Ex dividend, †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment unpaid. Dividend shares sold, 34,311 Non-dividend shares sold, 7,493 Total, New York, 104,25'

BOSTON MINING STOCK QUOTATIONS.

Table with columns for 'BOSTON MINING STOCK QUOTATIONS'. Lists company names and stock prices for various dates from April 25 to May 1, 1890. Summary row at the bottom: 'Boston: Dividend shares sold, 24,039 Non-dividend shares sold, 31,952. Total Boston, 55,991.'

COAL STOCKS.

Table with columns for 'COAL STOCKS'. Lists company names and stock prices for various dates from April 25 to May 1, 1890. Includes a summary row at the bottom: '**Sales in New York, 30,210; in Philadelphia, 26,657. Total sales, 241,438.'

San Francisco Mining Stock Quotations.

Table with columns for 'San Francisco Mining Stock Quotations'. Lists company names and stock prices for various dates from April 25 to May 1, 1890. Summary row at the bottom: 'CLOSING QUOTATIONS.'

STOCK MARKET QUOTATIONS.

Baltimore, Md.

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

Birmingham, Ala.

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

Pittsburg, Pa.

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

St. Louis, April 23.

CLOSING PRICES.

Table with columns: COMPANY, Bid, Asked, listing various commodity prices.

Table listing various mining and industrial stocks with prices and company names.

Trust Stocks. May 2.

Table listing trust stocks and their closing prices.

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

Foreign Quotations.

Table with columns: COMPANY, Highest, Lowest, listing international stock prices.

Table with columns: Paris, Francs, Francs, listing Paris market prices.

Table listing various commodities and their prices.

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Large table listing various chemicals and minerals with their respective prices.

Table listing various metals and their prices.

THE RARER METALS.

Table listing rarer metals like Aluminum, Arsenic, Barium, etc., with prices.

BUILDING MATERIAL.

Table listing building materials like Bricks, Cement, Lumber, etc., with 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.

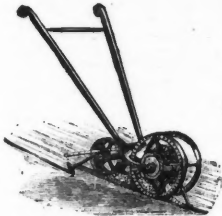
NEW YORK PRICES CURRENT.
MAY 3, 1890.

Discounts are for Export Only.

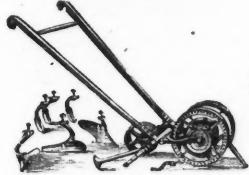
In the interest of the extension of the markets for American manufactures the ENGINEERING AND MINING JOURNAL has secured the services of gentlemen thoroughly acquainted with the export trade and with foreign markets, and it offers its services to foreign buyers who may desire information concerning any 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.

Agricultural Implements.

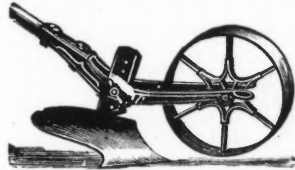
S. L. ALLEN & CO.



"Planet, Jr." No. 2 Seed Drill, \$9. Dis. 30%.



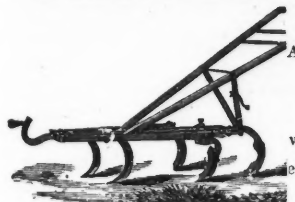
Combined Drill Cultivator Rake, Plow, etc., \$12. Dis. 30%.



"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.	87.75
32	12 "	4 to 6 ft.	9.00
32 S	12 "	"	10.50
32 B	12 "	"	9.50
32 BS	12 "	"	11.00
33	12 "	"	9.50
33 S	13 "	"	11.00
33 B	13 "	"	10.00
33 BS	13 "	"	11.50
34	14 "	"	10.25
34 B	14 "	"	10.75
35	15 "	"	11.25
35 B	15 "	"	11.75
42 B	12 "	"	12.50
42 BS	12 "	"	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.

HOES.
Ely Standard Socket, all Gold Bronze Neck, full Pol'd, C. S. Blade.



Field, 7 x 5 in., selected handles..	\$9.00
" 7 1/4 x 4 1/2 " " " " "	9.00
" 8 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

Popular Handles in Meadow Socket Hoes, unless otherwise ordered.



ONEONTA CLIPPER.

Reversible Oneonta Clipper.

16. Oneonta Clipper, Reversible, Iron beam Cutter..	\$14
" Oneonta Clipper, Reversible, Iron Wheel and Cutter..	15
18. Oneonta Clipper, Reversible, Iron Beam Cutter ..	15
" Oneonta Clipper, Reversible, Iron Beam, Wheel and Cutter ..	16
17. Hard Metal, Reversible, Iron Beam, Wheel and Jointer..	17
19. Hard Metal, Reversible, Wood Beam Cutter..	16
" " " " " Wheel and Jointer..	17
20. Steel Mould Board, Reversible, Wood Beam Cutter and Cutter..	15
" " " " " Wheel	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.

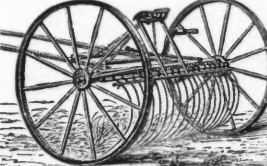
Subsoil Plows.

Two-horse 9.50 Draft Rod.
" 11.00 Wheel and Draft Rod.
Hitchcock's Potato Digger and Shovel Plow.
Improved adjustable handle shovel plow... 7.00
Hitchcock's Potato Digger... 8.00
and shovel plow... 10.50
Dis. 30%.



RAKES.

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



Golden Farmer Self-Dumping Rake, \$37.00; 22 cu. ft., 430 lbs. gro., 250 lbs. net.

Chieftain Hay Tedders, \$50.00; 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).

Teeth	Plain.	Braced.	Steel Garden.
8 teeth	\$5.50	\$6.00	\$8.00
10 "	6.50	7.00	9.00
12 "	7.50	8.00	10.00
14 "	8.50	9.00	11.00
16 "	9.50	10.00	12.00

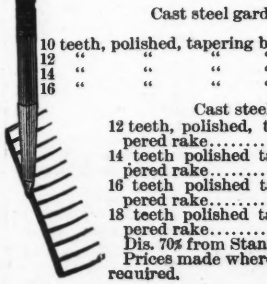
Braced malleable garden rakes.

10 teeth	\$5.50
12 "	6.00
14 "	6.50
16 "	7.00

Ten-Teeth Malleable Garden.

Teeth	Plain.	Braced.	Steel Garden.
10-Teeth	\$5.50	\$6.00	\$8.00
12 "	6.50	7.00	9.00
14 "	7.50	8.00	10.00
16 "	8.50	9.00	11.00

Dis. 70 and 5%.



Cast steel garden rakes.

Teeth	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 required.

SCYTHES (GRASS).

Waldron's pattern, oiled..	\$3.50
Silver steel, painted..	8.50
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..	9.01
--------------------------------	------

Dis., 40 and 10%.

SOWER, BROADCAST SEED.



Goodell & Co.
Per dozen..... \$36 f.o.b.
Gross wt., 110 pounds per dozen
Net wt., 75 pounds per dozen.

Anvils.

"Eagle anvils.

No. 000.	Weight about 1/2 lb.	No. 4.	Weight about 40 lbs.
00.....	4	5.....	50
0.....	10	6.....	60
1.....	15	7.....	70
2.....	20	8.....	80
3.....	30	9.....	90

Anvils weighing 100 to 800 lbs., 10 cts. per lb. Discount 20 and 10%.

Arms and Ammunition.

Wood Powder.
American Wood Powder Company.

	Kegs, 25 lbs.	1/4 kecs.	1 lb. cans.
Trap for first quality arms only..	\$19.50	5.00	.85
A. for large bore..	17.00	4.35	.75
C. for general use.			
D. fine for small bore and rifles..			
E. very fine for small bore rifles and gallery shooting..			

Discount. Per cent.

Bullet Breech Caps.....	per lb.	1.60	10
Conical Bullet Caps.....	"	1.75	10
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.....			6



Discount. Per cent.

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 1/4, 10 and 10 per cent.
Gun Wads, 20 and 5 per cent.

RIFLES.



Discount 10 per cent

40/60 and 45/60 calibre octagon barrel..	10 lbs.	\$15.38
" " " " " round ..	9 1/4 "	14.25
" " " " " carbine ..	9 "	14.25
32, 38, and 44 calibres, octagon ..	7 1/4 "	13.50
" " " " " round ..	6 1/4 "	12.38
" " " " " carbine ..	6 1/4 "	12.38
" " " " " baby carbine ..	5 1/4 "	12.38
22 calibre, rim fire, octagon barrel.....		13.38
" " " " " 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.
58 and 44 calibres, using the same cartridges as Winchester rifles of the respective sizes.
ctagon barrel, 24 inch, 6¼ lbs. \$19.50
 " " 26 6¾ 21.50
 " " 28 7 23.50
Round " 24 6¼ 18.50
Carbine " 20 5½ 17.50
Discount, 25, 10 and 10%.

REVOLVERS. Smith & Weston



32, Single Action, 3, 3¼ in., \$8.00.
32, Double Action, 3, 3¼ in., \$9.35.
32, Safety Hammerless, 3, 3¼ in., \$11.00.
38, Single Action, 3¼ in., \$9.40; 38, Single Action, 4 in., \$9.65; 38, Single Action, 4½ in., \$10.00; 38, Double Action, 3¼ in., \$10.40; 38, Double Action, 4 in., \$10.65; 38, Double Action, 5 in., \$11.00; 38, Safety Hammerless, 3¼ in., \$12.00; 38, Safety Hammerless, 4 in., \$12.25; 38, Safety Hammerless, 5 in., \$12.50; 44, Single Action, 4 in., \$11.50; 44, Single Action, 5 in., \$11.75; 44, Single Action, 6, 6½ in., \$12.00; 44, Double Action, 4 in., \$12.50; 44, Double Action, 5 in., \$12.75; 44, Double Action, 6½ 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, 4¾, 5¾, 7¾ inch bbl., \$13.00.
Double Action, 41 calibre, 2¼ to 6 inch bbl., \$11.20.
38 " " " 2¼ to 6 " " \$10.00.
Single " " " Army, 45 calibre, 4¾, 5¾, and 7¾ inch bbl., \$12.00.
Single Action Army, 44 calibre. "Frontier," 4¾, 5¾, and 7¾ inch bbl., \$12.00.
New Line, 41 calibre, blued or nicked, \$4.00.
 " 32 " " " " 2.00.
 " 30 " " " " 2.10.
 " 22 " " " " " half or full plate, 2.10.
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, 2½ inch barrel, \$1.60;
Double Action 32, 38 and 44 calibre, 4½ 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 2½ inch bbl., \$1.80.
F. & W. Automatic revolver, 32 and 38 calibre, 3¼ inch bbl., \$5.50.
H. & R. Automatic revolver, 32 and 38 calibre, 3¼ inch bbl., \$4.75.
Defender revolvers, Single Action, 22, wood handle, 65.
 " " " " 22, rubber " 70.
 " " " " 32, wood " 85.
 " " " " 32, rubber " 90.
Remington Army revolver, Single Action, 44 cal., frontier cartridge, 5¾ inch barrel, \$6.50.
Remington Army revolver, Single Action, 44 cal., frontier cartridge, 7¾ inch barrel, \$6.00.
Remington Double Deringers, 41 cal., rim fire, \$4.05.
National Deringers, 41 calibre, per pair, half or full late, \$4.00.
New House, 41 or 38 calibre, blued or nicked, \$5.00.
 " Police, 38 calibre, 6 in., 7.00.
 " 38 " 4½ in., " 7.00.

Assay Furnace:

Hydro-Carbon Blow-Pipe Assay Furnace.



No. 2, Muffle Furnace taking C Battersea Muffle 8x4¼x3 in. \$10.00
No. 3, taking F Muffle, 10x8x4 in. 15.00
No. 1, Crucible Furnace, taking Battersea, U or Colorado B Crucible, 4 in. dia. 5½ deep. 4.00
No. 2, taking Batter-
sea E, round, 5 in. dia., 6½ 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.

Hatchets, Broad Single Bevel.

Collins', cut in., 5, \$9.50; 5¼, \$10.00; 6, \$10.50; 6½, \$11.00; 7½, \$11.50; dis. 10%.

Peck's, cut in., 4, \$10.50; 4½, \$11.50; 5, \$13.00; 5½, \$14.50; 6, \$16.50; 6½, \$18.00; 7½, \$19.50; 8½, \$22.00; dis. 45%.

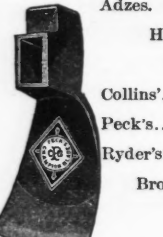
Ryder's, cut in., 5, \$13.00; 5½, \$14.50; 6, \$16.50; 6½, \$18.00; 7½, \$19.50; dis. 50%.



Shingling Hatchets.
1. 2. 3.
Collins, \$4.75, \$5.25, \$5.75 doz., dis. 10%
Peck's, \$8.00, \$8.50, \$9.00 doz. dis. 45%
Ryder's, \$8, \$8.50, \$9 doz., dis. 50%.

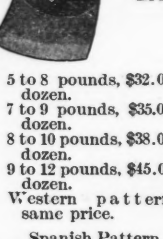
Claw Hatchets.

Collins', \$5.25, \$5.75, \$6.25 doz., dis. 10%
Peck's, \$9.00, \$9.50, \$10.00, doz 45%
Ryder's, \$9, \$9.50, \$10 doz., dis. 10%.



Adzes. House. Ship
Half flat head. spur poll. Discount.
Dozen. Dozen. Per cent.
Collins'... \$14.00 \$13.00 10
Peck's.... 24.00 25.00 45
Ryder's... 24.00 25.00 50

Broad Axes—Pittsburgh Pattern.



5 to 8 pounds, \$32.00 dozen.
7 to 9 pounds, \$35.00 dozen.
8 to 10 pounds, \$38.00 dozen.
9 to 12 pounds, \$45.00 dozen.
Western pattern same price.
Spanish Pattern. Detumba round eye, \$10.50 per doz.



Spanish Pattern. Media labor, \$12.25 per dozen.



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.
60 and 5½ dis.
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 5½ dis.
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% dis.

Belting.

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

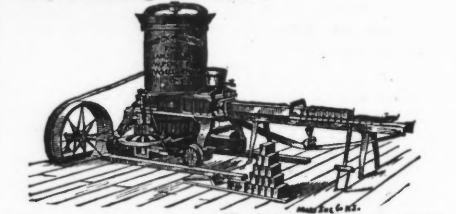
Width.		Width.	
1 inch.....10	6 inch.....76	20 inch.....2.84	
1¼ ".....13	".....78	".....2.90	2.81
1½ ".....17	".....88	".....1.02	2.22
1¾ ".....20	".....9	".....1.15	2.3
2 ".....23	".....10	".....1.29	2.4
2¼ ".....26	".....11	".....1.42	2.6
2½ ".....30	".....12	".....1.55	2.8
2¾ ".....33	".....13	".....1.68	3.0
3 ".....36	".....14	".....1.82	3.2
3¼ ".....43	".....15	".....1.98	3.4
4 ".....50	".....16	".....2.14	3.6
4½ ".....56	".....17	".....2.31	4.0
5 ".....63	".....18	".....2.49	4.4
5½ ".....70	".....19	".....2.68	4.8

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.
WELLINGTON MACHINE CO.
Heavy Steam Power Machine..... \$525.00
Horse-Power Machines.. 300.00
Additional Horizontal
Pugmill..... 225.00
Brick Moulds..... \$2.50 to \$3.00
Brick Trucks..... 5.00 to 13.50
Brick Barrows..... 7.25
Brick Barrows with Springs 8.20
Sand Barrows, steel tray..... 6.40

Clay Working Machines.



No. brick per day. Compl'te.
No. 10 D brick machine.....50,000 \$1,500
No. 10 S " " 30,000 1,200
No. 4 " " 40,000 1,100
No. 7 S " " 20,000 650
No. 6 S " " 15,000 575
No. 2 E. H. P. " " 6,000 3360
Tommins & Adams.

Burglar Alarm.



ALL OVER THE WORLD
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.

KALAMAZOO WAGON CO.

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.
Buckboard, \$30; shafts.

No. 0. Cart, top and fenders, \$150
No. 1. Cart, top and fenders, 90
No. 2. Cart, one man cart, open, 65
No. 2. Cart, one man, top, 86
No. 2. Cart, one man, top and fenders, 90
No. 3. Cart, two man, open, 54
No. 3-H. Cart, two man, open, 54
No. 4. Cart, two man, top, 86
No. 5. Cart, two man, top and fenders, 90

and fenders..... 90

No. 6. Cart, two men, top and fenders..... 90
 No. 7. Two-man combination cart..... 110
 Wide track 5 feet.
 Narrow track 4 feet 8 inches.
 Discount 33 1/2 per cent. off.

Crucibles.		E. H. Sargent & Co.	
Battersea Crucibles, Triangular.		Battersea Crucibles, Covers.	
No.	Height. Inches.	Width. Inches.	Per doz. Per doz.
S.....	4 1/4	4 1/4	\$1.00 \$0.50
T.....	4	3 3/4	0.80 0.50
U.....	3 3/4	3 1/4	0.60 0.40
V.....	3 1/4	2 3/4	0.45 0.40
W.....	2 3/4	2 1/4	0.35 0.30
X.....	2 1/4	2 1/4	0.30 0.30
Y.....	2 1/4	2 1/4	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 1/2	.75
C.....	8	4 1/2	3	.85
D.....	8 1/2	5	3 1/4	1.00
E.....	9	5 1/2	3 3/8	1.15
F.....	10	6	4	1.25
G.....	11	6 1/2	4 1/2	1.40
H.....	10 1/2	5 1/2	3 3/8	1.00
J.....	12	6	4	1.25
K.....	14	8	5	1.75
L.....	15	9	6	2.00

Export discount 15 %.
 (Tommins & Adams.)
 KNIVES—TABLE.

Japanned iron handles, \$10.70 per gross pairs.

Cocobola Ebony Bone handles, handles, 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 Ebony Bone handles, handles, handles, gross pairs.

28.00 29.35 38.00 " "

28.65 30.00 38.00 " "

28.65 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 " "

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.

Per dozen.											
4 and 4 1/2 in.	5 in.	5 1/2 in.	6 in.	6 1/2 in.	7 in.	8 in.	9 in.	10 in.	11 in.	12 in.	
1.15			1.20								
1.40			1.50								
1.15	1.20	1.30	1.40	1.70	1.90	2.35	3.00	3.70	5.35		
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			
3.40	3.55	3.70	4.10	4.60	5.30	7.00	8.15	11.00			
4.10	4.25	4.40	4.89	5.30	6.00	7.75	9.50	12.50			
2.00	2.15	2.30	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.
2.00	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
.55	2.70	3.00	3.30	3.55	4.00	5.00 .00

Discount, 25 and 10 %.

Putty knives, cocobola handles..... \$1.30@1.50

SHEARS.

TAILORS'—JAPANNED OR NICKEL HANDLES.		Per pair.	
12 in.	.....	6.00	
12 1/2 in.	.....	7.00	
13 in.	.....	8.00	
13 1/2 in.	.....	9.00	
14 in.	.....	10.00	
14 1/2 in.	.....	11.00	
12.00 | 16 in.	.....	14.00	

Discount, Japanned, 60 %; nickle, 45 %.

BENT TRIMMERS.

Per dozen.	
6 in.	..... 27.00
7 in.	..... 30.00
8 in.	..... 33.00
9 in.	..... 22.00

STRAIGHT TRIMMERS.

Per dozen.	
6 in.	..... 25.00
7 in.	..... 30.00
8 in.	..... 33.00
9 in.	..... 19.00

LADIES' SCISSORS.
 Per dozen.
 4 1/2 in. 10.00 | 6 in. 11.00
 5 in. 10.00 | 6 1/2 in. 12.00
 5 1/2 in. 10.50 | 7 in. 13.00

PAPER AND BANKERS'.
 Per dozen.
 9 in. 18.00 | 13 in. 36.00
 10 in. 25.00 | 14 in. 42.00
 11 in. 27.00 | 16 in. 54.00
 12 in. 32.00 | 18 in. 20.00

BARBERS'—Per dozen.
 7 1/2 in. 15.00 | 9 in. 18.00
 8 in. 16.00 | 9 1/2 in. 20.00
 8 1/2 in. 17.00

SCISSORS.
 BUTTON-HOLE.
 5 and 5 1/2 in., 14 00 per dozen.
 Disc. int. japanned, 70 and 10 % nickel, 60 and 10 %

PRUNING.
 1 B. 9 in., 24 per dozen; 2 B. 3 1/2 in., 21; 3 B. 7 1/4 in., 9.80.

No. 110,
 10 in.,
 \$30 per
 doz.

PRUNING SHEARS FOR LONG HANDLES.
 No. 1, \$36 per dozen; No. \$30 per dozen.
 Discount, 35%.

SPOONS, FORKS, ETC., BEST PLATE ON HARD WHITE METAL

Tipped Tea Spoon.

Oval Tea Spoon.

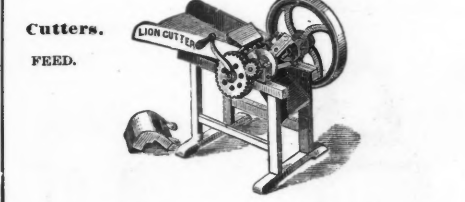
Perfect Tea Spoon.

Leader Tea Spoon.

5 oz. or extra plate.		Perfect and
Tip.	Oval.	Leader.
Tea spoons... 4.25	4.50	4.75 per doz
Dessert spoons... 7.50	8.00	8.50 " "
Table spoons... 8.50	9.00	9.50 " "
Coffee spoons... 4.25	4.50	4.75 " "
Dessert forks... 7.50	8.00	8.50 " "
Medium forks... 8.50	9.00	9.50 " "

Discount, 60 and 5%.
 Spoons and forks, German silver, tipped pattern.
 Tea spoons. Table spoons. Medium forks.
 22.50 45.00 45.00 per gross.

Discount, 60 %.
 Spoons and forks, made from brass, and silver plated a coating of hard, white nickel.



No. of cutter.	No. of knives.	Length in inches of knives.	Length in inches of feed cut.	Price.
1	2	6 1/2	1 1/2, 3/4 and 1 1/8	\$18.00
2	2	7 1/2	1 1/2, 3/4 and 1 1/8	21.00
2 1/2	1	7 1/2	5/8, 3/4, 1 1/4 and 1 1/2	21.00
2 1/2	2	7 1/2	5/8, 3/4, 1 1/4 and 1 1/2	23.00
3	1	8 1/2	5/8, 3/4, 1 1/4 and 1 1/2	25.00
3	2	8 1/2	5/8, 3/4, 1 1/4 and 1 1/2	27.00
4	1	10	5/8, 3/4, 1 1/4 and 1 1/2	30.00
4	2	10	5/8, 3/4, 1 1/4 and 1 1/2	33.00
5	2	10	5/8, 3/4, 1 1/4 and 1 1/2	35.00
6	2	11	5/8, 3/4, 1 1/4 and 1 1/2	45.00
6 1/2	2	11	5/8, 3/4, 1 1/4 and 1 1/2	45.00
7	2	13	5/8, 3/4, 1 1/4 and 1 1/2	60.00
7 1/2	2	13	5/8, 3/4, 1 1/4 and 1 1/2	60.00
10	2	16	5/8, 3/4, 1 1/4 and 1 1/2	80.00
12	2	20	5/8, 3/4, 1 1/4 and 1 1/2	100.00
11	2	11	5/8, 3/4, 1 1/4 and 1 1/2	45.00
13	2	13	5/8, 3/4, 1 1/4 and 1 1/2	60.00
16	2	16	5/8, 3/4, 1 1/4 and 1 1/2	80.00
20	2	20	5/8, 3/4, 1 1/4 and 1 1/2	100.00

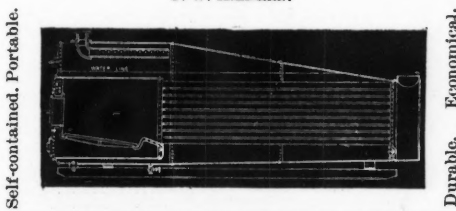
The knife arbors for all sizes are made of machinery steel. 30 per cent. dis.

Size of stones, in.	Grinding capacity.		Horse-power.	Weights.		Geared mills.	
	Corn, bu. per hour.	Wheat, bu. per hour.		Sing'l gear.	Double gear.	Iron wh'ls.	Mortise wh'ls.
18	8 to 10	.....	4	550	625	\$130	\$165
20	10 to 12	.....	5	600	700	140	175
22	12 to 15	.....	6	700	850	160	210
24	15 to 18	.....	8	900	1050	175	210
26	18 to 20	8 to 10	8	1200	1400	185	225
30	20 to 25	10 to 12	10	1500	1700	225	290
32	25 to 30	12 to 15	12	1800	2100	315	350
36	30 to 35	15 to 18	15	2000	2300	390	435

Driving pulley.	Revolutions per minute.	Length of belt above floor.	Approximate shipping weight.	Price.
10" x 5 1/4"	400 to 500	14'	.....	\$500.00
14" x 6 3/4"	350 to 450	18'	2600 lb.	600.00
14" x 7 3/4"	350 to 450	18'	3050 lb.	650.00
14" x 8 3/4"	350 to 450	18'	3350 lb.	735.00

Flue Boiler (Scotch).

F. W. IREDELL.



Horse power.....	8	10	15	20	25	30	35
Diameter.....	28"	32"	32"	36"	40"	40"	44"
Length, feet.....	9 1/2	10	12 1/2	13 1/4	14 3/4	16 1/4	16 3/4
Weight, pounds.....	3500	4000	4500	5 000	6500	6900	7500
Price, \$.....	.....	.....	387	487	580	634	767
Horse power.....	40	45	50	55	60	70	80
Diameter, inches.....	44	48	48	52	52	56	56
Length, feet.....	17 1/2	18 1/2	18	17 1/2	18 1/2	18	19
Weight, pounds.....	8000	8500	8800	9500	10,000	11,000	12,000
Price, \$.....	827	920	1027	1147	1227	1387	1500

Discount, 10%.

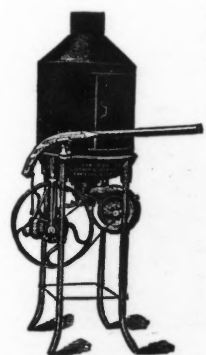
Flue Cleaner.
Hurley's Automatic Steam Flue Cleaner.



No.	Outside diam. of tubes.	With hose clamps.	Globe Valves.	Best 4-ply steam hose.	Per foot.
1.....	1 1/4 to 2	\$5.00	1 1/2	95 cents	3 1/2
2.....	2 to 2 1/2	6.25	1 1/2	95 cents	3 1/2
3.....	2 1/2 to 3	7.50	3/4	\$1.30	3 1/2
4.....	3 to 3 1/2	8.75	1	1.75	1 3/4
5.....	3 1/2 to 4 1/2	10.00	1 1/4	2.90	1 1/4

Dis. on steam hose, 50%, good to 90 lbs steam.
Forges (Portable).

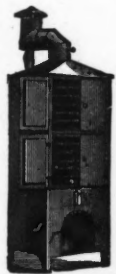
No.	Weight.	155 lbs.	21 x 27 hearth.	Price.
2c.....	\$42.00
3a.....	27.00
3b.....	24.00
3c.....	30.00
6a.....	18.00
6B.....	16.00



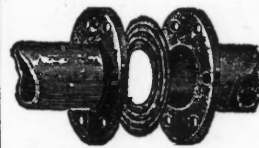
Fruit Evaporator.

No. 1. Evaporator..... \$30
No. 2. Fruit Drier and Baker, with Bleacher attachment. Weight, 225 lbs. Capacity, 5 to 7 bushels apples per day; 24 in. deep, 26 in. wide, 5 1/4 ft. high; 12 trays, 22; 40 square feet drying surface. Complete..... \$50
No. 3. Capacity, 15 to 20 bushels per day..... 100
No. 4. Capacity, 20 to 30 bushels per day..... 160
Dis., No. 1, 3 and 4 = 20%. No. 2 = 30%.
Boxing, extra:
No. 1, \$3.00; No. 2, \$5.00; No. 3, \$7.50; No. 4, \$12.50.
Freight to New York:
No. 1, \$4.00; No. 2, \$6.00; No. 3, \$12.00; No. 4, \$18.00.

Light work, 12 x 17; height, 15 in., \$16.00.
Same, with Hood, 12 x 17; height, 28 in., \$20.00.
Bridge, Boiler or Railroad work, Pan, 17 x 19; height, 29 in.; Fan, 8 in., \$27.00.
Same, with Hood, \$30.00.
Water Tank, \$4.00 extra.
Iron Fire Ring Round Tuyere, \$1.00 extra.
50% dis.



Riveting Forges.
Belows, 18 in. 20 in., 22 in., 24 in., \$8.00, \$10.00, \$13.00, \$17.00.
20% dis.



Gaskets.
Corrugated Copper.
Price, 2 cents per square inch, less 30 per cent. discount for home trade.
Less 60% discount for export trade.



Glass Tube Cutters.

One Arm Carries Rotary Cutter Price, \$2.50 each.
Glassware.
6-in. bowl and cover, per doz.....\$3.25
7-in. " " " " 4.50
8-in. " " " " 6.90
9-in. " " " " 8.00
10-in. " " " " 10.50
Net.



Nappy, 4 1/2-inch., per doz., 50c.; 6-inch., per doz., \$2 per doz., \$3; 8-inch., per doz., \$4.
Cream Pitcher, 1 pint, per doz., \$1.25; one quart, per doz., \$3.50; 3 pints, per doz., \$4.50.
Pint Pitcher, per doz., \$1.50; quart pitcher, per doz., 2; 1/2 gallon pitcher, per doz., \$3; 3 quart pitcher per doz., \$4.50.



Flange Butter and Cover, per doz., \$1.75.
Water Set, per doz., sets of 60 pieces, \$7.50.



Cheese Dish and Cover, 8 in., per doz., \$4.50.
Quart Water Bottle, per doz., \$4.50.

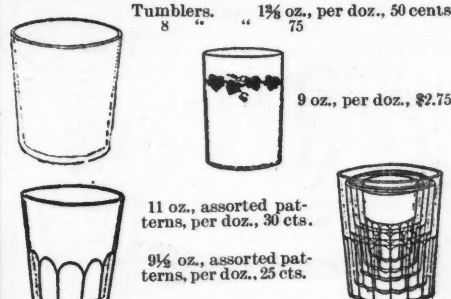
Ind. Salts; per gross, \$2.00. A sorted patterns.
4 Bottle Castors, per doz., \$7.50; 3 bottle, per doz., \$4.50.



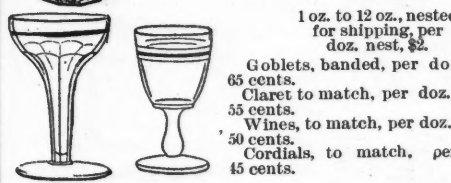
Berry Dish, 4 1/2-inch., per doz., 50c.; 10-inch, per doz., \$4.
Butter Dish and Cover, per doz., \$1.25.
Butter Dish and Cover, per doz., 75c.



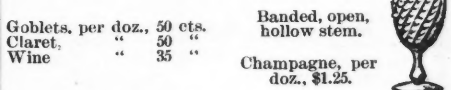
Candlesticks, per doz., \$2.00. Glass Slipper for Flowers, per doz., 50 cents; slipper and tray per doz., \$1. Jam Jar and Cover, 1 qt., per doz., \$2.50; 1/2 gal., per doz., \$3.25; 3/4 gal., per doz., \$4; 1 gal., per doz., \$5; 1 1/2 gals., \$9; 2 gals., per doz., \$12. Pocket Flask, 1 pint, \$1.



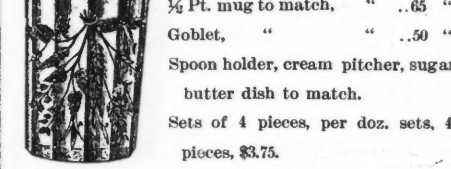
Tumblers. 1 1/4 oz., per doz., 50 cents.
8 " " " " 75



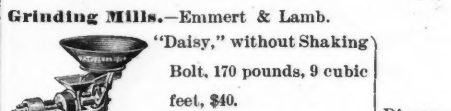
9 oz., per doz., \$2.75.
11 oz., assorted patterns, per doz., 30 cts.
9 1/2 oz., assorted patterns, per doz., 25 cts.



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

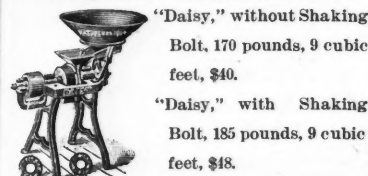


Goblets, per doz., 50 cts.
Claret " " 50 " " "
Wine " " 35 " " "
Banded, open, hollow stem, Champagne, per doz., \$1.25.
1/2 Pt. tumbler, per doz., .55 cts.
1/2 Pt. mug to match, " .65 " " "



Goblet, " " .50 " "
Spoon holder, cream pitcher, sugar butter dish to match.
Sets of 4 pieces, per doz. sets, 48 pieces, \$3.75.

Grinding Mills.—Emmert & Lamb.

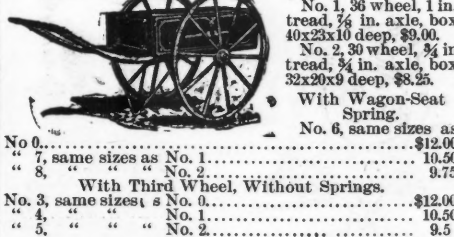


"Daisy," without Shaking } Bolt, 170 pounds, 9 cubic feet, \$40.
"Daisy," with Shaking } Bolt, 185 pounds, 9 cubic feet, \$48.
Discount 25 per cent.

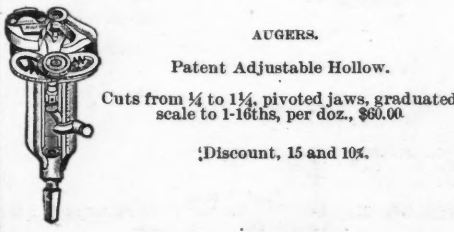
Diameter of Buhr Stones	Size of Pulleys	
	Diam.	Face.
12 in.	8 in.	6 1/4 in.
16 "	9 "	7 1/4 "

Horse Power	Capacity in B'sh's	Speed	With out Bolt	With Bolt	Sacking 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 48x28x10 deep, \$10.50.
No. 1, 36 wheel, 1 in. tread, 3/4 in. axle, box 40x23x10 deep, \$9.00.
No. 2, 30 wheel, 3/4 in. tread, 3/4 in. axle, box 32x20x9 deep, \$8.25.
With Wagon-Seat Spring.
No. 6, same sizes as No. 0.....\$12.00
" 7, same sizes as No. 1..... 10.50
" 8, " " No. 2..... 9.75
With Third Wheel, Without Springs.
No. 3, same sizes as No. 0.....\$12.00
" 4, " " No. 1..... 10.50
" 5, " " No. 2..... 9.5



Hardware Specialties.



AUGERS.
Patent Adjustable Hollow.

Cuts from 1/4 to 1 1/4, pivoted jaws, graduated scale to 1-16ths, per doz., \$60.00

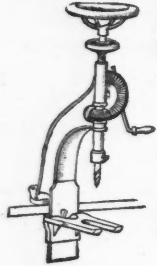
Discount, 15 and 10%.

Patent Hollow Auger.				
Inch.....	5-16	3/8	7-16	1/2
With bits....	12.00	12.00	12.00	12.00
Without bits	8.00	8.00	8.00	8.00
9-16	3/8	7/8	1	1 1/2
14.00	14.00	14.00	16.00	20.00
9.00	9.00	9.00	13.00	13.00
14	1 1/2	1 1/2		
20.00	24.00	24.00		
14.00	16.00	15.00		

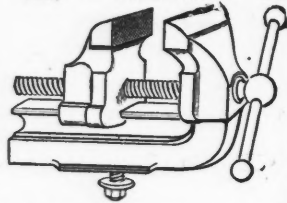


Discount, 15 and 10%.

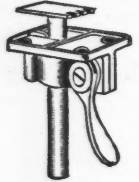
BENCH DRILL.



Adjustable bed plate.
2 1/2 high drills to 1/2 in. hole, 3/4 run of screw.
List price, each.....\$10.00
Net, "..... 3.75



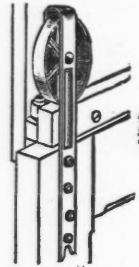
Bench Vise, Steel Jaws, 3 1/2 in., opens 3 in.; weight, 12 lbs.; list price, each, \$4.00.; net price, each, \$1.60.



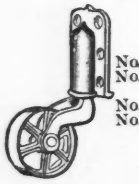
BENCH HOOK.
Patent, adjustable and reversible
List \$9 dozen, 1/2 dozen in box.
Discount, 20 and 10%.



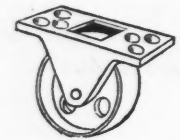
BLACKSMITH'S TONGS.
Swivel Jaw.
No. 1, 16 in., per doz.....\$10.00
2, 18 " " " " " " " " " " " " " " 10.00
Dis. 20%.



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, " " " " " " " " " " " " " " .75
Noiseless turned wheel.
No. 30, japanned, 4 in. wheel, each..... 1.30
No. 35, " " " " " " " " " " " " " " 1.60
Discount, 25%.



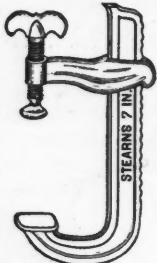
Store Truck, stationary.
No. 50, 5-inch wheel, 1 1/2 inch wide each, \$1.05.
No. 60, 5-inch, extra heavy, 1 1/2 inch wide, each \$1.50.
Discount, 25%.



CLOTHES REEL.
Extra heavy, gray iron, japanned.
List per doz.....\$15.00
Net "..... 7.00

JACK SCREWS.				
New pattern wrought iron screw.				
No.	rise of screw.	High.	Diameter.	Price.
20	4 1/2 in.	10 in.	2 in.	\$4.50
25	6 1/2 " "	12 " "	2 " "	5.25
30	8 1/2 " "	14 " "	2 " "	5.75
35	11 " "	16 " "	2 " "	6.50

Discount, 40%.



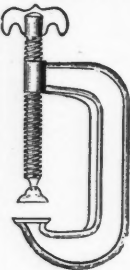
SCREW CLAMPS.
Adjustable.

3 in., per doz.....	\$4.00
5 " " " " " " " " " " " " " " "	6.50
7 " " " " " " " " " " " " " " "	9.00
9 " " " " " " " " " " " " " " "	10.50
12 " " " " " " " " " " " " " " "	15.00
16 " " " " " " " " " " " " " " "	20.00

1/2 doz. in box.
Discount, 20 and 10%.

CLAMPS.

New Door Frame.
3 ft. long, per doz., \$8 list; \$5 per doz. net.



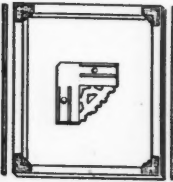
Malleable Iron Screw Clamps.

Per Doz.	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. 1/2 doz. in box.
Dis., 70%.

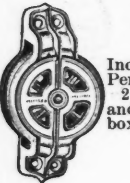
WINDOW SCREEN FRAMES.

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 1/2 by 1 in.
Dis., 20%.



PULLEYS.

Side, No. 45, Japanned.
Inches... 1 1/2 2 2 1/2 3 4 5
Per doz. .90 1.00 1.60 2.40 3.50 9.00 15.00
2 inch and under, 2 dozen in box; 2 1/2, 3 and 4, 1 dozen in box; 5 inch, 1/2 dozen in box.
Discount, 50%.



PULLEY HOOK (New Floor.)
Deep cut thread, forged point.
1/2 in. wrought iron, 8 in. long, list.....\$1.30
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%.

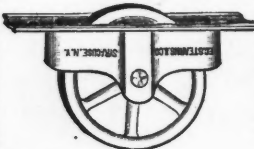


HAY FORK PULLEY.
New pattern.

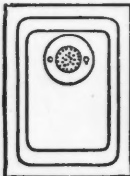


No. 15, 5 in. iron wheel..... per doz. \$4.50
25, 5 in. wood " " " " " " " " " " " " " " 4.50
66, 6 in. " " " " " " " " " " " " " " 6.00
4 dozen in case, 8 dozen in barrel.
No. 15, per dozen, \$2 net.

SHEAVES.
Patent Common
Turned and polished
iron wheels, round corners, brass pin, one set in box.
2 1/2 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.
Per doz.
No. 1, points 1 1/2 in. diameter, \$9.00
No. 2, points 2 1/2 in. diameter, \$15.00
Discount, 15 and 10%.
1/2 dozen in box.



WISE.
(Bench Vise, Steel Jaws.)
3 1/2 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 1/2%.

No.	per dz.	gr.	lbs.	Clamp.	per dz.	gr.	lbs.
1	Amateur	1 1/2			3.00		80
2	Amateur	2 1/2			5.00		220
3	Amateur	3 1/2			14.25		700
4	Amateur	4 1/2			21.00		1,425
5	Amateur	5 1/2			30.00		2,100
6	Amateur	6 1/2			40.00		2,800
7	Amateur	7 1/2			50.00		3,500
8	Amateur	8 1/2			60.00		4,200
9	Amateur	9 1/2			70.00		4,900
10	Amateur	10 1/2			80.00		5,600

Spot cash discount, 33, 20 and 2, f.o.b.
Nos. 1, 1 1/2, 2 and 2 1/2 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 " 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%.



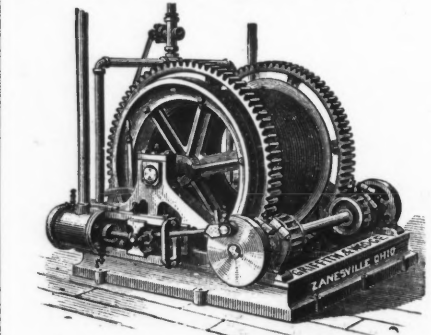
WRENCHES.
Coes' Knife Handle Wrenches.

Size.	per doz.	Size.	per doz.
6 inch.....	\$9.00	15 inch.....	\$24.00
8 " " " " " " " " " " " " " " "	10.00	18 " " " " " " " " " " " " " " "	30.00
10 " " " " " " " " " " " " " " "	12.00	21 " " " " " " " " " " " " " " "	38.00
12 " " " " " " " " " " " " " " "	14.00		

BRIGHT.
4 inch.....\$10.00 12 inch.....\$16.00
6 " 10.00 15 " " " " " " " " " " " " " " 26.00
8 " 11.00 18 " " " " " " " " " " " " " " 32.00
10 " 14.00 21 " " " " " " " " " " " " " " 38.00
Discount, 55, 10, 7 1/2 and 3%.

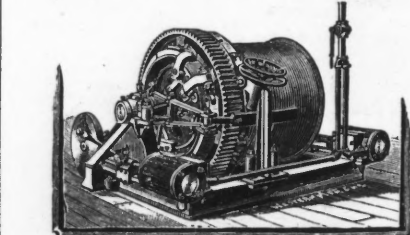
Coes Mechanics' Screw Wrenches, same list, less 55 10, 10, 7 1/2 and 3%.
A. G. Coes & Co. Pat. Screw Wrenches, same list as above. Discount, 55, 10, 7 1/2 and 3%.

Hoisting Engines.—Griffith & Wedge.



Hoisting Engines, Miner's Prospecting.....	Weight.	\$
Hoisting Engines, No. 1 Double Cylinder....	4,500	750
" " " " " " " " " " " " " " " " " " " "	4,500	800
Discount, 20%.		
" " " " " " " " " " " " " " " " " " " "	6,000	1,000
" " " " " " " " " " " " " " " " " " " "	11,000	1,550
" " " " " " " " " " " " " " " " " " " "	15,500	1,800
" " " " " " " " " " " " " " " " " " " "	17,000	2,100
" " " " " " " " " " " " " " " " " " " "	13,600	1,750
" " " " " " " " " " " " " " " " " " " "	17,000	2,100
" " " " " " " " " " " " " " " " " " " "	19,000	2,400
" " " " " " " " " " " " " " " " " " " "	48,000	4,500

Discount, 25%.

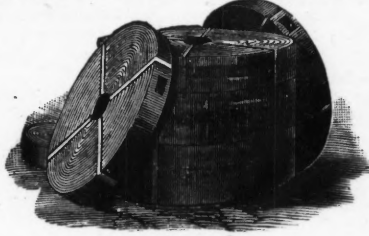


Webster Camp & Lane Machine Co.
Double drum.
Approx. weight, complete.

Single drum.	Average Load.	No.	Pounds.
\$825.00 = 5	1,950	6,000 =	.....
918.50 = 6	1,650	6,500 =	.....
1,177.00 = 7	2,200	8,000 =	\$1,661.00
1,331.00 = 8	3,000	8,500 =	1,815.00
1,694.00 = 9	3,500	14,000 =	2,722.50
1,914.00 = 16 1/2	3,700	16,000 =	3,124.00
2,343.00 = 17 1/2	5,500	19,000 =	3,333.00
2,475.00 = 18	5,500	22,000 =	3,872.00

Ice Machines (Family). L. DERMINGNY & Co.
 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, \$25.50.
 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.



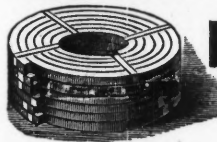
RUBBER BELTING.

Inches.	2 ply per foot.	3 ply per foot.	4 ply per foot.	5 ply per foot.	6 ply per foot.
1 1/4	\$0.07				
1 1/2	0.09				
1 3/4	0.11				
2	0.15	\$0.17	\$0.21		
2 1/4	0.18	0.22	0.26		
2 1/2	0.22	0.26	0.31		
3	0.26	0.30	0.37		
3 1/2	0.30	0.34	0.42		
4	0.33	0.39	0.47		
4 1/2	0.36	0.43	0.52		
5	0.43	0.52	0.62		
6	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	3.38	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

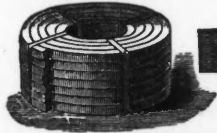
Dis. Reliance, 60 and 5. Dis. Royal, 60, 10 and 10. Dis. Manhattan, 70 and 5. See Leather Belting, page 3; Link Belting, page 2.



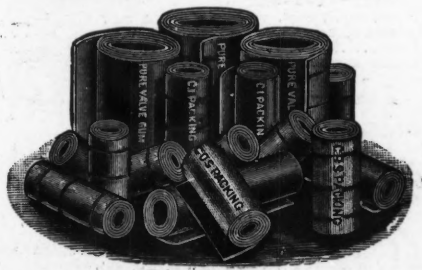
PACKING.
 Piston Packing.
 Round Piston Packing
 Per lb. 85c.
 Discount, 60, 10 and 5 per cent.



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.	55 cts.	55 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.

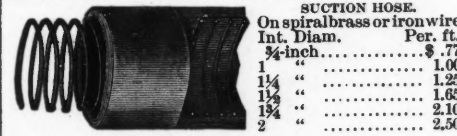
Wire insertion packing, all thicknesses, per lb, 50 cents.
 Discounts: Reliance, 70 & 10; Royal, 60, 10 & 10; Man hattan, 60 per cent.
 See Packing, page 10.



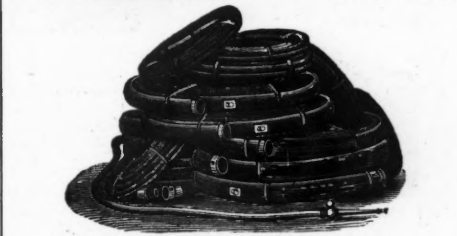
Improved "Smooth Bore" Rubber Suction Hose.

in. Diam.	Per ft.	Per Diam.	Per ft.
1/2	6.50	7/8	15.00
3/4	7.50	1	16.50
1	8.50	1 1/4	19.50
1 1/4	9.50	1 3/4	22.50
1 3/4	10.50	2	27.50
2	12.00		

Suction hose discount: Reliance, 50 and 10%; Royal, 60, 10 and 5%; Manhattan, 70 and 5%.



SUCTION HOSE. On spiral brass or iron wire



RUBBER HOSE—Two-ply.

Int. diam.	Per ft.	Int. diam.	Per ft.	Int. diam.	Per ft.
1/2 in.....	\$0.20	2 in.....	\$0.60	5 in.....	\$1.65
3/4 in.....	25	2 1/4 in.....	75	6 in.....	1.98
1 in.....	33	2 1/2 in.....	83	7 in.....	2.31
1 1/4 in.....	42	2 3/4 in.....	92	8 in.....	2.64
1 1/2 in.....	50	3 in.....	99	9 in.....	2.97
1 3/4 in.....	58	4 in.....	1.32	10 in.....	3.33

HYDRANT HOSE—THREE-PLY.
 1 1/2 in.....\$0.25
 3/4 in.....30
 1 in.....40
 1 1/4 in.....60

Discount—Reliance, 60; Royal, 70; Manhattan, 70 and 10 per cent.

Indurated Fibre Ware.

SPITTOONS.		Doz.
16 in. dia., 8 in. high.....		\$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 1/4	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 1/4	21.00

CHAMBER PAILS.
 12 in. dia., 9 in. deep, 3 gal.,..... 16.00

WATER COOLERS.		
3 gal.....		\$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. \$36.00
5 ".....		108.00
6 ".....		120.00
8 ".....		144.00
10 ".....		192.00
15 ".....		288.00



Dis. on all 25 and 20%.

Pails.		No. doz.	Cubic feet.	Price per doz.
Ladies' or Weaver's pails, 6 qt.....	1	1	3 3/4	\$5.35
Half or buggy pails, 6 qt.....	1	3 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).....	1/2	3 1/2		7.80
Fire pails, round bottoms.....	1/2	4		7.80
Milk pails, 14 qt.....	1	4		7.80
Stable pails, flush bottom, heavy wire ball, 14 qt.....	1	1/2 4		7.80
Stable pails, 16 qt., same as above.....	1/2	3 1/2		8.40
" 18 ".....	1/2	3 1/2		10.70
" 20 ".....	1/2	4		12.00
Covers for fire or star pails.....	1			3.55



KEELERS.			Doz.
A—20 in., 7 in. deep.....			16.20
B—19 ".....			15.00
C—18 1/2 ".....			14.00
1—17 1/2 ".....			13.20
2—15 1/2 ".....			12.00
3—13 1/2 ".....			10.20
4—12 ".....			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
 11 1/2 in..... 4.20
 11 in..... 3.60

Lamps.



Drummond Electric Hanging Lamp, 30 candle power, complete, each \$3.50.
 The electric lamp, 60 candle-power. With decorated shades, nickel, per doz. \$22.00
 With opal plain shades, nickel, per doz. 18.00.
 With decorated shades, brass, per doz. 21.00.
 With opal plain shades, brass, per doz. 17.00.
 Lamp chimney patent for Sun burners.

Per doz. No. 0, 50 cents. No. 1, 60c. No. 2, 75c.
 Hitchcock nickel table lamp (No. 653), each \$3.25
 " hanging " 655 " 7.25
 " bracket " 651 " 3.50
 " with reflector 653 " 3.75
 French bronze bracket, with reflector, No 653, each \$3.75.



Miners'.
 Brass, Collar and Breast in one piece, Spout and Body in one piece.
 Price, \$9 per gross net.

Demmler Bros.		Doz.
"Cherry" Miners' Lamps, double spout.....		\$2.00
" Drivers ".....		2.75
" " single ".....		2.50

Harp, complete, with square tin shade, per doz., \$9.50.
 Complete, with Burner and chimney, per doz., \$1.50.
 Hurricane lanterns 25 cents extra with guards.
 875. 1/2 wick, without guards, per doz., \$5.00.
 876. square safety lifting globe, per doz., \$5.50.
 877. 1/2 wick, safety lifting globe, per doz., \$6.75.
 Nickel plated diamond reflector reading lamp, 30 candle-power, \$13.50 per doz.
 Net.
 Illuminated night clock, per doz., \$27.

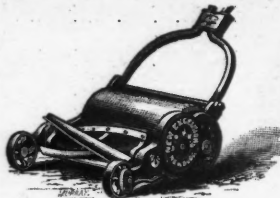


PAPER LAMPS.
Lined with oil proof composition.

No. 0.	No. 1.	No. 2.
Height, 2 1/2 in.	3 in.	3 3/4 in.
Diameter, 3 1/2 in.	2 1/2 in.	2 1/2 in.
Weight, 7 doz., 3 1/2 lbs.	1 1/2 lbs.	2 lbs.
Price, \$2.75 per doz.	\$2.25	\$2.75

No. 0.	No. 3.	No. 4.
Height, 2 1/2 in.	5 in.	6 1/2 in.
Diameter, 3 1/2 in.	3 1/2 in.	4 in.
Weight, 7 doz., 3 1/2 lbs.	3 1/2 lbs.	7 lbs.
Price, \$2.75 per doz.	\$3.25	\$4.50

Dis., 20%.



Excelsior Three-Blade Mower and Roller.
8 in., \$11.00; 10 in., \$13.00; 12 in., \$15.00; 14 in., \$17.00; 16 in., \$19.00; 18 in., \$21.00; 20 in., \$23.00.
Dis. 60% and 5% cash 30 days f.o.b. New York.



BRONZE SPRING PADLOCK.
2 flat steel keys.

In.	Price
1	11.00
1 1/4	12.00
1 1/2	13.50
1 3/4	14.50
2	16.00
2 1/4	17.50

Subject to special net prices; no discount.

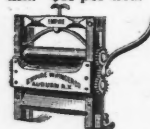
Laundry Appliances. Empire Wringer Co. Rolls.



"Volunteer." Length, 10 in. x 1 1/4 in. dia. \$40 per doz.
"Volunteer." Length, 11 in. x 1 1/4 in. dia. \$50 per doz.
"Volunteer." Length, 12 in. x 1 1/4 in. dia. \$60 per doz. Dis., 40%.



"Daisy." Length, 10 in. x 1 1/4 in. dia. \$30 per doz.
"Daisy." Length, 12 in. x 1 1/4 in. dia. \$48 per doz. Dis., 40%.



"Empire." Length, 10 in. x 1 1/4 in. dia. \$63 per doz.
"Empire." Length, 11 in. x 1 1/4 in. dia. \$74 per doz.
"Empire." Length, 12 in. x 1 1/4 in. dia. \$84 per doz.
"Empire." Length, 12 in. x 1 1/2 in. dia. \$87 per doz.
"Empire." Length, 14 in. x 2 1/4 in. dia. \$158 per doz.
"Empire." Length, 14 in. x 2 1/4 in. dia. with pulleys. \$220 per doz.
"Empire." Length, 16 in. x 2 1/4 in. dia. with pulleys. \$360 per doz. Dis., 40%.



Closed.



Open for use.



Washing Machine.

THE CATARACT.

All Metal.

Cubic Measurement 15 ft.

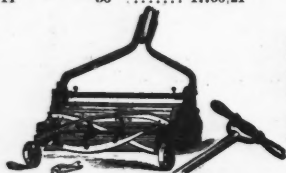
Price \$20.

Lawn Mowers.

Forward Cut Mowers.

In.	Lbs.	In.	Lbs.	Price
10	Weight, 30 1/2	16	Weight, 38	\$19.00
12	31 1/2	18	41	21.00
14	36	21		34.00

Dis. 60 and 5%.



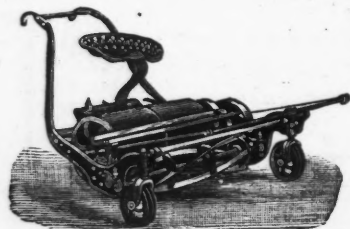
10 in.	12 in.	14 in.
\$13.00	\$15.00	\$17.00
16 in.	18 in.	20 in.
\$19.00	\$21.00	\$23.00

24 in., \$30.00.
Geared at both ends.
Dis. 60 and 5 and 5%.



Chadborn & Caldwell Mfg. Co.
10 in. Croquet, 18 pound mower. \$11.00
10 in. 13.00
12 in. 15.00
14 in. 17.00
16 in. 19.00
18 in. 21.00
20 in. 23.00

Dis., 60 and 5% and 5% cash 30 days, f.o.b. New York.



***New Excelsior Horse Lawn Mower.**

25 in. cut, without shafts or seat	\$65.00
30 " " " with shaft and seat	110.00
35 " " " " " " " " " " " "	135.00
40 " " " " " " " " " " " "	170.00
Horse boots, per set	12.00

Dis. 50%.

Link Belting. Link-Belt Machinery Co.'s. Price per running foot net.

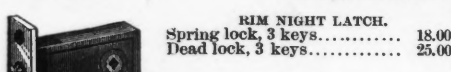
No.	Price	No.	Price
25	\$0.13	73	\$0.40
32	13	83	45
33	12	85	50
34	13	88	50
35	14	95	60
42	16	103	75
45	16	105	70
51	20	106	90
52	25	107	80
55	22	108	80
57	24	109	90
62	30	114	1.10
66	30	122	1.50
67	30	124	1.30
75	35	146	1.40
77	35		

Sprocket wheels..... 25%

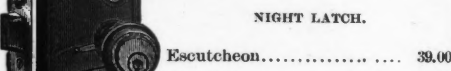
Locks.



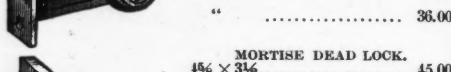
YALE PATENT RIM STORE LATCH.
Per doz.
3 x 5 in., 4 keys..... \$48.00
2 1/2 x 4 in., 3 keys..... 39.00



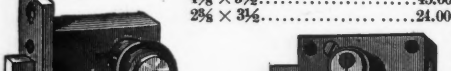
RIM NIGHT LATCH.
Spring lock, 3 keys..... 18.00
Dead lock, 3 keys..... 25.00



NIGHT LATCH.
Escutcheon..... 38.00
"..... 36.00



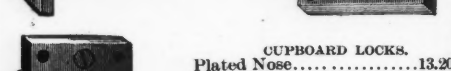
MORTISE DEAD LOCK.
4 1/2 x 3 1/2..... 45.00
2 1/2 x 3 1/2..... 24.00



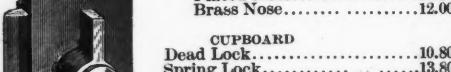
CUPBOARD LOCKS.
Plated Nose..... 13.20
Brass Nose..... 12.00



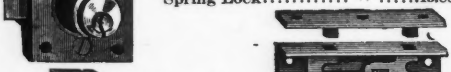
CUPBOARD DEAD LOCK.
Spring Lock..... 10.80
..... 13.80



CHEST LOCKS.
Plated nose..... 19.20
Brass..... 18.00



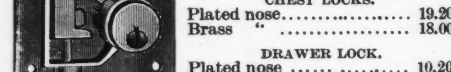
DRAWER LOCK.
Plated nose..... 10.20
Brass..... 9.00



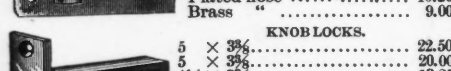
KNOB LOCKS.
5 x 3 1/2..... 22.50
5 x 3..... 20.00
4 1/4 x 3..... 13.25
3 1/2 x 3..... 10.50



STANDARD LATCHES.
Dead locks.
3 1/4 x 2 3/4..... 24.00
2 1/4 x 3 1/2..... 14.00
1 1/2 x 2 1/2..... 12.00



NIGHT LATCHES.
3 1/4 x 3 1/2..... 20.00
2 1/2 x 3 1/4..... 18.00



DRAWER LOCKS.
2 x 1 1/2, two tumblers.
Plated nose..... 7.50
Brass..... 6.00
Three tumblers.
Plated nose..... 9.00
Brass..... 7.50



RIM FLUSH DRAWER LOCK.
2 in. diameter.
2 tumblers. 3 tumblers.
Plated nose..... 7.50 9.00
Brass..... 6.00 7.50



YALE KEYS.

Machinery—Foot Power. S. M. & Co.'s Screw-Cutting Engine Lathes.

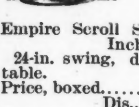


8 in. swing, 20 in. bet. centers, 36 in. bed, 240 lbs. weight, \$60.
8 in. swing, 30 in. bet. centers, 46 in. bed, 280 lbs. weight, \$70.
8 in. swing, 36 in. bet. centers, 52 in. bed, 280 lbs. weight, \$75.
Boxing for export, \$2.50 extra; f.o.b. at Cincinnati, 25% dis.

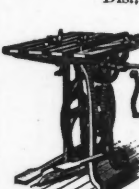
SAWS AND LATHES. Victor Scroll Saw, Cuts to 3 Inches.



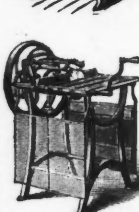
24-inch swing, with 12 saw blades ... \$4 Dis., 20%.



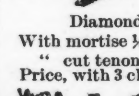
Empire Scroll Saw, Cuts to 3 Inches.
24-in. swing, drill and tilting table.
Price, boxed..... \$25
Dis., 20%



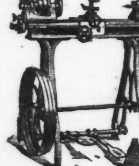
The Acme Combination Saw.
Hand or steam power.
Adjustable table and gauges.
Price, boxed..... \$40
Scroll saw attachment..... 7
Boring attachment..... 10
Moulding attachment..... 10
Dis., 20%.



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 1/2 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. Adjustable 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 3/4" thick, 19 in. wide.
Price \$50.00.
Dis.,





W. F. & J. Barnes Co. Scroll and Circular saw Combined. Combined Machines.
Combined circular saw and boring attachment—2 circular saws, 12 assorted scroll saws, boring attachment, and self-centering drill chuck..... \$50.00
Combined circular and scroll saw—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%.


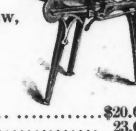
Mortising Machine.
\$22.00; Chisels, \$1.00 each.
Dis., 35%.

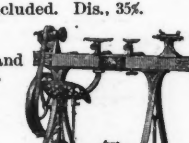
Blind Slat Chisels, 3 set bits, \$5.00.
Dis., 20%.
Tenoning Machine,
Price, \$25.
Dis., 35%.


Velocipede Scroll Saw,
Without boring attachment..... \$20.00
With 1 doz. saw blades, 1 3-16 bit. Lathe. Included. Dis., 35%.

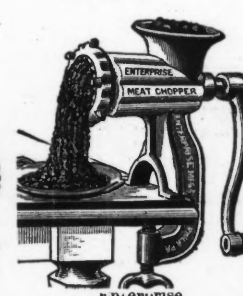
3 centres, 1 spur, 2 tool rests and sockets, 1 turned face-plate, \$35.
Dis., 30%.




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. 3 4
each, \$5.00 7.00 10.00 25.00
Dis., —
Enterprise. 10 12 22 32 42
each, \$3.00 2.50 4.00 6.00 15.00
Dis., 30%.

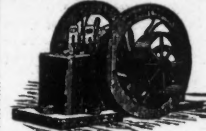
Motors (Water).
Size No. 8, for Sewing Machines, etc., \$18 each.
No. 9, 1/4 horse-power (30 lbs. pressure), 1/2 h. p. (50 lbs.), 1 h. p. (100 lbs.), 1 1/2 h. p. (150 lbs.), 2 h. p. (200 lbs.), \$30.
No. 10, 1/2 horse-power (30 lbs. pressure), 3/4 h. p. (50 lbs.), 1 h. p. (100 lbs.), 1 1/2 h. p. (150 lbs.), 2 h. p. (200 lbs.), \$50.
No. 10 1/2, 3/4 horse-power (30 lbs. pressure), 1 h. p. (50 lbs.), 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.



Mining Machinery.
N. B.—Special attention is invited to the goods advertised and illustrated in the advertising pages of the ENGINEERING AND MINING JOURNAL, quotations and discounts upon which would only mislead buyers.

Price-lists and other information may be obtained by addressing the advertisers direct, or by writing to the ENGINEERING AND MINING JOURNAL.

Concentrating Machinery.
Fort Scott Foundry & Machine Works Co.
Blake Improved Crusher: 10x7, weight 7,500; \$410.00.
Blake Improved Crusher: 15x3, 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, \$800. Discount, 10 per cent.
Automatic working Jig Machines, all complete, woodwork included, with slidemotion: 2 sieves, \$310; 3 sieves, \$360; 4 sieves, \$450.
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 Kittinger Percussion Tables, all the iron parts, \$350. Double Kittinger 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 weight 1/2 3/4 1 1 1/2 2 2 1/2 3 4	
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	

O. H. Swedes.
Price, same as Swedes.
Swedes steel tacks same list price as iron.
Discounts, 72%, 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 22 24 28 32 36
60 70 80 90 1.00 1.10 1.20 1.30 1.40 1.50
1/2 wt. 1 1 1/2 2 2 1/2 3 4 6 8 10
45 50 55 60 65 70 75 80 85 90
12 14 16 18 20 22 24 28 32 36
Full wt. 1.10 1.25 1.40 1.55 1.70 1.85 2.00 2.15 2.30 2.45
80 90 90 1.00 1.10 1.20 1.30 1.40 1.50 1.60
10 12 14 16 18 20 22 24 28 32 36
1.80 2.10 2.40 2.70 3.00 3.30
Discount, 70, 10 and 2%.


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
1.05 1.15
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
1/2 wt. 4 6 8 10 12 14 16 18 20
50 55 60 75 85 1.00 1.10
18 20 22 24
1.20 1.35 1.45 1.60
1/2 wt. 4 6 8 10 12 14 16 18 20
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%, 10 and 2%.

Finishing Nails.
Inch. 3/8 4/8 4/8 5/8 5/8 6/8 6/8 7/8 1
Per lb. 43 40 32 28 26 24 22 20 18
1/2 and larger.
16
Discount, 60, 10 and 2%.
Chair Nails.
Doz. 1/2 wt.; doz. full wt.; pound B. or P.
Inch. 3/4 3/8 4/8 4/8 5/8 5/8 6/8 6/8 7/8
Per lb. 51 43 35 31 29 27 25 23
1 1/2 1 1/2
21 19
Discount, 60, 10 and 2%.
Common and patent brads.
Price per doz. Price per doz. Price per lb. in papers or bulk.
1/2 wt. full wt.
2-8..... .50 1.00 1.25
3-8..... .60 1.20 .80
4-8..... .65 1.30 .85
5-8..... .72 1.44 .98
6-8..... .80 1.60 .95
7-8..... .90 1.80 .95
1..... 1.00 2.00 .95
1 1/2..... 1.12 2.24 .95
1 1/4..... 1.26 2.52 .95
1 1/2..... 1.82 3.64 .95
1 3/4..... 2.25 4.50 .95
2..... 2.43 4.86 .95
Discount, 60, 10 and 2%.

Oils.
LUBRICATING.—Fiske Bros.
Lubrolaine A cylinder oil 50 in. barrels.
Lubrolaine D cylinder oil 40 in. barrels.
Lubrolaine A machine oil 45 in. barrels.
Lubrolaine B machine oil 35 in. barrels.
Lubrolaine A engine oil 50 in. barrels.
Lubrolaine B engine oil 40 in. barrels.
In cases 50 gal. extra.

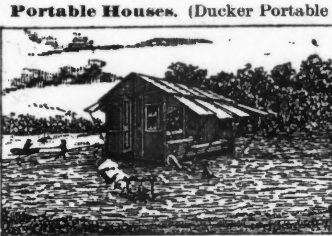
Crescent Axle Grease.—Barrels, 3c per lb.; 100-lb. kegs, 3 1/2c lb.; 2-lb. decorated tins, \$12, gross less 5 per cent.
Texas Star Axle Grease.—Barrel, 2 1/2c per lb.; 100-lb. kegs, 3c per lb.
See Axle Grease, page 2.

Oil Stoves.
Burns 8 hours; holds 1 quart.
Nickel plated crown plate, per doz. \$12.



Packing. Hine & Robertson.
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 5%.
With canvas core, 50 cents per lb. Dis., 30 and 5%.
See Rubber Packing, page 7.


Portable Houses. (Ducker Portable House.)
Weight, 450 lbs.
Price, \$150.
Closes securely.
Dis., 10%.




Weight, 85 lbs. per section.
Price, \$220.
Dis., 10%.
No. 10.—26 x 33 ft., including veranda and rear extension. Main part, 19 x 26 ft. \$500.00



Post Hole Diggers.
Chieftain Hay Rake Co.
Little Giant..... \$36.00 doz 11 cu ft.
Hercules..... 30.00 " " "
New Champion.... 20.00 " " "
Scheidler..... 36.00 " " "
Dis. 40% f.o.b. New York or Boston.



Press.
Combined press for cutting, forming, horning and seaming.
Particulars of flat front presses, including beds, slides, bolsters, plates, etc.
Prices are net, delivered on steamers in New York, including insurance, etc.



Nominal size of press.....	41	42	43	44	450
Price, including etc. ceteras.....	\$130	\$200	\$260	\$420	\$600
Weight, about..... lbs	600	1050	1900	3600	7200
Greatest diameter that can be wired..... ins	5	7	10	14	20
Greatest depth that can be wired..... ins	8	10	13	16 1/2	20
Hole through bed—circle intersecting..... ins	4 1/2	6	8 1/2	12	17
Hole through back—width..... ins	8	9 1/2	12	15 1/2	20 1/2
Width between die clamps—clear..... ins	8	11	15	20	27
Distance back from center of slide bar..... ins	4 1/2	5 1/2	7	9	12
Height to slide-bar, when up..... ins	5 1/2	6 1/2	7 1/2	9 1/2	9
Stroke of slide-bar..... ins	1	1 1/4	1 1/2	1 3/4	2
Adjustment of slide-bar..... ins	1	1 1/4	1 1/2	1 3/4	2
Diameter of fly-wheel..... ins	20	26	32	38	44
Width of fly-wheel..... ins	3	4	5	6	7
Weight of fly-wheel, about..... lbs	125	250	420	725	1100
Speed per minute, about..... rev	120	110	100	90	80
Cubic feet boxed, about.....	30	40	50	60	70

Printers' Sundries.
Vanderburgh, Wells & Co. And Liberty Machine Works.
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.

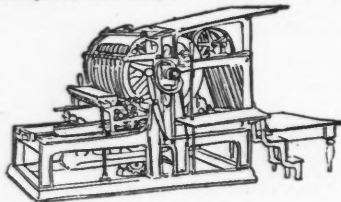


GAUGE PINS—ALL SIZES. Brass, 40c. doz. Steel, 60c. doz. Wire, 25c. doz. Golden, 40c. doz.

MITRE BOXES. Regular size, 2 in., 50c. each. Extra size, 3 1/2 in., 75c. each.



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.

No. 5-29 x 42 24 x 40.....\$1,200 6-33 x 47 28 1/2 x 45.....1,300 7-37 x 51 33 x 49.....1,600

THE "LIBERTY" JOB PRINTING PRESS.

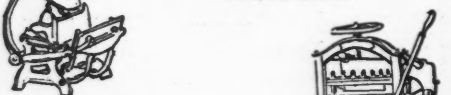
Table with columns for size of chase and price. Includes items like No. 2-7 x 11, 2a-9 x 13, etc.

Two sizes built extra strong for boxmakers, embossing, 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 columns for size and price. Includes items like No. 5-4 x 6, 7-6 x 9, etc.

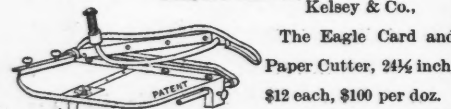


THE "LIBERTY" PAPER CUTTER.

Cuts 30 inches.....\$140.00 Extra knife..... 18.80 Dis., 12% and 5%.

THE "LIBERTY" IMPOSING TABLES

Table with columns for size and price. Includes items like Marble top, Slate Top, No. 1-24 x 36, etc.



The Eagle Card and Paper Cutter, 24 1/2 inch, \$12 each, \$100 per doz.

THE "LIBERTY" TYPE CABINETS.

Table with columns for number of cases, flat, galley, and grained prices. Includes items like No. 1-24 x 36, 2-32 x 48, etc.

Table with columns for Pine, Cherry, Napanoch, Walnut, Galley, Flat, and prices. Includes items like 12 1/2, 16 1/2, 18 1/2, etc.

THE "LIBERTY" CASE STANDS AND RACKS.

Table with columns for stands and racks, including single, double, and triple cases with various rack configurations.

Table with columns for Case Racks, including inches, high, price, back, and sides.

THE "LIBERTY" GALLEYS.

Table with columns for size and price. Includes items like Single, 3 3/4 x 23 1/2 inside, etc.

SMOOTH LINED NEWS GALLEYS.

Table with columns for size and price. Includes items like Single col., Double col., etc.

SCREW GALLEYS.

Table with columns for size and price. Includes items like Single column, Double column, etc.

SMOOTH LINED JOB GALLEYS.

Table with columns for size and price. Includes items like 6 x 10, 8 1/2 x 13, etc.

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.

Table with columns for size and price. Includes items like Zinc bottom, Brass bottom, etc.

GALLEYS RACKS.

Table with columns for size and price. Includes items like 6 x 10, 8 1/2 x 13, etc.

THE "LIBERTY" TYPE CASES.

Table with columns for name, measurements, and price. Includes items like Full size, Rooker size, etc.

Without Pat. Clasp. With Pat. Clasp. News, full, per pair.....\$1.60 \$1.75

Table with columns for name, measurements, and price. Includes items like Rooker, German, Music, etc.

Table with columns for Name, Without pat. clasps, and With pat. clasps. Includes items like Galley lower, full size, Enlarged Yankee job, etc.

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" MALLETS. 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

THE "LIBERTY" PLANERS AND PROOF PLANERS. Midget planer.....10c. Small Maple.....20c. Large.....25c. b'ked with leather.....30c. Midget.....12c. Proof planer, faced with cloth, 50c. Dis., 40%.

COMPOSING STICKS. GROVER'S PATENT AND UNION. Screw or News. 6 in., 1.10......90 8 " 1.20.....1.10 10 " 1.40.....1.20 12 " 1.60.....1.40 14 " 1.80.....1.60 16 " 2.00.....1.80 18 " 2.20.....2.00 20 " 2.40.....2.20

THE "LIBERTY" COMPOSING STICKS. Grover. 6 in., Steel.....\$.90 16 in., Steel.....\$1.80 8 " 1.00 18 " 1.20 10 " 1.20 20 " 1.40 Extra Clasp......10 12 " 1.60 Extra Knee......40 14 " 1.80 Screw......40

6 in., Steel.....\$.75 16 in., Steel.....\$1.45 8 " .80 18 " 1.00 10 " 1.00 20 " 1.20 12 " 1.15 Extra Knee......30 14 " 1.30 " Screw and Nut......10

Dis., 40%. 6 in., Steel.....\$1.00 6 in., German Silver.....\$1.50 8 " 1.10 8 " Extra Screw and Nut......175

Other Sizes to Order. Dis., 40%. 6 in., Steel.....\$1.00 6 in., German Silver.....\$1.50 8 " 1.10 8 " Extra Screw and Nut......175

Dis., 40%. 6 in., Steel.....\$1.00 6 in., German Silver.....\$1.50 8 " 1.10 8 " Extra Screw and Nut......175

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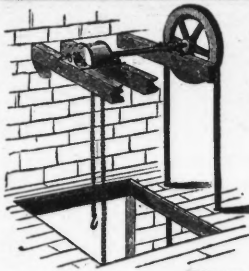
Dis., 40%. 6 in., Steel.....\$1.00 6 in., German Silver.....\$1.50 8 " 1.10 8 " Extra Screw and Nut......175

Dis., 40%. 6 in., Steel.....\$1.00 6 in., German Silver.....\$1.50 8 " 1.10 8 " Extra Screw and Nut......175

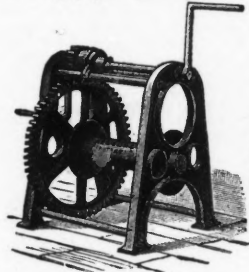
Dis., 40%. 6 in., Steel.....\$1.00 6 in., German Silver.....\$1.50 8 " 1.10 8 " Extra Screw and Nut......175

Dis., 40%. 6 in., Steel.....\$1.00 6 in., German Silver.....\$1.50 8 " 1.10 8 " Extra Screw and Nut......175

Dis., 40%. 6 in., Steel.....\$1.00 6 in., German Silver.....\$1.50 8 " 1.10 8 " Extra Screw and Nut......175



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.
 Each.
 21. \$35.00
 22. 45.00
 23. 65.00
 25. 100.00

Pumps.

Prices on all pumps include cylinders.

No.	Dia.	Cyl.	Suction stroke.	Cap. Iron.	Brass cyl.
0	2 1/2 in.	1 in.	1-15 gal.	\$3.50	.....
1	2 1/2 in.	1 in.	1-12 " "	4.00	\$6.00
2	2 3/4 in.	1 1/4 in.	1-11 " "	4.50	7.00
3	2 3/4 in.	1 1/4 in.	1-10 " "	5.00	8.00
4	3 in.	1 1/2 in.	1-6 " "	5.50	10.00
5	3 1/4 in.	2 in.	1-5 " "	6.50	14.00
6	3 1/2 in.	2 1/2 in.	1-4 " "	8.00	18.00
7	4 in.	2 1/2 in.	1-3 " "	12.00	20.00

Dis., 65%.

No.	Dia.	Cyl.	Suction stroke.	Cap. Iron.	Brass cyl.
1	2 1/2 in.	1 1/4 in.	1-10 gal.	4.25	.....
2	3 in.	1 1/2 in.	1-7 " "	4.75	.....
3	3 1/4 in.	1 3/4 in.	1-5 " "	5.25	.....
4	4 in.	2 in.	1-4 " "	5.75	.....
5	4 1/2 in.	2 1/2 in.	1-3 " "	6.25	.....

Dis., 70%.

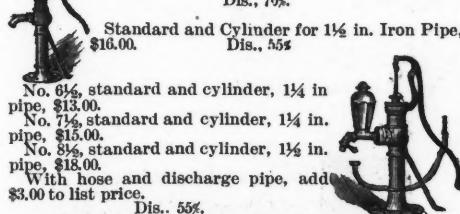
Standard and Cylinder for 1 1/2 in. Iron Pipe, \$16.00. Dis., 55%.

No. 6 1/2, standard and cylinder, 1 1/2 in. pipe, \$13.00.
 No. 7 1/2, standard and cylinder, 1 1/2 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 1/4 in. Price, iron, \$12.50; brass cyl., \$17.50.
 No. 2, diam. cyl., 3 in.; cap. stroke, 1-6 gal.; size pipe, 1 1/4 or 1 1/2 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., \$38.00.
 No. 2, diam. cyl., 4 in.; suction, 1 1/2 in.; cap. stroke, 1-2 gal. Price, iron, \$32.00; brass cyl., \$40.00.
 No. 3, diam. cyl., 5 in.; suction, 2 in.; cap. stroke, 6-7 gal. Price, iron, \$35.00; brass cyl., \$40.00.
 No. 4, diam. cyl., 6 in.; suction, 2 1/2 in.; cap. stroke, 1-5 gal. Price, iron, \$45.00; brass cyl., \$120.00.
 Dis., 45%.



Dis., 55%.

No. 1, diam. cyl., 2 1/2 in.; cap. stroke 1-8 gal.; size pipe, 1 1/4 in. Price, iron, \$12.50; brass cyl., \$17.50.
 No. 2, diam. cyl., 3 in.; cap. stroke, 1-6 gal.; size pipe, 1 1/4 or 1 1/2 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., \$38.00.
 No. 2, diam. cyl., 4 in.; suction, 1 1/2 in.; cap. stroke, 1-2 gal. Price, iron, \$32.00; brass cyl., \$40.00.
 No. 3, diam. cyl., 5 in.; suction, 2 in.; cap. stroke, 6-7 gal. Price, iron, \$35.00; brass cyl., \$40.00.
 No. 4, diam. cyl., 6 in.; suction, 2 1/2 in.; cap. stroke, 1-5 gal. Price, iron, \$45.00; brass cyl., \$120.00.
 Dis., 45%.

No.	Diam. cyl.	Cap. stroke.	Stroke.	Pipe.	Price.
0	2 in.	1-11 gal.	7 in.	1 1/4 in.	\$21.50
1	2 1/4 in.	1-5 " "	7 " "	1 3/4 " "	23.00
2	2 3/4 in.	1-3 " "	7 " "	1 7/8 " "	25.25
3	3 in.	1-2 " "	7 " "	1 7/8 " "	27.25
4	3 1/4 in.	1-2 " "	7 " "	2 " "	30.50
5	3 1/2 in.	1-2 " "	7 " "	2 " "	37.50
6	4 in.	1-2 " "	10 " "	2 1/2 " "	44.00
7	4 1/2 in.	1-2 " "	10 " "	2 1/2 " "	47.00
8	5 in.	1-2 " "	10 " "	3 " "	50.00

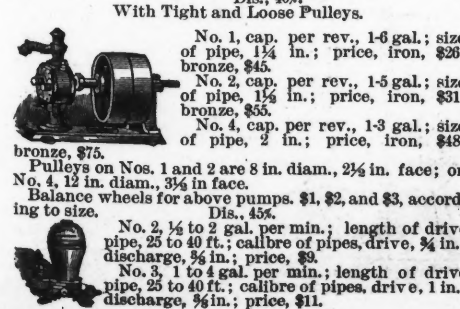
Dis., 40%.

With Tight and Loose Pulleys.

No. 1, cap. per rev., 1-6 gal.; size of pipe, 1 1/4 in.; price, iron, \$26; bronze, \$45.
 No. 2, cap. per rev., 1-5 gal.; size of pipe, 1 1/2 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, 3/4 in.; discharge, 1/2 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, 3/4 in.; price, \$11.



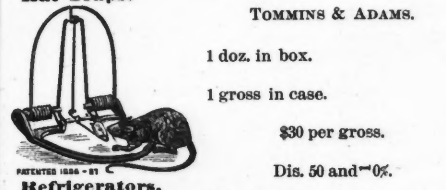
No. 4, 2 to 8 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive 1 1/2 in.; discharge 1/2 in.; price, \$14.
 No. 5, 3 to 14 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive 2 in.; discharge 1 in.; price, \$22.
 No. 6, 4 to 25 gal. per min.; length of 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.
 A. C. McEWEN.



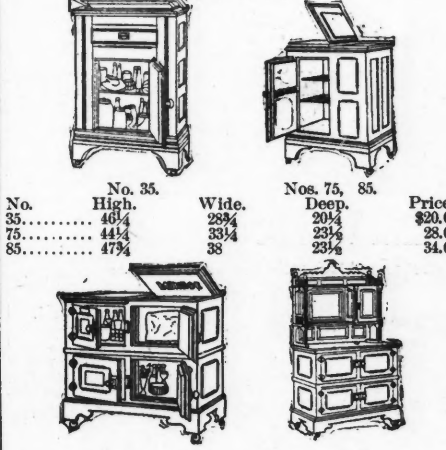
Cars.	Gauge.	Cap.	Net	Cap.	Net	Cap.	Net
Side Dumping End	24"	1 c. y.	\$55	2 c. y.	\$65	3 c. y.	\$75
Revolving "	"	"	55	"	80	"	75
Bottom "	"	"	70	"	90	"	100
Tunnel "	"	"	55	"	65	"	75
Mine "	"	"	50	"	60	"	70
Plantation "	30"	"	43	"	43	"	43
Logging "	36"	"	170	"	170	"	170
Hand "	4' 3 1/2"	"	45	"	45	"	45
Push "	4' 3 1/2"	"	40	"	40	"	40
R.R. Construction "	4' 3 1/2"	"	60	"	60	"	60
Carts.	4' 3 1/2"	"	45	"	45	"	45
Plantation and Railroad Wagons.	"	"	45	"	45	"	45
McEwen Patent Dumping "	"	1 "	175 1/2	"	200	"	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. TOMMINS & ADAMS.
 1 doz. in box.
 1 gross in case.
 \$30 per gross.
 Dis. 50 and 70%.



Refrigerators. Indurated Fibre and Stoneware-Lined.



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. Thompson Mfg. Co. 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, " "	4.35
No. 28, " "	4.00
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. 4.10
 Sizes, 24 x 12 = 115 to sq., 650 lbs. weight.
 Sizes, 20 x 10 = 170 to sq., 650 lbs. weight.

Sash Chains. Phosphor Bronze Smelting Co.
 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 75 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 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
 " " " " " " with " " " " 11.50
 " 8 " " 20 lbs., 12 in. " " " " 12.50
 " " " " " " " " " " 13.50

Tea Scales—All Seamless Scoops.
 Capacity. Scoop. Capacity. Scoop.
 1/4 oz. to 10 lbs. Tin .. \$3.00 1/4 oz. to 10 lbs. Brass .. 9.00
 Druggists.

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 1/2 oz. to 4 lbs., tin scoop, \$3.50;
 brass scoop, \$7.50.
 No. 2 1/2, capacity 1/2 oz. to 18 lbs., tin scoop, \$11; brass scoop, \$12.50.

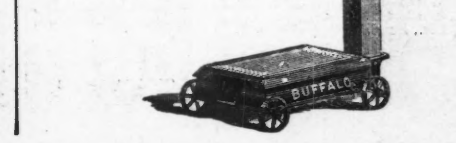


Capacity. Scoop. Counter. Capacity. Scoop.
 1/2 oz. to 36 lbs. Tin .. \$10.00 1/2 oz. to 36 lbs. Brass .. \$12.00
 Grocer.
 Capacity. Scoop. Capacity. Scoop.
 1/2 oz. to 62 lbs. Tin .. \$12.00 1/2 oz. to 62 lbs. Brass .. \$14.00
 Meat or Butter Scales, with Slab.
 1/2 oz. to 62 lbs., with Single Beam \$14.00
 Double " 15.00

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

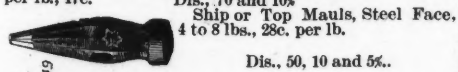




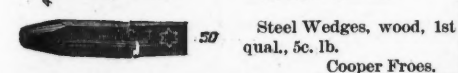
Stone Axes, Cast Steel.
All sizes, 50c. per lb.
Dis., 70 and 10%.



Five lbs. and over, 49c.; 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%.

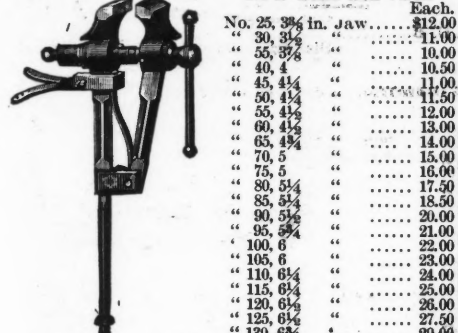


Steel Wedges, wood, 1st qual., 5c. lb.



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

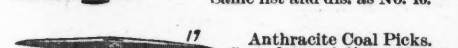
Discount, 60%
60 days, 2% 10 days.



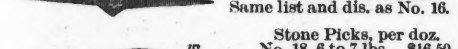
No. 1. Solid Box Vises.
Each.
No. 25, 3 3/4 in. Jaw..... \$12.00
" 30, 3 1/2 " " " " 11.00
" 35, 3 1/2 " " " " 10.00
" 40, 4 " " " " 10.50
" 45, 4 1/4 " " " " 11.00
" 50, 4 1/4 " " " " 11.50
" 55, 4 1/2 " " " " 12.00
" 60, 4 1/2 " " " " 13.00
" 65, 4 3/4 " " " " 14.00
" 70, 5 " " " " 15.00
" 75, 5 " " " " 16.00
" 80, 5 1/4 " " " " 17.50
" 85, 5 1/4 " " " " 18.50
" 90, 5 1/2 " " " " 20.00
" 95, 5 1/2 " " " " 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

No. 135, 6 3/4 in. Jaw.....	Each. \$31.50	No. 170, 7 1/4 in. Jaw.....	Each. \$44.50
" 140, 7 " " " "	33.00	" 180, 8 " " " "	47.00
" 145, 7 " " " "	35.00	" 190, 8 " " " "	53.00
" 150, 7 " " " "	36.00	" 200, 8 " " " "	56.00
" 160, 7 1/4 " " " "	41.50		

Dis., 60 and 10%.



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%.

No.	Weight, 2 lbs.	Per doz.
16	2 1/4	\$8.50
16	2 1/2	9.00
16	3	9.50
16	3 1/4	10.00
16	4	10.50
16	4 1/4	11.00
16	5	11.50
16	5 1/4	12.00
16	6	12.50
16	6 1/4	13.00
16	7	14.00

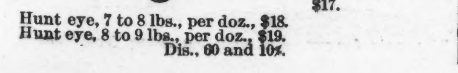
Packages charged at cost. Dis., 60%.

No.	Surface.	No.	Drifting.	No.	Poll.	per doz.
19	No. 1, 4 lbs.	19	No. 1, 3	21	No. 1, 3 1/4	\$14.00
19	No. 2, 4 1/4	19	No. 2, 4	21	No. 2, 4	15.00
19	No. 3, 5	19	No. 3, 4 1/4	21	No. 3, 4 1/4	16.00
19	No. 4, 5 1/4	19	No. 4, 5	21	No. 4, 5	17.00
19	No. 5, 6	19	No. 5, 6	21	No. 5, 6	18.00
19	No. 6, 6 1/4	19	No. 6, 6 1/4	21	No. 6, 6 1/4	19.00
19	No. 7, 7	19	No. 7, 7	21	No. 7, 7	20.00
20	No. 1, 3	20	No. 2, 4	21	No. 2, 4	12.50
20	No. 2, 4	20	No. 3, 4 1/4	21	No. 3, 4 1/4	14.00
20	No. 3, 4 1/4	20	No. 4, 5	21	No. 4, 5	15.00
20	No. 4, 5	20	No. 5, 6	21	No. 5, 6	16.00
20	No. 5, 6	20	No. 6, 6 1/4	21	No. 6, 6 1/4	17.50
21	No. 1, 3 1/4	21	No. 2, 4	21	No. 2, 4	15.00
21	No. 2, 4	21	No. 3, 4 1/4	21	No. 3, 4 1/4	16.00
21	No. 3, 4 1/4	21	No. 4, 5	21	No. 4, 5	17.00
21	No. 4, 5	21	No. 5, 6	21	No. 5, 6	18.50
21	No. 5, 6	21	No. 6, 6 1/4	21	No. 6, 6 1/4	20.00
21	No. 6, 6 1/4	21		21		21.50

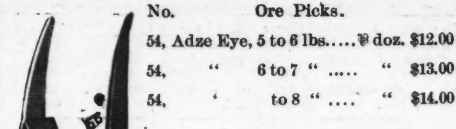
Dis., 60, 10 and 5%.



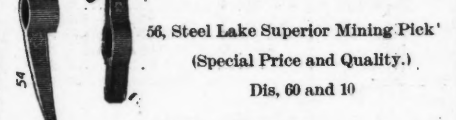
Tamping Picks.
Adze eye, 6 to 7 lbs., per doz., \$17.
Adze eye, 7 to 8 lbs., per doz., \$18.
Adze eye, 8 to 9 lbs., per doz., \$19.
Adze eye, 6 to 7 lbs., per doz., \$17.



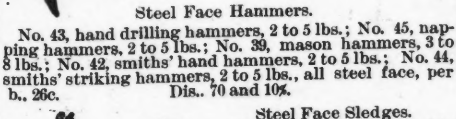
Hunt eye, 7 to 8 lbs., per doz., \$18.
Hunt eye, 8 to 9 lbs., per doz., \$19.
Dis., 60 and 10%.



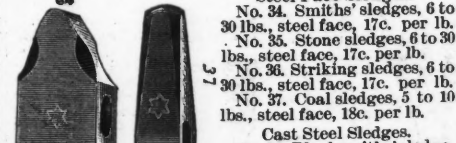
Ore Picks.
54, Adze Eye, 5 to 6 lbs. doz. \$12.00
54, " 6 to 7 " " " " \$13.00
54, " to 8 " " " " " \$14.00



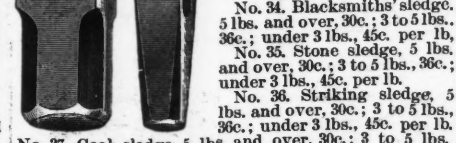
56, Steel Lake Superior Mining Pick (Special Price and Quality.)
Dis., 60 and 10



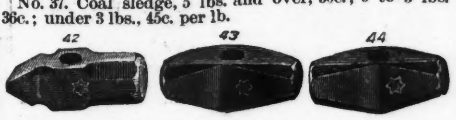
Steel Face Hammers.
No. 43, hand drilling hammers, 2 to 5 lbs.; No. 45, napping hammers, 2 to 5 lbs.; No. 39, mason hammers, 3 to 8 lbs.; No. 42, smiths' hand hammers, 2 to 5 lbs.; No. 44, smiths' striking hammers, 2 to 5 lbs., all steel face, per lb., 26c.
Dis., 70 and 10%.



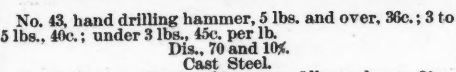
Steel Face Sledges.
No. 34, Smiths' sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 35, Stone sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 36, Striking sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 37, Coal sledges, 5 to 10 lbs., steel face, 18c. per lb.



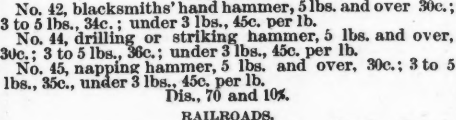
Cast Steel Sledges.
No. 34, Blacksmiths' sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 35, Stone sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 36, Striking sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.



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, 30c.; 3 to 5 lbs., 40c.; under 3 lbs., 45c. per lb.
Dis., 70 and 10%.



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 Pinch
Round Point.
15c. lb., net.
Track Wrench.
7 3/4 c. lb., net.



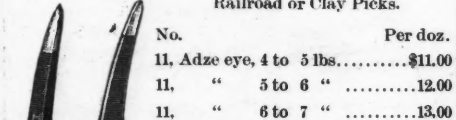
Rail Fork.
9c. lb., net.



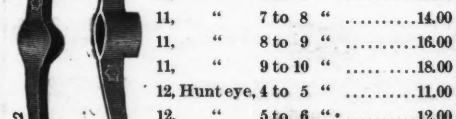
Crow Bars, Wedge Points, 3/4 c. lb., net.
Pinch Point, 3/4 c. lb., net.



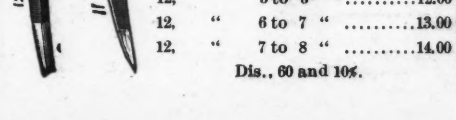
65 Tamping Bar, 6c. lb., net.



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. Per doz.
11, Adze eye, 4 to 5 lbs. \$11.00
11, " 5 to 6 " " " " 12.00
11, " 6 to 7 " " " " 13.00
11, " 7 to 8 " " " " 14.00
11, " 8 to 9 " " " " 16.00
11, " 9 to 10 " " " " 18.00
12, Hunt eye, 4 to 5 " " " " 11.00
12, " 5 to 6 " " " " 12.00
12, " 6 to 7 " " " " 13.00
12, " 7 to 8 " " " " 14.00
Dis., 60 and 10%.



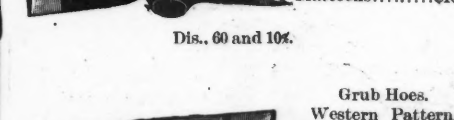
Mattocks—Price per doz.
2, Adze Eye, Long Cutter, 6 lbs., \$16.00
3, Adze Eye, Short Cutter, 5 1/2 lbs., \$15.50
2, Adze Eye, Long Cutter, Light, \$15.00
3, Adze Eye, Short Cutter, Light, \$15.00
4, Hunt Eye, Long Cutter, 6 lbs., \$16.00
5, Hunt Eye, Short Cutter, 5 1/2 lbs., \$15.50.



Adze Eye Pick Mattocks..... \$16.



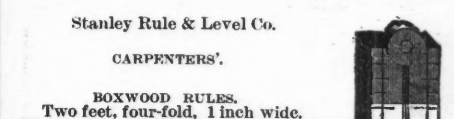
Hunt Eye Pick Mattocks..... \$16



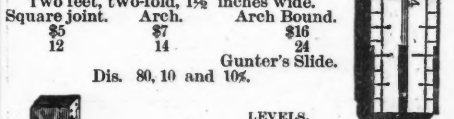
Grub Hoes.
Western Pattern, No. 0, 3 lbs., doz., \$10.50
Western Pattern, No. 1, 3 1/2 lbs., doz., \$11.
Western Pattern, No. 2, 4 lbs., doz., \$11.50
Western Pattern, No. 3, 4 1/2 lbs., doz., \$12.
Baltimore Pattern, No. 1, 3 1/2 lbs., doz., \$11.
Baltimore Pattern, No. 2, 4 1/2 lbs., doz., \$11.75
Baltimore Pattern, No. 3, 5 lbs., doz., \$12.75
Baltimore Pattern, No. 4, 5 1/2 lbs., doz., \$13.75.
Dis., 60 and 10%.



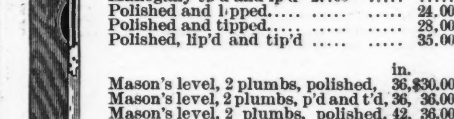
Stanley Rule & Level Co. CARPENTERS' BOXWOOD RULES.
Two feet, four-fold, 1 inch wide.
Plate. Middle. Edge. Bound.
Round joint..... \$4 \$7 \$15
Square " " " 5 \$7 \$15
Arch " " " 6 8 16



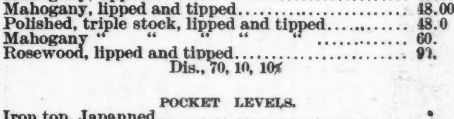
Two feet, four-fold, 1 1/2 inches wide.
Plate. Middle. Edge. Bound.
Square joint..... \$7 \$9 \$18
Arch " " " 9 11 20



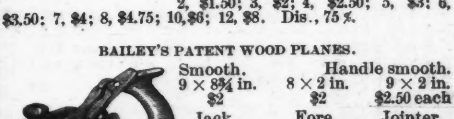
Two feet, two-fold, 1 1/2 inches wide.
Square joint. Arch. Arch Bound.
\$5 \$7 \$16
12 14 24
Dis. 80, 10 and 10%.



Gunter's Slide.
Dis. 80, 10 and 10%.



LEVELS.
10 to 18 to
16 in. 24 in.
Arch top plate, 2 side views. \$9.00 \$12.00



PLUMBS AND LEVELS.
Arch top plate, 2 side views.
12 to 18 to 24 to
18 in. 24 in. 30 in.
Polished..... \$14.00 \$16.00 \$18.00
Mahogany..... 16.50 22.50
Mahogany tp'd and lp'd 27.00
Polished and lipped..... 24.00
Polished and tipped..... 28.00
Polished, lipped and tipped..... 35.00



Mason's level, 2 plumbs, polished, 36, \$30.00
Mason's level, 2 plumbs, p'd and l'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..... 43.00
Polished, triple stock, lipped and tipped..... 45.0
Mahogany..... 60.
Rosewood, lipped and tipped..... 97.
Dis., 70, 10, 10%

POCKET LEVELS.
Iron top, Japanned..... 5.
Brass top..... 3.00
Dis., 70, 10, 10%.

SCREWDRIVERS.
Varnished handles, pat. metallic fastening. Size 1 1/2, \$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 smooth.
9 x 3 3/4 in. 8 x 2 in. 9 x 2 in.
\$2 \$2 \$2.50 each
Jack. Fore. Jointer.
15 x 2 1/4 in. 20 x 2 1/2 in. 24 x 2 1/2 in.
\$2.50 \$2.75 \$3.25 each
Dis., 40, 10 and 10%.

