A MECHANICAL COUNTER.

It is apparently a very simple matter to construct a counter, but experience shows that these apparatus are often the cause of a good deal of annoyance. Either the wheels indicating the high numbers stick on their axes by reason of their infrequent movement, or the stroke of the lever is too short and the pawl fails to engage with the ratchet, or the stroke is too long and the lever is bent, or some other trifling accident often intervenes to upset a test which has been conducted with care and at great expense. All these sources of difficulty appear to be avoided in Kaiser's counter, which we illustrate.

In it the axis of all the wheels is moved at each stroke, and the length of stroke of the lever is almost immaterial. Provided it moves over an arc of about 60 degrees, it will turn the number wheels satisfactorily, and if it swing the whole 360 degrees, the result is just the same. It is perfectly immaterial whether the lever reciprocates or whether it rotates steadily either in one direction or the other; in any case the numbers appear in proper rotation, and they are always in line, so that they can be read without effort.

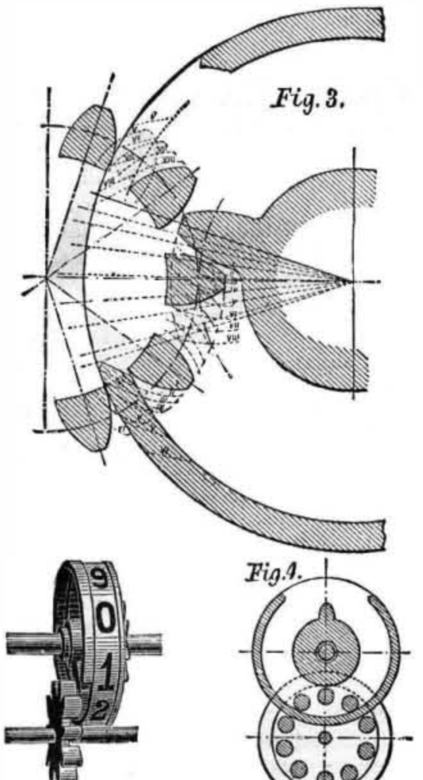


FIG. 2.

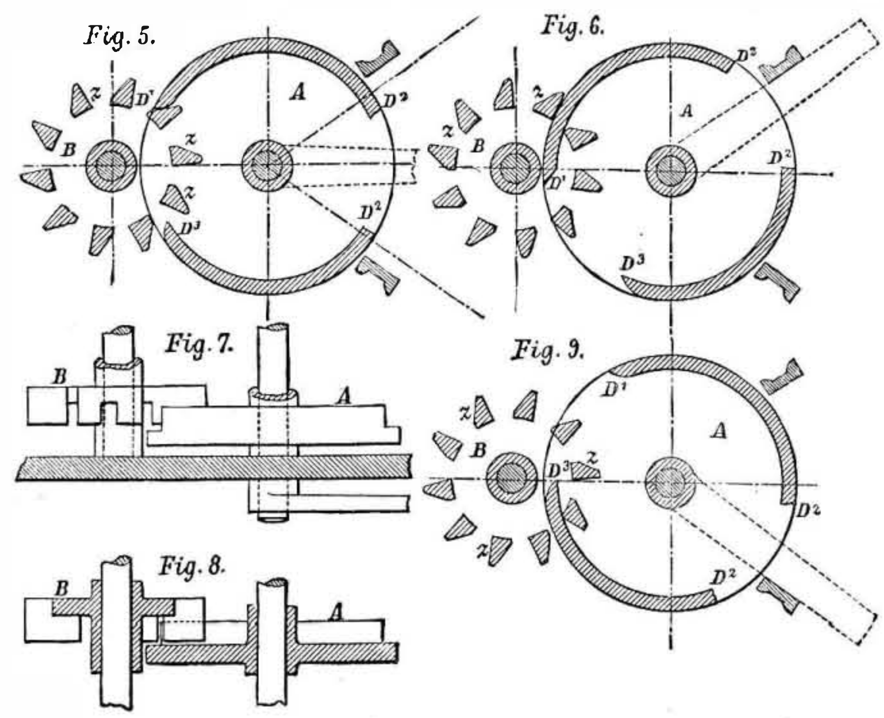
IMPROVED MECHANICAL COUNTER.

Fig. 1 shows a perspective view of one form of this counter laid upon its back, with the case removed to show the mechanism; Fig. 2 is a detached view of a pair of ring or star wheels; Fig. 3 shows the form of both of these wheels; Fig. 4 shows an alternative arrangement; Figs. 5 to 9 show the device by which the motion is communicated to the number train. Referring to Fig. 1, it will be seen that there are two parallel axes, one carrying the number wheels and the other star wheels; these are both of phosphor bronze. The periphery of each number wheel is made in two portions, one bearing the figures, and the other being a plain band, which serves to lock the star wheel. This plain band has a part cut away (Figs. 2 and 3); and at the time the star wheel is to be rotated, this gap comes opposite the wheel, and thus leaves it free to move. At all other times the band presses between one or two pairs of teeth on the star wheel, and so locks the latter fast.

In order that this arrangement may be practicable, the teeth of the star wheel are much wider than the disk upon which they are mounted, and half this width lies inside the rim of the number wheel (Fig. 2). This half gears with the single tooth shown in Fig. 3, and the other half with a ring of teeth cast on the back of the next number wheel (Fig. 2). This being understood, the action is similar to that of other counters. When the first number wheel has made a complete revolution, its single tooth rotates the star wheel one-tenth of a revolution, and this, in turn, rotates the next number wheel one-tenth of a revolution, and so on.

We now come to the means by which the rotation of the engine or shaft, which it is the object of the apparatus to register, is communicated to the first number wheel. A short spindle (Fig. 1) in the end plate of the counter carries at its inner extremity a disk crank with a crank pin in it. This pin works in a slotted lever, and causes the latter to reciprocate, whether the crank be driven round and round, or merely vibrated. Attached to this lever, which is loose on its axis, is an escapement (Figs. 5 and 6), gearing into an escapement wheel fastened to the main axis, upon which all the number wheels ride, the first wheel being fast to it. Figs. 5, 6, and 9 illustrate the escapement in this position, and show that a very large range of motion can be given to it without danger. A and B are the two wheels; D^1 D^2, the two pallets; *z z*, the teeth.

These counters are made in many different forms; the mode of mounting and fixing has been designed to meet every possible case. They are easy to read, strong and durable, while their great simplicity and handiness must insure them a very extensive use. The makers are Messrs. Trier Brothers, 19 Great George Street, Westminster.—*Engineering*.



IMPROVED MECHANICAL COUNTER.

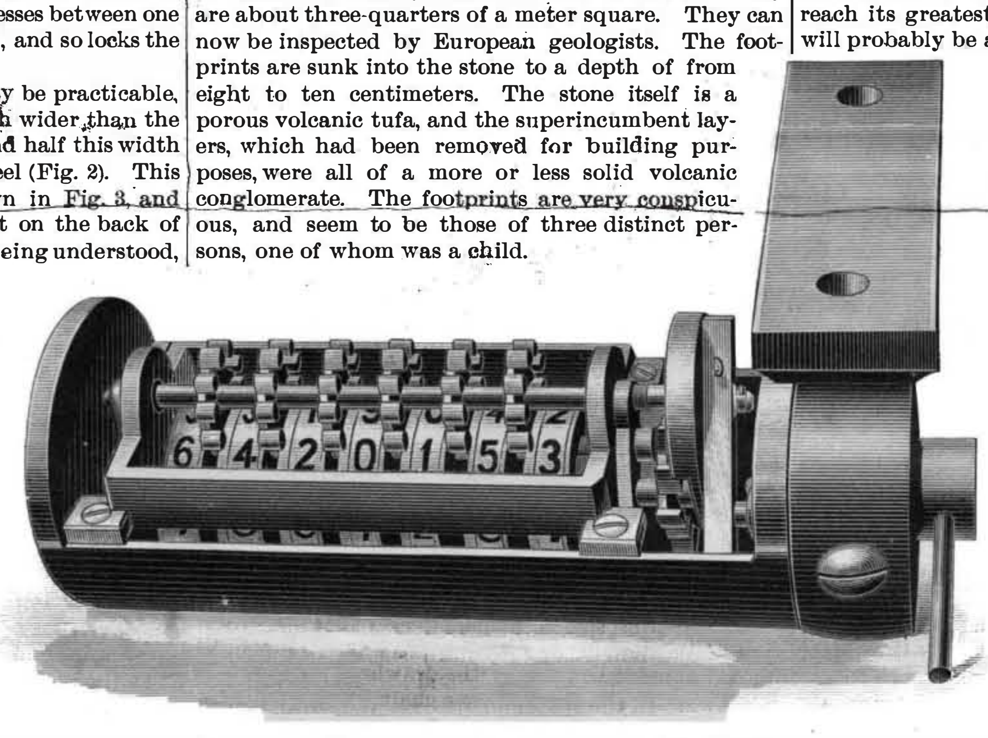


Fig. 1.—IMPROVED MECHANICAL COUNTER.

How She Converted Him.

The *Age of Steel* gives the following account of an experiment of the eight hour system in St. Louis:

Several weeks ago the proprietors of a machine foundry learned that their employes wanted to work under the eight hour rule. The latter were told they might do as they pleased, provided they were willing to accept eight hours' pay for eight hours' work. The proposition was agreed to, and the first day of trial all the men except seven or eight went home early. The next day the number that remained was a little larger, the third day still larger, and so on, until at the end of the week there wasn't a man in the establishment working less than the usual time.

One of the men who experimented with the eight hour rule, in the instance above referred to, tells how he came to change his opinion with regard to long and short time work. We give his story space, because it goes to show what an important factor of the labor problem home influence is. He says: "The second day we tried the eight hour plan I went home and found my wife sitting in the rocking chair, leisurely reading the afternoon paper, and there was not a sign of supper in preparation. Of course, I began to expostulate with her about so unusual a state of affairs; but she made me feel very blank when she looked up and naively remarked that her day's work was over, that she was an 'eight hour man.' The next day I was the last man to leave the shop, and on coming home I found the table spread and the meal waiting me."

Fossil Human Footprints.

Herr H. E. Low has obtained and forwarded to the Imperial Museum in Vienna twelve large stone slabs bearing the footprints discovered last year in the solid rock in the quarry over Lake Managua, in the territory of Nicaragua. The interest was increased by the statement that those footprints had been overlain by eleven different layers of stone, extending to a depth of four meters, and indicating an antiquity for our race quite transcending all conjectures hitherto hazarded. They are about three-quarters of a meter square. They can now be inspected by European geologists. The footprints are sunk into the stone to a depth of from eight to ten centimeters. The stone itself is a porous volcanic tufa, and the superincumbent layers, which had been removed for building purposes, were all of a more or less solid volcanic conglomerate. The footprints are very conspicuous, and seem to be those of three distinct persons, one of whom was a child.

Cost of Lighting Streets.

The city officials of Baltimore have been investigating anew the subject of lighting streets, in order to understand why that city has to pay so much more than other municipalities in this respect. Under the contract made early last year, Baltimore's cost of maintaining street gas lamps was $36.94 for each lamp per annum, burning only on dark nights, and $46.19 if allowed to burn all night. In comparison the following figures are collected, showing the amounts paid in other cities:

New York	$25.00	Rochester	$18.12
Boston	31.85	Richmond	44.00
Washington	22.00	Dayton	21.11
New Orleans	24.00	Jersey City	25.00
Burlington	25.00	Cleveland	17.50
Auburn	17.50	Baltimore	46.19

It may be interesting also to note the amount of lighting facilities which the larger cities possess. New York has 23,038 gas lamps and 647 electric lights; Philadelphia, 13,555 gas lamps; Boston, 9,781 gas lamps and 401 electric lights; and Baltimore 5,191 gas lamps and 243 electric lights.

Fuel Consumption of 156 Horse Power Engine.

At the Bussery & Verdie Works, at Lorette, France, a Corliss engine built by Schneider & Co., of Creusot, has been driving a train for rolling steel wire rods for four years. Some time since, a series of tests was made, continuing over ten days, to ascertain the fuel economy of the engine. The latter has a 26·59 inch cylinder, a 49·2 inch stroke, and makes from 61 to 64 revolutions a minute. Duuring the test, the billets were uniform in size, and the same size of rods was rolled. A series of diagrams, taken with a Richards indicator, showed that the cut-off varied from four-hundredths to one-tenth of the stroke. The indicated horse power was 156; the consumption of water per ton per horse power was 16·75; and the consumption of coal, which had 15 per cent of ash, 2·5 pounds per hour per horse power.

Fabry's Comet.

The students of Johns Hopkins University have been studying the path of the approaching comet, discovered by Fabry, and find that the celestial wanderer will reach its greatest brilliancy on May 2. At that time it will probably be a very conspicuous object in the western sky for some hours after sunset. Their results do not confirm the early conclusions of the German astronomers, who thought as the result of eighteen days' observation that the comet would remain visible all night. During the first half of May, it will set two or three hours after the sun, and later will rapidly disappear.

Paper for Wrapping up Silver.

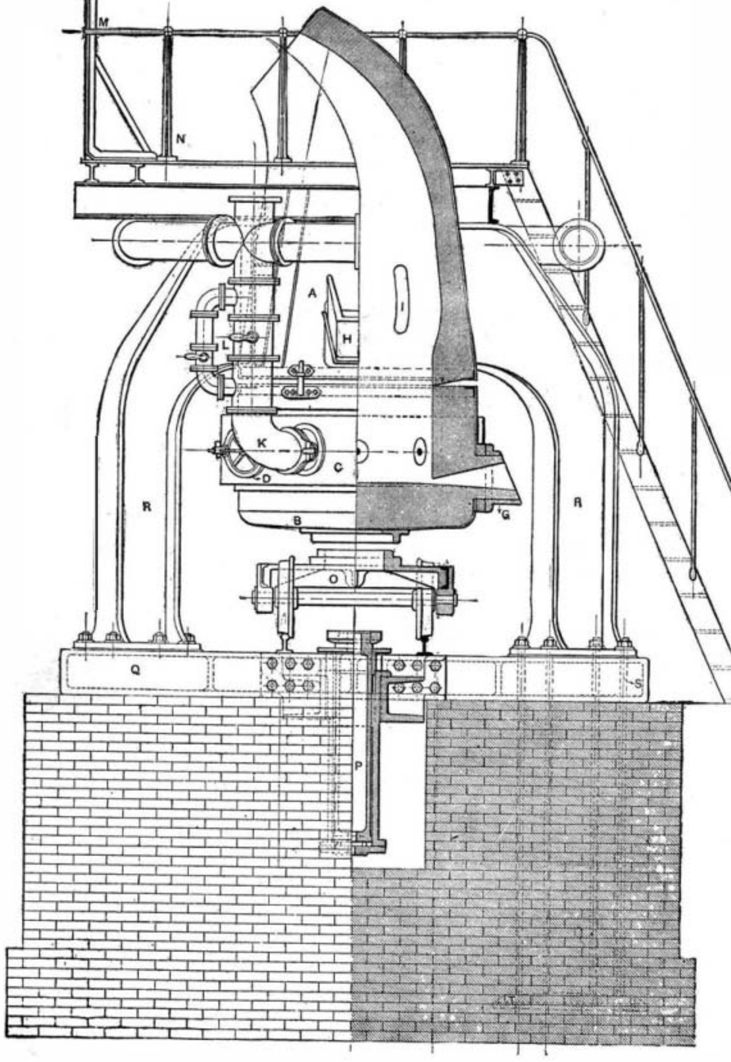
Six parts of caustic soda are dissolved in water until the hydrometer shows 20° B. To this solution are added four parts of oxide of zinc and boiled until dissolved. Sufficient water must next be added to reduce the solution to 10° B. Next dip paper or calico into this solution and dry. This wrapping will very effectually preserve silver articles from being blackened by sulphureted hydrogen, which, as is well known, is contained in the atmosphere of all large cities.

THE CLAPP-GRIFFITHS STEEL PROCESS.

(Continued from first page.)

But in spite of all this, the puddling furnace, though so often doomed to extinction, still remains. And it does so for two reasons. In the first place, it is a cheap affair. It can be built at little expense, and can handle a small output, or by easy duplications a very large one. Its mechanical working is, therefore, under easy control. In the second place—and this is the more important reason—the puddling furnace can produce an iron of high grade from indifferent materials. The operation of puddling eliminates phosphorus to a large extent, and it is this feature of the process which, in spite of its other disadvantages, has kept it in vogue. Recognizing these elements, mechanical puddlers, revolving hearths, and similar devices have been brought forward to remedy the existing defects; but while many of them possess considerable merit, they have hardly succeeded in making the system permanently desirable. The demand still remained for a process combining the advantages of an inexpensive plant and an ability to handle cheap grades of pig iron with the easy manipulations and large output of the Bessemer converter.

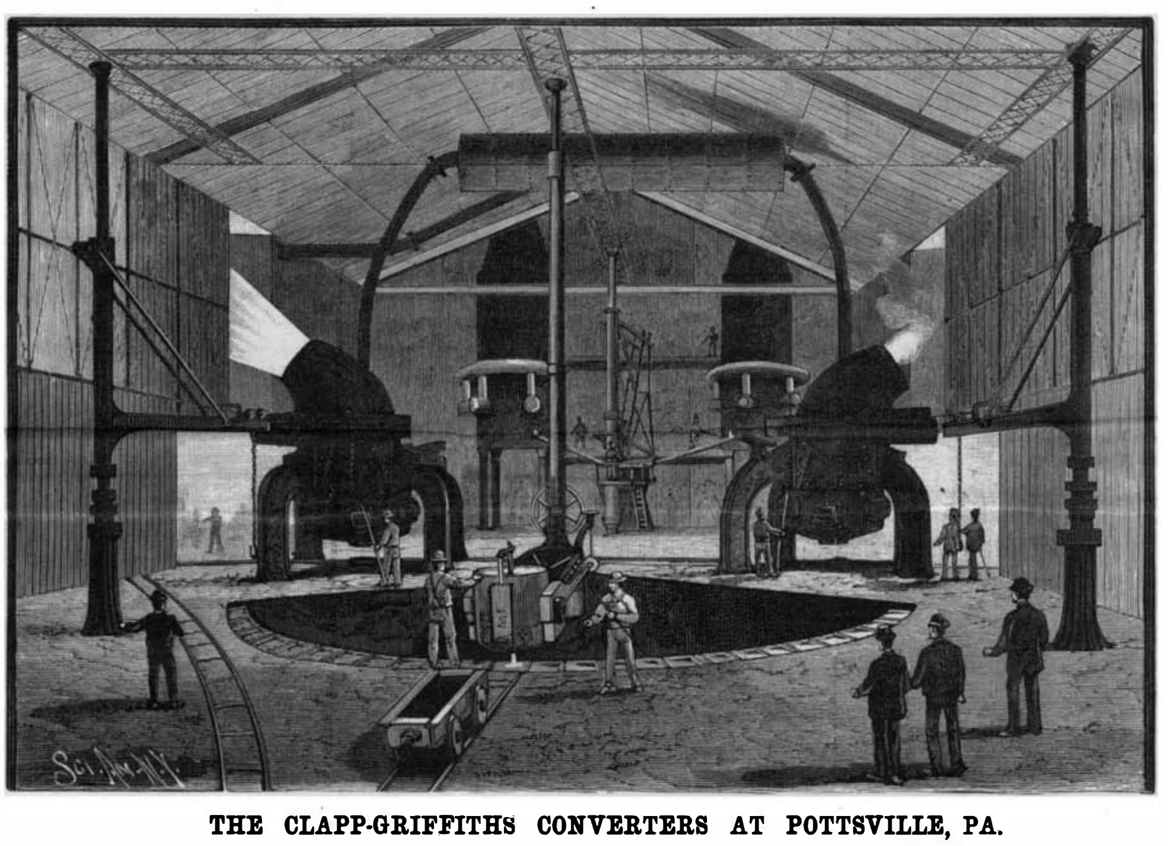
After an experimental run of several months and the practical operations of something more than a year, the Clapp-Griffiths process has so far demonstrated its ability to fulfill these conditions that metallurgists have turned to it as presenting the best answer to this demand which has yet been offered. The Clapp-Griffiths is a pneumatic system, similar in many respects to the Bessemer, and, like it, is an English invention. The principal difference is in the stationary converter, and the tuyeres in the side instead of the bottom. In addition to these features, the Clapp-Griffiths converter has an open slag hole and a charging hole, both in the side, and a tap hole at the bottom. At first sight these differences appear very small, and in one sense retrogressional, for Bessemer's earliest converters were stationary, and were abandoned for the present style of tilting vessels. But when we come to consider the chemistry of the process, it will be seen that these modifications in the construction of the converter are sufficient to so far change the reactions that the product of the new process is distinctive.



SECTION OF CONVERTER AND HYDRAULIC LIFT.

Mr. Griffiths was the engineer in charge of the Gilchrist-Thomas basic process during its experimental stages, while his associate, Dr. Clapp, was a prominent physician in one of the English iron districts. After the consolidation of their interests, the process was submitted to a practical test in Wales. These first plants were small and imperfectly equipped, but the steel they produced had so many admirable qualities that it speedily attracted the attention of American metallurgists.

In the summer of 1883, Messrs. Witherow & Oliver, of Pittsburg, visited Wales, and their personal inspection resulted in the purchase of the American patents. An experimental plant was started in the fall of that year, at the works of Messrs. Oliver Brothers & Phillips. Great difficulty was experienced in finding a suitable lining for the converters, as the fire-clay bricks imported from Stourbridge and Wales burned out almost immediately. Finally, a ganister lining was substituted, with very good results. So many changes, however, became necessary from time to time, more especially in the cranes and other facilities for handling the product, that the plant was not in full practical operation until the spring of 1885.



THE CLAPP-GRIFFITHS CONVERTERS AT POTTSVILLE, PA.

The present plant at Pittsburg consists of two 3-ton converters, and has a capacity of about 125 tons a day. This could be largely increased were the means of handling the ingots with greater facility, at hand. Our first page illustration shows the appearance of these works—the first Clapp-Griffiths plant in America. The pig metal is melted in a cupola furnace, which stands back of the converters, and about 10 feet above the ground level. From this it is tapped into a weighing ladle, which runs on a track alongside the converters. The charging is done through an opening in the side of the converter. The tuyere holes, through which the blast enters, are about 10 inches above the bottom of the converter and 12 inches below the level of the molten iron. At first, only sufficient blast is turned on to keep the metal from entering the tuyeres, but when the converter is fully charged, the blast is allowed to enter the bath under a pressure of six to seven pounds.

The blow lasts about 15 minutes, the general reactions being the same as in the Bessemer converter. First the brown smoke of burning iron is visible at the mouth of the converter. But this is very soon replaced by the brilliant flame caused by the combustion of the carbon in the pig iron. This, after a time, is in turn succeeded by a flame of smaller volume, but more intense heat, the result of the oxidation of the silicon. The end of the reaction is indicated, as in the Bessemer process, by the disappearance of the silicon flame. The metal must be tapped immediately, or the brown smoke of burning iron will again become visible and the metal will be overblown. In the Bessemer process, the steel, being poured instead of tapped, is very apt to suffer a slight oxidation at this stage of the process, because the blast must be kept on until the vessel is horizontal and the molten bath below the level of the tuyere holes. In the Clapp-Griffiths, however, there is less danger of over-oxidation. When the flame shows the decrease immediately preceding the end of the reaction, the blast is almost shut off again and the metal tapped into a ladle. In some forms of the converter, a differential plunger is used to effect this lessening of the blast, but, while generally in use in Great Britain, it is considered of less value in this country. The metal is tapped very quickly, so that only a few seconds elapse before the bath is below the level of the tuyeres and the blast may be turned off. About 1·1 per cent ferro-manganese (76 per cent manganese) is added to the molten iron in the ladle, in order to recarbonize it, and make the product steel.

While the reactions going on in the converter are in general those of the Bessemer process, they differ in degree. There are several points peculiarly characteristic of the Clapp-Griffiths. In the first place, the position of the tuyeres gives an early oxidation of the charge. This is shown in the immediate appearance of the brown smoke of burning iron. It is probable that the almost complete elimination of the silicon, which is characteristic of Clapp-Griffiths metal, is due to this feature of the blow, the oxide of iron formed uniting with the silicon to form a fusible slag. During the blow, limestone is added to furnish a base for the silica. The open slag hole is another distinctive feature of the process. As the metal boils and surges in the converter, a continuous slagging goes on, whereby the greater part of the slag is discharged, instead of being mixed with the metal, as in the Bessemer. These differences in the construction of the converter effect a marked change in the composition of the resulting metal. The well known Bessemer engineer, Captain R. W. Hunt, has made a chemical study of the steel, and his results have attracted wide attention from their unexpected character. The product is a very soft steel, containing only from 0·07 to 0·1 carbon, and the amount of silicon is usually so small as to be undeterminable. The best product is of course made from Bessemer pig, but astonishing results have also been obtained from steel made of cheap, phosphoric pig. Steel containing as much as 0·85 phosphorus gave a tensile strength of over 70,000 pounds, while another carrying 0·55 of this element gave a tensile strength of 79,780 pounds, an elongation of 23·5 per cent, and a reduction of area of 35·5. These qualities appear the more remarkable to us, because phosphorus has always been regarded as the one element above all others to be shunned by the iron master. In this process, however, it is rendered comparatively harmless by the almost total elimination of the silicon, and the low carbon. By careful manipulation, the Bessemer process can produce a steel very low in silicon, but there seems to be little dependence upon the certainty of such a result; but in the Clapp-Griffiths process, in spite of the variations in the composition of the pig iron, the silicon is always eliminated. This is a feature upon which the success of the process largely rests, because it makes it possible to produce a good steel with high phosphorus. The limit to which the phosphorus may be carried with safety has not been determined. In the product of the present works it seldom exceeds 0·3, but Captain Hunt's experiments have shown that a much larger amount can be borne without prejudicing the quality of the heavier products, such as nails, shovels, etc. In introducing this process into America, Messrs. Witherow & Oliver have made a great many improvements, unknown in the original converter. One of the most important of these is the movable bottom, shown in our sectional illustration. When the bottom is burned out, the hydraulic lift directly under it is raised, the bottom removed, and a fresh one put in place, the whole transfer occupying but twelve minutes. Natural gas has proved of great value in allowing a thorough drying of the converter bottoms before being put in place, for upon this depends their length of life. While a few have lasted for 80 and 86 blows, and quite a number for 60, the average life is about 45 blows. The lining of the body of the converter lasts about six months. No salamanders are formed on the sides, as the metal is tapped, in place of being poured. The loss from pig to ingot is about 11 per cent.

The low cost of erecting a Clapp-Griffiths plant is an essential part of the success of the process. It varies, of course, with the locality. Under ordinary circumstances, a two 3-ton converter plant can be put in running order, with all necessary accessories, for from forty-five to sixty thousand dollars. Compared with the hundreds of thousands necessary for the erection of a Bessemer plant, this is a very small sum, and will bring the process within reach of smaller iron works throughout the country. At the present time seven Clapp-Griffiths plants, in addition to the one at Pittsburg, are either in course of construction or have recently been completed. The one at Pottsville, shown in our illustration, has been planned to allow an output of 250 to 300 tons a day. The converters are similar in size and style to those in use at Pittsburg, but the more ample facilities for handling the product will permit a much larger output. At the Oliver Mill, the converters are blown alternately, and are out of blast Saturday afternoon and Sunday. The entire cost from pig iron to ingot steel is here $5 a ton. It was calculated that the cost would be $6 at mills and $4 at blast furnaces where the pig metal could be run directly from the furnace into the converter, and the men formerly employed at the pig bed transferred to the steel department. This, it is thought, will in time largely change the product of our blast furnace plants from pig to steel ingots, dispensing entirely with the puddling process and substituting a soft steel for wrought iron.

At the Pittsburg meeting of the American Institute of Mining Engineers, in the middle of February, the Clapp-Griffiths process was, as at the New York meeting of the year before, one of the chief subjects of discussion. The majority of the metallurgists present were very favorably impressed with what they saw of the operation of the process, and expressed themselves as having great confidence in the important role which it is henceforward to play in American metallurgy. From this verdict a few gentlemen dissented. As the process, however, will soon be in actual operation in at least eight different localities, it will undoubtedly receive extended and careful study, and will be judged from the dispassionate standpoint of whether it is or is not proving a success in the hands of those who have embarked their faith and capital in its practical working. For the present, it is sufficient that the results already obtained encourage a belief in the value of the process and its applicability to the present wants of American iron masters.

Alaska Gold.

A correspondent of the Marquette *Mining Journal* writes glowing reports about the prospects of Alaska as a gold field. He states that the mill on Douglas Island is running to its full capacity, and is turning out bullion at the rate of $100,000 a month, not counting the concentrates, which are rapidly accumulating for the want of sufficient roasters in the chlorination works. The capacity of the mine must not, however, be judged even by the value of both the bullion and concentrates now turned out; it is large enough to supply rock for half a dozen such mills, and the foundations for a second mill of the same size as the one now in operation are already laying. It is estimated that there are at least twenty million tons of quartz above the tunnel level. Concerning the Silver Bay (Fuller) claims, there is nothing new. In the Silver Bay District there are some very rich mines, and all that has been lacking until now has been a reasonable amount of capital to be honestly and judiciously applied in their development. The success of the Douglas Island venture will, it is thought, assure the erection of more stamp mills in Alaska during the next five years than were ever in operation in California and Nevada at one time.

Game Obtained by the Greely Expedition within the Arctic Circle.

In an appendix of Greely's "Three Years of Arctic Service," just published by Messrs. Charles Scribner's Sons, appears the following list of game obtained by the expedition within the Arctic circle in the three years from July, 1881, to June, 1884: One bear, 6 wolves, 32 foxes, 8 ermines, 8 lemmings, 103 musk ox, 57 hares, 35 seals, 84 brent geese, 91 ducks, 702 guillemots, 172 dovekies, 2 ravens, 18 owls, 178 skuas, 12 gulls, 99 ptarmigans, 99 turnstones, 28 knots, 1 sandpiper, 1 sanderling, 21 Arctic terns, 2 gray phalarope, 49 eider ducks, 1 red-throat diver, and 1 salmon. We should have thought the fish caught would have figured for more, especially as one of the illustrations is of Esquimau boys fishing with a line through a hole cut in the ice.

Correspondence.

A Paint to Preserve Ties.

To the Editor of the Scientific American:

I have what I call a "century paint," for posts, railroad ties, etc., made of linseed oil, resin, and charcoal dust. To one gallon of oil put two lb. of resin and enough coal dust to make the mixture the consistency of thick paint. Get the cross ties out of good timber well seasoned. Then dip them about one minute in a large vat of the paint, hot. Wipe off the ties, and they are ready for use. Bore an auger hole in the tie, fill it with the paint, then drive the spike home. I will guarantee *all* the ties treated in this manner to last 20 years. Fifty per cent will last 35 years, and 25 per cent will last 50 years sound. F. M. SHIELDS.

Coopwood, Miss., Jan. 25, 1886.

The Late Mr. Werdermann's Electro Magnetic Drills, Planers, and Lathes.

To the Editor of the Scientific American:

At a late meeting of the Electrical Section of the Franklin Institute, of this city, I made the accompanying statement, the subject matter of which caused some surprise; and as I have never noticed any public mention of it, or of the work having been attempted elsewhere, and as the members of the section could give no solution thereof, I am induced to make the communication to you, for you to make such use of as you may desire, with the view of eliciting from your correspondents, if deemed of sufficient importance, a true solution.

The statement was as follows:

While in London, in 1873-74, on telegraph business, I formed an acquaintance with Mr. Karl S. R. Werdermann (whose late death has recalled some very pleasant hours spent in his company).

On our New Year's Day I received the following note:

"LONDON, 1st January, 1874.

"DEAR MR. CHAPIN:

"I shall be happy to meet you to-morrow (Friday) at 2 o'clock P.M., at your hotel, to go with you to Bermondsey, where you will see some experiments with the magneto electric chucks, which will be, I hope, very interesting to you.

"My best wishes for all your family in the new year. Yours truly,

"R. WERDERMANN." *

The next day, in company with Mr. W. and a party of gentlemen who had also been invited, I visited a large factory at the place named.

On entering, our attention was first directed to a large drilling machine. This was arranged as usual, but the bed plate was cut into two parts, which formed the heads of a large pair of magnets. A piece of iron, about 4 inches thick by 10 wide and long, was placed on the bed plate, and the current being switched on, became firmly secured.

A one-fourth inch drill was then screwed down and the iron drilled through.

No lubrication was used. The particles of iron cut away assembled upon the drill, leaving the hole perfectly smooth—they being removed with the drill; and when the drill was withdrawn, *it*, as also the cuttings, *was found to be perfectly cool, no heat having been* (apparently) *created.*

To satisfy the company, the work was repeated several times, until each person felt assured of the fact stated.

We were then shown the planing machine, which was similarly arranged. A large piece of iron was lying upon the bed plate perfectly secured, although without any bolts or other usual fastening. As the planing tool passed along the face of the iron, we found that the surface was cut smoother than usual, and that there was no heat in cuttings or tool. We were told that the cutting point of the planer required much less attention or repair than in ordinary work.

We were then shown the lathe, the chuck of which was arranged as in the bed plates of the other machines, the current reaching the ends of the revolving magnets by sliding connections.

An iron T connection, weighing about forty pounds, was handled by two men and placed against the face of the chuck. When in right position, the current was switched on, and the iron was held firmly in place.

Change of position was made by striking the iron a sharp blow with a hammer. After one portion of the T had been turned off, it was released by switching off the current and put in a new position, as before.

Here again no heat was apparent, and the tools required very little repairs.

The currents for the work were furnished by a large Gramme magneto machine, the patents of which, for England and America, were owned by Mr. Werdermann.

Mr. W. informed us that he intended to introduce the work into the English Government factories, where cutting tools were kept cool by running water; but whether he succeeded in doing so I never heard.

Mr. Werdermann's solution of the matter was simply: It was supposed that the heat of the cutting tools was absorbed by the magnetized condition of the iron which formed the keeper of the heads of the magnets.

Was this the true solution?

CHAS. L. CHAPIN,
formerly Supt. Fire Alarm Telegraph, New York; lately Gen. Supt. Am. Dis. Tel. Co., Philadelphia.
No. 29 Carlisle Sq., Philadelphia, Pa., March 11, 1886.

* Mr. W. always used his baptismal name of Richard.

The Roosen Fish Preserving Process.

M. August Roosen, of Hamburg, has brought forward a process for preserving fish and meat which depends upon the well known antiseptic properties of boracic acid. The acid is perfectly harmless, and can be taken in quantities of fifteen grammes or more every day without danger to the human system. It is favorably known as a preventive of disease, being strongly recommended in times of cholera epidemic. M. Roosen's experiments covered a series of years. He finds that in the case of small fish, such as herrings, a sprinkling of boracic acid and salt between each layer will keep the fish fresh for a certain length of time if the temperature be kept low. With higher temperature, however, and larger fish the process is not quite so simple. In order to make it complete, steel barrels are employed, which are filled one-third with sea water, in which the antiseptic compound is dissolved. After filling the barrel with fish, the manhole is closed and a pressure pump connected. An additional quantity of water is then pumped into the barrel, the air escaping through an opening which is afterward hermetically sealed. A pressure of six atmospheres is put upon the contents of the barrel before it is closed. This makes the solution penetrate the fish, and prevents the air from finding access to the contents. No blood is drawn out of the fish, and the solution remains clear and pure all through. By the use of boracic acid, mutton has been kept thirty-three days, and still bled freely after that length of time, and fish after several days were found perfectly fresh and sweet.

A High Speed Engine.

During the last last year or two, it has come to be generally understood that large machines, driven at a comparatively low speed, were the best for electric lighting purposes; but the lighting at the Lincoln's Inn dining hall and library must be considered as an exception to this rule. The dynamo here is driven at no less than 12,000 revolutions per minute, by a Parsons high speed engine, which justifies its title by running at the same rate. It requires some mental effort to take a statement of this kind seriously; yet there is no reason to regard the Parsons motor as a toy. It was shown in action at the Inventions Exhibition, running with unimpaired steadiness from the commencement to the close of the show. It is, in reality, a combination of turbines driven by steam, and consists of two series of parallel flow turbines to the right and left of a central steam inlet, the steam exhausting directly from the first turbine into the second, from the second into the third, and so on through 20 turbines in each series. The steam parts with a portion of its energy in each turbine, and finally escapes at a pressure not much above that of the atmosphere. It is claimed that this is the first motor that has ever been made to work at the actual velocity of the steam as it escapes from the boiler.—*Engineer and Iron Trades Advertiser.*

A Powerful Gas Light.

At a recent meeting of the Dublin Royal Society, Prof. F. W. Barrett gave an account of experiments which he had made to test the penetrative power of the Wenham double quadriform burner in fogs. This burner consists of four superposed 88-jet gas burners placed alongside of four similar superposed burners. The eight burners are in one plane, parallel to which, and at the proper focal distance, are eight annular lenses on one side, and a similar set of lenses on the other. The lights blend into one at a distance of 1,500 feet from the lighthouse. The experiments were made on two foggy evenings, on the second of which the fog was so dense as to cut off a powerful revolving light at half the distance, and to silence a fog siren driven by a gas engine and placed beside the Wenham light. The latter was easily seen by the naked eye, and its position determined, at six miles distance. The revolving light in that case was cut off at something under three miles distance. The Wenham burner will be found illustrated in our SUPPLEMENT, No. 526.

A Fire Banked for Sixteen Months.

One of the blast furnaces of the Kemble Iron and Coal Company at Riddlesburg, Pa., was banked up in November, 1884. After being out of blast nearly sixteen months, it was recently opened for the first time, and the fire found still burning. The coke glowed brightly, and on the admission of the blast soon became hot enough to melt cinder. The furnace was started with as little difficulty as if it had only been standing a week.