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Cement for Belting.

C. Phelps of Salem, Mass. informs us that he has had in constant use for eight years, a six inch belt, which is jointed with Russian isinglass as a substitute for rivets. The isinglass for this purpose is applied in the same manner that glue is applied to join pieces of wood together. The end of the belt to be thus cemented, should be scarfed for about six inches lengthwise, then a strong solution of isinglass applied, and the surfaces so treated, brought together and held fast by joiner's screws until they are perfectly dry. "It might be well" says Mr. Phelps, "to put a row of small tacks along the thin edge of the scarf, and clinch them firmly." We would state, although we have never used isinglass for cementing belting, we have oftentimes used it for cementing leather, for various purposes, and have found it to answer well.

Varnish for Iron Works.

Put 28 pounds of asphaltum into an iron pot, and boil it for four hours. During the first two hours of boiling, introduce 14 lbs. of litharge, 3 lbs. of dried copperas, 10 gallons of boiled linseed oil, 8 lbs. of resin, and one of the sulphate of zinc. After four hours of boiling, these ingredients should be of a thick consistency. It is then suffered to cool, and when cold, it is thinned with turpentine, so as to be applied with a brush. It is used for blacking the iron work of carriages, &c. Of course the quantities given may be reduced, if the proportions are retained.

To Make the Oxyd of Gold.

Having received several communications recently making inquiries respecting the mode of preparing the oxyd of gold, we present the following as the best method with which we are acquainted for making it. Dissolve pure gold in two measures of muriatic, and one of nitric acid; and then evaporate to dryness. After this, dissolve the product in twelve times its weight of pure water, and then add a solution of pure carbonate of potash; apply a heat of 170° Fah., and a yellow precipitate falls, this is the hydrated per-oxyde of gold. Wash it well, and then boil it in pure water, when it becomes of a brownish black color which is the oxyd required.

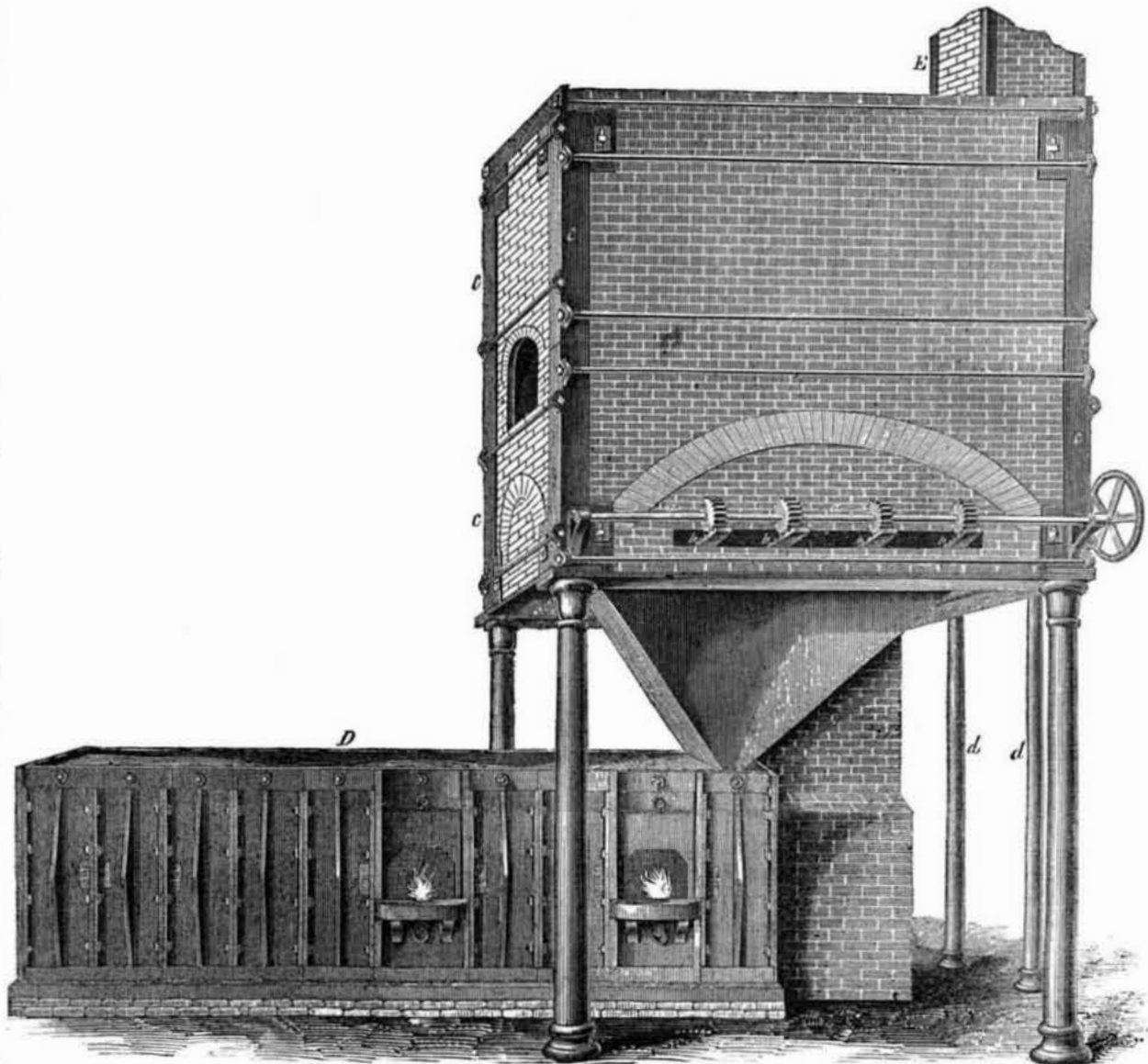
Stopping the Echoing of Halls.

The new Capitol of Nashville, Tenn., reverberated sound in such a manner as to destroy the use of the Legislative Hall, where the voice of a speaker, reverberated like that of a noisy crowd. This has been remedied by spreading a thick layer of sand dust on the floor, covering it with a heavy carpet and curtaining the windows with thick curtains. A similar defect in College Hall, Cincinnati, was remedied by covering the walls with canvas.

Characteristics.

Somebody says there are three kinds of men in this world—the "wills," the "won'ts," and the "cant's." The first effect everything, the next oppose everything, and the last fail in everything. "I will" builds our railroads and steamboats; "I won't" don't believe in experiments and nonsense; while "I can't" grows weeds for wheat, and commonly ends his days in the slow digestion of a court of bankruptcy.

RENTON'S FURNACE FOR MAKING WROUGHT IRON FROM THE ORE.—Fig. 1.



We present our readers this week with illustrations of James Renton's process for the manufacture of wrought-iron direct from the ore, the American and Foreign Patents upon which were obtained through our Agency.

Our readers are aware that the ordinary process of manufacturing iron is both tedious and complicated. The ore, in which the iron is found existing in combination with oxygen, carbon, and sulphur, is first subjected to the process of roasting. This is usually accomplished by piling it in large heaps, over a stratum of fuel which is then fired, and by the combustion of which sufficient heat is generated to calcine the ore. The object accomplished in this roasting, is the separation of the sulphur and the complete oxydation of the ore. After the pile has been sufficiently roasted it is *cleaned*, a process which consists in separating it from the dust and foreign matter which it contains. This is accomplished by means of various devices, consisting of screens, fans, and picking it over by hand.

The ore after being properly calcined and roasted, is generally mixed, the different varieties, when judiciously selected, furnishing a cheaper and better iron than any of them taken separately. It is often the case that some varieties cannot be employed profitably by themselves, but when combined with others, containing less sulphur perhaps, they can be economically worked.

The next step is technically termed "reviving" the iron,—in other words, bringing it from the state of an oxyd or sulphuret, as the case may be, to that of pig iron. This has usu-

ally been accomplished in a "blast" furnace, in which the ore, mixed with a due proportion of fuel, and a certain quantity of lime, clay, or other substance employed as a flux, is subjected to a strong heat, generated by the combustion of the fuel urged by a strong blast of cold or hot air, according as the process of "cold blast" or "hot blast" is employed. After being thoroughly deoxydized and separated from the sulphur or other foreign ingredients contained, it is melted, and flowing down to the bottom of the furnace it is drawn off and cast into "pigs." But it is now only cast-iron, and before it is adapted to the manufacture of the various articles for which malleable iron is employed, it must be decarbonized and brought to a purer state. This is done sometimes by transferring the pigs directly to the bloomeries, where, after being broken in pieces of suitable size, they are mixed with a due proportion of charcoal or coke, and heated until the carbon is burned out and the metal brought to a semi-fluid state, when it is drawn from the fire and placed upon an anvil, where, beneath the blows of a trip-hammer, it is converted into "blooms" or large bars of an impure wrought-iron.

In many other cases, however, an intermediate process is employed. The pigs after coming from the blast furnace, are taken to the "finery," as from the very impure condition in which the iron is found, in consequence of the employment of stone coal and the hot blast, it has often been necessary to separate a portion of the impurities before its removal to the forge or bloomery.

But we must not dwell longer on the ordina-

ry process of manufacture. We have referred to it that our general readers may the more readily appreciate the great advantages of the improved process, which we will now proceed to describe.

Fig. 1 is a perspective view of the furnace complete, and fig. 2 is a vertical section of the same.

The ore, after being properly calcined, is crushed by the action of stampers or any other suitable means to a granular state. It is then mixed with about twenty per cent. of carbon in a finely comminuted state, and is thrown in the tubes, *a a*, fig. 2, where it is subjected to a high red heat for about twelve hours. The contents of one or more of the tubes is then let down through the funnel-shaped chamber, *e*, into the preparatory bottom by withdrawing the slides, *b b*, which are then closed, and the tubes filled with fresh ore. The preparatory bottom is that part of the chamber, *K*, next the chimney. It is here worked for about 20 minutes, when it is passed along to the puddling bottom in the center of the chamber, and is there made in a ball, after which it is taken to the anvil to be wrought into a bloom. *l*, fig. 2 is the fire chamber. The heat of this chamber, after passing over and heating the iron in the puddling chamber, *K*, is conducted through the flue, *i*, to the flues, *f f*, surrounding the ore-flues, *a a*. It will therefore be seen that the whole operation is performed by a single fire. The stack of flues, as can be seen in the engravings, is built upon a heavy bed plate, supported by cast-iron pillar and is formed by a

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New Inventions.

Improved Lamps.

C. Monnin and W. Boeth, of Buffalo, N. Y., have invented an improvement in Lamps. The invention consists in dividing the oil chamber from the wick chamber of lamps having their burning tubes connected with them at the bottom, by means of a reticulated partition; and in attaching the shade or deflector which is frusto-conical, to the lamps in such a manner that it may be made to throw the reflected light, to any desired position. The lamp may be slid up and down upon a vertical standard. The inventors have applied for a patent.

Improved Truss Bridge.

William Cumberson, of Brooklyn, N. Y. has invented an improvement in Truss Bridges for Ferries, the nature of which consists in bracing the bridge transversely and longitudinally by means of strong truss braces, whereby, the bridge can be built of much greater length than heretofore, and also capable of sustaining a greater weight. Each of these truss braces is brought into place by a screw bolt and nut.—The bridge is suspended at the proper height by a series of weights and chains, combined with a double-purchase fall. The inventor has applied for a patent.

Sawing Spoke Stuff.

Harvey Blanchard, of Dayton, O., has invented an improved mode of sawing stuff for spokes. The invention consists in sawing radial grooves of the same depth, as the required stuff in logs of various diameters, by means of a circular saw arranged directly under and in line with the axes of the log, which is hung on adjustable centers and set so as to have the saw cut to the required depth. It is fed to the saw by means of a reciprocating carriage. The inventor has applied for a patent.

Gas Stove.

Andrew Mayer of Phil. Pa., has invented an improved gas stove for warming apartments.—A jet of ordinary coal or other gas is thrown into a tube, the top of which, is funnel shaped and covered with an incombustible screen, which becomes strongly heated, and imparts its heat to the copper bottom of a tube in close proximity with it. The gaseous products of combustion are conducted away in a small pipe leading to the flue. Application has been made for a patent.

Operating Railroad Pumps.

Joel V. Strait, of Litchfield, Ohio, has invented a mode of supplying the water tanks on rail-ways. It consists in placing inclined planes at the side of the rails, and in connecting them with a lever attached to the piston rod of a pump, so that the wheels passing over their inclines will depress them, thus operating the pump handle which will return to its place by a counterpoise attached to it. In this manner the cistern is supplied with water by the passing of the trains. The inventor has applied for a patent.

Improved Pencil Case.

J. H. Rauch, of N. Y. City, has applied for a patent upon an improved case for sliding pens and pencils. This invention consists in so forming the sliding tube that by a partial rotation in one direction, the slide will be made to operate upon the pen, while if it be made to resume the reverse position it will operate upon the pencil. By this means the pen or pencil can be extended at pleasure with an ease not before accomplished,—so the inventor avers. A patent has been applied for.

Street Pavement.

Daniel S. Darling, of Brooklyn, N. Y. has invented an improved mode of laying the foundation of street pavements. They are formed by imbedding a series of timber sills in the soil, so as to have their curved top surface even with the soil. Upon these are placed strong sectional floor timbers, which are placed close together edgewise, and made to follow the curved top surface of the sills. These timbers are then covered with cement, in which the flag stones are imbedded. The inventor has made application for a patent.

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strong double wall of self-binding bricks, held together by the corner plates, *c c*, and the iron rods passing between them.

Our readers are very many of them aware that the process of making wrought-iron direct from the ore, is the oldest mode of manufacturing iron. Indeed it was the only one known among the ancients. In Persia this method is still employed, and it is fully described by travelers. But the simple process employed con-

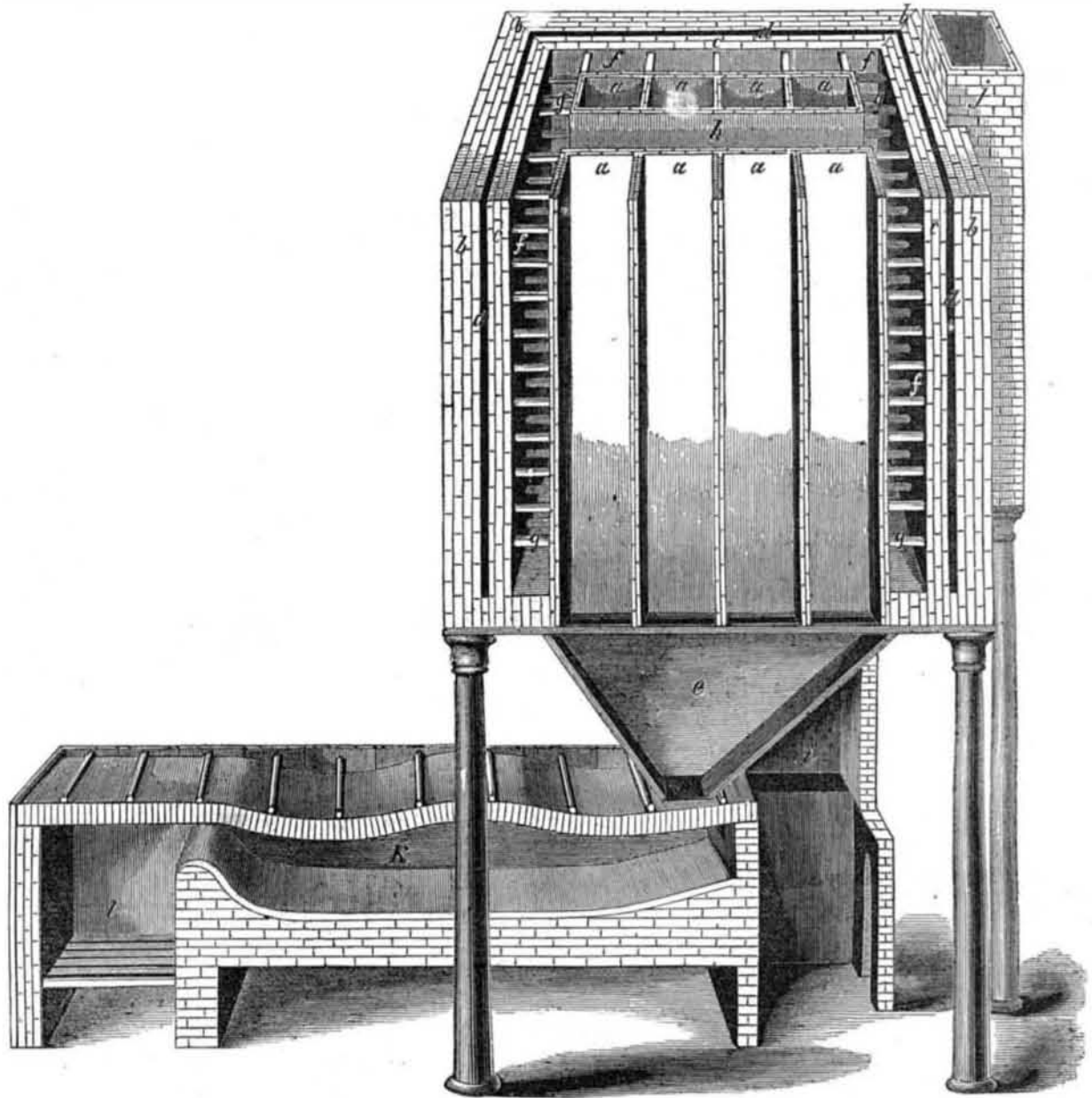
sisting merely of a heap of broken ore and powdered charcoal, would never answer for supplying iron in the quantities needed in civilized countries, and a modification of it, adapting it to the requirements of modern art, is what is accomplished in the process under consideration.

The proprietors of Renton's patent have also purchased that of Alex. Dickerson, and their joint claims embrace any mode of de-oxidizing the ore in a chamber, so constructed as to be

heated by the waste heat, and at the same time prevent the products of combustion from coming directly in contact with the ore, and likewise permit the charge of de-oxidized ore to descend into the puddling chamber without exposure to the atmospheric air. The ore box or tunnel-shaped chamber, *e*, is also covered by the claims.

This is one of the most important processes now before the public. We think it likely to effect a revolution in the mode of manufactur-

Figure 2.



ing iron. It seems certain that wrought-iron can, in this way, be manufactured 20 per cent. cheaper than by the old process, and we should

be glad to see it adopted by our iron-masters generally. Any further information which may be desired, can be obtained by addressing The

American Iron Co., 107 Market street, Newark, N. J., or by application personally to A. H. Brown, at that place.

Substitute for Pen and Ink.

Since we published the remarks, a few weeks ago, respecting the benefits that would be conferred upon the writing community, by the invention of a *jet black pencil*, to supersede pen and ink, we have received a number of letters about fountain pens, but we do not wish to have anything to do with these—their advantages and disadvantages being well known to us;—the pencil and nothing but the pencil is the watchword and reply for us.

American Plate Glass.

The experiment of making plate glass at Cheshire, Berkshire Co. Mass., is said to be quite successful. The proprietors of the glass works at Lenox are making experiments with the sand taken from the top of Washington Mountain, in the same county.

Street Indicators.

An excellent proposition has been made in Philadelphia to remedy the present defects in the form of street indicators, by painting the names of the streets upon the glass of the gas lamps, one of which is now to be found in every street corner in that city.

It has been discovered that feathers unskillfully cured and put into beds, are deadly to persons of weak lungs sleeping upon them.

Carey's Pump.—Erratum.

In our notices of the medals which had been awarded by the committees of the Crystal Palace, it was stated that one had been granted to A. C. Carey of N. Y. City; it should have read A. W. Carey, of Brockport Monroe Co., N. Y.

Crystal Palace Awards.

The sounds of discontent come muttering from East, West, North and South, respecting the awards of Prizes in the Crystal Palace. We do not wonder at this, for many of those Prizes were neither awarded with discretion nor impartiality.

Sizes of Books.

When the sheet of paper of which a book is made is folded in two leaves the book is called a folio; when folded into four leaves it is called quarto; when folded into eight leaves it is called octavo; when folded into ten leaves, a duodecimo, or 12mo; when folded into sixteen leaves, a 16mo; when folded into eighteen leaves, 18mo, etc.

There were 235,000 barrels of ale manufactured in Albany last year. 600,000 lbs. of hops are used, worth 35 cents per pound. The number of persons there employed is about 700.

American Coal.

In a recent outline of the Geology of the Globe, by Hitchcock, the accomplished geologist, some interesting facts are given respecting the extent and inexhaustibility of the coal measures of the globe, particularly those of the United States. In Nova Scotia and New Brunswick the coal field covers nearly ten thousand square miles. In the southeast part of Massachusetts, and in Rhode Island, is a deposit covering nearly five hundred square miles. The great Appalachian coal field, extending from New York to Alabama, is seven hundred and twenty miles in length, and covers nearly 100,000 square miles. The Indiana coal field, three hundred and fifty miles long, embraces about fifty thousand square miles. In Michigan is another, one hundred and fifty miles long, which covers twelve thousand square miles.—The Missouri and Iowa coal fields, embrace fifty thousand square miles. The grand total in the United States amounts to more than two hundred and twenty-five thousand square miles.—When we think of the immense extent to which the use of steam will hereafter be increased on this continent, in consequence of the use of coal, we can form no adequate conception of the future populousness and prosperity of the country.