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Method of Detecting Counterfeit Silver Coin.

If a piece of silver be dipped into a solution of chromate of potash, decomposed by sulphuric acid, (thirty-two parts by weight of water, three of chromate of potash, and four of sulphuric acid), the parts of the silver immersed in the solution quickly assume a purple colour. The colouring is deeper and more lively when the silver is quite pure, and diminishes in proportion to the quantity of alloy mixed with it. Of course this process will not hold good when a coating of silver has been deposited on a piece of white metal, &c.; in such cases as plated or electrotyped articles, for instance, a portion of the coating must be filed off; upon trial by this process, the German silver will remain of a white color. No other metals give the same color as silver when submitted to this test; copper, zinc, &c., are acted upon by the solution, but not colored as in the case of silver.

Sugar of Milk for Invalids.

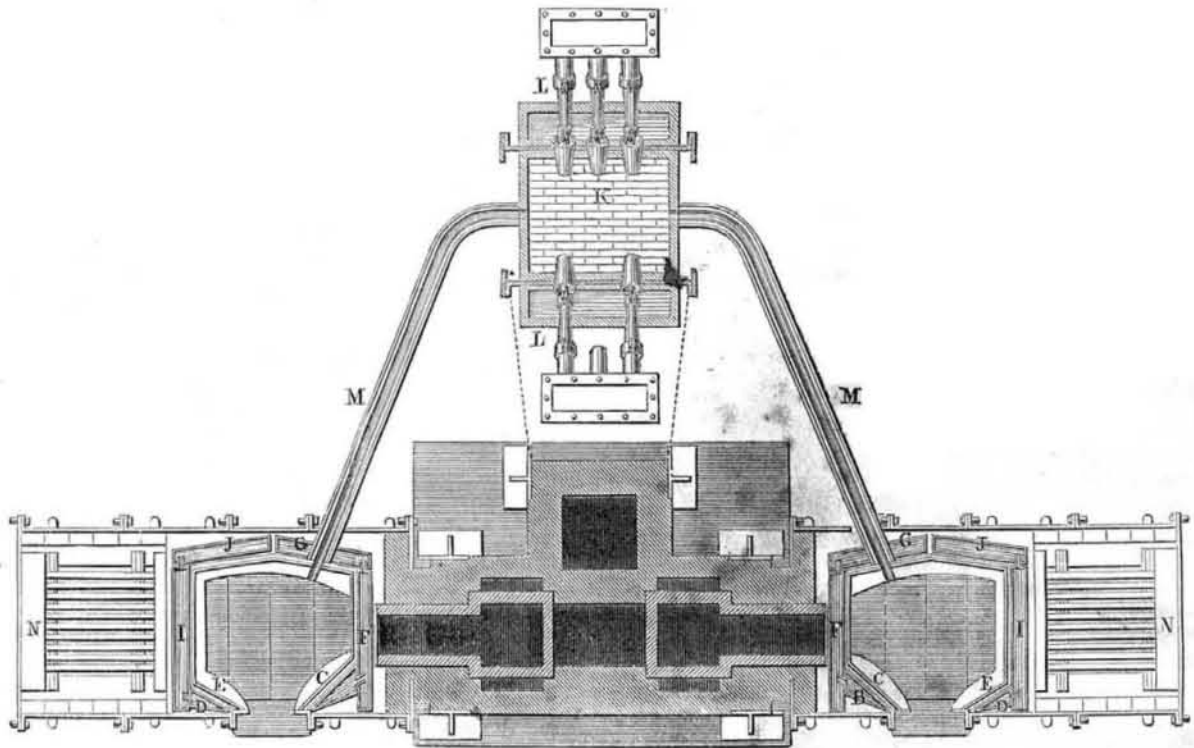
A short time ago Dr. Turnbull, of Liverpool, read to the Literary and Philosophical Society a paper on the use of sugar of milk as an article of food in consumption and other pulmonary diseases. It now appears that whey is coming into extensive use in Germany in the treatment not only of consumption, but also of gout and rheumatism, and that some German physicians entertain opinions as to the beneficial properties of sugar of milk (the ingredient to which whey owes its virtues) similar to those lately put forth by Dr. Turnbull. In the cheese dairies of this country the whey is frequently given to pigs, or otherwise wasted, and the lactine, or sugar of milk, now met with in commerce, is brought entirely from Europe, being prepared chiefly in Switzerland. Its present high price is, however, a great obstacle to its general use as a dietetic remedy; but it is most desirable that so valuable an article of food should no longer be wasted, and that therefore the attention of those engaged in making cheese should be directed to the manufacture of this other product from milk, which must sooner or later become an important article of food and of commerce.

Factory Labor in Rhode Island.

The recent passage of an act by the Rhode Island Legislature, making ten hours a legal day's work, is creating considerable disturbance among the manufacturing villages of that State. Upon the day on which the law went into operation many of the factories were closed the proprietors not being willing to have the law obeyed. A convention of manufacturers has since been held at Providence, and it was decided by them that the operatives should bargain to labor nine hours on Saturdays, and twelve hours during the other working days of the week, or they should not give them employment.

Prof. Silliman, Sen., has resigned his situation in Yale College. His son has been appointed to succeed him. Prof. Silliman has long been a distinguished teacher and writer on scientific subjects. In chemistry he has long held a high place.

IRON REFINING AND PUDDLING FURNACES.—Fig. 1.



The iron interests of our country are of great and rapidly increasing importance. All information, therefore, relating to improvements, small and great, in the manufacture of iron, is of no small consequence. The iron deposits of our country are on a scale commensurate with its vast extent, and the coal and wood to reduce the ores to metal, are more liberally supplied by the hand of nature than in any other country on the face of this terrestrial ball. The United States of America, are destined to be the greatest iron manufacturing countries in the world, and it is perhaps a great shame to us that they are not so at present. Be that as it may, however, no one can doubt, who is at all acquainted with both the resources and wants of our country, that the day is not far distant when it will be what it now should be.

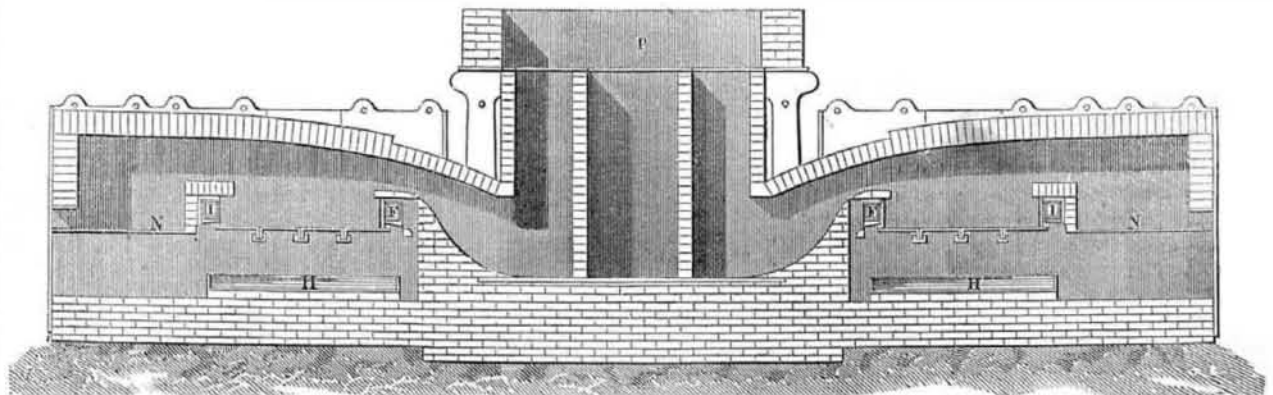
The annexed engravings are views of improvements in iron furnaces by Joseph Jones, of Bilson, Stafford, in England, an experienced iron maker. They consist, first, of the application of a cooling current of water to a water space, encircling the heated mass in the puddling furnace, to keep cool the materials of which the furnace is composed, and comparatively uninjured during the time it is in operation. Second, the combination of the refining with the puddling furnace by ducts passing between the two, so that the refined metal may flow directly from the chamber on to the puddling hearth, dispensing with the loss of time by removal, &c. Third, connecting the refinery furnace flue with a chimney, to carry off the heated air from the refinery. Fourth, carrying a flue from the refining furnaces into the flues of a steam boiler to use

the waste heat of the refinery, and make it available for generating steam for driving an engine.

Figure 1 is a plan view; fig. 2 is a longitudinal elevation of two furnaces combined together and fitted up on these principles, with the refinery attached. Fig. 3 is a corresponding vertical section of the same.

The water is conducted to the furnace shell by the vertical pipes, A A, fig. 3, which are in communication with a water reservoir conveniently situated for that purpose. The water enters in a cold state into the water space, B, at the back of the flue jamb plates, C, as well as into the water space, D, behind the bridge jamb plates, E. From the space, B, the water passes into the water space, F, between the flue bridge plates, thence into space, G, set near the back wall plate of the furnace, and

Figure 2.



is finally discharged into the tank, H, under the bottom plates of the furnace. The water supplied to the space, D, passes to the space, I, between the fire-bridge plates, and thence into the space, J, near the back wall plates of the furnace. After passing through this course, the heated current is finally received as before, by the bottom tank, H. By this contrivance the whole of the parts exposed to the intense heat of the puddling process, are effectually kept cool, as the passing current of water surrounds every part of the containing shell, and carries off the excess heat, and the warm water can be used as the feed water for the steam engine, or for other purposes. The refinery into which the raw pig iron is put in a broken state for melting, is at K. It is supplied with air blown through the tuyeres, L,

on two opposite sides in the usual way; and as the metal is melted and refined, it is run out direct into the two puddling furnaces by the inclined pipes or ducts, M M. In this way the metal is at once conveyed to the puddling hearths without any additional trouble. The two puddling furnaces are of the usual reverberating kind, and their grates, N, are supplied with coals in the usual manner, the iron being worked through a side opening, governed by a balanced sliding door, O. The flues from both furnaces pass into the central or intermediate chimney, P, carried on cast-iron framing. The entire furnace is encased in massive iron plates stayed together across the top transversely by tension rods; the fixed guide piece, Q, for operating the door is cast with side lugs, R, which fit into correspond-

ing recesses cast on the main frame plates, a bolt being put through from the upper side, in each case, to bind the whole together. The combination of the refining with an elevated stalk is not represented; neither is the mode of conveying the excess of heat and applying it to a steam boiler; these arrangements and appendages will be easily understood. The application of the waste heated products from smelting furnaces has been applied to steam boilers for a long time, at some of the smelting works in Wales and in Germany, whether many of our iron manufacturing establishments use them or not we do not know—no one that we have visited do so. By the arrangements and construction of furnaces represented, the exposed parts of the furnace are prevented from being rapidly injured by the