

**THE PERNOT ROTARY PUDDLER.**

The new puddling furnace represented herewith has its characteristic feature in an inclined hearth, not more than one half of which is ever covered by the molten metal. This modification, it is stated, has given important advantages, as the higher part of the hearth forms a rapidly oxidizing surface for the thin layer of metal by which, because of adhesion and by centrifugal force, it is constantly covered.

The hearth is supported by two pairs of wheels, which rest on a circular track, and is guided in its rotation by its central spindle passing down through the center of the supporting bed.

Rotary motion is given to it by a worm, F, which engages in the cogs on the circular portion, D, on which the hearth rests. The whole is mounted on trucks, as shown, resting on a suitable railway. The metal about the hearth has a lining of scoria or ore a few inches thick.

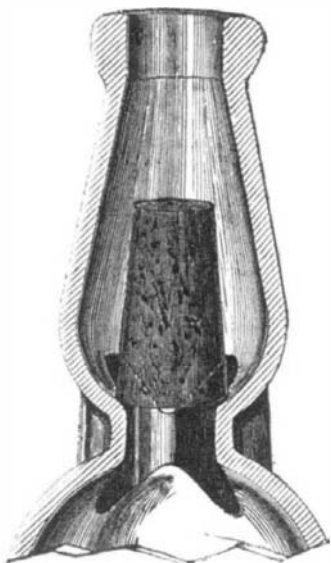
The hearth, mounted upon its car, is wheeled directly into the furnace, in a position as near as possible to the metal plate that supports the masonry above. When the hearth is at a reddish white heat, the interstices are closed with fragments of ore, and the operation of

puddling is carried on by rotating the hearth some three or four turns per minute, care being taken to spread the contents evenly over the surface. The formation of blooms is the same as in ordinary puddling, except that, owing to the rotation of the hearth, the work can always be done directly in front of the door. Water circulation can be employed for cooling. The ordinary charge is about 1,100 pounds, and this is divided into seven or eight blooms, the average time of forming which is about half an hour, including the period necessary to transport them to the forge. A complete operation, comprising the squeezing, lasts about two hours, the cleaning of the grate and reheating of the furnace occupying about half an hour of this period.

At the foundry of St. Chamond, France, in one week, there were produced, in 11 heatings of 25 hours each, 25 tons of fine puddled iron, while by hand puddling the same iron (gray charcoal) did not yield over 12 tons. In the former case the loss did not exceed 30 pounds of raw per 1,000 pounds of finished product; in the latter the loss was fully 200 pounds. The consumption of fuel, at the same time, was reduced from 3,300 to 2,640 pounds.

**A SELF-CORKING BOTTLE.**

This is an ingenious plan for arranging the cork inside the bottle, so that, when the latter is filled, the stopper rises into place and so closes the mouth. The neck of the bottle, at the

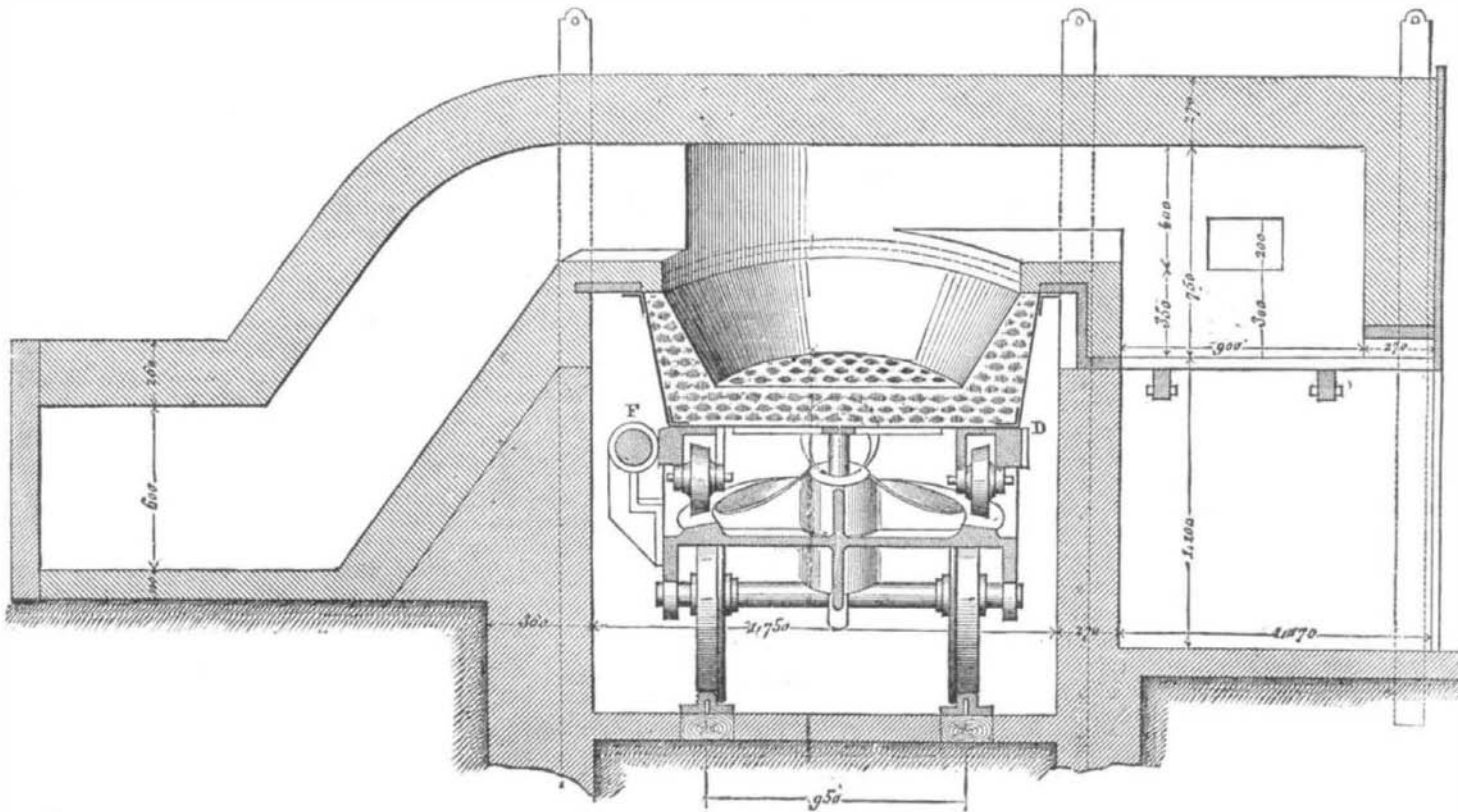


point where it joins the main portion, is provided with projections, four in number, which prevent the cork placed above them from pulling through. During the filling, the weight of liquid coming from above keeps the cork down upon the ribs, and the fluid, of course, flows in between said projections. As soon, however, as the bottle is full, the cork necessarily rises with the contents, and, being tapered upwards, wedges into the mouth. To open the bottle, the cork is simply pushed down; then, as the bottle is inverted to discharge the liquid, the cork will rise upward and so leave a

clear place of exit at the orifice. The ribs on the neck of the bottle act as strengthening pieces, and may be molded with the vessel in the ordinary way. Patented April 28, 1874, by Messrs. Henry and Thomas Miller, of Pittsburgh, Pa.

**A Universal Language.**

A language which could be understood all over the globe, says a contemporary, would be exceedingly useful in science, commerce, and social intercourse. Enthusiastic philosophers have more than once tried to invent a universal language, but have not succeeded; and the students or traders who

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desire to communicate have still to learn a number of languages, or to betake themselves to translations. To overcome these difficulties, a learned German, Dr. Bachmaier, has invented a method of correspondence in which numerals stand for words and ideas. Assuming (in round numbers) that four thousand words are sufficient for all purposes, he prepares a dictionary with columns of numbers from one to four thousand, each number having a word against it which it represents in every language. For example, if the word fire is number fifty-two, the same number will stand against *feu* in the French, and against *Feuer* in the German dictionary, and the same in any other that may be compiled. From this it will be understood that an Englishman entirely unacquainted with French or German might easily make a communication in either of those languages. He would look at his alphabetical list of words and set down the corresponding numbers. The Frenchman or German would look at his list of numbers, would set down the corresponding words, and thus have before him his correspondent's statement, and would have equal facility in answering. To make known masculine and feminine, nouns and adjectives, tenses and inflections, and other grammatical requirements, Dr. Bachmaier affixes certain simple marks to the numerals. He has already published three dictionaries—English, French, and German,—and is at work on other languages. At the meeting of the Oriental Congress last autumn, copies of these dictionaries were exhibited, and by the most competent judges were warmly approved.

**Silica in Cancer.**

In the November number of the *Edinburgh Medical Journal*, Mr. Fawcett Battye narrates his experience with an entirely new remedy in cancer. This is silica, powdered very fine, and administered internally twice or thrice a day, in one grain doses, combined with a third of a grain of morphia. He found it to diminish the pain in a marked degree, and by the tenth day to disperse it altogether. He does not precisely claim, however, that the patients recovered. They were relieved and benefited; and when they took it continuously, the disease was retarded. No satisfactory explanation of its action is advanced.

**The Preservation of Smoked Meat.**

Professor Nessler says that the keeping qualities of smoked meat do not depend upon the amount of smoking, but upon the uniform and proper drying of the meat. It is of considerable advantage also to roll the meat on its removal from the salt, before smoking, in sawdust or bran. By this means the crust formed in smoking will not be so thick; and if moisture condenses upon the meat it remains in the bran, the brown coloring matter of the smoke not penetrating. The best place to keep the meat is in a smoke house in which it remains dry, without drying out entirely as it does when hung in a chimney.

**Scientific Progress in Australia.**

Our advices from Port Adelaide, South Australia, report the foundation of an institute in that city for the advancement of art, science, and literature. The first stone of the building was laid on October 31, 1874, a large sum of money having been given for the purposes of the institution by

wealthy residents. Two gentlemen, Messrs. Elder and Hughes, have given \$100,000 each to found a university, and the colonial government has appropriated 95 acres of land for a site and 50,000 acres as an endowment.

**Mysterious Fire.**

The Niagara Falls *Gazette* gives the following account of a mysterious fire which was discovered in a house occupied by Mrs. P. A. Porter, at that place: "About noon, one of the servants noticed a little smoke issuing from the floor in the butler's room, which adjoins the dining room, on the first floor of the house. Smoke had been noticed in the house the day before, but no indications of dangerous fires had otherwise been apparent. A messenger was sent for Mrs. Porter's business manager, who was at church. Upon his arrival search was instantly made for the fire, which was evidently making headway somewhere between the floor and ceiling below. The trouble was finally found under the dining room floor, in a place where it would seem impossible for fire to originate. The floor has a deep layer of sawdust beneath for the purpose of deadening sound. Be-

neath the sawdust, and about an inch and a half above the ceiling beneath, is a thin flooring, keeping the sawdust from the lathing and plaster. The fire was found burning the under side of this thin flooring, between the flooring and the ceiling. It had evidently been smoldering for two or three days, but had burned through to the sawdust in only two or three small places. How fire could originate in such a confined place, several feet from any chimney or flue, remains an unsettled question. The only plausible theory that has been advanced throws the responsibility for the trouble upon some mischievous mouse."

*Apropos* of the above, a French paper states that quite an alarming proportion of the number of private houses burned down is to be traced to the thefts of mice, who are particularly fond of the wax matches which are chiefly in use in Europe. They steal these matches and carry them away to their nests, where, at some more convenient time, they commence their meal, and a single nibble in contact with the phosphorus may ignite the whole collection.

**COMBINED KNIFE AND PEPPER BOX.***Fig. 1.**Fig. 2.*

This is an ingenious arrangement of a pepper or salt box in a knife handle. The latter is hollow, and into it screws the box, which is shaped as in Fig. 2. The receptacle is filled from the top and then inserted in the handle, a neat cap, attached to its extremity, passing over and making a finish to the end of the same. Perforations around the bottom of the box allow of the escape of the condiment when the box is slightly drawn out.

The device will be found useful for picnics and camping parties, as it saves the room taken up by the ordinary pepper and salt cellars, and besides secures a supply of the useful seasoning materials being constantly, and literally, on hand. Patented April 21, 1874, by Messrs. R. W. and R. F. F. Brown, of Utica, N. Y.

**Carbolic Acid a Preservative for Hides.**

In South America and Australia, it is stated that the immersion of hides for 24 hours in a two per cent solution of carbolic acid, and subsequently drying them, has been successfully substituted for the more tedious and expensive process of salting.