

(No Model.)

J. ZENGERLE.

APPARATUS FOR CASTING COPPER PLATES, BARS, &c.

No. 306,990.

Patented Oct. 21, 1884.

fig. 1.

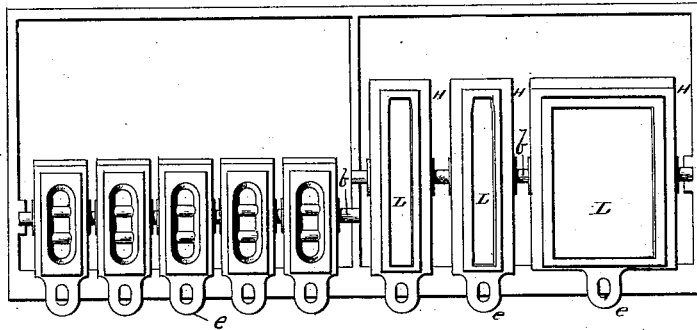


fig. 2.

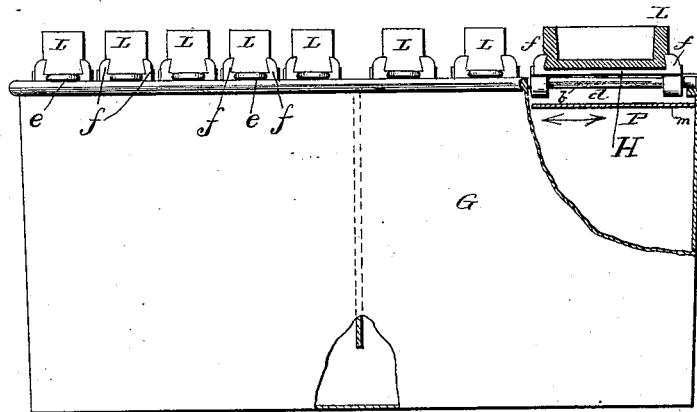


fig. 3.

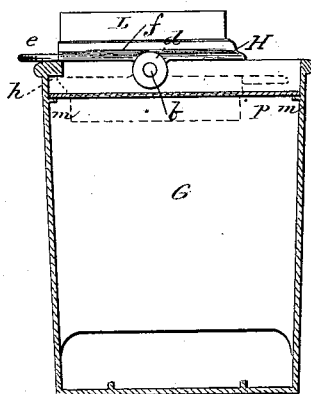
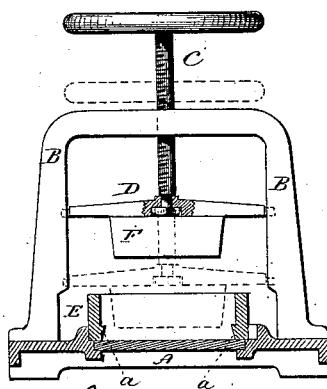


fig. 4.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOSEPH ZENGERLE, OF ANSONIA, CONNECTICUT.

## APPARATUS FOR CASTING COPPER PLATES, BARS, &c.

SPECIFICATION forming part of Letters Patent No. 306,990, dated October 21, 1884.

Application filed June 19, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH ZENGERLE, of Ansonia, in the county of New Haven and State of Connecticut, have invented a new Improvement in Apparatus for Casting Copper Plates, Bars, &c.; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan view of the tank and mold arranged thereon; Fig. 2, sectional side view of the same; Fig. 3, transverse section showing side view of one receiver and its mold; Fig. 4, sectional side view of the press in which the molds are made.

This invention relates to an improvement in an apparatus for casting plates, bars, ingots, and the like from copper.

In the method more generally practiced of making plates, ingots, &c., the metal is poured into molds which are formed in two parts clamped together, sand-packed to prevent the escape of the molten metal. The metal remains in the molds until thoroughly cool. It shrinks to a considerable extent, so that air is permitted to come into contact with the surface in cooling, causing that surface to oxidize. Again, the metal unavoidably flows into the joints in the mold, forming a fin which must be trimmed when the plates or ingots are removed from the mold. In rolling such plates and bars the oxidized surface forms a scale thereon, which frequently sticks to the rolls, causing bad work and rough sheets.

The object of my invention is to avoid this oxidation of the plates, bars, or ingots; and it consists in the combination of a receiver arranged over a bath, and hung so as to be inverted, with a mold fitted to said receiver, and so as to be inverted with it, and also constructed corresponding to the plate, bar, or ingot to be produced, and with a cover over the bath beneath the mold, as more fully hereinafter described.

The apparatus in which the molds are formed consists of a press, represented in Fig.

4, in which A represents the bed or lower platen; B, a yoke extending up over the platen, in which is a screw, C, carrying a movable platen, D, parallel with the platen below. On the lower platen a mold, E, is arranged corresponding to the exterior of the mold which is to be made in this apparatus, and in which the copper plate or ingot is to be cast.

In Fig. 4 I illustrate the device as constructed for making a plate of copper. The mold E has, near its bottom, longitudinal dovetail-shaped internal projections, *a*. The shape of the mold E corresponds to the exterior of the copper mold to be produced. To the upper platen, D, a former, F, is attached, which corresponds to the internal shape of the copper mold to be produced. The metal from which the copper mold is to be made is poured into the mold E while in the press. Then the upper platen, D, carrying the former F, is forced downward, driving the former into the molten metal in the mold, causing the metal to flow up around the former F and within the mold E until the platen is closed upon the upper edge. The metal is allowed to cool, which leaves the interior perfectly smooth, the exterior formed with dovetail grooves corresponding to the projections *a a*, as a means for attaching it to the dumping apparatus. By this method of making molds they are quickly cast and perfectly smooth, ready to receive the metal to form the plate. These molds are arranged over a tank, G, which is partially filled with water, or any suitable liquid, for cooling the ingots, plates, or bars which may be dumped therein.

Longitudinally over the tank G is a shaft, *b*, on which a frame or receiver, H, is hung. This receiver is provided with a handle, *e*, at its front end, which rests upon the front edge of the tank, as seen in Figs. 1 and 3. This receiver has dovetail-shaped sides *f*, as seen in Fig. 2, corresponding to the dovetails made in the mold L in the process of casting, so that the mold may be introduced between the sides *f f*, as seen in Fig. 2, and by the dovetail shape of those sides held in place in the receiver. The receiver is hung upon the shaft *b* so that it may be readily inverted, as indicated in broken lines, Fig. 3—that is, by

lifting upon the handle *e*, the receiver, with the mold *L*, may be turned over upside down—the edge of the receiver *H* opposite the handle striking a flange, *h*, at the front of the receiver when it has been so inverted, as seen in Fig. 3. The mold thus arranged and with its open side up, as seen in Fig. 2, the metal is poured into the mold, and so soon as the metal is set the receiver and the mold are inverted, which throws the plate, bar, or ingot, as the case may be, into the bath below, in which it is entirely submerged, so that the surface is not exposed to the atmosphere, and when cooled it is taken from the bath clean and bright, free from oxidation or scale, which unavoidably occurs when the plates are exposed to the atmosphere.

In Figs 1 and 2 I illustrate a mold for plate at the right, next two molds for bars, then at the left five molds for ingots. It will be understood that the mold is to be constructed according to the thing which is to be produced, whether it be ingot, bar, or plate; but in either case the mold is introduced to the receiver which is hung over the bath, and so as to dump the thing cast in the mold into the bath below.

It will frequently occur that in pouring the metal into the molds more or less will scatter or be accidentally poured outside the mold. To prevent the metal thus scattered from falling into the bath below, I arrange over the bath a plate, *P*, upon slides *m*. (See Figs. 2 and 3.) This plate stands beneath the mold

in which the metal is being poured, and then before dumping it is moved to one side so as to open the bath to receive the dumping. By this method of casting ingots, bars, or plates, the trimming is entirely avoided, as the molds are as deep at least as the ingot, bar, or plate to be produced; hence no fin is produced around the sides.

I make no claim to the mold or device shown in Fig. 4 for making it, as they will form the subject of a separate application for patent; and it is to be understood that this device is to be considered in this application only so far as it is necessary to show how the molds may be made.

I claim—

1. The combination of a receiver arranged over a bath, and hung so as to be inverted, with a mold fitted to said receiver so as to be inverted with it, and constructed corresponding to the plate, bar, or ingot to be produced, substantially as described.

2. The combination of a receiver arranged over a bath, and hung so as to be inverted, with a mold fitted to said receiver so as to be inverted with it, and constructed corresponding to the plate, bar, or ingot to be produced, and with a plate arranged over the bath beneath the mold and receiver, substantially as described.

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Witnesses:

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