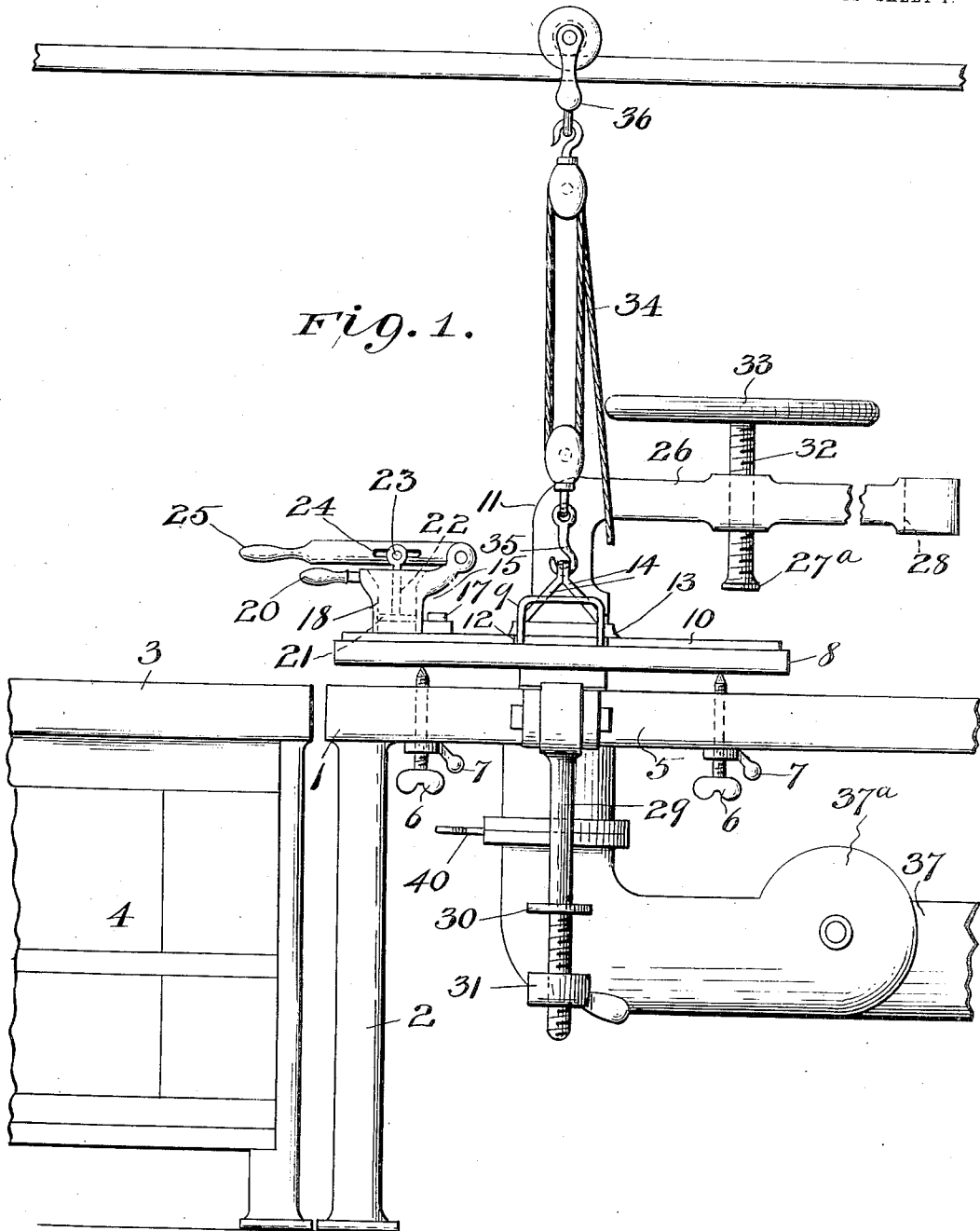


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 APPARATUS FOR BACKING ELECTROTYPE PLATES.
 APPLICATION FILED AUG. 5, 1907.

931,738.

Patented Aug. 24, 1909.

4 SHEETS—SHEET 1.



Witnesses
One Jones
Attorney

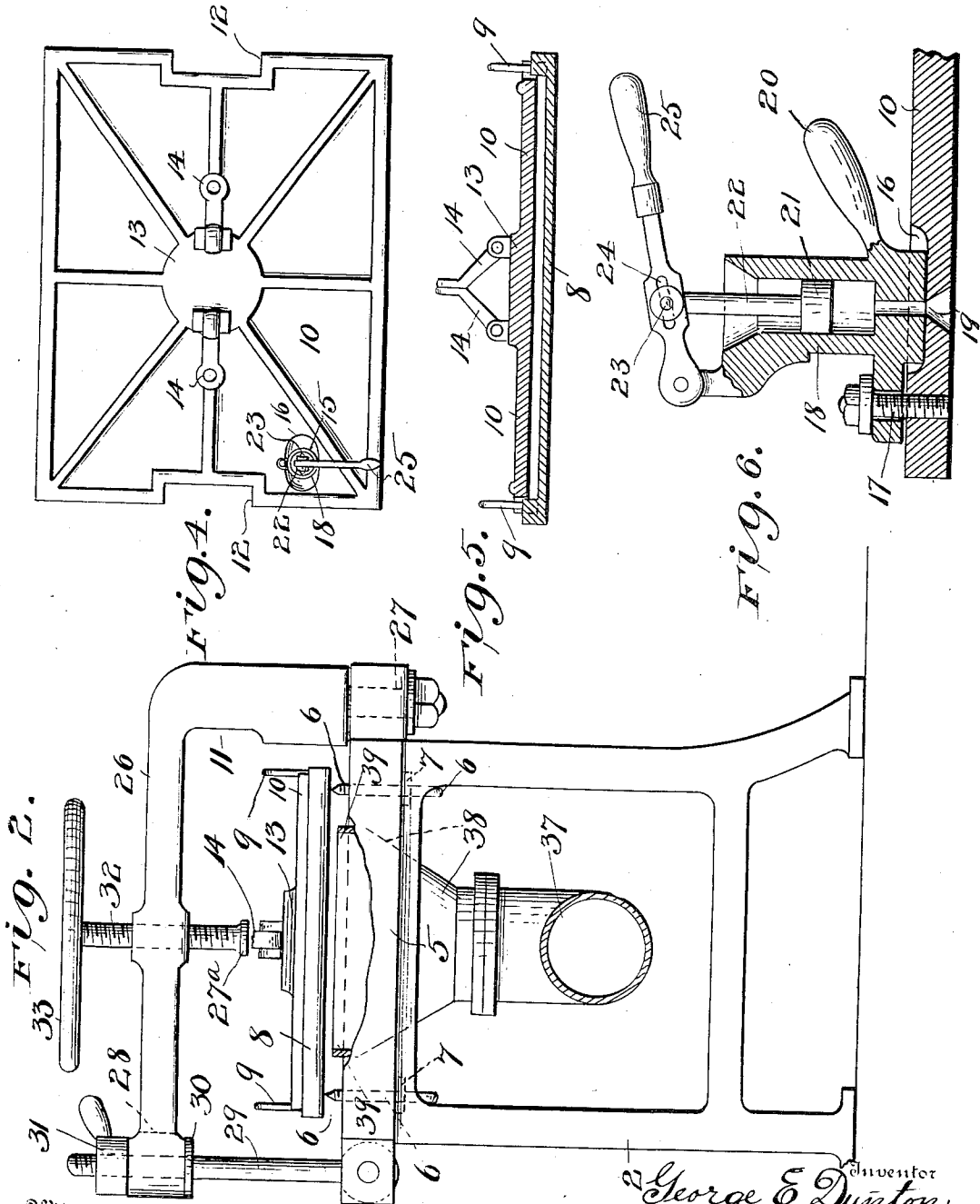
Inventor
George E. Dunton
 By *Blackwood Bros.*
 his Attorneys

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4 SHEETS—SHEET 2.



Witnesses
McJones
Brown

Inventor
George E. Dunton
 By *Blackwood Bros.*

his Attorneys.

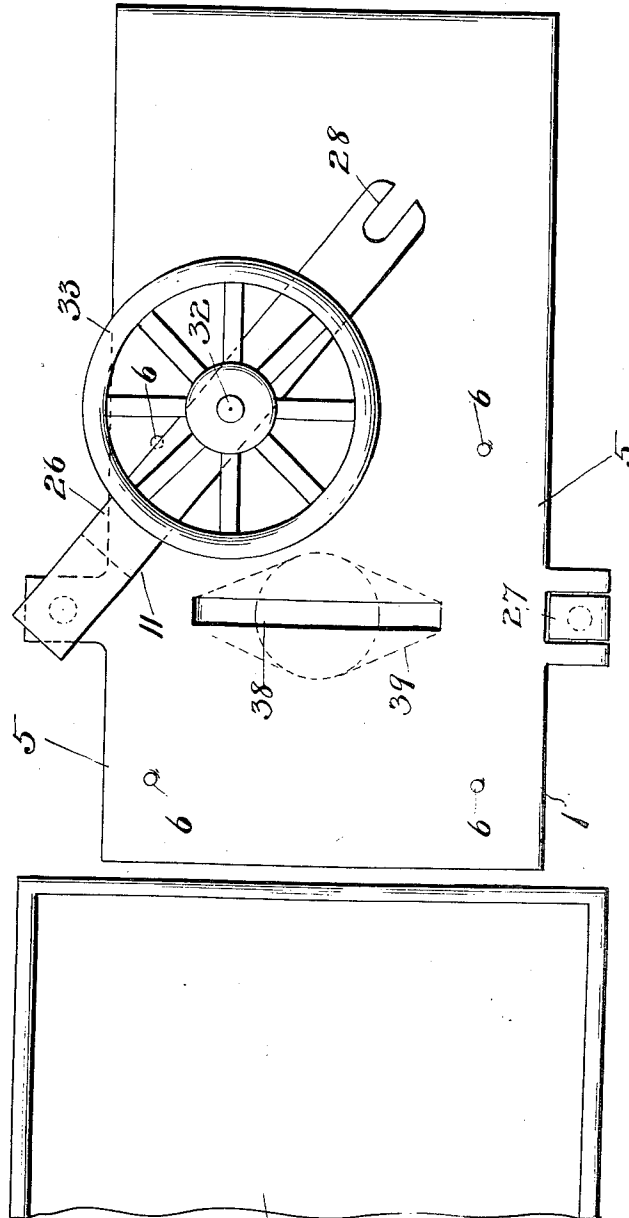
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4 SHEETS—SHEET 3

Fig. 3.



Witnesses
McJones
W. W. W. W. W.

Inventor
George E. Dunton
 By *Blackwood Bros*
 his Attorneys.

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4 SHEETS—SHEET 4.

Fig. 7.

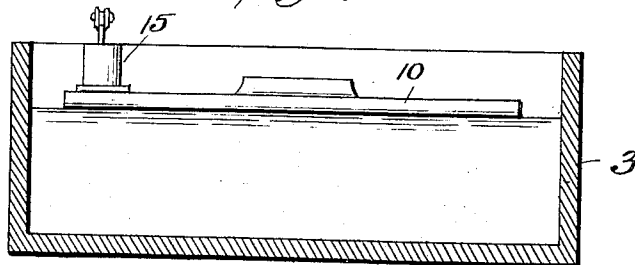


Fig. 8.

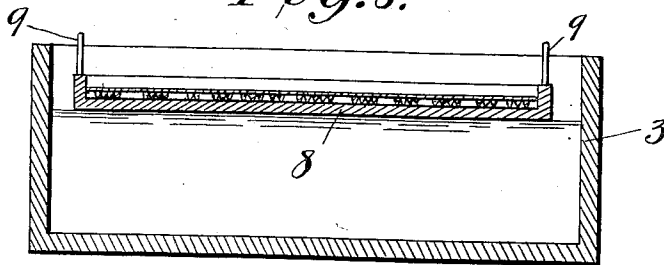


Fig. 9.

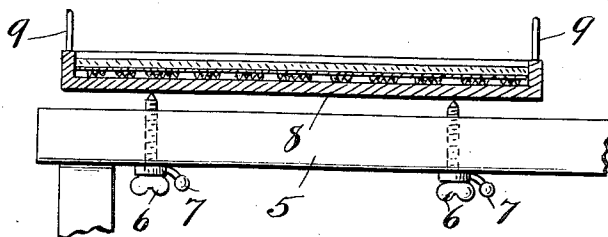
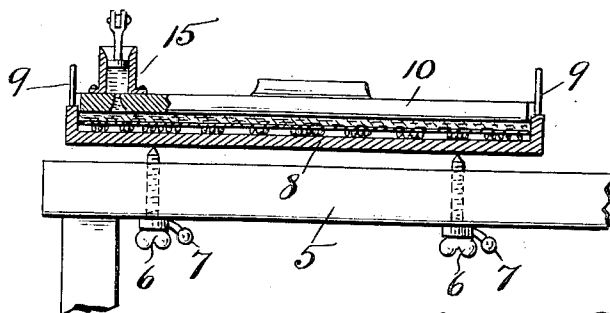


Fig. 10.



Witnesses
Wm. Jones Jr.
Arthur Mabou

Inventor
George E. Dunton
 By *Blackwood Bros.*
 his Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE E. DUNTON, OF NEW YORK, N. Y.

APPARATUS FOR BACKING ELECTROTYPE-PLATES.

931,738.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed August 5, 1907. Serial No. 387,203.

To all whom it may concern:

Be it known that I, GEORGE E. DUNTON, residing at New York city, county of New York, State of New York, a citizen of the United States, have invented certain new and useful Improvements in Apparatus for Backing Electrototype-Plates; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in apparatus for backing electrototype plates.

Electrotypes have been backed by placing the copper shells in backing pans, pouring the molten backing metal over the shells, and allowing it to set, but not to become cold, then placing the pan, backing and shell in a press and forcing the platen down on the back of the hot plate. This has a tendency to force the copper shell or face of the plate down on to the bottom of the backing pan and force out any inequalities in said shell and is very objectionable owing to the fact that the pressure flattens out the letters along the edges of the plate.

In backing up electrototype shells, by the ordinary methods, considerable difficulty has been experienced in producing perfectly straight level faces or printing surfaces as owing to the shells being so thin and delicate, or from inequalities in the texture of the copper, they become distorted during the process of backing showing inequalities known as shrinkages or indentures and often other serious defects. These defects are usually taken out by pounding on the back of the plate, the exact spot having been previously marked; which when done with the utmost care even by expert skilled workmen, at a great loss of time, damages the printing surface to such an extent that it is very often rendered useless.

The object of my invention is to obviate these and other disadvantages by applying a well defined and regulated pressure to the backing within the confines of a closed receptacle, which with its closure or cover has previously been heated to an even temperature with the backing metal. Forcing additional metal into said receptacle while the metal is fluid. Maintaining the pressure during the cooling process so that the entire surface of the backing will be forced evenly against the copper shell and the plate be free from all inequalities and imperfections and thereby

produce an electrototype plate that has an even, solid and perfectly level printing surface.

A further object of my invention is to provide an apparatus which is simple, inexpensive and durable in construction and easy to operate.

The metal is heated to a molten state in the melting pot of a furnace. The platen of a press or the closure or cover of a box or other receptacle or a plate of metal is swung into and allowed to float on the surface of said molten metal until it is of the same temperature as said molten metal, said platen, closure or cover or plate is then removed and a backing pan containing a metallic shell the back of which has been washed or flowed with a soldering flux of muriate of zinc reduced with water which has been slightly ammoniated is then covered with a very thin sheet of solder foil and is placed in, or floated on the molten metal in the melting pot until the solder melts and forms a thin coating over and adhering to the back of the metallic shell. This process which is known to electrotypers as tinning the shell, can be carried on over a separate gas heated table. If done this way the tinned shell is then placed on the backing pan and allowed to remain in the melting pot until the solder begins to lose its bright luster, or oxidize, molten metal is then poured over the back of the shell to weigh it down after which the pan and shell are lifted out of the melting pot and placed on the backing stand where enough additional metal is poured over the back of the shell to fill the pan even with the top of the rim or to the desired thickness. While the metal of the backing is still in a molten or fluid state, the previously heated closure, platen or cover of the press is forced down onto said backing until it rests upon the rim of the pan or within the rim of the pan or rests upon set screws, by this means any desired thickness of plate may be obtained, while not departing from the idea of maintaining a closed box. The density of the lead forms the basis of the backing metal supplemented by the pressure exerted by the force of the screw, while the pan, shell closure, or platen or cover are hot and the metal is molten and elastic it exerts an equal pressure upon the backing and metallic shell which is distributed evenly throughout the face of the shell against the surface of the pan, displacing any steam or gas which may have

generated under the shell, thus permitting every portion of the surface of said shell to be forced evenly against the surface of the receptacle with which it comes in contact.

5 The steam or gas produced under the shell while backing up is useful in that while it is not desired to have it hold any portion of the superficial area of the shell from the pan in whole or in part, it is of service in supporting the blanks and built up portions 10 while the shell is under pressure. The blanks can also be supported by filling the recesses with a paste composed of any suitable material such for instance as a compound of 15 flour, gypsum and powdered pumice stone. To still further augment the possible pressure and to maintain a constant degree up to the cooling point of the metal I inject or force additional metal into the box or receptacle 20 by means of pressure, which may be exerted by means of a pump placed at any convenient point, or by any other means preferably on the platen or cover or the desired result may be obtained by simple gravity, that is, 25 pouring additional metal into a lip or jetty raised above the platen or cover, providing means to shear the jet off before removing the platen. The metal is cooled or set under pressure. The cooling should commence at 30 the pan and be transmitted through the shell beginning at the face of shell and extending through the platen cover or closure of the box. By this means whatever shrinkage may occur in the backing will follow to 35 the last point that cools the back of the plate. This cooling may be accomplished by different methods, preferably by a blast of air from a pressure blower conducted to the underside of the receptacle through suitable pipes. 40 After the metal has become perfectly set or hard, the plate is removed from the pan by unscrewing the wheel of the screw removing the cover or platen and the plate is washed or cleaned by any suitable means.

45 There is an advantage in tinning the shells previous to applying the backing metal, also in doing the tinning upon a separate and independently heated table. First it expedites the work by eliminating the operation of melting the solder over the back of 50 the metallic shell upon the backing pan as any number of shells may be tinned in advance of the backing and the operation at the metal pot is confined wholly to the heating of the shell (to the temperature of the metal) 55 and pouring the metal onto and over the shell. Second, after the shells are tinned the muriate of zinc which adheres to the back of the shells in small dissolved patches, 60 owing to the evaporation of the water in which the muriate was previously dissolved, by the application of heat sufficient to melt the solder, may be washed off the back of the shell with water before the shell is placed on 65 the backing pan to receive the metal.

Otherwise this excess of muriate of zinc which will float on the top of the molten metal which has been poured over the shell, must be removed or skimmed off to keep the surface of the metal bright and clean. If 70 this muriate of zinc is allowed to remain on the surface of the metal, the platen or cover will solder or adhere to the metal, upon being pressed down onto, and in contact with the surface of the metal, and considerable difficulty 75 will be experienced in separating the cast from the platen or cover when the metal has become cooled or set.

In the drawings which illustrate my apparatus:—Figure 1 is a side view, Fig. 2 an 80 end view in elevation, Fig. 3 a top plan view of the backing stand and press, with the platen removed, Fig. 4 a top plan view of the removable platen. Fig. 5 a longitudinal sectional view of the platen and backing pan. 85 Fig. 6 a detail sectional view of a portion of the platen and the pump. Fig. 7 a sectional view of the melting pot showing the platen or closure inserted therein. Fig. 8 a sectional view of the melting pot showing the receptacle and plate or shell inserted therein. 90 Fig. 9 a sectional view showing the receptacle with the backing thereon in a molten state on the backing stand ready to have pressure applied. Fig. 10 is a sectional view showing 95 the receptacle or backing pan, the shell with the molten metal backing thereon and a heated platen applied thereto and a pump.

Referring to the drawings in which like numerals of reference denote like parts 100 throughout the several views: 1, represents the frame of the apparatus supported on legs 2, and provided with a melting pot 3, having a suitable furnace 4, below the same, a backing pan stand 5, having set screws 6 preferably four in number, 7 being lock nuts for locking said set screws after they have been 105 adjusted to the desired position.

8, is a backing pan or receptacle which is designed to be placed on and leveled by the set screws 6, and is provided with a handle or bail 9, at each end. 110

The platen 10 of the press 11, constitutes the cover or closure for the backing pan and comprises a plate having recesses 12 at each 115 end to allow for the bails 9 of the backing pan, a boss 13 at the center having two links 14 pivoted thereto. A pump 15, is seated in a recess 16 in the upper surface of the platen said recess 16 being of sufficient size to allow of a horizontal movement of the 120 pump therein. The pump 15 is pivoted on a bolt 17, extending above the upper surface of the platen 10, for the purpose of allowing it to be moved horizontally in the recess 16, 125 said pump comprising a cylinder 18, having a contracted opening 19 at the bottom, a handle 20 designed to be grasped by the hand for the purpose of swinging the pump around to 130 shear off the teat of metal left on the back of

the cast. The piston 21 of the pump is mounted in the cylinder 18 and the upper end of the piston rod 22 is pivoted by means of a pin 23 in an elongated slot 24 in the pump handle 25.

The press 1' comprises a yoke 26, pivoted to a lug projecting laterally from the frame of the apparatus by means of a bolt 27, said yoke being provided at its end with a slot 28, and 29 is a link screw threaded at its outer end and pivoted to a lug projecting from the frame of the apparatus and provided with a flange 30, on which the yoke is designed to rest and a screw nut 31 engaging the screw threads of the link locks said link to the yoke. A screw 32, having a hand wheel 33, is carried by the yoke 26, and the lower end of the said screw is provided with an enlargement 27^a which is designed to press against the boss of the platen. By the use of the pivoted yoke the screw, hand wheel and yoke can be swung back out of the way when not in use.

The platen is placed on and removed from the backing pan and inserted into the molten metal in the furnace by means of a block and tackle 34, having a hook 35 which engages with the links 14, of the platen said block and tackle being supported by an overhead trolley 36.

The means for cooling the electrotype comprises a pipe 37 having a flat fan shaped nozzle 38, with an elongated mouth 39, which is placed under the backing pan, said pipe 37 designed to have cold air forced therethrough by a centrifugal blower 37^a, or other suitable air forcing device, and to deliver said air against the bottom of the backing pan at a high pressure. A gate or valve 40 is provided in the pipe 37 to regulate the quantity of air passing therethrough.

The operation is as follows:—The backing pan having been placed in position resting on the leveling screws and leveled the copper plate or shell is placed therein and covered with a backing of molten metal to the requisite thickness, and the platen having been previously heated is lowered by the screw onto and into said molten backing and at the same time the pump is operated and additional molten metal is forced into the backing pan onto the molten metal backing, a blast of cold air is then forced against the underside of the backing pan and when the plate has become sufficiently cool to handle without breaking, the teat is sheared off by swinging the pump around the pressure is released by turning the hand wheel of the press, releasing the link from the yoke and swinging the yoke and platen back out of the way when the cast now well cooled is removed from the pan and cleaned and finished in the usual way.

Although I have shown the pump located on the platen and the additional molten

metal is designed to be introduced into the backing pan through the platen yet the pump may be located on the furnace or in the metal pot and the additional metal introduced through the side of the pan and through an orifice between the platen or cover and pan.

I do not desire to be understood as limiting myself to the specific details as herein described as it is manifest that variations may be made without departing from the spirit and scope of my invention and improvements, I therefore reserve the right to all such variations and modifications as properly fall within the scope of my invention and the terms of the following claims.

I claim:—

1. In an apparatus for backing electrotype plates, a receptacle for containing the plate and backing, a closure for the receptacle provided with means for forcing metal into said receptacle, means for causing pressure to be exerted on said closure and means for removing excess metal on the back of the cast, substantially as described.

2. In an apparatus for backing electrotype plates, a receptacle for containing the plate and a backing of molten metal, a press, a heated platen designed to close said receptacle and be pressed against said molten backing by said press and means on said platen for forcing additional metal into said receptacle and onto said backing, substantially as described.

3. In an apparatus for backing electrotype plates, a receptacle for containing the plate and backing, means for pressing said backing and forcing additional metal thereon, and means for cooling said plate and backing comprising a pipe thereunder having a flat nozzle and means for forcing air through said nozzle, substantially as described.

4. In an apparatus for backing electrotype plates, a receptacle for containing the plate and backing, means for pressing said backing and forcing additional metal thereon, and means for cooling said plate and backing comprising a pipe thereunder having a nozzle with an elongated mouth and means for forcing air through said pipe and nozzle, substantially as described.

5. In an apparatus for backing electrotype plates, a receptacle for containing the plate and backing, a press, a closure designed to be mounted on the backing and to close said receptacle and be pressed upon by said press, a pump mounted on said closure for forcing metal into said receptacle and means for removing excess metal on the back of the cast while said metal is under pressure, substantially as described.

6. In an apparatus for backing electrotype plates, a receptacle for containing the plate and backing, a press, a closure designed to be mounted on the backing and to close said

receptacle and be pressed upon by the press, a horizontally movable pump mounted on said closure designed to remove excess metal on the back of the cast while said metal is under pressure by the pump, substantially as described.

7. In an apparatus for backing electrotypes, a receptacle for containing the plate and backing, a press, a closure designed to be mounted on the backing and to close said receptacle and be pressed upon by the press, a horizontally movable pump mounted on

said closure designed to remove excess metal on the back of the cast while said metal is under pressure by the pump and means for cooling said plate and backing comprising a pipe and means for forcing cooling means through said pipe, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

GEORGE E. DUNTON.

Witnesses:

W. J. LOVELOCK,

GEO. P. WILLIAMSON.