G. E. DUNTON.

METHOD OF BACKING ELECTROTYPE PLATES.

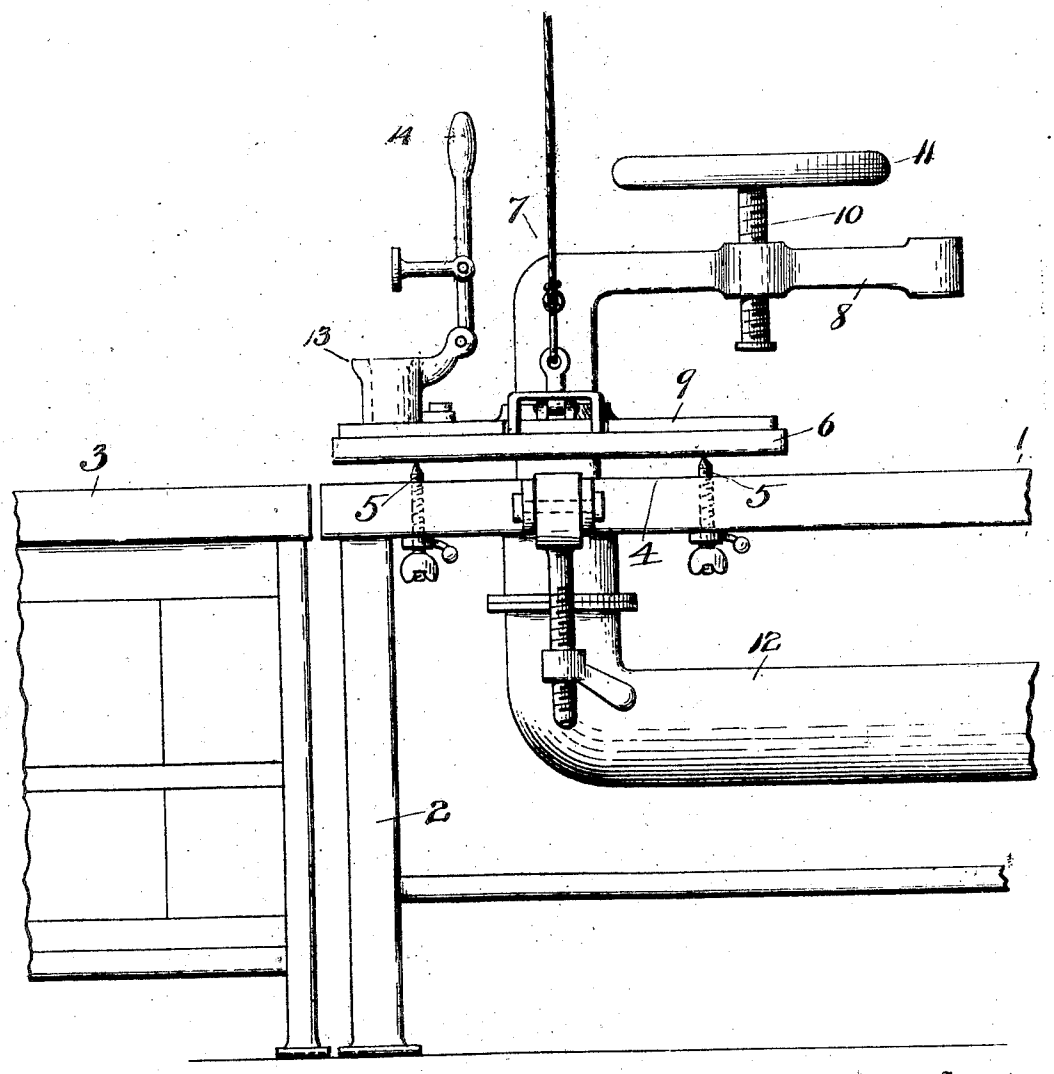
APPLICATION FILED JUNE 14, 1907.

915,021

Patented Mar. 9, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

A. P. Doolittle

Wm. H. Somerwell

Inventor

George E. Dunton

By Blackwood Bros.

Attorneys

G. E. DUNTON.

METHOD OF BACKING ELECTROTYPE PLATES.

APPLICATION FILED JUNE 14, 1907.

915,021.

Patented Mar. 9, 1909.

2 SHEETS—SHEET 2.

Fig. 2.

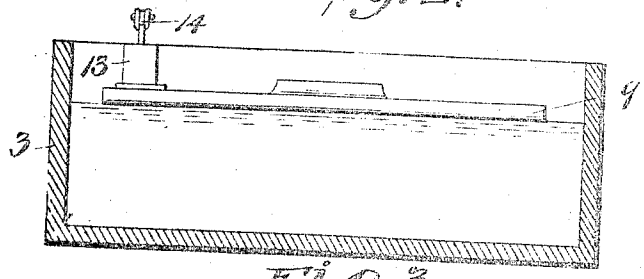


Fig. 3.

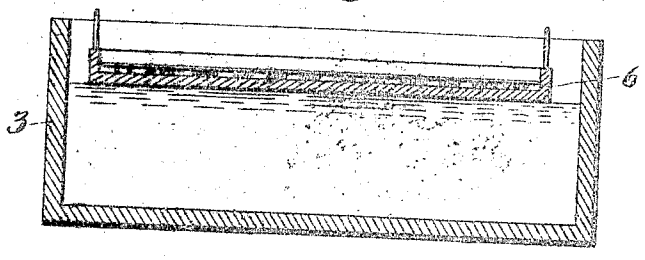


Fig. 4.

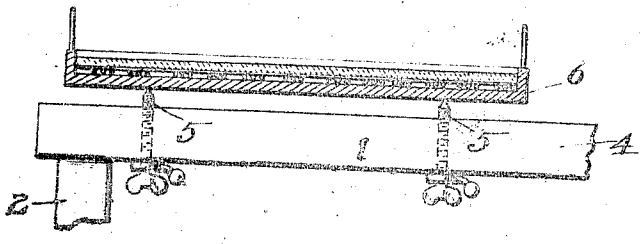
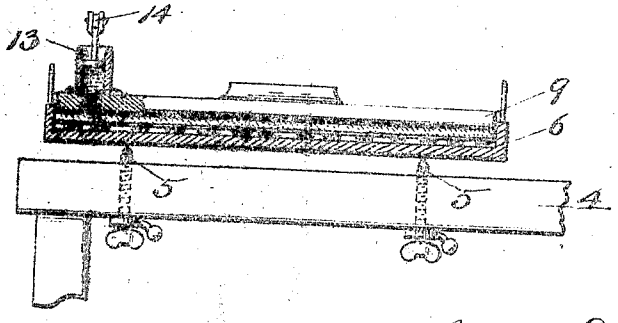


Fig. 5.



Witnesses

H. P. Dodicke

Wm. H. Somerwell

Inventor

George E. Dunton

By Blackwood Bros.

Attorneys.

UNITED STATES PATENT OFFICE.

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

METHOD OF BACKING ELECTROTYPE-PLATES.

No. 915,021. Specification of Letters Patent. Patented March 9, 1909.

Application filed June 14, 1907. Serial No. 379,004.

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 Methods of Backing Electrotype-Plates; and I do hereby 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 an improved method of backing up electrotype shells in the manufacture of electrotype plates and has for its object, to apply 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 electrotype plate that has an even, solid and perfectly level printing surface.

In backing up electrotype 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 and 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.

I produce the copper electrotype shell in the usual manner by the electrodeposition of the metal upon a conductive wax mold. Having secured the desired thickness of metal for the shell which may be made of copper, nickel, steel or any other suitable material, I remove the shell from the wax by pouring hot water over the surface of the shell which heats the metal and breaks the adhesion between the wax and the metal when the shell can be readily stripped or pulled away from the mold, I then rinse this metallic shell in boiling lye to remove all traces of the wax which may have adhered thereto and then plunge said shell into a pickle of acidulated water to remove all traces of the lye, then after rinsing in running water the shell is reasonably clean.

By my process 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. 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 build up portions 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 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 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 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 the pan and be transmitted through the shell beginning at the face or 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 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. 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.

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 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) 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 dissolute patches, 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 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 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 will be experienced in separating the cast from the platen or cover when the metal has become cooled or set.

I wish to call particular attention to the fact that I exert additional pressure upon my electrotype shell. First by the use of a closed box or receptacle having a fixed rim and removable closure, cover or platen both being heated to the temperature of the metal which is to be used in backing the electrotype shell. Second by making this combination into a closed box by screwing the heated closure down onto the rims or inside of the rims to any desired depth by means of set screws provided at suitable points which does not detract from the idea of the closed box. Third, by means of a pump placed at any suitable location or position preferably on the cover of the receptacle I am able to exert additional pressure on the shell by forcing more metal into the box after the closure or cover has been screwed fast in position resting on the rims of the receptacle or box, and by making this pump which is pivoted suitably at its base shear off the jet from the back of the cooled cast so that the closure, cover or platen may be removed from the back of the metal.

I term this process backing electrotype shells by hydrostatic pressure, although I do not limit myself to the use of a jetty as before mentioned, so long as I maintain a closed box or receptacle which with its removable cover or platen and contents have been heated to an even or equal temperature and the exerting of pressure on an electrotype shell during the process of backing. First by the reaction of the metal against the cover of a closed box or receptacle or the pressure of the cover on the metal exerted by a screw, screws or clamps applied to the top of the cover. Second, by the introduction of additional metal to that already contained within the box or receptacle at the time the cover is screwed or forced down closing the receptacle or box, preferably by the means of a suitable pump conveniently located on the top side of the platen or cover of the box.

In the drawings, which illustrate an apparatus to carry out my method:—Figure 1, is a side view comprising a melting pot of a furnace, backing stand, press and a pipe leading from a blower. Fig. 2, a sectional view of the melting pot showing the closure inserted therein. Fig. 3, a sectional view of

the melting pot showing the receptacle and plate or shell inserted therein. Fig. 4, is a sectional view showing the receptacle and shell with the backing thereon in a molten state on the backing stand ready to have pressure applied. Fig. 5, is a sectional view showing the receptacle, the shell with the molten metal backing thereon and a heated platen applied thereto as a closure and a pump for forcing additional metal into the receptacle.

Referring to the drawings, in which like numerals of reference denote like parts throughout the several views:—1, represents the frame of the apparatus supported on legs 2, and provided with a melting pot 3, and a suitable furnace or heater below the same (not shown), a backing stand 4, having set screws 5, adapted to provide means for leveling the receptacle 6.

7, is the press which comprises a yoke 8, a platen 9, comprising a closure for said receptacle and which is made removable so that it can be removed and heated, a screw 10, and a hand wheel 11, for exerting pressure on the shell.

12, is a blower pipe connected to a blower for supplying a blast of cold air to the underside of the receptacle for the purpose of affording means for cooling the same, the electrotype, shell and backing.

13, is a pump for forcing additional molten metal into the receptacle 6, and 14, is the handle thereof.

The operation of the apparatus is as follows:—The copper shell having been covered with the backing metal to the desired thickness by the manner already described and the platen having been heated to the desired temperature the receptacle is placed in position resting on the set screws 5, and after being adjusted by said set screws so as to be perfectly level the heated platen is lowered and deposited on the molten metal backing which has been poured over the copper shell in the receptacle. The platen being in the desired position pressure is applied thereto by turning the wheel 11, which causes the screw 10, to press down onto the boss of the platen forcing the platen down onto and into the metal backing to the desired depth, additional metal is forced into the closed receptacle by a pump or other means to make up for the shrinkage loss in cooling, so that an equal pressure is maintained upon the shell until the metal or plate has become cold and set, a blast of cold air is then applied to the underside of the backing pan through the blower pipe 12, by means of a blower until the receptacle, backing and shell are cooled to a sufficient degree. Whatever shrinkage there is to the metal will follow to the last point that cools which is around the edges of the platen, and away from the printing surface of the plate. When the shell and backing have become sufficiently cool to handle without breaking, pressure is released by turning the hand wheel in the reverse direction which causes the screw to withdraw from the boss of the platen when the platen is removed from the backing and the cast plate and backing are removed from the receptacle and then cleaned and finished.

What I claim is:—

1. The method of backing electrotype plates consisting in providing a receptacle having a closure, heating said receptacle and closure, heating the shell in molten metal, removing the shell from said molten metal, placing said shell in said receptacle, pouring molten metal over said shell to form a backing for the same, pressing the heated closure of the receptacle down upon the molten backing, forcing additional molten metal into the receptacle and causing it to be distributed over the surface of the metal backing while said backing is in a molten state and under pressure and allowing said backing to cool under pressure, substantially as described.

2. The method of backing electrotype plates consisting in providing a receptacle having a closure or cover, heating the backing metal, heating the said closure to the same temperature as the backing metal, heating a shell in molten metal, removing the shell from the molten metal, placing said shell in said receptacle, pouring molten metal over said shell to form a backing therefor before applying the closure, pressing the heated closure or cover down upon said backing while it is in a molten state, and cooling and removing the closure and shell, substantially as described.

3. The method of backing electrotype plates consisting in providing a closed receptacle having a removable closure, heating said closure to the same temperature as the backing metal by inserting it onto the backing metal, when said metal is in a molten state, placing a shell in said receptacle, heating the shell, pouring molten metal over the shell to form a backing therefor, pressing the heated closure down upon said backing while it is in a olten state, introducing additional metal into the receptacle and distributing it over the entire surface of the backing of the shell to compensate for the shrinkage of the said backing which occurs when it cools, and removing the closure, substantially as described.

4. The method of backing electrotype plates consisting in providing a receptacle with a closure, heating the closure in molten metal in the melting pot of a furnace until it is of the same temperature as the metal therein, removing said closure, heating the receptacle and shell in said pot, removing the receptacle and shell from the pot, placing the shell in the receptacle, pouring molten

metal over said shell, pressing the heated closure down upon the molten metal backing, forcing additional metal into said receptacle and onto the backing of the shell before it cools, cooling the backing while under pressure and finally removing the pressure, substantially as described.

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

GEORGE E. DUNTON.

Witnesses:
WM. J. LOVELOCK,
H. F. W. BECKER.