Nov. 26, 1935. J. H. SHEA 2,022,156

ART OF PRINTING

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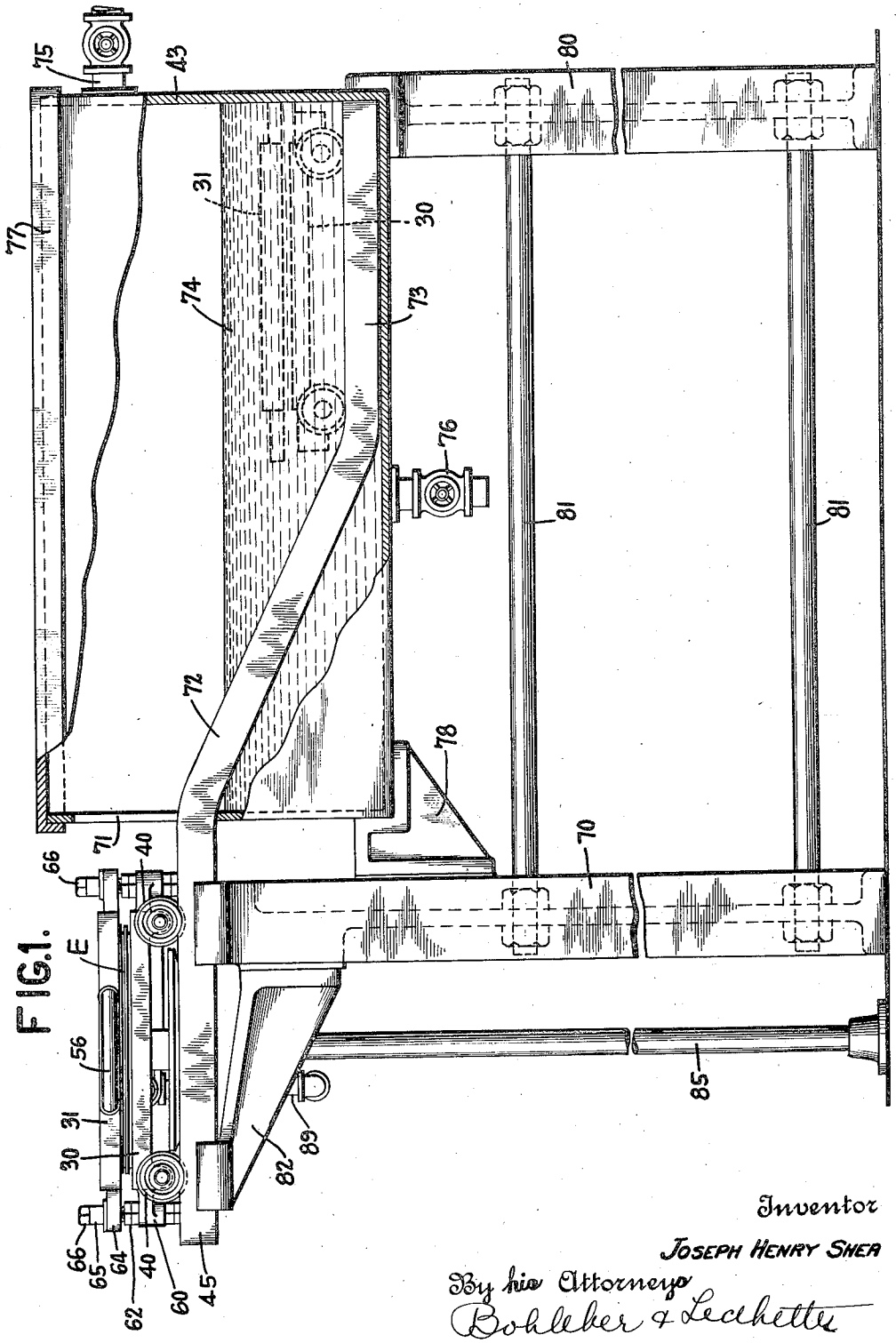

FIG. 1.

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By his Attorneys

Bohleber & Lechette

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ART OF PRINTING

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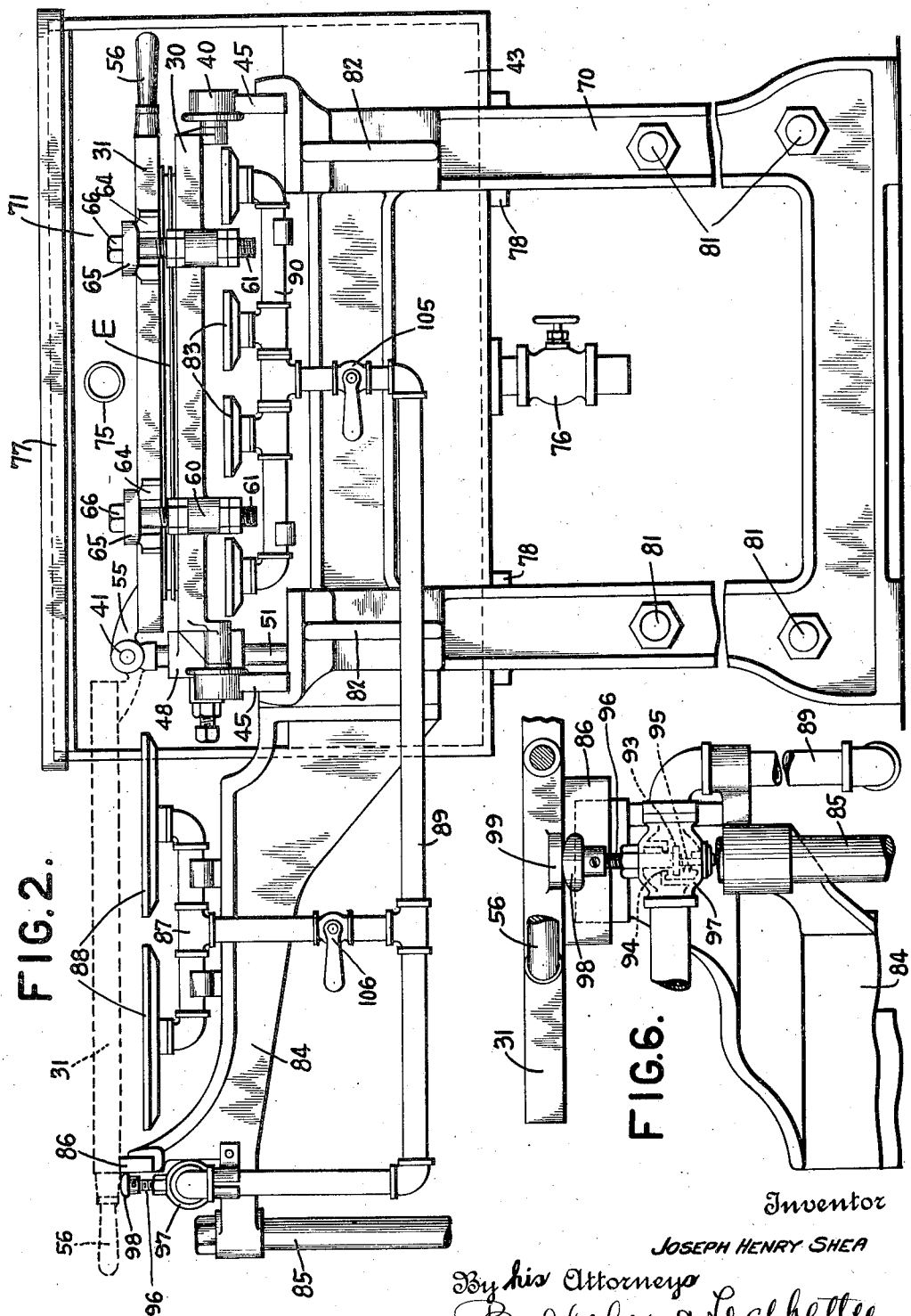

FIG. 2.

FIG. 6.

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ART OF PRINTING

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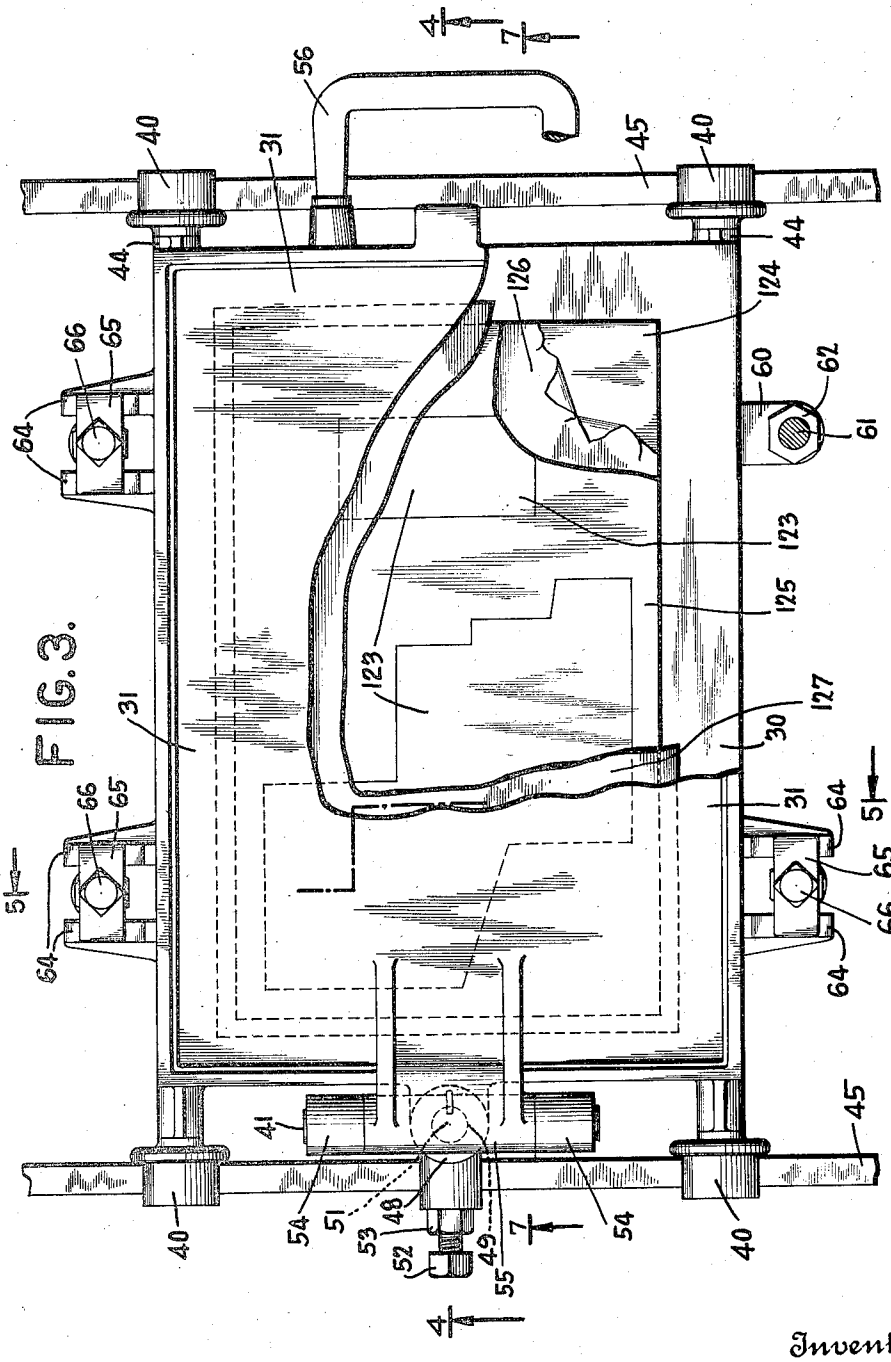

FIG. 3.

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Nov. 26, 1935. J. H. SHEA 2,022,156

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FIG. 4.

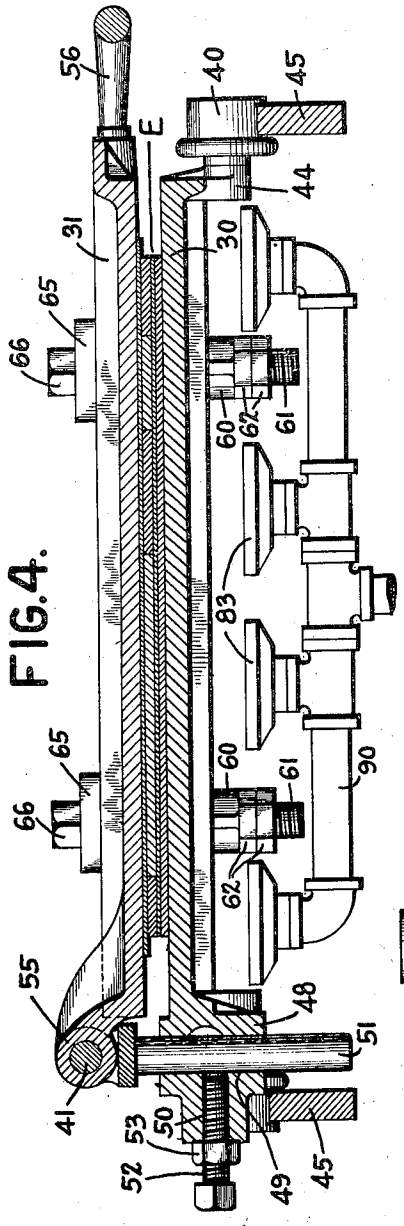
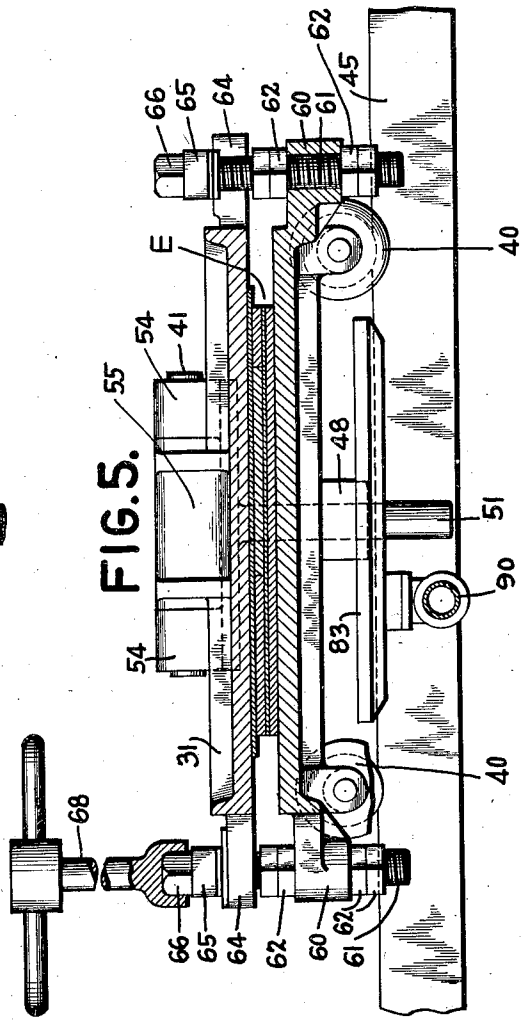


FIG. 5.



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Nov. 26, 1935. J. H. SHEA 2,022,156

ART OF PRINTING

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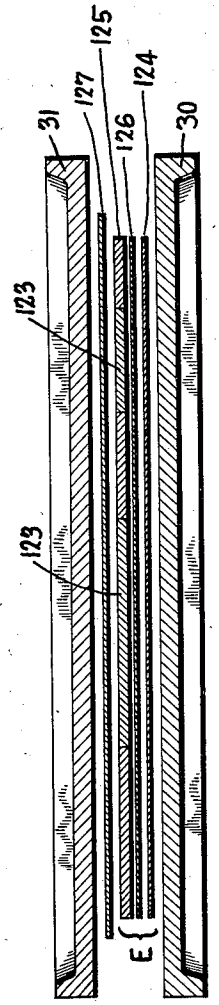

FIG. 7.

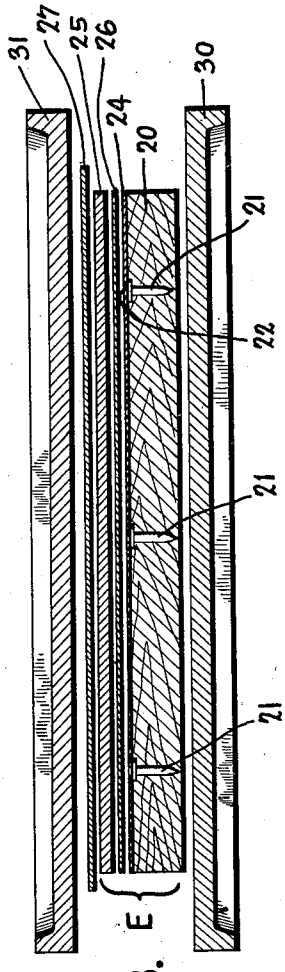

FIG. 8.

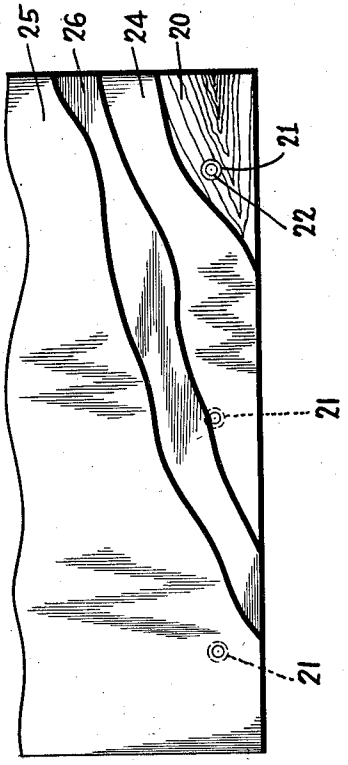

FIG. 9.

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ART OF PRINTING

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FIG. 10.

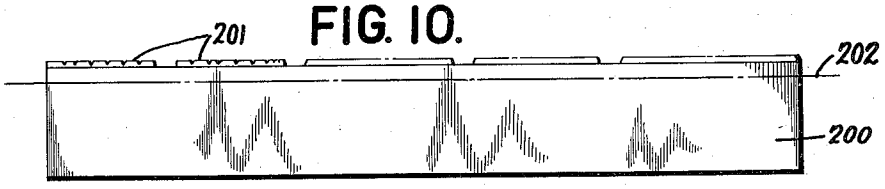


FIG. 11.

FIG. 12.

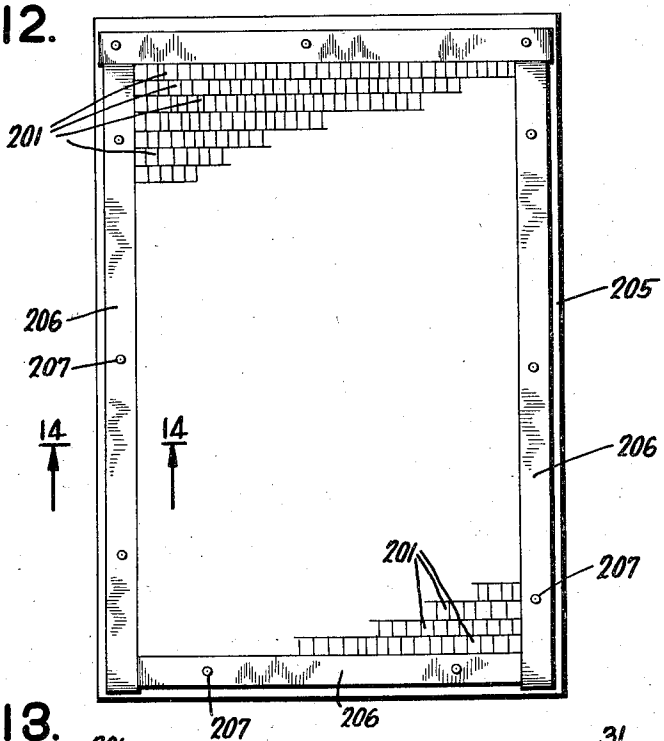


FIG. 13.

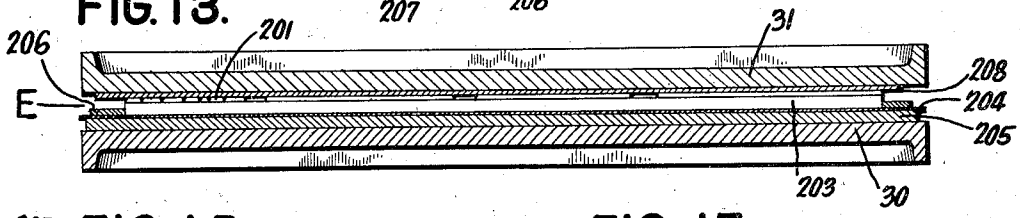


FIG. 14.

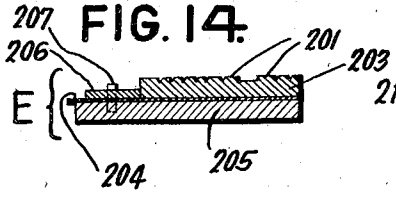
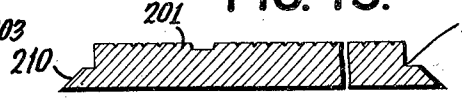


FIG. 15.



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Nov. 26, 1935. J. H. SHEA 2,022,156

ART OF PRINTING

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FIG. 16.

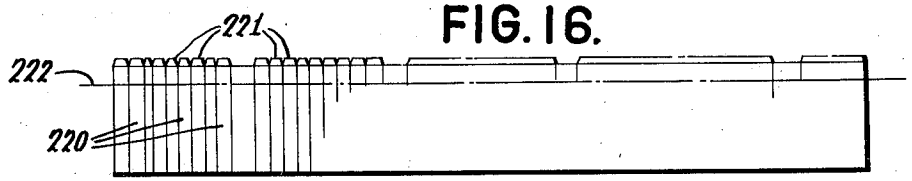


FIG. 17.

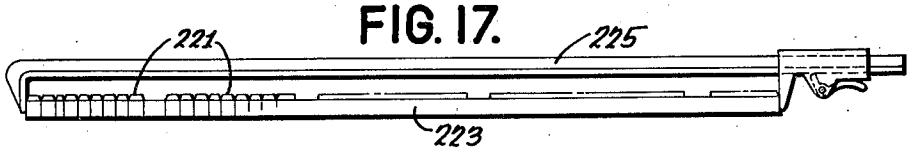


FIG. 18.

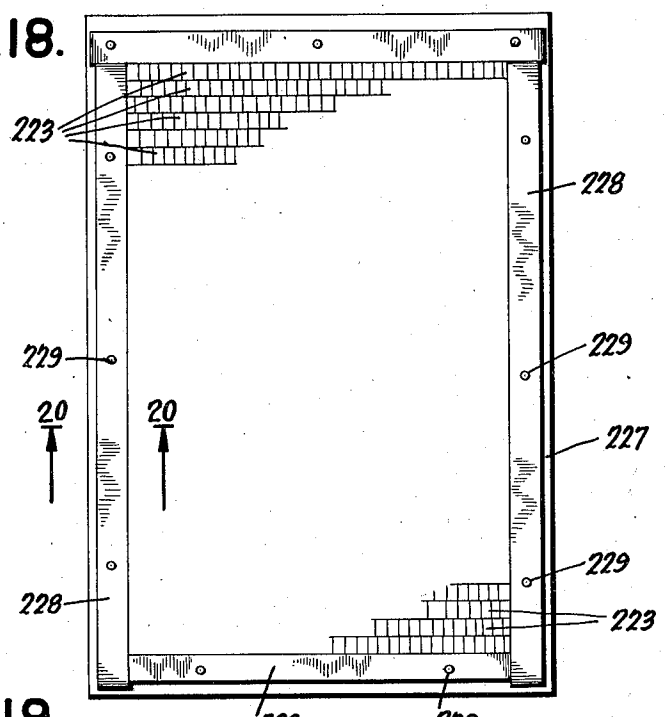


FIG. 19.

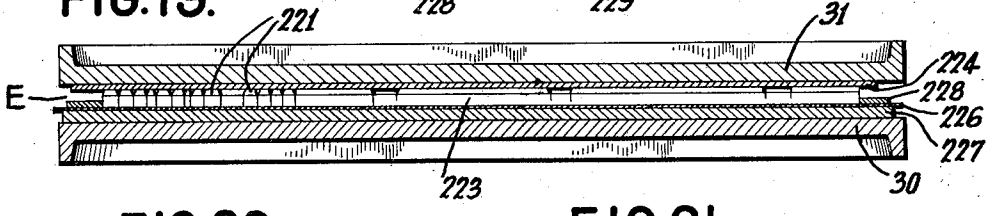


FIG. 20.

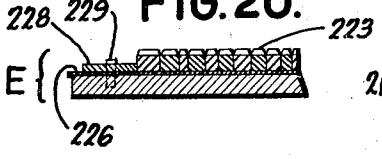
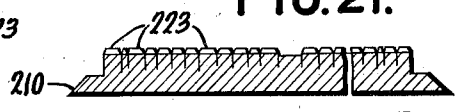


FIG. 21.



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Patented Nov. 26, 1935 2,022,156

UNITED STATES PATENT OFFICE

2,022,156

ART OF PRINTING

Joseph Henry Shea, Baldwin, N. Y., assignor to Frederick Griswold, Jr., as trustee

Application October 3, 1929, Serial No. 396,989

10 Claims. (Cl. 101—401.1)

This invention relates broadly to the art of printing and more particularly to a process and apparatus for backing plates or other metallic members bearing indicia by which an impression, as in printing, may be made, and to the products of such process. By the term plates or other metallic members bearing indicia by which an impression may be made, it is intended to cover any instrumentality bearing configurations such as illustrations, pictorial or otherwise, or type either in the original or in reverse, as electrotypes, halftones, originals, zinc etchings, linotype, monotype, pattern plates and other indicia by which impressions may be made whether for use in the final or an intermediate step in printing, or any other impression making art. Inasmuch as the plates will find their greater usefulness in connection with printing, the invention will be described in connection with that art.

Heretofore, electrotypes have been prepared for use in printing by providing the plate with a flange about its periphery and securing the plate to a wooden block by means of nails driven through the flange into the wood. In use, after many impressions have been run off from the electrotype, the nails work loose and sometimes pull part way out of the block so that the heads of the nails are in or above the plane of the etched face of the plate and receive ink during the inking of the plate and form blurs on the paper when subsequent impressions are made. This method of securing the electrotype to the wood block has the further disadvantage that the wooden block must be made oversize by reason of the marginal securing flange, thus forming, in printing, a blank space around the impression since the type cannot be set close to the subject matter depicted on the plate because of the flange.

It is an object of the present invention to improve the method of securing the etched plate to the wooden block and thus avoid the requirement of a marginal flange, thereby reducing the size of the block and doing away with the blank space about the impression.

In accordance with this aspect of the invention, there is provided a wooden block which may be of exactly the same size as the etched matter on the plate. To one face of this wooden block there is secured a sheet or plate adhesive to solder, preferably of copper, as by nails, conveniently double headed, passing through the plate into the wood. To this metal plate the etched plate is secured by an adhesive, as by solder, preferably by interposing tin foil between the etched plate and the plate secured to the wood block and subjecting the assembled plates to heat and pressure.

The invention also has to do with a method of securing inserts or patches or corrections, as they are sometimes called, in an electrotype. Heretofore, when it has been desired to correct a portion of an electrotype, that portion to be corrected has been cut out of the electrotype and a new etched plate portion bearing the subject matter to be substituted, of substantially the same shape and size as the cut-out portion, has been inserted and soldered to the original plate at points around the edges. This has usually been accomplished by laying the electrotype face downward on a suitable flat surface and applying the solder to the joints on the back side of the plate by running a stick of solder and a soldering iron over the same in the usual method of soldering. In printing, there is a certain degree of flexing of the electrotype when impressions are being made and after a number of impressions have been made, the soldered joints break, necessitating a cessation of printing while the electrotype is returned to the bench to have the joints resoldered. When one of more inserts occur in the same electrotype, a day or more may be required each time the joints must be resoldered, thus increasing the expense of printing materially.

It is also an object of this invention to provide an electrotype in which corrections may be inserted which will withstand the stresses and strains set up by the flexing of the electrotype during printing and in which corrections may be made with a minimum of time and effort and which, after once being made, will not work loose and require resoldering.

In accordance with this aspect of the invention, the electrotype is backed by a sheet or plate of metal to which both plate and insert may be secured over its entire surface. Thus matter inserted in a cut-out portion is firmly secured to the backing plate and an integral corrected electrotype is formed. More particularly, the electrotype with the inserts in place, is superimposed upon a backing plate of the same size, with, say, tin foil therebetween, and the whole subjected to heat and pressure, thereby fusing the tin foil and forming a solid composite structure which will resist all strains and stresses and can be used for any number of impressions without the insert working loose.

In the manufacture of electrotypes for the printing of books, magazines and the like it is the practice to first set up the printed matter on

a linotype machine. The linotypes assembled in consecutive order are then blocked up into chases and taken to the foundry where a wax matrix is formed by pressing the type face downward into a sheet of wax by a hydraulic molding press. After this molding operation the matrix goes to the bench for building up; that is, filling all the low spots by running a hot iron and a bar of wax over the low spots. From this bench the wax matrix is taken to another location where the wax impression is cleaned with a camel's hair brush and iron filings dusted over it. It is then suitably connected to a source of electric current and suspended in an electrotype bath for approximately two hours' time until a copper shell has been deposited in the depressions in the matrix in which impression it is held by means of the iron filings. This copper shell has the same configuration as the original block of linotype. This electroplated impression or electrotype shell is then taken to the backing-up room where tin foil is laid over the concave surface of the shell and ladles of molten metal poured thereinto to form a backing for the copper shell. Thereafter the back is planed by a roughing machine and after that an electrotype finisher, as he is called, rubs over the face of the electrotype with a rubber roller to locate any low spots, and then hammers the plate until the front face of the type lies in the same plane so that impressions may be printed therefrom.

It is still another object of the invention to eliminate practically all of the steps herebefore described and to utilize, directly, the type as it issues from a linotype or a monotype machine for the printing of impressions. To this end, type, either linotype or monotype, of proper height is soldered directly to a backing sheet to form the plate taking the place of the electrotype from which impressions are made in the printing of the book or magazine pages. More particularly, the type, either linotype or monotype, is arranged in proper sequence in a frame upon a backing plate with tin foil or other adhesive forming material therebetween and the whole united by subjection to heat and pressure to produce the desired plate from which the impressions are made. If desired, the type face of the plate may be copper plated to withstand hard usage.

It is also an object of the invention to provide a method whereby the electrotypes as heretofore described and other indicia bearing plates may be expeditiously manufactured. To this end, a heated platen may be placed upon the assembled electrotype and backing sheet, causing the tin foil to melt and, when pressure is applied, run evenly over the entire interior surfaces, after which the assembly may be quenched and the integral electrotype results. If desired, a second heated platen may be placed beneath the backing sheet in carrying out the method.

The invention also seeks apparatus by which the aforesaid method may be carried out. To this end, apparatus which consists, preferably, of upper and lower platens, conveniently hinged together, are adapted to be heated, as desired, to a predetermined temperature. Upon the bottom platen is then placed, for example, the lower sheet or backing plate and upon its upper face one or more sheets of tin foil are then disposed and the electrotype placed thereupon face upwardly. The upper platen may then be closed down upon the electrotype and the two platens clamped together. After a suitable interval of time to allow for a heat transfer from the platens to the work during the pressure, the work is cooled as by quenching in a tank and upon opening the platens, the reenforced or backed electrotype will be found to be an integral structure capable of withstanding the hardest usage.

These and other objects of the invention and the means for their attainment will be more apparent from the following detailed description, taken in connection with the accompanying drawings, illustrating means by which the invention may be realized, and in which:

Figure 1 is a view showing, in front elevation, apparatus whereby electrotypes, and other metallic members from which impressions may be made, may be backed in accordance with the present invention, parts being broken away in the interest of clearness.

Figure 2 is an end view of the apparatus, looking from the left in Figure 1.

Figure 3 is a view showing, in plan, a fragmentary part of the apparatus at the left hand side of Figure 1 and illustrating particularly the platens whereby heat and pressure is applied to the metallic members from which impressions are made, a corrected electrotype being indicated between the platens.

Figure 4 is a longitudinal sectional view, taken in the plane indicated by line 4—4 of Figure 3, and looking in the direction of the arrows.

Figure 5 is a transverse sectional view, taken in the plane indicated by line 5—5 of Figure 3 and looking in the direction of the arrows.

Figure 6 is a fragmentary view showing a valve adapted to supply combustible fuel to the burners used to heat the platens, which valve is adapted to be automatically opened when the platens are separated to receive the assembled elements which are to be united to form the metallic members from which impressions are made.

Figure 7 is a view in vertical longitudinal section, taken in the plane indicated by the line 7—7 in Figure 3 and showing the method by which corrections or patches are inserted in electrotypes.

Figure 8 is a view similar to Figure 7 but showing the apparatus applied to the backing of an electrotype with a wood block.

Figure 9 is a plan view of a fragment of an electrotype backed by a wood block, parts being removed in the interest of clearness.

Figure 10 is a view in side elevation showing a linotype slug as it comes from the linotype machines as now constituted.

Figure 11 shows a similar linotype slug which has been reduced in height, it being cut off along the dot and dash line indicated in Figure 10, or which linotype slug of reduced height has been produced by a modified linotype machine.

Figure 12 shows a plurality of linotype slugs set within a frame and mounted upon a backing plate preparatory to being formed into a unitary plate from which impressions may be made in printing.

Figure 13 shows the assembly of Figure 12 disposed between platens, one of which, at least, is heated, in carrying out the method of manufacture of the printing plate in accordance with this invention.

Figure 14 is a fragmentary view, taken in the transverse vertical plane indicated by the line 14—14 of Figure 12 and looking in the direction of the arrows.

Figure 15 is a view, in transverse vertical section, showing the finished printing plate made as shown in Figure 12.

Figure 16 is a view similar to Figure 10 but

showing a plurality of monotype as delivered from a monotype machine.

Figure 17 shows the monotype of Figure 16 held within a clamp in accordance with this invention and cut off to a predetermined height for use in accordance with this invention.

Figure 18 is a view similar to Figure 12 but showing monotype within the frame.

Figure 19 is a view similar to Figure 13 but showing the method applied to monotype.

Figure 20 is a fragmentary vertical sectional view taken in the plane indicated by the line 20—20 of Figure 18 looking in the direction of the arrows.

Figure 21 is a view in vertical transverse section showing the completed printing plate when made from monotype.

Reference will first be had to Figures 3, 7, 8 and 9 for an understanding of some of the products of the method according to this invention. In Figures 8 and 9, a wooden block is shown at 20, into one face of which double headed nails 21 are driven, having one end 22 protruding slightly above the face of the wooden block. Upon this face of the wooden block 20, and the nail ends 22 protruding therefrom, there is placed a sheet of metal 24 which is adhesive to solder, preferably a copper sheet, which sheet or plate 24 is permanently secured to the wood block 20 by means of the said double headed nails 21, 22 in a manner well understood. The sheet 25 represents the plate upon which the desired indicia appears and from which impressions are to be made in printing and which is to be secured to the wooden block 20. Between the copper plates 24 and 25 there is placed one or more sheets of tin foil 26 or other adhesive, together with an appropriate flux such as acid, as will be understood, and these parts 24, 25, juxtaposed as shown, are then heated until the solder 26 melts and pressed together until the solder adheres to the bottom surface of the top plate 25 and the top surface of the bottom plate 24. The whole is then quickly cooled as by quenching in water, when the plate 25 will be found to be firmly and permanently secured to the wood block 20.

Preferably, this heating and compression is accomplished by assembling the wooden block 20 faced with say the copper sheet 24 and the etched plate 25 and interposed tin foil 26, as shown in Figure 8, upon a platen 30 or other flat supporting surface. Preferably a sheet of tissue paper 27 is placed over the etched surface of the plate 26 to protect it. A heated platen 31 is placed on top of the tissue 27, pressure is applied until the tin foil is melted and the two copper sheets adhere together by reason of the melted film of solder and then the electrotype may be quickly quenched and the backed electrotype is ready for use.

It will thus be seen that no circumferential flange is necessary, as heretofore, to secure the etched plate or electrotype 25 to the wooden block 20 and thus the etched indicia may extend to the very perimeter of the plate 25 and when set up for printing, type may be placed in close proximity to the etched indicia and no space is wasted. Furthermore the electrotype 25 is permanently secured to the wood block 20 and will not work loose in use no matter how many impressions are made therefrom.

The invention is also applicable where an electrotype is to be repaired, i. e., parts thereof replaced by new matter. That part of the electrotype not desired is cut out and new matter etched or otherwise formed on a sheet or plate of substantially the same size as that portion which has been removed and inserted in the cut out portion of the electrotype. Such substituted portion will be referred to, for the sake of convenience, as an insert or correction. Referring to Figures 3 and 7, the sheet 125 may represent an electrotype etched on its upper face and parts thereof, such as at 123, are corrected by having the original matter cut out and new etched sections inserted therein. The parts to be removed or corrected are cut out and the corrected matter in the form of a piece of copper plate 123 of the same shape and size as the parts cut out and containing, upon its upper face, the indicia to be substituted, is inserted in the holes cut in the original electrotype. The mutilated original electrotype with the inserts in place are formed into an integral plate by being secured throughout to a backing plate as now to be described. First a sheet say, of copper 124 is placed, preferably, upon a bottom platen 30. Upon this plate 124 is laid one or more sheets of tin foil 126, the surfaces suitably treated with a flux, and the electrotype 125 from which the parts have been cut out is laid thereupon, face upwardly, and the corrected matter 123 inserted in the holes which have been cut out. Upon the face of the electrotype may be placed a sheet of tissue paper 127, as before, to protect the etched surface from the top plate 31 which is now superimposed. The two platens 30 and 31 are clamped together so as to subject the sheets therebetween to pressure. These platens 30, 31 are preferably first heated to a predetermined temperature and a heat transfer occurs while the platens 30 and 31 are clamped together which causes the tin foil 126 to melt and the corrected electrotype 125, 123, and the backing sheet of copper 124 to be formed into a unitary structure. The entire clamped unit is then quickly cooled as by quenching in water or other cooling fluid so that the solder is cooled and unites the two plates rigidly and solidly together, and the electrotype may then be removed as a unit.

This improved electrotype 124, 126 has the advantage, among others, over those at present in use by reason of the fact that the solder not only finds its way between the joints, but secures the entire bottom surface of the electrotype, both original part 125 and inserts 123, to the backing sheet 124 and thus when the impressions are made in printing any flexing of the plate will not serve to break loose any of the corrections 123 and render it necessary to make repairs.

The invention is also applicable in the manufacture of plates from which pages of books and magazines may be printed involving the direct use of linotype or monotype slugs as they come from a standard or modified linotype or monotype machine.

Figure 10 shows a slug 200 such as produced by a linotype machine having the indicia or type 201 on its upper face. The slug as produced by the present linotype machine is too high and it is proposed to cut the slug off along the dot and dash line shown at 202 in Figure 10 to produce a slug 203 as shown in Figure 11. Obviously, the linotype machine may be modified to produce directly the slug 203 of less height such as shown in Figure 11. A plurality of these slugs 203 are then set up in proper sequence on a galley, as is the usual practice, and from the galley they are slid, in accordance with this invention, on to one or more sheets of tin foil 204, suitably treated with acid, lying upon a backing plate 205, preferably of lead or tin, and at any rate adherent to

solder. Instead of placing the assembled slugs of linotype in a chase as heretofore practiced, the slugs are held in position by means of strips 206 of fusible metal, such as lead, which form, in effect, a frame about the assembled linotype slugs, and are tacked in position to the backing plate as shown at 207.

The assembled linotype slugs 203 and backing plate 205 may then be placed between platens 30 and 31 as shown in Figure 13, with suitable sheets of tissue paper 208 between the face of the type 201 and the top platen 21. In this instance, only the bottom platen 30 need be heated. These platens 30, 31 are drawn together as heretofore described to apply pressure while a heat transfer is taking place, and after a predetermined period of heating are cooled or quenched. The heat causes the solder to melt and the pressure causes the permanent adherence of the linotype slugs 203 to each other and to the backing sheet 205, the framing strips also adhering to the backing sheet and slugs, and forming, in effect, a unitary mass in the form of a plate having type formed in its upper face as shown in Figure 15. This plate may then be routed out as at 209 and bevelled as shown at 210 in Figure 15 and, if desired, may be copper plated by electrolysis to withstand excessive wear.

It will thus be seen that all of the steps of molding and working on the electrotypes as now practiced are eliminated while the equivalent of the electrotype as now used is produced.

Monotype may similarly be used in the production of a printing plate. Figure 16 shows a plurality of monotype 220, each bearing a character 221, as delivered in proper sequence upon a galley by a standard monotype machine. These monotype slugs 220 are again too high and must either be cut off along the dot and dash line 222 or produced of a reduced height as at 223 by a modified monotype machine. In order to reduce their height, the standard monotype slugs 220 may be gripped by a suitable adjustable clamp 225 (Figure 17) and the entire row cut to size by a saw.

The monotype slugs 223, assembled in proper sequence on a galley, are slid off onto one or more sheets of tin foil 226, treated with suitable flux, which sheets 226 are disposed upon a backing plate 227 of, say, lead or tin and secured in assembled relation as by the lead cleats 228 tacked on at 229 to the backing plate. As before, the assembly 223, 227—228, is disposed between the platens 30, 31 with tissue paper 224 or other suitable shielding material over the type face 221. The bottom platen, having been heated beforehand, the work is laid thereon, the platens are drawn together and, as before, the parts are united by heat and pressure and subsequent cooling to produce the integral plate shown in Figure 21.

Suitable apparatus by which the method heretofore described may be put into practice is illustrated in Figures 1 through 6. The top and bottom platens, 30 and 31 respectively, are shown as forming what has been termed a carriage mounted upon wheels 40 and hinged together as at 41, (Figure 2). To receive the work, the top platen 31 is folded back to the dotted line position shown in Figure 2, and either the top or bottom platen or both platens are heated as desired. After the platen or platens are heated to the desired degree, the work indicated generally at E is placed upon the bottom platen 30, the top platen 31 closed down and the platens clamped together. After a predetermined period of time during which the work E is subjected to heat and pressure, the carriage may be pushed quickly down into the bath 74 and there cooled, whereafter it may be removed, as by the handles 56, opened and the work E, now a solid metallic member, removed.

The top and bottom platens 31, 30 are preferably rectangular in form, the bottom platen 30 being formed near each of its corners with a depending ear 44 adapted to form a bearing for the axle of a wheel 40, inwardly flanged, which rests upon the track 45. Near one end and centrally, the bottom platen 30 is formed with a boss 48 intermediate the wheels, which boss 48 is provided with a vertical bore 49 and a horizontal bore 50 extending thereinto from the outside. The vertical bore 49 receives a spindle 51 which is adjustable therewithin and held in place by means of a set screw 52 threaded into the horizontal bore 50 and locked in position by means of the lock nut 53. On the top of the spindle 51 is mounted, in spaced relation, a pair of ears 54 forming the outside elements of the hinge and receiving the hinge pin 41. On this hinge pin 41 is pivotally mounted the other hinge member 55 formed as an ear on the upper platen 31.

On the end opposite the hinge, the top platen 31 is shown as provided with a handle of any convenient kind such as a U-shaped handle 56 for convenient grasp of the hand in opening and closing the platens and removing the carriage from the tank 43. On the longer sides of the platens are the clamp members by which pressure is applied to the work E. In this instance, two clamps are shown on each side. Protruding from the bottom platen 30, in spaced relation, are lugs 60 formed with threaded vertical apertures receiving upwardly extending bolts 61 secured in the apertures by means of the nuts 62 above and below the lugs 60. The upper platen 31 is provided with spaced or slotted lugs 64, or clamp abutments which, when the platens are in closed position, extend upon opposite sides respectively of the bolts 61 and these abutments 64 are drawn downwardly on the bolts by means of cross-members or bridges 65 carried with the respective bolts 61 and held in adjusted or clamping position by means of the nuts 66. The nuts 66 are screwed home to tighten the clamp by means of any suitable wrench, such as the socket wrench 68 shown in Figure 5 of the drawings.

The two clamping platens 30, 31, hinged together, form a sort of carriage, the flanged wheels 40 of which rest upon tracks 45 one end of each of which is carried by one vertical standard or end frame member 70 of the machine. These tracks 45 extend first in the horizontal direction, as shown at the left hand end of Figure 1 to support the carriage at loading position, and then enter an opening 71 in one wall of the quenching tank 43, after which the tracks bend downwardly, as at 72, to a second horizontal position 73 in the bottom of the tank 43 so that the carriage 30, 31 entering the tank 43 through the opening 71 travels down the tracks to the quenching position below the surface of the liquid 74 in the tank. To maintain the liquid in the tank at the proper quenching temperature it may be replenished through the valve controlled inlet 75 and evacuated by means of the valve controlled outlet 76 in the bottom. To protect the operator of the machine, the tank may be provided with a cover 77 as shown, which is easily removed, when necessary. The tank may

be supported on brackets 78 carried with one frame member 70 and on a suitable seat formed on the other frame member 80, the two frame members being, in the illustrated embodiment, secured together by tie rods 81 passing therebetween. Extending outwardly from the end frame member 70 and in a direction opposite to that of the tank 43, brackets 82 support the tracks 45 and between the brackets 82 and suitably supported thereby are the fuel burners 83 adapted to heat the bottom platen 30. Also carried with the frame member 70 is a bracket 84 extending rearwardly of the tracks 45 or at right angles thereto as shown in Figure 2. This bracket is supported at its outer end upon a post 85 and is formed at the top with a stop 86 upon which the upper platen 31 rests when in open position.

The bracket 84 also carries a manifold 87 provided with a plurality of burners 88 adapted to heat the upper platen 31 when in the dotted line position of Figure 2, which manifold communicates with the main fuel feed pipe 89 leading to the manifold 90 supplying the burners 83. The main feed pipe 89 is controlled by a valve 93 carried with the bracket 84 and shown in detail in Figure 6. Obviously, however, means other than fuel burners may be used to heat the platens.

The fuel control valve 93 is normally closed on its seat 94 by means of the spring 95 and the valve stem 96 extends upwardly out of the valve casing 97 and terminates in a bearing member 98 adapted to be engaged by an ear 99 on the upper platen when in the dotted line position shown in Figure 2. Thus when the carriage is out of the tank on the tracks at what is called charging position and the upper platen 31 thrown back, as shown in Figure 2, that platen rests upon the valve stem 96 causing the valve 93 to open and permitting gas, say, to pass through the main feed pipe 89 to the burners, where it is ignited from a pilot, not shown, to heat the platens. The stop 86 takes the full weight of the platen 31 after the valve 93 is open.

In operation, the carriage 30, 31 is first placed upon the tracks 45 outside of the tank 43, as shown in full lines in Figure 1, at what is called the loading or charging position, the nuts 66 being unscrewed and the clamping members 65 removed from the bolts 61 and the top platen 31 thrown back about its hinged connection 41 to the position shown in dotted lines in Figure 2 where it rests upon and depresses the valve stem 96 thereby opening the valve 93 and permitting gas to flow to the burners 83 and 88. After opening the valve, and in order to relieve the valve mechanism of shock, the weight of the top platen 31 is carried on the stop 85. After the platens 30 and 31 are heated sufficiently, the work E which may have been assembled at a remote point, is placed upon the lower platen 30 and the top platen 31 closed thereover. Preferably the top platen 31 is heated to approximately 400° F. while the lower platen is heated to between 400° F. and 450° F.

The work E is assembled for positioning upon the bottom platen 30 as follows: Using a corrected electrotype as an example, there is first laid on platen 30 a sheet of copper or other metal adhesive to solder forming the backing plate of the electrotype. Upon this is laid one or more sheets of tin foil treated as will be understood with acid upon both sides and the corrected electrotype is placed on top of the tin foil. Preferably, a sheet of tissue paper is placed upon the top of the electrotype to protect the etched face thereof and the top platen 31 is then folded down on top of the work and clamped in position by means of the clamps previously described. After a lapse of sufficient time to permit the work to be thoroughly heated by a heat interchange with the platens and the tin foil melted whereby a solder is formed which will unite the two plates, the carriage is pushed through the opening 71 into the tank 43 where it travels down the incline and rests at the bottom in the dotted line position shown in Figure 1 where it is quickly quenched. After the solder is cooled and the two plates firmly united thereby, the carriage may be pulled back up the tracks to loading position, the platens opened and the work removed, where it is ready for use. Obviously the track may be made to accommodate more than one carriage with appropriate sets of burners to heat the platens.

Where the electrotype is to be mounted upon a wooden block, as illustrated in Figures 8 and 9, the bottom platen 30 is not heated since the wood rests directly thereon. To this end, a valve 105 is shown leading to the burners 83 under the bottom platen 30 which may be closed to shut off these burners from automatic operation by the control valve 93. Otherwise, the method of operation for electrotypes to be mounted upon wooden blocks is the same as that previously described for the corrected electrotypes. Similarly where linotype or monotype slugs are used and only the bottom platen is heated, the flow of fuel to the burners 83 heating the top platen 31 may be cut off by the normally operable valve 106.

It will thus be seen that a method and apparatus has been provided whereby metallic members bearing indicia may be mounted in a rigid and durable manner thus enabling new and improvided results to be obtained.

Various modifications will occur to those skilled in the art in the type of machine used to carry out the method of this invention in its broadest aspects as well as in the various applications of the method to different purposes and the products of such method and no limitation is intended by the phraseology of the foregoing specification or illustrations in the accompanying drawings except as indicated in the appended claims.

What is claimed is:—

1. A corrected electrotype comprising an etched plate having an opening, an insert in said opening and a backing plate, said etched plate and insert being soldered over their entire surface to the backing plate.

2. The method of manufacturing a plate from which impressions may be made comprising providing a backing plate adhesive to solder, placing a sheet of tin foil thereupon, assembling a plurality of slugs bearing indicia on one surface upon the tin foil, securing fusible metal strips to the backing plates and thereby framing the slugs and applying heat and pressure to the assembly.

3. The method of manufacturing an intermediate product in the manufacture of a plate from which impressions may be made comprising superimposing a sheet of tin foil upon a backing plate adhesive to solder, superimposing upon the tin foil a plurality of slugs bearing indicia on one surface and securing fusible metal strips

to the backing plates to frame the slugs and applying heat thereto.

4. The method of making an electrotype comprising superimposing a sheet of tin foil upon a metal plate and superimposing a metal plate bearing indicia upon the tin foil, applying heat to a pair of metal platens having predetermined heat carrying capacities and thereby raising the temperatures of the platens to predetermined amounts, respectively, interposing said plates so superimposed between the platens, drawing said platens together to apply a predetermined clamping pressure to said superimposed plates and then cooling the assembly when clamped together.

5. The method of making an electrotype comprising superimposing a sheet of tin foil upon a metal plate and superimposing a metal plate bearing indicia upon the tin foil, applying heat to a pair of metal platens having predetermined heat carrying capacities and thereby raising the temperatures of the platens to predetermined amounts, respectively, interposing said plates so superimposed between the platens, drawing said platens together to apply a predetermined clamping pressure to said superimposed plates and then suddenly cooling the assembly when clamped together.

6. The method of making an electrotype comprising superimposing a sheet of tin foil upon a metal plate and superimposing a metal plate bearing indicia upon the tin foil, applying heat to a pair of metal platens having predetermined heat carrying capacities and thereby raising the temperatures of the platens to predetermined amounts, respectively, interposing said plates so superimposed between the platens, drawing said platens together to apply a predetermined clamping pressure to said superimposed plates and then suddenly cooling the assembly when clamped together by quenching.

7. The method of making an electrotype comprising superimposing a sheet of tin foil upon a metal plate and superimposing a metal plate bearing indicia upon the tin foil, applying heat to at least one of a pair of metal platens having predetermined heat carrying capacities whereby the platens have predetermined temperatures, interposing said plates so superimposed between the platens, drawing said platens together to apply a predetermined clamping pressure to said superimposed plates and then cooling the assembly when clamped together.

8. The method of making an electrotype comprising superimposing a sheet of tin foil upon a metal plate and superimposing a metal plate bearing indicia upon the tin foil, applying heat to a pair of metal platens having predetermined heat carrying capacities to thereby raise the temperatures of the respective platens to predetermined amounts, interposing said plates so superimposed between the platens, drawing said platens together to apply a predetermined clamping pressure to said superimposed plates and then applying cooling water to at least one heated platen.

9. The method of securing an insert in a plate which consists in superimposing tin foil upon a backing plate, superimposing an etched plate with the insert disposed in a cut-out portion therein upon the tin foil, applying heat to a pair of metal platens having predetermined heat carrying capacities and thereby raising the temperatures of the platens to predetermined amounts, respectively, interposing said plates so superimposed between the platens, drawing said platens together to apply a predetermined clamping pressure to said superimposed plates and then cooling the assembly when clamped together.

10. The method of making an electrotype comprising superimposing a sheet of tin foil upon a metal plate and superimposing a metal plate bearing indicia upon the tin foil, applying heat in predetermined amounts to opposite faces of said metal plates while simultaneously applying a predetermined pressure to remote faces of said superimposed plate and then cooling the assembly while still maintaining the same under pressure.

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