

(No Model.)

2 Sheets—Sheet 1.

J. MICHAUD.  
METHOD OF AND APPARATUS FOR PRODUCTION OF PLATES FOR COLOR  
PRINTING.

No. 543,040.

Patented July 23, 1895.

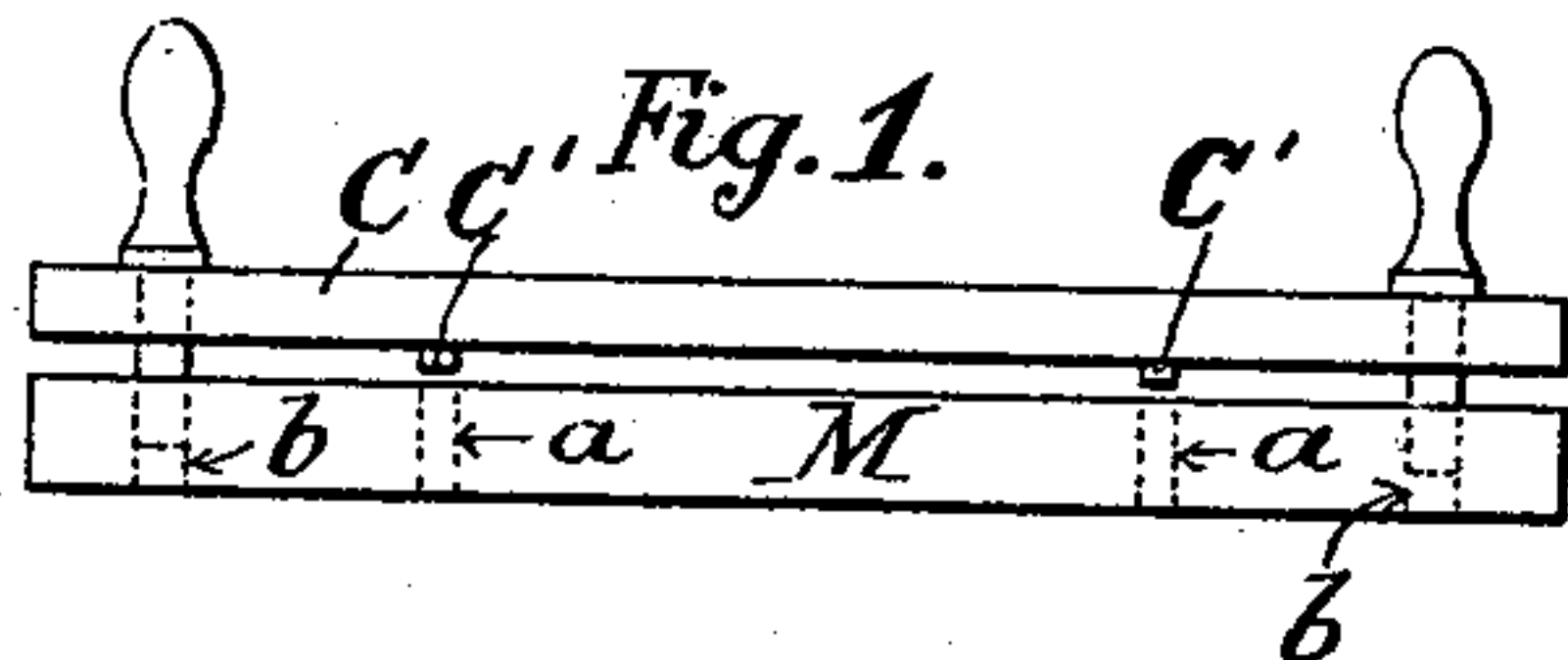


Fig. 2.

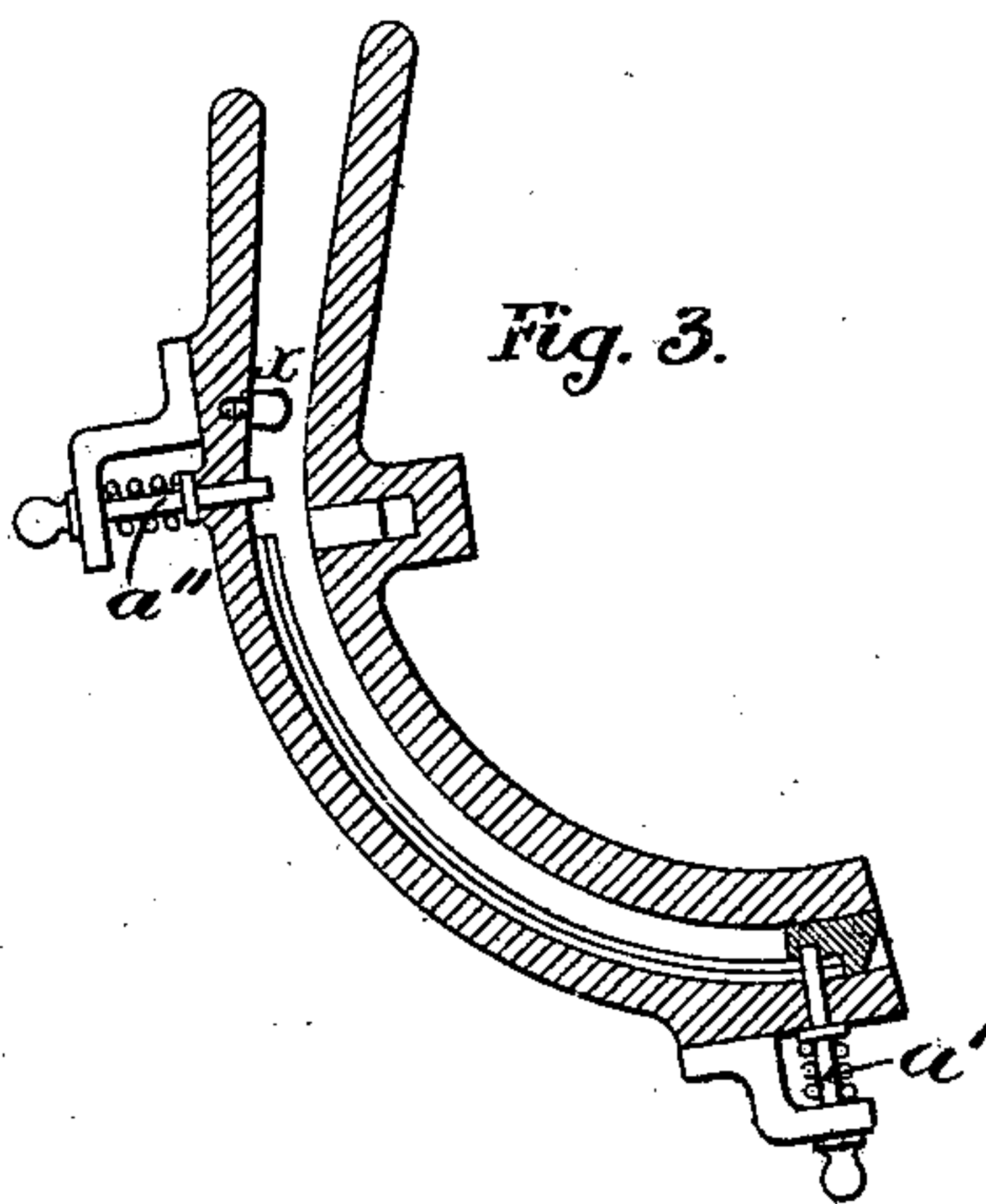
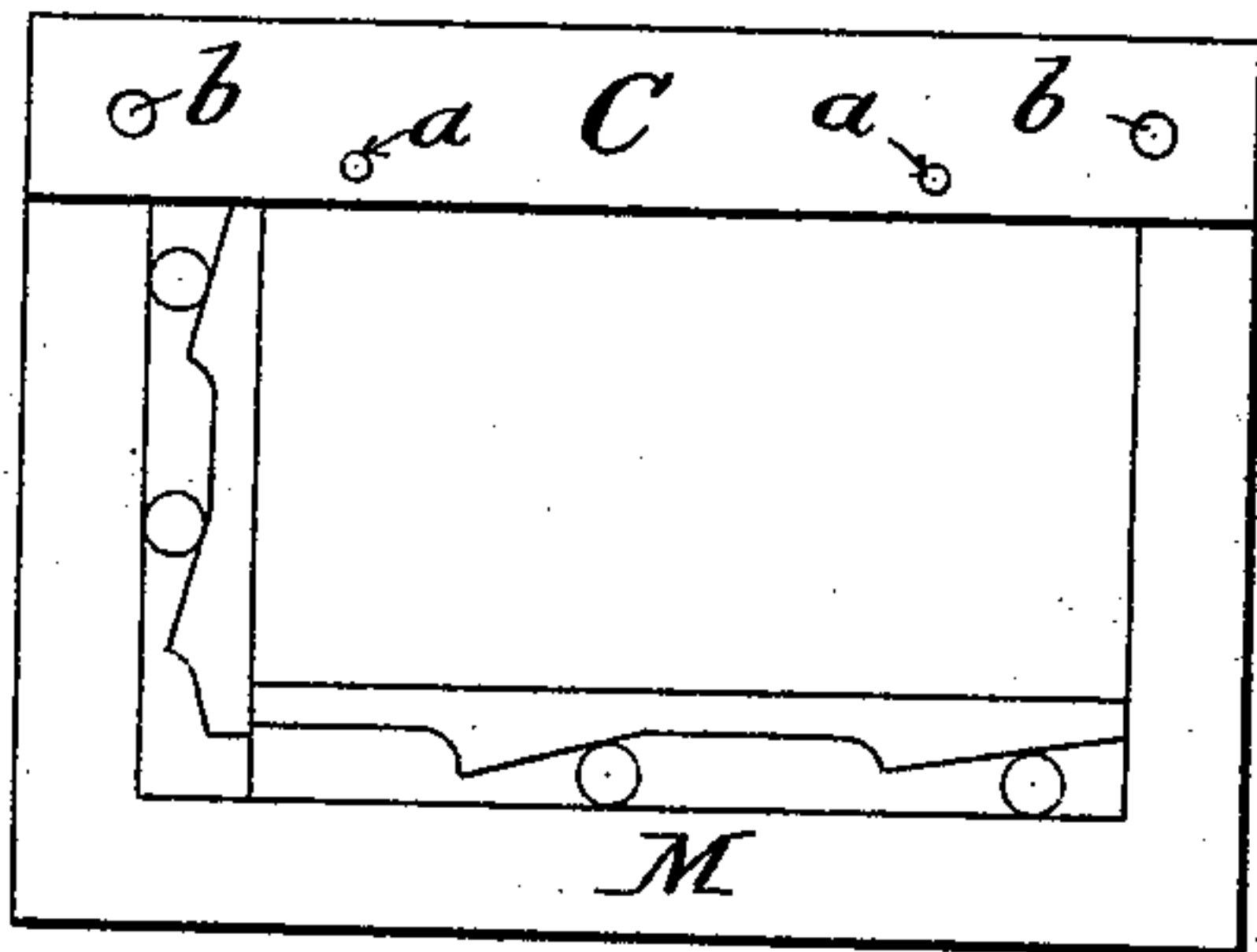


Fig. 4.

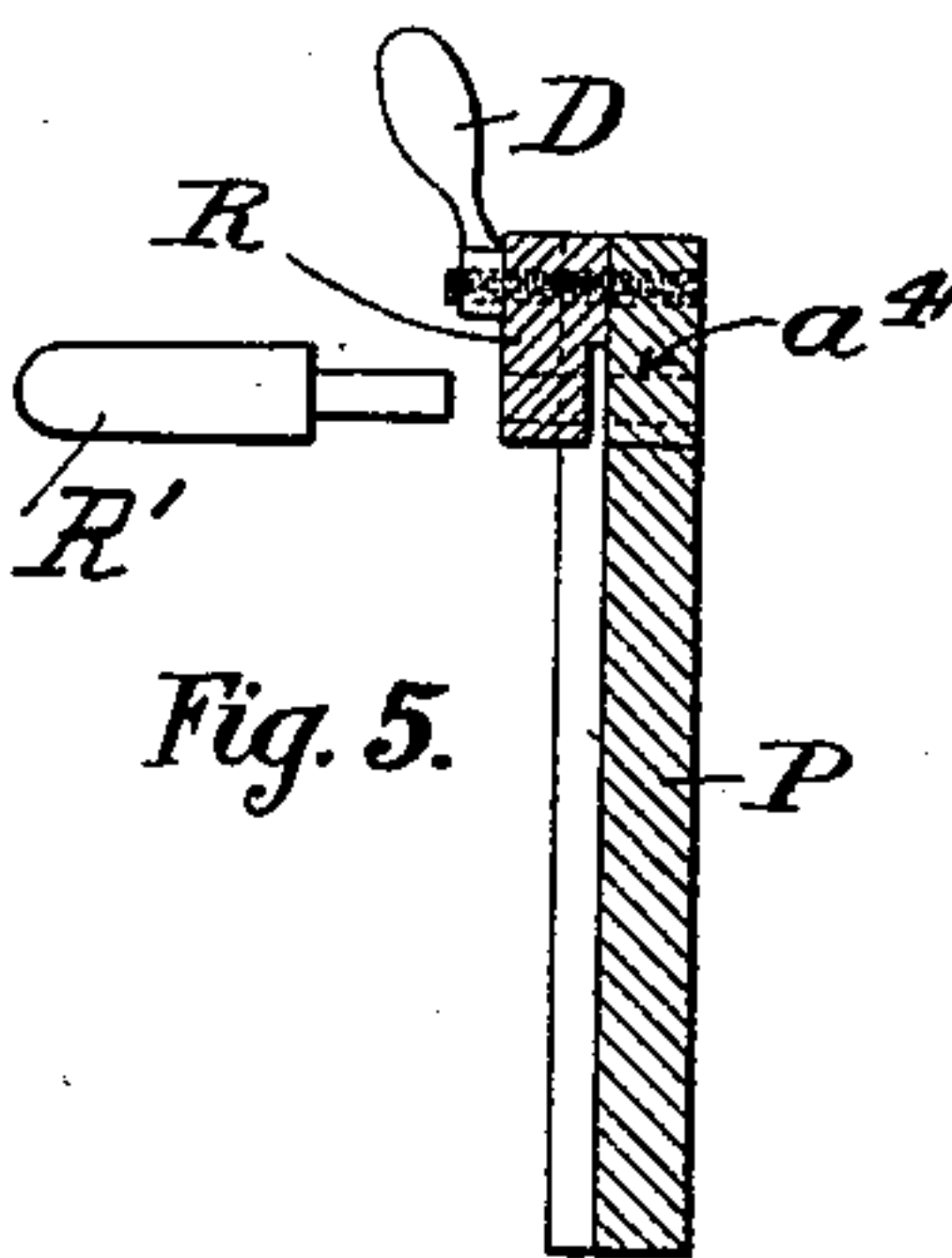
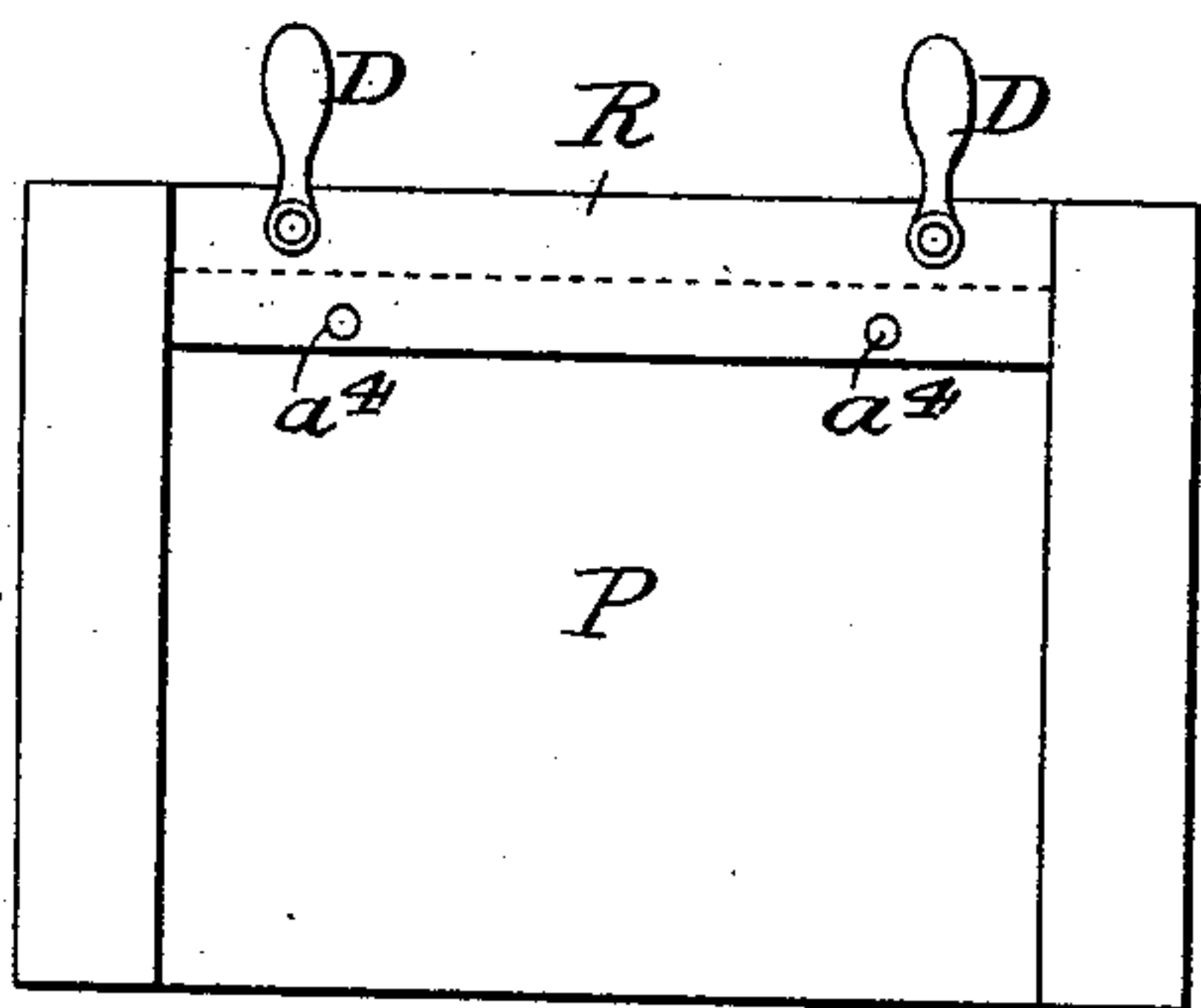


Fig. 5.

Fig. 7.

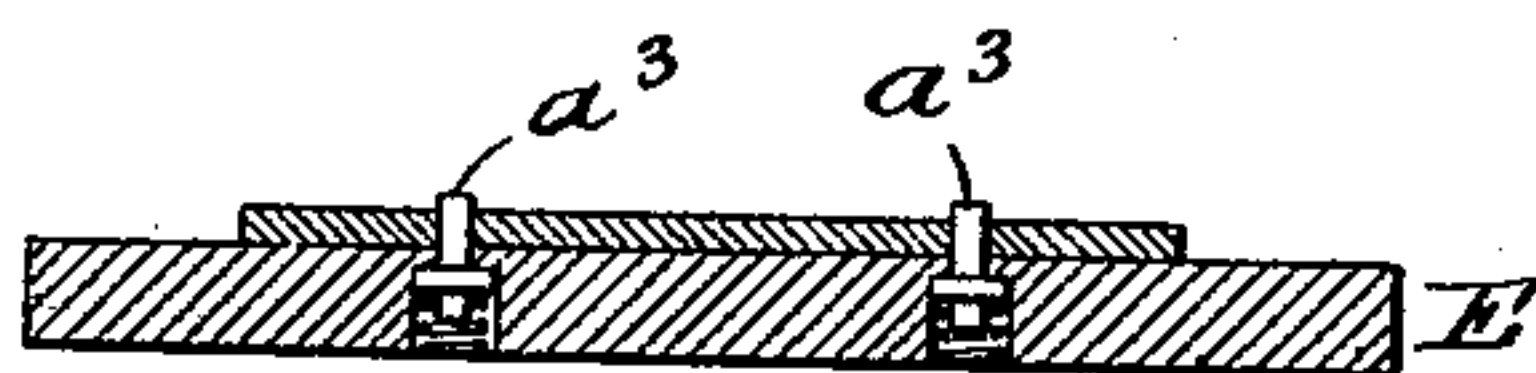
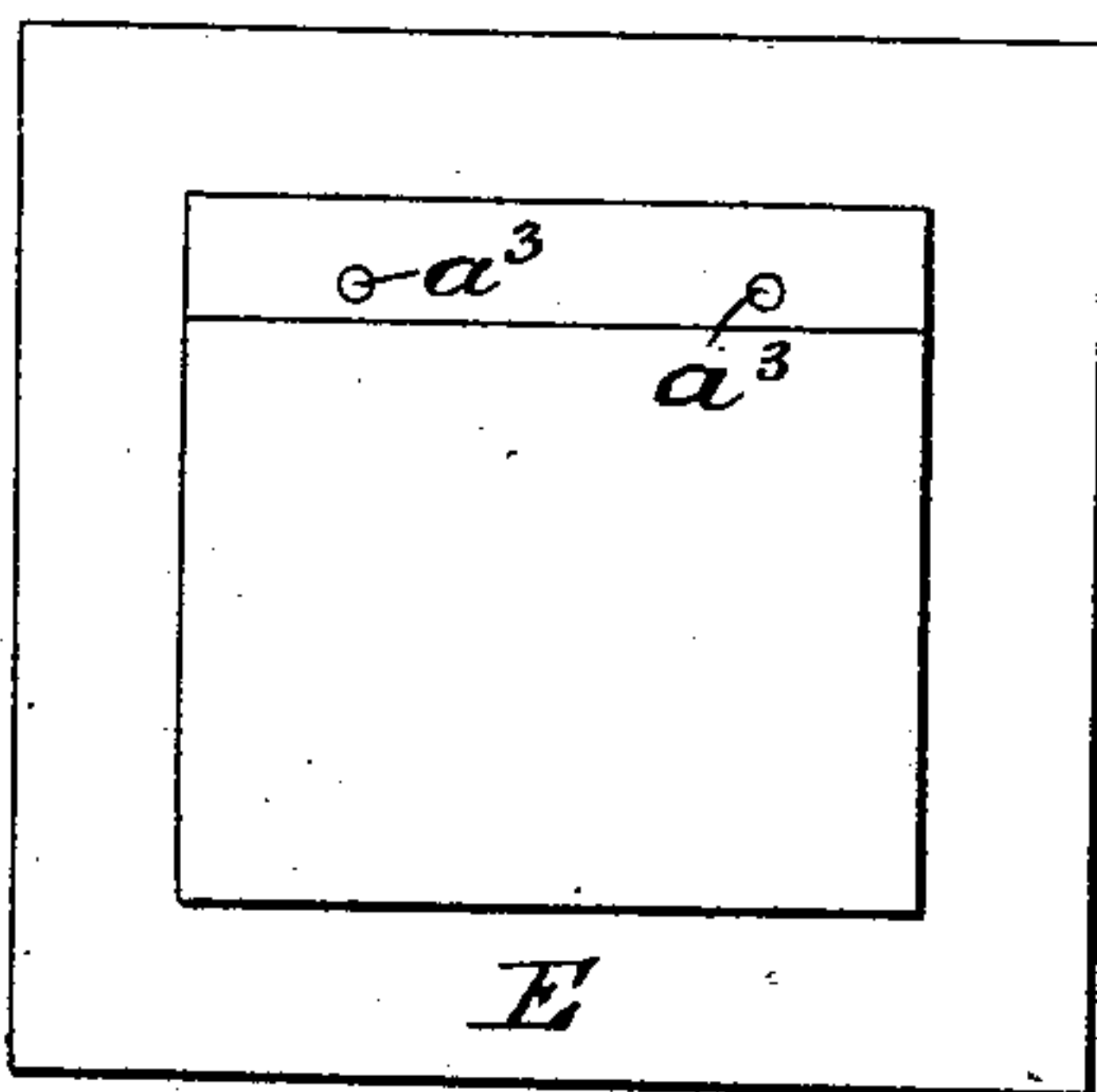


Fig. 6.



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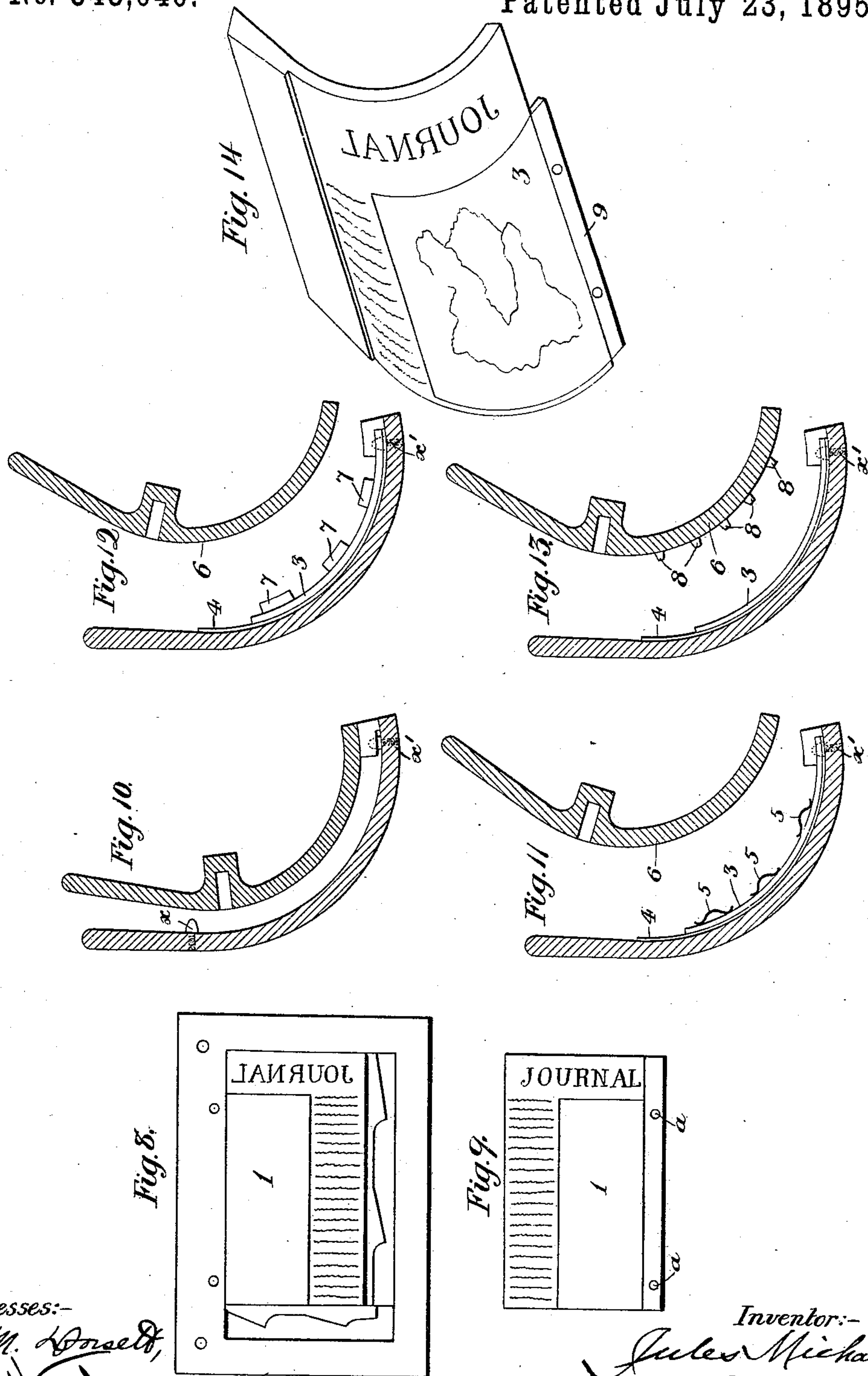
(No Model.)

2 Sheets—Sheet 2.

J. MICHAUD.  
METHOD OF AND APPARATUS FOR PRODUCTION OF PLATES FOR COLOR  
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No. 543,040.

Patented July 23, 1895.



Witnesses:-

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# UNITED STATES PATENT OFFICE.

JULES MICHAUD, OF PARIS, FRANCE.

METHOD OF AND APPARATUS FOR PRODUCTION OF PLATES FOR COLOR-PRINTING.

SPECIFICATION forming part of Letters Patent No. 543,040, dated July 23, 1895.

Application filed August 4, 1892. Renewed June 17, 1895. Serial No. 553,152. (No model.) Patented in France October 28, 1890, No. 209,139, and in England October 30, 1890, No. 17,382, and April 8, 1892, No. 6,782.

*To all whom it may concern:*

Be it known that I, JULES MICHAUD, a citizen of the Republic of France, residing at 96 Rue d'Assas, Paris, France, have invented certain new and useful Improvements in the Method of and Apparatus for the Production of Plates for Color-Printing, (for which I have obtained patents in Great Britain, No. 17,382, dated October 30, 1890, and No. 6,782, dated April 8, 1892, and in France, No. 209,139, dated October 28, 1890, with three certificates of addition thereto, dated, respectively, July 17, 1891, January 19, 1892, and January 23, 1892,) of which the following is a specification.

My invention relates to improvements in the means employed for producing different plates, such as zinc, galvano process, or other plates intended for printing in several colors, and especially for printing on rotary machines, and also to a new method of soldering engraved plates to the printing-plates produced in casting-boxes.

The means hitherto employed for fixing zinc, galvano, or other engraved plates to a curved printing-plate, so as to print engravings and letter-press at the same time, would not afford sufficient exactitude to prepare the different plates which are to serve for color-printing. In order to afford the greatest precision I have invented the method hereinafter described.

In the accompanying drawings, Figure 1 is a front elevation of a frame for taking the matrix of a page in which engravings are to be inserted. Fig. 2 is a plan view thereof. Fig. 3 is a vertical section of a casting-box for producing the printing-plates. Fig. 4 is a plan view of an apparatus for piercing holes in the engraved plates, and Fig. 5 is a transverse section thereof. Fig. 6 is a plan view of an apparatus for checking the engraved plates to be used for printing different colors, so as to see that the holes formed therein correspond exactly; and Fig. 7 is a vertical section thereof. Fig. 8 represents a frame with the form and block placed therein, the block occupying the place of the engraving. Fig. 9 represents the matrix produced thereupon and provided with holes  $\alpha$ . Fig. 10 is a vertical section of a casting-box provided with

the fixed pins or studs which may be either at  $x$  or  $x'$ . Fig. 11 is a similar view representing the engraved plate 3 placed on the matrix in the casting-box, and on this engraved plate springs are shown on which the cover will bear when the casting-box is closed. Fig. 12 is a similar view representing a modification, showing strips of metal placed on the back of the engraved plate in the place of the springs. Fig. 13 is a similar view showing another modification, showing projecting points fixed to the cover of the casting-box and which bearing on the engraved plates 3 when the casting-box is closed serve the same purpose as the springs 5 or the strips of metal 7. Fig. 14 is a perspective view showing the cast printing-plate with the engraved plate 3 soldered thereto. The part 9 having the holes therein serves to place the engraved plate in position in the mold on the fixed pins or studs  $x'$  and will be cut off before fixing the printing-plate on the cylinder of the printing-machine.

Similar letters and numerals of reference indicate corresponding parts in the different figures.

In the case where the engraved plate is to be placed in position in the printing-plate so that one edge of such engraved plate is to be at one edge of the printing-plate, I make a matrix of the page which is to contain the letter-press and the engraving in the ordinary manner, but in a special frame M, Figs. 1 and 2, in which holes  $a a$  are pierced, which are to appear in the matrix outside the impression part of the plate, so as to serve as adjusting-points and also holes  $b b$ , which are to serve as guides for a bar C carrying punches C'. A block 1 is placed in the form to cover said matrix where the engraving is to be. The letter-press impression on the matrix having been taken and dried in the ordinary way, when dry and before removing it from the form, I pierce holes  $a a$  therethrough by means of the bar C and its punches C'.

The matrix produced as above described is placed in the casting-box, which, as shown in Fig. 3, has projecting pins  $a' a'$  occupying positions exactly corresponding to the holes formed in the matrix by the punches C' C'.



These pins  $a' a'$  of the casting-box may be fixed or movable, as shown. They will be fixed when the construction of the casting-box will allow same to be opened after casting without enlarging the holes of the matrix; and they will be movable—that is to say, capable of disappearing when the casting-box is opened—if it is inadvisable to leave them projecting at the moment of opening.

I may when possible place the pins of the casting-box at  $a''$ , so that they are situated at the part of the plate which will be cut off by the saw and thus simplify the work, the cutting off of the jet or runner then producing a finished plate without having to cut off the small band or strip in which the holes for the pins are formed, such band or strip being hereinafter referred to. I may further use both the pins  $a$  and  $a''$  if there is any advantage in so doing.

When fixed pins or studs are used they are screwed into the casting-box, as shown at  $x$  in Fig. 3.

I prepare the engraved plate so that upon the side corresponding to the edge of the matrix in which the holes  $a a$  are formed it has a strip of metal with holes exactly corresponding with those of the matrix, such holes being produced in any suitable manner. The back of the engraved plates thus prepared are tinned or soldered, so as to cause them to become soldered to the printing-plate when cast. Then the printing-plate is curved as required and placed in the casting-box over the blank part of the matrix, great care being taken to place it so that the holes formed therein pass over the pins  $x'$  or  $a'$  in the casting-box. Upon this engraved plate, tinned or soldered on its back, I place either springs 5, as shown in Fig. 11, or strips of metal 7, as shown in Fig. 12, or, (what would answer the same purpose,) I place on the cover of the casting-box a series of small projecting points 8, as shown in Fig. 13, of such a depth that they will bear on the back of the engraved plate so as to press it well against the matrix, and consequently also cause the latter to bear well against the bottom of the casting-box. I then run in the metal and thus obtain a first plate having the engravings and the letter-press or text, which are to be of the same color as shown in Fig. 14, the engraved plate being sunk and embedded in the printed plate and fused thereto, so that the surface of the engraved plate is on a level with the letter-press impression of the printing-plate. To obtain the engraved plates for the other colors without the letter-press impressions, I place a sheet of cardboard of the same thickness as the matrix in the casting-box, having removed the matrix, and over this sheet I place the plate for one of the colors, still making use of the pins in the casting-box for placing the engraved plate in position therein. The engraved plate is caused to bear on the cardboard and the latter on the bottom of the casting-box, as be-

fore, and I then run in the metal and the engraved plate is fused to the printing-plate, so that the printing-plate has only an engraved surface without a letter-press surface, said printing-plate thus forming the second plate. The operation is repeated for each color, and I obtain curved plates all of exactly the same height and development, and further all bearing the engraving in exactly the same position in the plates.

To avoid the necessity of having to remove the parts of the finished printing-plates not carrying letter-press, I stick on the cardboard which replaces the matrix where the letter-press parts are thicknesses of cardboard, so as to obtain sunken parts in the printing-plates at the points which are not to be inked.

Before placing the plates in the machine the strip of metal which is outside the impression part and in which the holes to receive the pins of the casting-box are formed must be removed from each if the same has not been removed with the jet or runner.

The engraved plates may be tinned or soldered in the ordinary manner before placing them in the casting-box, but I have invented a new method of effecting this which renders the operation very easy.

I employ sheets of rolled metal, such as tin, an alloy of tin and lead, or of tin, lead, and bismuth, or any other suitable alloy used for soldering. The nature of this metal is varied according to whether it needs to be more or less easily fused. In order to produce efficient soldering it is only requisite to apply such sheets by means of stearin or other analogous material to the parts to be soldered, and to place the plates when thus prepared and heated in the casting-box. When the material which produces the plate for printing and which serves as a backing has been run on the top of these engraved plates a perfect soldering will have been obtained. With these sheets the soldering may be effected just as readily before as after the plates are curved, which is a great advantage. These sheets may be employed for soldering zinc, copper, galvano, or other kind of plates. They may be equally well employed for soldering the shells of galvanos, as for the second soldering which is necessary when galvanos are employed which, although already backed, are not sufficiently thick to be used on a rotary press. In the latter case, when it is desired to employ a backed galvano having a thickness of from three to four millimeters, for example, same is heated, curved, and then soldered again by rubbing the back with stearin and applying a sheet of the fusible material thereto, when by placing it in the casting-box and running the metal therein a curved plate will be obtained having the necessary thickness for a rotary machine.

The stearin being spread over the engraved plate and heated on the opposite side to that



bearing the engraving serves to cause the sheet of tin, which is subsequently applied, to adhere thereto, and further it is found that its presence facilitates the soldering.

5 When a galvano, which has already received a backing of from three to four millimeters in thickness, is to be used in a printing-plate of from ten to twelve millimeters, the sheet of fusible metal applied thereto being less than a half of a millimeter in thick-  
10 ness will not produce the increased thickness necessary, but, as is described, will facilitate the soldering between the metal already applied to the galvano and which gives it a  
15 thickness of from three to four millimeters, and the metal, which when run into the casting-box on the curved galvano, will by becoming soldered to the first metal give the necessary thickness of from ten to twelve millime-  
20 ters.

In Figs. 4 and 5 I show a special apparatus which I may employ for forming the holes in the engraved plates to enable the same to be placed in the proper position in the casting-  
25 box. When the plate has been placed on the block P by means of the adjusting points  $a$ , it is held firmly by a recessed bar R by means of screws and handles D D, so that it cannot shift. The bar R and the block P are  
30 pierced with holes  $a^4 a^4$  exactly corresponding with those pierced in the matrix and with the pins in the casting-box, and the punches R' are caused to work through the holes in the bar R and enter those in the block P, thus  
35 forming corresponding holes in the plate held upon such block.

Before tinning or soldering and curving the engraved plates it is very important to well check the plates for the different colors to see  
40 that they correspond exactly with regard to the holes formed in each, and in order to effect this I employ a machine which enables this to be done with certainty. This apparatus consists of a bed or block E, Figs. 6 and  
45 7, on which I place two spring-pins  $a^3 a^3$ , which are exactly the same distance apart as the holes formed in the engraved plates, and I successively place the engraved plates upon the block, taking care to pass the holes in  
50 such plates over the pins of the block. In taking an impression the pins recede, but without leaving the plates, thus preventing shifting.

For taking a proof I place the block E in a  
55 press, and upon the frisket or the cylinder of the press I place a sheet of paper, so that it can receive several impressions without being able to shift, and upon such sheet I take the different impressions by changing the  
60 plates on block E in succession

If, for example, four colors are to be produced—yellow, red, blue, and black—the yellow plate being placed on the block E and inked, I take the yellow impression. I then re-  
65 place the yellow plate by the red, ink same, and take a new impression. I then do the same

for the blue and black plates. If the plates correspond well and the pin-holes are properly pierced, I ought to obtain a perfect register on the sheet, and I have thus a very exact  
70 means of checking the plates before proceeding to submit such plates to the different operations.

The invention is more particularly applicable to rotary printing-presses, because the  
75 mold shown for producing the printing-plates is cylindrical. The production of two or more of such cylindrical printing-plates for color-printing presents more difficulty to enable a correct register to be obtained than is the case  
80 when dealing with flat printing-plates.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a testing block for printing plates, the combination of a block having recesses there-  
85 in, spiral springs resting on the bottom of said recesses, pins projecting above said recesses and provided with collars resting on said springs said pins being adapted to enter holes in the printing plates.  
90

2. In a device for forming holes in an engraved plate, the combination of a block provided with holes near one side, a recessed bar resting on one side thereof, means comprising  
95 a screw and a handle for adjustably pressing said bar against said block so that said bar can be raised and lowered for the insertion of a plate under the recess thereof, said bar being provided with holes registering with the  
100 holes in the block, and punches for working in said holes in the bar and block.

3. The art of making a printing plate containing letter press and illustrative matter consisting in forming a matrix, the molding  
105 face of which is in part plain and in part letter press, then placing an engraved plate over the plain portion of said matrix, then applying to the back of said engraved plate a sheet of metal fusible at a lower temperature than the metal of the engraved plate, then casting  
110 a printing plate over the letter press portion of said matrix and over said engraved plate, the engraved plate being embedded in and united with the body of the printing plate flush with the letter press matter thereof.  
115

4. The method of making a printing plate for register printing in colors of an area corresponding to another printing plate having  
120 letter press matter, consisting in forming a mold having a raised surface opposite that part of the printing plate which corresponds to the letter press in the original plate, placing in the depressed portion of said mold an engraved plate, and casting over the back of  
125 said engraved plate and over the raised portion of said mold a printing plate in which the said engraved plate is embedded.

5. The method of making a printing plate for register printing colors of an area corresponding to another printing plate having  
130 letter press matter, consisting in forming a mold having a raised surface opposite that



part of the printing plate which corresponds to the letter press in the original plate, placing in the depressed portion of said mold an engraved plate having registering devices, 5 outside the printing surface thereof, and casting over the back of said engraved plate and over the raised portion of said mold a printing plate in which the said engraved plate is embedded.

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