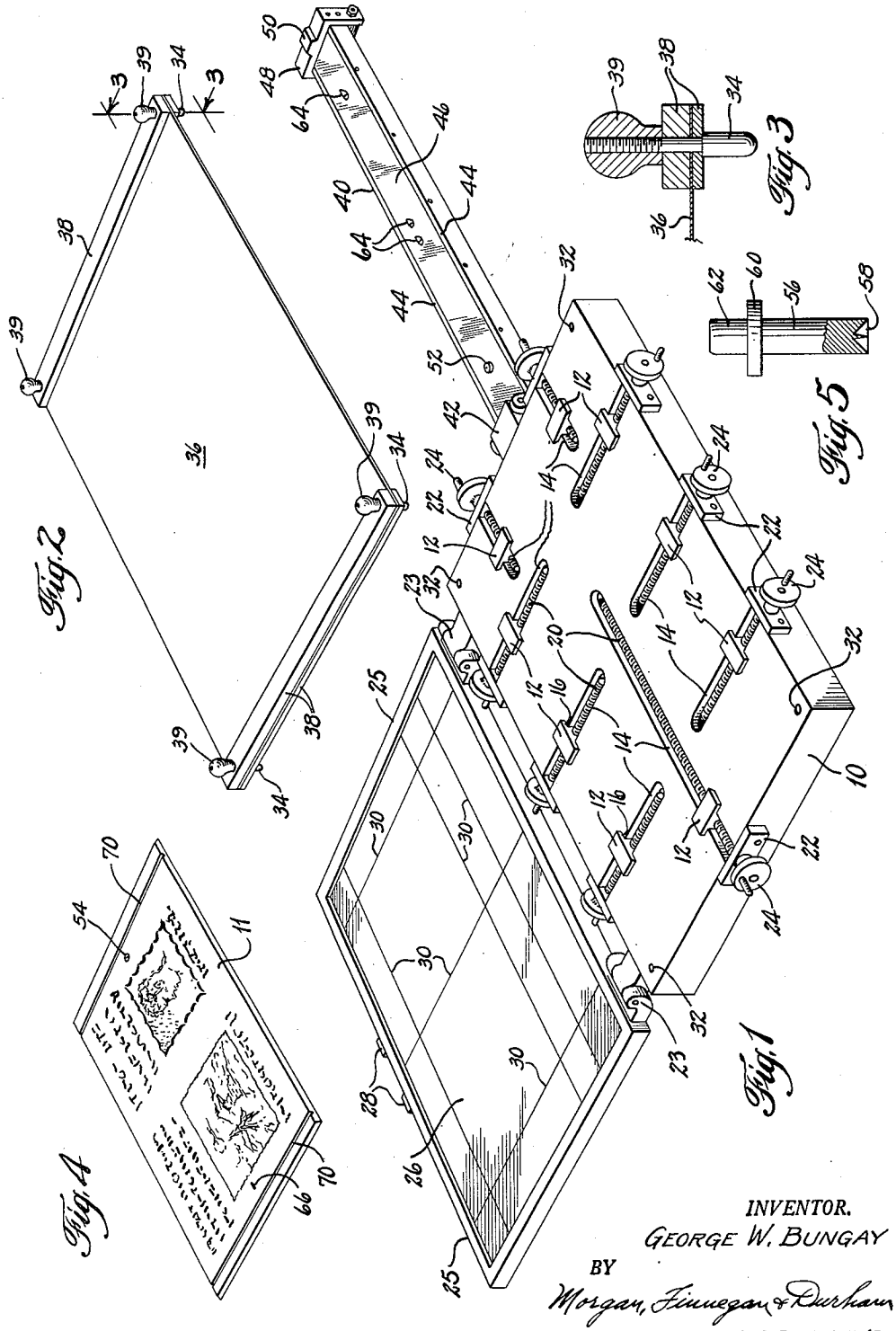
June 1, 1954 G. W. BUNGAY 2,679,695

APPARATUS FOR REGISTERING PRINTING PLATES TO BE DUPLICATED

Filed Dec. 26, 1950 2 Sheets-Sheet 1



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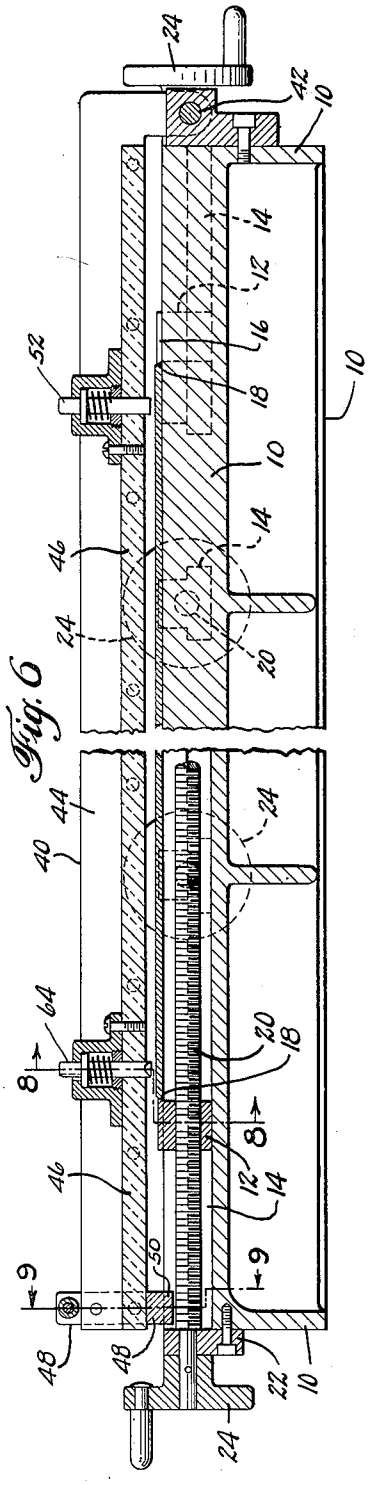


Fig. 6

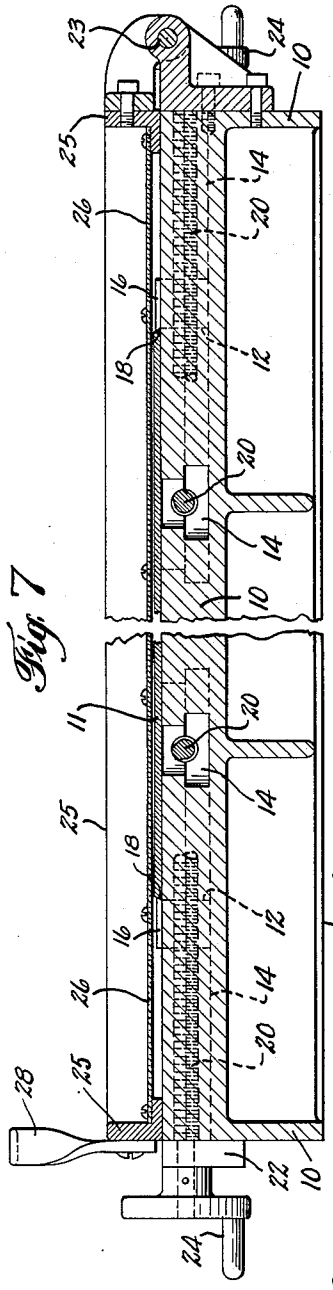


Fig. 7

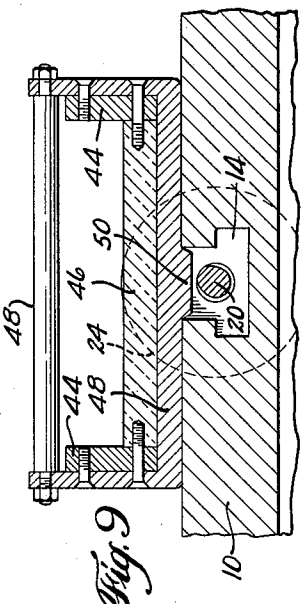


Fig. 9

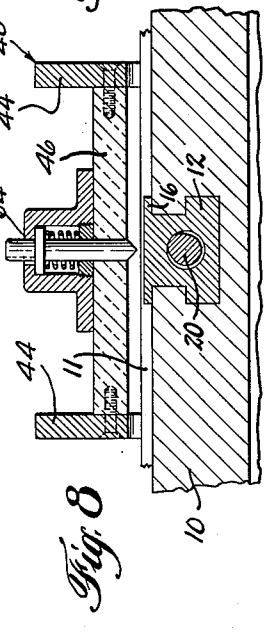


Fig. 8

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APPARATUS FOR REGISTERING PRINTING PLATES TO BE DUPLICATED

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1 Claim. (Cl. 33—184.5)

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The present invention has for its object the provision of a novel and improved apparatus for forming a set of similarly located register marks on each of the printing plates forming a set of multicolor printing plates, which plates are to be duplicated by electrotyping or stereotyping.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claim.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is a perspective view showing a typical and illustrative embodiment of the present invention;

Figure 2 is a similar view of a flexible transparent overlay sheet for receiving a proof impression of the key plate;

Figure 3 is a fragmentary detailed sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a perspective view of one of the printing plates of a multicolor set as marked with register marks by the apparatus of the present invention;

Figure 5 is a detailed view, partly in section, showing one of the marking punches forming part of the apparatus shown in Figure 1;

Figure 6 is a longitudinal sectional view taken centrally of the embodiment shown in Figure 1 and showing the marking punches in position to mark the printing plate;

Figure 7 is a transverse sectional view taken at right angles to the view of Figure 6;

Figure 8 is a detailed sectional view taken on the line 8—8 of Figure 7; and

Figure 9 is a detailed sectional view taken on the line 9—9 of Figure 7.

The present invention has for its object the provision of a novel and improved apparatus for providing each of a set of multicolor printing plates with a plurality of identically located register marks which are to be reproduced throughout the successive stages of the process of duplicating the set of plates and finally serve to assist in properly positioning the plates on the printing press. A further object is the provision

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of an improved multicolor printing plate registering apparatus which is relatively simple in its construction, may be operated rapidly and with certainty and permits the operator to have an almost unobstructed view of the plate being operated on as the plate is brought to its proper position.

In accordance with the present invention there is provided a bed member on which the plates are supported one after another, which bed is provided with means for minutely moving the plate over its surface and for clamping the plate after it has been properly located on the bed. Hinged along one edge of the bed is a transparent member provided with two sets of parallel lines or other indicia, one set being at right angles to the other. By swinging the transparent member so that it lies directly over the printing plate supported on the bed, the plate may then be moved and finally clamped so that its margins are square and parallel to the indicia lines on the transparent member, after which the plate is securely clamped in position so that it may be held firmly while register marks are made on the surface of the plate. The bed is also provided with means for precisely locating a flexible transparent sheet over the plate in impression relation to the plate, so that after the key plate has been inked, a guide impression thereof may be taken on the flexible sheet which may then be removed and replaced so as to form the guide for locating the remaining plates similarly to the key plate by registering the guide impression from the key plate with the faces of the other plates.

After the guide impression has been made on the transparent overlay sheet the overlay sheet is removed, and a second hinged member is swung down over the key plate, the second hinged member carrying a plurality of fixed punches or other marking members in definite location so that a plurality of register marks may be made on the key plate in definite locations relative to the impression taken from the key plate on the overlay sheet, the marks preferably being such as may be reproduced from the plate as the duplicate plates are made.

Thereafter the key plate is removed from the bed, and another one of the multicolor set is substituted for the key plate, and is registered with the impression on the overlay after the overlay has been replaced, after which the second plate is clamped in a fixed position, the overlay sheet is removed, the register marking frame is swung into position and the second plate is

marked with register marks identically positioned as in the key plate. Thereafter the third, fourth and other plates of the multicolor set are similarly treated so that all of the set is finally provided with register marks in identical relation to the design of the several plates.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Refering now in detail to the present preferred and illustrative embodiment of the invention as shown in the accompanying drawings, the apparatus is particularly adapted for use in the preparation of the several plates of a multicolor set of plates to be duplicated by electrotyping or stereotyping for eventual use on rotary magazine printing presses.

The apparatus is preferably constructed using a relatively heavy rigid metal base member 10 having a flat upper surface considerably larger than the size of the plates (single or double page) to be worked on. The bed 10 may be of a generally rectangular shape and is provided with means for minutely moving and securely clamping on its upper surface a flat printing plate, such as a photoengraving 11, from which the duplicate plates are to be formed. Extending inwardly from each side of the base member 10 is at least one and usually more guideways for plate moving and clamping members by which the plate may be minutely moved and securely clamped.

Illustratively, the plate clamping members each comprise a conventional clamp body 12 to slide in an inverted-T groove 14 formed in the base member 10, the clamp body extending above the face of the base member for a short distance and being provided with an integral plate engaging member 16 which is slightly undercut at its plate engaging edge 18. Each of the clamp bodies is provided with a threaded aperture in which is threaded a screw rod 20 held against axial movement by means of a plate 22 fast to the base member at the end of the groove 14 and provided at its outer end with a crank 24 by which the rod 20 may be turned to traverse the clamps individually along their respective grooves. The grooves leading from each edge are parallel to each other and to those leading from the opposite edge of the base member 10. By proper movement of the several clamp bodies 12 the plate may be shifted in a straight line movement toward one edge or another of the base member 10 or may be angularly moved in case the edge of the plate should not be parallel with the edge of the base member 10.

At the rear of the base member 10 is pivotally mounted, by means of offset hinges 23, a frame member 25 carrying a rigid transparent sheet 26 of substantially the same size as the upper surface of the base member 10. The transparent sheet is preferably formed of some relatively thick plastic material, such as methyl methacrylate or cellulose acetate, having good dimensional stability, and is preferably so located in the frame member 25 that the sheet 26 does not come in contact with the face of a printing plate on the base member 10 as the frame is swung into position over the plate. On its edge opposite the hinges, the frame 25 is preferably provided with a handle portion 28, by which the frame may be lifted, the handle also serving as a support for the frame when it is laid back, as shown in Figure 1.

On the face of the transparent sheet 26 adjacent the printing plate are provided a plurality of index lines 30, the lines being in two sets with the lines in each set spaced apart and parallel to each other while those in the one set are at right angles to those in the other set. Preferably, some of the lines are formed near the edges of the transparent sheet 26 and are adapted to serve as alining gauges with which the marginal edges of a printing plate or some other linear portion of the plate may be registered by movement of the plate clamping members 12 after the transparent sheet has been moved into an overlying position with respect to the printing plate, thereby accurately squaring-up the plate on the base member 10, after which the opposite clamping members may be moved towards each other so as to secure the plate in the desired position.

After the plate is properly squared-up on the base member, the frame 25 is swung back to its normal position and the printing face of the printing plate is inked by means of a hand inking roller so that a proof impression may be taken from the plate.

Near each of the four corners of the base member is provided a vertical hole 32 adapted to receive a pin 34 by which a transparent proof sheet may be located over the printing plate while a proof impression is taken on the proof sheet. As embodied, the proof sheet comprises a strong, flexible sheet 36 of some transparent plastic material, such as methyl methacrylate or cellulose acetate, the sheet being substantially the same size as the upper surface of the base member 10, and being provided at its opposite ends with rigid bars 38 to which it is securely fastened. Projecting through the sheet and clamping bars, and serving to press the clamping bars together to securely clamp the sheet 36 are the locating pins 34, the upper portions of which are threaded to cooperate with the threaded hand nuts 39 by which the pins may be lifted.

The location of the pins 34 is such that the pins may enter the several holes 32 in the base member 10 and thereby draw the transparent sheet tightly over the surface of the base member 10 so that it rests lightly on the inked face of the printing plate or very slightly above the inked face. With the transparent sheet so supported, a guide or proof impression of the inked face of the printing plate is taken on the under side of the transparent sheet by rubbing the transparent sheet to press it against the inked face of the plate or by passing an impression roller over the sheet. The transparent sheet 36, now bearing the guide impression, is lifted from the base member by grasping the hand nuts 39, first at one end of the sheet and then at the other end.

At one edge of the base member 10 is pivotally mounted a bar 40, by means of the offset hinge 42, this bar comprising a pair of parallel rails 44 formed of rigid metal and supporting a long, relatively narrow, rigid sheet of transparent plastic material 46 on which are mounted the various marking means to form the register marks on the printing plate. The ends of the rails 44 and the plastic material 46 are connected to an end member 48 which serves as a strengthening member, as a handle to lift the bar 40 and also as a support when the bar is in the position shown in Figure 1. The end member is provided with an alining key 50 adapted to enter and seat in the slot 14 opposite the hinge 42 thereby more accurately positioning the bar 40 as it lies over the printing plate to be marked with register marks.

The plastic sheet 46 is provided along its length with a plurality of register marking means, preferably in the form of prick punches which can be lightly tapped with a hammer to form an impression on the face of the underlying printing plate.

The register marking means 52 closest to the hinge 42 is preferably adapted to impress a point surrounded by a circle on the face of the printing plate, as shown at 54 in Figure 4, such a punch being shown in detail in Figure 5. As shown, the punch comprises a shank portion 56, a shaped end 58, a shoulder 60 by which the punch is snugly supported in a hole in the plastic sheet 46 and a head 62 which may be tapped with the hammer.

The other punches 64 on the sheet 46 are preferably formed with straight chisel points alined with the punch 52 thereby allowing for possible unequal shrinkage between the several plates as they are duplicated. The punch 52 is located so that its impression may be made near one edge of the plate, while the other punches 64 are arranged with a pair close together for different sizes of single page plates and a distant punch 64 which is adapted to make its impression near the opposite edge of a double spread plate, as shown at 66 in Figure 4.

In using the apparatus of the present invention, the key plate 11 of a set of multicolor printing plates which are to be duplicated by electrotyping or stereotyping is provided with parallel shallow grooves 70 which are spaced slightly to the outside of the margins of the pages to be printed and are also parallel to the marginal edges of the pages. Such a plate is positioned on the upper surface of the base member 10 between the various clamp members 12. The clamp members 12 are then moved to the edges of the plate after which the frame member 25 is swung to overlie the plate 11, as shown in Figure 7. Then the clamp members 12 are moved so as to position one or the other of the grooves 70 directly beneath one of the index lines 30 thereby squaring-up the plate with respect to the base member.

In case the subject matter of the plate 11 is such that it cannot be provided with the grooves 70, the operator may select some portion of the plate as representing a straight line parallel to the marginal edge of the page and aline that portion with the index line 30. When the plate has been properly squared-up it is securely clamped in position by moving the clamping members which are not already against the edge of the plate as the result of being used to position the plate.

Thus squared-up, the face of the plate 11 is then inked by means of a hand operated ink roller, after which the transparent proof sheet is positioned over the inked face of the plate 11, the proof sheet being accurately located and stretched by means of the clamping bars 38 and the pins 34 which project into the locating holes 32. The proof sheet 36 is then pressed into contact with the face of the printing plate 11 so as to draw a proof impression on the lower face of the sheet 36, after which the proof sheet 36 is lifted from the printing plate by means of the hand nuts 39.

The punches 52 and 64 are then swung into

punching position over the printing plate while it is still clamped by the plate clamps 12 and the register marks 54 and 66 are punch or otherwise marked on the face of the plate. The plate clamps 12 are then released and the key plate is replaced by another of the same set of multicolor plates. These plates are individually registered with the impression of the key plate on sheet 36 after the sheet has been repositioned over each new plate and such movement of the plate into registering position may be accomplished while the sheet 36 is in place by turning the cranks 24 for the plate clamps which it is desired to move. Then with a plate securely clamped in proper registered position, the sheet 36 is removed, the punches are moved into operative position and the plate is provided with the register marks from the same punches as were used on the key plate. Each of the other plates is then treated in the same manner to provide a complete set all of which bear register marks in identical relation to the design borne by the plates.

The plates are then ready for the molding operation and subsequent electrotyping or stereotyping operations by which the surface design of the plates including the register marks are accurately reproduced.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claim without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

Registering apparatus for multicolor printing plates, including in combination a plate supporting bed, threadedly movable plate registering and clamping means for moving and then securing a printing plate on the bed, a transparent member hinged to one edge of the bed to overlie a plate on the bed, index lines on the transparent member at right angles to each other, the base member being provided with locating holes adjacent its corners, a removable transparent proof sheet to be positioned over the bed, locating pins carried by the proof sheet and engageable in the locating holes to position, stretch and hold the proof sheet in a fixed location over the plate supported on the bed, a rigid transparent member hinged to the bed at a second edge of the bed and a plurality of register marking punches carried by said rigid transparent member for marking the face of the plate on the bed.

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