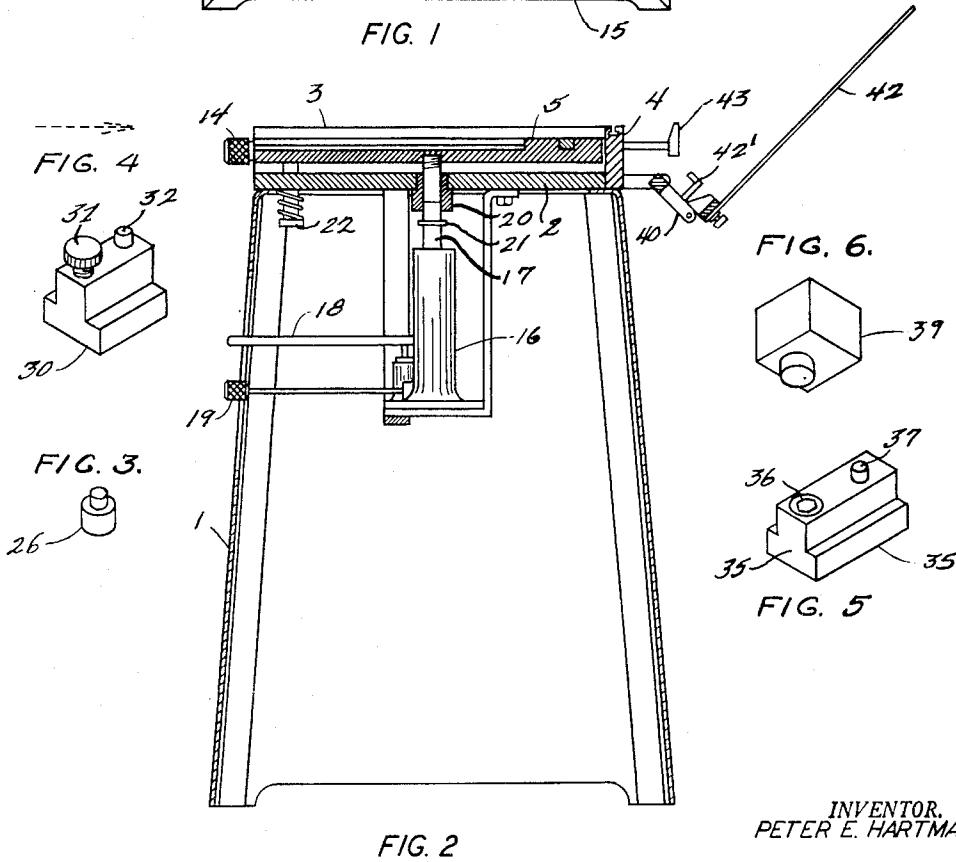
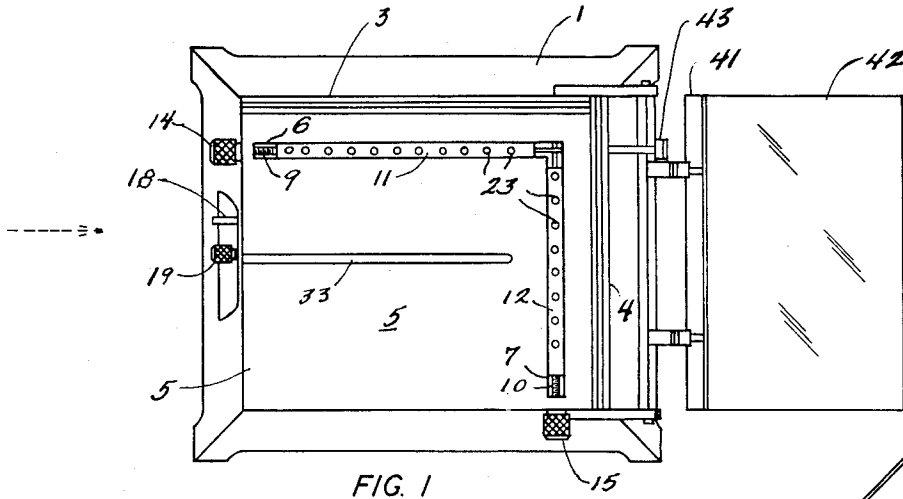


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PRINTER'S LINE-UP TABLE

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PRINTER'S LINE-UP TABLE

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1

This invention relates to the art of photo-engraving, electrotyping, stereotyping, and other forms of printing-plate making for the letterpress printing industry, and more particularly, to the squaring of duo-tone and process printing plates and to transferring and registering color printing plates on mounting bases.

In printing-plate making, it is frequently necessary to perform the foregoing operations; and this is usually done on what is known as a "printer's line-up table," which takes the form of a table top with two straight edges so mounted as to be movable thereover in right-angular directions with respect to each other. Such tables are particularly useful in multi-color printing, wherein successive printings in different colors are superposed on one another, it being imperative that the printing lines for the various colors accurately register with each other. For example, in multi-color printing, it is necessary to make a series of plates, each of which is designed to apply color to a given portion of the printed surface; and an extremely accurate registration of the plates must be obtained if satisfactory results are to be produced. This situation requires both an accurate initial positioning of the plates and an accurate checking of the results after the proof sheets have been made in order to determine whether the registration has in any way been disturbed.

It is among the objects of the present invention to provide a printer's line-up table upon which extremely accurate work may be speedily performed, particularly the squaring of duo-tone and process printing plates and transferring and registering color printing plates on mounting bases.

Another object is the attainment of the foregoing advantages in a single apparatus which is highly efficient in operation, durable in service, and relatively simple and inexpensive to manufacture.

The invention, then, comprises the features fully described and as particularly pointed out in the claims, the following description and annexed drawings setting forth in detail an illustrative embodiment of the invention, this being indicative of but one of a number of ways in which the principles of the invention may be employed.

In said drawings:

Figure 1 is a plan of the apparatus of the present invention;

Figure 2 is a sectional elevation; and

Figures 3, 4, 5 and 6 are perspective views of

2

individual operating elements which will be specifically referred to hereinafter.

Referring more particularly to the drawings, wherein like reference numerals designate like parts throughout the several views, the base or stand of the apparatus of the present invention is shown at 1; and it supports an upper horizontal table 2 which may take any convenient form, preferably being of such shape and size as to be convenient to a workman standing in front of it at the position of the arrows of Figures 1 and 2.

Mounted on the stand 1, is a pair of squaring bars 3 and 4, the former of which extends above and along the left-hand side of the table 2 (as viewed by an operator standing in front of it); while the latter (4) extends along the back edge of the said table, as shown.

Mounted above the table 2 is the squaring bed 5 of the present invention. This squaring bed 5 has an elongate slot 6 extending along the left-hand side of the stand, and in parallelism with the squaring bar 3. Another elongate slot 7 in the squaring bed 5 connects with the rearward end of the elongate slot 6 and extends inwardly at right-angles thereto in parallelism with the rearward squaring bar 4.

An elongate shaft 9 extends throughout the elongate slot 6 and is journaled at both ends in the squaring bed 5; while a corresponding shaft 10 is similarly disposed and maintained in the elongate slot 7. These portions of the shafts 9 and 10 which lie between their journaled ends are screw-threaded as shown in Figure 1 in order that each may receive (in screw-threaded engagement) a slidable bar, as indicated at 11 and 12, respectively. The outer ends of the elongate shafts 9 and 10 extend through and project from the correspondingly adjacent edges of the squaring bed 5 and each has a knurled knob secured to its projecting end, as shown at 14 and 15, respectively.

From the foregoing construction and arrangement, it will be seen that, as the knurled knobs 14 and 15 are rotated, the slidable bars 11 and 12 are respectively moved in the elongate slots 6 and 7. In practice, the permissive movement of the slidable bars in the elongate slots 6 and 7 need be but slight; for example, of the order of $1\frac{1}{4}$ inches.

As shown in Figure 2, a hydraulic jack 16 is suspended from beneath the table 2 with its plunger 17 extending through the center of the table and connected to the bottom of the squaring bed 5. The operating handle 18 of the hy-

hydraulic jack 16 and its release lever 19 both extend through the front of the stand 1 in order to be readily accessible to the operator.

A hardened steel collar 20 is press-fitted into the bottom of the center of the table 2 for co-operation with a hardened grooved collar ring 21 on the plunger 17 of the hydraulic jack 16. By this or equivalent means, the squaring bed 5 may be restrained against excessive upward movement.

Positive and smooth up and down movement of the squaring bed 5 is further assured by two spring loaded hardened steel guide pins 22 which extend upwardly through the table 2 and are screwed into the bottom of the squaring bed at opposite corners thereof.

Each of the slidable bars 11 and 12 is provided with a series of evenly spaced holes 23, each one of which is adapted to receive a register pin 26 (Figure 3), the purpose of which will be later described.

Each of the squaring bars (3 and 4) is provided with a longitudinally extending slot of inverted-T shape, the latter being adapted to receive a plurality of slidable pins 30, one of which is shown in Figure 4. Each of the slidable pins 30 (which will be hereinafter referred to as the "bumping pins") is provided with a set-screw 31, by means of which it may be locked against sliding movement, and also a pin portion 32 to act as a stop for a T-square when bumping pins 30 are placed at predetermined positions on squaring bars 3 and 4, as will be later described.

The squaring bed 5 is provided with a centrally disposed longitudinally extending slot 33 of inverted-T shape; the said slot being adapted to receive a slidable pin 35 (see Figure 5) which will hereinafter be referred to as the "locking pin." This locking pin 35 is provided with a set-screw 36, by means of which it may be locked against sliding movement, and also a pin portion 37 which is adapted to fit in a registering hole in a printing plate in much the same manner as the register pins 26.

Referring to Figure 6, there is provided a series of "lock-up" pins 39 which are adapted for insertion in certain of the holes 23 in the slidable bars 11 and 12 at a stage of operation which will be mentioned hereinafter.

Referring to the upper right-hand portion of Figure 2, the table 2 carries at its rearward edge a pair of double hinges 40 to which there is connected a transfer frame 41, the latter carrying a transparent transfer sheet 42 (of acetate, etc.).

The transfer frame 41 is provided with a pair of lugs 42' which extend upwardly (as viewed in Figure 2) and may be mounted on the double hinges 40, as shown. These lugs 42' are adapted to abut the back of the stand 1 when the transfer frame 41 is in operative position over the squaring bed 5. An offset lug 43 which is carried by the stand 1 locks the transfer frame in this position.

In operation:

The hydraulic jack 16 is, through manipulation of its operating handle 18, made to raise the squaring bed 5 to its uppermost position. For use with 16-gauge printing plates, this uppermost position of the squaring bed 5 is regulated to .064 inch below the squaring bars 3 and 4. It will be readily understood by those skilled in the art that this spacing will necessarily be different in the case of squaring electrotypes, stereotypes, or other printing plates; and means for obtaining this result will, as occasion requires, be

associated with the hydraulic jack 17 (or, more properly, its stop ring 20).

The operator places a register pin 26 in the center of the holes 23 of the slidable bar 12 at the back of the squaring bed 5. Then one register hole of the key printing plate (not shown) is placed over the said register pin 26.

The locking pin 35, having previously been placed in the centrally disposed longitudinally extending slot 33 in the squaring bed 5, is moved to fit the other register hole in the key printing plate; after which the locking pin 35 is locked in this position by means of its set-screw 36.

A conventional T-square is then placed on either of the squaring bars 3 and 4, and the register pin 26 in the middle hole 23 of the slidable bar 12 is moved by means of the knurled knob 15 on the projected end of the elongate shaft 10. By turning the knurled knob 15, the slidable bar 12 is moved in one direction or the other a sufficient distance to permit the key printing plate to be turned (for example, 1 1/4 inches) using the locking pin 35 (in the slot 33) as an axis of rotation. As soon as the subject is square with the squaring bars 3 and 4, the size of the key printing plate is determined (as by measuring with a ruler); and the T-square placed on the square bars 3 and 4 in exact position for top, bottom and both sides, locking a bumping pin 30 at each position on the squaring bars 3 and 4.

The T-square may then be placed on the squaring bars 3 and 4 and against the bumping pins 30 in turn and the key printing plate scratched with a pointed scriber. When this has been done, the key printing plate is lifted from the squaring bed 5 and replaced with the other plates in the set in turn and scratched as in the case of the first plate.

For registering and aligning color printing plates on mounting bases, the squaring bed 5 is lowered to its bottom position by actuating the release lever 19. In this position, the squaring bed 5 is .918 from its top face to the top of the squaring bars 3 and 4, making the transparent transfer sheet 42 on the transfer frame 41 flat across the top of the mounted printing plate.

In the accepted way, one mounting block is cut for each printing plate in the color set and trimmed to the same size. The key plate is mounted on one of the blocks and printer's ink applied to the face of the printing plate.

The slidable bars 11 and 12 are moved to their outside maximum positions by turning the knurled knobs 14 and 15, respectively. The mounted printing plate is then placed tightly against the upper left corner in the square formed by the intersection of the two squaring bars 3 and 4. This position leaves uncovered one or more holes 23 in each of the slidable bars 11 and 12. A lock-up pin 39 is then inserted in those holes 23 in the slidable bars 11 and 12 which are closest to the mounting block, and the inserted lock-up pins are tightened against the block by turning the knurled knobs 14 and/or 15, as required.

The transfer frame 41 is moved from its position on the back of the machine through the double hinges 40, and the acetate or other transparent transfer sheet 42 is placed over the face of the printing plate. Increased accuracy in the use of the transparent transfer device is provided by the locking of the lugs 42' and offset lug 43.

With the transparent transfer sheet 42 over the printing plate and the transfer frame 41 locked in position, the image on the printing

plate is transferred to the acetate by rubbing gently with a wide, blunt tool. Then the acetate is moved up by utilizing only the tops of the double hinges 40, not releasing the offset locking lug 43 unless necessary.

The printing plate is released by turning the knurled knobs 14 and 15 back and the plate removed. Another mounting block of the same color set is inserted and locked in as was the first. The transparent transfer sheet 42 is returned to its position on top of the mounting block and another printing plate of the same color set is moved into position on top of the mounting block and under the transparent transfer sheet; and by viewing through the latter, the printing plate is manipulated until it is exactly in register with the image of the key plate. The transparent transfer sheet is turned back, the locking pins 39 released and the printing plate may be tacked on its mounting base. This procedure is followed for each printing plate in the color set.

While I have shown and described certain specific embodiments of the present invention, it will be readily understood by those skilled in the art that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of the invention as defined in the appended claims.

I claim:

1. A printing-plate squaring and registering instrument comprising, in combination, a stand, right-angularly disposed squaring bars mounted on said stand and extending thereabove along one longitudinal edge and across the back thereof, each of said squaring bars having a longitudinally extending slot, a plurality of slidable blocks adapted for reception in and sliding movement with respect to the slots in said squaring bars, means for locking each of said slidable blocks at selected locations in the aforementioned slots, a vertically extending pin mounted on each of said slidable blocks, a vertically moveable squaring bed mounted on said stand, said squaring bed having a pair of right-angularly disposed slots extending in parallelism when said squaring bars, a slidable bar mounted in each of said slots, each of said slidable bars having a series of spaced recesses adapted to receive a pin, means for effecting the sliding movement of said slidable bars, a central slot extending longitudinally of said squaring bed, a slidable element for reception in and sliding movement with respect to said central slot, means for locking said slidable element at selected locations in said central slot, a jack suspended beneath said table top, the plunger of said jack being secured to said vertically moveable squaring bed, and control means for effecting the upward and downward movement of the plunger of said jack.

2. A printing-plate squaring and registering instrument comprising, in combination, a stand, right-angularly disposed squaring bars mounted on said stand and extending thereabove along one longitudinal edge and across the back thereof, each of said squaring bars having a longitudinally extending slot, a plurality of slidable blocks adapted for reception in and sliding movement with respect to the slots in said squaring bars, means for locking each of said slidable blocks at selected locations in the aforementioned slots, a vertically extending pin mounted on each of said slidable blocks, a vertically moveable squaring bed mounted on said stand, said squaring bed having a pair of right-angularly

disposed slots extending in parallelism with said squaring bars, a slidable bar mounted in each of said slots, each of said slidable bars having a series of spaced recesses adapted to receive a pin, means for effecting the sliding movement of said slidable bars, a central slot extending longitudinally of said squaring bed, a slidable element for reception in and sliding movement with respect to said central slot, means for locking said slidable element at selected locations in said central slot, a jack suspended beneath said table top, the plunger of said jack being secured to said vertically moveable squaring bed, control means for effecting the upward and downward movement of the plunger of said jack, and means for urging said vertically moveable squaring bed toward said jack.

3. A printing-plate squaring and registering instrument comprising, in combination, a stand, right-angularly disposed squaring bars mounted on said stand and extending thereabove along one longitudinal edge and across the back thereof, each of said squaring bars having a longitudinally extending slot, a plurality of slidable blocks adapted for reception in and sliding movement with respect to the slots in said squaring bars, means for locking each of said slidable blocks at selected locations in the aforementioned slots, a vertically extending pin mounted on each of said slidable blocks, a vertically moveable squaring bed mounted on said stand, said squaring bed having a pair of right-angularly disposed slots extending in parallelism with said squaring bars, a slidable bar mounted in each of said slots, each of said slidable bars having a series of spaced recesses adapted to receive a pin, means for effecting the sliding movement of said slidable bars, a central slot extending longitudinally of said squaring bed, a slidable element for reception in and sliding movement with respect to said central slot, means for locking said slidable element at selected locations in said central slot, a jack suspended beneath said table top, the plunger of said jack being secured to said vertically moveable squaring bed, control means for effecting the upward and downward movement of the plunger of said jack, means for urging said vertically moveable squaring bed toward said jack, and means for limiting the upward movement of said squaring bed with respect to said squaring bars.

4. A printing-plate squaring and registering instrument comprising, in combination, a stand, right-angularly disposed squaring bars mounted on said stand and extending thereabove along one longitudinal edge and across the back thereof, each of said squaring bars having a longitudinally extending slot, a plurality of slidable blocks adapted for reception in and sliding movement with respect to the slots in said squaring bars, means for locking each of said slidable blocks at selected locations in the aforementioned slots, a vertically extending pin mounted on each of said slidable blocks, a vertically moveable squaring bed mounted on said stand, said squaring bed having a pair of right-angularly disposed slots extending in parallelism with said squaring bars, a slidable bar mounted in each of said slots, each of said slidable bars having a series of spaced recesses adapted to receive a pin, means for effecting the sliding movement of said slidable bars, a central slot extending longitudinally of said squaring bed, a slidable element for reception in and sliding movement with respect to said central slot, means for locking said slidable element

at selected locations in said central slot, a jack suspended beneath said table top, the plunger of said jack being secured to said vertically moveable squaring bed, control means for effecting the upward and downward movement of the plunger of said jack, a pair of double hinges at the rear of said table top, a transfer frame carried by said double hinges, and a transparent transfer sheet carried by said transfer frame, said transfer frame and said transfer sheet being adapted for such movement as to permit the transparent transfer sheet to assume a position above and parallel to said squaring bed.

5. A printing-plate squaring and registering instrument comprising, in combination, a stand, right-angularly disposed squaring bars mounted on said stand and extending thereabove along one longitudinal edge and across the back thereof, each of said squaring bars having a longitudinally extending slot, a plurality of slidable blocks adapted for reception in and sliding movement with respect to the slots in said squaring bars, means for locking each of said slidable blocks at selected locations in the aforementioned slots, a vertically extending pin mounted on each of said slidable blocks, a vertically moveable squaring bed mounted on said stand, said squaring bed having a pair of right-angularly disposed slots extending in parallelism with said squaring bars, a slidable bar mounted in each of said slots, each of said slidable bars having a series of spaced recesses adapted to receive a pin, means for effecting the sliding movement of said slidable bars, a central slot extending longitudinally of said squaring bed, a slidable element for reception in and sliding movement with respect to said central slot, means for locking said slidable element at selected locations in said central slot, a jack suspended beneath said table top, the plunger of said jack being secured to said vertically moveable squaring bed, control means for effecting the upward and downward movement of the plunger of said jack, a pair of double hinges at the rear of said table top, a transfer frame carried by said double hinges, a transparent transfer sheet carried by said transfer frame, said transfer frame and said transfer sheet being adapted for such movement as to permit the transparent transfer sheet to assume a position above and

parallel to said squaring bed, and lugs for preventing the excessive forward movement of said transfer frame and said transparent transfer sheet.

6. A printing-plate squaring and registering instrument comprising, in combination, a stand, right-angularly disposed squaring bars mounted on said stand and extending thereabove along one longitudinal edge and across the back thereof, each of said squaring bars having a longitudinally extending slot, a plurality of slidable blocks adapted for reception in and sliding movement with respect to the slots in said squaring bars, means for locking each of said slidable blocks at selected locations in the aforementioned slots, a vertically extending pin mounted on each of said slidable blocks, a vertically moveable squaring bed mounted on said stand, said squaring bed having a pair of right-angularly disposed slots extending in parallelism with said squaring bars, a slidable bar mounted in each of said slots, each of said slidable bars having a series of spaced recesses adapted to receive a pin, means for effecting the sliding movement of said slidable bars, a central slot extending longitudinally of said squaring bed, a slidable element for reception in and sliding movement with respect to said central slot, means for locking said slidable element at selected locations in said central slot, a jack suspended beneath said table top, the plunger of said jack being secured to said vertically moveable squaring bed, control means for effecting the upward and downward movement of the plunger of said jack, a pair of double hinges at the rear of said table top, a transfer frame carried by said double hinges, a transparent transfer sheet carried by said transfer frame, said transfer frame and said transfer sheet being adapted for such movement as to permit the transparent transfer sheet to assume a position above and parallel to said squaring bed, lugs for preventing the excessive forward movement of said transfer frame and said transparent transfer sheet, and locking means for maintaining said transfer frame and said transparent transfer sheet in the aforementioned position.

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No references cited.