

Sept. 27, 1938.

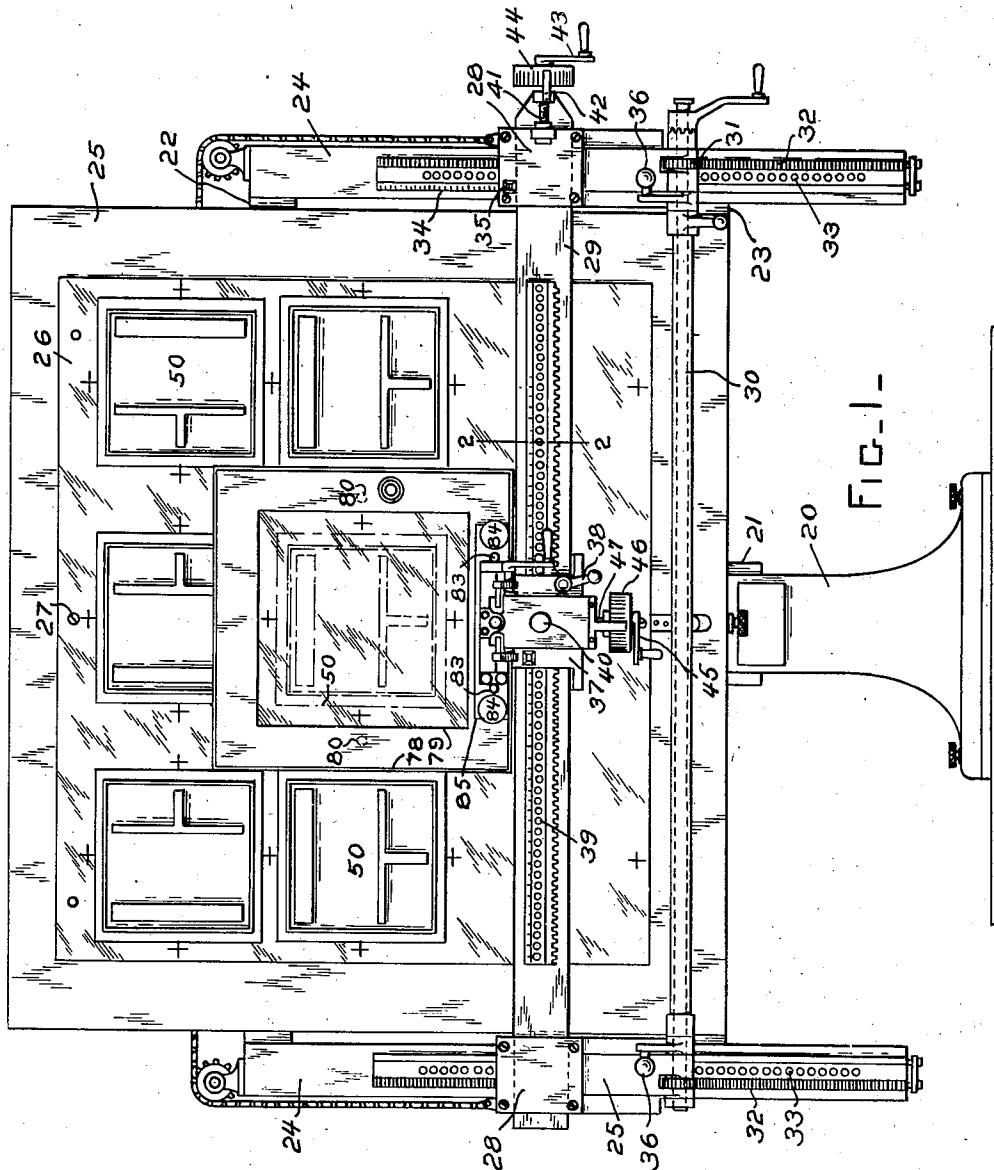
W. C. HUEBNER

2,131,323

METHOD AND MEANS FOR COMPOSING RELIEF PRINTING PLATES

Filed Aug. 9, 1937

4 Sheets-Sheet 1



INVENTOR

William C. Huebner

BY Joseph Harris  
ATTORNEY

Sept. 27, 1938.

W. C. HUEBNER

2,131,323

METHOD AND MEANS, FOR COMPOSING RELIEF PRINTING PLATES

Filed Aug. 9, 1937

4 Sheets-Sheet 2

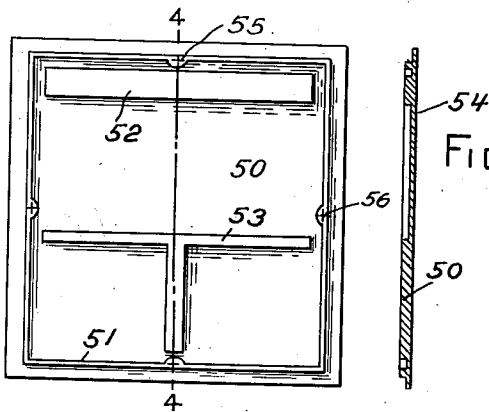


FIG. 3.

FIG. 4.

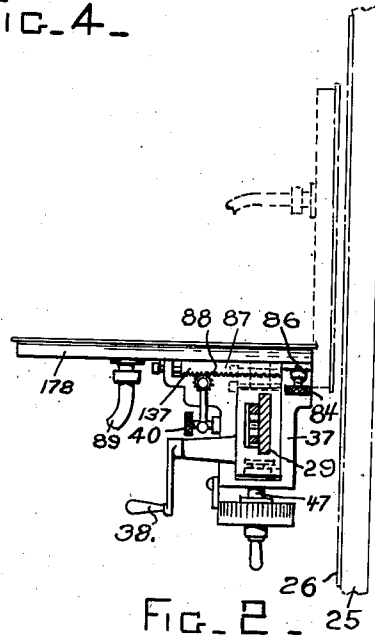


FIG. 2.

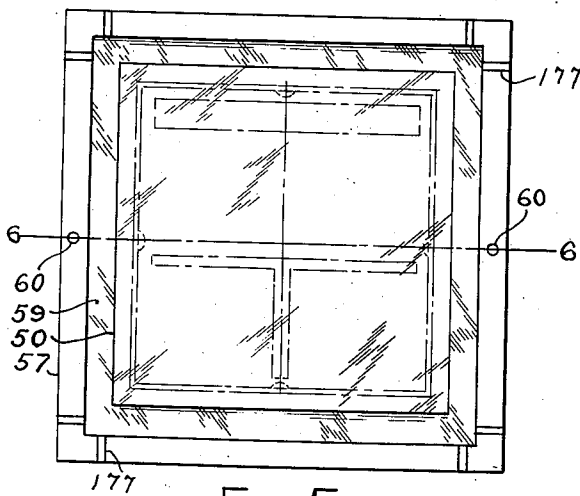


FIG. 5.

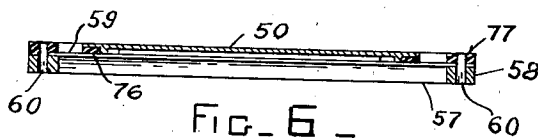


FIG. 6.

INVENTOR

William C. Huebner

By Joseph Harris  
ATTORNEY

Sept. 27, 1938.

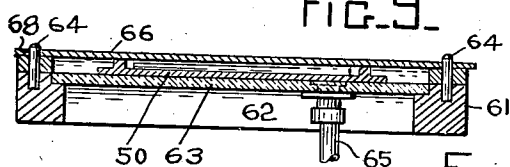
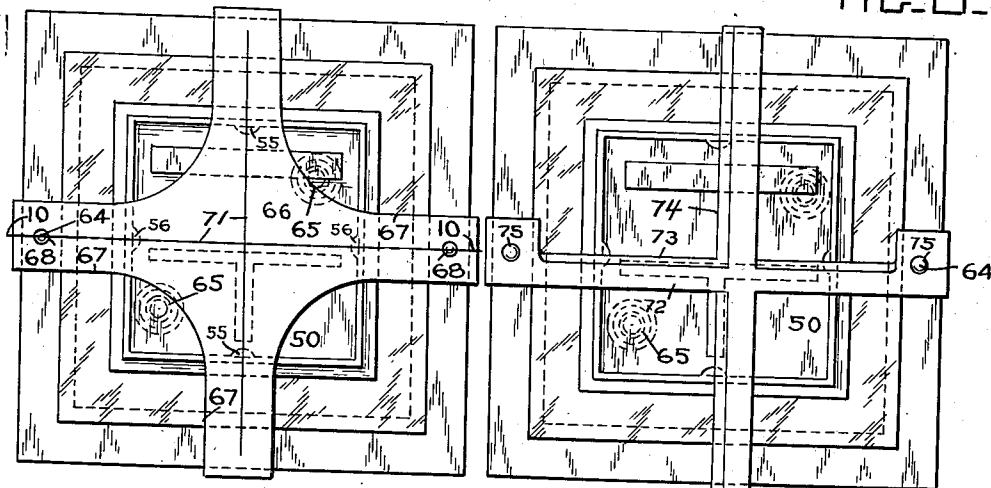
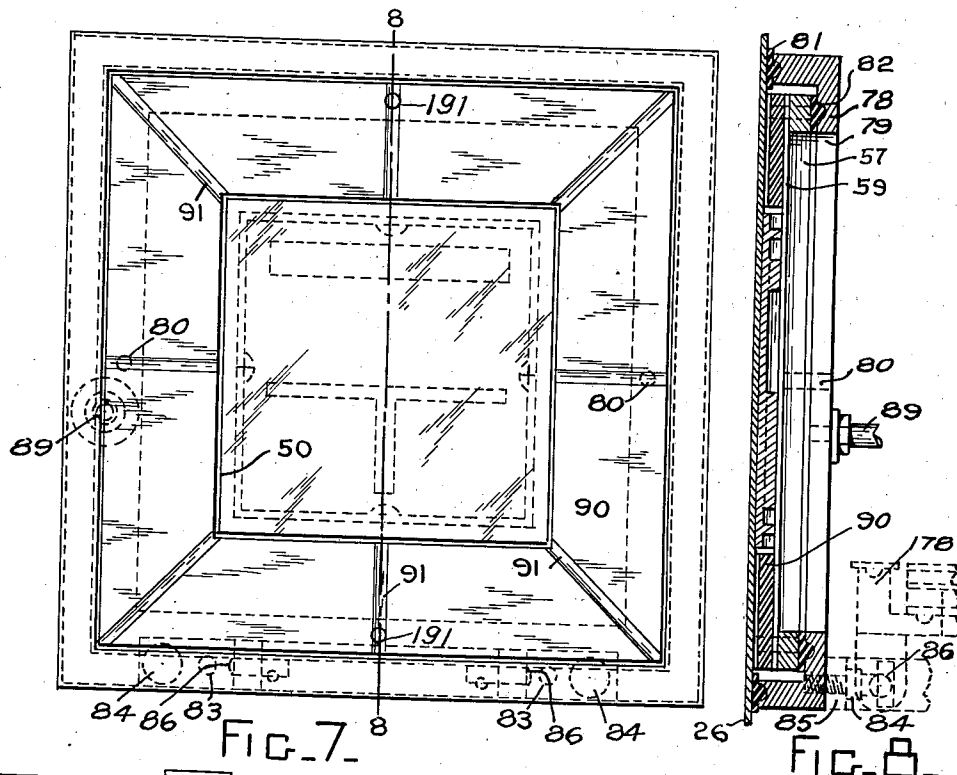
W. C. HUEBNER

2,131,323

METHOD AND MEANS FOR COMPOSING RELIEF PRINTING PLATES

Filed Aug. 9, 1937

4 Sheets-Sheet 3



INVENTOR

William C. Huebner

BY Joseph Harris  
ATTORNEY

Sept. 27, 1938.

W. C. HUEBNER

2,131,323

METHOD AND MEANS FOR COMPOSING RELIEF PRINTING PLATES

Filed Aug. 9, 1937

4 Sheets-Sheet 4

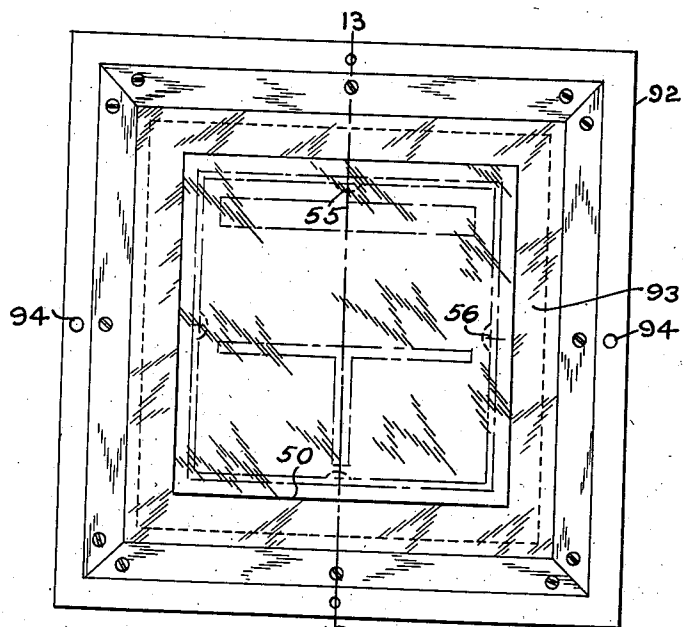


FIG. 12.

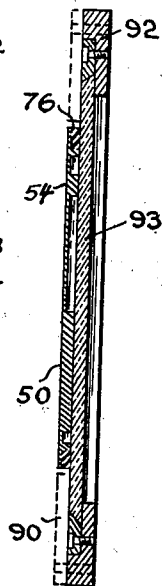


FIG. 13.

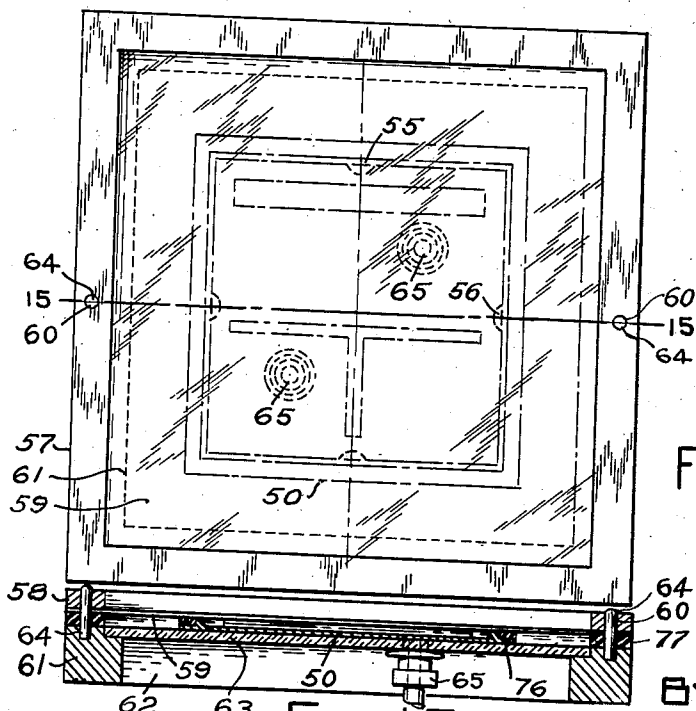


FIG. 15.

FIG. 14.

INVENTOR

William C. Huebner  
BY Joseph Harris  
ATTORNEY

## UNITED STATES PATENT OFFICE

2,131,323

## METHOD AND MEANS FOR COMPOSING RELIEF PRINTING PLATES

William C. Huebner, New York, N. Y.

Application August 9, 1937, Serial No. 158,088

8 Claims. (Cl. 101—401.1)

This invention relates to improvements in method and means for composing relief printing plates.

In the typographic printing art, one of the more recent developments is the use of rubber relief printing plates. Many practical considerations necessarily limit the size or work area of such rubber printing plates to only a fraction of the available area of cylinders of regular type presses. Other molded types of printing plates are also coming into use for offset and typographic presses.

One object of this invention, therefore, is to provide a simple and efficient method of composing and imposing prepared relief printing plates, such as indicated in the preceding paragraph, in predetermined locations and positions on a suitable supporting press plate to thus constitute a large form which latter may then be mounted in any suitable manner on the cylinders of typographic and other printing presses for printing large editions.

Another object of this invention is to provide coordinated means for carrying out the foregoing process in a simple and expeditious manner.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming a part of this specification, Figure 1 is a front elevational view of a composing machine and associated parts suitable for carrying out the improved process and illustrating the manner in which a composed relief press plate is made according to the present invention. Figure 2 is a partial sectional view corresponding to the line 2—2 of Figure 1, illustrating the holder in open position in full lines and in vertical position in dotted lines, the press plate and support therefor being also indicated in dotted lines. Figure 3 is a plan view of a relief printing plate such as adapted to be mounted on a press plate in accordance with the present invention. Figure 4 is a sectional view of the printing plate shown in Figure 3 and corresponding to the section line 4—4 thereof. Figure 5 is a top plan view of a printing plate carrier showing the printing plate temporarily attached thereto in registered position. Figure 6 is a horizontal sectional view, corresponding to the section line 6—6 of Figure 5. Figure 7 is an enlarged elevational view similar to Figure 1, illustrating more in detail the assembly of relief printing plate, carrier therefor, and vacuum holder. Figure 8 is a vertical sectional view of the structure shown in Figure 7 and corresponding to the section line 8—8 thereof. Figure 9 is a top plan view of a registering table for registering the relief printing plate prior to temporary attachment thereof to the printing plate carrier. Figure 10 is a transverse sectional view corresponding to the section line 10—10 of

Figure 9. Figure 11 is a view similar to Figure 9, illustrating a somewhat different embodiment of registering apparatus. Figure 12 is a view similar to Figure 5, but illustrating a somewhat different type of carrier for the relief printing plate. Figure 13 is a sectional view corresponding to the section line 13—13 of Figure 12. Figure 14 is a top plan view of assembly of carrier, printing plate and register table. And Figure 15 is a transverse sectional view corresponding to the section line 15—15 of Figure 14.

In said drawings is illustrated a composing machine which may be of the type disclosed in my prior Patent No. 2,021,959, granted November 26, 1935 and which, in association with certain other coordinated parts, hereinafter described in detail, is suitable for carrying out the improved composing process. Referring more particularly to Figures 1 and 2, said composing machine comprises, broadly, a base or pedestal 20 from which extends an upright column 21 which in turn carries upper and lower cross bars 22 and 23 to which are secured side guides or columns 24—24. The cross bars 22 and 23 connect the side columns and, in addition, also constitute the supporting means for the press plate support 25, the latter preferably being in the form of a heavy slab of slate or equivalent of rectangular form and of sufficient area to accommodate the largest press plate 26 for which the composer is designed. The press plate is adapted to be secured to the support 25 as by screws 27 so as to lie flat and taut thereon.

Vertically slidably mounted on the columns 24 are cross heads 28—28 in which is horizontally slidably mounted for a limited distance, a beam or monorail 29. A cross shaft 30 is also journaled at its ends in the cross heads 25. The monorail 29 is adapted to be adjusted vertically by the shaft 30 which carries pinions 31 cooperable with racks 32 mounted on the faces of the columns 24.

On each of the columns 24 is provided a vertically arranged series of dowel holes 33 accurately spaced apart at predetermined intervals, preferably one inch center to center, and associated with one of the series of dowel holes 33 will preferably be provided a scale as indicated at 34. The adjusted vertical position of the monorail with reference to the main framework may be conveniently ascertained by means of a sight hole 35 provided in the cover plate of the right hand cross head 28, as shown in Figure 1. To positively retain the cross heads and monorail in desired vertical coarsely adjusted position, as determined by the dowel holes 33, dowel pins 36 are provided, carried by the cross heads and adapted to be inserted in the respective dowel holes 33, as will be apparent.

To provide for the necessary relatively coarse adjustments of the holder, hereinafter described more in detail, the monorail 29 has slidably

mounted thereon a saddle 37 adapted to be shifted horizontally back and forth by suitable pinion and rack arrangement through the crank handle 38. Said saddle is also adapted to be retained in coarse adjusted position by a similar dowel hole and dowel pin arrangement 39 and 40.

The fine or micrometer horizontal adjustments of the saddle 37 are obtained by means of the screw 41 swiveled to the right hand cross head 28 and having threaded engagement through the nut section 42 at the outer end of the beam 29, said screw 41 being operated by the crank handle 43 and the amount being determined by the graduated dial 44 carried by the screw 41. A similar arrangement for obtaining the fine or micrometer vertical adjustments of the holder carried by the saddle 37 is obtained through the crank arm 45, graduated dial 46 and screw 47.

For a more detailed description of the construction and operation of the parts of the composer so far referred to, reference may be had to my said prior Patent No. 2,021,959.

Referring now to Figures 3, 4, 5, and 6, 50 indicates conventionally a prepared relief printing plate which may be of rubber or other plastic composition, or, in certain instances, an electrotype with a composition or rubber backing. The printing plate 50, as shown, has a surrounding relief margin 51 and relief characters or images as represented by the cross bar 52 and T formation 53, it being apparent from Figure 4 that the back or nonrelief side of the plate is perfectly flat as indicated at 54. In the preparation of the printing plate 50 in the carrying out of the present invention, the same will be provided with suitable register marks, as indicated at 55 and 56 to locate the exact center lines vertically and horizontally in a manner customary in photo composing and lithographing.

The member 57 is what may be termed a "carrier" for the relief printing plate and the same preferably consists of a metal or other rectangular frame 58 with a central opening over which is stretched and secured a preferably flexible film 59. The carrier frame 58 is provided with registering devices preferably in the form of dowel holes 60—60 on opposite sides thereof which are coordinated with other registering devices, hereinafter described. The carrier member 57 is also provided with a spacing element 77 around the periphery thereof. Such spacing element 77 will be of a thickness corresponding to the thickness of the printing plate 50 intended to be used with the carrier. Said spacing element 77 preferably is of yieldable material so as to be somewhat compressible and may be permanently affixed to the frame 58 as shown in Figure 6 or of a detachable character as hereinafter described. To enable the air to be exhausted from beneath the carrier 57 when engaged with the press plate, as hereinafter described, the spacing element 77 may have one or more grooves 177 cut in the face thereof at different places, as shown in Figure 5.

Referring now more particularly to Figures 9, 10 and 11, 61 indicates a support or registering table preferably comprising a suitable metal frame 62 with a glass top 63 extending over the large central opening of the support. Said support is also provided with cooperable registering devices in the form of dowel pins 64—64 on opposite sides thereof and which are adapted to be entered into the dowel holes 60 of the carrier frame 58. To further facilitate the carrying out of the invention, the support 61 is preferably provided with one or more vacuum line connections

65 through the glass support 63 in the central area thereof.

Cooperable with the support 61 is a registering frame, of which two forms are shown in Figures 9 and 11, respectively. The registering frame 66 of the Figure 9 construction is more or less in the form of a cross with the four arms thereof extending at right angles to each other, the two horizontally extending arms 67—67 being provided with registering dowel openings 68—68 cooperable with the dowel pins 64. In actual practice, the registering frame 66 will be composed of a heavy transparent material and the arms thereof scribed with horizontally and vertically extending register lines 71 coinciding with two lines at right angles to each other which intersect at the exact center of the register support and which correspond to the two travel lines at right angles to each other of the composer machine, hereinbefore referred to.

In the Figure 11 form of registering frame 72, two bars at right angles to each other are employed, formed with straight edges 73 and 74 extending at exactly right angles to each other horizontally and vertically and so located that their point of intersection is also at the exact center of the register support 61. The horizontally extending arms of the register frame 72 are also provided with dowel holes 75—75 cooperable with the dowel pins 64 of the register support.

The first step in carrying out the process of the present invention, is the securing of the relief printing plate to the carrier 57 in predetermined position and location and to this end, the following procedure is followed. The printing plate 50 is first laid on the register support 61 with the relief side of the printing plate uppermost, as shown in Figures 9, 10 and 11, and also in Figure 15. The registering frame, such as 66 or 72, is then superposed on the register support 61 in registered position by means of the dowel holes and dowel pins. The operator then adjusts the relief printing plate 50 so as to bring the register marks 55 and 56 thereof exactly in alignment with the register lines or register edges of the register frame 66 or 72, as the case may be, thus accurately positioning and centering the printing plate with reference to the register dowel pins and corresponding dowel holes. With the printing plate 50 thus in registered position, vacuum is applied through the pipes 65, thus securely holding the printing plate fast to the top of the register support 61. The register frame 66 or 72 is then removed and the carrier 57 then placed on the register support by engaging the dowel pins and dowel openings of said members, the carrier being positioned with its film 59 at the bottom, as shown in Figure 15. The relief printing plate 50 is then temporarily secured to the carrier film 59. One way of conveniently doing this, is to employ rubber strips 76 which will first be lightly cemented to the printing plate at suitable points therearound and preferably outside of the margin, as shown in Figure 15. After the printing plate 50 has been registered and held down by the application of vacuum, another light coating of cement may then be applied to the upper exposed surfaces of the rubber strips 76 so that, when the carrier is superposed on the printing plate, the film 59 of the carrier can be pressed down and thus cemented to the printing plate.

With the printing plate 50 thus temporarily secured to the carrier 57, the latter is then removed from the register support and mounted in a carrier holder 78 which preferably con-

sists of a rectangular metal frame having a large central opening 79, the frame being preferably of right angular cross section, as best shown in Figure 8. Said carrier holder 78 is also provided with cooperable registering devices in the form of dowel pins 80—80 on opposite sides thereof so that, when the carrier is positioned in the holder 78, the carrier will occupy a predetermined position and location with respect thereto. As will be understood, the carrier 57 is placed in the carrier holder 78 with the back or flat side of the printing plate outermost, that is, in a position for the back of the printing plate to face the press plate 26. As best shown in Figure 8, the carrier holder 78 is provided with two air sealing gaskets therearound, one as indicated at 81 and the other as indicated at 82, the former being adapted to engage with the press plate 26 and the gasket 82 forming an air seal with the carrier 57.

The carrier holder 78 is detachably secured to the saddle 37 of the composer preferably by means of another set of dowel pins and dowel holes as indicated at 83—83 and securing screws 84—84 on an adaptor 85 which in turn is pivotally connected to the saddle as by the pintles 86—86. As will thus be apparent, the carrier holder 78 occupies a predetermined position and location with reference to the saddle of the composer machine and hence its position can always definitely be ascertained with reference to the two travel lines of the composer machine and with reference to the press plate secured thereto.

By means of the pivoted mounting of the carrier holder with reference to the saddle, the carrier holder 78 may be swung down to a horizontal position as indicated at 178 in Figure 2 and the carrier 57 with its temporarily attached printing plate 50 placed therein, as will be understood. With the carrier mounted in the carrier holder, the latter is then swung up to vertical position, as indicated by the dotted lines in Figure 2 opposite the press plate 26, in which condition a slight clearance is left between the press plate and holder so as to allow of the necessary horizontal and vertical adjustments of the saddle and holder without injury to either the press plate or printing plate. When the saddle, carrying the printing plate 50 as hereinbefore described, has been adjusted over the face of the press plate 26 to the desired position and location as called for by a layout sheet, the printing plate is then moved horizontally into intimate contact with the press plate 26 by adjusting the subsaddle 137 through the rack and pinion 87, 88, as shown in Figure 2. Prior to placing the relief printing plate 50 into contact with the press plate 26, the back or flat side of the printing plate 50 will have a layer of cement applied thereto. When the printing plate 50 is thus placed in contact with the press plate 26, pressure is applied preferably by means of vacuum through the vacuum line 89 entered through the carrier holder 78 and the cement between the relief plate 50 and the press plate allowed to set which, under the vacuum pressure requires only a few minutes. When the relief plate has been permanently secured to the press plate, the holder 78 is drawn back and the carrier 57 removed or stripped from the relief side of the printing plate 50, thus leaving the relief portions of the printing plate exposed on the press plate 26, as shown in Figure 1.

Where the printing plate is of appreciable lesser area than the area defined by the sealing

gasket 81 of the carrier holder 78 or is of appreciable lesser area than that of the film to which attached, a detachable gap-bridging member is preferably employed such as indicated at 90 in Figures 7 and 8, in lieu of the spacing element 77 heretofore referred to and shown in Figures 5 and 6. Said gap-bridging member 90 will be of suitable size and form to approximately fill the gap between the edges of the printing plate and the sealing gasket 81, to thereby prevent indentation of the press plate when the vacuum pressure is applied. The member 90 is preferably retained in position on the carrier 57 by an auxiliary set of dowels and dowel holes as indicated at 191. The member 90 is also preferably provided with shallow grooves 91—91 at suitable intervals therearound on that face which engages the press plate so as to permit exhaustion of the air when the vacuum is applied.

Referring to Figures 12 and 13, a modified form of carrier for the relief printing plate is there shown, the same comprising an outer metal rectangular frame 92 with a glass support 93 extending over the central opening, the glass plate being used in lieu of the film 59 of the previously described form. Said carrier 92 will be provided with registering dowel openings 94—94 corresponding to the dowel openings 60 of the first described carrier and cooperating in the same manner with the register support and carrier holder, as will be understood.

In carrying out the process in actual practice, a layout for the press plate to be composed, is first made, which layout will have indicated thereon the exact positions and locations of the several relief printing plates to be mounted thereon, whether the printing plates are all of like character as illustrated in Figure 1 or of different character. The layout may call for the printing plates being arranged head up, head right, head left or head down, depending upon the particular job to be printed. Each relief printing plate is mounted in a carrier in the position called for by the layout and registered in the carrier and temporarily secured thereto, as hereinbefore described. The printing plates in their carriers are then successively placed in the composer machine, adjusted to the position and location called for by the layout and then permanently secured to the press plate, as previously described. It will thus be seen that a composed relief press plate may be made up with any desired combination and arrangement of individual relief plates and the thus composed press plate mounted on a cylinder of a typographic or other printing machine.

In the preceding description, specific reference has been made to the use of rubber relief printing plates and the use of vacuum for obtaining pressure during the step of securing the printing plates to the press plate. As will be apparent to those skilled in the art, mechanical means may be employed in lieu of the vacuum means for obtaining the desirable pressure. It will further be appreciated by those skilled in the art that other than rubber relief printing plates may be composed on a press plate without departing from the spirit of the invention. Also, while one particular type of composer machine has been described, other types might be employed, provided the essential features are present, of relative movement between the press plate and printing plate carrier in two lines at right angles to each other and having the necessary registering features. All changes and modifications are

contemplated that come within the scope of the appended claims.

What is claimed is:

1. The herein described process of preparing a composed relief press plate which includes: preparing a relief printing plate temporarily securing the prepared relief printing plate to a carrier with the relief side of the printing plate against the carrier; then placing the back side of the relief printing plate, while still temporarily secured to the carrier, in contact with a press plate and permanently securing the relief printing plate to the press plate; and then removing the carrier from the relief printing plate to leave the relief surface thereof available for inking and printing when the press plate is in a press.

2. The herein described process of preparing a composed relief press plate which includes; temporarily securing the relief side of a prepared relief printing plate to a carrier in predetermined position and location on the carrier, then positioning the carrier in predetermined position and location with reference to a press plate and with the back side of the relief printing plate opposed to the press plate; then permanently securing the back side of the relief printing plate to the press plate while so positioned with reference thereto; and then removing the carrier from the relief side of the relief printing plate.

3. The herein described process of preparing a composed relief press plate in accordance with a layout, which includes: temporarily securing each prepared relief printing plate to a carrier in predetermined position and location thereon in accordance with the layout and with the relief side of the printing plate against the carrier; positioning each carrier, while the printing plate is temporarily secured thereto, in predetermined position and location with reference to a press plate and in accordance with the layout for the particular printing plate, the carrier being positioned with the back side of the relief printing plate opposed to the press plate; permanently securing the back side of each printing plate to the press plate while so positioned; and removing the carriers from the relief printing plates after each of the latter is permanently secured to the press plate.

4. The herein described process of preparing a composed relief press plate which includes: temporarily attaching the relief side of a prepared relief printing plate having a rubber backing, to a carrier in predetermined position and location thereon; then positioning the carrier in predetermined position and location with reference to a press plate and with the rubber backing of the printing plate opposite the press plate; cementing the rubber backing of the printing plate to the press plate while so positioned by the carrier; and then destroying the temporary attachment between the printing plate and carrier and removing the carrier from the relief side of the printing plate.

5. The herein described process of preparing a composed relief press plate which includes: temporarily securing the relief side of a prepared relief printing plate to a carrier in predetermined position and location thereon; then positioning the carrier in predetermined position and location with reference to a press plate and with the back

side of the relief printing plate opposed to the press plate; applying pressure between the printing plate and the press plate and, while under pressure, securing the printing plate to the press plate; and finally removing the carrier from the relief side of the printing plate.

6. The herein described process of preparing a composed relief press plate which includes; taking a prepared relief printing plate and registering the same in and temporarily securing to a carrier with the relief side of the printing plate against the carrier; placing the carrier with the printing plate thereon in registered position and location in a vacuum holder; securing a press plate in a composing machine; placing the vacuum holder with the carrier in the composing machine and then positioning the holder to predetermined location; applying vacuum pressure between the holder and the press plate and securing the back side of the relief plate to the press plate; and then disengaging the carrier from the relief plate.

7. The herein described process of preparing a relief press plate having composed thereon a plurality of relief printing plates, which includes: securing a plain press plate in taut condition; registering each of the relief printing plates in a carrier and temporarily securing each printing plate to its respective carrier with the relief side of the printing plate against the carrier; positioning each of the carriers with its printing plate temporarily secured thereto, opposite the press plate in a predetermined location with reference to the press plate; permanently securing the back side of each of the relief printing plates to the press plate while so positioned by its corresponding carrier; and removing each carrier from its printing plate when the latter is secured to the press plate.

8. The herein described coordinated apparatus for preparing a composed relief press plate from a plurality of separate relief printing plates, comprising: a register device; a carrier to which a relief plate is adapted to be temporarily attached; a carrier holder; a composer machine including a press plate holder, a support for said carrier holder, means for relatively adjusting said support and press plate holder relatively to each other in two directions at right angles to each other in a plane parallel to the press plate, and means for moving the support and press plate holder toward and from each other for contacting purposes; said register device and relief plate carrier, said relief plate carrier and the carrier holder, and said carrier holder and support, each having cooperable sets of detachable interengageable registering means, all of said sets of registering means being coordinated with said two lines of movement at right angles to each other of the press plate holder and support whereby, a relief press plate may be registered in and temporarily secured to said relief plate carrier, the latter then mounted in register on the carrier holder, the assembly of relief printing plate, carrier and carrier holder then mounted in register on the carrier holder support and the relief press plate adjusted to predetermined position and location relative to the press plate and then permanently secured to the press plate.

WILLIAM C. HUEBNER. 70