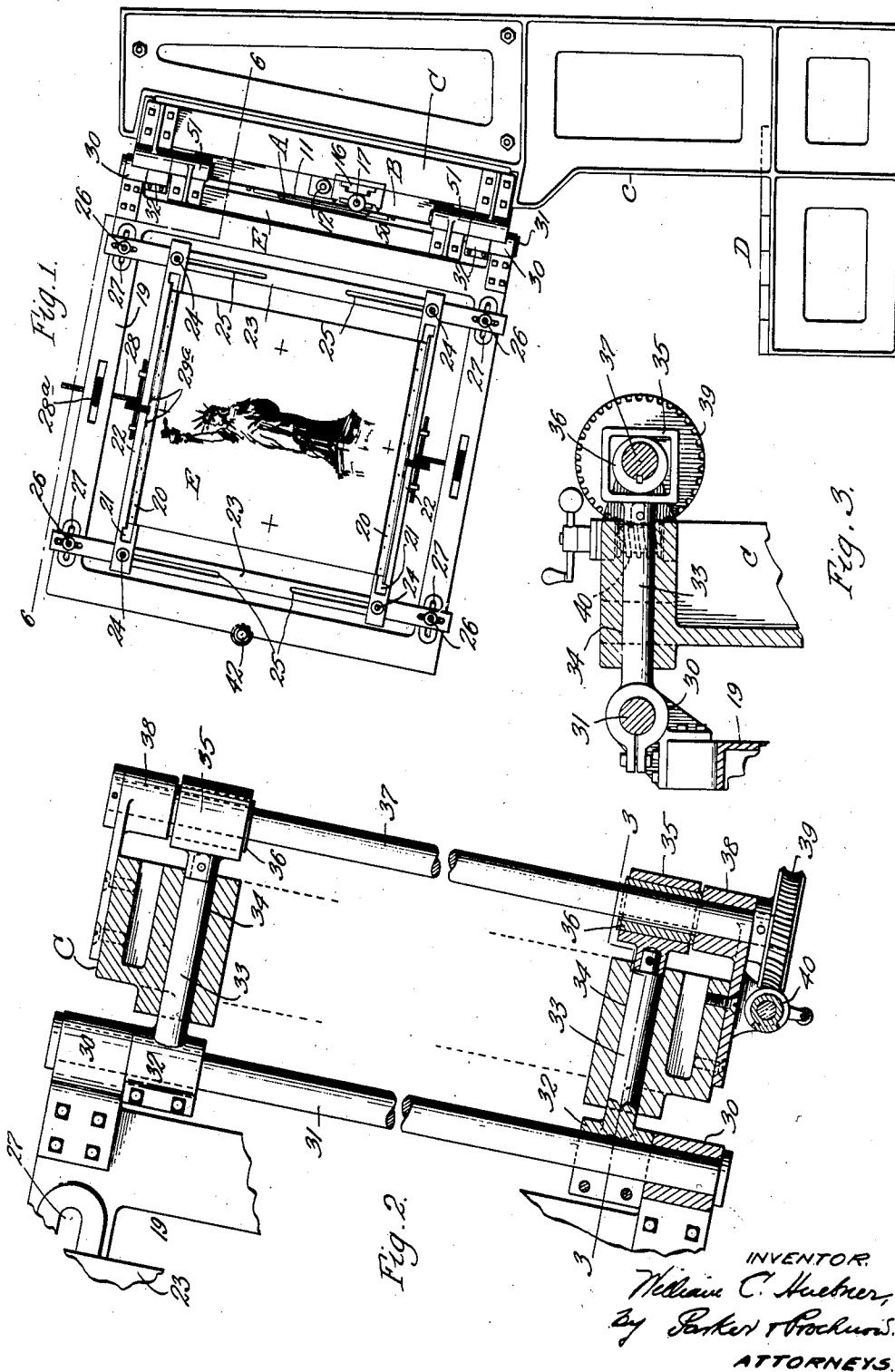


Apr. 17, 1923.

1,452,078

W. C. HUEBNER
 APPARATUS FOR POSITIONING THE PRINTING PLATES ON THE PLATE HOLDERS OF
 PHOTOGRAPHIC PRINTING MACHINES
 Filed Oct. 16, 1920

3 Sheets-Sheet 1



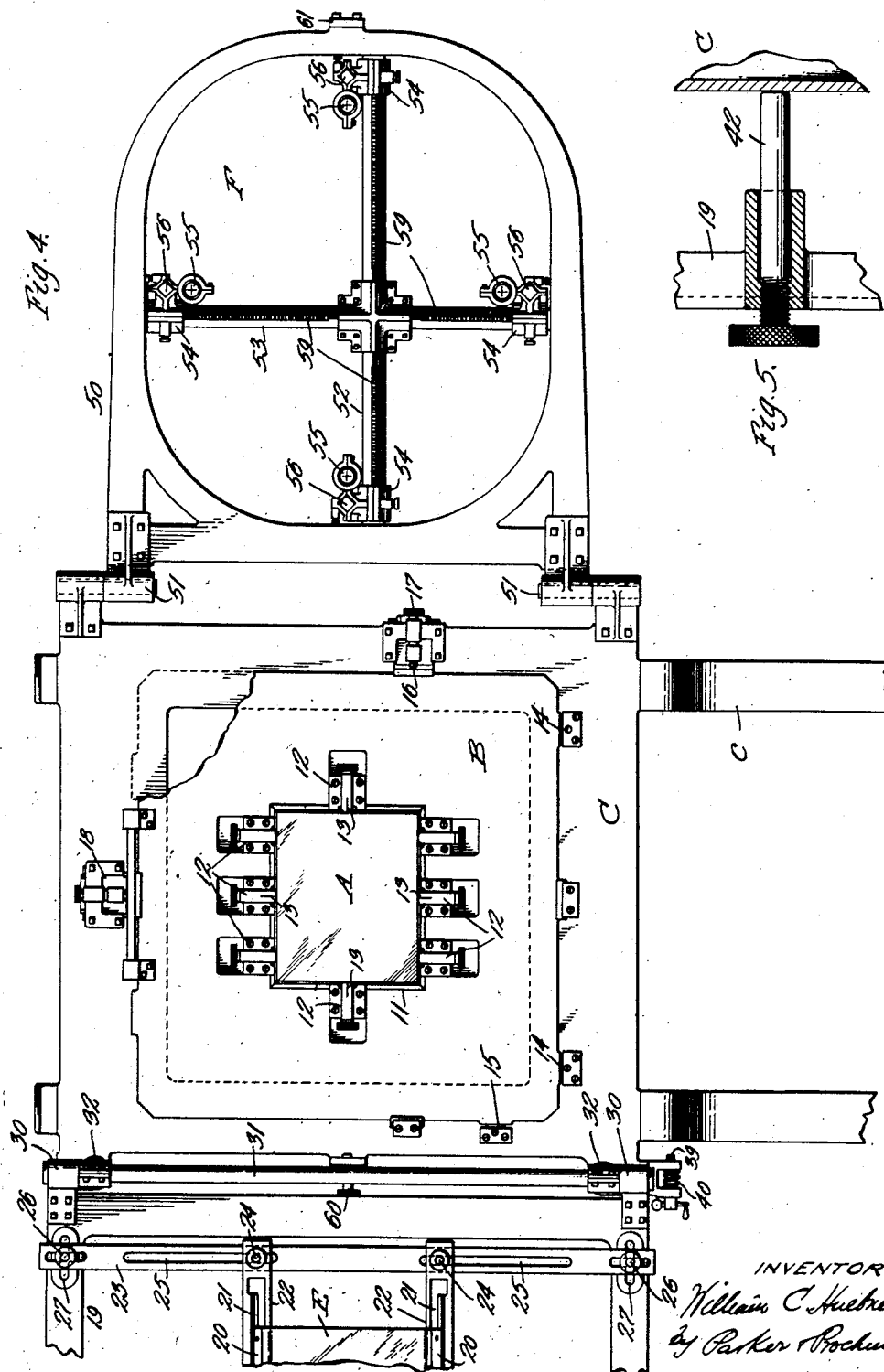
INVENTOR
 William C. Huebner
 By Parker & Prochman
 ATTORNEYS

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3 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

WILLIAM C. HUEBNER, OF BUFFALO, NEW YORK, ASSIGNOR TO HUEBNER-BLEISTEIN PATENTS COMPANY, OF BUFFALO, NEW YORK.

APPARATUS FOR POSITIONING THE PRINTING PLATES ON THE PLATE HOLDERS OF PHOTOGRAPHIC-PRINTING MACHINES.

Application filed October 16, 1920. Serial No. 417,385.

To all whom it may concern:

Be it known I, WILLIAM C. HUEBNER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Apparatus for Positioning the Printing Plates on the Plate Holders of Photographic-Printing Machines, of which the following is a specification.

This invention relates to apparatus for accurately positioning the printing plates on the plate holders of photographic printing machines and is particularly adapted for enabling the accurate positioning of the images on the negatives or transparent printing plates or analogous members used in photographic printing or composing apparatus of the kind which are intended for photographing like or different original prints in any required predetermined and registered positions and relative arrangements upon the sensitized surfaces of the same or different plates that are afterwards suitably finished and used in mechanical printing presses for printing in one or more colors or for other photographic reproduction work.

In some classes of color printing, register marks are provided on the several plates, whereby all of the colors can be caused to register properly one with the other. For photo composing purposes these register marks preferably consist of vertical marks at the top and bottom of the subject and horizontal marks at the right and left sides of the subject, the vertical and horizontal marks being located respectively in vertical and horizontal lines intersecting at the center of the subject. When several negatives, each representing a separate color of the subject to be reproduced, are to be used for making photo composed press plates, it is necessary that the image on each negative be placed in exactly the same position in the machine so that the register marks and the work will occupy exactly the same position in register with each other on the several plates whereby, when all of the plates are printed the different colors will register exactly.

One of the objects of this invention is to provide means whereby a negative with register marks can be readily placed with the image thereon accurately in a required pre-

determined position upon the plate holder used in the photo-composing apparatus, or whereby two or more negatives with register marks can be readily placed with their images in exactly like positions upon the same or different plate holders.

Some classes of work have no register marks, or carry register marks which are not placed to conform with the vertical and horizontal center lines of a subject and therefore are not desirable for photo composing purposes. It also happens at times that some color plates carry only two register marks which make it very difficult to register exactly the various negatives in the photo composing apparatus.

Another purpose of the invention is to provide means whereby negatives having misplaced or unsuitable register marks, and negatives that have no register marks at all, can be placed in a predetermined position upon the negative holders used in photo composing machines, whereby a set of negatives can be registered one with the other visually by placing the images of the various negatives in register with a master device such as an image contained on one plate, or a suitable sheet or film.

Another purpose of the invention is that when a negative with an image is so registered, register marks suitable for photo composing purposes can be placed quickly, easily and accurately in the required position on all of the negatives comprising a set, so that if the set of negatives are required for future repeat orders, each negative can be quickly placed in the required position on the negative holder by means of the register marks.

The device embodying this invention can be attached directly to or form a part of a photo composing machine, or can be placed near the machine as a separate unit, in which latter case the positioning means for the negative holder must correspond exactly as regards its relation to the negative holder, to the holder positioning means which are a part of the negative holder support of the photo composing machine. Whether the positioning means constitute a part of a photo composing machine or is an individual unit coordinated with the machine is entirely optional, because the mode of operation and the results obtained will be identical in

either case except that when the printing means are detached from the photo composing machine, negatives can be placed and registered on additional negative holders, while the photo composing machine is in operation. Thus delays are avoided and the photo composing machine can be kept in constant operation, increasing its output over a machine on which the negative positioning means form a part of the photo composing machine.

In the accompanying drawings:

Fig. 1 is a side elevation of an apparatus embodying the invention for positioning the printing plates on the holders therefor, and showing the swinging holder for the master image extending forwardly from the printing plate holder and the register device in operative position in front of the printing plate holder.

Fig. 2 is an enlarged fragmentary sectional elevation thereof on line 2—2, Fig. 6.

Fig. 3 is a sectional plan view thereof on line 3—3, Fig. 2, but showing a different position of the master image holder.

Fig. 4 is a front elevation of the apparatus showing the two swinging registering devices extending laterally from opposite sides of the printing plate holder.

Fig. 5 is a detail sectional elevation of the adjustable stop for the master image.

Fig. 6 is a plan view, partly in section, of the apparatus on line 6—6, Fig. 1.

Fig. 7 is a detail section of one of the securing devices for the master image sheet or plate.

Fig. 8 is an enlarged sectional plan view of the lock for the registering device.

Fig. 9 is a fragmentary enlarged elevation showing one of the registering elements, and Fig. 10 is a sectional plan view of the same showing the device in contact with the printing plate.

Figs. 11 and 12 are respectively an enlarged front elevation and section showing the adjusting means for the registering sheet.

A represents a photographic negative or transparent printing plate adapted to make a photographic print, and B is the holder on which the printing plate is adjustably secured and which is adapted to be mounted in a photographic printing apparatus for making the prints from the plate A. The plate holder B is supported, preferably in substantially upright position on a stand or support C so that the printing plate faces forwardly preferably in a slightly inclined position, such that the image thereon can be readily seen. The stand or support C may be of any suitable construction but it is preferably provided with a stationary supporting frame *c* on which the plate holder B is mounted, and with a forwardly projecting base portion or step D on which

the operative can stand when manipulating the apparatus and securing and adjusting the printing plate and other parts thereon.

The printing plate holder B is preferably substantially like the holders shown in my copending application filed February 27, 1919, No. 279,493 for mounting the printing plate in the photographic printing apparatus. This holder, as shown, consists of a substantially rectangular, metal plate provided with a central opening covered by a stationary glass plate 11, on the face of which the transparent printing plate A is adjustably secured by suitable holding devices 12. Each of these holding devices has a jaw or part actuated by a screw or other suitable means for moving the jaw into holding engagement with the bevelled edge of the printing plate. Three of the holding devices are shown at each of the upper and lower edges of the printing plate and one at each of the opposite edges thereof. By appropriate adjustments of the holding devices the printing plate is permitted a limited adjustment on the holder B and can be stationarily secured thereon, thus permitting the plate to be properly lined up and centered and registered with reference to a registering device as hereinafter explained. Preferably the central, upper and lower holding devices 12 and the holding devices at the opposite ends of the plate are provided with index marks 13 adapted to register with cross lines or register marks on the printing plate to facilitate the centering and squaring of the printing plate on the holder.

The plate holder B with the printing plate secured thereon is adapted to be removably secured on the front face of the supporting frame *c* in a predetermined position corresponding to the position in which the holder is mounted on its supporting frame in the printing apparatus when making prints. For this purpose, in the construction shown, the supporting frame *c* is provided with two projecting blocks 14 on which the lower edge of the printing plate holder is adapted to rest and with an abutment 15 against which one end of the holder is adapted to abut. The printing plate holder is placed against the front face of the frame C with its bottom edge resting on the blocks 14 and is then shoved over against the abutment 15 by a movable securing device 16 actuated by a screw 17 or other suitable means for forcing the plate holder edgewise firmly against the abutment 15. A similar securing device 18 is also preferably provided at the upper edge of the holder for forcing and holding it down firmly on the bottom supporting blocks 14. These securing means for the plate holder enable the holder to be repeatedly secured exactly in the same position on the stand C, and different plate

holders, which are alike, to be secured in exactly corresponding positions. The securing devices for the plate holder are also disposed on the stand C just like the corresponding parts in the printing apparatus in which the plate is to be used, thereby enabling the printing plate A to be secured in exactly corresponding positions in the positioning device of this apparatus and in the printing apparatus.

The construction shown and above described is employed because it has been found in practice to enable the printing plate to be readily and accurately secured on the plate holder and the plate holder to be readily and accurately secured in the apparatus, but any other suitable construction of the plate holder and means for securing it on its support and affording the above results could be employed.

E represents a registering member, preferably consisting of a transparent sheet, film or the like, bearing a master image or copy of a subject and which is mounted on a movable frame 19 whereby the member can be placed in a position face to face with the printing plate, and preferably in contact with the front face of the printing plate for the purpose of registering the image on the printing plate with the image on the registering sheet E. The registering sheet E can be mounted on its supporting frame 19 in any suitable way adapted to permit the sheet to be readily secured in place, adjusted and removed, and the frame 19 for the same is preferably suitably hinged on the stand frame *c* so as to permit the frame 19 to be swung to and from the operative position in front of the printing plate. In the construction shown the registering sheet has secured to its upper and lower edges parallel fastening strips 20, adapted to be removably seated in recesses 21, Figs. 4 and 7 in upper and lower horizontal supporting bars 22, which are adjustably secured at their ends to two upright bars 23, which in turn are adjustably secured at their upper and lower ends on the swinging frame 19. The fastening strips 20 are adapted to be inserted, while in an inclined position into the recesses 21 in the supporting bars 22 and retained therein by the engagement of the lower bevelled edges of the fastening strips in correspondingly shaped grooves in the supporting bars. Then, by adjusting the supporting bars 22 and upright bars 23, the registering sheet can be stretched taut and squared on the supporting frame 19. The bars 22 and 23 can be adjustably secured so as to enable registering sheets E of different sizes to be mounted and properly adjusted on the swinging frame, preferably by thumb screws 24 on the bars 22 movable in vertical slots 25 in the bars 23, and screws 26 for these bars movable in horizontal slots 27 in the upper and

lower portions of the swinging frame. The upper holding bar 22 is also preferably connected to a screw 28 engaged by a nut 28^a retained on the upper end of the frame 19, so that when the screws 24 are loosened the bar will be supported by the screw 28 and can be adjusted by turning the nut 28^a. The lower bar 22 is also preferably provided with a similar adjusting screw and nut. On each bar 22 is a screw adjusting device, see Figs. 11 and 12, having a circular disk projecting into one of several notches 29^a in the adjacent attaching bar 20 and adapted to be turned for adjusting the latter endwise on the holding bar to center or line up the registering sheet E.

The swinging frame 19 is preferably hinged on the stand frame *c* in the following manner:

The frame 19 is provided at its upper and lower ends with hinge loops 30 through which passes a hinge rod 31 which also passes through hinge loops 32 on the front end of two rods 33 which are movable forwardly and rearwardly in guide holes 34 in the stand frame *c*. At their rear ends the rods 33 are provided with loops 35 in which work eccentrics 36 on an upright shaft 37, which is journaled in suitable bearings 38 on the stand frame *c*. When this shaft is rotated, the eccentrics working in the loops 35 will move the hinge rod 31 and consequently the hinged ends of the swinging frame 19 inwardly or outwardly toward or from the plane of the printing plate A on the stand or support. For turning the eccentric shaft 37, it is provided at its lower end with a worm wheel 39 meshing with a worm 40 on a short, horizontal shaft which is suitably journaled on the stand frame *c* near the lower end thereof and is provided at its outer end with a crank or handle for turning with an adjustable stop 42, Figs. 5 and 6, adapted to engage the stand frame *c*. This stop, as shown, consists of a screw working in a threaded hole in the free end of the swinging frame 19 with its inner end arranged to bear against the front face of the stand frame *c*. By appropriately adjusting the eccentric shaft 37 and the stop screw 42, the hinged frame 19 can be adjusted inwardly or outwardly, as may be necessary, to insure that the registering sheet E will bear throughout flat against and parallel with the front face of the printing plate, notwithstanding variations in the thickness or the adjustment of different printing plates.

When the transparent registering sheet E is positioned in front of and in contact with the front face of the printing plate A, the holding devices for the printing plate are accessible around the edges of the registering sheet and can be manipulated as may be necessary to adjust the printing plate so that

the image thereon will register accurately with the image on the registering sheet. The image on the printing plate can be seen through the transparent registering sheet, thus permitting a ready, visual registration of the two images. Other suitable means for mounting the swinging frame 19 and adjusting it relatively to the printing plate could be employed.

F represents a centering or registering and scribing device which is preferably hinged to the stand or support C at the side thereof opposite to that at which the swinging image registering frame 19 is located so that said device can be swung around to a position in front of the printing plate, as indicated in Fig. 6, when the frame 19 is out of the way. This registering and scribing device preferably comprises an open supporting frame 50 which is hinged in any suitable manner at 51 to the stand frame *c* and is provided with horizontal and vertical guide bars 52 and 53 on which carriages or slides 54 are arranged to move horizontally and vertically across the face of the printing plate when the frame 50 is secured in its operative position in front of the printing plate. On each carriage is mounted a registering element preferably consisting of a small glass 55 provided with fine cross lines. This glass is secured in a ring or mounting on a leg 56 which is slidably mounted on the carriage 54 and is adapted to be moved toward and from the printing plate, as by a pinion 57, meshing with a toothed rack on the leg 56 to place the register glass into and out of contact with the face of the printing plate. Each of the carriages 54 is adapted to be moved along its guide rod parallel with the face of the printing plates as by a pinion 58 meshing with a toothed rack 59 on the guide bar. 59^a, Figs. 9 and 10 represents a scribing or marking blade or point which is mounted on each of the registering elements for the purpose of making register marks on the printing plate. The registering elements are so located that when their carriages are moved on the guide rods the intersections of the marks on the registering glasses and the scribing points will follow perpendicular diametrical lines intersecting at the center of the printing plate holder. The registering and scribing device can be stationarily secured in place in front of the printing plate by any suitable means, such as a bolt 60, Figs. 6 and 8, adapted to enter a keeper 61 on the frame 50.

By means of this registering device the printing plate can be adjusted on its holder B until the register marks on the plate register with the marks on the registering elements of the registering device, thus enabling the printing plate to be accurately lined up and centered or placed in the required, predetermined position on the holder.

And after a printing plate which has no register marks, has been registered with the master image on the sheet E, as above described, register marks can be scribed on the plate by means of the points 59^a, so that thereafter when it is necessary to use the printing plate for a subsequent job, it can be properly registered in its holder without the use of the master image E, by adjusting the plate to cause the register marks to register with the marks on the registering elements 55.

This invention is not necessarily restricted to the described construction of the registering and scribing device, the holder for the printing plate, its securing means and the holder for the master image. These various devices are constructed much like analogous devices disclosed in some of my copending applications and patents, and the described constructions or other suitable constructions can be employed. The combination or coordination of the several devices set forth in the appended claims whereby the described useful functions are made possible, is, however, believed to be novel.

I claim as my invention:

1. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device arranged to support said device face to face with said printing plate whereby the relative positions of the images on the registering device and printing plate can be observed visually, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering device can be placed in register.

2. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a transparent registering device bearing a master image, a holder for said registering device arranged to support said device in front of and close to said printing plate whereby the relative positions of the images on the registering device and printing plate can be seen through said registering device, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering device can be placed in register.

3. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device movably mounted to carry said registering device to and from a position face to face with said printing plate whereby the rela-

tive positions of the images on the registering device and printing plate can be observed visually, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering device can be placed in register.

4. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device arranged to support said device face to face with said printing plate whereby the relative positions of the images on the registering device and printing plate can be observed visually, means for adjusting said registering device holder to cause said device to bear flat against the face of the printing plate, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering device can be placed in register.

5. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device hinged to swing relatively to said plate holder for carrying said register device to and from a position face to face with said printing plate, whereby the relative positions of the images on the register device and printing plate can be observed visually, an adjustable hinge and stop for said hinged holder whereby the registering device is caused to bear flat against the face of the printing plate, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering device can be placed in register.

6. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, two dissimilar registering devices, holders for said registering devices movably mounted to place one or the other of said registering devices in a position face to face with said printing plate, and means for adjusting the printing plate on its holder for registering the printing plate with the facing registering device.

7. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, two dissimilar registering devices, hinged holders for said registering devices arranged to swing relatively to said printing plate holder for placing one or the other of said registering devices in a position face to face with said printing plate, and means for adjusting the printing plate on its hold-

er for registering the printing plate with the facing registering device.

8. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, two dissimilar registering devices, oppositely swinging holders for said registering devices adapted to place one or the other of said registering devices in a position face to face with said printing plate, and means for adjusting the printing plate on its holder for registering the printing plate with the facing register device.

9. In an apparatus of the character described the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device arranged to support said device face to face with said printing plate whereby the relative positions of the images on the registering device and printing plate can be observed visually, means for adjusting the printing plate on its holder whereby the images on the printing plate and registering device can be placed in register, and a scribing device mounted in definite relation to said printing plate holder and adapted to make register marks on said printing plate.

10. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device arranged to support said device face to face with said printing plate whereby the relative positions of the images on the registering device and printing plate can be observed visually, means for adjusting the printing plate on its holder whereby the images on the printing plate and registering device can be placed in register, a scribing device, and a holder for said scribing device movable to support the scribing device opposite the printing plate, said scribing device being movable on said holder over the face of the printing plate in a predetermined relation to the printing plate holder.

11. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a master image supported in definite relation to said printing plate holder, means for registering the image on the printing plate with said master image, and means mounted in definite relation to said printing plate holder for making index marks on the registered printing plate.

12. In an apparatus of the character de-

scribed, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, means for registering the image on the printing plate with a master image supported in definite relation to said printing plate holder, and a registering device mounted for movement in definite relation to said printing plate holder for registration with register marks on said printing plate.

13. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, means for registering the image on the printing plate with a device supported in definite relation to said printing plate holder, means mounted in definite relation to said printing plate holder for making index marks on the registered printing plate, and a registering device mounted for movement in definite relation to said printing plate holder for registration with the index marks on said printing plate.

14. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering sheet bearing a master image, a holder for said registering sheet arranged to support said sheet face to face with said printing plate whereby the relative positions of the images on the registering device and printing plate can be observed visually, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering sheet can be placed in register, said registering sheet holder being adjustable to suit registering sheets of different sizes.

15. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering sheet bearing a master image, a holder for said registering sheet arranged to support said sheet face to face with said printing plate whereby the relative positions of the images on the registering plate and printing plate can be observed visually, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering plate can be placed in register, said registering sheet holder comprising adjustable supporting bars, and attaching bars secured to the registering sheet and constructed to detachably engage with said supporting bars.

16. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master

image, a holder for said registering device movably mounted to carry said registering device to and from a position face to face with said printing plate whereby the relative positions of the images on the registering device and printing plate can be observed visually, means for adjusting said registering device to a predetermined position on its holder, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering device can be placed in register.

17. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering sheet bearing a master image, a holder for said registering sheet arranged to support said sheet face to face with said printing plate whereby the relative positions of the images on the registering plate and printing plate can be observed visually, and means for adjusting the printing plate on its holder whereby the images on the printing plate and registering plate can be placed in register, said registering sheet holder comprising adjustable supporting bars, attaching bars secured to the registering sheet and constructed to detachably engage with said supporting bars, and means for adjusting said attaching bars endwise on said supporting bars.

18. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device arranged to support said device face to face with said printing plate whereby the relative positions of the images on the registering device and printing plate can be observed visually, and means for adjusting the printing plate on its holder operable when the registering device holder is in position in front of said printing plate, whereby the images on the printing plate and registering device can be placed in register.

19. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device arranged to support said device face to face with said printing plate, whereby the relative positions of the images on the registering device and printing plate can be observed visually, means for relatively adjusting said printing plate and registering device to cause the same to occupy parallel positions, and means for adjusting the printing plate on its holder, whereby the images on the printing plate and registering device can be placed in register.

20. In an apparatus of the character described, the combination of a holder for a transparent printing plate, means for supporting said holder in a predetermined position, a registering device bearing a master image, a holder for said registering device arranged to support said device face to face with said printing plate, whereby the relative positions of the images on the registering device and printing plate can be observed visually, means for adjusting said registering device and printing plate relatively to and from one another and adjusting the same relatively to cause said printing plate and registering device to occupy parallel positions, and means for adjusting the printing plate on its holder, whereby the images on the printing plate and registering device can be placed in register. 15

Witness my hand this 8th day of October, 1920. 20

WILLIAM C. HUEBNER.