W. C. HUEBNER.

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

APPLICATION FILED JAN. 27, 1915.

1,291,897.

Patented Jan. 21, 1919.

4 SHEETS—SHEET 1.

Fig. 1.

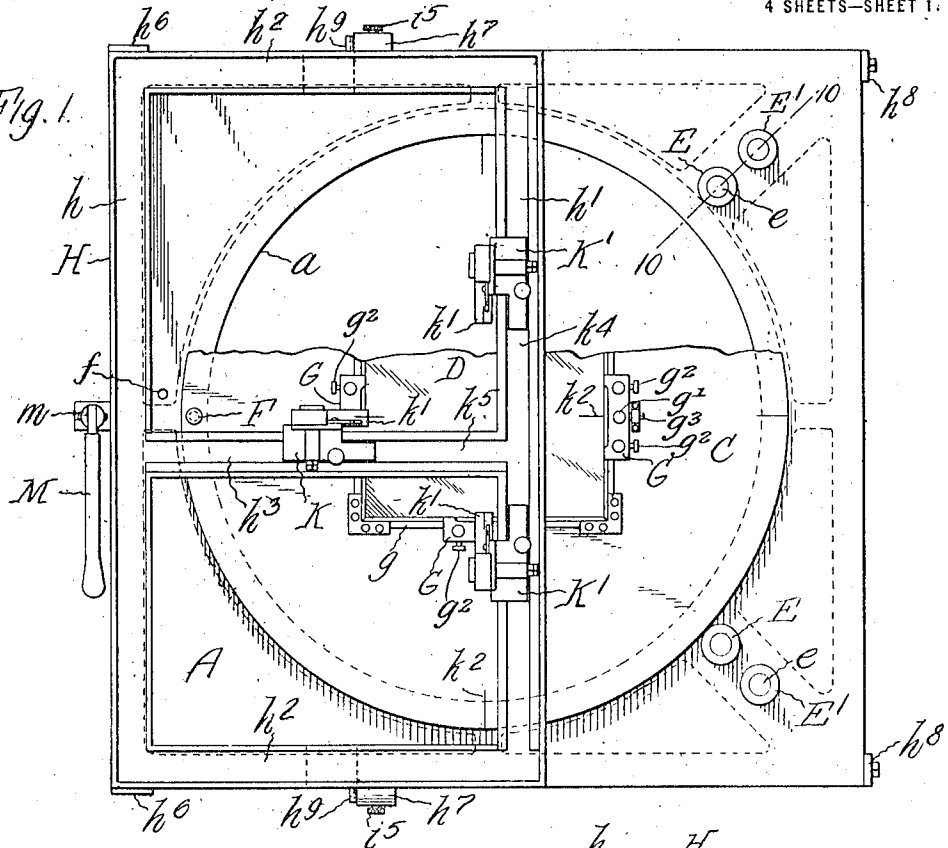
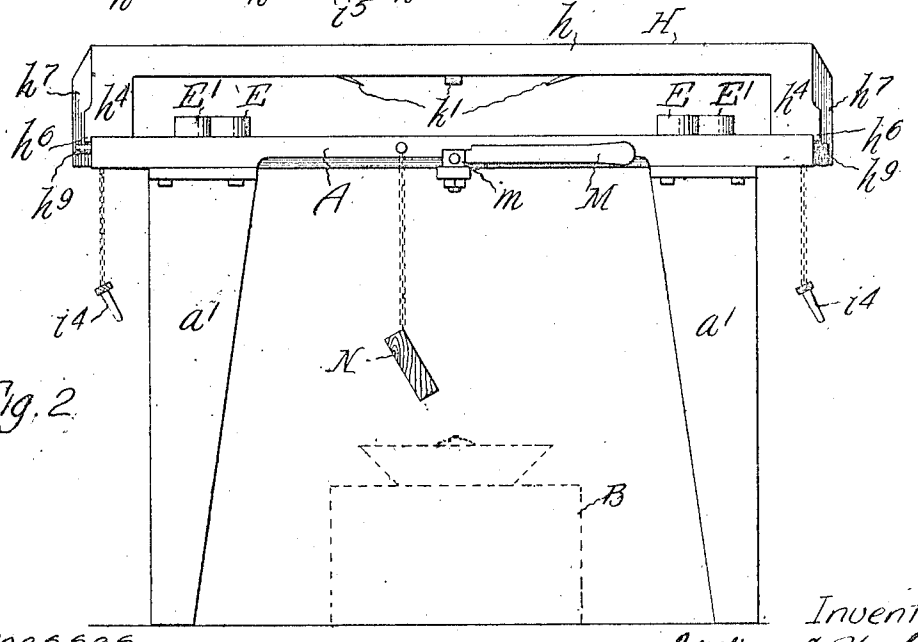


Fig. 2.



Witnesses.
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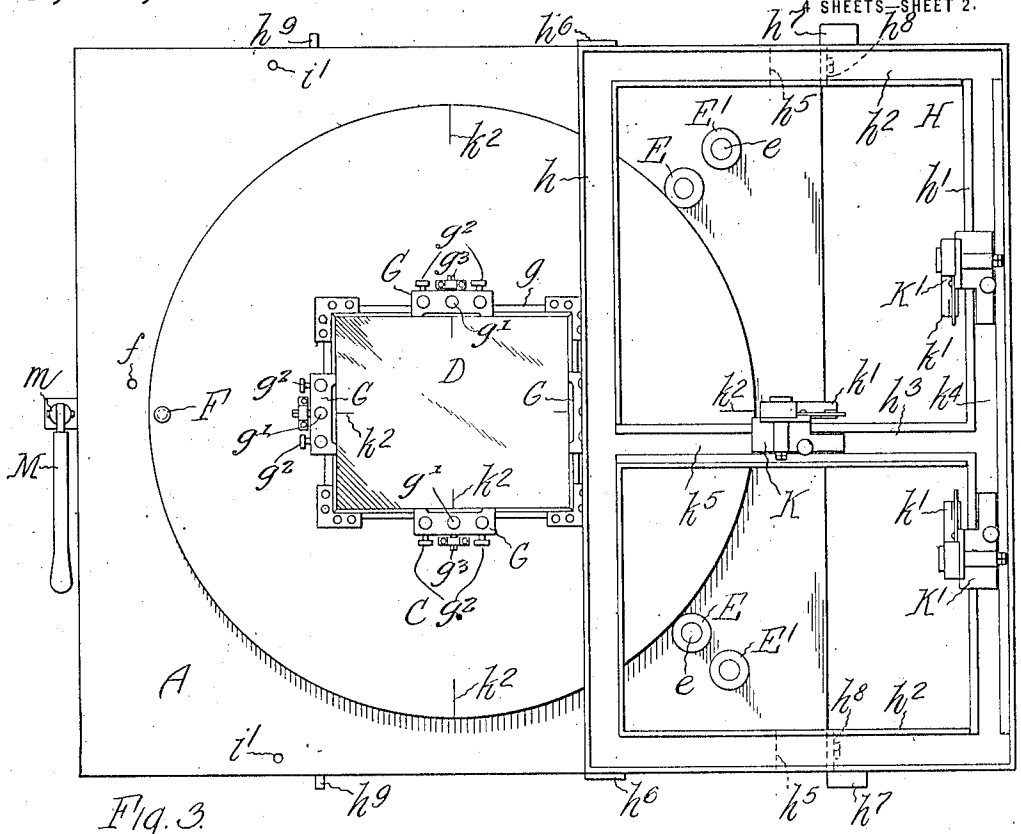


Fig. 3.

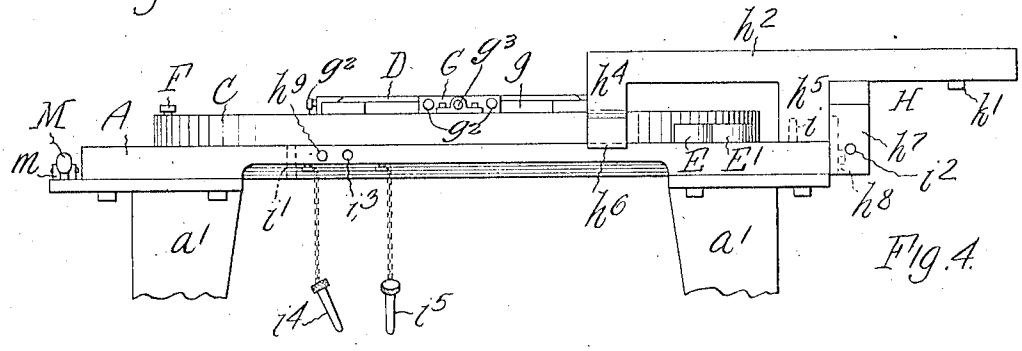


Fig. 4.

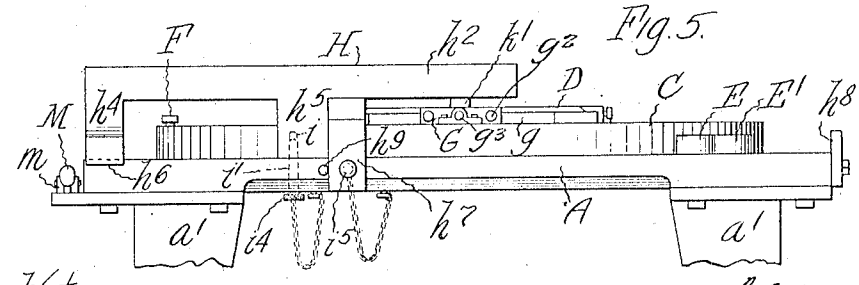


Fig. 5.

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4 SHEETS—SHEET 3.

Fig. 6.

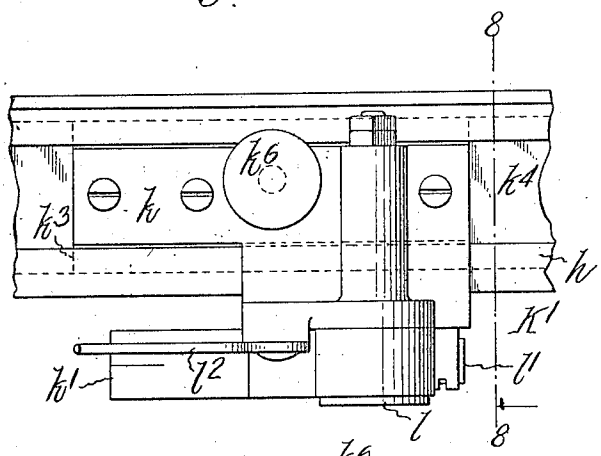
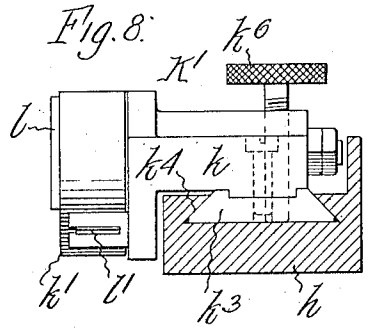


Fig. 8.



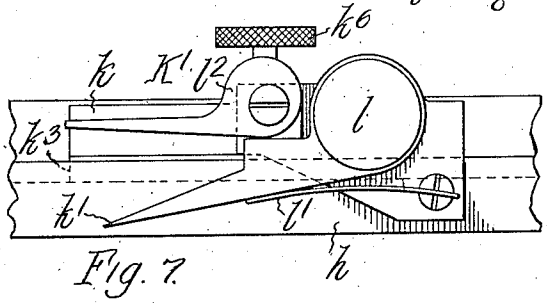
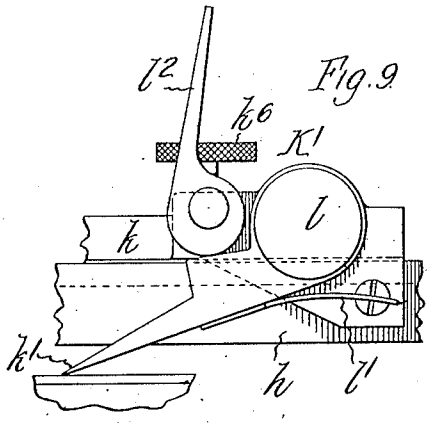


Fig. 7.

Fig. 9.



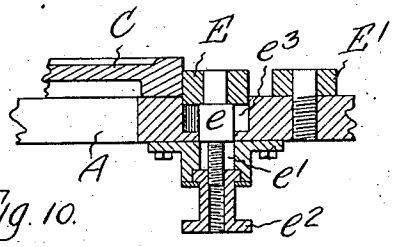


Fig. 10.

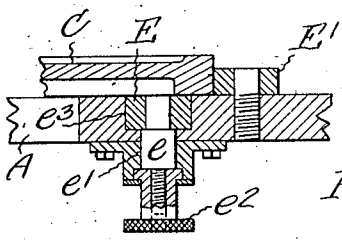


Fig. 11.

Fig. 12.

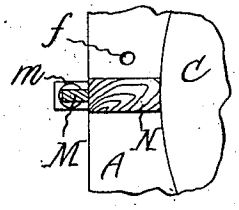
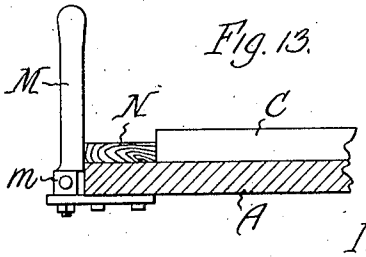


Fig. 13.



Witnesses.

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4 SHEETS—SHEET 4.

Fig. 14.

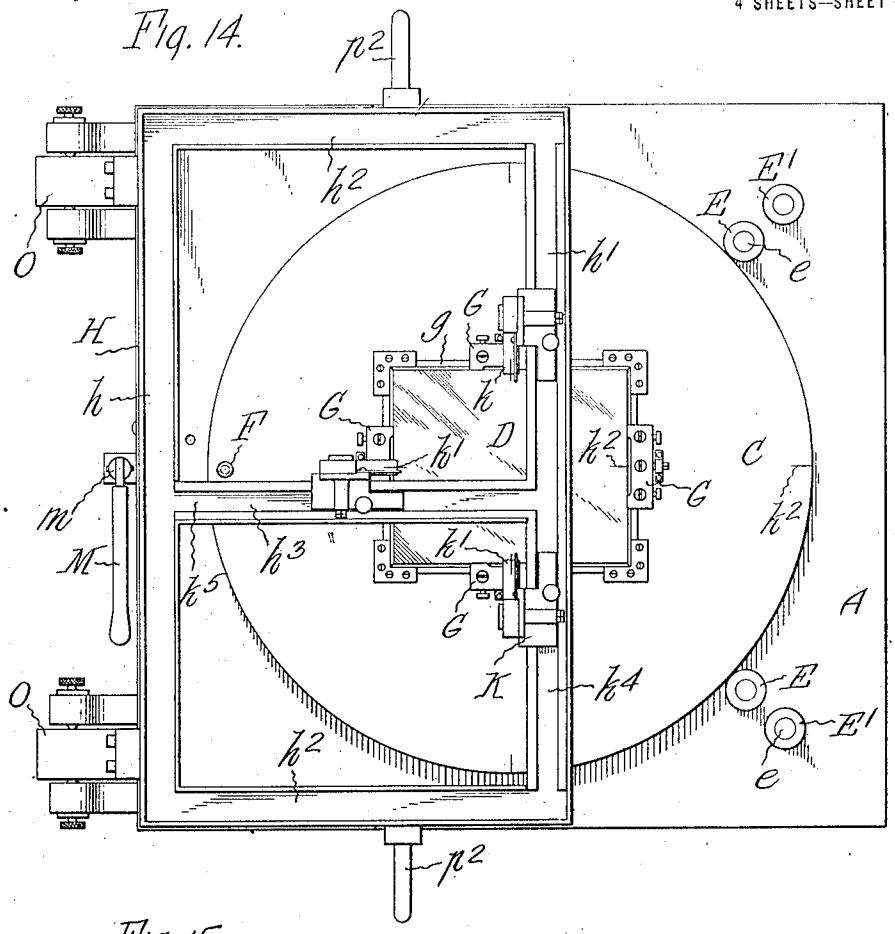
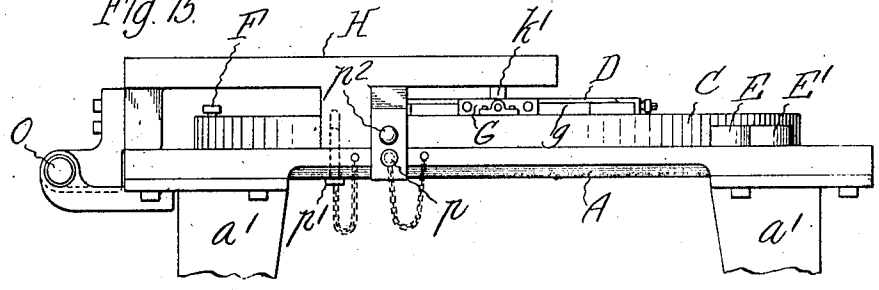


Fig. 15.



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UNITED STATES PATENT OFFICE.

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

1,291,897. Specification of Letters Patent. Patented Jan. 21, 1919.

Application filed January 27, 1915. Serial No. 4,653.

To all whom it may concern:

Be it known that 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 Apparatus, of which the following is a specification.

This invention relates to apparatus for use in connection with photographic printing apparatus, such, for example, as disclosed in my application for patent filed May 21, 1914, Serial No. 839,997, for the purpose of correctly positioning the transparent photographic printing plate or negative on the plate holder of the photographic printing apparatus. In the apparatus disclosed in said application the transparent printing plate is secured on a plate holder or disk which is removably supported in the printing apparatus so as to be placed in contact with a sensitized surface and illuminated for making photographic prints on said sensitized surface.

The object of this invention is to provide a desirable and practical apparatus whereby the transparent printing plate or negative can be readily positioned on the plate holder with great precision so as to be accurately centered and have the intended position on the plate holder when the plate holder is placed in the operative position in the photographic printing apparatus.

Briefly stated, the apparatus comprises a table or stand on which the holder for the transparent printing plate is adapted to be placed and retained in a predetermined position, a registering frame which preferably is movably mounted so that it can be placed in a position over the plate holder, parallel with the face of the printing plate, or moved to a position where it will be out of the way and will not prevent the ready placing of the plate holder on the table, and indicators or registering devices which are preferably adjustable at right angles to each other on said registering frame and adapted to cooperate with register marks on the transparent printing plate to indicate the correct positioning of the latter on the plate holder. The register marks on the transparent printing plate are located at suitable points on the face of the plate in the two diametrical lines thereof, or of the subject to be printed. The transparent printing plate can therefore be accurately positioned and centered on the plate holder by shifting it on the latter to a position in which the register marks on the transparent printing plate are in register with the adjustable registering devices on the movable frame of the apparatus.

In the accompanying drawings:

Figure 1 is a plan view of an apparatus embodying the invention, the plate holder being partly broken away.

Fig. 2 is an end eleva ion thereof.

Fig. 3 is a plan view of the apparatus, showing the registering frame moved out of its operative position.

Fig. 4 is a fragmentary side elevation thereof.

Fig. 5 is a fragmentary side elevation thereof showing the registering frame in the operative position.

Fig. 6 is a plan view, on an enlarged scale, of one of the registering devices.

Fig. 7 is a side elevation thereof.

Fig. 8 is a sectional elevation thereof on line 8—8, Fig. 6.

Fig. 9 is a side elevation similar to Fig. 7 but showing a different position of the parts.

Figs. 10 and 11 are sectional elevations in line 10—10, Fig. 1, showing respectively the raised and depressed positions of the positioning studs or rollers for the plate holder.

Fig. 12 is a plan view, partly in section, of the device for shifting the plate holder on the table.

Fig. 13 is a sectional elevation thereof.

Fig. 14 is a plan view of an apparatus showing another way of mounting the registering frame.

Fig. 15 is a fragmentary side elevation thereof.

The supporting stand or table for the transparent printing plate holder may be of any suitable construction, that shown consisting of a flat surface top plate A having a large central opening *a* for the passage of light and supported by corner legs *a'*. B represents a lamp or source of light

of any suitable sort located beneath the table for illuminating the transparent printing plate or negative.

C represents the holder on which the transparent printing plate D is secured. This holder C, which is hereinafter designated the "plate holder", is a portable plate or disk, preferably of circular form, provided with suitable means for securing the printing plate thereon over a central opening in the disk, and is adapted to be secured in the photographic printing apparatus for supporting the transparent printing plate in printing relation to the sensitized print receiving surface. The plate holder is adapted to be laid on the table A over the opening *a* thereof and secured in a predetermined position on the table by any suitable means. The means shown for this purpose comprise two pairs of rollers E and E′ which project upwardly from the surface of the table and against which the circular edge of the plate holder is adapted to be placed, and a pin F which is adapted to be inserted through a hole in the plate holder into a hole in the table top. By placing the plate holder on the table with its circular edge in contact with one pair of rollers E and turning the plate holder until the holes in the plate holder and table for the pin F are in register, the plate holder is centered with relation to the supporting stand or table and it is secured by inserting the pin F in its holes. The table is preferably provided with two pairs of the positioning rollers E and E′ located at different distances from the center thereof for centering plate holders of different diameters. When the apparatus is used in connection with a large plate holder, the inner set of rollers E is lowered to or below the top surface of the table so that the plate holder can be laid on the table in contact with the outer set of rollers E′ and shifted and secured as before explained. As shown in Figs. 10 and 11, each of the two inner rollers E is for this purpose journaled on the upper end of a stud *e* adapted to slide vertically in a guide opening *e′* in the table top and provided with a screwthreaded stem engaged by a thumb nut e^2 for raising and lowering the roller. Fig. 10 shows the inner roller elevated for use in conjunction with a small plate holder, and Fig. 11 shows the roller depressed into a recess e^3 in the table top to permit a larger plate holder to be laid flat on the table against the outer set of rollers E′. A second hole *f* is shown in the table top in Figs. 1 and 3 for the insertion of the pin F when securing a large plate against the outer set of rollers E′. Means of other construction could be employed for securing the plate holder in proper position on the table.

The means for securing the printing plate or negative on the plate holder C may be of any suitable sort adapted to permit the printing plate to be shifted sufficiently on the plate holder to enable it to be centered and turned in the plane of the plate accurately to a definite angular relation to the plate holder. As shown, the plate holder is provided with a glass or transparent supporting plate *g* stationarily secured over the central opening therein and on which the transparent printing plate is held by clamps or holding devices G. Each of these holding devices comprises a bar or member which is adapted to bear against the beveled edge of the negative or printing plate and is adapted to be moved angularly on a pivot *g′* by means of adjusting screws g^2 to allow the angular adjustment of the printing plate, and can also be moved relative to the edge of the printing plate by a screw g^3 for properly gripping and securing the latter. Clamps or holders suitable for the purpose are fully described in said application hereinbefore mentioned.

H represents the movable registering frame for supporting the registering devices over the plate holder on the table. In the construction shown in Figs. 1–5, this frame, which is rectangular and composed of side bars *h h′* connected by end bars h^2 and an intermediate bar h^3, is arranged horizontally over the table A, on which it is adapted to slide from an operative position over the plate holder, as shown in Figs. 1 and 5, to a position, shown in Figs. 3 and 4, where it is out of the way at one end of the table so as to enable the plate holder to be readily placed in position on the table. Legs h^4 h^5 on the registering frame slidably support it on the table, and it is guided in its sliding movements by flanges h^6 on the legs h^4 and feet h^7 on the legs h^5 extending down at the opposite side edges of the table. The outward and inward movements of the frame are arrested respectively by the engagement of the legs h^5 with projecting stops h^8 at one end of the table and with stop pins h^9 which project from the side edges of the table. In order to hold the registering frame rigid in its operative horizontal position over the table and insure of it always occupying exactly the same position relative to the table, the legs h^5 are provided with holes *i* adapted to register with vertical holes *i′* in the table, and the feet h^7 are provided with horizontal holes i^2 adapted to register with holes i^3 in the edges of the table. By passing pins i^4 i^5 through these registering vertical and horizontal holes, the registering frame is accurately positioned with reference to the table and is rigidly held in position against both horizontal and vertical movements. The stop pins h^9 serve to arrest the registering frame when the holes *i* and i^2 in the legs h^5 are substantially in register with the holes *i′*

and i^3, and the insertion of the pins i^4 i^5, which are preferably slightly tapered, brings the registering frame exactly to and holds it rigidly in the intended position. The pins i^4 i^5 shown are attached to the table by chains which prevent the misplacement of the pins.

Any other suitable means could be employed for rigidly securing the registering frame in operative position over the table.

The registering frame could also be mounted in various other ways to permit it to be moved to and from an operative position over the plate holder. Another arrangement is described hereinafter.

K represents a registering or indicating device arranged to slide horizontally on the bar h^3 of the registering frame in one direction, for instance longitudinally of the table, and K′ is a similar device arranged to slide on the bar h' of the registering frame in a direction transversely of the frame or at right angles to the direction of movement of the registering device K. Preferably two of the transversely movable devices K′ are provided, located at opposite sides of the longitudinal center of the frame and movable toward and from each other on a common line. The three registering devices shown are alike and each comprises a slide or carriage k which can be constructed and slidably mounted on the frame H in any suitable way, and a finger or index k' which is adapted to move close to the surface of the transparent printing plate and is provided at its end with a mark adapted to register with the register marks k^2 on the printing plate and plate holder. The slide has a dove-tailed guide block k^3, see Fig. 8, which is confined and guided in one of the dove-tailed guide grooves k^4 k^5 in the frame bars h' or h^3, and is provided with a hand screw k^6 for securing the registering device in adjusted positions. The guide grooves extend in directions at right angles to each other. The finger or index k' is preferably pivoted on one side of the slide k by a stud or bolt l, or otherwise, so that its free end can be lowered so as to bear on or lie close to the surface of the printing plate or can be raised high enough to prevent contact of the finger with the printing plate or plate holder in the operation of the apparatus. The free end of the finger is preferably reduced to a thin edge to insure a more exact registration of its mark with the mark on the printing plate. A spring l' secured to the slide k and engaging the finger k' is shown for normally holding the finger in its raised position, and a cam lever l^2 pivoted on the slide and engaging the finger is shown for lowering the finger against the lifting action of its spring.

The index fingers are so positioned on the registering frame that when the latter is secured in its operative horizontal position over the table, the register mark on the finger of the registering device K will register with the longitudinal diameter of the plate holder while the register marks of the other registering devices K′ will register with the transverse diameter of the plate holder, and when either of the registering devices is slid on its guide the mark on the finger of said device will follow the direction of the diameter with which it registers. By adjusting the registering devices on the frame H so that the free ends of the fingers k' rest on or lie close to the surface of the transparent printing plate and adjacent to the register marks k^2 thereon and then shifting or adjusting the printing plate in the plate holder until the marks k^2 thereon register accurately with the coöperating marks on the fingers, the printing plate will be centered and positioned properly with reference to the plate holder C.

M represents a lever which is pivoted on a swiveled fulcrum piece m at the far edge of the table A from the positioning rollers E for shoving the plate holder C on the table into engagement with the rollers E. By raising the lever M to an upright position, as shown in Fig. 13, and placing a block N of wood or other suitable material between the lever M and the adjacent edge of the plate holder and forcing the free end of the lever inwardly, the plate holder, which is heavy, can be easily shoved over against the rollers E. The block N is preferably attached to the table by a chain to prevent its being misplaced and is made of such dimensions that when placed lengthwise, as shown in Fig. 12, it is suitable for use with a small plate holder, and when placed sidewise it is suitable for use with a larger plate holder. The lever and block can be used or not as preferred, or other suitable means could be employed for shoving the plate holder on the table.

Figs. 14 and 15 show a construction like that above described except that the registering frame H′ is hinged by hinges O of any suitable construction to one end of the table so that it can be swung from the operative horizontal position over the plate holder on the table, as shown in Fig. 14, to a position in which it hangs down out of the way at the end of the table. The registering frame in this construction is held stationary in its operative position, as in the other construction, by horizontal pins p and vertical pins p' which are placed in registering holes in the table and the supporting legs of the registering frame. p^2 represents handles on the ends of the frame for swinging it. The registering frame could be movably mounted and secured in operative position in still other ways.

It is believed that the manner of using the apparatus will be understood from the foregoing description. Since the plate holder C when placed on the table in contact with the rollers E and secured by the pin F, is held stationary in a definite position relative to the table, and since the registering frame H when secured in its operative position by means of the pins i^4 i^5 also is held stationary in a definite relation to the table, it will be apparent that if the printing plate D is shifted either bodily or turned on the plate holder until its register marks are placed in line with the registering devices, the plate will occupy a predetermined position on the plate holder. The clamps or holding devices G are slightly adjustable on the plate holder both bodily toward and from the edges of the printing plate and also so as to tilt or pivot slightly, so that by adjusting these clamps or holding devices it is possible to shift the printing plate D either bodily in directions at right angles to each other or rotatably in the plane of the plate, sufficiently to bring the register marks on the plate in line with the registering devices K K'. When the printing plate is thus positioned on the plate holder its register marks k^2 will be in line with registering marks on the plate holder, and when the plate holder is placed in the photographic printing machine in the proper position, determined by registering the register marks on the plate holder with suitable indicating marks on the part of the machine which supports the plate holder, then the printing plate D will necessarily be in proper printing position in the printing apparatus.

I claim as my invention:

1. The combination of a support, means for securing a plate holder bearing a printing plate in predetermined position on said support, a frame which is supported by said support in an operative position over said plate holder, and registering devices slidably mounted on said frame to move respectively in directions extending at right angles to each other substantially parallel with the plane of the face of the printing plate and having parts with which register-marks on the printing plate are adapted to be placed in registration to enable the printing plate to be placed accurately in a predetermined position on the plate holder.

2. The combination of a table, a plate holder bearing a printing plate provided with register-marks, means for holding the plate holder in a predetermined position on the table, a supporting frame for registering devices, means for securing said frame in operative position over the plate holder, and registering devices mounted to slide on said frame respectively in directions extending at right angles to each other substantially parallel with the plane of the face of the printing plate, and adapted to be placed in register with the register-marks on the printing plate to enable the printing plate to be placed accurately in a predetermined position on the plate holder.

3. The combination of a table, a plate holder provided with means for adjustably securing a printing plate thereon, means for holding said plate holder in a predetermined position on the table, a supporting frame which is provided with guides extended at right angles to each other, and registering devices arranged to move along said guides respectively in directions extending at right angles to each other substantially parallel with the plane of the face of the printing plate and having index parts located at the sides of said guides and adapted to register with register-marks on the printing plate to enable the printing plate to be placed accurately in a predetermined position on the plate holder.

4. The combination of a table, a plate holder provided with means for securing a printing plate thereon, means for holding said plate holder in a predetermined position on the table, a supporting frame which is provided with guides extending at right angles to each other, registering devices comprising slides movable along said guides respectively in directions extending at right angles to each other substantially parallel with the plane of the face of the printing plate, and members on said slides in position to register with register-marks on the printing plate to enable the printing plate to be placed accurately in a predetermined position on the plate holder, said members being mounted to move toward and from the surface of the printing plate.

5. The combination of a table, a plate holder provided with means for securing a printing plate thereon, means for holding said plate holder in a predetermined position on the table, a supporting frame which is provided with guides extending at right angles to each other, registering devices comprising slides movable along said guides respectively in directions extending at right angles to each other substantially parallel with the plane of the face of the printing plate, and fingers pivoted on said slides at the sides of said guides to swing toward and from the surface of the printing plate to register with register-marks on the printing plate to enable the printing plate to be placed accurately in a predetermined position on the plate-holder.

6. The combination of a table, a plate holder provided with means for securing a printing plate thereon, means for holding said plate holder in a predetermined position on the table, a supporting frame which is provided with guides extending at right

angles to each other, registering devices comprising slides movable along said guides respectively in directions extending at right angles to each other substantially parallel with the plane of the face of the printing plate, members on said slides in position to register with register-marks on the printing plate to enable the printing plate to be placed accurately in a predetermined position on the plate holder, said members being movably mounted on said slides, and means for moving said members toward and from the surface of the printing plate.

7. The combination of a table, a plate holder provided with means for securing a printing plate thereon, means for holding said plate holder in a predetermined position on the table, a supporting frame which is provided with guides extending at right angles to each other, registering devices comprising slides movable along said guides respectively in directions extending at right angles to each other substantially parallel with the plane of the face of the printing plate, fingers on said slides in position to register with register-marks on the printing plate to enable the printing plate to be placed accurately in a predetermined position on the plate holder, said fingers being movably mounted on said slides, springs for normally holding said fingers off the printing plate, and means for moving said fingers toward the surface of the printing plate.

8. The combination of a table, a plate holder provided with means for securing thereon a printing plate provided with register-marks, means for holding said plate-holder in a predetermined position on the table, a supporting frame which is arranged on said table to move to and from an operative position over the plate holder, means for holding said frame stationary in place, and registering devices slidably mounted on said frame to move respectively in directions extending at right angles to each other substantially parallel with the plane of the face of the printing plate and adapted to be placed in register with the register-marks on the printing plate to enable the printing plate to be placed accurately in a predetermined position on the plate holder.

9. The combination of a table, a circular plate holder provided with registering holes and with means for securing a printing plate thereon, positioning stops on the table against which the edge of said plate holder is adapted to bear, a pin adapted to be placed in the registering holes in the plate holder and table for securing the plate holder, a frame arranged over the plate holder, and registering devices movable on said frame along diametrical lines of said plate holder.

10. The combination of a table, a plate holder provided with means for securing a printing plate thereon, a plurality of pairs of positioning stops on the table against one pair of which the edge of the plate holder is adapted to bear, one of said pairs of stops being adapted to be lowered to the plane of the table to permit the plate holder to bear against the other pair of stops, and means for securing the plate holder against one or another pair of said stops.

11. The combination of a table, a plate holder provided with means for securing a printing plate thereon, positioning stops on the table against which the edge of the plate holder is adapted to bear, a block adapted to be placed against the edge of said plate holder, and a lever fulcrumed on the table and adapted to work against said block for shoving the plate holder against said stops.

12. The combination of a plate holder having a light opening therethrough and a printing plate secured on the said holder in register with said opening, a support for holding said holder in position, a registering device, means whereby a relative movement may be effected between the registering device and said holder for removably locating said registering device adjacent the face of the printing plate in predetermined relation to said plate holder, and means for adjusting the printing plate on the holder to cause a part of the printing plate to register with said registering device whereby the printing plate can be adjusted accurately to a predetermined position on the plate holder.

13. The combination of a plate holder having a light opening therethrough and a printing plate secured on said holder in register with said opening, a support for holding said holder in position, a registering device, a carrier for said registering device movably mounted to carry said registering device to and from an operative position adjacent to the face of the printing plate and in predetermined relation to said plate holder, and means for adjusting the printing plate on the holder to cause a part of the printing plate to register with said registering device whereby the printing plate can be adjusted accurately to a predetermined position on the plate holder.

14. The combination of a plate holder having a light opening therethrough and a printing plate secured on said holder in register with said opening, a support for holding said holder in position, a registering device, a carrier for said registering device movably mounted to carry said registering device to and from an operative position adjacent the face of the printing plate and in predetermined relation to said plate holder, said registering device being adjustable on said carrier in a definite direc-

tion substantially parallel with the face of the printing plate, and means for adjusting the printing plate on the holder to cause a part of the printing plate to register with said registering device whereby the printing plate can be adjusted accurately to a predetermined position on the plate holder.

Witness my hand, this 22nd day of January, 1915.

WILLIAM C. HUEBNER.

Witnesses:
C. W. PARKER,
C. B. HORNBECK.