

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.
 12 SHEETS—SHEET 1.

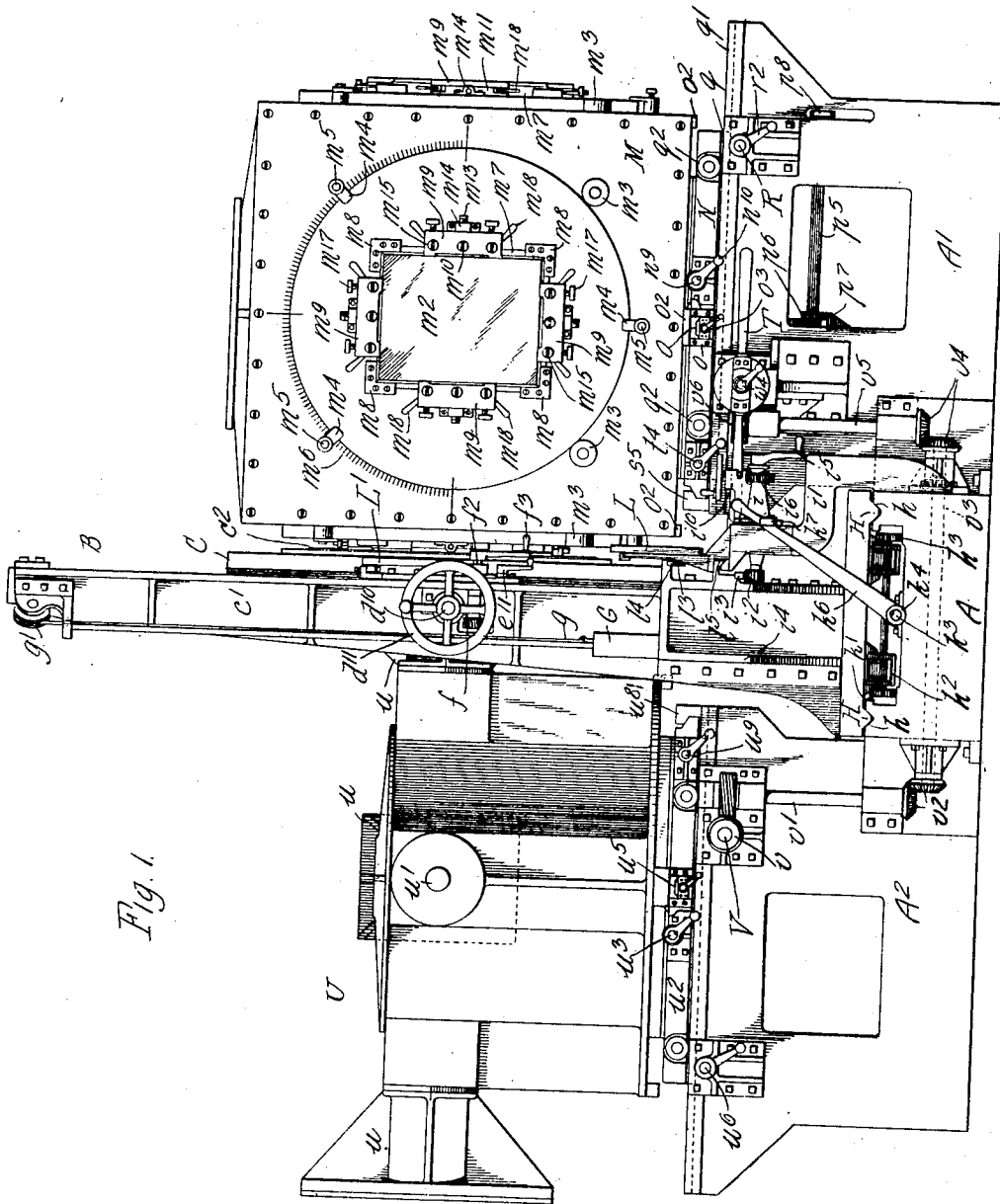


Fig. 1.

Witnesses
 A. G. Diamond.
 Richard Sommer

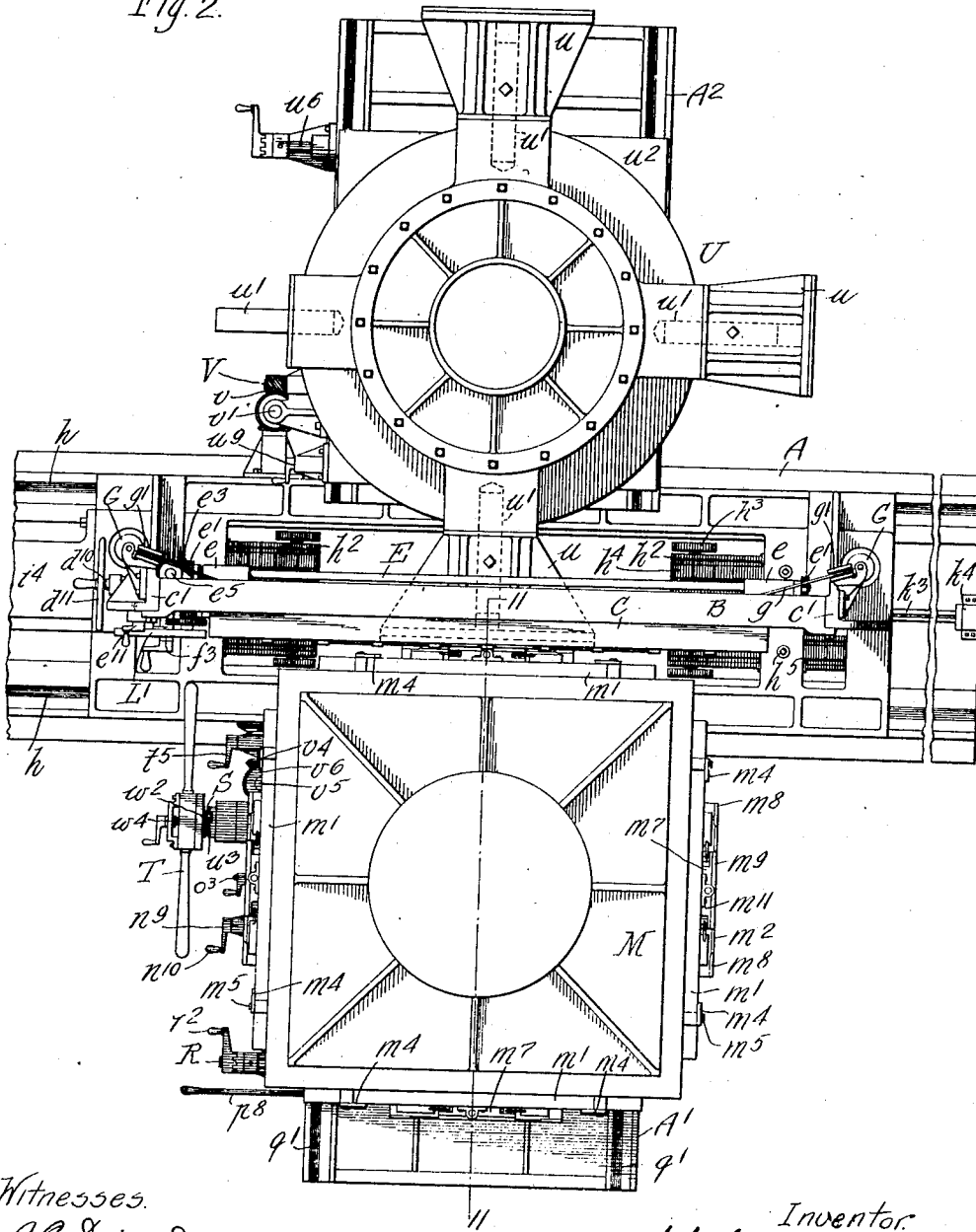
Inventor.
 William C. Huebner
 by Wilhelm Parker
 Attorneys.

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.
 12 SHEETS—SHEET 2.

Fig. 2.



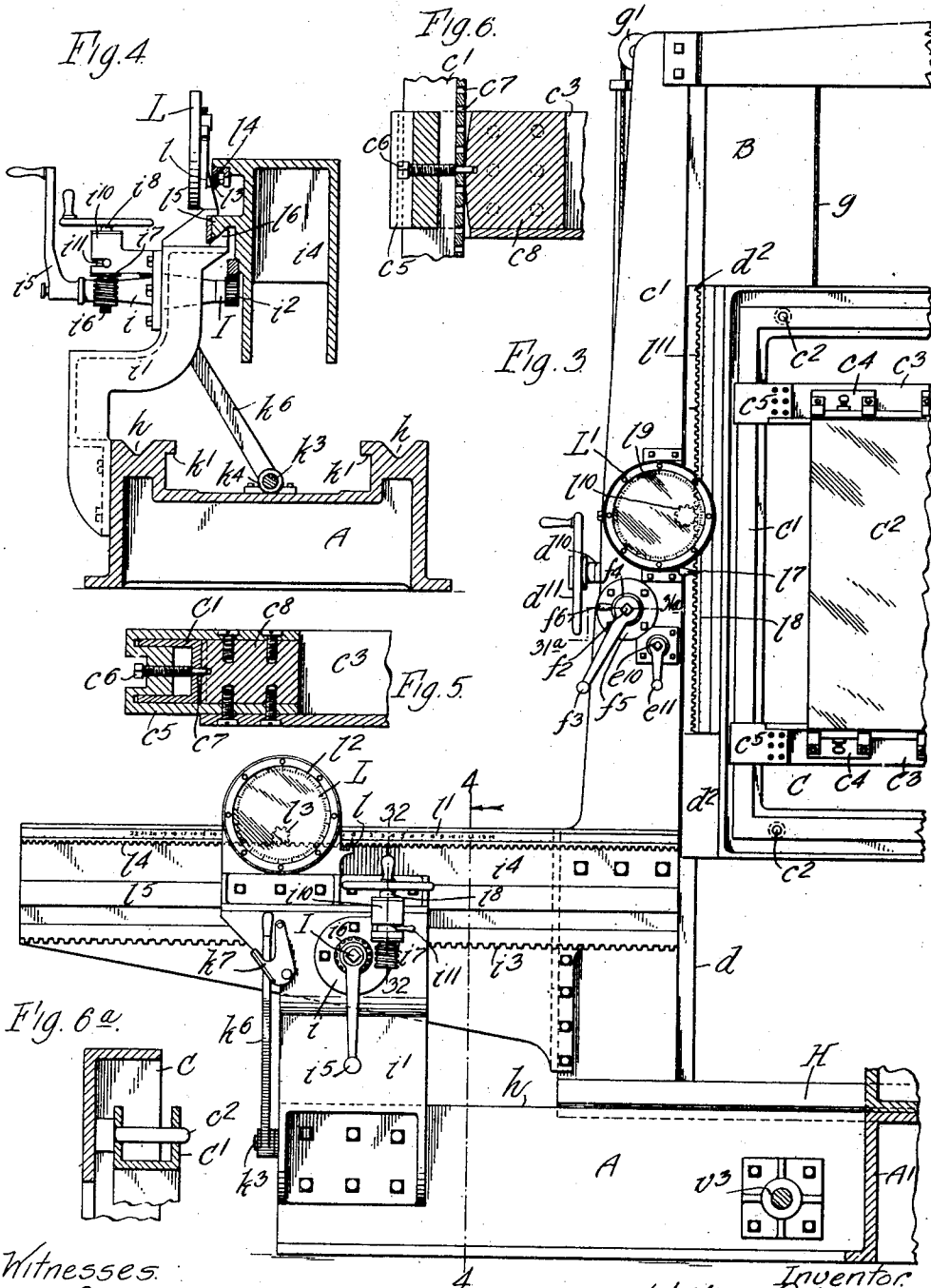
Witnesses.
 A. P. Driscoll.
 Richard Sommer

Inventor.
 William C. Huebner
 by *Wilhelm & Partner*
 Attorneys.

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.
 12 SHEETS—SHEET 3.



Witnesses
 A. F. Diamond
 Richard Sommer

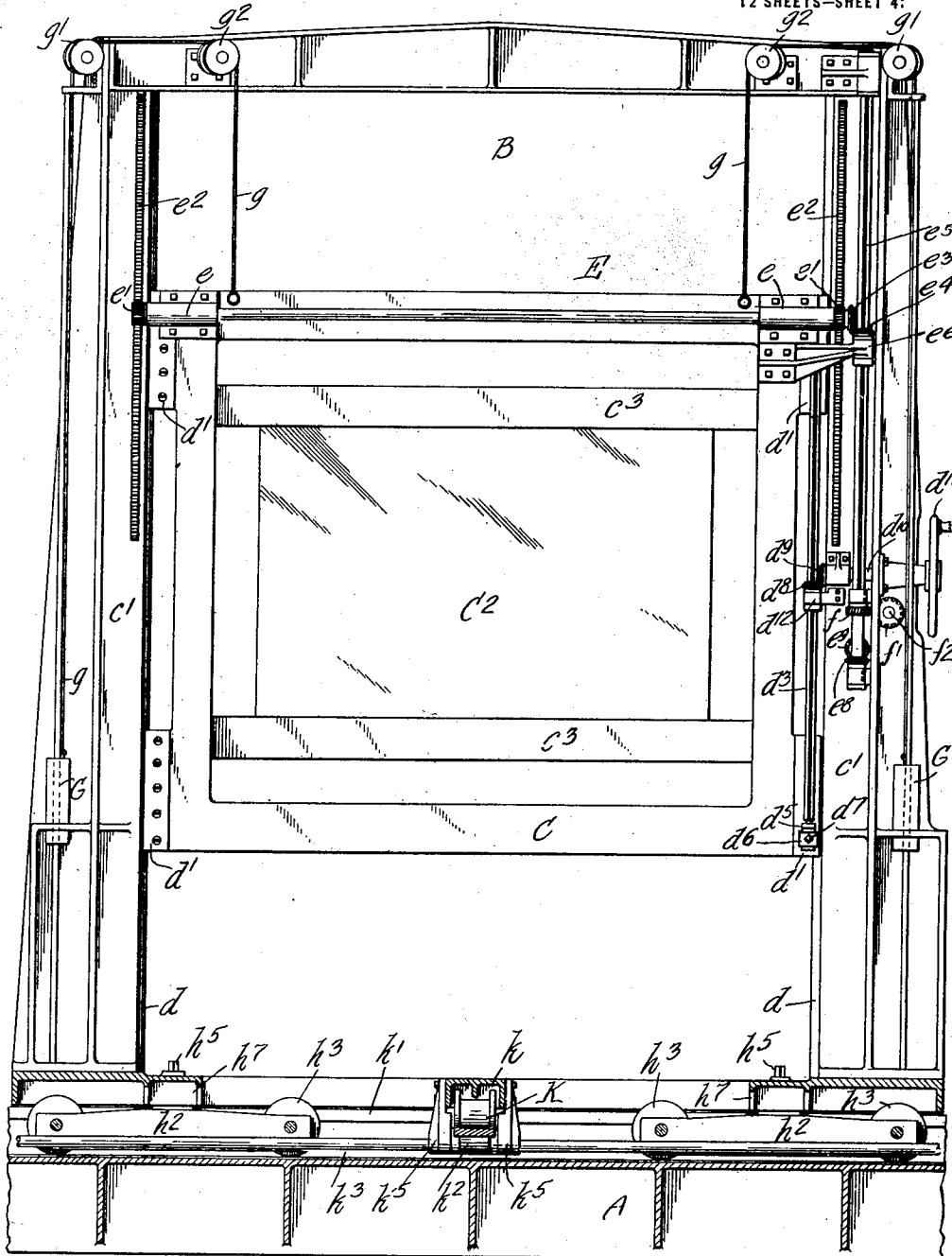
Inventor
 William C. Huebner
 By Wilhelm Parker
 Attorneys

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.

12 SHEETS—SHEET 4:



Witnesses.
 A. G. Diamond.
 Richard Sommer

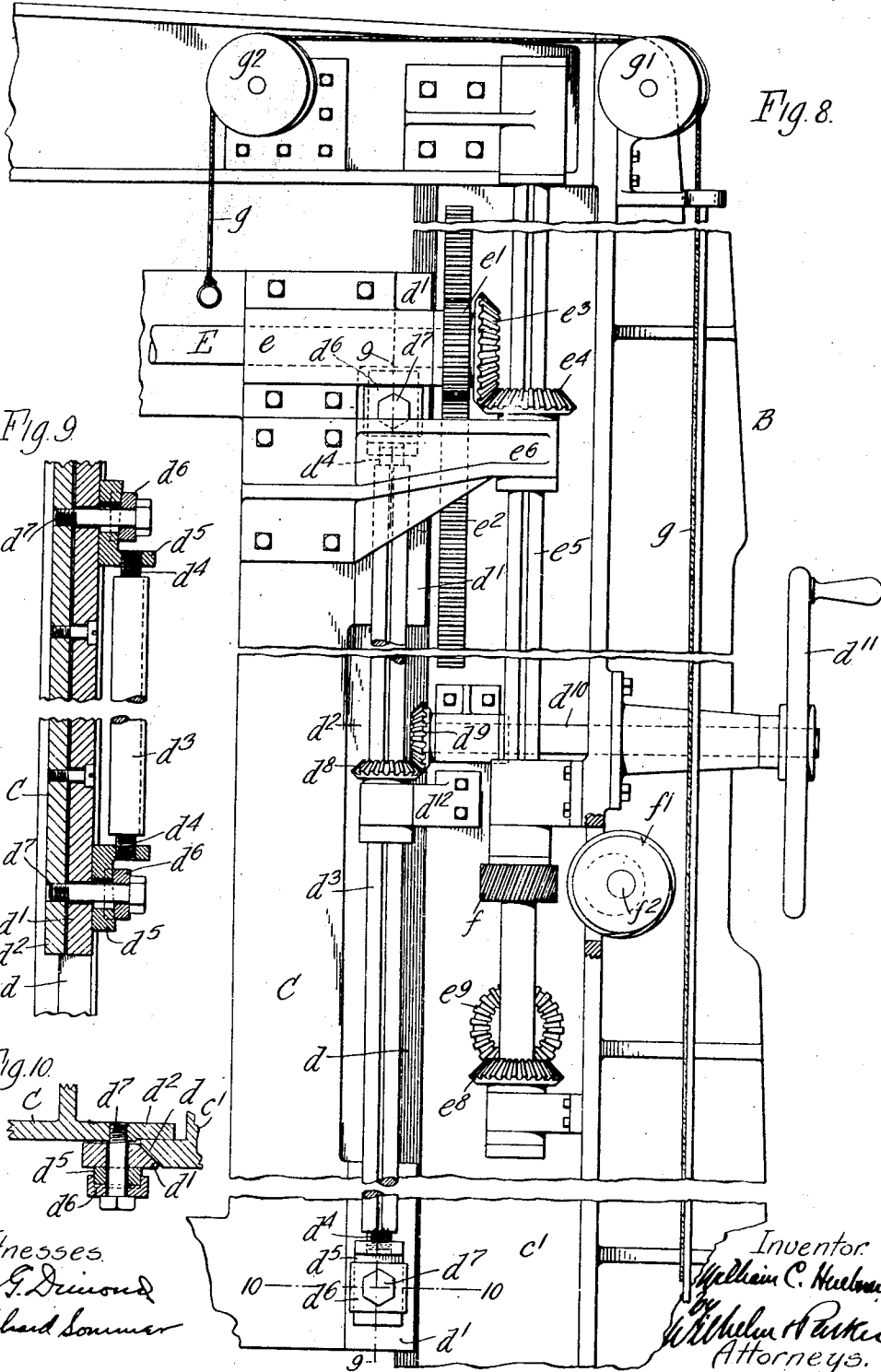
Fig. 7

Inventor.
 William C. Huebner,
 by Wilhelm F. Parker
 Attorneys

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.
 12 SHEETS—SHEET 5.



W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.

12 SHEETS—SHEET 6.

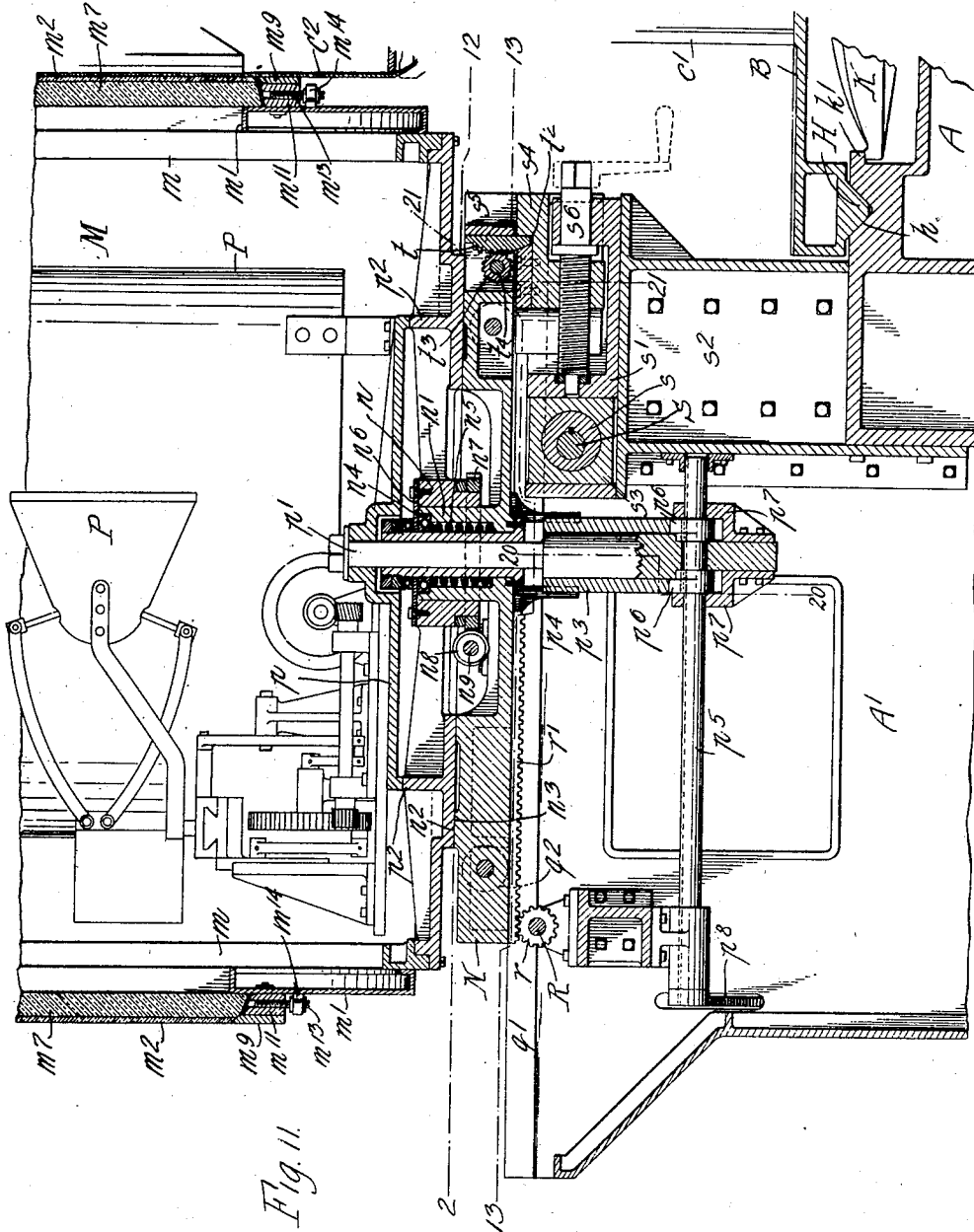


Fig. 11.

Witnesses
 A. P. Diamond.
 Richard Sommer

Inventor.
 William C. Huebner
 By Wilhelm A. Parker
 Attorneys.

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.
 12 SHEETS—SHEET 7.

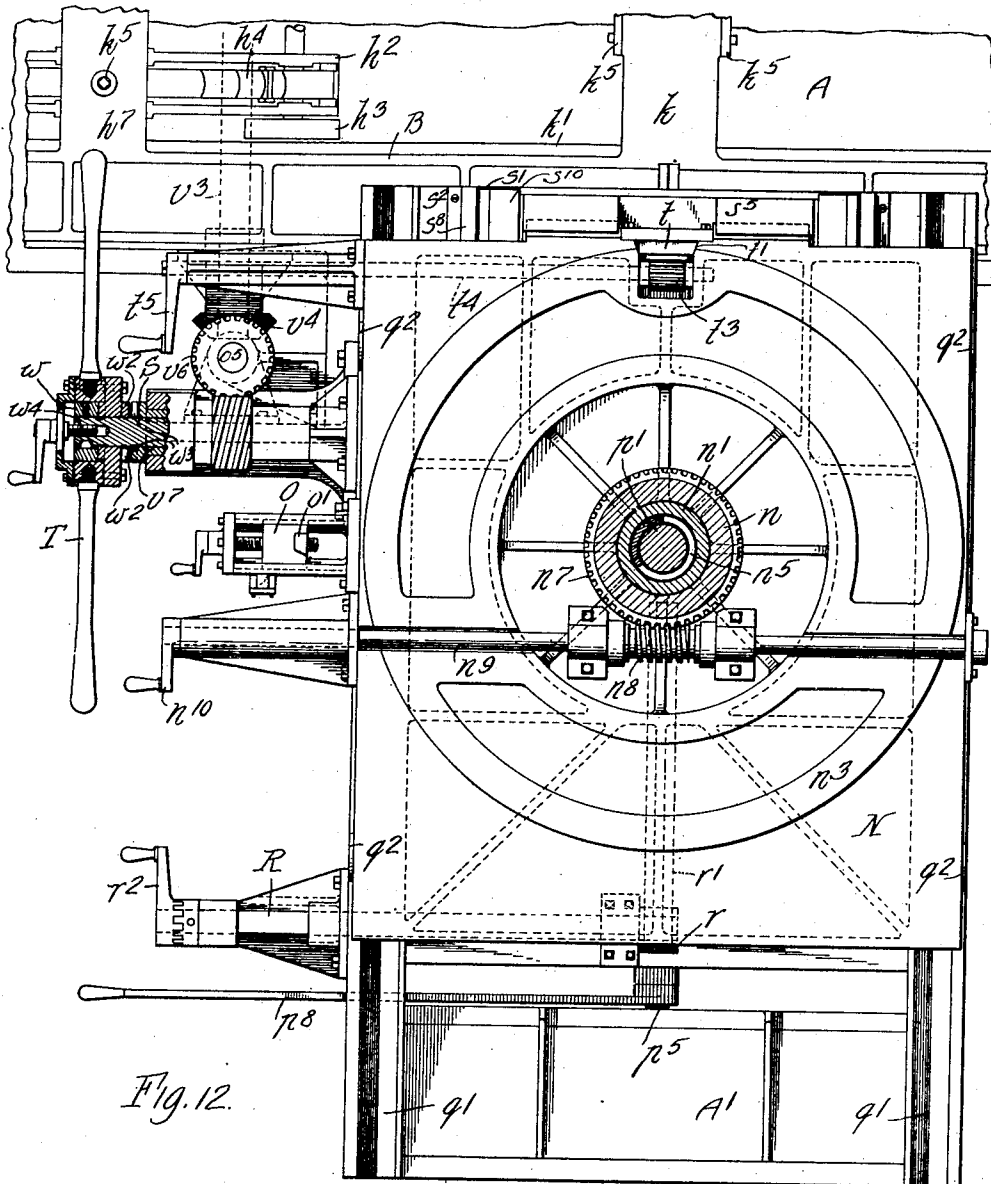


Fig. 12.

Witnesses:
A. G. Demond
Richard Sommer

Inventor:
William C. Huebner
 by *Wilhelm Pauer*,
 Attorneys.

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.

12 SHEETS—SHEET 8.

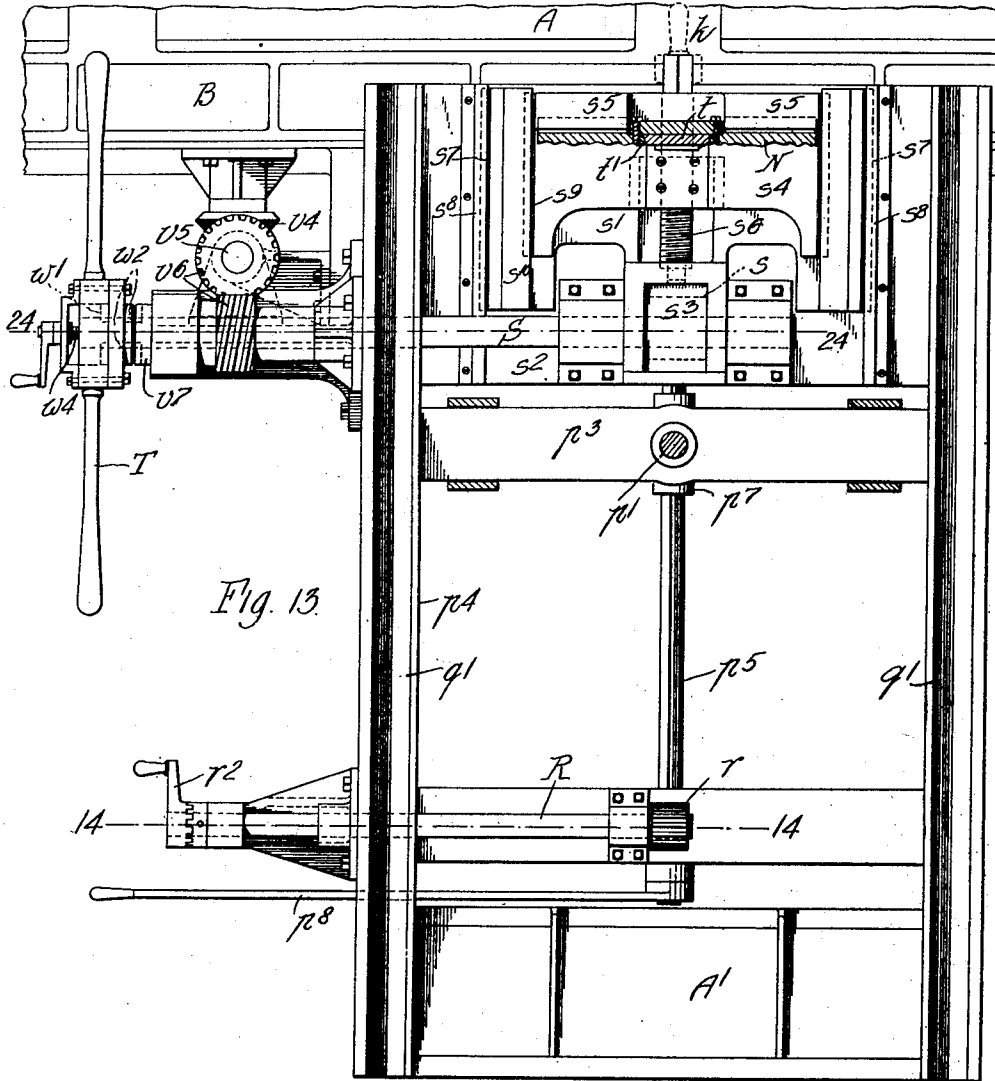


Fig. 13.

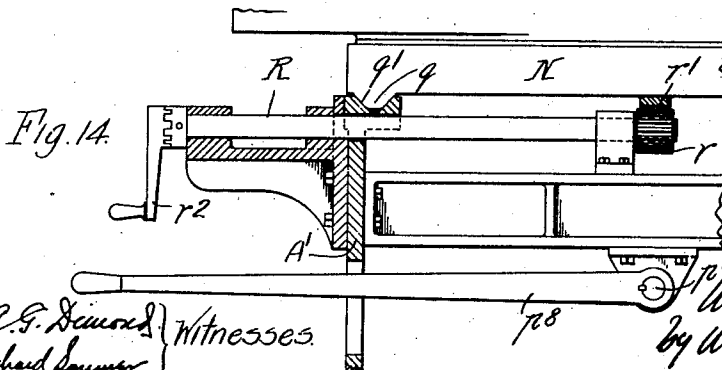


Fig. 14.

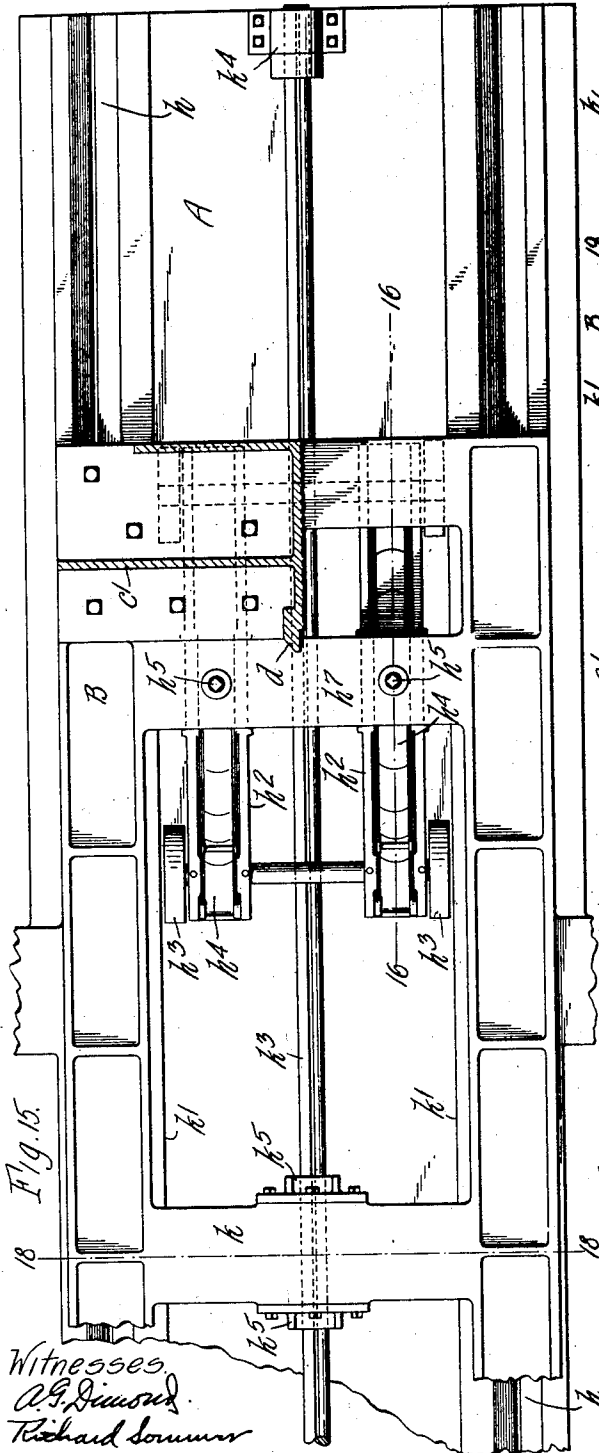
A. G. Simon }
 Richard Simon } Witnesses

Inventor:
 William C. Huebner,
 by William F. Foster,
 Attorneys.

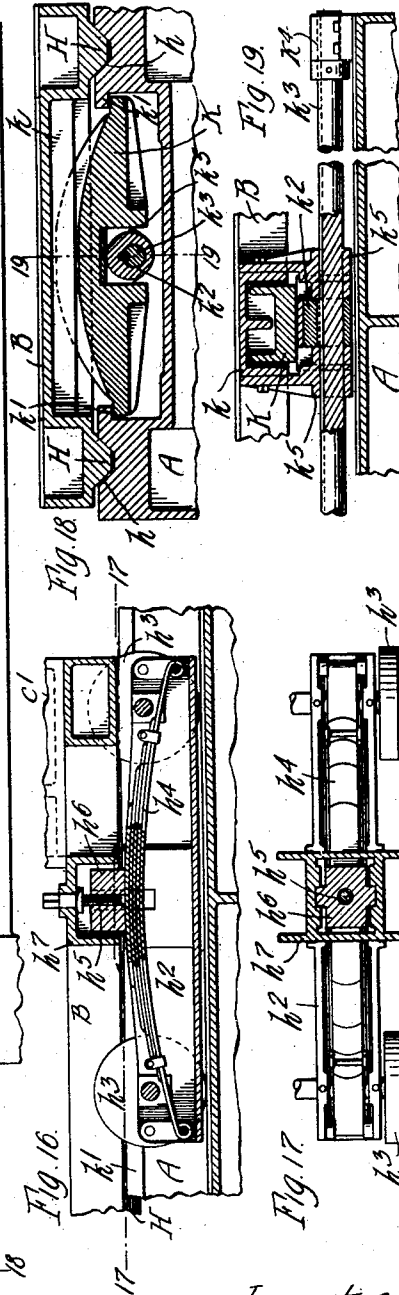
W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.
 12 SHEETS—SHEET 9.



Witnesses
 A. G. Diamond
 Richard Sommer



Inventor,
 William C. Huebner
 by Wilhelm Ficker,
 Attorneys.

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.
 12 SHEETS—SHEET 10.

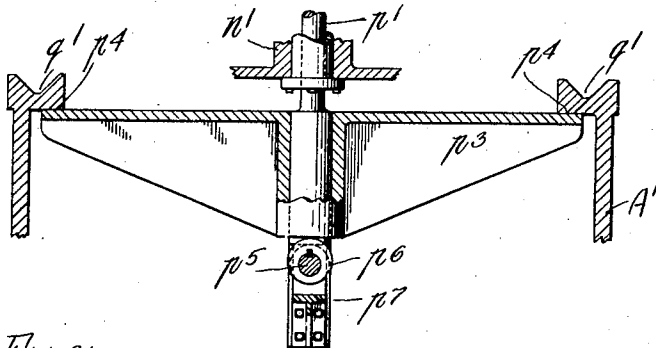


Fig. 20

Fig. 21

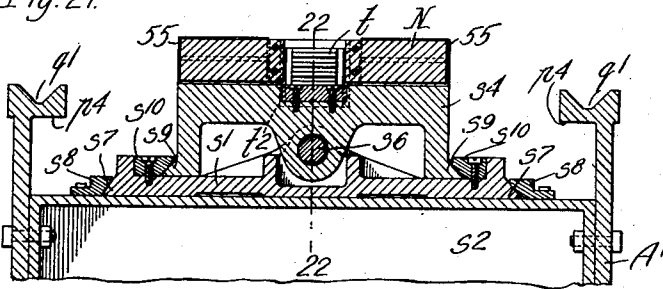


Fig. 25

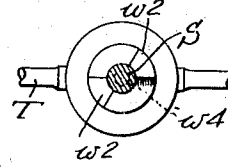


Fig. 22

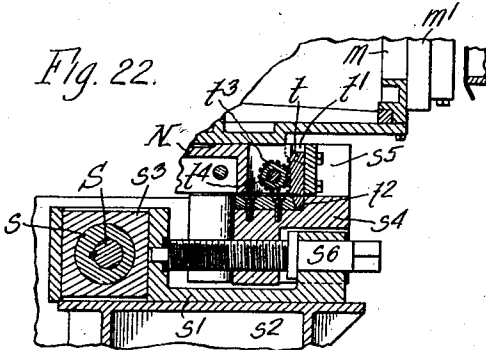


Fig. 23

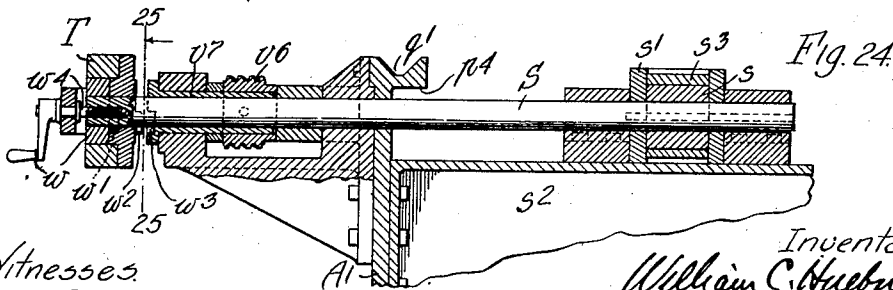
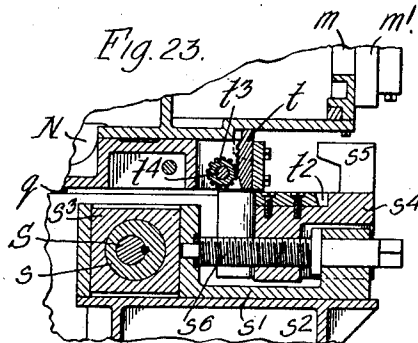


Fig. 24

Witnesses
 A. F. Diamond
 Richard Sommer

Inventor:
 William C. Huebner,
 By Wilhelm Parker
 Attorneys.

W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.
 12 SHEETS—SHEET 11.

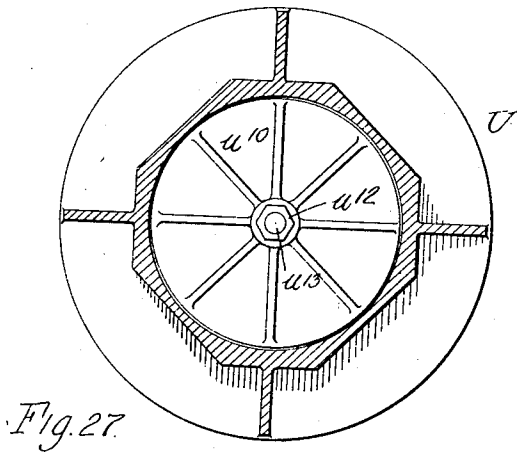
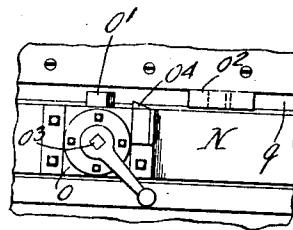
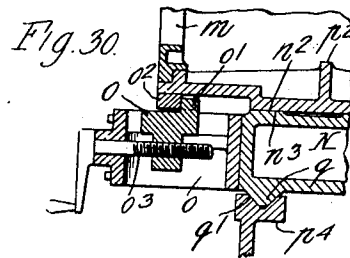
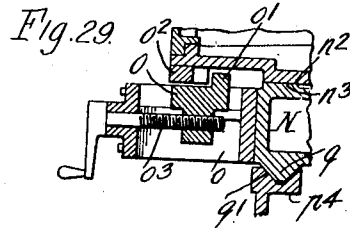
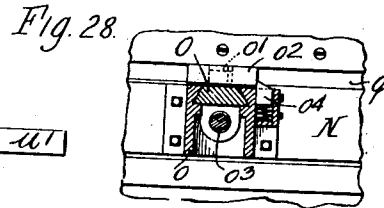
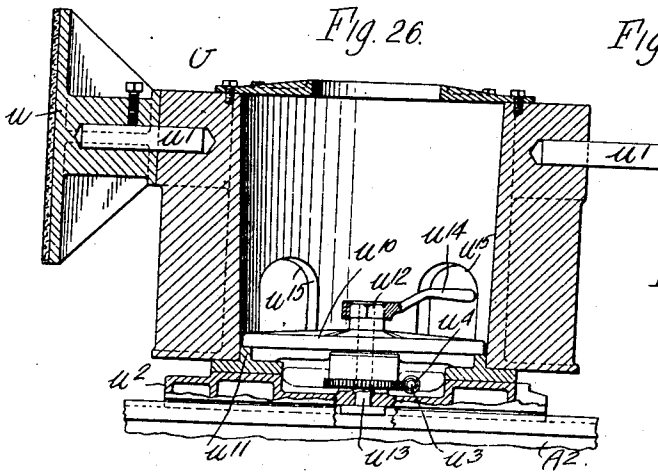
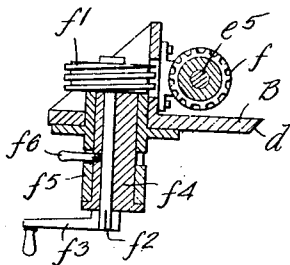


Fig. 31a.



Witnesses.
 A. F. Diamond.
 Richard Sommer.

Inventor.
 William C. Huebner
 by Wilhelm & Parker
 Attorneys.

W. C. HUEBNER.
PHOTOGRAPHIC PRINTING APPARATUS.
APPLICATION FILED MAY 21, 1914.

1,201,048.

Patented Oct. 10, 1916.

12 SHEETS—SHEET 12.

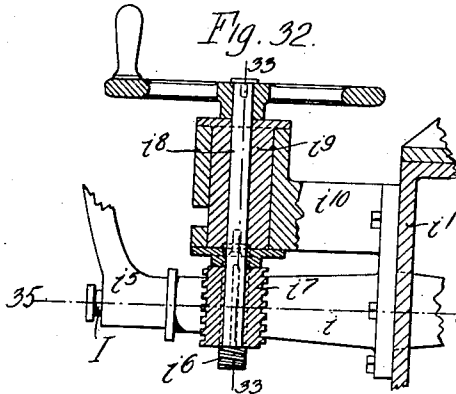


Fig. 33.

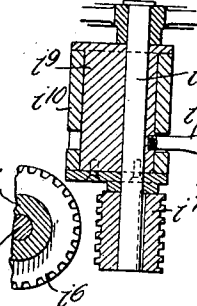


Fig. 34.

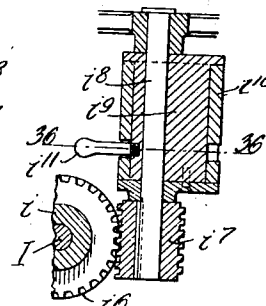


Fig. 35.

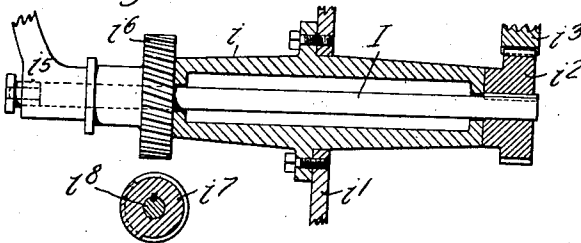


Fig. 36.

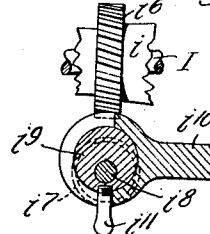


Fig. 37.

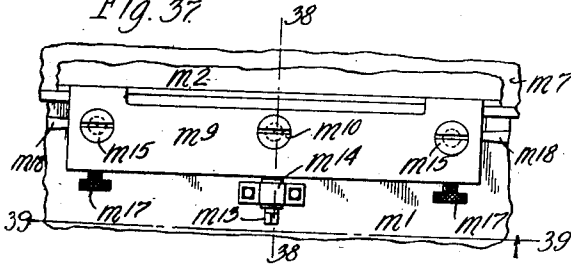


Fig. 38.

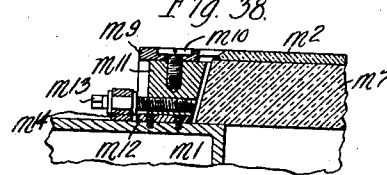


Fig. 40.

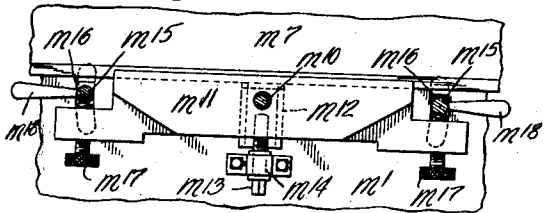


Fig. 39.

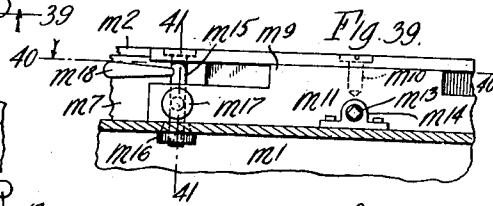
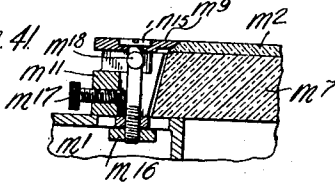


Fig. 41.



Witnesses
A. E. Diamond.
Richard Sommer

Inventor.
William C. Huebner
By Wilhelm F. Parker
Attorney's.

UNITED STATES PATENT OFFICE.

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

PHOTOGRAPHIC-PRINTING APPARATUS.

1,201,048.

Specification of Letters Patent.

Patented Oct. 10, 1916.

Application filed May 21, 1914. Serial No. 839,997.

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 Photographic-Printing Apparatus, of which the following is a specification.

This invention relates to apparatus for producing photographic prints upon sensitized surfaces of plates of metal or other material, or lithographic stones which are afterward finished in any suitable manner for printing in one or more colors.

More particularly the invention relates to improvements in apparatus of the type disclosed in Patents 954,291 and 954,292, granted to myself and George Bleistein April 5, 1910, which are intended for producing photographically upon a sensitized surface any desired number of like or different prints in any desired positions and relative arrangement. Such apparatus are adapted, for instance, for repeating like prints upon a single sensitized plate or stone which is afterward used for printing a plurality of impressions and for composing purposes where it is desired to place different subjects in a specified arrangement on the printed sheet or sheets. The apparatus are also adapted for preparing plates or stones for multi-color printing where it is necessary to make the prints in exact register on the different plates or stones that are used for printing the different colors.

Briefly stated, the apparatus comprises a holder or support which holds the sensitized plate, stone or other part in a vertical position, a light chamber arranged in front of the sensitized part on which a transparent photographic printing plate is mounted for producing the photographic print upon the sensitized surface, and a back support or pressure device which is pressed against the rear side of the sensitized part opposite the light chamber for holding the sensitized surface in close and uniform contact with the transparent printing plate. The light chamber and pressure device are movable toward and from each other into and out of contact with the sensitized part, and the holder for the sensitized part is adjustable parallel with the plane of the sensitized surface both horizontally and vertically between the light chamber and back support for placing any

desired portion of the sensitized surface opposite to the transparent printing plate to receive the print.

The improved apparatus of this application is similar in these general respects to said prior patented apparatus but differs therefrom in various respects. The light chamber is provided on different sides thereof with a plurality of holders for transparent printing plates, and the light chamber in addition to being movable toward and from the sensitized surface, is swiveled so that it can be turned to place any one of the several printing plates thereon opposite to the sensitized surface. It is thus possible to mount several printing plates on the light chamber and quickly and easily bring one plate after another into position for printing therefrom. This construction also makes it possible to remove one of the holders from the light chamber and secure a printing plate thereon while the machine is being used for printing from another plate, thereby saving much time and making it much more convenient to properly adjust the printing plates on the holders. The back support or pressure device is likewise rotatably mounted and is provided with a plurality of pressure heads or members which may be of different sizes or shapes, or differently adjusted to suit the different printing plates on the light chamber. The apparatus furthermore differs from the prior patented apparatus in the construction and arrangement of the various parts thereof and in the provision of improved mechanisms for adjusting and manipulating the plate holder, light chamber and back support, as herein-after described.

In the accompanying drawings, consisting of twelve sheets: Figure 1 is a side elevation of a photographic printing apparatus embodying the invention. Fig. 2 is a plan view thereof, partly broken away. Fig. 3 is a front elevation, partly in section, on an enlarged scale, of that end of the apparatus which is not shown in Fig. 2. Fig. 4 is a transverse sectional elevation thereof in line 4-4, Fig. 3. Figs 5 and 6 are respectively fragmentary horizontal and vertical sections, enlarged, of the sensitized plate holder. Fig. 6^a is a fragmentary transverse section, enlarged, of the sensitized plate holder. Fig. 7 is a fragmentary rear elevation, partly in section, showing the sensi-

tized plate holder and carriage. Fig. 8 is a similar view, on a larger scale, of the same parts. Fig. 9 is a sectional elevation in line 9—9, Fig. 8. Fig. 10 is a section in line 10—10, Fig. 8. Fig. 11 is a fragmentary sectional elevation of the apparatus in line 11—11, Fig. 2. Fig. 12 is a plan view thereof, partly in section in line 12—12, Fig. 11. Fig. 13 is a plan view thereof partly in section in line 13—13, Fig. 11. Fig. 14 is a sectional elevation in line 14—14, Fig. 13. Fig. 15 is a fragmentary plan view partly in section, of the sensitized plate holder carriage and its supporting means. Fig. 16 is a sectional elevation in line 16—16, Fig. 15. Fig. 17 is a sectional plan in line 17—17, Fig. 16. Fig. 18 is a sectional elevation in line 18—18, Fig. 15. Fig. 19 is a sectional elevation in line 19—19, Fig. 18. Fig. 20 is a sectional elevation in line 20—20, Fig. 11, showing the clamping device for the light chamber. Fig. 21 is a sectional elevation in line 21—21, Fig. 11, of the actuating and stop mechanism for the light chamber. Figs. 22 and 23 are sectional elevations thereof in line 22—22, Fig. 21, showing different positions of the parts. Fig. 24 is a sectional elevation in line 24—24, Fig. 13. Fig. 25 is a sectional elevation in line 25—25, Fig. 24. Fig. 26 is a sectional elevation of the back support. Fig. 27 is a sectional plan thereof. Fig. 28 is a transverse sectional elevation of the lock for holding the light chamber from turning. Fig. 29 is a longitudinal sectional elevation thereof, showing the released position thereof. Fig. 30 is a similar view thereof, showing the same in holding position. Fig. 31 is an end elevation thereof. Fig. 31^a is a fragmentary horizontal section on line 31^a—31^a, Fig. 3, of the adjusting mechanism for the plate holder. Fig. 32 is a sectional elevation, on an enlarged scale, in line 32—32, Fig. 3, of the adjusting mechanism for the sensitized plate holder carriage. Figs. 33 and 34 are sections in line 33—33, Fig. 32, showing the inoperative and operative positions of the fine adjusting worm gearing. Fig. 35 is a sectional plan in line 35—35, Fig. 32. Fig. 36 is a sectional elevation in line 36—36, Fig. 34. Fig. 37 is a front elevation of one of the clamps for the photographic printing plate. Fig. 38 is a section thereof in line 38—38, Fig. 37. Fig. 39 is a sectional plan view thereof in line 39—39, Fig. 37. Fig. 40 is an elevation thereof in line 40—40, Fig. 39. Fig. 41 is a sectional elevation thereof in line 41—41, Fig. 40.

The stationary main frame of the apparatus may be of any suitable construction. The frame shown comprises a low horizontal central portion A on which a carriage which supports the sensitized plate or part is movable horizontally, and forwardly and rearwardly extending wings or portions

A' and A² on which the light chamber and the back support are mounted to move toward and from the sensitized part.

B represents an upright frame or carriage which is mounted to move horizontally, longitudinally of the apparatus, on the central portion A of the main frame and supports a holder on which the sensitized plate or part is secured and which is adjustable vertically in the carriage B. The plate holder, see Figs. 3, 7 and 8, preferably comprises an adjustable rectangular frame C which is arranged to slide vertically on the upright sides c' of the carriage B, and a rectangular frame or holder C' on which the sensitized plate or part is secured and which is removably held on the adjustable frame C preferably by pins c², Figs. 3 and 6^a, which project forwardly from the adjustable frame C into holes on the removable holder C'. This construction enables a sensitized plate or part to be secured on one holder C' while prints are being made on another sensitized plate or part in another holder in the apparatus. The holder in the apparatus can then be quickly removed and replaced by the other one, thus permitting the rapid operation of the apparatus. The removable holder C' shown is intended for use with a thin metal plate or sheet C² having a sensitized surface and is therefore provided with upper and lower horizontal clamp bars c³ carrying suitable clamps c⁴ for securing and stretching the sensitized plate. The clamp bars are adjustable toward and from each other on the holder C' to accommodate plates of different sizes. Each of the clamp bars c³ shown is provided at its ends with straps c⁵, Figs. 5 and 6, which embrace and are adapted to slide on the side bars of the holder C', and the clamp bar is adjustably held on the holder C' by screws c⁶ on the ends of the straps c⁵ adapted to enter perforations c⁷ in the side bars of the holder C'. The inner ends of the screws c⁶ preferably extend through the perforations c⁷ into holes in blocks c⁸ fixed to the ends of the clamp bar for the purpose of supporting the inner ends of the screws and relieving the same from undue strain. The clamps c⁴ may be of any suitable construction adapted to grip the edges of the sensitized plate and stretch the same on the clamp bars of the holder C'. The removable holder C' can of course be provided with securing means of any construction that may be necessary, depending upon the kind of sensitized part which is used. When a lithographic stone is used it can be held in place between the clamp bars c³.

The plate holder is preferably guided in its vertical movement on the carriage B by beveled guide ribs d on the upright sides of the carriage which extend between guide flanges d' d² on the holder frame C at the

upper and lower portions of its opposite ends thereof. The flanges d' at one end of the holder are adapted to be forced against the guide rib for gripping the guide rib d between the guide flanges to lock the frame in any position to which it may be adjusted. The means shown for this purpose comprise a shaft d^3 , Figs. 8 and 9, which is provided with oppositely screwthreaded end portions d^4 working in screwthreaded holes in wedges d^5 . These wedges are arranged to slide between the movable guide flanges d' and confining plates d^6 which are secured to the fixed flanges d^2 by screws d^7 passing through holes in the confining plate, wedges and movable flanges. By turning the shaft the two wedges are drawn toward each other, and acting against the inclined faces of the confining plates, force the movable guide flanges against the guide rib d so as to grip the rib between the fixed and movable guide flanges and thus lock the plate holder. It is only necessary to provide the locking means at one end of the plate holder, since when the beveled faced guide flanges d' are forced against the beveled guide rib the guide flanges at the opposite end of the plate holder will be pressed firmly against the cooperating guide rib, thereby binding the plate holder at each end thereof. For turning the shaft d^3 to operate the locking wedges it is preferably connected by bevel pinions d^8 and d^9 to a shaft d^{10} which is suitably journaled on the carriage and is provided at its outer end with a wheel or handle d^{11} for turning it. The beveled pinion d^8 is journaled and held from endwise movement in a suitable bearing d^{12} on the carriage and is splined to the shaft d^3 . The shaft is thus adapted to move with the plate holder in the vertical adjustments thereof but can be turned by the rotation of the hand wheel d^{11} in any adjustment of the plate holder. Other suitable means for locking the plate holder after it is adjusted could be used.

The plate holder is adjusted vertically in the carriage, in the construction shown, by a horizontal shaft E which is journaled in bearings e on the upper end of the plate holder frame C and is provided at opposite ends with pinions e^1 which mesh with toothed racks e^2 on the rear faces of the upright sides of the carriage B. The shaft E is connected by beveled pinions e^3 e^4 to an upright shaft e^5 suitably journaled on the carriage B. The pinion e^4 is splined to the shaft e^5 and is held from endwise movement in a bearing e^6 on the plate holder frame C, so that the pinion will turn with the shaft but can slide thereon in the vertical movements of the plate holder in the carriage.

In order to enable a fine or precise adjustment of the plate holder on the carriage and yet permit of the same being effected rapidly, separate operating devices for the shaft

e^5 are preferably provided, one for producing a quick, coarse adjustment, and the other a fine or exact adjustment of the plate holder. For the coarse adjustment, the shaft e^5 is connected by beveled pinions e^8 and e^9 , Figs. 7 and 8, to an operating shaft e^{10} which is journaled on the carriage B and extends to the front side thereof where it is provided with a handle e^{11} , Figs. 1 and 3, for turning it. By turning this handle the shaft e^5 can be turned to move the plate holder quickly to approximately the desired position. The shaft e^5 is also provided with a worm gear f , Figs. 7 and 8, with which a worm f' is adapted to mesh for turning the shaft e^5 a small amount to produce a fine adjustment of the plate holder. The worm f' is normally out of mesh with the worm wheel f and is secured to an operating shaft f^2 which extends to the front of the carriage where it is provided with a handle f^3 for turning it. The shaft f^2 , see Fig. 31^a, is journaled eccentrically in a bushing f^4 which is rotatably mounted in a suitable bearing f^5 on the front of the carriage B. The bushing is provided with an arm f^6 projecting through a slot in the bearing f^5 and by turning the bushing by means of this handle the worm can be shifted into and out of mesh with the worm wheel. In adjusting the plate holder the shaft e^5 is first turned by means of the operating handle e^{11} to move the holder rapidly approximately to the desired position, the worm wheel f being then out of mesh with the worm f' . The worm is then moved into mesh with the worm wheel and turned by its operating handle f^3 for effecting the final fine adjustment of the plate holder. The worm gearing enables the shaft e^5 to be turned a very small fraction of a revolution if necessary, and the plate holder to be thus adjusted with great precision. The separately operable coarse and fine adjusting mechanisms make it possible to secure a precise adjustment much more quickly than could be accomplished if only the slow moving fine adjusting mechanism were employed.

G, Fig. 7, represents weights attached to cables g that pass over guide pulleys g' g^2 at the top of the carriage B and are fastened to the frame C of the plate holder for more or less counterbalancing the weight of the plate holder. These counterbalancing weights can be omitted if desired or any other counterbalancing means substituted therefor.

The plate holder carriage B may be mounted to move horizontally and may be guided in its horizontal movement in any suitable way. Preferably, however, the carriage is provided at its bottom with longitudinal beveled guide ribs H which slidably engage in correspondingly shaped guide ways h in the upper surface of the central

portion A of the main frame. In order to lessen the pressure on the guides and enable the carriage to be moved more easily, the carriage is preferably mounted on trucks h^2 , Figs. 7 and 15 to 17, provided with wheels h^3 which are adapted to travel on the main frame between the guide-ways h . The trucks shown are provided with leaf springs h^4 which are hung at their ends on the end portions of the trucks and yieldingly support the carriage through the medium of screws h^5 , which are threaded into bearing blocks h^6 that rest upon the central portions of the springs h^4 . The screws are adapted to be turned by a suitable tool or other means to regulate the lifting action of the springs on the carriage. The bearing blocks h^6 are confined and held from turning in bottom recesses in cross bars h^7 of the base portion of the carriage. By adjusting the screws the guide-ways h can be relieved of the weight of the carriage to such an extent that the guide ribs will bear lightly in the guide-ways, the friction in the guides being thus greatly reduced without lessening the guiding function of the guides.

I, Figs. 3 and 4, represents a shaft for adjusting the carriage B horizontally on the main frame. This shaft is journaled in a suitable bearing i on a bracket i' rising from one end of the portion A of the main frame and is provided with a pinion i^2 which meshes with a toothed rack i^3 secured to a horizontal extension i^4 of the carriage. The shaft I is preferably provided at its forward end with a handle i^5 for turning it to effect a quick or coarse adjustment of the carriage. Worm gearing similar to that employed for the fine adjustment of the plate holder C is also preferably employed for turning the shaft I to produce a fine adjustment of the carriage. As shown in Figs. 3, 32-36, the shaft I is provided with a worm wheel i^6 with which a worm i^7 is adapted to mesh. This worm is secured to an upright shaft i^8 which is journaled eccentrically in a bushing i^9 rotatably mounted in a suitable bearing i^{10} secured to the bracket i' . The eccentric bushing is provided with a handle i^{11} projecting through a slot in the bearing i^{10} by which the bushing can be turned to throw the worm into or out of mesh with the worm wheel on the shaft I. The worm shaft i^8 is provided at its upper end with a wheel or handle for turning it. The carriage is adjusted approximately to the desired position by turning the shaft I by means of its handle i^5 , while the worm is out of mesh with the worm wheel. The worm is then thrown into mesh with the worm wheel as explained, and the shaft I turned by means of the handle i^5 and the worm gearing for effecting the fine adjustment of the carriage.

The described adjusting mechanisms for

the plate holder C and the carriage B are simple and efficient, and therefore preferred, but mechanisms of other construction adapted to perform similar results could be employed.

Suitable means are employed for locking the carriage stationarily in the position to which it is adjusted. The means shown for this purpose comprise a locking bar K, Figs. 7, 18 and 19, which extends transversely of the carriage in a recess in a cross bar k of the base of the carriage. The ends of the locking bar project under longitudinal flanges k' on the portion A of the main frame at the inner sides of the carriage guide-ways h , and the locking bar is supported centrally upon an eccentric k^2 on a shaft k^3 which extends lengthwise beneath the carriage. The shaft k^3 is journaled at its ends in suitable bearings k^4 on the main frame and passes through bearings k^5 depending from the cross bar k of the carriage. The eccentric k^2 is splined on the shaft between the bearings k^5 so that it is caused to turn with the shaft but is adapted to slide lengthwise thereon when the carriage is moved horizontally. By rocking the shaft the eccentric forces the locking bar against the flanges k' on the main frame, thereby locking the carriage from movement. The shaft k^3 is turned preferably by a lever k^6 secured to the end thereof adjacent the bracket i' .

k^7 , Fig. 3, represents a latch pivoted on the bracket i' and adapted to engage the lever k^6 for holding the shaft k^3 in the normal position in which the locking bar K is released. The latch shown is adapted to be moved by hand to release the lever and to automatically engage and hold the lever. When the lever is raised it strikes and swings the latch aside and the latch then swings by gravity in front of the lever and holds it in the raised position shown in Figs. 1 and 3.

L and L', Figs. 1 and 3, represent indicators for showing respectively the adjustments of the carriage B and of the plate holder on the carriage. The indicator L comprises an index or pointer l which co-operates with a scale l' on the carriage extension i^4 , and a graduated dial l^2 which is rotated by a pinion l^3 which meshes with a toothed rack l^4 on the carriage. The pinion l^2 is suitably geared to the dial so as to cause the dial to turn one revolution during the travel of the carriage a distance equal to one inch or other unit of measure represented by the divisions of the scale l' . The dial is provided with graduations indicating, for example, thousandths of an inch, and it is thus possible for the operator by observing the indicator to adjust the carriage with great accuracy to the desired position.

l^5 represents an undercut rib on the carriage extension which slides in a correspondingly shaped groove l^6 in the bracket which

supports the indicator, to prevent undesirable play between the pinion l^3 and the toothed rack l^4 . The other indicator, L' , comprises an index l^7 cooperating with a scale l^8 on the plate holder frame C, and a dial l^9 which is driven by a pinion l^{10} meshing with a toothed rack l^{11} on the plate holder frame C. This indicator operates in the same manner as the indicator L. Any other suitable micrometer indicators could be used instead of those shown.

M represents the light chamber or support on which the transparent printing plates are mounted and which contains an electric lamp or other source of light for illuminating the plates to make the photographic prints on the sensitized surface. The light chamber preferably consists of a rectangular casing of any suitable construction which is provided in its side walls with openings m over which are removably secured holders or disks m' on which the printing plates, indicated at m^2 , are mounted. The printing plates may be secured on the holder disks and the disks may be removably secured on the light chamber in any suitable manner, permitting the ready securing, rotary adjustment and removal of the disks. As shown, each disk rests on rollers m^3 journaled on the wall of the light chamber and is retained thereon by pivoted fingers or clamps m^4 which are secured by screws m^5 to the wall of the light chamber and overhang the edge of the disk. The disk is thus held against the outer face of the wall of the light chamber but is adapted to be rotatably adjusted on the rollers to place the printing plate at any desired angle. When adjusted to the desired position, indicated by index marks on the disk cooperating with a graduated scale m^6 on the wall of the light chamber, the plate holder can be firmly clamped in position by tightening the securing screws for the clamps m^4 . In the construction shown, a heavy glass face plate m^7 is secured on the holder disk by corner pieces m^8 . The printing plate m^2 rests flat against the surface of the face plate and is held thereon by clamping bars m^9 , Figs. 1 and 37-41, which are mounted on the holder disk at the edges of the face plate. Each clamping bar is pivoted centrally by a screw m^{10} on a slide block m^{11} and bears at its ends against the beveled edge of the printing plate. The slide block m^{11} is slidably secured on the holder disk by a dove-tailed guide piece m^{12} entering a dove-tailed groove in the slide block and is moved toward and from the edge of the face plate by a screw m^{13} which turns in a lug m^{14} on the holder disk. The clamping bar is provided at its ends with screws m^{15} which extend through holes in the bar and screw into nuts m^{16} which are adapted to slide in slots in the holder disk. These nuts have flanges adapt-

ed to bear against the inner side of the holder disk. Thumb screws m^{17} extending through threaded holes in the ends of the clamp block bear against the screws m^{15} . By turning these thumb screws the clamping bar can be swung to more or less of an angular relation to the slide block as may be necessary to insure a perfect bearing of the clamping bar on the edge of the printing plate. The slide block is then forced toward the printing plate by its screw m^{13} to cause the clamping bar to engage and hold the printing plate. When the clamping bar has been adjusted to bear firmly on the edge of the printing plate, the screws m^{15} are turned by means of handles m^{18} projecting therefrom so as to secure the clamping bar in its adjusted position and draw the same down firmly against the beveled edge of the printing plate, thereby pressing the latter into firm contact with the face plate. The screws m^{15} also hold the slide block rigidly in place. The described securing means for the printing plates enable the same to be accurately adjusted and rigidly held in place notwithstanding irregularities in the size, shape and thickness of the plates.

The light chamber is swiveled on a supporting carriage N so that it can be turned to place the printing plate on either side of the light chamber opposite to the sensitized surface, and the carriage is movable on the front wing A' of the main frame toward and from the holder for the sensitized plate for moving the printing plate into and out of contact with the sensitized plate. As shown in Fig. 11, the bottom of the light chamber is provided with a hub n arranged to turn on an upwardly projecting boss or axle n' on the carriage N. The light chamber is provided with a circular bottom face n^2 which rests upon a circular track or surface n^3 on the carriage N to prevent the tilting of the light chamber on the carriage. In order to relieve the weight or pressure of the light chamber on this track and reduce the friction, the hub of the light chamber is preferably provided with an antifriction thrust bearing n^4 which bears upon a spring n^5 located in a cavity in the axle boss n' . This spring presses the bearing upwardly against an overlying plate n^6 secured to the hub of the light chamber and tends to lift the light chamber, thus lessening, to a material extent, the pressure on the circular track. For turning the light chamber on the carriage N to place one or another of the printing plates opposite to the sensitized part, the hub of the light chamber is preferably provided with a worm wheel n^7 which meshes a worm n^8 secured to a horizontal shaft n^9 which is journaled on the carriage N and is provided at one end thereof with a crank or handle n^{10} for turning it. O, Figs. 12-28-31, represents a bolt or

locking device for securing the light chamber when it has been turned to a position in which any one of the printing plates supported thereby is parallel with the sensitized surface. The bolt O shown is slidably mounted on a bracket o secured to one side of the carriage N and is provided with an upwardly projecting lug o' adapted to enter notches in plates o² depending from the outer portion of the bottom of the light chamber which overhangs the bolt. When the notch in one of the plates o² is in register with the lug of the bolt, the bolt is moved outwardly by means of a screw o³ to cause the lug to enter the notch and secure the light chamber. In order to facilitate the locking of the light chamber, a spring-pressed plunger o⁴ is mounted in the supporting bracket o for the bolt. The upper end of this plunger is beveled so that when the light chamber is turned in one direction the plates o² will engage the beveled end of the plunger and pass the same. In adjusting the light chamber it is turned until one of the plates o² engages the spring plunger o⁴ and passes a slight distance beyond the same. The light chamber is then moved in the return direction until the notched plate o² strikes the abrupt face of the plunger and is arrested thereby. The light chamber will then be in position for the bolt O to be moved into the notch in the plate o².

P represents an electric lamp in the light chamber. This lamp is preferably supported in the light chamber on a stationary or non-rotatable base plate p, so that the lamp does not rotate with the light chamber but always throws the light in the same direction, that is, toward the sensitized part. A shield P' of any suitable sort is preferably supported by the base plate p and surrounds the sides of the lamp P to prevent the escape of light through the openings in the sides of the light chamber when changing the holders for the printing plates. The base plate p is secured centrally to the upper end of a vertical post p', and is provided with a depending circular edge which bears upon an opposing circular face p² on the bottom of the light chamber. The base plate is utilized for pressing the light chamber down to a firm seat on its carriage, and pressing the carriage to a firm seat on its support for the purpose of preventing any movement of the light chamber when the back support is operated to press the sensitized part into contact with the printing plate. For this purpose the post p' extends down through the swivel bearing for the light chamber and through a clamp bar p³ which is located in the wing A' of the main frame and is adapted to bear at its ends against downwardly facing flanges or shoulders p⁴ on

the sides of the frame, see Figs. 13 and 20. A shaft p⁵ passes through a hole in the bottom of the post p' and is provided at opposite sides of the post p' with eccentrics p⁶ which support the clamp bar p³ and are adapted to draw the post p' and base plate p downwardly against the bottom of the light chamber when the eccentric shaft p⁵ is turned. The eccentrics are splined on the shaft p⁵ and confined between the post p' and bearings p⁷ attached to the post, so that they turn the shaft but are adapted to slide thereon when the light chamber is moved toward or from the sensitized part. The eccentric shaft p⁵ is journaled in suitable bearings on the frame and is provided at its outer end with a lever or handle p⁸ for turning it to clamp and release the light chamber.

The carriage N for the light chamber may be mounted to travel on the main frame toward and from the sensitized plate holder in any suitable way, but preferably the carriage is provided with depending V-shaped guide ribs q which slide in correspondingly shaped guide-ways q' on the top of the front wing A' of the main frame, and is provided with wheels q² which are adapted to roll on the main frame adjacent to the guide-ways for supporting the weight of the carriage and the parts carried thereby and relieving the friction in the guides.

It will be apparent that the device described, comprising the base plate p and the clamping bar p³ for clamping the light chamber on the carriage N, also acts to press the carriage firmly down on the main frame, so that the one clamping device acts to prevent any movement of either light chamber on the carriage or the carriage on the main frame, and the light chamber is therefore held perfectly rigid. The light chamber could be differently swiveled and mounted to move toward and from the sensitized plate holder, and means different from those described could be employed for turning the light chamber, locking it from turning and clamping it and the carriage stationarily in position.

When the apparatus is being employed for repeating or making a plurality of prints from the same printing plate on the sensitized surface, it is only necessary to move the light chamber away from the sensitized part a sufficient distance to permit of the adjustment of the latter to present successive positions of the sensitized surface to the printing plate. When, however, it is desired to turn the light chamber on the carriage to bring another printing plate into operative relation to the sensitized part, or to change or adjust the printing plates, the light chamber is moved a considerable distance away from the sensitized part.

Separate means are preferably employed for effecting these different movements of the light chamber so as to enable the light chamber to be moved away from the sensitized part to any required position when desired, or to be moved quickly a short distance away from the sensitized surface and again returned to the same position, in contact with the printing surface. For producing the extended movement of the light chamber, a shaft R, Figs. 1 and 11-14, is shown which is suitably journaled on the main frame and is provided at its inner end with a pinion r which meshes with a toothed rack r' on the bottom of the light chamber carriage N. This shaft can be turned by a crank r^2 at its outer end. Any other suitable means for producing the extended or variable movement of the light chamber could be employed.

For the other or limited movement of the light chamber, a shaft S is preferably provided which is journaled in suitable bearings on the main frame and is provided with an eccentric s which is adapted to reciprocate a slide s' which is arranged below the carriage N to slide on an underlying portion s^2 of the main frame A', see Figs. 11-13 and 21-25. The eccentric turns in an eccentric block s^3 confined in a pocket in the slide s' . Slidably mounted on the slide s' is an auxiliary slide s^4 which is provided with upwardly projecting stops or abutments s^5 adapted to engage the adjacent end of the carriage N to limit the movement of the same by the shaft R toward the holder for the sensitized plate. The auxiliary slide s^4 is adapted to be adjusted on the slide s' toward and from the sensitized plate holder by suitable means, such as a screw s^6 which is journaled and held from endwise movement on the slide s' and engages in a screw-threaded hole in the auxiliary slide s^4 . The auxiliary slide s^4 can be adjusted by the screw s^6 toward or from the sensitized plate holder to the extent necessary to insure of the proper contact between the printing plate and the sensitized surface when the carriage is arrested by the stops s^5 . As shown, the slide s' is provided at opposite sides with beveled flanges s^7 , Fig. 21, which are confined and slide between guide strips s^8 on the main frame, and the auxiliary slide is provided with beveled flanges s^9 at opposite sides which are confined and guided between guide strips s^{10} on the main slide s' . The light chamber carriage is adapted to be moved toward the sensitized plate holder by the shaft R until arrested by engagement with the stops s^5 and the carriage can be moved in the opposite direction to any desired extent. By locking the carriage to the slide s' the carriage and the light chamber can be moved toward and from the sensitized plate holder a distance

equal to the throw of the eccentric by turning this eccentric s a half revolution in one direction or the other. The carriage N is locked to the slide s^4 for this purpose, for instance by a bolt t which is arranged to slide vertically in a guide t' on the end of the carriage N between the stops s^5 and is adapted to be moved into and out of a recess t^2 in the auxiliary slide s^4 by a pinion t^3 engaging rack teeth on the bolt. This pinion is secured to a shaft t^4 which is journaled in suitable bearings on the carriage N and extends to the side thereof where it is provided with a handle t^5 , see Fig. 12. After the stops s^5 have been once adjusted to give the proper contact between the printing plate and the sensitized surface, the light chamber can be moved quickly by the eccentric shaft S to remove the printing plate from and again return it to the same position in proper contact with the sensitized surface. This enables a very rapid operation of the apparatus when repeating prints from the same printing plate. The shaft S is preferably turned by an operating handle T at its end which is also utilized, as hereinafter explained, for similarly operating the back support.

U represents the back support or device for pressing the sensitized part firmly against the printing plate. The back support is provided with a plurality of pressure heads u having facings of yielding material for contact with the sensitized part, and is mounted so that it can be turned to place any one of the pressure heads in position for use. The pressure heads are of different sizes and it is thus possible to use a pressure surface of appropriate size for the particular printing plate being used. This is a great advantage since if a pressure head having a larger area than the printing plate is used the sensitized plate is apt to be bent or indented and injured more or less by the edges or corners of the printing plate, especially if the glass printing plate is not perfectly flat or of uniform thickness throughout. This trouble is obviated by using a pressure head of slightly smaller dimensions than the printing plate. Preferably the pressure heads are removably secured by set screws or otherwise on cylindrical studs u' projecting laterally from the body of the back support so that the heads can be turned to a vertical or inclined position as may be necessary. This also enables a head to be removed and replaced by one of still another size or shape if necessary. The back support, like the light chamber, is swiveled on a carriage u^2 which travels on the main frame for moving the pressure head into and out of contact with the sensitized plate. This carriage is preferably mounted and guided on the back wing A² of the main frame in the same way that the light cham-

ber carriage is mounted and guided. Means substantially similar to those described in connection with the light chamber are preferably provided for turning the back support, for locking it from turning, for moving the carriage u^2 , and for regulating the movement of the carriage toward the sensitized part.

u^3 , Figs. 1 and 26, indicates the shaft connected by worm gearing u^4 to the hub of the back support for turning it, and u^5 is the bolt or locking device for holding the back support from turning.

u^6 represents the adjusting shaft for the carriage u^2 which is connected to the carriage by a rack and pinion, and is turned by a crank at its end, as in the case of the light chamber.

u^8 , Fig. 1, indicates the adjustable stop which is engaged by the carriage for regulating the movement of the back support toward the sensitized part. This stop is mounted and adjusted in the same way as the stops s^5 for the light chamber.

u^9 is the operating shaft for the lock by which the carriage is locked to the slide which is actuated by the eccentric for moving the back support a fixed short distance into and out of contact with the sensitized part.

As these various parts are constructed and operate substantially like the corresponding parts for the light chamber a more detailed description thereof is believed to be unnecessary.

u^{10} , Fig. 26, represents a clamping plate for forcing the back support down to a firm seat on its carriage u^2 . As shown, this clamping plate is located in the hollow body of the back support and bears at its edge on a flange u^{11} on the bottom of the back support against which it is forced by a nut u^{12} on a central bolt u^{13} extending up through the carriage and the hub of the back support. The nut u^{12} is adapted to be turned by a tool u^{14} inserted through holes u^{15} in the sides of the back support. The back support could, if desired, be clamped down on the carriage by means similar to those employed for the light chamber, or any other suitable means could be used for this purpose.

V represents the shaft to which is secured the eccentric for producing the limited movement of the back support toward and from the sensitized part. Preferably means are provided whereby the eccentric shaft V is adapted to be actuated by the same handle or device T that actuates the eccentric shaft S which reciprocates the light chamber. In the means shown for this purpose, see Figs. 1, 12, 24 and 25, the shaft V is connected by worm gearing v , a shaft v' , bevel gears v^2 , a shaft v^3 , bevel gears v^4 , a shaft v^5 and worm gearing v^6 to a sleeve v^7 which sur-

rounds and is adapted to turn independently of the shaft S. The operating handle T for the shaft S is adapted to be connected by a clutch either to the shaft S for turning it, or to the sleeve v^7 for turning the shaft V. The worm gearing in the operating connections for the shaft V enables the back support to be forced with great pressure against the sensitized part to enable an absolutely perfect and close contact of the printing plate against the sensitized surface. Any clutch device suitable for the purpose may be used. As shown in Figs. 12 and 24, the shaft S is provided at its end with a fixed collar w on which the hub of the handle T is adapted to slide and turn. The hub of the handle T has a plate at its inner end provided with teeth w' and w^2 on the opposite sides thereof. If the handle is shifted outwardly the teeth w' will engage cooperating teeth on the collar w and couple the handle to the shaft S, whereas if the handle is shifted inwardly the teeth w^2 will engage cooperating teeth w^3 on the end of the sleeve v^7 and couple the handle to said sleeve. The handle is shifted for this purpose by a screw w^4 which turns in the outer end of the hub of the handle and engages in a screwthreaded hole in the end of the shaft S. The screw is turned by a crank at its outer end. The handle T can thus be readily coupled to the shaft S for turning it, or to the sleeve v^7 for turning it, and the one handle serves for operating either the actuating eccentric s for the light chamber or the actuating eccentric for the back support.

I claim as my invention:

1. In a photographic printing apparatus, the combination of a support for a sensitized part, a support which carries a plurality of photographic printing plates, means for moving one of said supports toward the other to place one of said printing plates in contact with the sensitized surface, and means for illuminating the printing plate, said support for the printing plates being rotatable to place one or another of the printing plates opposite the sensitized part.
2. In a photographic printing apparatus, the combination of a support for a sensitized part, a support which carries a plurality of photographic printing plates, means for moving said latter support toward said other support to place one of said printing plates in contact with the sensitized surface, means for illuminating the printing plate, and means for turning said support for the printing plates to place one or another of the printing plates opposite the sensitized part.
3. In a photographic printing apparatus, the combination of a support for a sensitized part, a support which carries a plurality of photographic printing plates, means for adjusting one of said supports parallel with

the sensitized surface to determine the position of the print on the sensitized surface, means for moving one of said supports toward the other to place one of said printing plates in contact with the sensitized surface, and means for illuminating the printing plate, said support for the printing plates being rotatable to place one or another of the printing plates opposite the sensitized part.

4. In a photographic printing apparatus, the combination of a support for a sensitized part, a support which carries a plurality of photographic printing plates, means for adjusting the sensitized part in a plane parallel with the sensitized surface, means for moving said printing plate support toward said other support to place one of said printing plates in contact with the sensitized surface, and means for illuminating the printing plate, said support for the printing plates being rotatable to place one or another of the printing plates opposite the sensitized part.

5. In a photographic printing apparatus, the combination of a support for a sensitized part, a swiveled light chamber which supports a plurality of photographic printing plates and is rotatable to place one or another of the printing plates opposite the sensitized part, a source of light in said light chamber, and means for moving said light chamber toward said sensitized part to place the printing plates into contact with the sensitized surface.

6. In a photographic printing apparatus, the combination of a support for a sensitized part, a support which carries a plurality of photographic printing plates, means for moving one of said supports toward the other to place one of said printing plates in contact with the sensitized surface, means for illuminating the printing plate, said support for the printing plates being rotatable to place one or another of the printing plates opposite the sensitized part, and a back support for the sensitized part which is rotatable to present different portions thereof to the sensitized part.

7. In a photographic printing apparatus, the combination of a support for a sensitized part, a support which carries a plurality of photographic printing plates, means for moving said latter support toward said other support to place one of said printing plates in contact with the sensitized surface, means for illuminating the printing plate, means for turning said support for the printing plates to place one or another of the printing plates opposite the sensitized part, and a back support for the sensitized part which has a plurality of pressure heads and is rotatable to present one or another of said pressure heads to the sensitized part.

8. In a photographic printing apparatus,

the combination of a support for a sensitized part, a light chamber, a source of light therein, means for supporting photographic printing plates on different sides of said light chamber, means for turning said light chamber to present one or another of said printing plates to the sensitized part, and means for causing contact between the printing plate and the sensitized surface.

9. In a photographic printing apparatus, the combination of a support for a sensitized part, a light chamber, a source of light therein, holders for photographic printing plates removably mounted on different sides of said light chamber, means for turning said light chamber to present one or another of said printing plates to the sensitized part, and means for causing contact between the printing plate and the sensitized surface.

10. In a photographic printing apparatus, the combination of a support for a sensitized part, a light chamber, a source of light therein, means for supporting photographic printing plates on different sides of said light chamber, a carriage on which said light chamber is swiveled and adapted to turn to present one or another of said printing plates to the sensitized part, and means for moving said carriage toward the sensitized part to cause the contact of the printing plate with the sensitized surface.

11. In a photographic printing apparatus, the combination of a support for a sensitized part, a light chamber, a source of light therein, means for supporting photographic printing plates on different sides of said light chamber, a carriage on which said light chamber is swiveled and adapted to turn to present one or another of said printing plates to the sensitized part, means for moving said carriage toward the sensitized part to cause the contact of the printing plate with the sensitized surface, a back support for the sensitized part, a carriage on which said back support is swiveled and adapted to turn to present different portions thereof to the sensitized part, and means for moving said back support carriage toward the sensitized part.

12. In a photographic printing apparatus, the combination of a support for a sensitized part, a light chamber, a source of light therein, means for supporting photographic printing plates on different sides of said light chamber, means for turning said light chamber to present one or another of said printing plates to the sensitized part, a back support for the sensitized part which is rotatable to present different portions thereof to the sensitized part, and means for moving said light chamber and back support separately toward the sensitized part.

13. In a photographic printing apparatus, the combination of a support for a sensitized part, a light chamber, a source of

light therein, means for supporting photographic printing plates on different sides of said light chamber, a carriage on which said light chamber is swiveled and adapted to
 5 turn to present one or another of said printing plates to the sensitized part, means for moving said carriage toward the sensitized part to cause the contact of the printing plate with the sensitized surface, and means
 10 for stationarily securing said carriage and holding said light chamber rigid on the carriage after the adjustment of the light chamber and carriage.

14. In a photographic printing apparatus, the combination of a support for a sensitized part, a light chamber, a source of light therein, means for supporting photographic printing plates on different sides of said light chamber, a carriage on which said
 15 light chamber is swiveled and adapted to turn to present one or another of said printing plates to the sensitized part, a frame on which said carriage is movable toward and from the sensitized part, means for moving
 20 the carriage, and means for clamping said light chamber on said carriage and said carriage on said frame.

15. In a photographic printing apparatus, the combination of a support for a sensitized part, a light chamber, a source of light therein, means for supporting photographic printing plates on different sides of said
 25 light chamber, a carriage on which said light chamber is swiveled and adapted to turn to present one or another of said printing plates to the sensitized part, a frame on which said carriage is movable toward and from the sensitized part, means for moving
 30 the carriage, and a single clamping device for rigidly securing said light chamber on said carriage and said carriage on said frame.

16. In a photographic printing apparatus, the combination of a support for a sensitized part, a support for a photographic printing plate, means for illuminating said
 35 printing plate, means for moving said printing plate support toward and from the sensitized part, and additional means for moving said printing plate support a predetermined limited distance toward and from the sensitized part.

17. In a photographic printing apparatus, the combination of a support for a sensitized part, a support for a photographic printing plate, means for illuminating said
 40 printing plate, means for moving said printing plate support toward said other support to place the printing plate into contact with the sensitized surface, and additional means having a fixed throw for moving said printing plate support to withdraw the printing plate from and return it into contact with
 45 the sensitized surface.

18. In a photographic printing apparatus,

the combination of a support for a sensitized part, a support for a photographic printing plate, means for illuminating said printing plate, means for moving said printing plate support variable distances toward
 50 and from said support for the sensitized part, and an eccentric for operating said printing plate support to move the printing plate a fixed distance toward and from the sensitized part.

19. In a photographic printing apparatus, the combination of a support for a sensitized part, a support for a photographic printing plate, means for illuminating said printing plate, means for moving said printing plate support toward and from the sensitized part, a stop for limiting the movement of said printing plate support toward the sensitized part, means for locking said printing plate support to said stop, and
 55 means for moving said stop with the support attached thereto for withdrawing the printing plate from the sensitized part and returning it to the same position.

20. In a photographic printing apparatus, the combination of a support for a sensitized part, a support for a photographic printing plate, means for illuminating said printing plate, means for moving said printing plate support toward and from the sensitized part, a stop for limiting the movement of said printing plate support toward the sensitized part, means for adjusting said stop relative to the sensitized part, means for locking said printing plate support to
 60 said stop, and means for moving said stop with the support attached thereto for withdrawing the printing plate from the sensitized part and returning it to the same position.

21. In a photographic printing apparatus, the combination of a support for a sensitized part, a support for a photographic printing plate, means for illuminating said printing plate, means for moving said printing plate support toward and from the sensitized part, a stop for limiting the movement of said printing plate support toward the sensitized part, a slide carrying said stop, means for locking said printing plate support to said slide, and means for reciprocating said slide with the printing plate support attached thereto.

22. In a photographic printing apparatus, the combination of a support for a sensitized part, a support for a photographic printing plate, means for illuminating said printing plate, means for moving said printing plate support toward and from the sensitized part, a slide, means for reciprocating the same toward and from the sensitized part, a stop which is adjustable on said slide for regulating the movement of said printing plate support toward the sensitized part, and means for locking said printing plate
 65 support toward the sensitized part.

support to said slide for reciprocating the support.

23. In a photographic printing apparatus, the combination of a holder for a part 5 having a sensitized surface, a light chamber adapted to carry a plurality of photographic printing plates, a support on which said light chamber is swiveled and adapted to turn to present one or another of said 10 printing plates to the sensitized surface, a bearing surface on said support for said light chamber, and a yielding bearing which supports at least a portion of the weight of the light chamber and relieves the pressure 15 on said bearing surface.

24. In a photographic printing apparatus, the combination of a holder for a part having a sensitized surface, a light chamber adapted to carry a plurality of photo- 20 graphic printing plates, a support on which said light chamber is swiveled and adapted to turn to present one or another of said printing plates to the sensitized surface, a bearing surface on said support for said 25 light chamber, a yielding bearing which supports at least a portion of the weight of the light chamber and relieves the pressure on said bearing surface, and means for forcing said light chamber to firm bearing 30 on said bearing surface against the lifting action of said yielding bearing.

25. In a photographic printing apparatus, the combination of a holder for a part having a sensitized surface, a light chamber adapted to carry a plurality of photo- 35 graphic printing plates, a support on which said light chamber is swiveled and adapted to turn to present one or another of said printing plates to the sensitized surface, a bearing surface on said support for said 40 light chamber, a yielding bearing which supports at least a portion of the weight of the light chamber and relieves the pressure on said bearing surface, a plate engaging the bottom of the light chamber opposite 45 said bearing surface, and means for operating said plate to clamp the light chamber firmly against said bearing surface.

26. In a photographic printing apparatus, the combination of a holder for a part 50 having a sensitized surface, a light chamber adapted to carry a plurality of photographic plates, a support on which said light chamber is swiveled and adapted to 55 turn to present one or another of said printing plates to the sensitized surface, and a lamp in said light chamber for illuminating the printing plate, said light chamber being rotatable about said lamp.

27. In a photographic printing apparatus, the combination of a holder for a part 60 having a sensitized surface, a light chamber adapted to carry a plurality of photographic plates, a support on which said light chamber is swiveled and adapted to turn to pre- 65

sent one or another of said printing plates to the sensitized surface, a non-rotatable plate located inside of the light chamber and above the bottom thereof, means for operating said plate to hold the light cham- 70 ber stationary, and a lamp supported in the light chamber on said plate.

28. In a photographic printing apparatus, the combination of a support for a sensi- 75 tized part, a support for a photographic printing plate, means for illuminating said printing plate, a back support for the sensitized part, means for moving said back support toward and from the sensitized 80 part, and additional means for moving said back support a predetermined limited distance toward and from the sensitized part.

29. In a photographic printing apparatus, the combination of a support for a sensi- 85 tized part, a support for a photographic printing plate, means for illuminating said printing plate, a back support for the sensitized part, means for moving said back support variable distances into and out of 90 engagement with the sensitized part, and additional means having a fixed throw for withdrawing the back support from and returning it into engagement with the sensi- 95 tized part.

30. In a photographic printing apparatus, the combination of a support for a sensi- 95 tized part, a support for a photographic printing plate, means for illuminating said printing plate, a back support for the sensitized part, means for moving said back 100 support toward and from the sensitized part, a stop for limiting the movement of the back support toward the sensitized part, means for locking the back support to said 105 stop, and means for moving said stop for withdrawing the back support from the sensitized part and returning it to the same position.

31. In a photographic printing apparatus, the combination of a support for a sensi- 110 tized part, a support for a photographic printing plate, means for illuminating said printing plate, a back support for the sensitized part, means for moving said back support toward and from the sensitized part, 115 a stop for limiting the movement of the back support toward the sensitized part, means for adjusting said stop relative to the sensitized part, means for locking the back support to said stop, and means for moving 120 said stop for withdrawing the back support from the sensitized part and returning it to the same position.

32. In a photographic printing apparatus, the combination of a support for a sensi- 125 tized part, a support for a photographic printing plate, means for illuminating said printing plate, a back support for the sensitized part, means for moving said back support toward and from the sensitized part, 130

a slide, means for reciprocating the same toward and from the sensitized part, a stop which is adjustable on said slide for regulating the movement of the back support toward the sensitized part, and means for locking the back support to said slide for reciprocating the back support.

33. In a photographic printing apparatus, the combination of a support for a sensitized part, means for supporting and illuminating a photographic printing plate, means for causing contact between the photographic printing plate and the sensitized part, and a back support for the sensitized part which is provided with a plurality of different pressure heads and is rotatably mounted for presenting one or another of said pressure heads to the sensitized part.

34. In a photographic printing apparatus, the combination of a support for a sensitized part, means for supporting and illuminating a photographic printing plate, means for causing contact between the photographic printing plate and the sensitized part, a back support for the sensitized part which is provided with a plurality of different pressure heads, a carriage on which said back support is swiveled for presenting one or another of said pressure heads to the sensitized part, and means for moving said carriage to press the pressure head against the sensitized part.

35. In a photographic printing apparatus, the combination of a holder for a sensitized part, means for supporting and illuminating a photographic printing plate, adjusting means operatively connected to said holder for effecting a coarse adjustment thereof relative to the printing plate, and additional means which are normally disconnected from said adjusting means and are adapted to be operatively connected therewith for effecting a fine adjustment of said holder.

36. In a photographic printing apparatus, the combination of a support for a sensitized part, means for supporting and illuminating a photographic printing plate, means for causing contact between the photographic printing plate and the sensitized part, an adjusting shaft operatively connected to said holder and adapted to be turned for effecting a coarse adjustment of the holder, and fine adjustment mechanism which is normally disconnected from said shaft and is adapted to be operatively connected therewith for effecting a fine adjustment of said holder.

37. In a photographic printing apparatus, the combination of a support for a sensitized part, means for supporting and illuminating a photographic printing plate, means for causing contact between the photographic printing plate and the sensitized part, an adjusting shaft operatively connected to said holder and adapted to be

turned for effecting a coarse adjustment of the holder, and worm gearing which is normally disconnected from said shaft and is adapted to be connected therewith for operating the shaft to effect a fine adjustment of said holder.

38. In a photographic printing apparatus, the combination of means for supporting and illuminating a photographic printing plate, a holder for a sensitized part, a carriage in which said holder is adjustably mounted, said carriage and said holder being adjustable in different directions, and separately operable means for effecting a coarse and a fine adjustment of said carriage and of said holder.

39. In a photographic printing apparatus, the combination of means for supporting and illuminating a photographic printing plate, a holder for a sensitized part, a carriage in which said holder is mounted, separately operable means for effecting a coarse and a fine adjustment of said carriage, and separately operable means for effecting a coarse and a fine adjustment of said holder in the carriage in a different direction from the direction of adjustment of the carriage.

40. In a photographic printing apparatus, the combination of means for supporting and illuminating a photographic printing plate, a holder for a sensitized part, a support on which said holder is adjustably mounted, cooperating parts on said holder and said support for guiding the holder, means for adjusting the holder on the support, and means for clamping together the guide parts on the holder and the support for stationarily securing the holder.

41. In a photographic printing apparatus, the combination of means for supporting and illuminating a photographic printing plate, a holder for a sensitized part, a support on which said holder is adjustably mounted, guide ribs for the holder on said support, guide flanges on said holder embracing one of said guide ribs, and means for clamping said guide flanges on said guide rib for stationarily securing the holder.

42. In a photographic printing apparatus, the combination of means for supporting and illuminating a photographic printing plate, a carriage for supporting a sensitized part, a frame on which said carriage is movable, guides on said frame for said carriage, and wheeled trucks for said carriage which relieve said guides at least in part from the weight of the carriage.

43. In a photographic printing apparatus, the combination of means for supporting and illuminating a photographic printing plate, a carriage for supporting a sensitized part, a frame on which said carriage is movable, guides on said frame for said carriage, and wheeled trucks by which said carriage is yieldingly supported and which

relieve said guides at least in part from the weight of the carriage.

44. In a photographic printing apparatus, the combination of means for supporting and illuminating a photographic printing plate, a carriage for supporting a sensitized part, a frame on which said carriage is movable, guides on said frame for said carriage, means which relieve said guides at least in part from the weight of the carriage, and means for forcing said carriage in opposition to the lifting action of said relieving means to a firm seat on said frame.

45. In a photographic printing apparatus, the combination of a holder for a sensitized part, a support for a plurality of photographic printing plates, a carriage on which said holder is rotatably mounted for presenting one or another of said printing plates to said sensitized part, a device for holding said support in different rotary adjustments, and means for clamping said support rigidly to said carriage.

46. In a photographic printing apparatus, the combination of a holder for a sensitized part, a support for a photographic printing plate, a back support for said sensitized part, a carriage on which said back support is rotatably mounted for presenting different portions thereof to said sensitized part, a device for holding said back support in different rotary adjustments, and means for clamping said back support rigidly to said carriage.

47. In a photographic printing apparatus, the combination of a holder for a sensitized part, a support for a photographic printing plate, a back support for said sensitized part, separate mechanisms for moving said printing plate support and said back support toward said sensitized part, a common operating device for said mechanisms, and means for operatively connecting said operating device with either of said mechanisms.

48. In a photographic printing apparatus, the combination of a holder for a sensitized part, a support for a photographic printing plate, a back support for said sensitized part, separate mechanisms for moving said printing plate support and said back support toward said sensitized part including concentric operating shafts, a common handle for turning said shafts, and a clutch device for connecting said handle to one or the other of said shafts.

49. In a photographic printing apparatus, the combination of a holder for a sensitized part, a light chamber having an opening in its side and provided with a source of light, a holder for a photographic printing plate removably and rotatably secured on said light chamber over said opening, means for securing the printing plate on said holder, and means for placing said printing plate in contact with said sensitized part.

50. In a photographic printing apparatus, the combination of a holder for a sensitized part, a light chamber having an opening in its side and provided with a source of light, a holder disk for a photographic printing plate, means for removably and rotatably securing said disk on said light chamber over said opening, means for securing the printing plate on said disk, and means for placing said printing plate in contact with said sensitized part.

51. In a photographic printing apparatus, the combination of a main frame, a carriage movable in one direction on said frame, a second carriage movable in a different direction on said first carriage parallel with the plane of movement of the first carriage, a supporting frame for a member having a sensitized surface detachably mounted on said second carriage, bars adapted to be connected with said sensitized member and adjustably mounted on said detachable frame for stretching the sensitized member, and means for producing photographic prints on said sensitized member.

52. In a photographic printing apparatus, the combination of a main frame, a carriage movable in one direction on said frame, a second carriage movable in a different direction on said first carriage parallel with the plane of movement of the first carriage, and a supporting frame for a member having a sensitized surface detachably mounted on said second carriage and provided with parallel rows of perforations in two of its bars, parallel stretching bars each provided at its ends with perforated parts engaging said perforated bars, pins passing through registering openings in said parts and in said bars, and clamps mounted on said stretching bars and adapted to grip said sensitized member.

53. In a photographic printing apparatus, the combination of a main frame, a carriage movable in one direction on said frame, a second carriage movable in a different direction on said first carriage parallel with the plane of movement of the first carriage, means for supporting a member having a sensitized surface on said second carriage, a transparent printing plate adapted to engage the sensitized surface of said member and a block adapted to engage the opposite surface of said member, means for moving said printing plate and block toward and from opposite sides of said sensitized member, and means adapting said printing plate and block to be rotated in planes parallel with the sensitized surface so as to place the same in any required angular relation on said sensitized surface.

54. In a photographic printing apparatus, the combination of means for supporting a sensitized member, a printing frame adapted to support a printing plate, a light cham-

ber in which said printing frame is mounted, said printing frame being rotatable to turn in a plane parallel with the surfaces of said sensitized member and printing plate so as to place said printing plate in any required angular relation to said sensitized surface.

55. In a photographic printing machine, the combination of means for supporting a sensitized member, a transparent printing plate adapted to engage the sensitized surface of said member, a transparent supporting plate on which said printing plate is mounted, a printing frame on which the supporting plate is mounted, blocks arranged on said printing frame at the edges of the supporting plate, jaws guided on said blocks and engaging the edges of said printing plate, and clamping screws connecting said blocks and said jaws.

56. In a photographic printing machine, the combination of means for supporting a member having a sensitized surface, a printing plate adapted to engage the sensitized surface of said member, a light chamber on which said printing plate is mounted, said printing plate being rotatably supported and adapted to turn about an axis at right angles to the plane of said sensitized surface, a back support adapted to engage the opposite surface of said sensitized member, said back support being rotatably mounted and adapted to turn about an axis at right angles to the plane of said sensitized member, and means for indicating the rotary adjustment of said printing plate and back support about said axes relative to the sensitized member.

57. In a photographic printing machine, the combination of means for supporting a member having a sensitized surface, said supporting means being adjustable in different directions at right angles to each other in a plane parallel with the sensitized surface, a transparent printing plate, a holder for said printing plate, supporting means for said holder, said holder being removable from said supporting means and being rotatably supported to turn in a plane parallel with said sensitized surface, a back support at the opposite side of said sensitized member, means on which said back support is mounted to turn in a plane parallel with said sensitized surface, and means for illuminating said printing plate.

58. In a photographic printing machine, the combination of means for supporting a member having a sensitized surface, means for adjusting said member in different directions in a plane parallel with the sensitized surface, a printing plate, a holder for said printing plate, and a back support arranged at opposite sides of said sensitized member and adjustable toward and from the same,

said printing plate holder being rotatably mounted to turn in a plane parallel with said sensitized surface, supporting means on which said printing plate holder is detachably mounted, and means for illuminating said printing plate.

59. In a photographic printing machine, the combination of a holder for a member having a sensitized surface, a support on which said holder is detachably mounted, said support being adjustable in different directions in a plane parallel with said sensitized surface, a transparent printing plate arranged to engage said sensitized surface, a holder for said printing plate which is rotatably mounted to turn in a plane parallel with said sensitized surface, a support on which said printing plate holder is detachably mounted, a back support for said sensitized surface, said printing plate and back support being arranged to engage opposite surfaces of said sensitized member, and means for illuminating said printing plate.

60. In a photographic printing apparatus, the combination of a carriage which supports a member having a sensitized surface and which is mounted to move in a plane parallel with the sensitized surface in different directions, a holding frame for the sensitized member detachably mounted on said carriage, and bars which are provided with means for securing them to the sensitized member and are adjustably mounted on said detachable frame for stretching the sensitized member.

61. In a photographic printing apparatus, the combination of a holding frame provided with means for securing thereon a member having a sensitized surface, a support on which said holding frame is removably mounted, said holding frame being adjustable in different directions parallel with the plane of the sensitized surface, a holder for a transparent printing plate which is rotatably supported to turn in a plane parallel with the sensitized surface to place the printing plate in different angular relations to the sensitized surface, means for causing the contact of the printing plate with the sensitized surface, and means for illuminating the printing plate for producing photographic prints on the sensitized surface.

62. In a photographic printing apparatus, the combination of a portable holding frame provided with means for securing thereon a member having a sensitized surface, a support on which said holding frame is removably mounted, said holding frame being adjustable in different directions parallel with the plane of the sensitized surface, a holder for a transparent printing plate which is rotatably supported to turn in a plane parallel with the sensitized surface to place the

printing plate in different angular relations to the sensitized surface, said printing plate holder being removable from its support with the printing plate in place thereon, means for causing the contact of the printing plate with the sensitized surface, and means for illuminating the printing plate for producing photographic prints on the sensitized surface.

63. In a photographic printing apparatus, the combination of means for supporting a member having a sensitized surface and adjusting said member in different directions in a plane parallel with the sensitized surface, a holder for a transparent printing plate which is provided with means for securing the printing plate thereon and is rotatably supported to turn in a plane parallel with the sensitized surface to place the printing plate in different angular relations to the sensitized surface, said printing plate holder being removable from its support with the printing plate in place thereon, and means for producing photographic prints on the sensitized member.

64. In a photographic printing apparatus, the combination of a holder for a member having a sensitized surface, a holder for a transparent printing plate, means for supporting said holders and effecting relative adjustments of the printing plate and sensitized member in different directions and also rotatably parallel with the sensitized surface to place the printing plate in different locations and angular relations to the sensitized surface, each of said holders being removable with the parts carried thereby from its supporting means, and means for producing photographic prints on the sensitized surface.

65. In a photographic printing machine, the combination of means for supporting a member having a sensitized surface, a transparent printing plate, and a holder for said printing plate comprising a transparent supporting plate on which the printing plate rests, a frame on which said supporting plate is mounted, clamping devices for said printing plate slidably mounted on said frame at the edges of said supporting plate, and screws for forcing said clamping devices into holding engagement with the edges of said printing plate.

66. In a photographic printing machine, the combination of means for supporting a member having a sensitized surface, a transparent printing plate, and a holder for said printing plate comprising a transparent supporting plate on which the printing plate rests, a frame on which said supporting plate is mounted, clamping devices for said printing plate slidably mounted on said frame at the edges of said supporting plate, screws for forcing said clamping devices

into holding engagement with the edges of said printing plate, and means for adjusting said clamping devices angularly.

67. In a photographic printing machine, the combination of means for supporting a member having a sensitized surface, a transparent printing plate, and a holder for said printing plate comprising a transparent supporting plate on which the printing plate rests, a frame on which said supporting plate is mounted, clamping devices for said printing plate slidably mounted on said frame at the edges of said supporting plate, screws for forcing said clamping devices into holding engagement with the edges of said printing plate, and means for moving said clamping devices to press the printing plate firmly against the face of said supporting plate.

68. In a photographic printing machine, the combination of means for supporting a member having a sensitized surface, a transparent printing plate, and a holder for said printing plate comprising a transparent supporting plate on which the printing plate rests, a frame on which said supporting plate is mounted, clamping devices for said printing plate slidably mounted on said frame at the edges of said supporting plate, screws for forcing said clamping devices into holding engagement with the edges of said printing plate, and means for adjusting said clamping devices angularly and moving them to press the printing plate firmly against the face of said supporting plate.

69. In a photographic printing apparatus, the combination of a holder for a member having a sensitized surface, a light chamber having an opening facing said sensitized surface, a holder for a transparent printing plate which is provided with means for securing the printing plate thereon and is rotatably mounted on said light chamber over said opening, and means for placing said printing plate in contact with said sensitized surface.

70. In a photographic printing apparatus, the combination of a holder for a member having a sensitized surface, a light chamber having an opening facing said sensitized surface, a holder for a transparent printing plate which is provided with means for securing the printing plate thereon and is removably mounted on said light chamber over said opening, means for moving said light chamber toward said sensitized surface, and means for effecting a relative adjustment of said printing plate and sensitized member in a plane parallel with the sensitized surface.

71. In a photographic printing apparatus, the combination of a holder for a member having a sensitized surface, a light

chamber having an opening facing said sensitized surface, a holder for a transparent printing plate which is provided with means for securing the printing plate thereon and
5 means for adjusting said sensitized surface parallel with the plane thereof, and means for placing said printing plate in contact with said sensitized surface.

Witness my hand, this 15th day of May, 1914.

WILLIAM CARL HUEBNER.

Witnesses:

C. W. PARKER,
A. L. MCGEE.