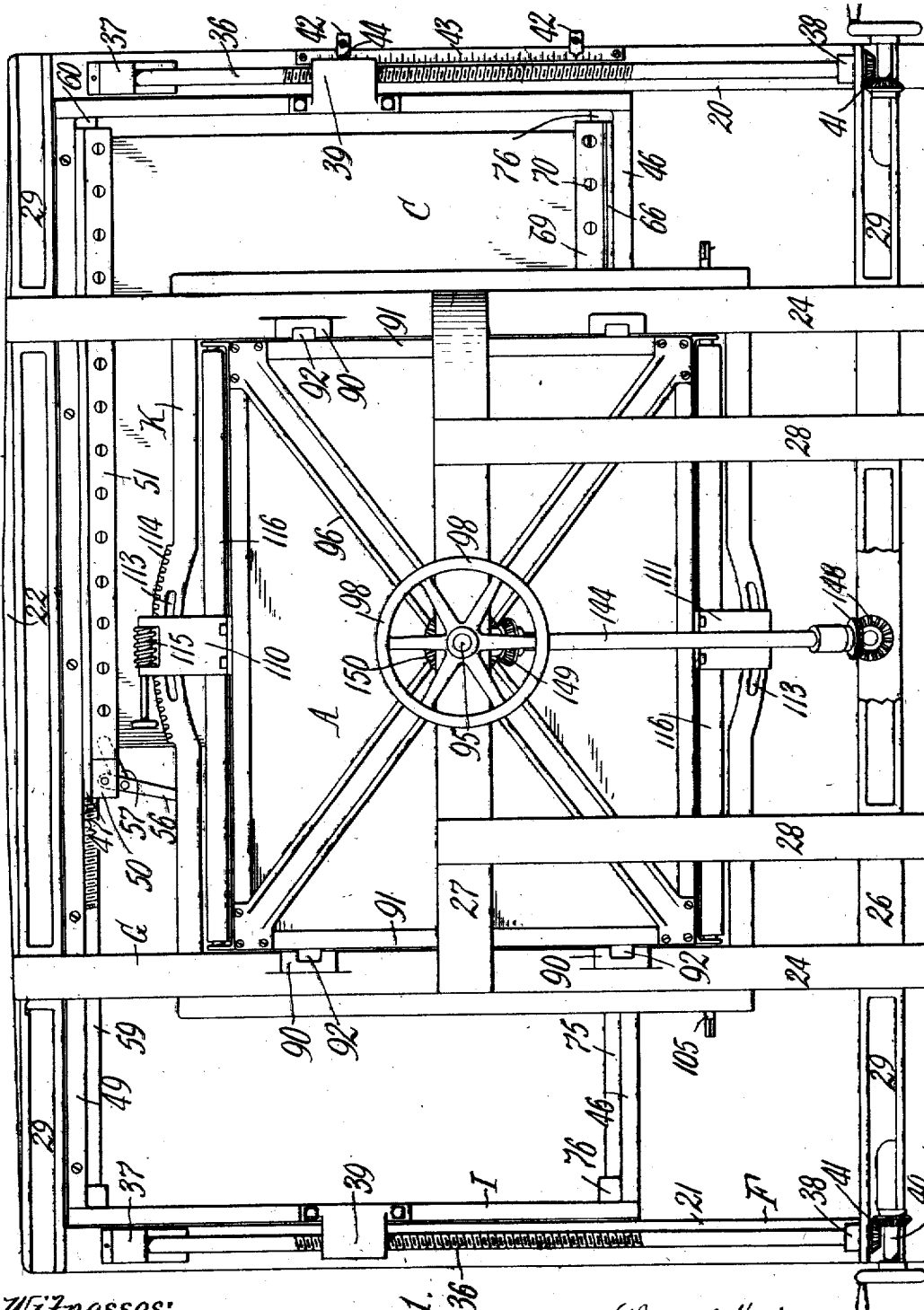


W. C. HUEBNER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED FEB. 19, 1908.

954,292.

Patented Apr. 5, 1910.

6 SHEETS—SHEET 1.



Witnesses:
 E. A. Volk.
 A. J. Dimond.

FIG. 1.

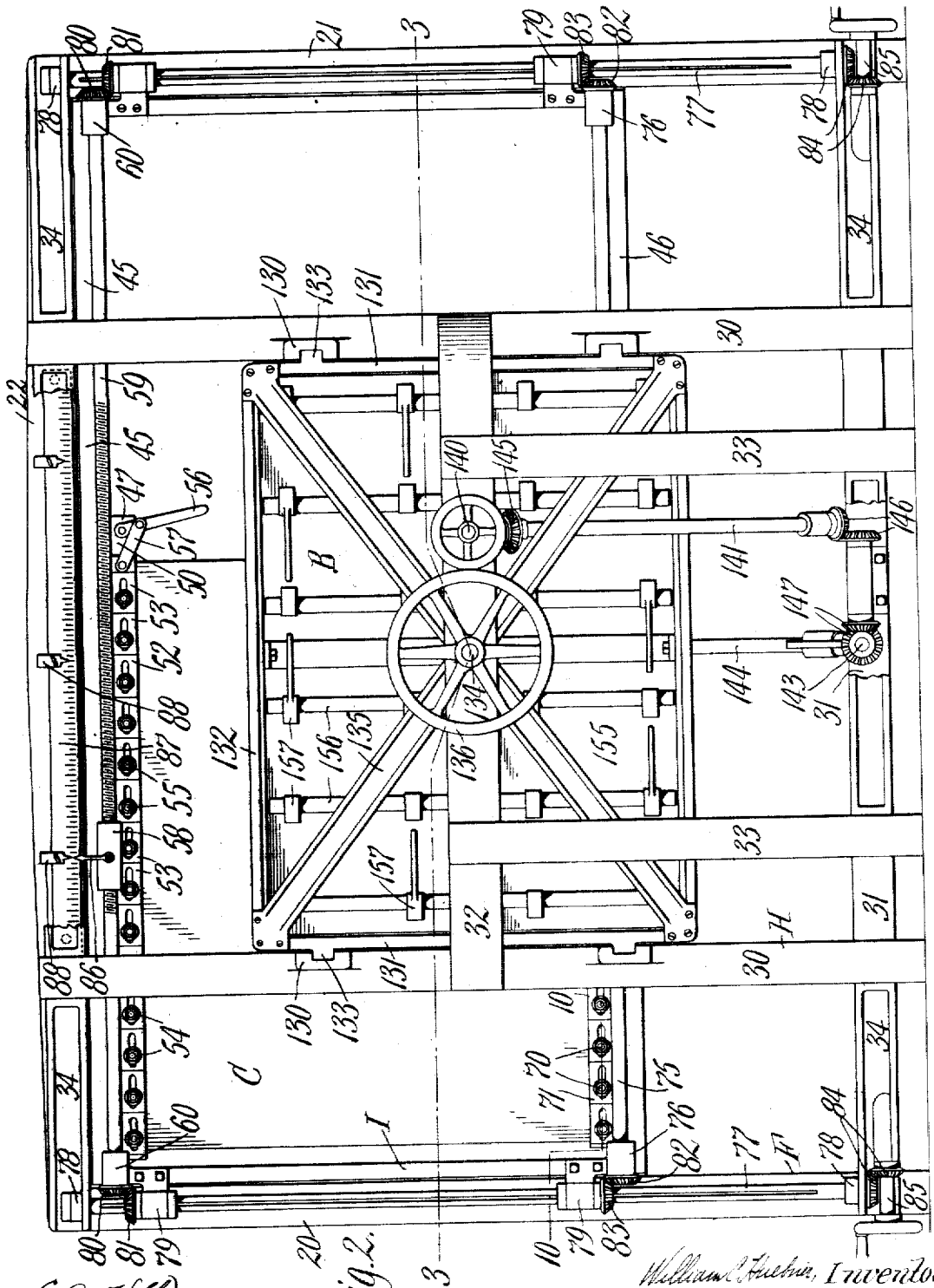
William C. Huebner, Inventor.
 By Wilhelm. Parker & Ham, Attorneys.

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6 SHEETS—SHEET 2.



E. A. Vock
 A. B. Dimond

Witnesses:

Fig. 2.

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6 SHEETS—SHEET 3.

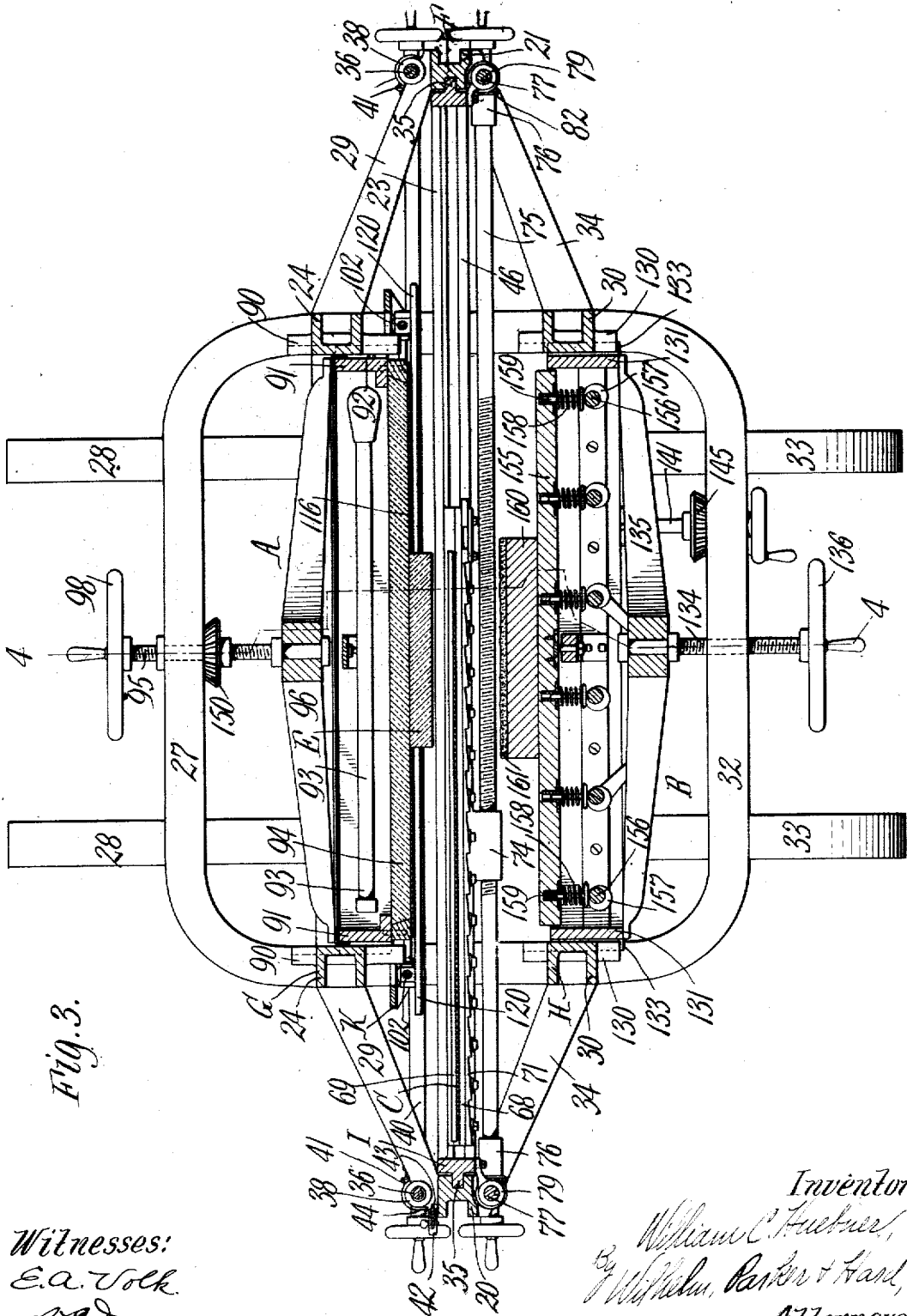


Fig. 3.

Witnesses:
 E. A. Volk.
 A. A. Dimond.

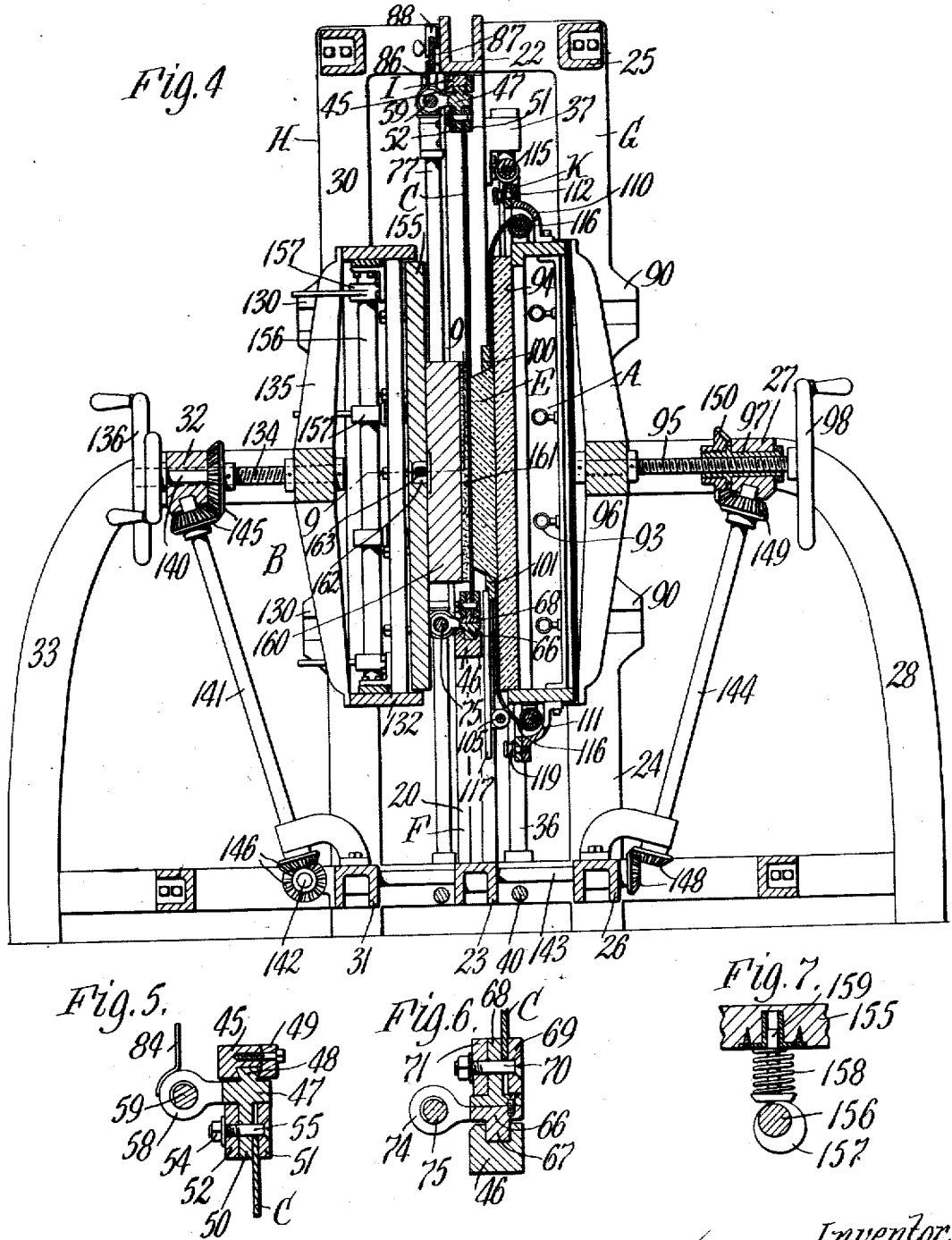
Inventor
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6 SHEETS—SHEET 4.

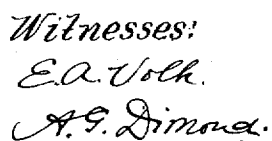


Witnesses:
 E. A. Volk.
 A. G. Dr. et al.

Inventor:
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954,292.

6 SHEETS—SHEET 6.



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Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM C. HUEBNER, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO GEORGE BLEISTEIN, OF BUFFALO, NEW YORK.

PHOTOGRAPHIC-PRINTING APPARATUS.

954,292.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed February 19, 1908. Serial No. 416,643

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 an 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.

A plurality of printing surfaces formed upon the same plate or stone is desirable in many cases, for instance, when a large edition is to be printed, in which case the time required for producing the edition is correspondingly shortened, or when several multi-colored pictures or designs are to be printed upon the same sheet, in which case the printing surfaces on the same plate or stone produce in a single impression all of the pictures or designs in the same color. In multi-color printing it is essential that corresponding printing surfaces on the plates or stones for the different colors should be in exact register.

The object of this invention is to produce a photographic printing apparatus by which perfect printing surfaces can be produced upon sensitized surfaces in predetermined locations with great certainty and accuracy and in a very expeditious and inexpensive manner.

The apparatus comprises a stationary frame or support for holding a light chamber having a transparent face plate to which a transparent negative or positive printing plate is applied for producing a photographic print upon the sensitized surface of the plate or stone, and a back support or pressure device which bears against the rear side of the plate or stone opposite the light chamber and establishes a close and uniform contact of the printing plate with the sensitized surface, thereby insuring the production of a perfect and uniform printing effect over the entire exposed portion of the sensitized surface. The sensitized plate or stone may be supported in a holder which is adjustable in the stationary frame or support transversely to the axis of the light chamber in such manner that any portion

of the sensitized surface upon which a print is to be made can be placed in line with the light chamber and back support.

In the accompanying drawings, consisting of six sheets: Figure 1 is an elevation of the apparatus viewed from the side on which the light chamber is arranged. Fig. 2 is an elevation viewed from the side on which the back support is arranged. Fig. 3 is a horizontal section in line 3—3, Fig. 2. Fig. 4 is a vertical transverse section in line 4—4, Fig. 3. Fig. 5 is a sectional elevation of the upper bar and connected parts of the plate holder, on an enlarged scale. Fig. 6 is a similar view of the lower bar and connecting parts. Fig. 7 is a horizontal sectional view of one of the eccentrics and connecting parts of the back support, on an enlarged scale. Fig. 8 is a face elevation of the light chamber. Fig. 9 is a fragmentary horizontal section through the back support in line 9—9, Fig. 4. Fig. 10 is a longitudinal section in line 10—10, Fig. 2. Fig. 11 is a sectional elevation of an adjustable support for a lithographic stone. Fig. 12 is a vertical cross section in line 12—12, Fig. 11, on an enlarged scale. Fig. 13 is a fragmentary elevation of the carrying frame and modified holding devices for a sensitized metallic plate. Fig. 14 is a vertical section in line 14—14, Fig. 13.

Like reference characters refer to like parts in the several figures.

The stationary main frame of the apparatus may be of any suitable construction and supports on opposite sides the light chamber A and the back support or pressure device B which face each other. The main frame also contains holding means which support a sensitized metallic plate C or a lithographic stone D in such manner that the sensitized surface thereof is located between the light chamber and the back support, the light chamber pressing the transparent negative or positive printing plate E against the sensitized surface, while the back support bears against the rear side of the plate or stone and presses the same toward the light chamber.

The main frame shown in the drawings comprises a rectangular upright central frame F which contains the holding devices for the plate or stone, and two side frames G H, one supporting the light chamber and the other the back support.

The central frame consists of upright end posts 20 21 and longitudinal top and bottom pieces 22 and 23. The side frame G, in which the light chamber A is mounted, comprises upright posts 24 which are secured at their inturned upper ends to the longitudinal top piece 22 and connected at the top by a horizontal piece 25, while the lower ends are connected by a horizontal piece 26. The posts 24 are provided in line with the axis of the light box with a horizontal bow-shaped bridge or cross piece 27 which is braced by legs 28 and suitable connecting pieces. The upper and lower ends of the posts 24 are connected with the upper and lower ends of the posts of the central frame by oblique braces 29.

The side frame H, in which the back support is mounted, is of similar construction and comprises posts 30 connected at the top and bottom with the central frame, a horizontal bottom piece 31, an intermediate horizontal bow-shaped bridge or cross piece 32, legs 33 and oblique braces 34.

The stationary central frame F is provided with a rectangular carrying frame I which carries the holding devices for the plate or stone and which is vertically adjustable in the stationary frame, the posts 20 and 21 of the latter being provided with upright grooves and the carrying frame with tongues 35, Fig. 3, which slide therein. The carrying frame is moved vertically in the stationary frame by upright screws 36 which are journaled in bearings 37 38 on the stationary frame and engage in threaded lugs 39 on the carrying frame. These screws are simultaneously rotated by a horizontal shaft 40 connected with the upright screws by bevel wheels 41, Figs. 1 and 3. The position of the carrying frame in the stationary frame can be ascertained by pointers 42 adjustably secured to an upright scale 43 on the stationary frame and a pointer 44 on the carrying frame, Figs. 1 and 3.

The holding devices attached to the carrying frame for securing the sensitized plate therein may be of any suitable construction and, as shown, comprise top and bottom holding means which are simultaneously adjustable in a horizontal or longitudinal direction between the top and bottom bars 45 46 of the carrying frame.

The top holding means, Figs. 1 2, 4 and 5, comprise a longitudinal holding bar 47 provided on its upper side with a dovetail tongue 48 slidably arranged in a longitudinal groove formed between the top member 45 of the carrying frame and a side plate 49. The bar 47 is provided on its under side with a web 50 against which the upper portion of the sensitized plate C is held by a clamping plate 51 which is drawn against the plate C and toward the web 50 by a wedge plate 52 having on its face side slotted

wedges or inclines 53 which engage nuts 54 on bolts 55 attached to the clamping plate. By moving the wedge plate lengthwise in one or the other direction the clamping plate movement is effected by a lever 56 pivoted is tightened or released. This longitudinal to the top bar 47 and connected by a link 57 with the wedge plate. The top bar 47 is provided with a threaded lug 58 with which engages a horizontal adjusting screw 59 journaled in bearings 60 on the upper portion of the carrying frame.

The bottom holding means, Figs. 1, 2, 3, 4, 6 and 10, comprise a longitudinal holding bar 66 provided on its under side with a rib 67 slidably arranged in a longitudinal groove in the upper side of the bottom bar 46 of the carrying frame and provided on its upper side with a web 68 against which the lower portion of the sensitized plate C is pressed by a clamping plate 69 provided with bolts 70 engaged by a wedge bar 71 connected with a shifting lever, not shown, these parts being constructed and operating like the corresponding parts of the top holding means. The holding bar 66 is provided with a threaded lug 74 in which engages a horizontal adjusting screw 75 journaled in bearings 76 on the carrying frame.

The horizontal adjusting screws 59 and 75 are simultaneously rotated by means of two upright shafts 77 which are journaled in bearings 78 on the central frame and pass through bearings 79 on the sides of the carrying frame I. The upper screw 59 is geared at each end with the shaft 77 by a bevel wheel 80 secured to the screw and a bevel wheel 81 having its hub held in the upper bearing 79, the hub containing a feather or key which engages in a groove in the shaft, whereby a driving engagement of the shaft with the wheel 81 is maintained as the carrying frame is raised or lowered in the main frame. The lower screw 75 is geared at each end in a similar manner with the shaft 77 by gear wheels 82 83. The upright shafts 77 are geared at their lower ends by wheels 84 with a hand shaft 85 by which they are actuated. The horizontal position of the holding bars in the carrying frame I can be readily ascertained by a pointer 86 on the upper holding bar, a scale 87 on the top member of the main frame, and pointers 88 adjustably secured to the scale, Fig. 2.

The light chamber A is movable to and from the central frame F on horizontal guides 90, Figs. 1, 3 and 4, formed on the posts 24 of the side frame G at right angles to the plane of the central frame, the upright side pieces 91 of the chamber being provided with lateral lugs or ribs 92 which slide in the grooves of the guides. The light chamber is provided with suitable electric illuminating devices 93, Figs. 3 and

4, and has a transparent face plate 94 to which the transparent negative or positive printing plate E is applied. The light chamber is adjusted toward and from the sensitized surface by a screw 95, Figs. 1, 3 and 4, which is connected with a spider 96 on the outer or rear side of the light chamber and works in a nut or threaded sleeve 97 arranged in the cross piece 27 of the side frame G, this screw being provided with a hand wheel 98.

The transparent printing plate E may be secured to the face plate 94 of the light chamber by any suitable means, preferably, as shown in Figs. 1, 3, 4, and 8, by transverse beveled bars 100 101 which overlap the beveled upper and lower edges of the printing plate. These bars are adjustably connected with two vertical screws 102 for tightening the bars against the plate, the upper bar being secured to sleeves 103 which can be raised or lowered on the upper, unthreaded portions of the screws, while the lower bar is secured to threaded sleeves 104 in which the screws work. Both screws are turned simultaneously by a horizontal shaft 105 which is geared with the screws by bevel wheels 106. The screws and their connecting shaft are journaled in brackets 107 108 secured to a rectangular frame K which is somewhat larger than the light chamber and is adjustably secured thereto in such manner that this frame can be given a partial rotation with reference to the chamber, thereby giving the printing plate E a partial rotation on the face plate 94 for registering the printing plate on the face plate.

The rotary connection of the frame K with the light chamber may be established, as shown, by arms 110 111 secured to the chamber and screws 112 which engage in curved slots 113 in the frame. The upper portion of the latter may be provided with a gear segment 114 with which engages an adjusting worm 115 journaled on the arm 110. The upper and lower portions of the face plate are preferably covered by opaque curtains 116.

For securing the printing plate E to the transparent face plate the sleeves 103 of the upper bar 100 are loosened on the screws, the lower bar 101 is adjusted to the proper position by means of the screws, the plate E placed on the lower bar, and the upper bar placed on the plate and secured to the screws. The lower bar 101 may be braced at the middle by an upright slotted bar 117, Figs. 4 and 8, which is secured to a sleeve 118 and the cross shaft 105 by a screw 119. The printing plate E may be held against lateral displacement by side rests 120 secured to sleeves 121 and the screws 102. When the screws are to be rotated the lower brace 117 and the side rests are released.

The back support or pressure device B is mounted in the side frame H in the same manner in which the light chamber is mounted in the side frame G and stands opposite the light chamber, so that the latter presses the printing plate against the sensitized surface of the plate or stone and the back support presses against the rear side of the plate or stone. The upright posts 30 of the side frame H are provided with horizontal guides 130 arranged at right angles to the plane of the main frame, Figs. 2, 3 and 4. The side pieces 131 of the frame 132 of the back support are provided with lateral ribs or lugs 133 which slide in the grooves of the guides. The back support is adjusted toward and from the back of the plate or stone by a screw 134, Figs. 2, 3 and 4, which is connected with a spider 135 on the outer side of the back support and works in a thread in the cross piece 32 of the side frame H, this screw being provided with a hand wheel 136.

It is sometimes desirable to adjust the light chamber from the same side of the apparatus from which the back support is adjusted. Figs. 2, 3 and 4 represent a convenient mechanism for that purpose, comprising a horizontal hand shaft 140, journaled in the cross piece 32, an oblique shaft 141, a longitudinal shaft 142, a transverse horizontal shaft 143, an oblique shaft 144 and connecting pairs of gear wheels 145, 146, 147, 148. The oblique shaft 144 is connected at its upper end by a wheel 149 with a wheel 150 on the threaded sleeve 97 in which the adjusting screw 95 of the light chamber works. When this mechanism is not employed the screw 95 can work directly in the cross piece 27.

In order to produce an intimate contact of the sensitized surface with the printing plate over the entire surface of the latter, the pressure plate 155 of the back support is preferably so mounted in the frame 132 thereof that pressure can be applied separately at different portions of the pressure plate. For that purpose the frame 132 may be provided with shafts 156 carrying cams or eccentrics 157 by which pressure can be applied to the plate 155. Slightly yielding devices comprising a spring 158 and a bolt 159 are preferably interposed between the eccentrics and the plate, Figs. 3, 7 and 9. The main pressure plate 155 is preferably provided with a supplemental pressure plate 160, Fig. 9, having a yielding facing 161 and connected with the main plate by studs 162 entering openings in the main plate and secured therein by transverse screws 163.

A lithographic stone D, Figs. 11 and 12, may be secured to the lower holding bar 66 by means of a base 165 which is secured to the bar after removing the web 68, Fig. 6. The base 165 is provided on its upper side with a dove-tail groove 166 which receives a

longitudinally movable carriage 167 on which the stone rests and which may be supported by rollers 168. The stone is held in position between standards 169 which are secured in the dove-tail groove and have their heads provided with screws 170 bearing against the ends of the stone.

In Figs. 13 and 14 the sensitized plate C is represented as being secured in a frame 171 which is horizontally adjustable by the screws 59 and 75 in the vertically adjustable carrying frame I and which is provided at its top and bottom with holding devices 172 173 for the plate. The lower holding devices 173 may be vertically movable in the frame 171 by levers 174 for stretching the plate.

In adjusting the apparatus for producing a print upon a sensitized surface the light chamber is adjusted so as to bring the transparent printing plate in close contact with the sensitized surface and the back support is adjusted to bear against the rear side of the plate or stone. If necessary, the supplemental pressure appliances, consisting of the eccentrics or cams, are resorted to where additional pressure is needed in order to produce an intimate and uniform contact of the printing plate with the sensitized surface.

The plate mounted in the adjustable carrying frame can be readily adjusted, if necessary, so as to bring that part of the sensitized surface opposite the light chamber upon which the photographic print is to be made. If it is desired to produce a plurality of like prints upon the sensitized surface, this is readily done by shifting the carrier frame containing the plate or the holding devices of the plate, or both, after every exposure so as to bring different portions of the sensitized surface successively opposite the light chamber and back support. If it is desired to provide several plates or stones with prints for printing in different colors, the plates or stones are successively exposed and the correct position of each plate or stone for each exposure is readily produced by the aid of the scales and pointers, thereby producing the prints upon each plate or stone in correct register.

I do not wish to claim anything in this application which is claimed in my pending applications Serial No. 358,251, filed Feb. 19, 1907, and Serial No. 408,307, filed Dec. 27, 1907.

I claim as my invention:

1. In a photographic printing apparatus, the combination of a supporting frame having means for holding a sensitized part, a light chamber adapted to carry a photographic printing plate, rectilinear guiding means on said frame on which said light chamber is movable to and from the printing position, and means for moving the light chamber on said guiding means to the print-

ing position and pressing the printing plate against the sensitized surface, substantially as set forth.

2. In a photographic printing apparatus, the combination of a supporting frame having means for holding a sensitized part, a light chamber adapted to carry a photographic printing plate, rectilinear guiding means on which the light chamber is movable toward and from the sensitized surface for pressing the printing plate squarely against said surface or removing the plate therefrom, a back support arranged opposite the rear side of the sensitized part, and means for moving the back support toward and from said part, substantially as set forth.

3. In a photographic printing apparatus, the combination of a stationary frame having means for holding a print-receiving part provided with a sensitized surface, a light chamber for a transparent printing plate mounted in said frame opposite the sensitized surface and provided with means for holding a photographic printing plate, a back support mounted in said frame opposite the rear side of said part, and means for adjusting said light chamber and back support separately toward and from said sensitized part, substantially as set forth.

4. In a photographic printing apparatus, the combination of a stationary frame having means for holding a print-receiving part which is provided with a sensitized surface, a light chamber adapted to carry a transparent printing plate and mounted opposite the sensitized surface, guiding means on which said light chamber is movable toward and from said surface, a screw for adjusting said chamber and printing plate toward and from said surface, and a back support mounted opposite the rear side of said sensitized part and provided with a screw for adjusting the back support toward and from the same, substantially as set forth.

5. In a photographic printing apparatus, the combination of a stationary frame having means for holding a print-receiving part provided with a sensitized surface and having guides arranged in planes at right angles to said surface, a light chamber adapted to carry a transparent printing plate and mounted on said guides opposite said surface, means for adjusting said chamber carrying said printing plate on said guides and holding said chamber in its adjusted position, a back support mounted on said guides opposite the rear side of said part, and means for adjusting said back support on said guides and holding said support in its adjusted position, substantially as set forth.

6. In a photographic printing apparatus, the combination of a supporting frame having means for holding a sensitized part, means for adjusting said sensitized part in a

plane parallel with the sensitized surface, a light chamber adapted to carry a photographic printing plate, and rectilinear guiding means on which the light chamber is movable toward and from the sensitized surface for pressing the printing plate securely against said surface or removing the plate therefrom, substantially as set forth.

7. In a photographic printing apparatus, the combination of a supporting frame having means for holding a sensitized part, means for adjusting said sensitized part in a plane parallel with the sensitized surface, a light chamber adapted to carry a photographic printing plate, means for adjusting said chamber and plate toward and from the sensitized surface, a back support, and means for adjusting said support toward and from the rear side of the sensitized part, substantially as set forth.

8. In a photographic printing apparatus, the combination of a stationary frame, a carrying frame having holding means for a print-receiving part provided with a sensitized surface, said carrying frame being adjustable in said stationary frame parallel with said surface, a light chamber for a transparent printing plate mounted in said frame opposite said surface, a back support mounted in said frame opposite the rear side of said part, and means for establishing a close contact of the printing plate with the sensitized surface, substantially as set forth.

9. In a photographic printing apparatus, the combination of a stationary frame, a light chamber for a photographic printing plate and a back support mounted in said frame and facing each other, a carrying frame adapted to hold a print-receiving part provided with a sensitized surface between said light chamber and back support, said carrying frame being adjustable in said stationary frame transversely to the axis of said light chamber, and holding means for said part adjustable in said carrying frame at right angles to the direction in which the carrying frame is adjustable in the stationary frame, substantially as set forth.

10. In a photographic printing appara-

tus, the combination of a stationary frame, a carrying frame adapted to hold a print-receiving part provided with a sensitized surface and adjustable in said stationary frame parallel with said surface, adjusting screws journaled in said stationary frame and engaging said carrying frame, holding means for said part adjustable in said carrying frame at right angles to the direction in which the latter is adjustable, adjusting screws journaled on said carrying frame and engaging said holding means, and a light chamber and a back support arranged on opposite sides of said carrying frame and facing each other, substantially as set forth.

11. In a photographic printing apparatus, the combination of a stationary frame provided with holding means for a print-receiving part having a sensitized surface, a light chamber for a transparent printing plate arranged opposite said surface and adjustable toward and from the same, a back support arranged opposite the rear side of said part and adjustable toward and from the same, means for adjusting said light chamber and back support independently, and mechanism for adjusting both the light chamber and the back support from the same side of the stationary frame, substantially as set forth.

12. In a photographic printing apparatus, the combination of a stationary frame provided with holding means for a print-receiving part having a sensitized surface, a light chamber arranged opposite the sensitized surface and having a transparent face plate, a transparent printing plate arranged on said face plate, transverse attaching bars engaging the upper and lower sides of said printing plate, and a brace engaging the lower attaching bar between the ends thereof, substantially as set forth.

Witness my hand, this 15th day of February, 1908.

WILLIAM C. HUEBNER.

Witnesses:

EDWARD WILHELM,
C. B. HORNBECK.

Corrections in Letters Patent No. 954,292.

It is hereby certified, that in Letters Patent No. 954,292, granted April 5, 1910. upon the application of William C. Huebner, of Buffalo, New York, for an improvement in "Photographic-Printing Apparatus," errors appear in the printed specification requiring correction as follows: Page 2, lines 70 and 71 should be transposed; page 5, line 6, the word "securely" should read *squarely*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of April, A. D., 1910.

[SEAL.]

C. C. BILLINGS.

Acting Commissioner of Patents.

plane parallel with the sensitized surface, a light chamber adapted to carry a photographic printing plate, and rectilinear guiding means on which the light chamber is movable toward and from the sensitized surface for pressing the printing plate securely against said surface or removing the plate therefrom, substantially as set forth.

7. In a photographic printing apparatus, the combination of a supporting frame having means for holding a sensitized part, means for adjusting said sensitized part in a plane parallel with the sensitized surface, a light chamber adapted to carry a photographic printing plate, means for adjusting said chamber and plate toward and from the sensitized surface, a back support, and means for adjusting said support toward and from the rear side of the sensitized part, substantially as set forth.

8. In a photographic printing apparatus, the combination of a stationary frame, a carrying frame having holding means for a print-receiving part provided with a sensitized surface, said carrying frame being adjustable in said stationary frame parallel with said surface, a light chamber for a transparent printing plate mounted in said frame opposite said surface, a back support mounted in said frame opposite the rear side of said part, and means for establishing a close contact of the printing plate with the sensitized surface, substantially as set forth.

9. In a photographic printing apparatus, the combination of a stationary frame, a light chamber for a photographic printing plate and a back support mounted in said frame and facing each other, a carrying frame adapted to hold a print-receiving part provided with a sensitized surface between said light chamber and back support, said carrying frame being adjustable in said stationary frame transversely to the axis of said light chamber, and holding means for said part adjustable in said carrying frame at right angles to the direction in which the carrying frame is adjustable in the stationary frame, substantially as set forth.

10. In a photographic printing appara-

tus, the combination of a stationary frame, a carrying frame adapted to hold a print-receiving part provided with a sensitized surface and adjustable in said stationary frame parallel with said surface, adjusting screws journaled in said stationary frame and engaging said carrying frame, holding means for said part adjustable in said carrying frame at right angles to the direction in which the latter is adjustable, adjusting screws journaled on said carrying frame and engaging said holding means, and a light chamber and a back support arranged on opposite sides of said carrying frame and facing each other, substantially as set forth.

11. In a photographic printing apparatus, the combination of a stationary frame provided with holding means for a print-receiving part having a sensitized surface, a light chamber for a transparent printing plate arranged opposite said surface and adjustable toward and from the same, a back support arranged opposite the rear side of said part and adjustable toward and from the same, means for adjusting said light chamber and back support independently, and mechanism for adjusting both the light chamber and the back support from the same side of the stationary frame, substantially as set forth.

12. In a photographic printing apparatus, the combination of a stationary frame provided with holding means for a print-receiving part having a sensitized surface, a light chamber arranged opposite the sensitized surface and having a transparent face plate, a transparent printing plate arranged on said face plate, transverse attaching bars engaging the upper and lower sides of said printing plate, and a brace engaging the lower attaching bar between the ends thereof, substantially as set forth.

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