No. 754,252. PATENTED MAR. 8, 1904.

F. P. STEVENS.

PHOTOGRAPHIC PRINTING MACHINE.

APPLICATION FILED JUNE 17, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. II.

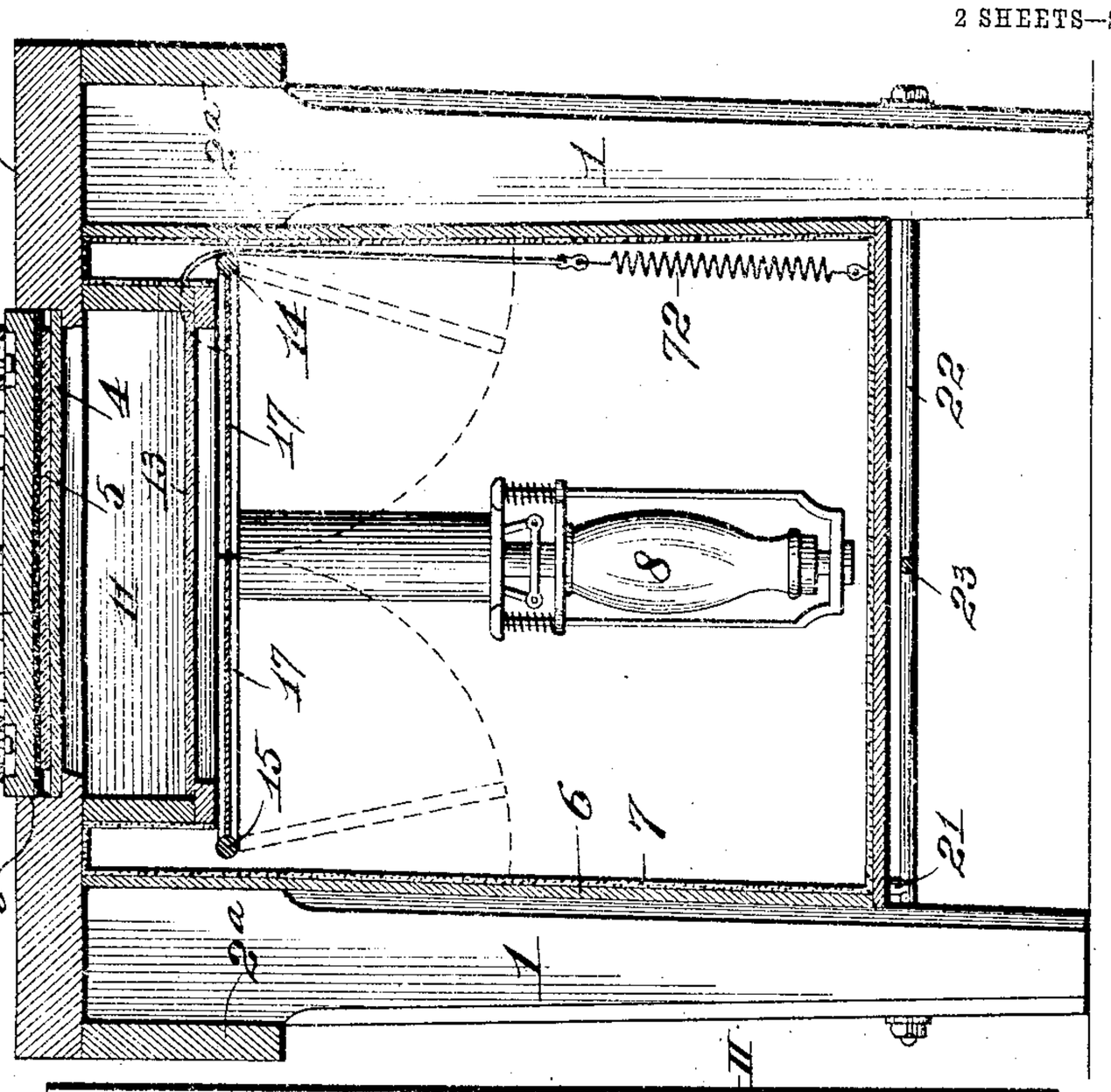
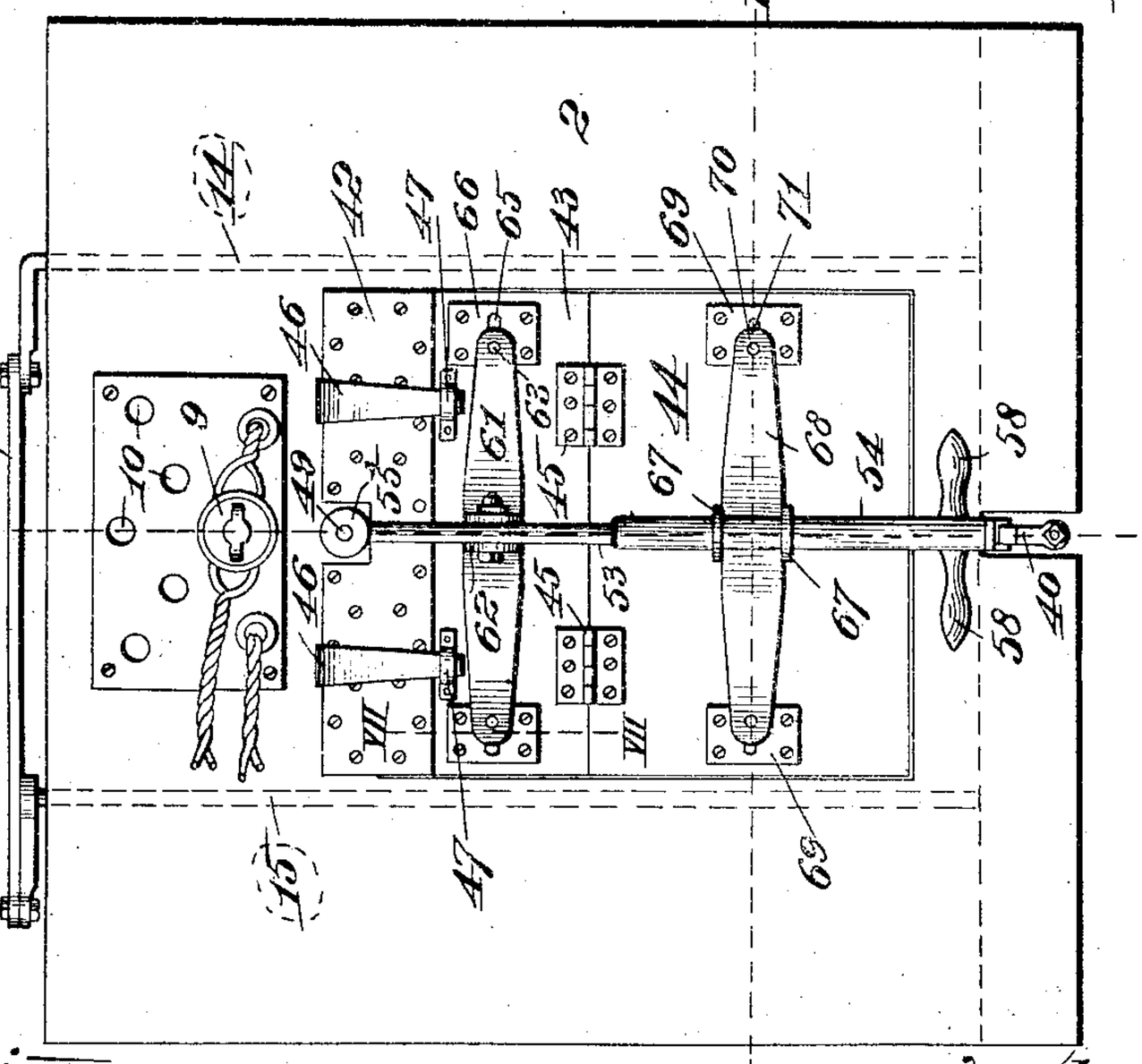


Fig. I.



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NO MODEL. 2 SHEETS—SHEET 2.

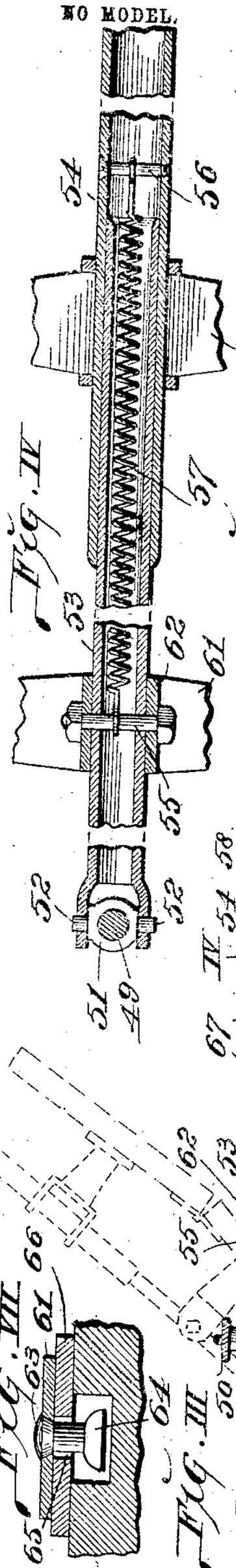

FIG. IV.

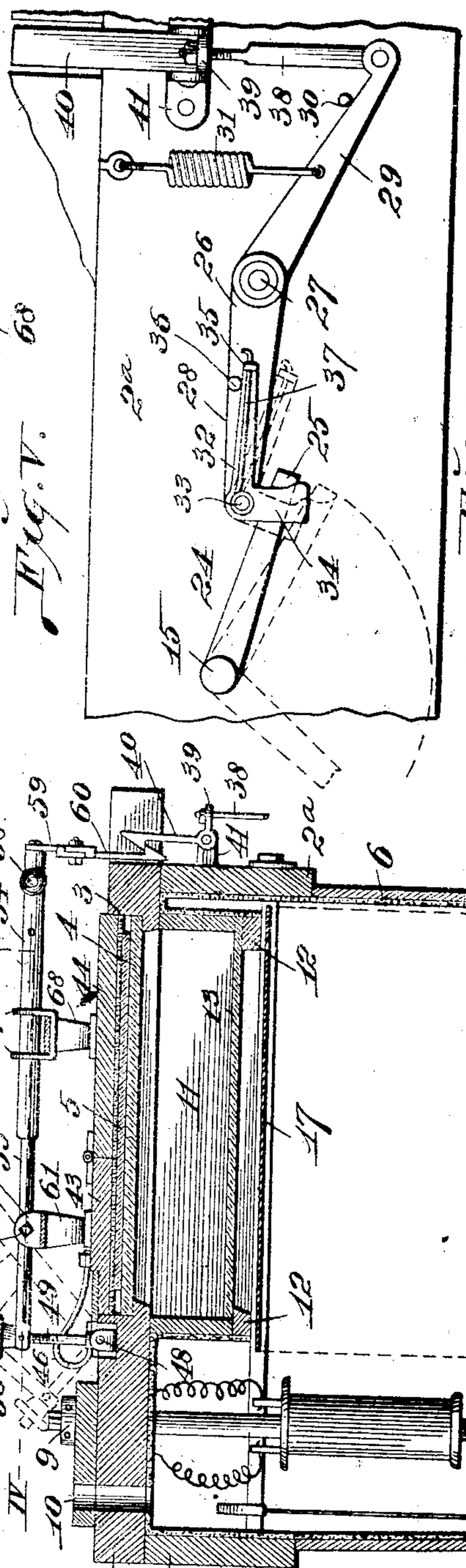

FIG. V.

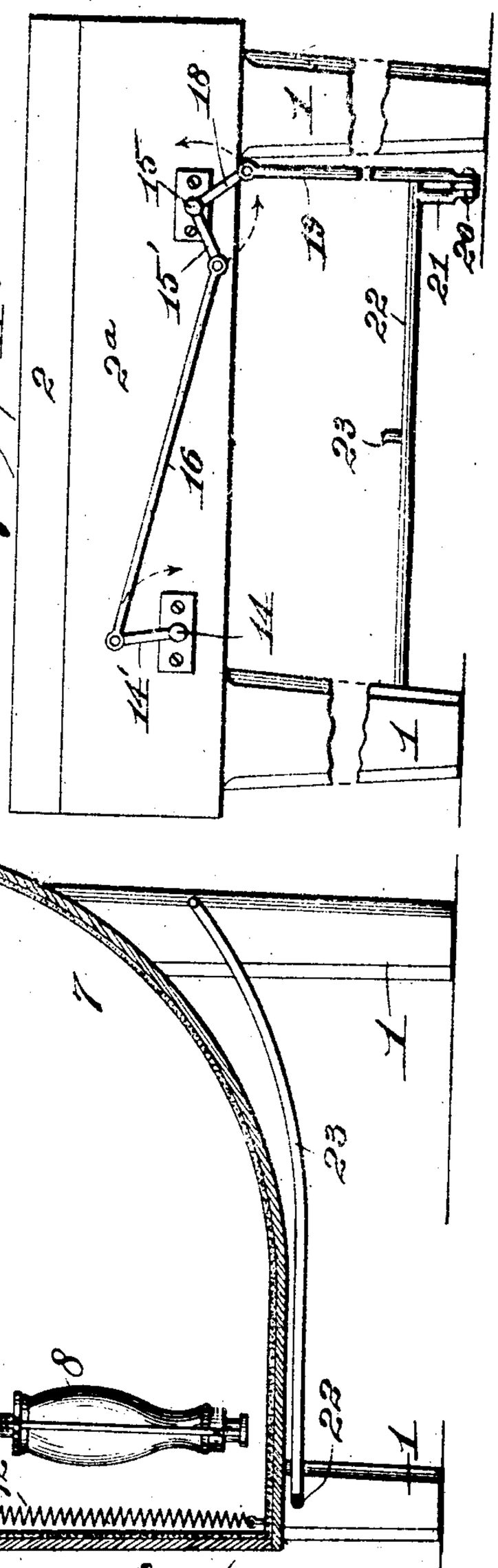

FIG. VI.

FIG. VII.

FIG. III.

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No. 754,252. Patented March 8, 1904.

UNITED STATES PATENT OFFICE.

FRED PARK STEVENS, OF ST. LOUIS, MISSOURI.

PHOTOGRAPHIC-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 754,252, dated March 8, 1904.

Application filed June 17, 1903. Serial No. 161,856. (No model.)

To all whom it may concern:

Be it known that I, FRED PARK STEVENS, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Photographic-Printing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a machine for use in making photographic prints on sheets of sensitized paper or other material by the use of artificial light.

The invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a top or plan view of my machine. Fig. II is a vertical transverse section taken on line II II, Fig. I. Fig. III is a longitudinal section taken on line III III, Fig. I. Fig. IV is an enlarged section taken longitudinally through the telescoping lever by which the pressure-back of the machine is operated. Fig. V is an elevation of the pressure-back holding and releasing mechanism. Fig. VI is a side elevation of the machine, illustrating the treadle mechanism by which the shutters of the machine are actuated. Fig. VII is a section taken on line VII VII, Fig. I, through one of the pressure-back springs and one of the keepers to which said spring is connected.

1 designates the legs of my machine, and 2 the table, supported by said legs. 2^a designates side rails secured to the upper ends of the table-legs. In the table 2 is an opening which provides a shoulder-pocket 3, in which is seated a transparent bed 4, preferably of glass. This transparent bed is designed to serve as a support for a photographic negative, as indicated at 5, Figs. II and III, and onto which is placed a sheet of paper or other sensitized material which is to receive the image borne by the negative.

6 designates a reflector-box located beneath the table 2 and preferably covered on the interior with a lining 7, that may be of asbestos or other suitable material and coated with a white paint to serve as a desirable reflector.

8 is a lamp located in the reflector-box 6 and preferably of the electric-arc type. Electric current to supply the lamp 8 is controlled through a switch 9. Ventilation for the interior of the reflector-box is secured by a plurality of vents 10 in the table 2.

11 designates a boxing situated beneath the table 2 at the location of the pocket 3 therein and provided at its lower end with shoulders 12.

13 is a transparent diffusing-plate, preferably of ground glass, though it may be of plain glass, and a suitable mat used thereon for the purpose of controlling the light passing therethrough from the reflector-box 6 to reach the negative supported on the transparent bed-plate 4.

14 and 15 designate rock-shafts mounted in the side rails 2^a and extending longitudinally within the reflector-box 6. These rock-shafts are furnished, respectively, with crank-arms 14′ and 15′, located exterior of the machine, as seen in Figs. I, III, and VI, and they are connected to a coupling-rod 16. Each of the rock-shafts 14 and 15 has fixed to it a swinging blind 17, that is designed for movement with the shafts into a horizontal position beneath the boxing 11 to prevent the passage of actinic rays of light into said boxing, and which also swing downwardly into the position seen in dotted lines, Figs. II and III, to permit the passage of light from the interior of the reflector-box into said boxing 11. The blinds 17 are of any desirable translucent material, such as red or orange-colored fabric or paper, through which approximately non-actinic rays of light may pass from the reflector-box when the blinds are in elevated or closed position. The purpose of using blinds of the description stated is to permit the projection of rays of light therethrough to the bed-plate and negative situated in the pocket 3 of the machine-table that will not act upon the sensitized print-sheet placed on the negative, but which will, however, be sufficient to enable the operator to observe the outlines of the negative and adjust the print-sheet properly thereon.

The crank-arms of the rock-shafts 14 and 15 and their coupling-rod 16 are so positioned, as seen in Fig. VI, that when one of the rods

is rotated the blind 17 carried thereby is swung in one direction, either into closed or open position, and the blind carried by the other rod is likewise swung into closed or open condition, but travels in a reverse direction, as indicated in Fig. II. As seen in Fig. VI, the rock-shafts are actuated through the medium of a lever-arm 18, to which is pivoted one end of a throw-rod 19, that is at its opposite end pivoted at 20 to an arm 21, carried by a treadle-rocker 22, journaled in two of the legs of the machine, as seen in Figs. II and III. Projecting forwardly from the rocker 22 is a treadle 23, that extends to the front of the machine, as seen in Fig. III, to receive the operator's foot and upon the depression of which the blinds 17 are swung into open position.

24 designates a finger carried by the rock-shaft 15 at its forward end in front of the forward side rail 2^a of the machine. This finger is fixed to the rock-shaft 15 to move therewith and is provided at its far end with a forwardly-projecting cam-lug 25, the service of which will be hereinafter pointed out.

26 designates a lever pivoted at 27 intermediate of its ends to the forward side rail 2^a and having arms 28 and 29, the latter of which is normally held against a stop 30 by a retractile spring 31, (see Fig. V,) which connects it to the table of the machine.

32 designates a trigger mounted on a pivot 33, carried by the arm 28 of the lever 26. This trigger has a trip-arm 34, adapted to receive the engagement of the cam-lug 25, carried by the finger 24, projecting from the rock-shaft 15, and it also has a lever-arm 35, that is normally held to a stop 36, carried by the lever-arm 28, through the medium of a spring 37, that is secured to the pivot 33, on which the trigger 32 is mounted. The arm 29 of the lever 26 has pivotally connected to it a pull-rod 38, that extends to the arm 39 of a catch-hook 40, which is pivotally supported in a bracket 41. (See Figs. III and V.) The catch-hook 40 projects upwardly from said bracket at the front of the machine and is designed for service in connection with an opposing member to be hereinafter referred to.

42 designates a flexible hinge secured to the top of the table 2 at the rear of the pocket 3 therein. This flexible hinge is connected to the rear section 43 of a pressure-back, that in turn receives the flexible connection of a forward pressure-back section 44 through the medium of hinges 45. The entire pressure-back consists of the sections 43 and 44, so designed to enter the pocket 3 in the table 2 to rest upon the negative and sensitized sheet supported therein on the transparent bed-plate 4. 46 designates lift-springs fixed at their rear ends to the table 2 in a position back of the flexible hinge 42. The forward free ends of these lift-springs extend to the rear pressure-back section 43 and are slidably connected to said section by passing through loops 47, secured to said section. Secured to the table 2 at the rear of the pockets 3 therein is a bracket 48, in which is swiveled the lower end of a pivot-post 49, the upper end of which is screw-threaded and bears an adjustment thumb-nut 50.

51 is a slide-block loosely fitted to the pivot-post 49 (see Fig. IV) and having laterally-projecting pivot-stems 52. The pivot-stems 52 receive the pivotal connection of a rear tubular lever-section 53, onto which telescopes a tubular forward lever-section 54. Passing through the rear lever-section is a cross-pin 55, and passing through the forward lever-section 54 is a cross-pin 56.

57 is a retractile spring situated in the telescoping levers 53 and 54 and having its ends connected to the cross-pins 55 and 56, passing therethrough.

58 designates handles projecting from the forward lever-section 54. (See Figs. I and III.) At the front end of the lever-section 54 is a downwardly-extending arm 59, to which is adjustably connected a catch-hook 60, that is adapted for movement to the catch-hook 40, hereinbefore referred to. The hook 60 is by the means stated adjustably connected to the lever-section 54 to provide for its adjustment with respect to said lever and necessitate greater or diminished travel of said lever-section when the catch-hook 60 is to be engaged with the catch-hook 40 in a manner to be hereinafter referred to.

61 is a leaf pressure-spring pivotally connected intermediate of its ends to the rear lever-section 53 by a clip 62, that is held to said section by the cross-pin 55, before mentioned. In the ends of the pressure-spring 61 are seated slide-pins 63, that are provided with knobs 64. (See Fig. VII.) These slide-pins pass through slots 65 in keepers 66, carried by the rear pressure-back section 43, in which they operate in the flexing of the spring 61 to travel transversely of the keepers to permit the flexing of the spring, while held from escape from the keepers by the knobs 64, which are positioned beneath the keepers.

67 is a clip or saddle fitted to the forward lever-section 54 and in which the central portion of a forward pressure-spring 68 is held. The arms of this last-named pressure-spring extend to keepers 69, carried by the forward pressure-back section 44, and they contain slide-pins 70 of similar shape to those, 63, in the rear pressure-spring 61 and which operate in the keepers 69 in the same manner as the pins 63 operate in the keepers 66.

72 designates a spring by which the treadle 23 and the mechanism connected therewith, including the rock-shafts 14 and 15 and the blinds 17 carried thereby, are returned to normal positions after the treadle has been depressed to permit the passage of light from the reflector-box for the impression of the

image on the negative beneath the pressure-back onto the sensitized sheet associated therewith.

In the practical use of my printing-machine the operation is as follows: The lamp 8 in the reflector-box is kept constantly burning, and the blinds 17 are normally in the horizontal closed position seen in Figs. II and III, thereby excluding rays of light from the boxing 11, except the non-actinic rays that pass through the blinds, which are translucent, as hereinbefore stated, for the purpose mentioned. With the pressure-back, consisting of the sections 43 and 44, in the elevated position seen in dotted lines, Fig. III, the operator places a negative in position on the transparent bed-plate 4 in the table-pocket 3 and lays thereon a sensitized sheet onto which he desires to impress the image of said negative. Then holding the negative and sensitized sheet in position with the fingers of one hand he draws the rear pressure-back section 43 forwardly with the other hand until it rests on the sensitized sheet to hold it in position, when the hand by which it was previously held is withdrawn therefrom. During this part of the operation the operator may constantly observe that the sensitized sheet is properly positioned on the negative by reason of passage of non-actinic rays of light through the blinds 17 from the reflector-box 6. Now by a pull upon one or both of the handles 58, carried by the forward section of the telescoping lever 53 54, said lever is elongated, and the forward pressure-back section 44 is thus lowered into the table-pocket 3 to press against the negative and sensitized sheet beneath it, at which time the pressure-back is yieldingly held to the negative by the pressure-springs 61 and 68, which are depressed by the telescoping lever, and when the lever has been fully drawn down the catch-hook 60, carried thereby, engages with the catch-hook 40 to retain the pressure-back in lowered position. The degree of pressure exerted by the pressure-spring against the pressure-back is obtained by adjustment of the thumb-nut 50 to lower the position of the slide-block 51 on the post 49 and the adjustment of the catch-hook 60 with respect to the lever-carried arm 59. The parts are now in condition for exposure to secure a print from the negative beneath the pressure-back, and the operator depresses the treadle. On such depression of the treadle the crank-arms 14′ and 15′, connected together and united to the treadle, as described, are moved in opposite directions to rotate the rock-shafts 14 and 15 and lower the blinds 17 simultaneously, thereby permitting passage of rays of light through the diffusing-plate 13 and transparent bed-plate 4 to reach the negative on said last-named plate. When in the judgment of the operator the exposure has been sufficient, the pressure upon the treadle 23 is relieved, and the treadle and the parts connected thereto return to normal positions under the action of the spring 72, thereby closing the blinds 17 to stop the exposure. As the blinds are opened the finger 24, carried by the rock-shaft 15, is rotated therewith, and the cam-lug 25 on said finger swings downwardly and out of engagement with the trip-arm 34, as seen in dotted lines, Fig. V, in which action the trigger 32 is moved on its pivot without affecting the release-lever 26, by which it is carried, and when said cam-lug becomes disengaged from the trip-arm the trigger 32 is returned to normal position by the spring 37 and bears against the stop 36. When the blinds 17 are returned to closed position under the action of the treadle-operated mechanism of the machine, the finger 24, carried by the rock-shaft 15, is moved upwardly into engagement with the trip-arm 34 of the trigger 32 and bears thereagainst, as shown by dotted lines, Fig. V. Continued movement of said finger causes said trip-arm to be elevated and carry therewith the release-lever arm 28 and swing said lever-arm upwardly and the lever-arm 29 downwardly against the action of the spring 31, connected thereto. As a consequence the pull-rod 38 is drawn downwardly, thereby swinging the lower catch-hook 40 out of engagement with the upper lever-carried catch-hook 60 to free the last-named hook. As a result of such freeing of the hook 60 the forward section 54 of the telescoping lever, by which the pressure-back is depressed, is drawn downwardly under the action of the spring 57, connecting it to the rear lever-section 53, so that the forward pressure-back section 44 is drawn into an angle with respect to the rear pressure-back section 43, and at the same time both of the pressure-back sections are elevated into the position seen in dotted lines, Fig. III, under the action of lift-springs 49, that are fitted to the rear pressure-back section. The pressure-back is thereby raised into a position that exposes the negative-receiving pocket in the table of the machine for the removal of the print-sheet or the print-sheet and negative previously in the machine, and the parts are all in a position at such time for the next printing operation.

I claim as my invention—

1. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a reflector-box, a pressure-back, means for holding said pressure-back to the negative, and a lift-spring for elevating said pressure-back after it is freed, substantially as set forth.

2. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a pressure-back for movement to the

negative, a lever for holding said pressure-back to the negative, means for holding said lever, springs interposed between said lever and said pressure-back, and a lift-spring for elevating said pressure-back and lever after said lever is freed, substantially as set forth.

3. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a pressure-back for movement to the negative, a lever for holding said pressure-back to the negative, springs interposed between said lever and said pressure-back, and means by which said springs are slidably connected to said pressure-back to permit flexing of the springs, substantially as set forth.

4. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a pressure-back for movement to the negative, a lever for holding said pressure-back in lowered position, springs interposed between said lever and said pressure-back, slide-pins carried by the springs, knobs carried by said slide-pins, and slotted keepers carried by said pressure-back in which said slide-pins have sliding engagement, substantially as set forth.

5. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a pressure-back for movement to the negative, means for holding said pressure-back to the negative, and a lift-spring for elevating the pressure-back when its holding means is freed, substantially as set forth.

6. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a pressure-back consisting of sections hinged together, a sectional lever for holding said pressure-back to the negative, and means for holding said lever when the pressure-back is resting against the negative, substantially as set forth.

7. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a pressure-back consisting of sections hinged together, a sectional lever for holding said pressure-back to the negative, means for holding said lever when the pressure-back is resting against the negative, and means for contracting said lever when the pressure-back is freed, substantially as set forth.

8. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a pressure-back consisting of sections hinged together, a sectional lever for holding said pressure-back to the negative, means for holding said lever when the pressure-back is resting against the negative, and means for contracting said lever when the pressure-back is freed, substantially as set forth.

9. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for holding a negative in said opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a pressure-back for movement to the negative in said opening, a lever, springs carried by said lever arranged to press against said pressure-back, and means for adjusting said lever with respect to said pressure-back, substantially as set forth.

10. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, means for supporting a negative in said opening, a sectional pressure-back, a lever composed of telescoping sections having connection with said pressure-back, and swingingly connected to said table, and a spring connecting the sections of said lever and through the medium of which its length is contracted, substantially as set forth.

11. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, a reflector-box, means for controlling the passage of light from said reflector-box to said negative-receiving opening, a sectional pressure-back, a lever connected to said table and having engagement with said pressure-back, means for holding said lever when said pressure-back is resting against the negative, means for operating said light-controlling means, and means operating through said last named means for releasing said pressure-back lever, substantially as set forth.

12. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, a reflector-box, blinds for controlling the passage of light from said reflector-box to said negative-receiving opening, mechanism for operating said blinds, a pressure-back for movement to said negative-

receiving opening, a lever connected to said table and having engagement with said pressure-back, a catch for engaging said lever, a release-lever having connection with said catch, and means carried by said blind-operating means for actuating said release-lever, substantially as set forth.

13. In a photographic-printing machine, the combination of a table provided with a negative-receiving opening, a reflector-box, blinds for controlling the passage of light from said reflector-box to said negative-receiving opening, mechanism for operating said blinds, a pressure-back for movement to said negative-receiving opening, a lever connected to said table and having engagement with said pressure-back, a catch for engaging said lever, a release-lever having connection with said catch, means carried by said blind-operating means for actuating said release-lever, and a finger carried by said blind-operating means to engage said release-lever, substantially as set forth.

In testimony whereof I have hereunto set my hand this 30th day of May, 1903.

FRED PARK STEVENS.

In presence of—
E. S. KNIGHT,
BLANCHE HOGAN.