

W. F. FOLMER.  
 PHOTOGRAPHIC PRINTING MACHINE.  
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Patented June 19, 1917.

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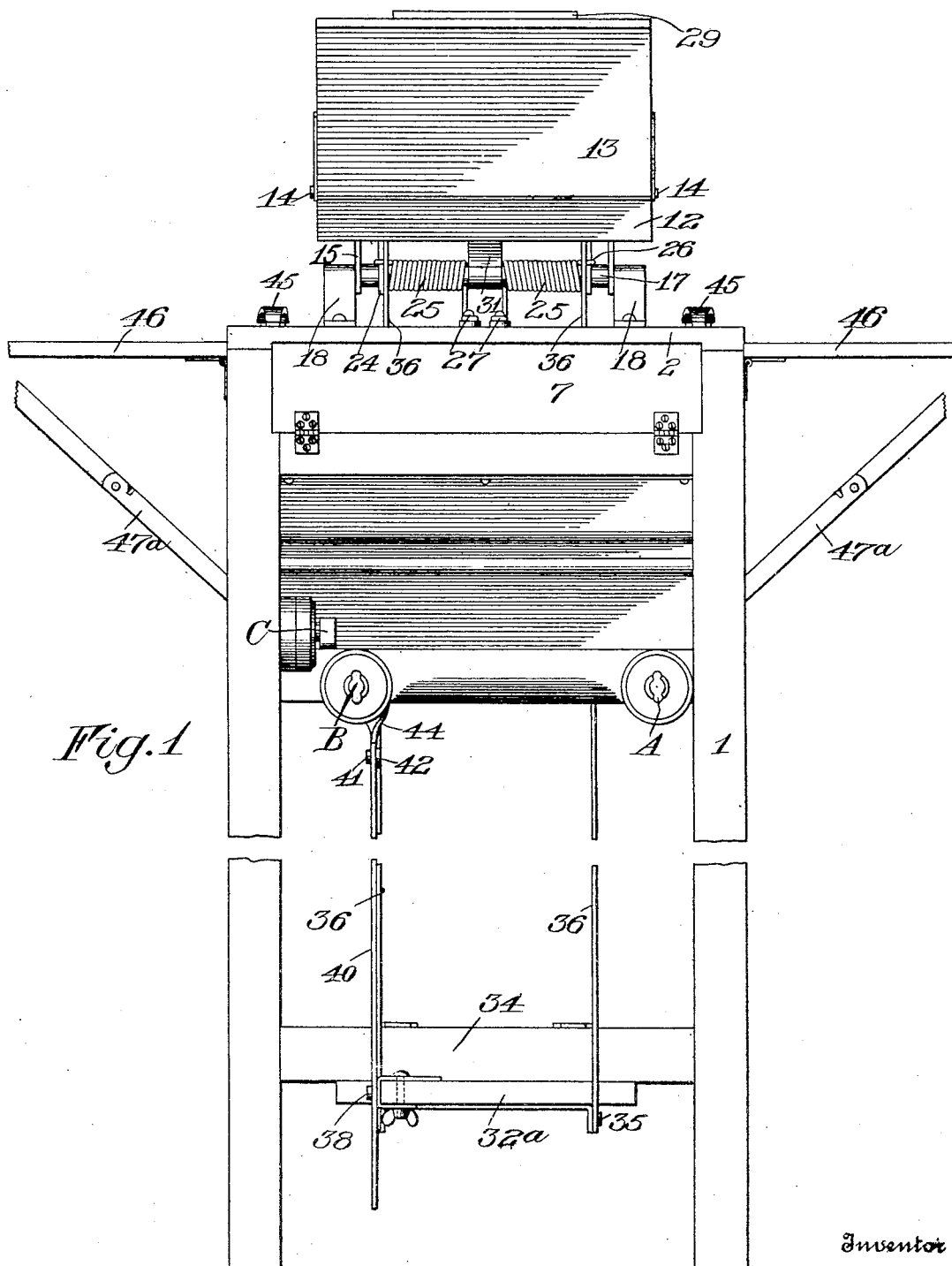


Fig. 1

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4 SHEETS—SHEET 3.

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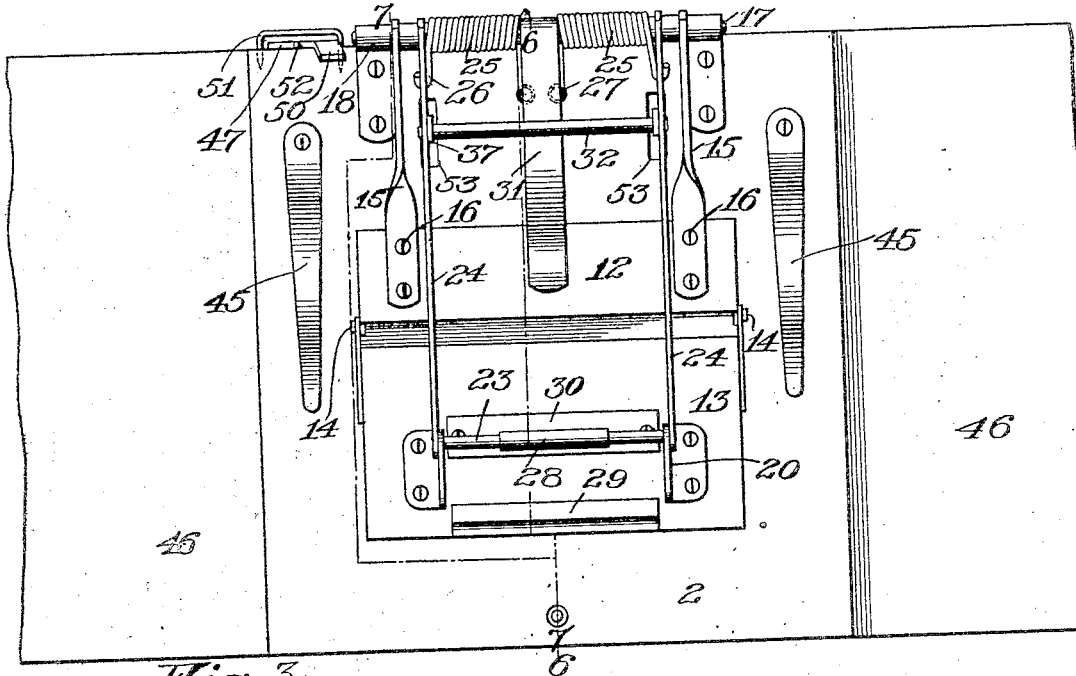


Fig. 3

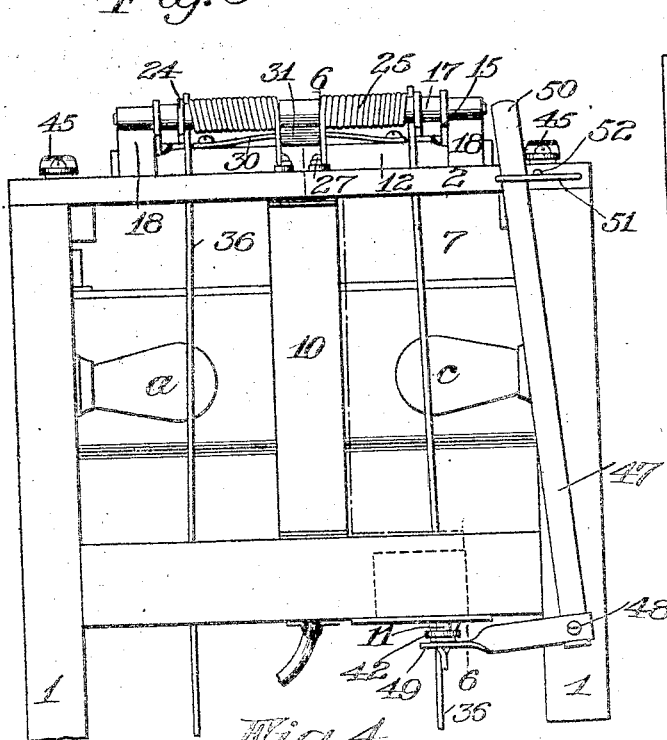


Fig. 4

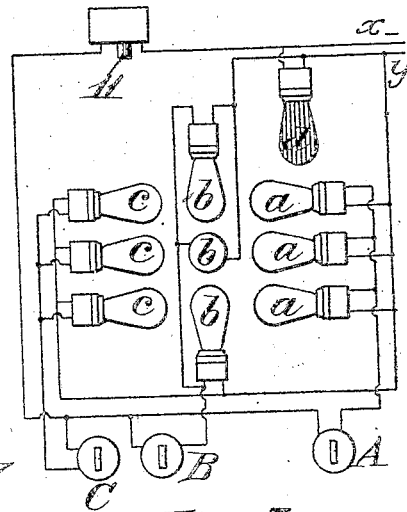


Fig. 5

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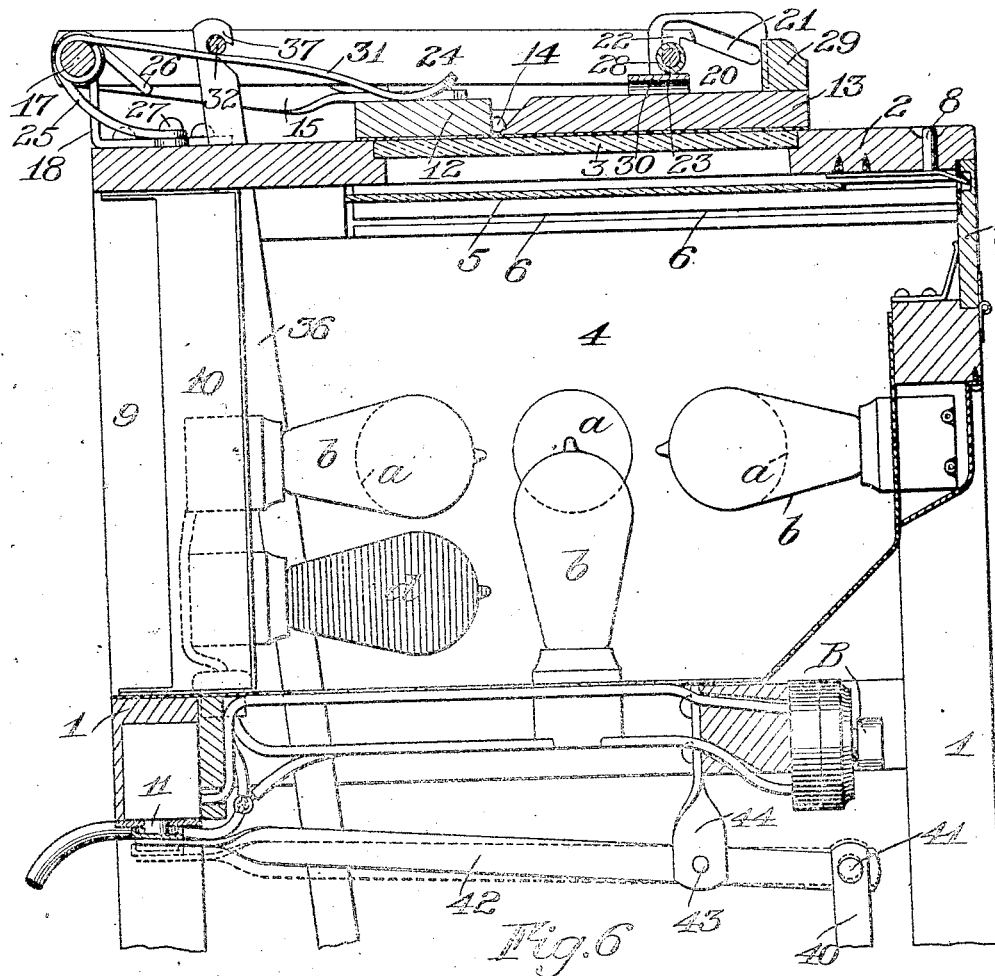


Fig. 6

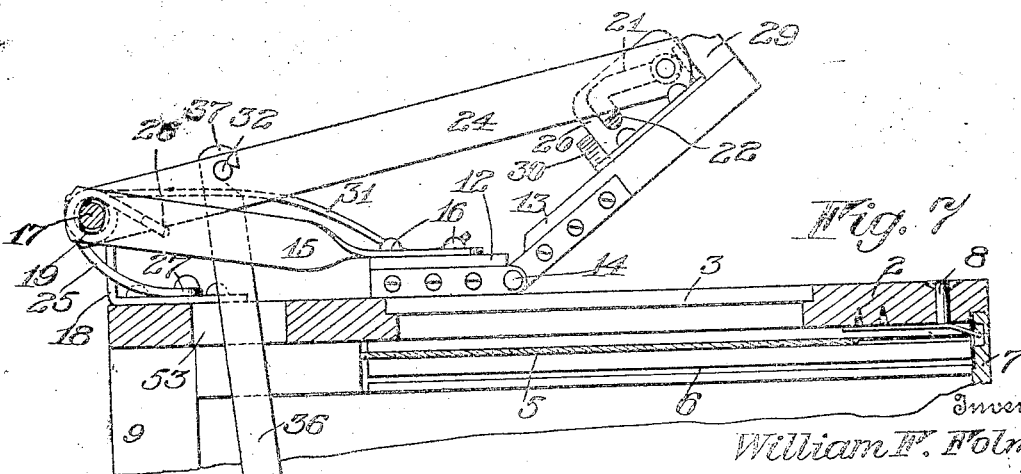


Fig. 7

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# UNITED STATES PATENT OFFICE.

WILLIAM F. FOLMER, OF ROCHESTER, NEW YORK, ASSIGNOR TO EASTMAN KODAK COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

## PHOTOGRAPHIC-PRINTING MACHINE.

1,230,392.

Specification of Letters Patent.

Patented June 19, 1917.

Application filed December 18, 1914. Serial No. 877,852.

*To all whom it may concern:*

Be it known that I, WILLIAM F. FOLMER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Photographic-Printing Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and to the reference-numerals marked thereon.

My present invention relates to photography and more particularly to photographic printers, and it has for its object to provide a simple, durable and efficient machine for making contact prints from negatives, particularly where it is desired to strike off rapidly a large quantity of prints from a single negative and to these ends, the improvements are directed in part to the means for pressing the negative and the sensitized paper into intimate contact with each other during exposure to the light. With these and other objects in view, the invention consists in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a front elevation of a photographic printing machine, constructed in accordance with and illustrating one embodiment of my invention;

Fig. 2 is a side elevation of the machine with the parts in the same position as in Fig. 1, except that the table leaves at the sides are lowered;

Fig. 3 is a top plan view showing the printing table and platen with the latter in its operative position;

Fig. 4 is a rear elevation of the upper portion of the machine;

Fig. 5 is a diagrammatic view of the circuit arrangements of the electric lamps contained in the light box;

Fig. 6 is an enlarged vertical section through the upper portion of the machine taken substantially on the lines 6—6 of Figs. 3 and 4, and

Fig. 7 is a view corresponding to a position of Fig. 6 with the platen in another position, the section, however, being taken on the line 7—7 of Fig. 3.

Similar reference numerals throughout the several figures indicate the same parts.

The machine illustrated is of the type comprising a translucent table, a source of light beneath the table, a platen above the table beneath which the negative and printing paper are inserted in superposed relationship, and a treadle beneath the table for operating the platen into and out of contact with the work and table. Referring more particularly to the drawings, 1 indicates a stand or frame, the top of which constitutes a table 2 having a transparent panel 3 of heavy glass in the center thereof. Below the table is arranged a suitable light box or chamber 4 and interposed between the latter and the panel 3 are one or more diffusion screens 5 that may be detachably inserted or removed in guides 6 through a small door 7 at the front controlled by a latch 8. This door may also be used for the purpose of inspecting the interior of the light box from the front. The rear of the chamber 4 except for a lamp supporting conduit 10 is left open as at 9 for ventilating purposes and also to permit the insertion of the hand to manipulate the lamps. The latter are suitably distributed within the light box or chamber and preferably arranged in banks on different circuits controlled by different switches so that different combinations may be turned on for printing light of greater or less intensity. Thus, in the diagrammatic plan of Fig. 5, the lamps *a* on a main circuit *x—y* are controlled by the switch A; the lamps *b* by the switch B and the lamps *c* by a switch C, but all the lamps and the main circuit are controlled by a single plunger switch 11 of suitable construction that projects downwardly from beneath the box and that will be later referred to. The lamp *d* is not controlled by an individual switch, nor by the main switch 11 but is a ruby lamp that is left on all the time and used as a pilot light for giving a harmless working illumination between and during successive operations of the machine.

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Movable into and out of contact with the table 2 in the region of the panel 3 is a swinging platen composed of a heel board 12 and a toe board 13 hinged together at 14 to move relatively within certain limits. The platen is carried by two arms 15 rigidly connected to the heel board 12 at 16 and pivoted on a rod 17 supported in brackets 18 at the rear of the table. The bearings of the arms on the rod are enlarged, as shown at 19 in Fig. 7 so that the arms may be permitted a limited degree of lost motion in addition to their turning movement for a purpose that will later appear.

The toe board 13 is fitted with a pair of bracket plates 20 having inclined guides or cam slots 21 therein terminating in straight portions 22 and operating in these guide slots is a transverse bar 23 connecting a pair of operating arms 24 that are also pivoted on the rod 17, the said arms 24 having a tendency to assume the elevated positions of Figs. 1 and 2 under the influence of springs 25 engaging the arms at 26 and reacting against the table at 27. When so elevated, a rubber buffer sleeve 28 on the rod 23 cooperates with an abutment 29 on the toe board 13 of the platen and holds the latter in the raised or retracted position of Figs. 1 and 2 in which it is out of contact with the table.

Beneath the vertical portions of the guide slots 22 is arranged a leaf spring 30 carried by the toe piece 13 while pivoted to turn freely at a central point on the pivot rod 17 is a normally inactive leaf spring or finger 31, the free end of which engages the heel board 12. This spring comes beneath a second transverse bar 32 on the operating members 24 at a point near their axis of movement.

At the bottom of the stand or frame 1 a foot treadle 32<sup>a</sup> is hinged at 33 to a cross piece 34 of the frame and pivoted thereto on each side at 35 is an actuating rod 36 having a hook 37 at its upper end engaging over the cross bar 32 of the operating member 24. The treadle 32<sup>a</sup> also carries an adjustable stud 38 engaging in a slot 39 in the lower end of a vertically disposed actuating link 40 pivoted at 41 to a lever 42 which in turn is pivoted at 43 on a stationary bracket 44 fixed to the frame 1. The opposite end of the lever engages beneath the plunger switch 11 as clearly shown in Fig. 6.

The operation is as follows:

With a selected number of the lamps *a*, *b*, *c*, sufficient for the desired illumination, put in readiness by closing the individual switches *A*, *B* and *C*, or some of them, and with the platen in the normal retracted position of Figs. 1 and 2, the operator places his negative and print paper together on the table panel 3, holding the negative in position beneath suitable pivoted spring clips 45.

He then depresses the treadle 32<sup>a</sup> which, through the actuating rods 36, lowers the platen operating arm 24. The cross bar 23 at the outer end of the arms remains against the abutment 29 on the toe board until the platen swings downwardly with its two hinged parts maintaining their angular relationship far enough for the heel board 12 to squarely engage the face of the table, as shown in Fig. 7, so that the rear edges of the negative and paper are preliminarily clamped by such heel board firmly against the table. Continued downward movement of the operating members 24 causes the outer cross bar 23 to ride the cam slot 21 until the toe board 13 is also flat against the table, smoothing out the remaining portion of the work, though neither portion of the platen is thus far being firmly pressed against the table. At this point, however, the cross bar 23 reaches the vertical portion 22 of each guide slot 21 and a further slight pressure on the treadle carries it straight downward so that it engages and compresses the leaf spring 30, thus exerting a strong but yielding pressure on the toe board. At the same time, the pivoted spring finger 31 is being engaged by the rear cross bar 32 and through the medium of this normally inactive spring, the operating member exerts a strong yielding pressure on the heel board 12 also so that the work is firmly and flatly held against the table.

As soon as the double spring pressure just described has become effective against the platen, the stud 38 on the treadle 32<sup>a</sup> reaches the lower end of the slot 39 and, through the medium of the link 40 and lever 42, actuates the plunger switch 11 to close the circuit through such of the lamps as have been previously selected and the printing proceeds.

The treadle 32<sup>a</sup> is held down during the period of exposure, but the instant pressure thereon is released and as a result of the first fractional return travel of the parts indicated in dotted lines in Fig. 6, the plunger switch 11 which is spring actuated, is permitted to open turning off the light. The operating member 24 has not, in the meantime, been able to move far enough to wholly relieve the tension on the leaf springs 30 and 31 and in this way, the turning off of the lights is insured before the work has been released sufficiently to allow of any blurring in the print. When the treadle is fully released, the platen is elevated to its normal position under the influence of the springs 25 and the print is removed.

In order that the operator may work rapidly through a convenient disposition of his materials, I provide folding leaves 46 at each side of the table 2 on one of which the fresh sheets of printing paper may be piled

and upon the other of which the finished prints may be placed. These leaves are held extended by folding braces 47<sup>a</sup>.

While examining and adjusting the negative for a series of prints and for adjusting the intensity of the light, it is desirable that the lamps be turned on for a continuous period while the platen is in raised position. To these ends, I provide an additional actuator for the plunger switch 11 that is best shown in Fig. 4 and which comprises a bell crank lever 47 pivoted to the frame at 48 and engaging at 49 beneath the end of the switch actuating lever 42 to operate the plunger through the medium of said lever. A handle 50 at the upper end of the lever projects through a guide 51 and above the table to be accessible to the operator. When the lever is swung over to the right in Fig. 4 behind a detent 52, it holds the switch 11 closed, irrespective of the position of the treadle and the latter does not interfere with its use because of the sliding connection of the treadle with the automatic actuating mechanism 40—42 at 38 and 39.

It will be noted that the actuating rods 36 for the operating members 24 pass through the light box 4, emerging through slots 53 in the table 2 so that they are housed within and protected by the casing and there are no moving parts exposed on any side of the machine.

I claim as my invention:

1. In a photographic printer, the combination with a printing table and a swinging platen board adapted to cooperate therewith, of a pivoted operating member arranged to turn on a different center from the platen board, for forcing the latter against the table, said member having a connection with the platen board comprising a member having an L-shaped cam slot permitting sliding movement of the member during the latter's movement on its pivot and a relatively transverse movement toward the platen board while the latter is in cooperation with the table and a resilient member flexed between the operating member and the platen board during said last mentioned movement.

2. In a photographic printer, the combination with a printing table and a swinging platen adapted to cooperate therewith and comprising a heel board and a toe board hinged together, of a pivoted operating member for forcing the platen against the table, said member having a sliding connection with the toe board, and abutments on the latter and the operating member adapted to cooperate when the operating member is retracted to carry both the heel board and toe board of the platen away from the table.

3. In a photographic printer, the combination with a printing table and a swinging platen adapted to cooperate therewith and

comprising a heel board and a toe board hinged together, of a pivoted operating member for forcing the platen against the table, said member having a sliding connection with the toe board, permitting sliding movement of the member during the relative movement of the two boards on their hinge and said member also having a relatively transverse movement toward the toe board while the latter is in cooperation with the table, a resilient member interposed between the operating member and the toe board during said last mentioned movement, and abutments on the toe board and the operating member adapted to cooperate when the operating member is retracted to carry both the heel board and the toe board of the platen away from the table.

4. In a photographic printer, the combination with a printing table and a swinging platen adapted to cooperate therewith and comprising a heel board and a toe board hinged together, of pivoted supporting arms for the platen connected to the heel board and an operating member arranged to swing on the same center as the supporting arms and movably connected to the toe board.

5. In a photographic printer, the combination with a printing table and a swinging platen adapted to cooperate therewith and comprising a heel board and a toe board hinged together, of an operating member pivoted to the table and operatively connected with one of said parts to press it against the table and a normally inactive spring independent of such connection cooperating with the other part and adapted to be placed under tension by the operating member.

6. In a photographic printer, the combination with a printing table and a swinging platen adapted to cooperate therewith and comprising a heel board and a toe board hinged together, of a pivoted supporting arm connected to the platen through the medium of the heel board, a normally inactive spring cooperating with the latter and a pivoted operating member on the table cooperating with the toe board to press it against the table, and arranged to simultaneously place the spring under tension.

7. In a photographic printer, the combination with a printing table and a swinging platen adapted to cooperate therewith and comprising a heel board and a toe board hinged together, of a pivoted supporting arm for the platen connected to the heel board, an operating member arranged to swing on the same center as the supporting arm and movably connected to the toe board to press it against the table and a normally inactive spring arm arranged to turn on the same center as the supporting arm and the operating member and cooperating with the heel board, said spring arm being adapted

to be placed under tension to press the heel board against the table by the operating member.

8. In a photographic printer, the combination with a printing table and a swinging platen adapted to cooperate therewith and comprising a heel board and a toe board hinged together, of pivoted supporting arms for the platen connected to the heel board and means for resiliently forcing both platen boards against the table, the pivotal bearing of the supporting arms being laterally enlarged to permit a degree of lost motion on the part of the heel board whereby it may flatten itself against work pieces of different thicknesses interposed between it and the table.

9. In a photographic printer, the combination with a printing table and a light box beneath the same, of a platen adapted to cooperate with the table, an operating member therefor arranged above the table, a treadle arranged beneath the light box and an actuating member connected to the treadle and to the operating member and extending through the light box and table.

10. In a photographic printer, the combination with a printing table, an electric lamp arranged beneath it and having circuit connections, a switch in said circuit, a platen above the table adapted to cooperate therewith and a treadle, of an actuating

member for the platen connected to the treadle and means independent of said actuating member connected to the treadle for throwing the switch.

11. In a photographic printer, the combination with a printing table, an electric lamp arranged beneath it and having circuit connections, a switch in said circuit, a platen above the table adapted to cooperate therewith and a treadle, of an actuating member for the platen connected to the treadle and an operating member for the switch connected to the treadle to be moved thereby during only a part of the travel of the treadle.

12. In a photographic printer, the combination with a printing table, an electric lamp arranged beneath it and having circuit connections, a switch in said circuit, a platen above the table adapted to cooperate therewith and a treadle, of an actuating member for the platen connected to the treadle, an operating member for the switch connected to the treadle to be moved thereby during a part of the travel of the treadle and a second operating member for the switch adapted to be actuated independently of the treadle.

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