Jan. 2, 1923.

1,440,622

C. H. OWEN.

PHOTOGRAPHIC PRINTING MACHINE.

FILED AUG. 29, 1921.

FIG. 1.

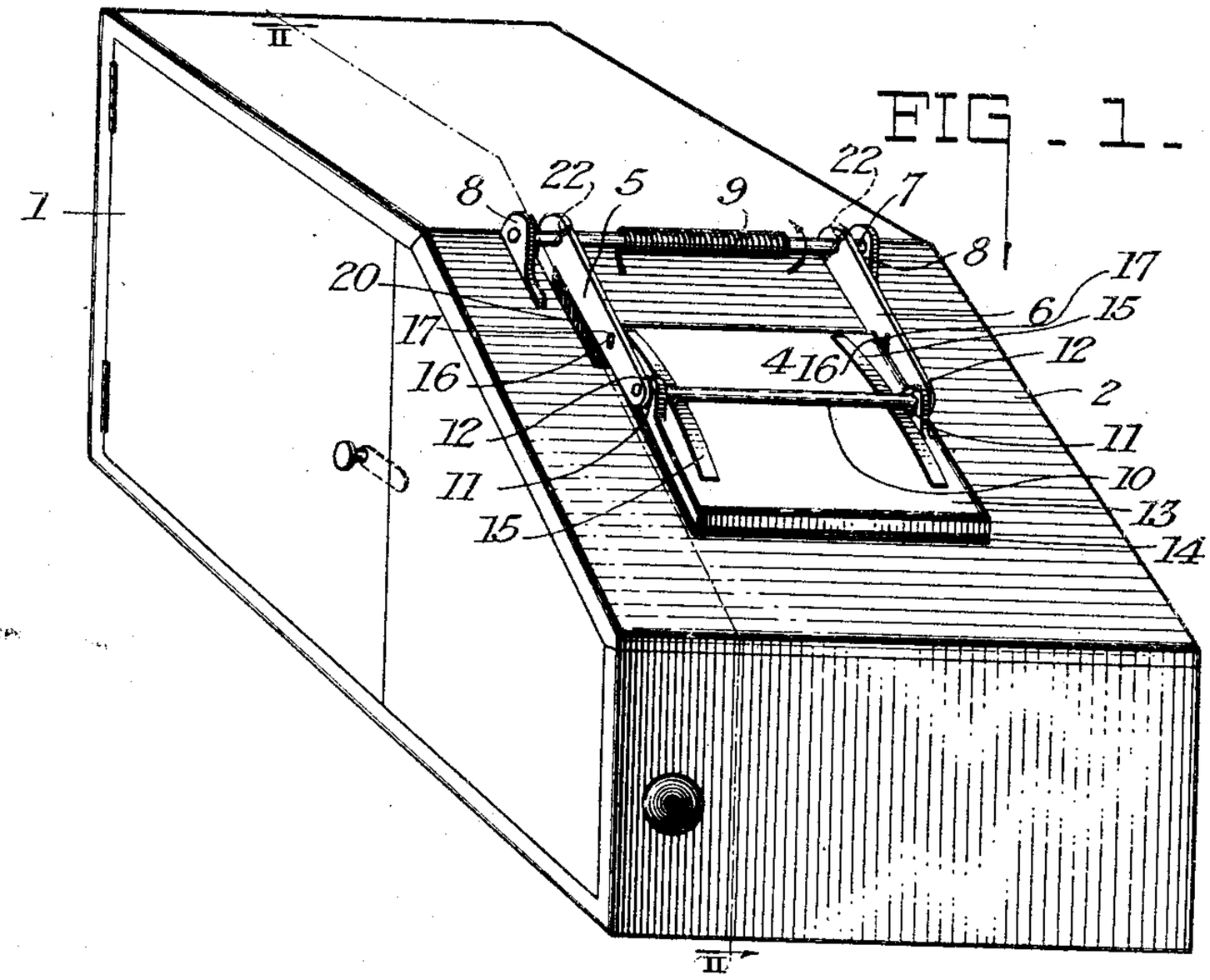


FIG. 2.

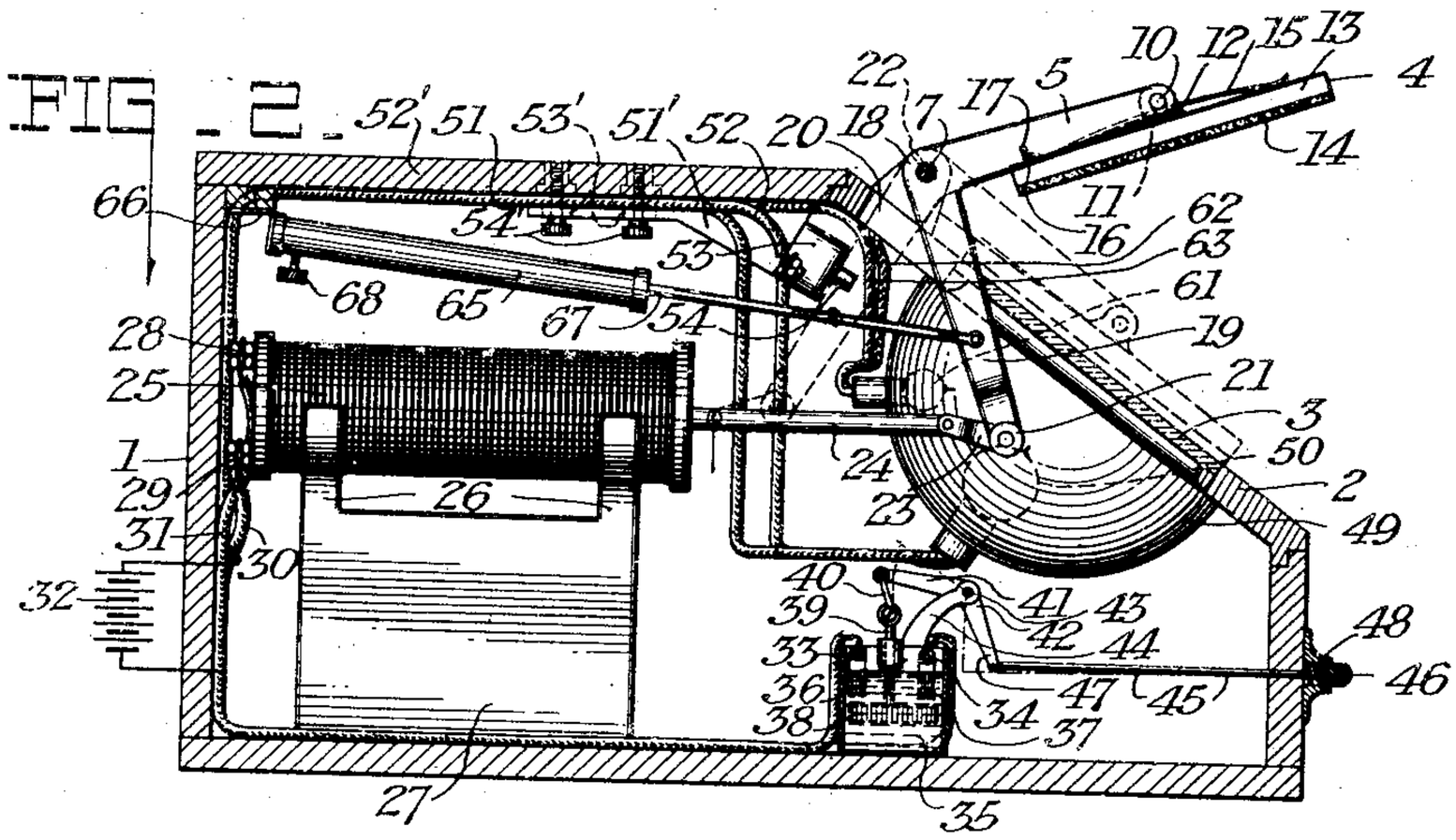
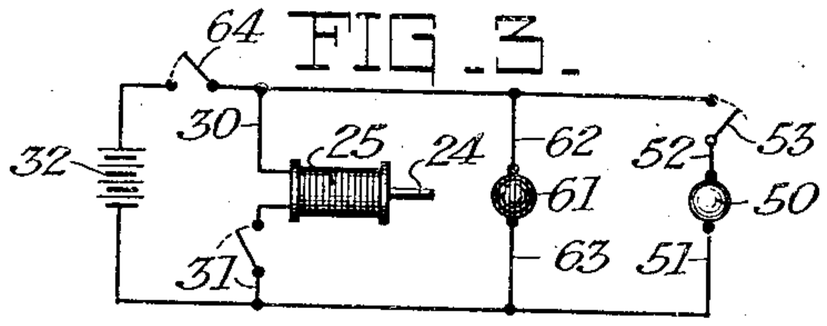


FIG. 3.



WITNESS

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Patented Jan. 2, 1923. 1,440,622

UNITED STATES PATENT OFFICE.

CLARENCE H. OWEN, OF ROCHESTER, NEW YORK, ASSIGNOR TO EASTMAN KODAK COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

PHOTOGRAPHIC-PRINTING MACHINE.

Application filed August 29, 1921. Serial No. 496,349.

To all whom it may concern:

Be it known that I, CLARENCE H. OWEN, a citizen of the United States of America, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Photographic-Printing Machines, of which the following is a full, clear, and exact specification.

This invention relates to photography, and more particularly to photographic printing machines, and has for its object to provide a simple, compact and durable machine for rapidly making contact prints from either glass or film negatives. To these ends the improvements are directed particularly to the means for automatically actuating the platen which presses the paper against the negative; to means for varying the duration of the printing time; to means for automatically retaining the platen in operative position; and to means for accomplishing the steps of lowering the platen, lighting the lamp, holding the platen closed and finally raising the platen with the least possible effort upon the part of the operator. 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 drawing, in which like characters designate like parts throughout:

Fig. 1 is a perspective view of a printing machine constructed in accordance with and illustrating one embodiment of my invention;

Fig. 2 is a section on the line II—II of Fig. 1; and

Fig. 3 is a wiring diagram.

The printing machine consists of a cabinet 1 having a slanting front or frame 2 in which a printing panel 3 is mounted, the panel being constructed preferably of heavy glass, as shown, mounted flush with the frame 2. A platen designated generally as 4 is carried by arms 5 and 6 and can be moved to and from panel 3 as arms 5 and 6 turn with a shaft 7, which is carried in brackets 8 affixed to front 2. A coiled spring 9 normally tends to hold the platen raised, as shown in Fig. 2. the force applied being in the direction of the arrow in Fig. 1. The outer ends of levers 5 and 6 are connected by a rod 10 which projects through slots 11 in lugs 12, cast on the platen back 13. This is faced with felt 14 or other soft material. Leaf springs 15—15 pass under rod 10 so as to keep the rod normally at the top of slots 11, these springs being compressed when the platen is lowered upon the panel in operative position. Pins 16 on the rear of platen back 13 are loosely fitted into slots 17 of arms 5 and 6, and are merely for preventing platen 4 from rotating about rod 10. As the arms are lowered a continuation of the closing movement (that of lowering the platen upon the panel) compresses springs 15—15 which both insures proper contact between a negative and printing paper and allows a slight universal movement of the platen with respect to the panel, thus automatically caring for the varying thicknesses of different plates, films and papers.

One of the lever arms, 5, is part of a bell crank lever 18, the other arm 19 of which passes through a slot 20 in the frame 2 of the cabinet, there being a yoke 21 on the end of arm 19. Both of the arms 5 and 6 are pinned to shaft 7 by pins 22. In order to actuate the platen I connect arm 19 by means of a link 23 to a plunger 24 which forms the core of solenoid 25. This solenoid is carried by yokes 26—26 attached to a supporting block 27. The solenoid terminals 28 and 29 are attached to wires 30 and 31, and are connected to a source of power, diagrammatically illustrated at 32. Both wires 30 and 31 have one terminal at an oil switch, being fastened thereto by nuts 33 and 34. The oil tank 35 supports terminals 36 and 37, against which a switch bar 38 contacts when raised by rod 39, link 40 and arm 41 of bell crank lever 42. This lever is pivoted at 43 to a support 44 extending up from oil tank 35.

An actuating rod 45 connects push button 46 to arm 47 of bell crank lever 42, and a spring 48 keeps the button pressed outwardly. To energize the solenoid it is only necessary to push the button. I find an oil switch convenient because it prevents arcing and thus reduces the fire hazard, but any other convenient type of switch may be used in its place.

Under panel 3 there is a reflector 49 adapted to cast the light rays from lamp 50

evenly over the printing panel. This lamp is connected to the source of power 32 by wires 51 and 52 the latter passing through a switch 53. A plunger 54 makes the circuit when pressed inwardly, and is of the variety which springs outwardly automatically. As the plunger 54 is in the path of arm 19 of bell crank lever 18, the lamp 50 is lighted each time the platen is lowered. The base block 51′ is adjustable along the top 52′ of cabinet 1, as it is slotted at 53′ and nuts 54′ can be loosened to permit of sliding the block 51′. In this way the lamp timing can be synchronized with the platen, the parts being adjusted so that lamp 50 will be lighted after proper contact is secured between the platen and printing frame.

A second red or pilot lamp 61 can be connected by wires 62 and 63 so as to burn continuously, thus affording a safe light by which the negative, paper and masks can be adjusted over panel 3. Switch 64 (Fig. 3) breaks the circuit for this lamp and the other circuits above described.

To eliminate the jar due to the solenoid rapidly moving the platen, I provide a shock absorber in the form of a dash pot 65 hinged at 66 to the cabinet 1. Plunger 67 is pivoted to arm 19 of the bell crank lever and its speed of movement into the dash pot is regulated by the adjustable vent 68.

With the machine as above described an operator needs only to adjust the paper and negative and press the button to lower the platen, light the lamp, and maintain printing contact, and to release the button to raise the platen and extinguish the printing lamp. The time necessary for printing is controlled by merely holding in the push button. I contemplate providing a complete printer with negative clamps, masks, etc., but as these form no part of the present invention, they are omitted from the drawing.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a photographic printing machine, the combination with a support, and a printing panel mounted thereon, of a platen pivoted to the support to move to and from the printing panel, means for moving the platen, a solenoid, said means being actuated by the solenoid, an electric circuit including a hand switch and the solenoid, enabling an operator to lower the platen and hold it in contact under pressure upon the printing panel by making the circuit with the switch.

2. In a photographic printing machine, the combination with a support, and a printing panel mounted thereon, of a platen pivoted to the support to move to and from the printing panel, a lever for operating the platen, a solenoid connected to said lever for moving the platen in one direction, a spring for moving the platen in the opposite direction, a manually controlled switch, a source of electric energy connected in circuit with said solenoid and switch, whereby the operator can, by making the circuit with the switch, lower the platen and hold it against the printing panel at will, and can, by breaking the circuit, raise the platen from the printing panel at will.

3. In a photographic printing machine, the combination with a frame and printing panel mounted thereon, of a platen pivoted to the frame and movable to and from an operative position with respect to the printing panel, a solenoid for moving the platen into an operative position, a printing lamp adapted to be lighted when the platen is in operative position, and means including an electric circuit and a hand switch for an operator to manually control at will the duration of the exposure by holding the switch in position to make the circuit, thus energizing the solenoid and causing it to lower the platen to an operative position in which the printing lamp is lighted.

4. In a photographic printing machine, the combination with a frame and a printing panel mounted thereon, of a platen hinged to move to and from an operative position over the panel, a lever connecting the platen to the frame, with a spring for moving the platen in one direction, and a solenoid for moving the platen in the other direction, a printing lamp adapted to be lighted when the platen has reached its operative position, an electric circuit including the solenoid, with a single manually operated switch by which an operator controls at will each step of the entire cycle of movement of the machine, making the circuit to first, lower the platen to the printing panel, second, to hold the platen under pressure in its operative position, and finally breaking the circuit to release the platen and return it to its inoperative position.

5. In a photographic printing machine, the combination with a frame and a printing panel mounted thereon, of a platen movable to and from an operative position over the panel, a lever for moving the platen, a solenoid for moving the lever, there being a shock absorber for limiting the shock of the suddenly applied force of the solenoid upon the platen as it is moved to a position over the panel.

6. In a photographic printing machine, the combination with a frame and a printing panel mounted thereon, of a platen hinged to the frame movable to and from an operative position with respect to the printing frame, a platen moving means including a solenoid, there being a solenoid controlling means comprising a dash pot for limiting the force and speed of operation of the solenoid as it moves the platen.

7. In a photographic printing machine,

the combination with a printing panel, of a platen hinged to move to and from an operative position in contact with the printing frame, a lever for moving the platen, and a solenoid for moving the lever, a push button switch for controlling the solenoid through an electric circuit, enabling an operator to depress the button to lower the platen and to hold it in its operative position at will, and to release the push button to release the platen from its operative position at will.

8. In a photographic printing machine, the combination with a frame, a printing panel mounted in the frame, of a platen hinged to the frame to move to and from an operative position over the printing panel, a solenoid for actuating the platen in one direction and a spring for moving the platen in the other direction, an electric circuit including a source of power, the solenoid, and a manually operated two-contact switch movable to make the circuit by which the movements of the platen are controlled, the switch being moved to make the circuit to lower the platen and hold it under pressure against the printing frame and moved to break the circuit to allow the spring to move it from the printing panel.

9. In a photographic printing machine the combination with a frame having a printing panel mounted therein, of a platen hinged to the frame and movable to and from an operative position over the printing panel, a platen moving means including a solenoid, an electric circuit including the solenoid and a switch, there being connections between the solenoid and the platen to move the latter about its hinge as the solenoid is actuated when the circuit is closed by the switch.

10. In a photographic printing machine, the combination with a frame and a printing panel mounted on the frame, of a platen hinged to the frame and movable to and from an operative position over the frame, platen moving means including a solenoid, and connecting members between the platen and the solenoid, whereby the platen is turned about its hinge when the solenoid is actuated.

11. In a photographic printing machine, the combination with a frame and a printing panel mounted on the frame, of a platen hinged on one side of the frame and movable to and from an operative position over the printing panel, a solenoid including a reciprocating plunger on the other side of the frame, and connections between the solenoid plunger and the platen whereby the reciprocating movement of the plunger will cause the platen to move about its hinge.

12. In a photographic printing machine, the combination with a frame and a printing panel mounted on the frame, of a platen hinged to one side of the frame and movable to and from the printing panel, a spring for moving the platen in one direction, means for moving the platen against the spring action including a solenoid, there being connections between the solenoid and the platen whereby the latter is moved about its hinge against the action of the spring when the solenoid is actuated.

13. A photographic printing machine, comprising a printing panel, a platen movable into printing position on said panel and removable from said panel to clearance position to permit manual access to the space between it and the panel, means, including an electro-magnetic source of motive power, for moving said platen to printing position, holding it in such position, and removing it to clearance position, a control member the actuations of which are manually governed, and connections, including a device for regulating the current to said source between said member and said means which govern the means to move said platen to printing position upon manual actuation of the control member, to remove said platen to clearance position upon further actuation of said member, and to retain said platen in printing position between said actuations.

14. A photographic printing machine, comprising a printing panel, a platen movable into printing position on said panel and removable into clearance position from said panel to permit manual access to the space between said platen and panel, means, including an electro-magnetic source of motive power, for moving said platen to printing position, holding it therein, and removing it to clearance position, a control member movable to different positions, the movements of which are manually governed, and connections including a device for regulating the current to said source between said member and said means which govern said means first to move the platen to printing position when said member is manually moved to one of its positions, then to retain said platen in printing position while the member remains in said one position, and then to remove said platen to clearance position when said member is moved to a different position.

Signed at Rochester, New York, this 24 day of August, 1921.

CLARENCE H. OWEN.