J. WALTER.

MAKE AND BREAK MECHANISM FOR ELECTRICAL CIRCUITS.

APPLICATION FILED APR. 7, 1910.

1,002,887. Patented Sept. 12, 1911.

2 SHEETS—SHEET 1.

FIG. 1.

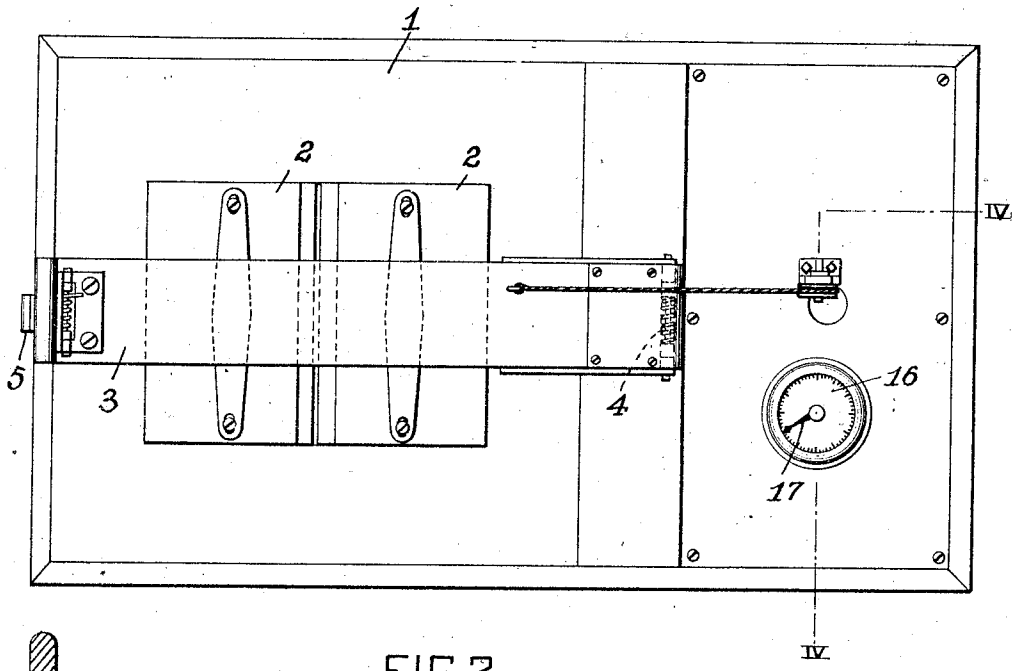
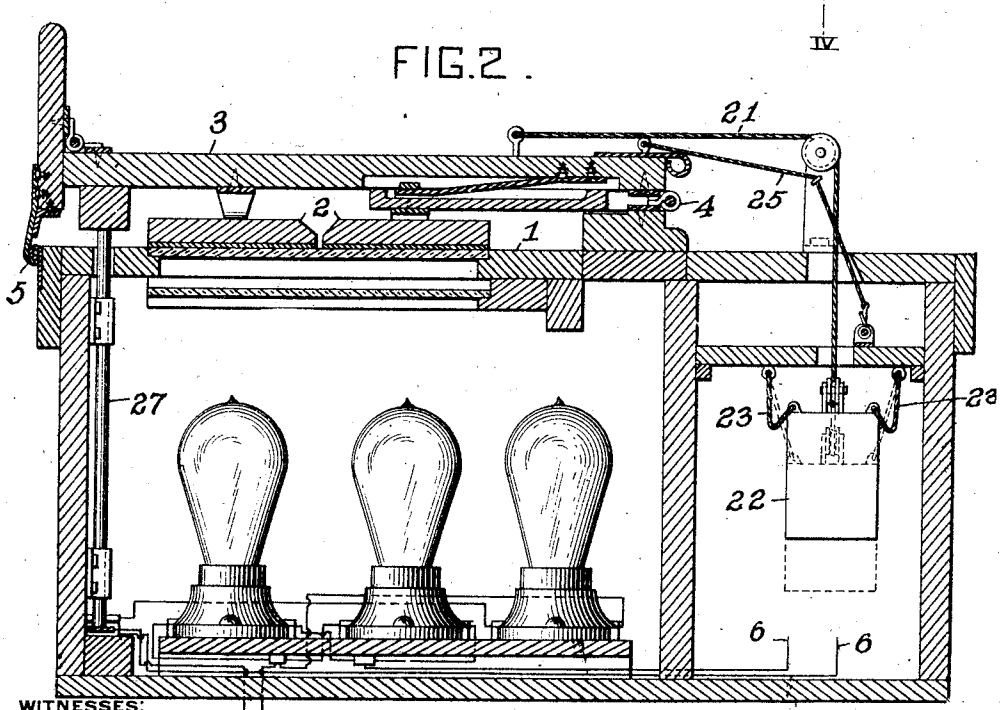


FIG. 2.



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2 SHEETS—SHEET 2.

FIG. 3.

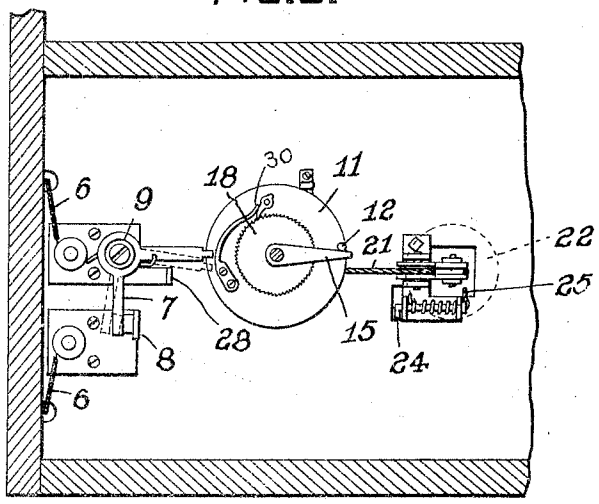


FIG. 5.

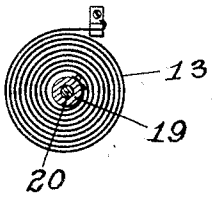
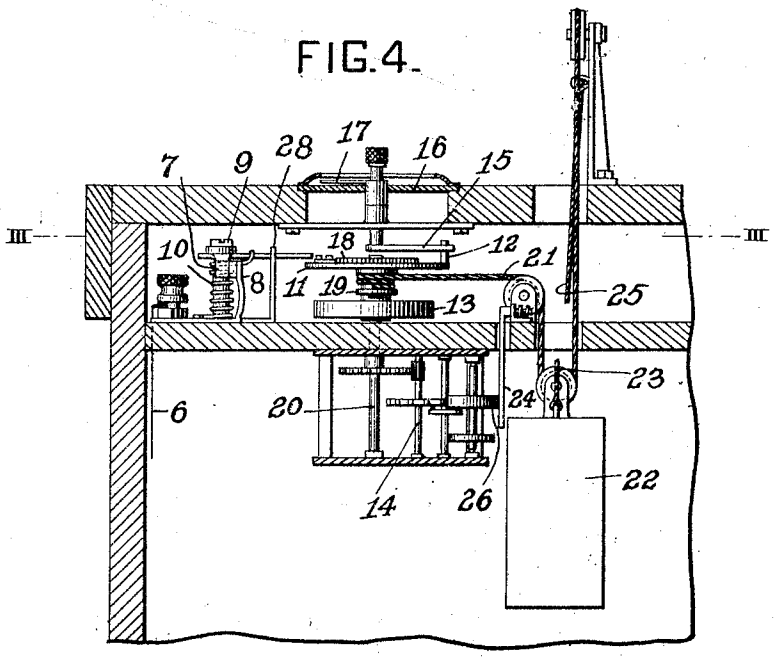


FIG. 4.



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UNITED STATES PATENT OFFICE.

JACOB WALTER, OF NATRONA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN A. WALTER, OF NATRONA, PENNSYLVANIA.

MAKE-AND-BREAK MECHANISM FOR ELECTRICAL CIRCUITS.

1,002,887. Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed April 7, 1910. Serial No. 553,966.

To all whom it may concern:

Be it known that I, JACOB WALTER, residing at Natrona, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Make-and-Break Mechanism for Electrical Circuits, of which improvements the following is a specification.

My invention relates to improvements in make-and-break devices for electrical circuits, and the object is a make-and-break device in which the length of period of contact may, within certain limits, be absolutely controlled, and varied as desired. Specifically, my invention finds its use in a printing machine for making photographic prints. In an application filed by me February 19, 1910, Serial No. 544,924, I have shown and described a photographic printing machine with an automatic cut-off for the printing light, operating at a predetermined interval after the printing operation begins. My present invention is in the same field, but the means employed for the end in view are different.

The accompanying drawings which form part of this specification illustrate a machine in which my improvements are embodied.

Figure 1 is a plan view of the machine; Fig. 2 a longitudinal vertical section; Fig. 3 is a view in horizontal section of a portion of the machine; Fig. 4 a vertical section of the portion of the machine shown in Fig. 3 and on the line IV—IV, Fig. 1; and Fig. 5 shows a certain operating spring in detail.

Parts which are repeated in the several figures bear the same reference numerals in each case.

The machine consists essentially of a printing frame, a light, a means for controlling the light to cause it to burn or be extinguished, and of course the particular form of light will preferably be electric light. The printing-frame itself consists of a frame proper, indicated at 1 in the drawings, and the movable back for the frame, indicated at 2. The frame proper is built into a box, as will be seen; and, within the box, and opposite the face of the frame is placed the light for doing the printing. The movable back of the printing frame is preferably carried on a bar 3, which swings to bring the back to and from position, and this bar is preferably pivoted at one end, the pivot point being provided with a spring 4 which normally holds the bar 3 in elevated position, and the frame open. A latch 5 secures the bar depressed and the back of the frame closed, against the tension of the spring 4.

6 indicates the circuit which is broken and closed to control the burning of the light, and in this circuit 6 is included my improved contact make-and-break device. This includes a contact piece 7, which may be moved to and from contact with a corresponding contact piece 8. The movable contact piece is preferably in the form of a bell-crank lever as shown, pivoted in the supporting body of the frame, as at 9, and this pivoted contact piece is preferably held normally in contact with its fellow, by a spring 10. By swinging the free arm of the bell-crank lever 7 against the opposing tension of spring 10, the contact may be broken as is indicated in dotted lines in Fig. 3.

A movable member, preferably in the form of a rotating disk 11 provided with a peripheral pin 12, is mounted to engage and open the contact piece 7, against the tension of spring 10. Means are provided, preferably in the form of a coiled spring 13, tending to rotate disk 11 in a direction to carry pin 12 away from engagement with bell-crank lever 7; and the disk 11 is turned in the opposite direction, against the tension of spring 13, by a driving weight 22, which operatively engages the stem 19 upon which disk 11 is carried. In order to time the return movement of the disk 11, the said disk is provided with a spring and pawl 30 to the end that engagement may be made with the ratchet 18, which is connected to the stem 20 of the retarding clock work 14. By using the spring and pawl 30 of the disk it will be observed that the return movement of the disk 11 may be accomplished independently of the clock work 14, through the action of the spring 13. An adjustable stop 15 is provided, limiting the retrograde movement of the pin 12, and accordingly determining the period required to advance pin 12, retarded by the clock-work 14, from engagement with stop 15 to engagement with bell-crank lever 7. A dial 16, through which the stem carrying stop 15 projects,

and an index finger 17 afford means for determining with accuracy the position of stop 15.

The weight 22 or equivalent clock-driving means engages the stem 19 through cord 21, and tends to turn disk 11 in opposition to spring 13. The power of weight 22 exceeds that of spring 13, and its effect in turning disk 11 is controlled in point of time by the clock-work 14.

It will thus be seen that the time which elapses in turning disk 11 to bring pin 12 into engagement with lever 7 depends on the initial position of pin 12, and since this is dependent, as will presently be more fully explained, upon the setting of stop 15, the duration of this interval may be accurately predetermined.

The weight 22 is connected by the cord 21 with the swinging bar 3 of the printing frame, and means, such as cords 23, are provided for sustaining the weight from the body of the frame when the cord 21 is slacked by the opening of the printing frame. The closure of the frame brings weight 22 again into operation relative to the clock-work. Means are provided for starting the clock-work upon the closing of the frame, and the means to this end preferably consist of a pivoted finger 24, swung by a cord 25 connected with bar 3; so that, upon the closing of the frame, finger 24 swings to engage the balance wheel 26 of clock-work 14, thus causing it to swing.

The operation will readily be understood. The object is to maintain the printing light burning for a predetermined time after the closure of the frame, and for the extinction of the light at the end of such time. When the frame is open, weight 22 is carried in inactive position. Under such condition, stop 15 may be shifted to the desired position, and, as it is shifted, disk 11 will turn in response to the tension of spring 13, pin 12 remaining always in contact with stop 15. The position of the stop being fixed, the negative and printing paper adjusted, the frame is closed. Thereupon, the printing light is ignited through any preferred instrumentality, as by a contact controlled by a rod 27. The closure of the frame raises weight 22 from its inactive position, and makes it effective to turn disk 11, its action in this regard being controlled by clock-work 14, coincidently set in motion by finger 24. The disk continues to turn until pin 12 swings lever 7, breaks the contact, and extinguishes the printing light; the interval during which the light has burned being dependent on the initial position of stop 15, as already explained.

A stop, 28, may be provided, limiting the pivotal movement of bell-crank lever 7, and bringing it to a stop while still in the path of revolution of pin 12. By such means further rotation of the disk is prevented and the clock-work stopped.

I claim herein as my invention:

1. A make-and-break device for an electrical circuit including a movable contact piece yieldingly held in engagement with a corresponding contact piece, a movable member arranged to engage within the range of its movement said movable contact piece, a spring exerting its tension to hold said movable member out of engagement with said contact piece, and a clock-work operatively connected to said movable member, and in operation advancing said movable member to engage and swing said movable contact piece against the resistance of said spring, substantially as described.

2. A make-and-break device for an electrical circuit including a movable contact piece yieldingly held in engagement with a corresponding contact piece, a movable member arranged to engage within the range of its movement said movable contact piece, a spring exerting its tension to hold said movable member out of engagement with said contact piece, an adjustable stop determining the extent of retrogression of said movable member from engagement with said movable contact piece, and a clock-work operatively connected to said movable member, substantially as described.

3. In a circuit breaker, the combination of a movable contact piece held yieldingly in engagement with a second contact piece, a rotary member arranged to engage within the range of its rotation said movable contact piece but held yieldingly out of engagement therewith by a spring, a stationary dial, a rotary adjusting member provided with means for limiting the range of movement of said rotary member, said adjusting member further provided with an index finger movable therewith and adjacent to said stationary dial, and means to move said rotary member with a uniform speed against the resistance of said spring, substantially as described.

4. In a circuit breaker for a photographic printing machine, the combination of a movable contact piece held yieldingly in engagement with a second contact piece, a rotary member arranged to engage within the range of its rotation said movable contact piece, but held yieldingly out of engagement therewith by a spring, a stationary dial, a rotary adjusting member consisting of a stem provided with an arm for limiting the return movement of said rotary member and with an index arm movable therewith and registering on said stationary dial, and a weight operated clockwork for moving said rotary member against the resistance of said spring, substantially as described.

5. In a circuit breaker for a photographic printing machine, the combination of a mov-

able contact piece held yieldingly in engagement with a second contact piece, a movable member arranged to engage within its movement said movable contact piece, a spring exerting its tension to hold said movable member out of engagement with said contact piece, a weight-operated clock-work connected to said movable member and in its operation moving said movable member against the resistance of said spring, and means for resting the weight of the said clock-work, substantially as described.

In testimony whereof, I have hereunto set my hand.

JACOB WALTER.

Witnesses:
JOHN A. WALTER,
BAYARD H. CHRISTY.