

M. W. LOWDER.
 PHOTOGRAPHIC PRINTING APPARATUS.
 APPLICATION FILED JULY 7, 1911.

1,028,369.

Patented June 4, 1912.

2 SHEETS-SHEET 1.

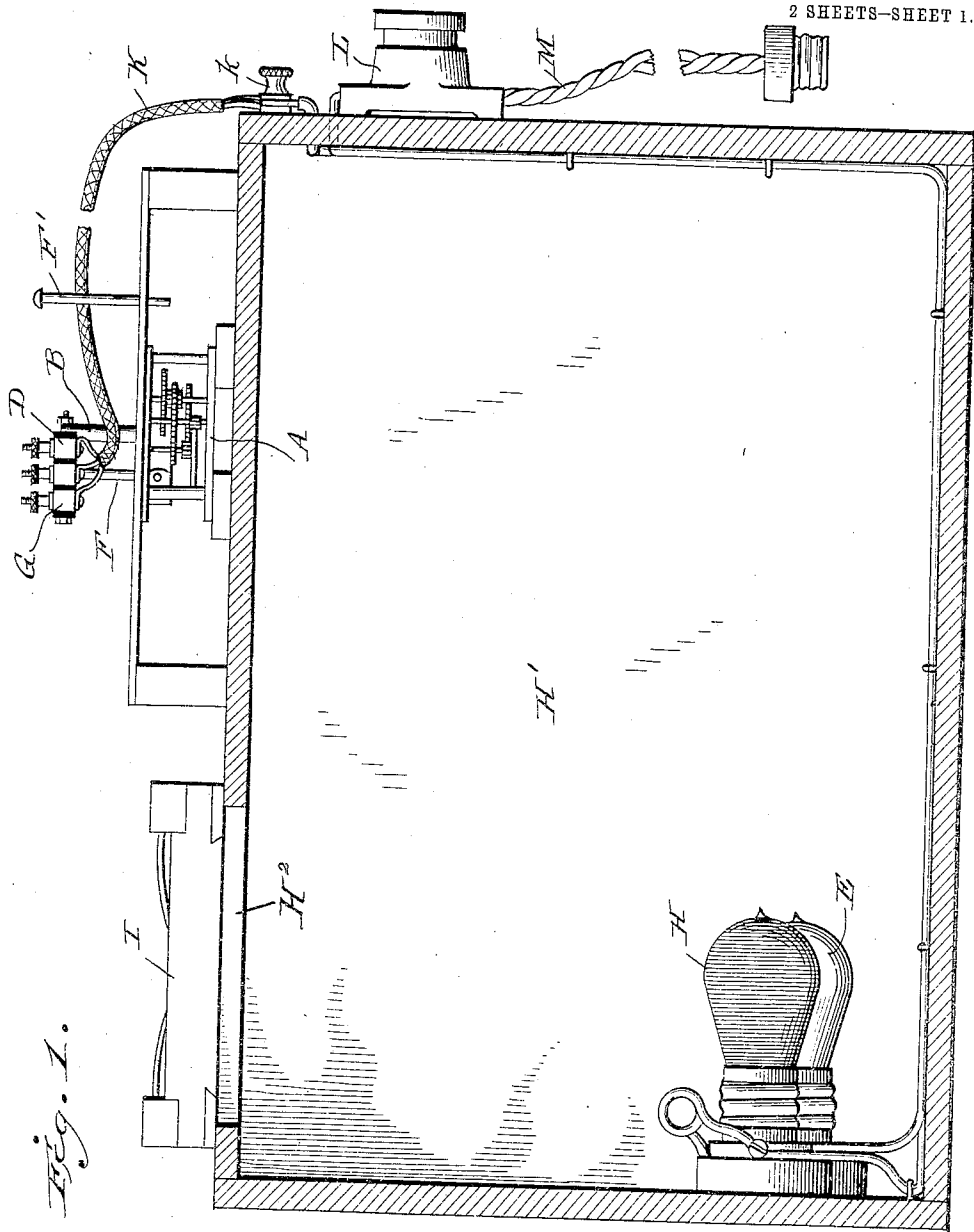


Fig. 1.

Witnesses

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2 SHEETS-SHEET 2.

Fig. 2.

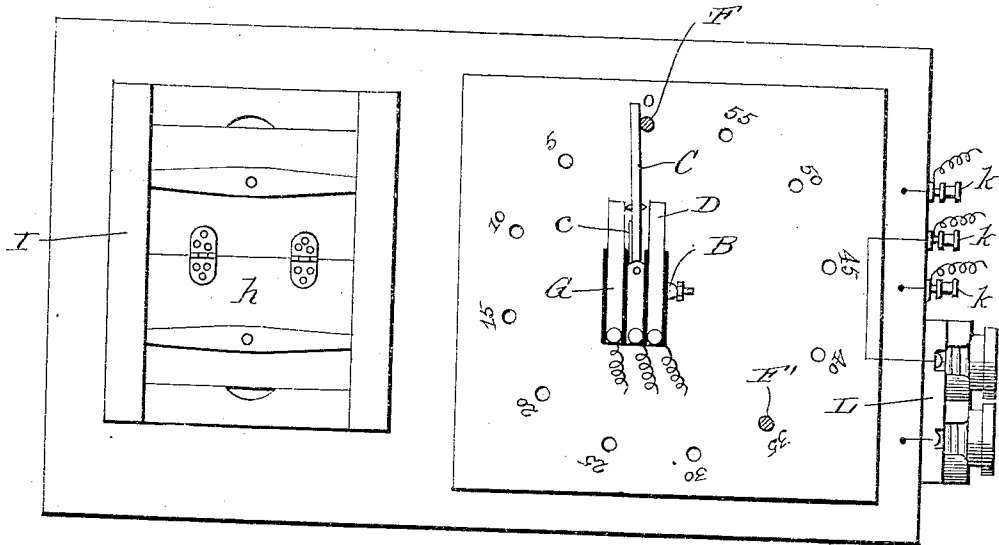
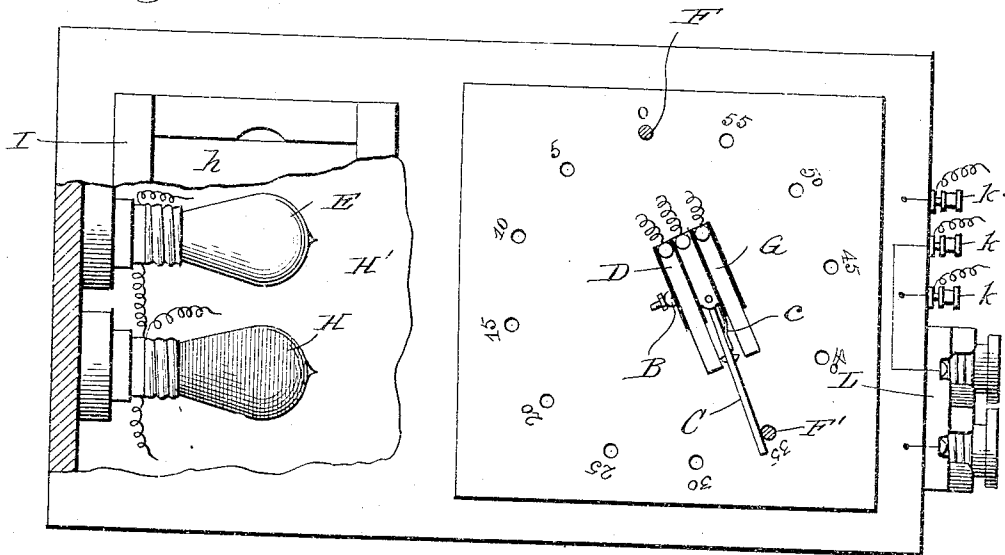


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

MATTHEW W. LOWDER, OF INDIANAPOLIS, INDIANA.

PHOTOGRAPHIC-PRINTING APPARATUS.

1,028,369.

Specification of Letters Patent.

Patented June 4, 1912.

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To all whom it may concern:

Be it known that I, MATTHEW W. LOWDER, a citizen of the United States, and residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Photographic-Printing Apparatus; 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 figures and letters of reference marked thereon.

This invention relates to improvements in apparatus for printing photographs from negatives, the objects of the invention being to provide a simple and convenient form of apparatus by which the period of exposure may be accurately timed, and when once determined for a given negative and for a given light, may be repeated for duplicate printing as often as desired, without further thought or attention on the part of the attendant.

The invention consists in certain novel details of construction and combinations and arrangements of parts all as will be now described and pointed out particularly in the appended claims.

In illustrating the invention a form of apparatus adapted for the employment of artificial light, such, for instance, as electric lamps of the incandescent type has been adopted, but it will be understood that the invention may be utilized in other forms of apparatus, wherein the light is interrupted in any usual or preferred manner in lieu of the usual method of controlling electric lights by manipulation of the current supplied thereto.

Referring to the accompanying drawings,—Figure 1 is a sectional view in a vertical plane through an apparatus embodying the present invention; Fig. 2 is a top plan view; Fig. 3 is a detail plan with the parts in the relative position occupied by them during an exposure period, a portion of the light chamber and negative holder being broken away to disclose the electric lights.

Like letters of reference in the several figures indicate the same parts.

The apparatus embodies in its construction a timing motor mechanism, that is to say, a motor of some type which will advance a moving part a certain distance in a

given time, or which will advance the moved part at a definite rate. Motor mechanisms of this character are well understood, and are of various types, such as electric motors, weight motors or spring driven gear trains. A timing motor mechanism of the latter type has been adopted for illustrating the present invention and is indicated by the reference letter A in the accompanying drawings. This motor mechanism is competent to rotate a shaft, or, as hereinafter termed, a controller carrier B, at a substantially uniform and predetermined speed, and it is preferably of such character that a reverse movement of the shaft or carrier will rewind the spring of the motor in a manner which will be at once apparent to those skilled in the art.

Mounted on the carrier B is an exposure controller having a movement in unison with said carrier and a limited movement independently thereof, the limited independent movement being utilized as the means whereby the exposure period is inaugurated and terminated. In the electrical form of the apparatus illustrated, this is easily accomplished by making the controller form part of a switch, one of the contacts of which is mounted to move uniformly in unison with the carrier, while the other contact is given a limited independent movement so as to establish the circuit when in one position on the carrier and to interrupt said circuit when in another position on the carrier, a fixed stop or stops being provided for effecting the limited independent movement of the controller and for limiting the range of movement of the carrier itself.

Referring particularly to Fig. 2, it will be seen that the switch adopted for illustrating the invention embodies a pivotally mounted controller C which forms one terminal of an electric circuit and is adapted to be advanced on its pivotal center by a spring e, and when so advanced to make contact with a cooperating terminal formed by the arm or base D which is rigidly mounted on the carrier B. The circuit controlled by the terminals C and D includes an electric light E which is conveniently an ordinary incandescent lamp which will affect in proper manner the sensitive surface which is to receive the impression. Normally, the controller C rests against a fixed stop F and is thereby held out of engagement with the

terminal D so that the circuit of the lamp E is broken or interrupted, and it is obvious that by grasping the controller and turning the carrier with the controller backwardly away from the stop F, and then releasing the controller, it will, under the influence of its spring *c*, on the carrier complete this circuit, and during the time the carrier is traveling back to normal position the lamp E will be lighted. Inasmuch as the carrier has a definite predetermined speed of rotation, the duration of the exposure period may be accurately determined by the distance the carrier and controller are permitted to travel after being released, as before described. Conveniently, the controller is mounted over a dial which is graduated to indicate seconds of time, and while the apparatus may be designed for exposure periods of any desired duration, in the illustrated apparatus the dial is graduated to indicate periods of five seconds each up to a total of sixty seconds or one minute, and at each graduation there is provided an aperture in which a pin or stop F' may be removably inserted for the purpose of indicating to the attendant the distance the controller must be moved reversely in order to secure the desired duration of the exposure period.

Inasmuch as in photographic printing it is desirable that when the actinic light is cut off, a non-actinic light should be supplied, advantage is taken of the controller movement upon the carrier for controlling the non-actinic light as well as the actinic light. This result is conveniently accomplished by mounting a third terminal G on the carrier on the opposite side of the controller from the terminal D, and including in the circuit with the terminals G and C a red or ruby light or lamp H. With this arrangement, when the controller is in normal position and resting against its stop F, the circuit including the red or ruby lamp will be established and that through the white or actinic lamp will be broken, but the opposite condition prevails as soon as the controller is released after having been moved back to the desired point on the dial, as at this time the said controller is moved on the carrier so as to interrupt the branch of the circuit including the terminal G and ruby lamp and establish the branch of the circuit including the terminal D and the white or actinic lamp.

The lamps are preferably located in a chamber H' below the dial and controller and directly beneath an exposure aperture H² over which is placed the printing frame I adapted to receive the negative and sensitive paper for making the photograph from the negative. The printing frame may be of ordinary construction with a sectional back *h* whereby the progress of the printing may be observed in the usual manner, particu-

larly for determining initially, the length of the exposure necessary for making a print of the desired density. After this has been once determined and the adjustable pin properly positioned in the dial, each of the subsequent exposures will, of necessity, conform thereto and no further attention is necessary to this portion of the operation further than to carry forward the necessary mechanical manipulation of the parts.

Conveniently, the circuit wires extend through a flexible cord such as K to binding posts *k* and thence to the lamps and a fuse or blow-out device L of usual construction, to which the current may be supplied through a second flexible cord such as indicated at M and adapted to be plugged into any ordinary electric light fixture.

In the use of the apparatus, after the period of exposure necessary for any particular negative has been determined and the adjustable stop located in the dial in accordance with said period, it is only necessary for the attendant to supply successive sensitized sections of paper to the upper side of the negative, close the printing frame and swing the controller back until it is arrested by the adjustable stop F'. Upon the release of the controller, the circuit including lamp E is automatically established for the desired exposure period, and is automatically interrupted at the termination of said period. When the exposure period has terminated, the ruby lamp H is lighted and supplies the necessary or desired light for changing the materials, etc.

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

1. A photograph printing apparatus embodying a timing motor mechanism, an exposure controlling member, means whereby said controlling member is moved by the motor mechanism during the period of exposure, and having a movement independently thereof to terminate the period of exposure, and means for automatically effecting such independent movement of the controlling member.

2. A photographic printing apparatus embodying a timing motor mechanism, a carrier driven by the motor mechanism, an exposure controlling member movably mounted on the carrier, yielding means tending to normally hold the said controlling member in position on the carrier to effect an exposure, and means for effecting a relative movement of the carrier and member to terminate the exposure.

3. A photographic printing apparatus embodying a timing motor mechanism, a carrier driven by the motor mechanism, a switch mounted on said carrier and embodying terminals, one fixed and the other movable with relation to the carrier, a lamp in

circuit with said switch, and means for automatically effecting the movement of the movable terminal to control said lamp circuit.

5 4. A photographic printing apparatus embodying a timing motor mechanism, a carrier driven thereby, an electric switch mounted on said carrier and embodying a terminal fixed with relation to the carrier
10 and a controlling terminal movable with relation thereto, a lamp in circuit with said terminals, a spring for normally holding said movable terminal in contact with its cooperating terminal to complete the circuit, and means for automatically separating
15 said terminals during the movement of the carrier to break the circuit and terminate the exposure period.

5 5. A photographic printing apparatus embodying actinic and non-actinic lamps, a printing frame in juxtaposition thereto, a timing motor mechanism, a switch embodying relatively fixed and movable contacts, means whereby the switch is moved
20 by the timing motor mechanism, independent circuits including said actinic and non-actinic lamps and switch, and a fixed projection adapted to cooperate with said switch for interrupting the circuit through
25 one of said lamps and establishing the same through the other of said lamps.

30 6. A photographic printing apparatus embodying a timing motor mechanism, a carrier driven thereby, a switch mounted on said carrier and embodying two terminals fixed on the carrier, and an intermediate terminal movably mounted on the carrier to establish a circuit through one
35 or the other of said relatively fixed terminals, means for normally holding the movable terminal in position to establish one of said circuits, means for moving the said movable terminal into contact with the other relatively fixed terminal for establishing the

other circuit, actinic and non-actinic lamps 45 included respectively in the circuits controlled by said movable terminal, and a printing frame arranged in juxtaposition to said lamps.

7. A photographic printing apparatus 50 embodying a light chamber, a lamp mounted in said chamber, a printing frame located in proximity to said lamp, a timing motor mechanism, a controller carrier driven by said motor mechanism, a controller movably mounted on said carrier and adapted
55 to control the duration of the exposure period, a dial over which said controller is moved by the carrier, a fixed projection with which the controller contacts for terminating the exposure period and arresting the movement of the timing motor mechanism, and an adjustable stop for determining the range of movement of the controller in unison with the carrier. 60

8. A photographic printing apparatus embodying a light chamber, actinic and non-actinic electric lamps located within said chamber, a printing frame mounted in position to receive light from said lamps, a timing motor mechanism, a carrier driven
65 thereby, two circuit terminals mounted in fixed position on said carrier, an intermediate terminal forming a control arm movably mounted on said carrier and adapted to establish circuits including said lamps, a fixed stop with which said control arm contacts whereby it is moved with relation to the carrier to establish one of said circuits, and a spring normally tending to
70 move said control arm for establishing the other of said circuits, substantially as described. 75 80

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Witnesses:

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