

(No Model.)

F. M. SPAULDING.
PHOTOGRAPHIC SHUTTER.

No. 462,335.

Patented Nov. 3, 1891.

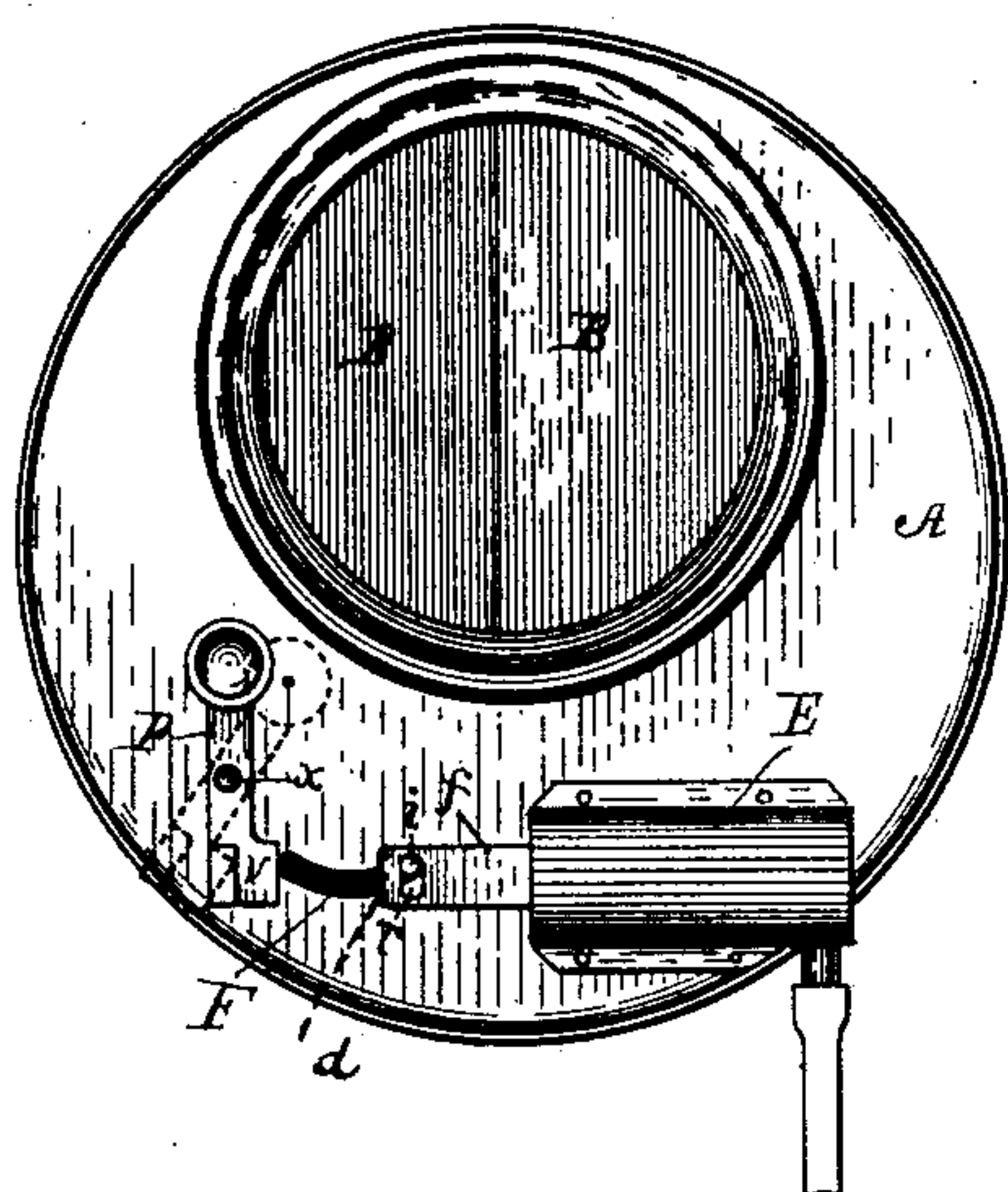


Fig. 1

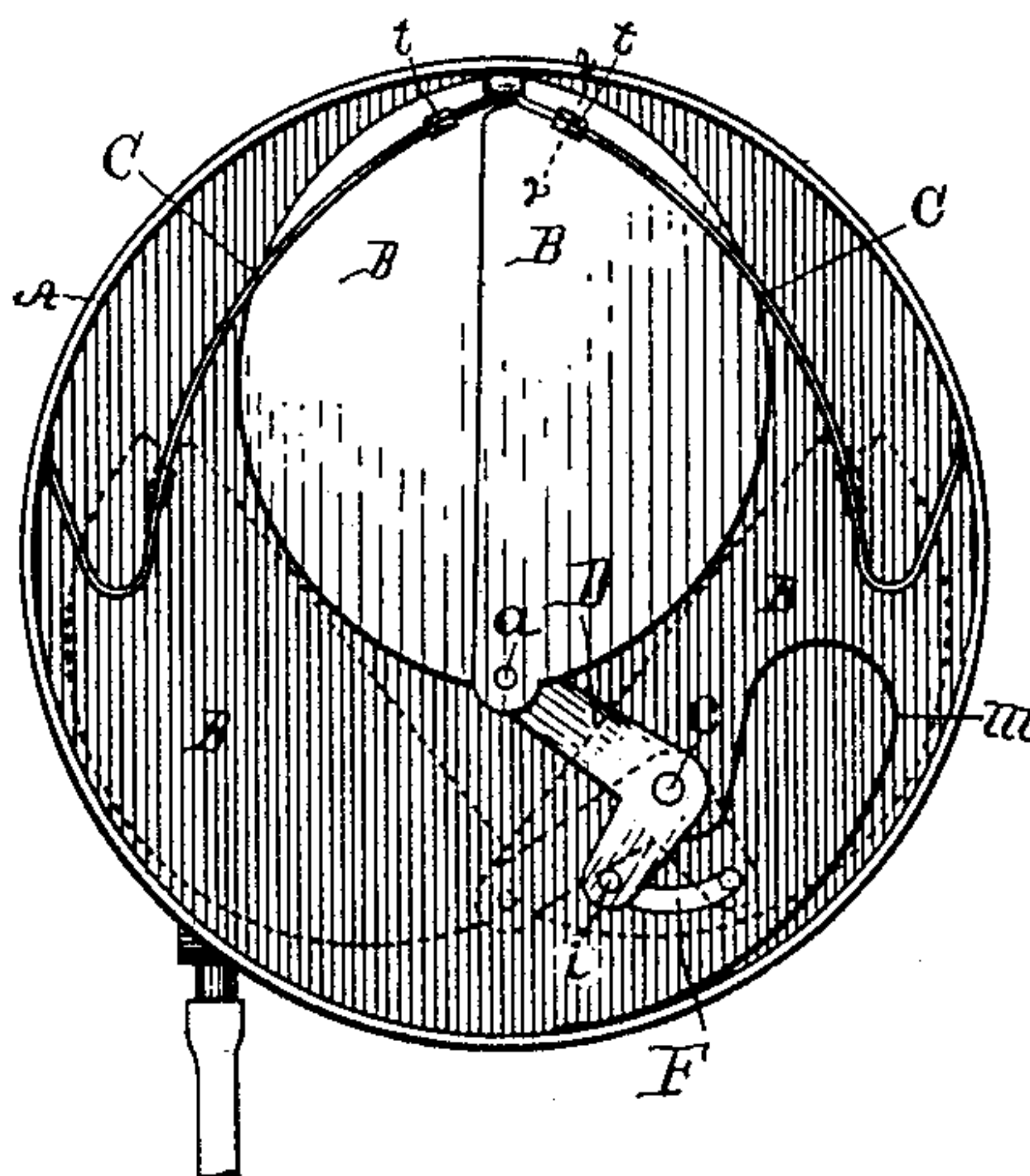


Fig. 2

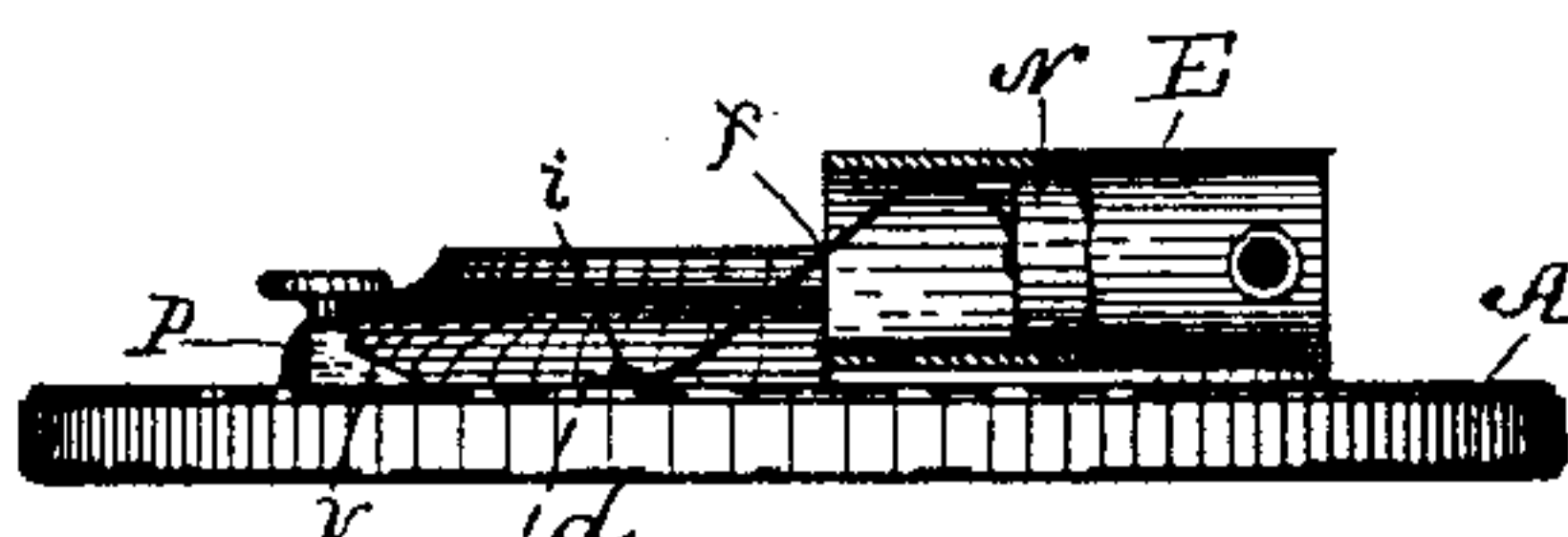


Fig. 3



Fig. 4

Witnesses:

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Inventor.

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his Att'y.

UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC SHUTTER.

SPECIFICATION forming part of Letters Patent No. 462,335, dated November 3, 1891.

Application filed October 11, 1890. Serial No. 367,883. (No model.)

To all whom it may concern:

Be it known that I, FRANK. M. SPAULDING, of the city of Kalamazoo, county of Kalamazoo, and State of Michigan, have made and
5 invented a new and useful Improved Photographic Shutter, of which the following is a full, clear, and exact description, reference being had to the drawings forming part of this application.

10 My invention consists in a new and improved construction of the parts composing the apparatus and their combination and co-action in such manner that I am enabled to make an instantaneous exposure or a time
15 exposure, and also my apparatus is so constructed that the shutter-wings are reset or may be reset for a second exposure immediately after an instantaneous exposure by simply squeezing the bulb which actuates the
20 engine once, the single action of the engine serving both to make the instantaneous exposure and to effect the resetting of the shutter for the second exposure.

25 Figure 1 illustrates an elevation of the front of my shutter. Fig. 2 illustrates an elevation of the interior mechanism within the shutter-case. Fig. 3 illustrates an edge view of the shutter-case in elevation. Fig. 4 illustrates a sectional view on the line 2 2 of Fig. 2.

30 A is the shutter-case. It is shown as round in the drawings; but it may be of any other preferred shape, and it may be made of any preferred material.

B B are the shutter-wings.

35 C C are two guides, which may be made of wire, as shown in the drawings, or may be made in any other form or of any other material, so that they guide the shutter-wings in a lateral direction, thus separating them during the action of the engine.

40 D is a bell-crank lever, pivoted at *c* to the case of the shutter.

E is a pneumatic engine, which may be of any preferred form. I illustrate it as being
45 the well-known metallic cylindrical engine now largely in use in photographic shutters.

N is the piston for the engine; and *f* is a spring piston-rod, which is preferably, but not necessarily, curved, as shown in Fig. 3.
50 It has a hole *r* at its forward end, through which projects a pin *i*, which is attached to one

end of the bell-crank lever D. The other end of the bell-crank lever is attached by a pivot *a* to the lower ends of the shutter-wings B.

m is a string which is fastened at one end 55 to the shutter-case and at its other end is attached to the bell-crank lever D in such manner as normally to retract that lever, placing the shutter-wings in their closed position.

t t are two clips, one of which is attached 60 at or near the upper end of each of the shutter-wings B, and they engage with the guides C, as best seen in Fig. 4, in such manner that they can easily slide upon these guide-wires, and thus guide and control the move- 65 ments of the shutter-wings during the action of the engine, separating them as the exposure is made.

P is a lever pivoted to the outside of the front plate of the shutter-case, as at *x*, hav- 70 ing at one end a knob or hand-grasp, as shown, and at the other end an inclined surface *v*.

The operation of the device is as follows: When it is desired to make a time exposure, the lever P is turned away from the slot F, 75 as shown in dotted lines in Fig. 1, up through which slot the pin *i* extends to engage with the piston-rod. The bulb is then squeezed, and the consequent action of the engine through the piston-rod *f*, pin *i*, bell-crank le- 80 ver D, and pivot *a* draws the shutter-wings B away from the exposure-aperture, during which movement the wings are likewise guided in a lateral direction by the clips *t*, engaging with the guides C, until the parts as- 85 sume the position shown in dotted lines, Fig. 2, and they will remain in that position as long as pressure is maintained upon the bulb. To make an instantaneous exposure the lever P is swung into the position shown in full lines 90 in Figs. 1 and 3. Upon now squeezing the bulb the engine will move outwardly, drawing the shutter-wings away from the exposure-aperture, as above described, thus making the exposure; but when the piston-rod *f* has nearly 95 reached its extreme outward position its upwardly-curved extremity *d* slides up upon the inclined surface *v*, whereby the spring piston-rod is lifted from off the pin *i*, and as soon as its hold upon the pin *i* is released then the spring 100 *m* instantly returns the bell-crank lever D and the wings B to their normal closed position,

the pin *i* then of course returning to the other end of the slot F. Now, upon relieving the bulb of pressure the piston N and the piston-rod *f* are withdrawn again, and the piston-rod rides up upon the pin *i* until it is a second time coincident with the slot *r* near the end of the piston-rod. It then immediately enters the slot *r*, and the parts are in a position for a second exposure.

10 Having described my invention, I claim—

1. The combination, in a photographic shutter, of a plurality of shutter-wings connected with the same motor at one end and guides with which the shutter-wings are connected at or near their other ends and by which they are given a movement away from each other when the motor is operated, substantially as set forth.

2. The combination, in a photographic shutter, of a plurality of shutter-wings connected with the motor at one end and guides with which the shutter-wings are connected at or near their other ends, by which they are given a movement away from each other when the motor is operated, and means, substantially as described, whereby the hold of the motor upon the wings may be broken, for the purpose set forth.

3. The combination, in a photographic shutter, of a plurality of shutter-wings connected with the same motor at one end and guides with which the shutter-wings are connected at or near their other ends, by which they are given a movement away from each other

when the motor is operated, means, substantially as set forth, whereby the hold of the motor upon the wings may be broken, and means separate and distinct from the motor, such as a spring, for returning the shutter-wings to their closed position, for the purpose set forth.

4. The combination, in a photographic shutter, of a plurality of shutter-wings connected with the same motor at one end and guides with which the shutter-wings are connected at or near their other ends, and means, substantially as shown, such as a spring, separate and distinct from the motor, for returning the wings to their closed position, for the purpose set forth.

5. The combination, in a photographic shutter, of shutter-wings connected at one end to a lever and at their other ends to deflecting-guides, a motor connected to the lever by a flexible connection, and adjustable inclined surfaces adapted to engage with the flexible connection and break its hold upon the said lever, substantially as set forth.

6. The combination, in a photographic shutter, of shutter-wings, a motor, and a flexible connection or piston-rod between the moving part of the motor and the wings, substantially as set forth.

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Witnesses:

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