(No Model.)

R. E. M. BAIN.

SHUTTER FOR PHOTOGRAPHIC CAMERAS.

No. 370,673. Patented Sept. 27, 1887.

Fig. I.

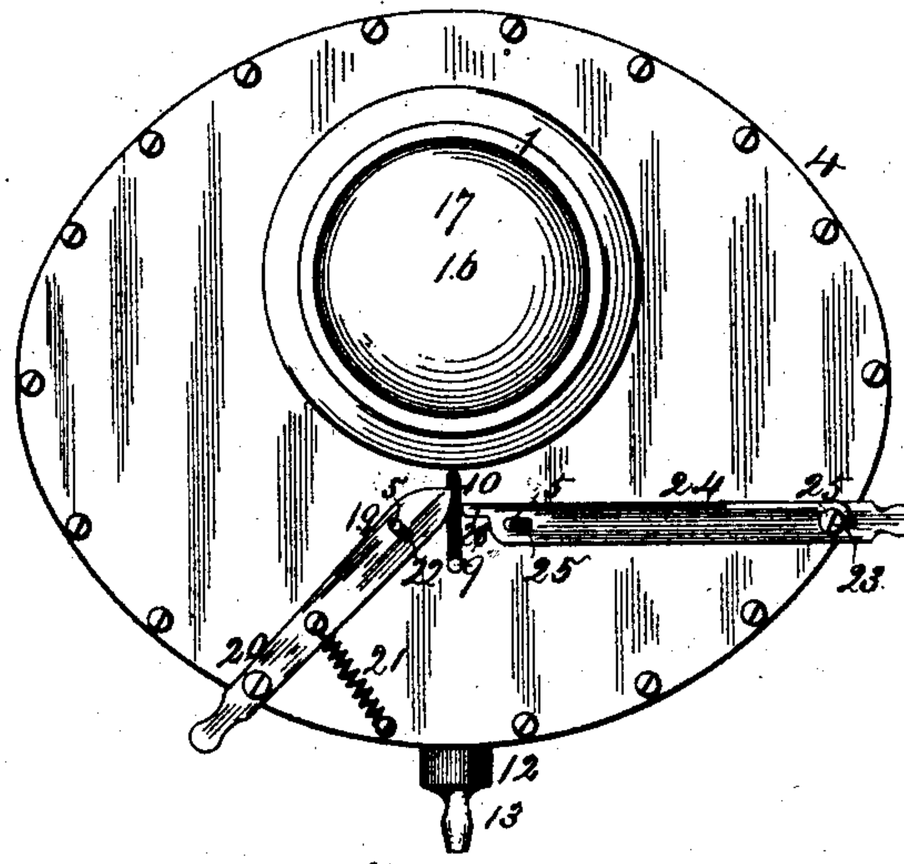


Fig. II.

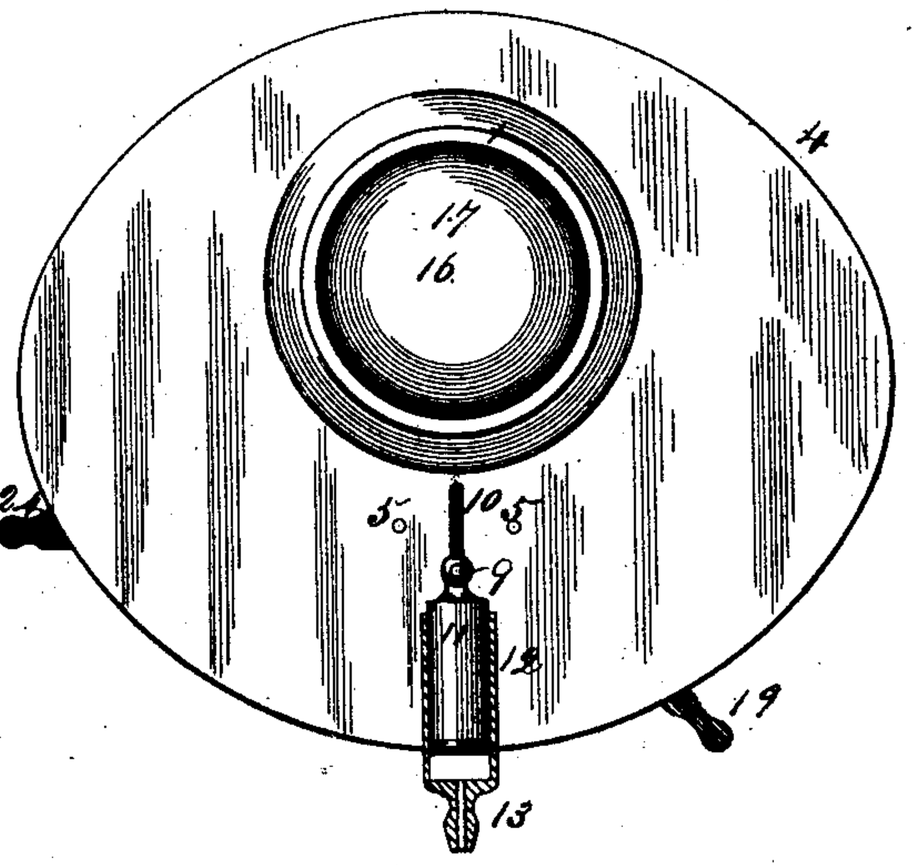


Fig. III.

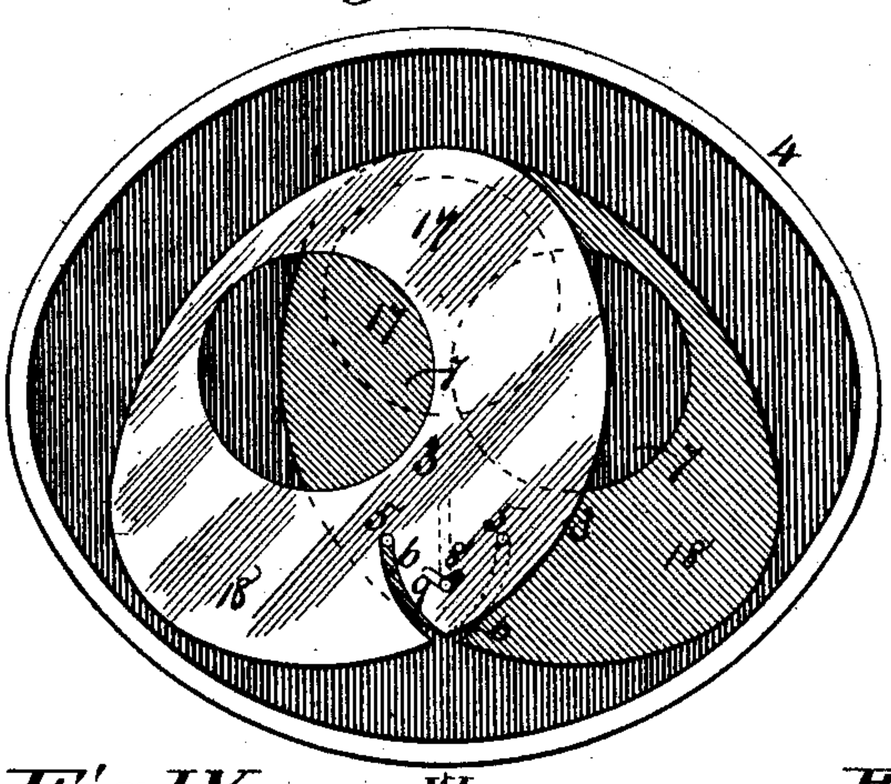


Fig. V.

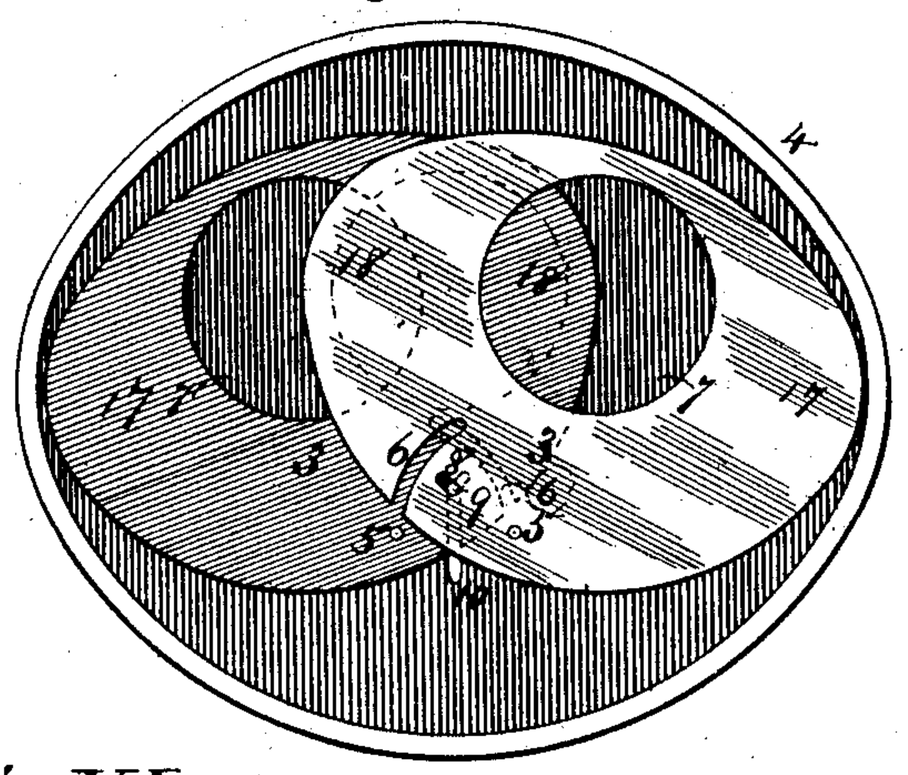


Fig. IV.

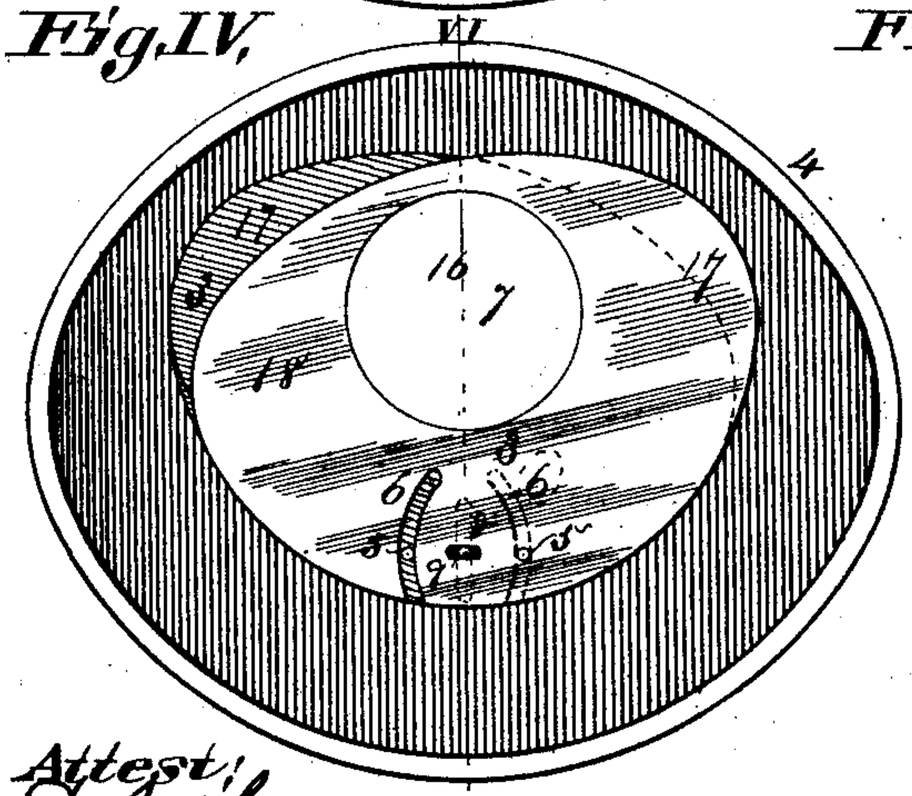
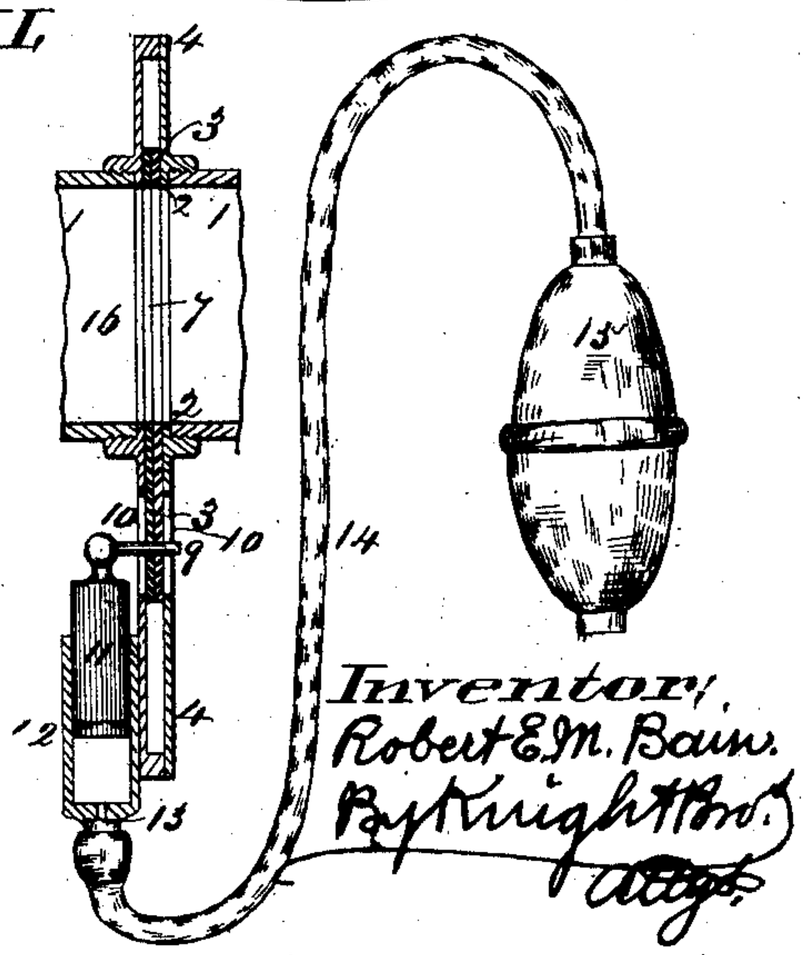


Fig. VI.



Attest:
E. Arthur.
W. C. Knight.

Inventor:
Robert E. M. Bain.
By Knight Bros.
Attys.

UNITED STATES PATENT OFFICE.

ROBERT E. M. BAIN, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO EDWARD W. PIKE, OF SAME PLACE.

SHUTTER FOR PHOTOGRAPHIC CAMERAS.

SPECIFICATION forming part of Letters Patent No. 370,673, dated September 27, 1887.

Application filed July 20, 1887. Serial No. 244,829. (No model.)

To all whom it may concern:

Be it known that I, ROBERT E. M. BAIN, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Shutters for Photographic Cameras, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This is a shutter which may be arranged for instantaneous or time exposure.

Figure I is a front elevation. Fig. II is a a rear elevation with the cylinder in section. Figs. III, IV, and V are elevations with one cap removed, showing the shutters in the three positions. Fig. VI is a section at VI VI, Fig. IV.

1 is part of a camera-tube, the same having a circumferential aperture at 2, to allow the play of the shutters 3. The shutters work in a case, 4, surrounding the tube 1. These shutters are of similar form, and each turns on its own pivot, 5. Each shutter has a curved slot, 6, concentric with its own pivot, through which passes the pivot-pin of the other shutter, the slots being long enough to allow the required movement of the shutters on their pivots.

Each shutter has balance-wings 17 18, and a circular aperture, 7, so located in the shutter that it may be brought to coincide with the bore 16 of the tube when the shutter is at half-stroke. The shutters have short slots or pin-holes 8, through which passes a pin, 9, that works in vertical slots 10 in the front and back walls of the case 4. The pin extends horizontally through the case from the top of a piston, 11, that works in an air-cylinder, 12. This cylinder is located at the back of the case, and has a nipple, 13, suitable for the attachment of the air-hose 14, upon which is an elastic compression-bulb, 15. When the piston is at the lowest position, as seen in Fig. II, the shutters are in the position shown in Fig. III, and the aperture or bore 16 of the tube is closed by the wings 17 of the shutters. When the piston is at half-stroke, as seen in Fig. VI, the apertures of the shutters coincide with the bore 16 of the tube, and of course the tube is open. When the portion is in its highest position, the shutters are in the position shown in Fig. V, and the tube is closed by the wings 18 of the shutters. The shutters may be retained in the latter position by continued pressure upon the bulb, or by a spring-catch, 19, which is pivoted to the case at 20, and is drawn into the position shown in Fig. I, so as to engage the pin 9 by a spring, 21. The catch is transversely slotted at 22, and through the slot projects one of the moat-pins 5, which then limits the oscillation of the catch. When the point of the catch is moved out of line with the slot 10, the pin 9 may descend from the upper end of the slot, and this it does as soon as the bulb is allowed to expand, producing a vacuum beneath the piston.

24 is a sliding catch working on guide-pins 5 and 23, which occupy the longitudinal slots 25. The point 26 of the catch is in position to arrest the upward movement of the pin 9 and stop the movement of the shutters 3 when the tube 1 is wide open, and while pressure is maintained on the bulb they will continue in position. When the bulb is allowed to expand, the pin 9 is drawn down and the shutters carried again into the position shown in Fig. III.

In making an instantaneous negative the stop-catch 24 is in the position shown in Fig. I, so that when the bulb is compressed the shutters will move from the position shown in Fig. III to the position shown in Fig. V, the tube 1 being thrown open for an instant as the shutters reach the position shown in Fig. IV. The shutters 3 are held in position shown in Fig. V by the catch 19.

In taking a time-negative, the shutters being in position shown in Fig. III, the sliding catch 24 is pushed forward, so that its point 26 crosses the slot 10. Then the sensitive plate being in position, the bulb is compressed and the shutters move into the position shown in Fig. IV, and then stop. When the exposure has continued the desired time, the bulb is allowed to expand, and the shutters immediately take the position shown in Fig. III, thus closing tube 1. The case 4 has been described as surrounding the tube 1. It is not necessarily in this position. It may be placed outside the lens or other position, when it will perform the office described.

I claim as my invention—

1. The combination, with the shutters 3 and the pin 9, engaging in pin-holes 8 and working in guide-slots 10, of the spring-catch 19, sustaining the pin in its elevated position, substantially as set forth.

2. The combination, with the shutters 3 and a pin, 9, engaging in pin-holes 8 and working in guide-slots 10, of the catch 24, arresting the shutters at half-stroke, substantially as set forth.

3. The combination of shutters 3, formed with apertures 7, wings 17 18, and pin-holes 8, and turning on pivots 5, air-cylinder 11, piston 12, worked by means of a compression-bulb, 15, the pin 9, engaging in the pin-holes 8 of the shutters and working in the guide-slots 10 of the case, and the spring-catch 19, substantially as and for the purpose set forth.

4. The combination of the shutters 3, formed with apertures 7, wings 17 and 18, and pin-holes 8, pin 9, engaging in pin-holes 8 and working in slot 10, an air-cylinder, 11, piston 12, to which the pin 9 is attached, a compression-bulb in communication with the interior of the cylinder, and a stop, 24, arresting the shutters at half-stroke, substantially as and for the purpose set forth.

ROBERT E. M. BAIN.

In presence of—

SAML. KNIGHT,

JOS. WAHLE.