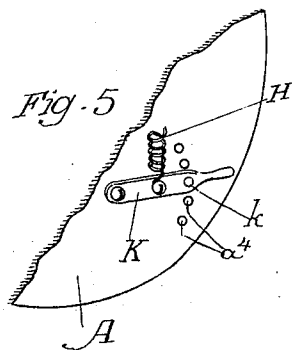
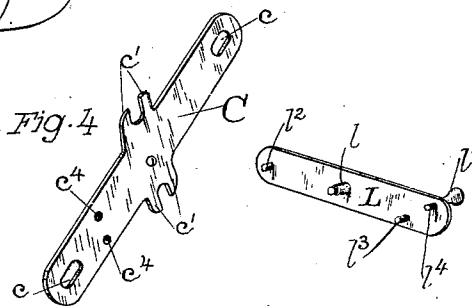
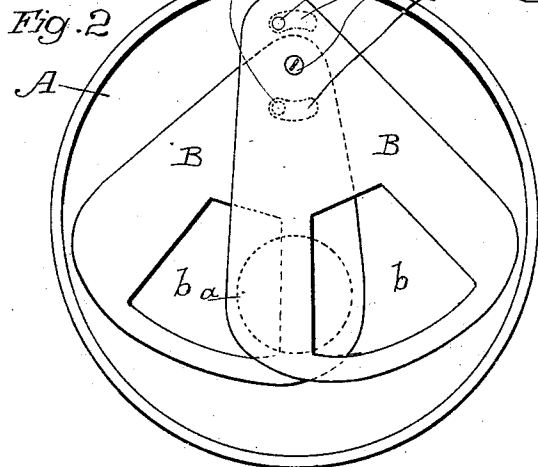
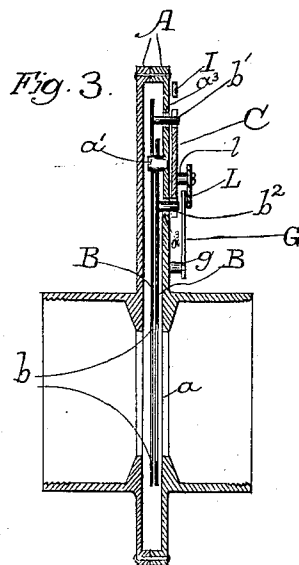
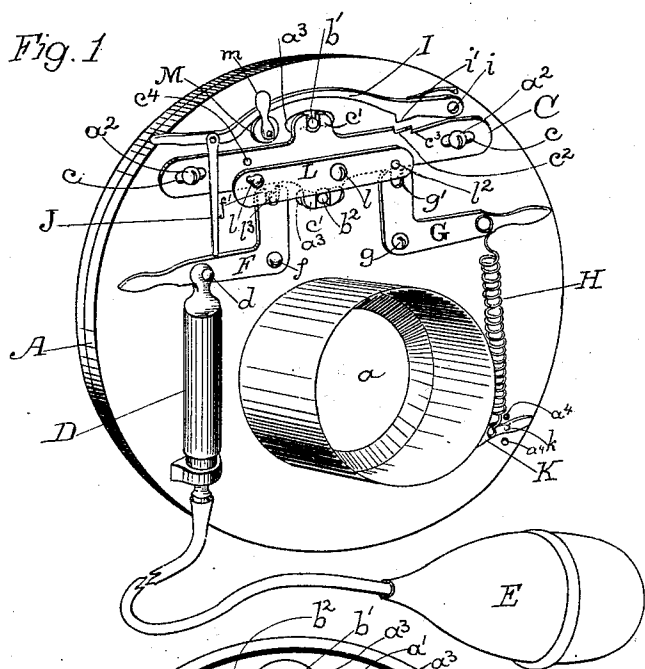


(No Model.)

S. SLAYTON.
PHOTOGRAPHIC SHUTTER.

No. 546,198.

Patented Sept. 10, 1895.



Witnesses,
J. A. Bayless

Inventor,
Samuel Slayton
By Devery & Co

UNITED STATES PATENT OFFICE.

SAMUEL SLAYTON, OF SAN FRANCISCO, CALIFORNIA.

PHOTOGRAPHIC SHUTTER.

SPECIFICATION forming part of Letters Patent No. 546,198, dated September 10, 1895.

Application filed December 27, 1894. Serial No. 533,088. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL SLAYTON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Shutter for Photographic Cameras; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of camera-shutters in which apertured leaves are caused to pass each other in such a way as to effect during their passage the coincidence of their apertures with the lens or diaphragm opening; and my invention consists in the novel arrangements, constructions, and combinations of the devices for operating the apertured leaves, which I shall hereinafter fully describe and specifically claim.

The object of my invention is to provide a photographic-camera shutter adapted for both time and instantaneous exposures and of such a character that the holding and locking mechanism shall be positive, the tripping mechanism delicate, and the operation comparatively noiseless and without jar.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a perspective front view of my shutter. Fig. 2 is a view showing the shutter-leaves B B within the shell A. Fig. 3 is a vertical central section. Fig. 4 is a view of the operating-bar C, the arm L being shown detached therefrom. Fig. 5 is a view showing the tension-regulating device of spring H.

A is the shell of the shutter, consisting, as usual, of two plates fitted together in such a manner as to leave a cavity or space between them in which to hang and operate the leaves of the shutter. Through this shell is made an opening a , to correspond with the lens-opening and with the opening in the diaphragm in the usual manner.

Within the shell are the leaves B of the shutter. These are both hung from a common pivot a' at their upper ends, and their lower ends have formed in them the necessary apertures b , which, by the passage of said leaves by one another, are adapted to coincide with each other and with the lens and diaphragm opening, as is usual with this class of shutters.

Upon the exterior of the shell, either upon its face or on its back, as may be desired, is mounted and adapted to slide the operating-bar C, the manner of mounting said bar being here shown as by means of studs or screws a^2 in the shell A, over which play elongated slots c in the ends of the bar C; but it is obvious that the bar may be mounted in other ways. This bar C engages in a suitable manner with both shutter-leaves B, the engagement with one of said leaves being on one side of the pivotal point a' , and with the other leaf on the other side of said pivotal point, whereby as the bar C moves it will move the leaves in opposite directions the one to the other. This engagement may be by any suitable connections, the best form being that here shown—namely, slotted projections c' , one on top and the other on the bottom of said bar, the former engaging with a pin b' in one of the shutter-leaves and the latter engaging with a pin b^2 in the other shutter-leaf, said pins operating in curved slots a^3 , formed in the shell A.

Upon the shell A is mounted an air-pump D, of usual construction, having the ordinary air-bulb connection E. The movable part or piston of the air-pump D is connected at the point d with a lever F, (here shown in the form of a bell-crank lever,) which is pivoted at the point f . The upright arm of this lever is connected with the operating-bar C in suitable manner, which, as far as the operation of the device for a time-exposure is concerned, may be of any character, but the particular character of which and to serve further purposes I shall hereinafter describe.

It will now be seen that when the air-pump D is operated the bell-crank lever F will be thrown over, so as to carry the operating-bar C over to one side, the extent of this movement being such as to open the leaves of the shutter, this extent being limited and defined by any suitable stop—as, for example, by a stop such as J, with which the lever F comes in contact. The shutter remains open as long as the pressure upon the air-bulb continues; but upon this being removed the return of the air to the bulb causes the return of the piston of the air-pump, which, being connected with the lever F, will bring said lever back, and thus the operating-bar C will be returned

and the shutter will be closed. Thus the time-exposure is effected.

For an instantaneous exposure I have the following mechanism: Pivoted at the point *g* to the shell A is a lever G, which is in the shape of a bell-crank, to the lower arm of which is attached a spring H, and its upper arm is connected, in any suitable manner, with the operating-bar C, the form of connection being described hereinafter. When the sliding or operating bar C is pulled over to one side—say to the left—to its limit, in which position the shutter-leaves are closed, said bar is engaged by a trigger, which is here shown and designated by I, pivoted at the point *i*, and having a shoulder *i'* which engages with a notch *c*² on the bar C. The other end of this trigger is adapted to be operated by contact with the lever F, moving under the impulse of the pump D, this contact being here shown as effected through the interposition of the arm J, which has been heretofore mentioned as serving also the function of a stop in connection with the time operation of the shutter. Now upon operating the air-bulb and forcing the movement of the lever F, as has been heretofore described, the contact of said lever with the arm J will throw the trigger I upwardly, so that its shoulder *i'* will be released from engagement with the notch *c*², and thereupon the bar C will, by reason of its connection with the lever G, which is operated by the spring H, move over rapidly to the right, and will thus cause the instantaneous operation of the shutter.

The speed of the shutter is regulated, as usual, by varying the tension of the spring H, and to vary this tension I have the novel device, which consists of the pivoted arm K, to which the spring is attached, said arm having on its under side a short catch-pin *k*, which is adapted to engage with any of a series of indentations *a*⁴ made in the shell A. By turning this arm or lever K down, and causing its pin *k* to engage with one of the lower indentations *a*⁴, it is obvious that the spring H will be tightened and the speed of the shutter thereby increased. Now in order to change from one of these operations to the other at will—namely, to set the shutter for a time or an instantaneous exposure, as may be desired—I arrange the parts as follows: Pivoted at the point *l* to the operating-bar C is an arm L, having at one end a knob *l'*, by which it may be grasped and rocked or vibrated about its pivotal center *l*. At one end of this rocking arm is a stud *l*², which is adapted to pass down into and engage with a groove or notch *g'* in the lever G. Near the other end of the rocking arm L is another stud *l*³, which is adapted to pass down into and engage with the notch or groove *f'* in the lever F. The relative position of these two studs *l*² and *l*³ is such that when one of them is in engagement with its notch or groove

the other is out of engagement with its notch or groove. Thus when the shutter is to be set for a time-exposure the rocking arm L is so moved as to cause its stud *l*² to engage with the notch or groove *f'* of the lever F, and in this position of the arm its stud *l*³ will be out of engagement with the notch or groove *g'* of the lever G, whereby the sliding bar C will be independent of and not affected by the spring H, and its operation to effect a time-exposure will be carried out wholly by the movement of the lever F upon the outward and inward movement of the pump, as heretofore described. During this operation the trigger I is elevated, so that its shoulder *i'* will be above the path of the bar C and will not engage the notch of said bar, and this same elevation of the trigger I will so raise its contact-arm J that the latter will then be in the proper position to serve as a stop to limit the movement of the lever F and the consequent throw of the bar C at a point at which the shutter shall be open. This elevation of the trigger I may be effected in any suitable manner, as by the cam or eccentric M, having the handle *m*, said cam or eccentric operating under the trigger, as shown. Now for the instantaneous exposure the rocking arm L is so moved that its stud *l*² will engage with the notch or groove *g'* of the lever G, and in this position its stud *l*³ will be out of engagement with the notch or groove *f'* of lever F. The trigger I is then let down by the movement of the cam M, so that its shoulder *i'* will be in engagement with the notch *c*² of the bar C when said bar is thrown over to the left to its extreme closed position, and this movement of the trigger I will throw its contact-arm J down into position to be immediately operated by the upward movement of the lever F. Now upon operating the pump the lever F is thrown up, and through contact with the arm J the trigger I is lifted and releases the bar C, and said bar through its connection with the lever G, due to the engagement of the stud *l*² of the rocking arm with said lever, will be thrown over to the right, thus making an instantaneous exposure.

In order to open the lens and keep it open for focusing purposes, I have a second notch *c*³, adapted to be engaged by the trigger, and so located on the bar C as to hold said bar in the position to hold the shutter-leaves open.

In order to hold the arm L in the position to which it is rocked, I have projecting from its under side, directly under the knob *l'*, a pin *l*⁴, adapted to engage either of two holes or depressions *c*⁴ in the bar C.

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

1. In combination with pivoted apertured leaves of a photographic camera shutter, the means for operating said leaves to open and close the shutter, consisting of a sliding bar connected with the shutter leaves, and a piv-

oted lever connected with said bar and adapted by its movement to effect the sliding thereof.

2. In combination with pivoted apertured leaves of a photographic camera shutter, the means for operating said leaves to open and close the shutter, consisting of a sliding bar connected with the shutter leaves, a pivoted lever connected with said bar and adapted by its movement to effect the sliding thereof, and an air pump for effecting the movement of the lever.

3. In combination with the pivoted apertured leaves of the photographic camera shutter, said leaves being mounted upon a common pivot, the means for operating the leaves, consisting of a sliding bar connected with said leaves, with one above and with one below the pivotal point common to both said leaves, and a pivoted lever connected with said sliding bar and adapted to effect the sliding thereof.

4. In combination with the pivoted apertured leaves of the photographic camera shutter, said leaves being mounted upon a common pivot, the means for operating the leaves, consisting of a sliding bar connected with said leaves, with one above and with one below the pivotal point common to both said leaves, a pivoted lever connected with said sliding bar adapted to effect the sliding thereof, and an air pump for effecting the movement of the lever.

5. In combination with the pivoted apertured leaves of a photographic camera shutter, the means for operating the leaves consisting of a sliding bar connected therewith, a trigger for holding said bar, means for tripping the trigger to release the bar, a lever connected with said bar and a spring controlling the lever, whereby the bar is thrown over when released from the trigger.

6. In combination with the pivoted apertured leaves of a photographic camera shutter, the means for operating the leaves consisting of a sliding bar connected therewith, a trigger for holding said bar, means for tripping the trigger to release the bar, a lever connected with said bar, a spring controlling the lever whereby the bar is thrown over when released from the trigger, and the pivoted lever arm to which the other end of the spring is attached, said arm having the pin adapted to engage any of a series of indentations whereby the tension of the spring is varied.

7. In combination with the pivoted apertured leaves of a photographic camera shutter, the means for operating them, consisting of a sliding bar connected with said leaves, a pivoted lever connected with the bar and adapted by its movement to actuate the same, means for operating the lever and a stop to limit the movement of said lever.

8. In combination with the pivoted apertured leaves of a photographic camera shutter, the means for operating them consisting of a sliding bar connected with said leaves, a

pivoted lever connected with the bar and adapted to actuate the same by its movement, an air pump for operating the lever and a stop in the path of the lever to limit the movement of said lever.

9. In combination with the pivoted apertured leaves of a photographic camera shutter, the means for operating them, consisting of a sliding bar connected with said leaves, a trigger adapted to engage and hold said bar, a lever with pump connection adapted to trip said trigger to release the bar, and a lever and spring connected with said bar for throwing it over when released.

10. In combination with pivoted apertured leaves of a photographic camera shutter, a means for operating them consisting of a sliding bar connected with said leaves, a pivoted trigger engaging said bar and adapted to hold it, an arm extending from said trigger, a lever connected with the sliding bar and having a pump connection for operating it, said lever being adapted to come in contact with the arm of the trigger to release said trigger, and a spring connection with the bar for throwing it over when released.

11. In a photographic camera shutter and in combination with the sliding bar for operating the shutter, the trigger adapted to engage said bar and the handled cam for lifting the trigger out of the way when not needed or allowing it to return to operative position.

12. In a photographic camera shutter having pivoted apertured leaves, the sliding bar engaging and operating the leaves, separate lever connections with said bar for operating it and means for connecting and disconnecting either of said lever connections at will.

13. In a photographic camera shutter having pivoted apertured leaves, the sliding bar engaging and operating the leaves, separate lever connections with said bar for operating it, and means on the bar adapted to be thrown into engagement with either of said connections, whereby the bar is connected or disconnected with either at will.

14. In a photographic camera shutter having pivoted apertured leaves, the sliding bar engaging and operating the leaves, separate lever connections with said bar for operating it, and a rocking arm pivoted to the bar and having at each end a pin or stud adapted to engage alternately with said separate lever connections, whereby either may be connected or disconnected at will.

15. In a photographic camera shutter having pivoted apertured leaves, a sliding bar connected with said leaves, a lever F and pump connection, a lever G and spring connection and a swinging arm pivoted to the bar C and adapted to engage alternately said levers, whereby either may be connected or disconnected with said bar at will.

16. In a photographic camera shutter having pivoted apertured leaves, a sliding bar connected with said leaves, a lever F and

pump connection, a lever G and spring connection, and a rocking arm having a stud at each end adapted to alternately engage with a groove or notch in said levers, whereby either

5 may be connected or disconnected at will.

17. In a photographic camera shutter having pivoted apertured leaves, a sliding bar connected with said leaves, a lever F and pump connection, a lever G and spring connection, a rocking arm having a stud at each

10 end adapted to alternately engage with a groove or notch in said levers, and means for holding said arm in position adjusted, consisting of the stud or pin adapted to engage

15 different depressions in the bar.

18. A photographic camera shutter comprising the apertured pivoted leaves mounted

upon a common pivot within a suitable chambered shell, a sliding bar mounted upon said shell and having a connection with said 20 leaves, one above and the other below their common pivotal center, a trigger adapted to engage said bar, a lever F and pump connection adapted to operate the trigger, a lever G and a spring connection therewith, and an 25 arm pivoted to the bar C and adapted to be alternately thrown into and out of engagement with said levers F and G.

In witness whereof I have hereunto set my hand.

SAMUEL SLAYTON.

Witnesses:

S. H. NOURSE,
JESSE C. BRODIE.