

(No Model.)

F. M. SPAULDING.
PHOTOGRAPHIC SHUTTER.

No. 385,483.

Patented July 3, 1888.

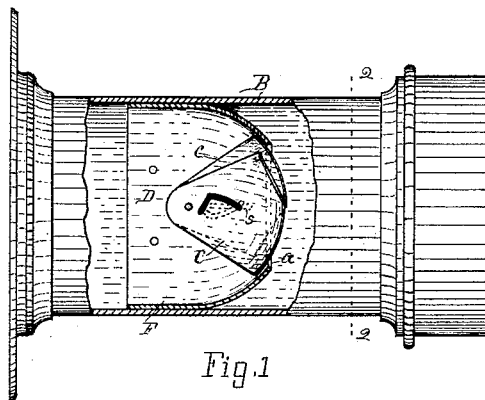


Fig. 1

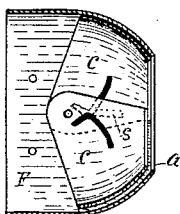


Fig. 4

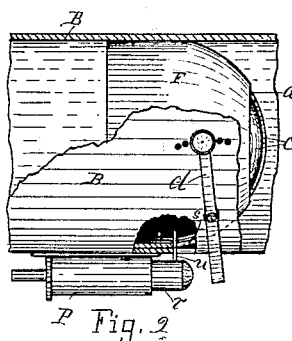


Fig. 2

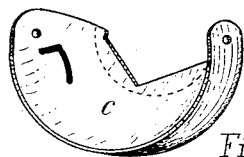


Fig. 5

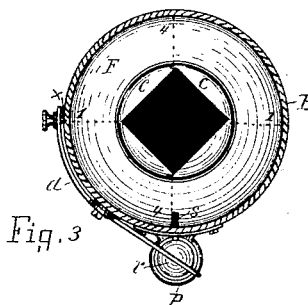
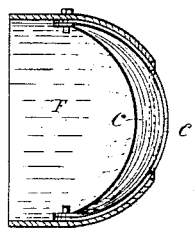


Fig. 3

Witnesses.
John C. Perkins.
James H. Perkins.

Fig. 6



Inventor.
Frank M. Spaulding

UNITED STATES PATENT OFFICE.

FRANK. M. SPAULDING, OF KALAMAZOO, MICHIGAN.

PHOTOGRAPHIC SHUTTER.

SPECIFICATION forming part of Letters Patent No. 385,433, dated July 3, 1888.

Application filed January 16, 1888. Serial No. 260,830. (No model.)

To all whom it may concern:

Be it known that I, FRANK. M. SPAULDING, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo and State of Michigan, have invented certain new and useful Improvements in Photographic Shutters, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that class of shutters known as "diaphragm-shutters."

The object of this invention is to provide a shutter which may be operated entirely inside the lens tube, thereby making it more compact and less liable to get out of order by coming in contact with outside obstructions. I attain these objects by the mechanism illustrated in the said drawings, in which similar letters refer to similar parts throughout the several views.

Figure 1 is a top view of a lens-tube of a photo-camera with a portion broken away and in section, showing my device contained therein, which is also in section, showing the wings in a closed position. Fig. 2 is a detail showing means for stopping wings in different positions. Fig. 3 is a sectional view taken on dotted line 2 2, Fig. 1. Fig. 4 is a sectional view taken on dotted line 1 1, Fig. 3. Fig. 5 is a perspective view of one of the wings. Fig. 6 is a sectional view taken on dotted line 4 4, Fig. 3.

In referring to the lettered portions of the drawings, B is the lens-tube of an ordinary photographic camera.

D represents my device, which consists of the tube F, one end of which is contracted and semi-globular in form and provided with the aperture *a*, said aperture being opened or closed by means of wings *c c*, which are pivoted to the inside of the tube F, as shown in Fig. 6, and adapted to exclude or admit rays of light. Said wings are operated by pin, *u*, attached to plunger *r* of the cylinder P, which

is operated by pneumatic means, said pin engaging in the L-shaped slots in the wings. It will be observed that if the pin *u* be moved throughout the whole length of the slot *s* that by a single movement of said pin the wings will open and close the aperture, thereby making an instantaneous exposure; or the plunger *r* may be stopped at the point where the wings are open, in which case two movements of the pin *u* will be required to open and close the aperture, thus making a time exposure. The mechanism for stopping said plunger consists of a curved spring-lever, *d*, pivoted to the lens-tube having its free end extending downward and in front of said plunger, and is adjustable by means of point *x* engaging in holes burr'd into the lens-tube, as shown in Fig. 2, and by means of said lever the wings can be adjusted to almost any point desired. It will be observed that the aperture formed by the wings is square. This construction is necessary when used as a diaphragm-shutter.

This device may be used on the outer end of the lens-tube, in which case the wings will be made to form a circular aperture, which may be done by cutting to dotted line, Fig. 5. If desired, there can be a tube placed inside the tube F for the purpose of hiding and protecting the wings. (Not shown.)

What I do claim, and desire to secure by Letters Patent, is—

1. In a lens-tube used in a photographic camera, the combination of the tube F, having the semi-globular-shaped end, the aperture *a*, and the wings *c c*, adapted to open and close said aperture, as shown and described.

2. In a lens-tube used in a photographic camera, the combination of the globular-shaped end of tube F, the aperture *a*, the wings *c c*, the spring-lever *d*, adapted to stop said wings, the L-shaped slots in the semi-globular-shaped wings, as described and shown.

FRANK. M. SPAULDING.

Witnesses:

JOHN C. PERKINS,
JAMES K. PERKINS.