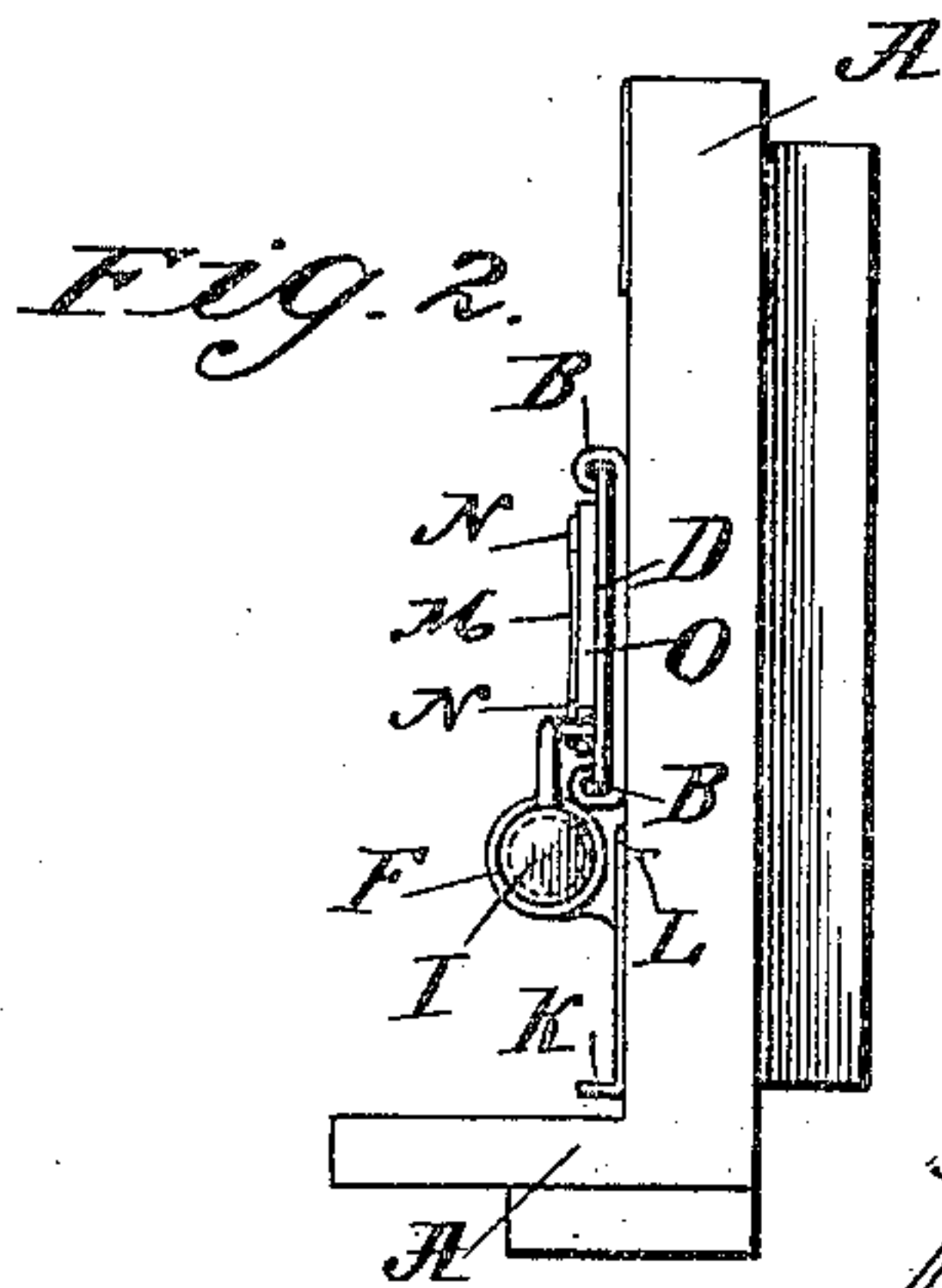
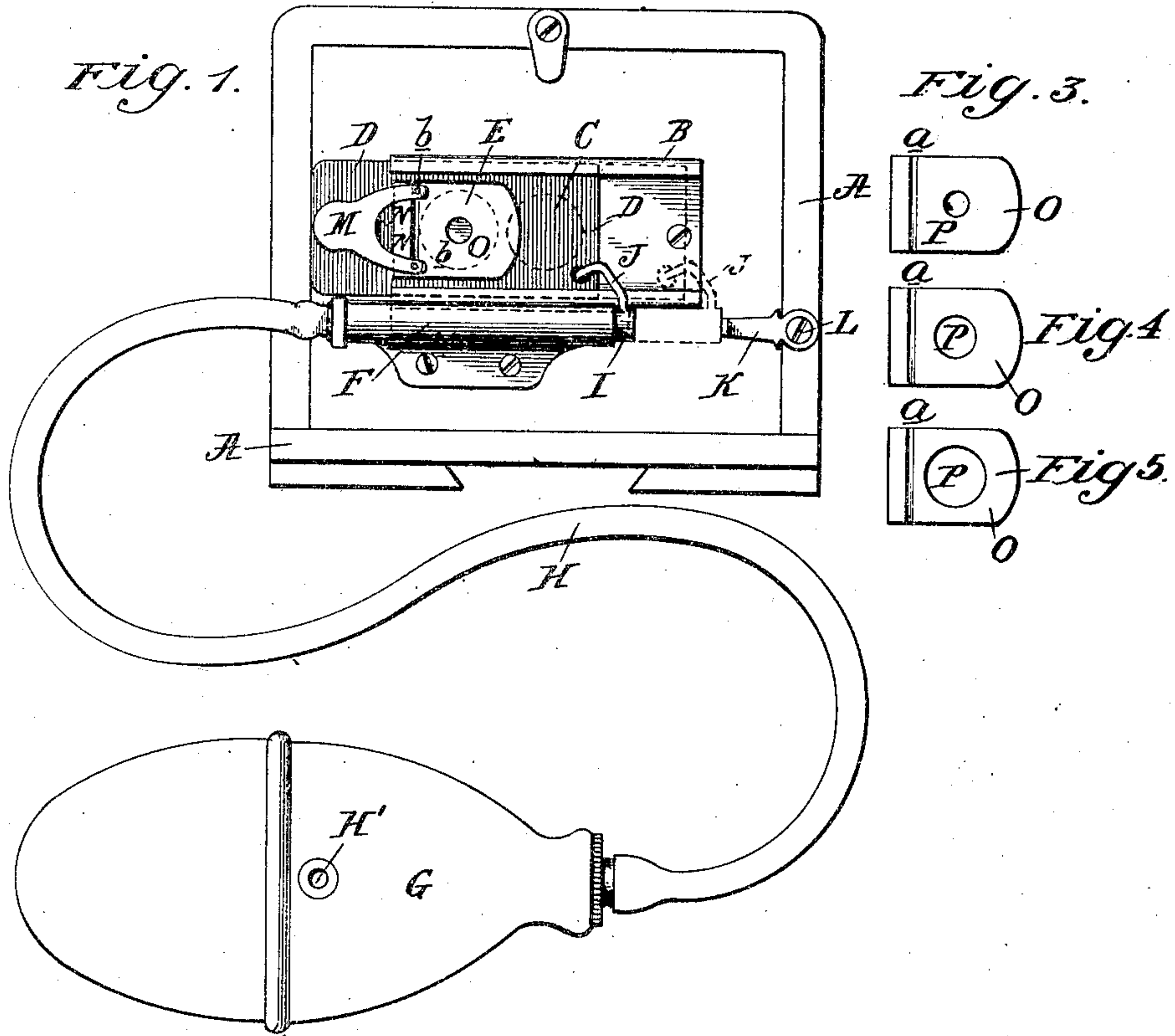


(No Model.)

W. V. ESMOND.
PHOTOGRAPHIC SHUTTER.

No. 591,347.

Patented Oct. 5, 1897.



Witnesses
Edward C. Roubens.
A. B. Morrison.

William V. Esmond
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UNITED STATES PATENT OFFICE.

WILLIAM V. ESMOND, OF NEW YORK, N. Y., ASSIGNOR TO THE E. & H. T. ANTHONY & COMPANY, OF SAME PLACE.

PHOTOGRAPHIC SHUTTER.

SPECIFICATION forming part of Letters Patent No. 591,347, dated October 5, 1897.

Application filed May 11, 1897. Serial No. 836,011. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM V. ESMOND, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Photographic Shutters, of which the following is a specification.

The invention relates to the kind of shutter known as the "pneumatic;" and it consists in the construction and arrangement of the parts and their conjoint operation as hereinafter set forth.

In the drawings, Figure 1 illustrates a front elevation of the invention. Fig. 2 illustrates an endwise elevation; and Figs. 4 and 5 illustrate, respectively, separate diaphragms which when in use are detachably attached to the shutter wing or slide.

A is the frame or casing of the shutter.

B is a slideway formed on the board or platen of the casing.

C is the exposure-aperture in the platen.

D is the shutter wing or slide. It may be made of metal, rubber, celluloid, wood, or other suitable material.

E is the exposure-aperture in the slide.

F is the pneumatic engine.

G is the bulb thereof, provided with the usual rubber tube H.

H' is a hole in the bulb.

I is the piston of the engine, to which the wing or slide D is attached by a connecting device J.

K is a stop pivoted, as seen at L, to the casing and adapted to be swung into the path of the piston.

M is a bifurcated plate attached to the face of the slide at its rear part, having the bifurcated points N N free. They are of spring metal.

O O O are diaphragms, each having a hole P in it. They differ in size.

The operation is as follows: For a time exposure the stop K is swung upwardly and held by the friction in its pivotal joint in a horizontal position. The bulb is then squeezed and the slide, under the action of the piston of the engine, is shot through the slideway B until the opening E in it coincides with the exposure-aperture in the platen of the shut-

ter, and at this point the end of the piston comes in contact with the stop K, and the pressure on the bulb being continued the slide will be held in its then position for the desired time. Now upon allowing the bulb to expand the suction will cause the piston to move in the reverse direction and the slide will be returned to its normal position. To make an instantaneous exposure, the stop is swung downwardly out of the way of the piston, as shown in Fig. 2. The bulb is then squeezed and the slide passes quickly entirely across the exposure-aperture in the platen, and during the time that the exposure-apertures in the platen and in the slide coincide the picture is taken. The operator removes his thumb or the pressure of the ball of his hand from the hole H' in the bulb as soon as the slide has completed its transit, so that there shall be no suction to retract the slide. When desired, however, the bulb may be again collapsed, and then the hole H' in it being covered the suction on the expansion of the bulb will withdraw the slide to its normal position.

In order to regulate the brilliancy and quantity of the light entering the camera at the time of exposure, I provide small flat pieces of rubber, metal, or other suitable material, (seen at O O O.) They are each perforated, as shown, with a hole P of differing size and are adapted to be pressed under the free spring-acting ends N N of the clamp-plate M, and thus held to the face of the wing or slide by the resiliency of the ends N N in such manner that the center of the holes in them shall coincide with the center of the exposure-aperture in the slide, and yet capable of easy removal therefrom when desired. I prefer to form a shallow groove *a* in the rear portion of these diaphragms, in which small projecting points *b b* on the respective ends N N of the clamp-plate M engage, the more securely to hold the diaphragms in position.

I do not limit myself to the details of construction shown and described, because they may be departed from and still the essentials of the invention be employed.

I claim—

1. In a photographic shutter, a movable wing provided with an exposure-aperture, a

spring-plate attached to the wing, and a flat, perforated diaphragm adapted to be slipped under the spring-plate and held by its resiliency against the face of the wing, for the purposes set forth.

2. In a photographic shutter, a movable wing provided with an exposure-aperture, a spring-plate attached to the wing, a flat, perforated diaphragm adapted to be slipped under the spring-plate, and interlocking or en-

gaging devices on the spring-plate and diaphragm to aid in holding the latter to the shutter-wing, for the purposes set forth.

Signed at New York, in the county of New York and State of New York, this 10th day of May, A. D. 1897.

WILLIAM V. ESMOND.

Witnesses:

E. SIMPSON,

A. B. MORRISON.