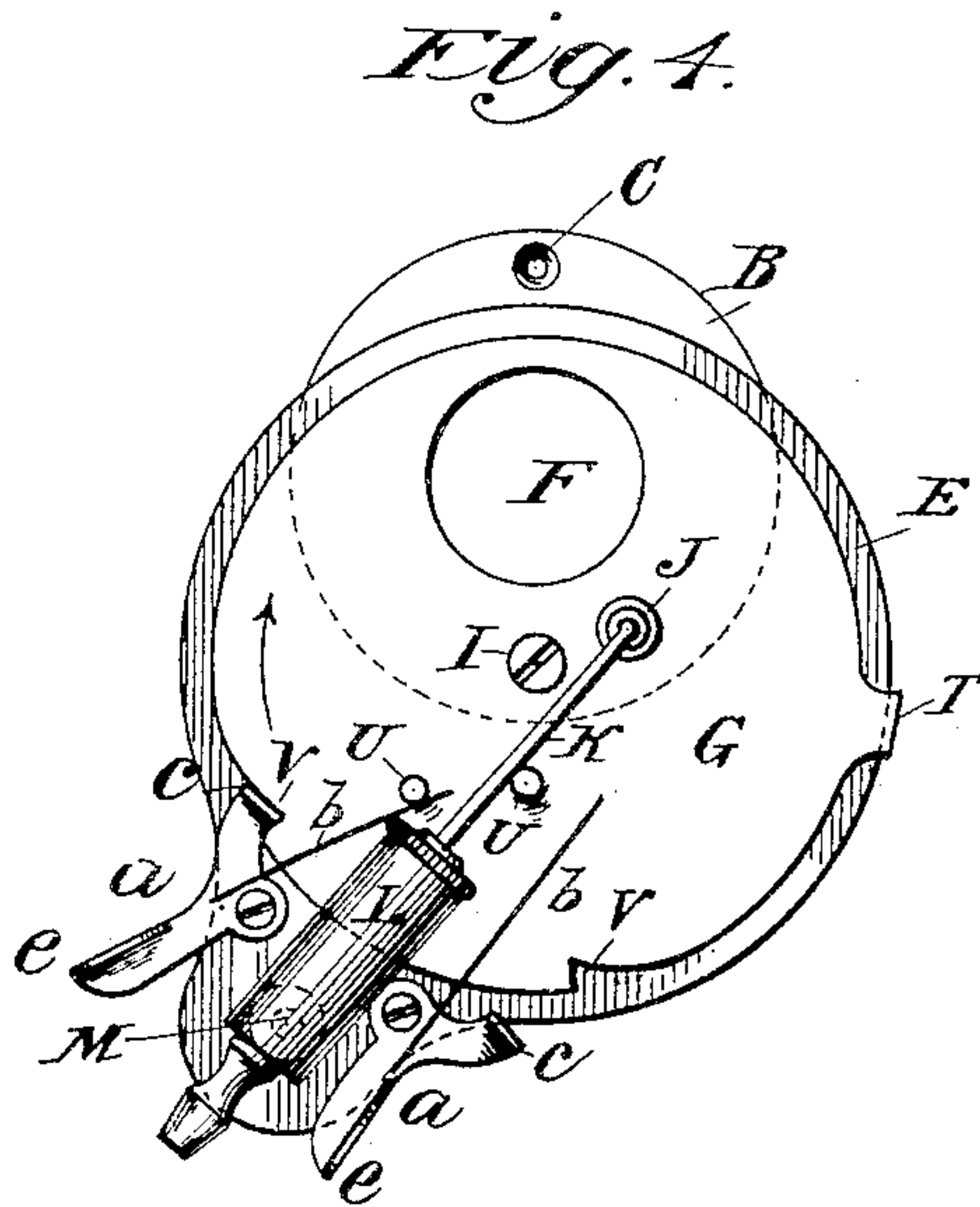
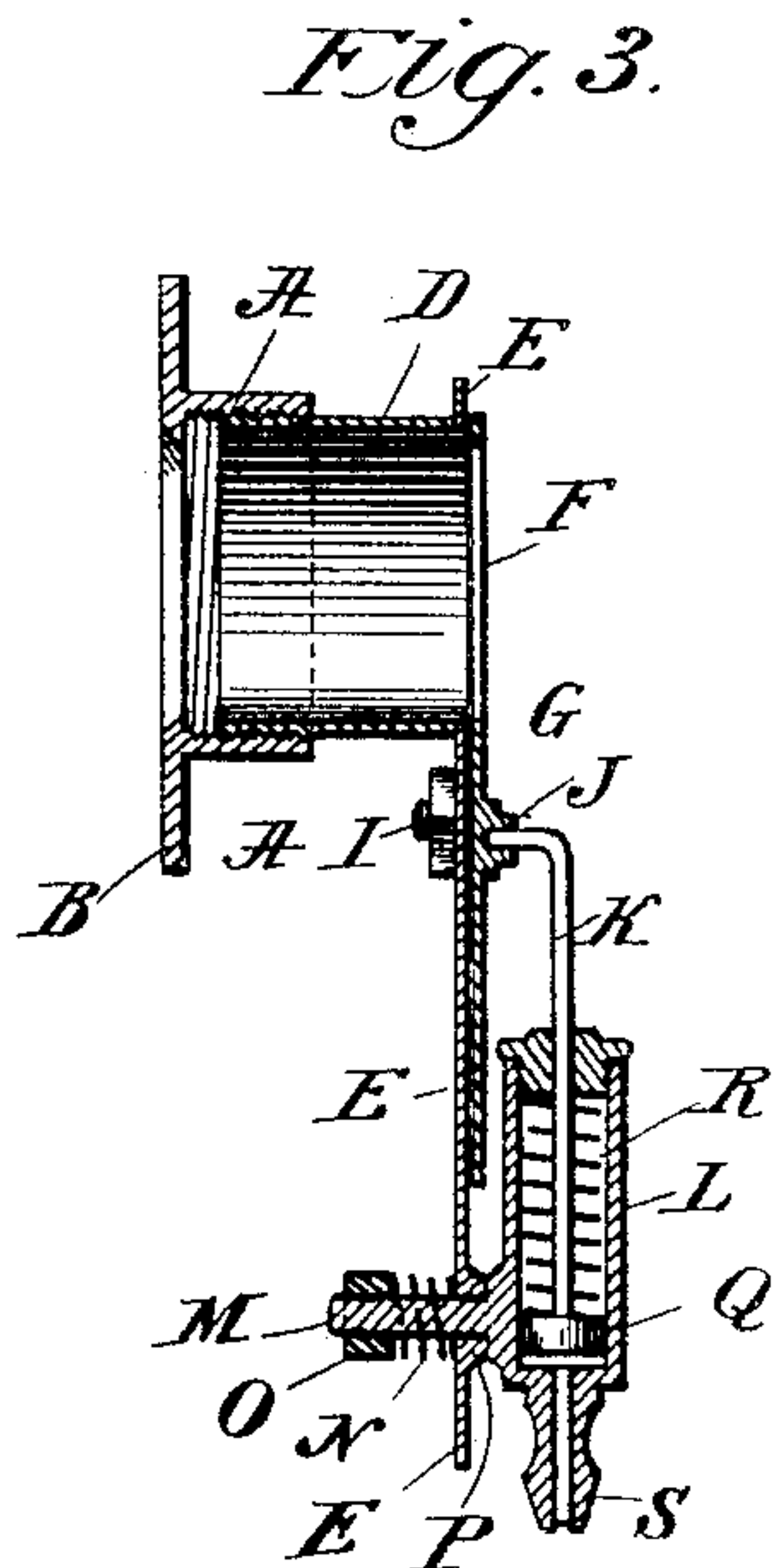
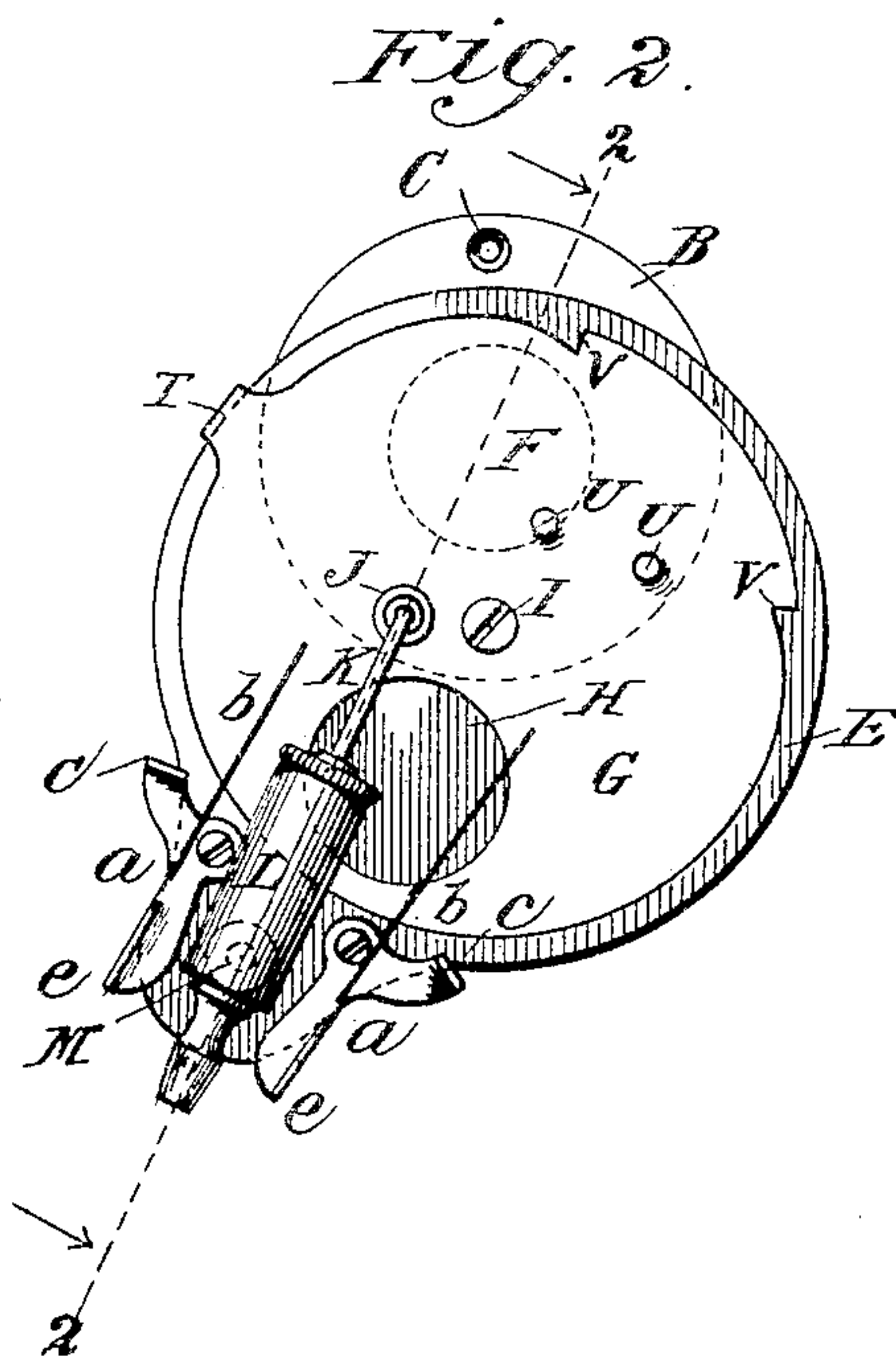
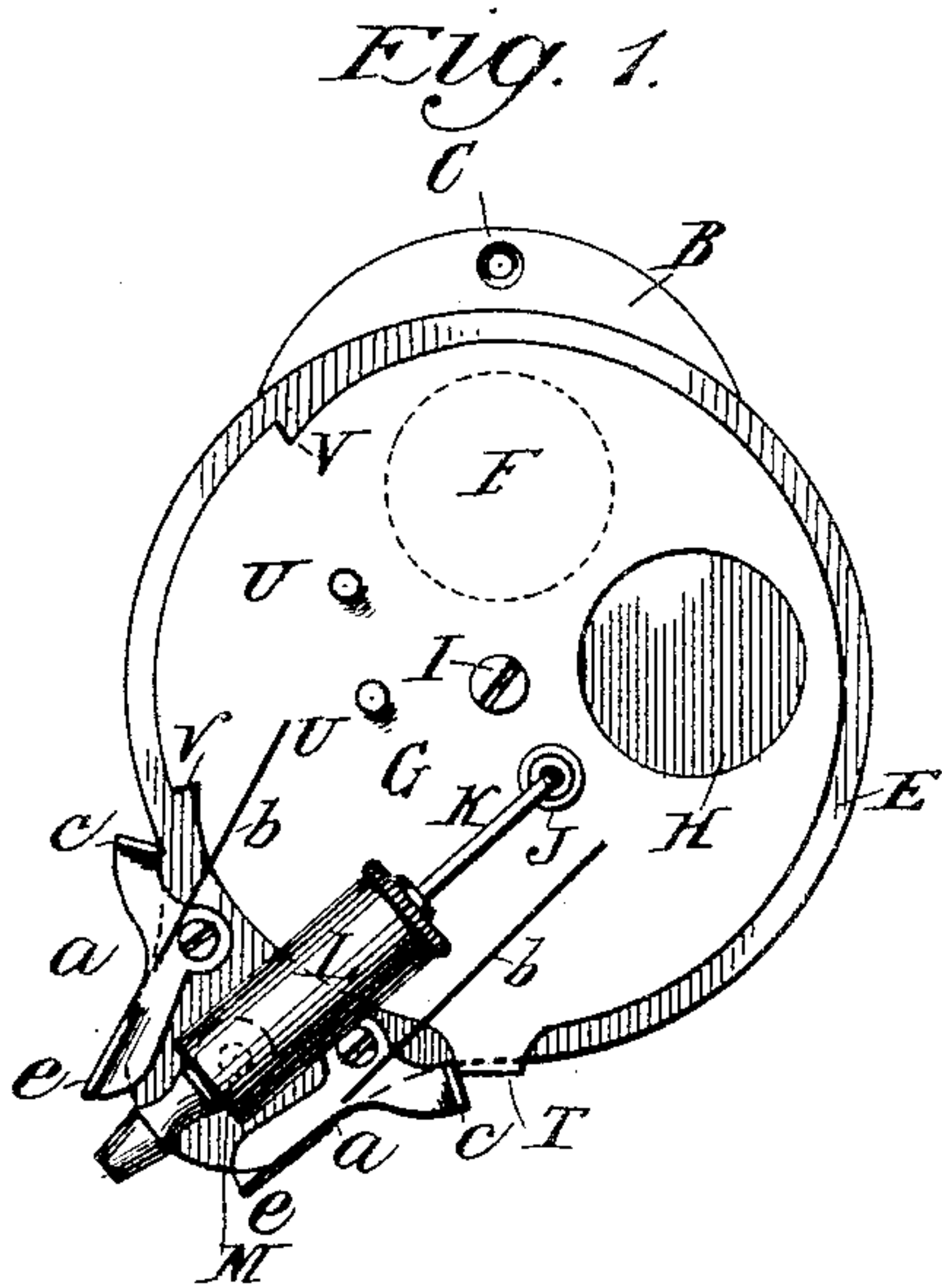


(No Model.)

W. V. ESMOND.
PHOTOGRAPHIC SHUTTER.

No. 581,984.

Patented May 4, 1897.



Witnesses
Edward C. Rowland
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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 NEW YORK.

PHOTOGRAPHIC SHUTTER.

SPECIFICATION forming part of Letters Patent No. 581,984, dated May 4, 1897.

Application filed March 5, 1897. Serial No. 626,106. (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 city, 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 consists in the construction and arrangement of the parts whereby a new and useful operation results, as hereinafter set forth, and illustrated in the drawings, in which—

Figure 1 illustrates an elevation of the apparatus, the parts being in one of their positions when at rest. Fig. 2 illustrates an elevation the same as shown in Fig. 1, the parts being in the position they assume after having made an instantaneous exposure. Fig. 3 illustrates a vertical sectional view on the line 2 2 of Fig. 2. Fig. 4 illustrates an elevation of the parts in the position they assume during a time exposure.

A represents an ordinary brass collar having a flange B, in which are screw-holes C, whereby it may be attached to the camera-box.

D is a section of tubing threaded to the collar A and having a brass plate E soldered eccentrically to it.

F is the exposure-aperture, made in the said plate. It is coincident and preferably coextensive with the opening in the tubular part D.

G is a circular shutter provided with an exposure-opening H, and it is pivoted centrally to the plate E, as seen at I.

J is a stud mounted eccentrically on the face of the shutter-plate, with which loosely engages the end of a piston-rod K, which works in a cylinder L, which is attached to the stationary plate E by a spindle M in such manner that it can easily oscillate on the same.

N is a spring held in place by a nut O, which normally draws the cylinder into contact with the face of the plate E or against a stud P, mounted thereon, which I prefer to use as an additional support for the spindle.

Q is the piston within the cylinder, and R is a spring, likewise inside the cylinder, which normally presses the piston to the rear end of the cylinder.

S is the usual nipple for the attachment of the rubber tubing of the usual compression-bulb.

T is a lip on the shutter-plate, which passes around the edge of the stationary plate E and serves to guide and support the shutter-plate. This is not always necessary, but I prefer to use it.

U U are pins or stops on the face of the shutter-plate, and V V are detents or equivalent stops on or near the edge of the shutter-plate.

a a are two latches, which are loosely pivoted to the base-plate E at about the position shown, and each is provided with a spring-finger b b, projecting laterally therefrom, and also with a tooth or pawl, like part c c. They are at their pivots respectively subjected to sufficient friction against the base-plate E, so that they will remain in any position in which they may be left.

The operation of the apparatus is as follows: To make an instantaneous exposure, the latches a a are both turned outwardly, as shown in Fig. 1. The subject is then properly focused, and when all things are ready for taking the picture the bulb is squeezed somewhat sharply. The pressure of the air upon the piston within the cylinder is sufficient to overcome the spring R and the piston-rod is consequently projected, and, owing to its being attached eccentrically to the shutter, the latter is quickly rotated on its central pivot, during which the exposure-aperture in the shutter passes over and registers with the light-admitting aperture in the base-plate and tube D, so that the plate is exposed in the usual manner. As soon as this shutter-plate has passed over the center the spring R exerts its force (because the pressure on the bulb has meantime been released) and the shutter is thus caused to complete its movement until it attains the position shown in Fig. 2, at which it is stopped by the piston reaching its starting-point at the rear end of the cylinder. A second instantaneous exposure may now be made by a repetition of the above-described acts and movements, excepting that the shutter will move from left to right instead of from right to left.

To make a time exposure, the appropriate

latch *a* is turned inward, as shown in Fig. 4, (in which the shutter is supposed to have moved from right to left until it attained the position shown in that figure,) and when
 5 turned inward the spring-finger *b* on the latch is in the path of the appropriate pin *U* on the shutter, so that as the shutter revolves the pin will strike against the spring-finger and carry it with it until the pawl *c* of the latch
 10 engages with the appropriate detent *V* on the shutter, at which time the spring-finger will be under some tension and the shutter will be locked by the pawl in its then position, in which the exposure-aperture in the shutter
 15 will coincide with that of the base-plate and tube *D* and a time exposure will result, at the termination of which the latch will be released by pressure on its free end, as at *e*, which rocks the latch on its pivot, thus withdrawing
 20 the pawl from the detent in the shutter and putting the spring-finger under increased tension, which the moment the pawl is disengaged from the detent forcibly throws the shutter backward, carrying it beyond the cen-
 25 ter, so that the spring in the cylinder again acts to return it to normal starting position.

It will be observed that time exposures may be made the same as instantaneous ones, from right to left or left to right, because the latches,
 30 pins, detents, and all coacting parts are duplicated on opposite sides of the several devices involved. The pins *U U* are set at different distances from the center of the shutter-plate, as shown, and also the spring-fingers
 35 *b b* of the latches are made of different lengths, in order that the proper pin may engage with the proper spring-finger to effect the desired time exposure and not with the other one, which would result in defective operation.
 40 In other words, the pin which is nearest the center of the shutter engages with the longer spring-finger only and the pin which is farther from the center engages with the shorter finger only during the operation of the parts in
 45 making time exposures.

I claim—

1. A shutter mechanism embodying a centrally-pivoted shutter, a pneumatic engine, the piston whereof is connected eccentrically
 50 to the shutter, and a spring within the cylinder of the engine, for the purposes set forth.

2. A shutter mechanism embodying a centrally-pivoted shutter, a pneumatic engine the piston whereof is connected eccentrically
 55 to the shutter, a spring within the cylinder, a detent on the shutter, a pin on the shutter, and a pivoted latch adapted to be thrown into

and out of the path of the said pin, for the purposes set forth.

3. A shutter mechanism embodying a cen- 60 trally-pivoted shutter, a pneumatic engine the piston whereof is connected eccentrically to the shutter, a pin on the shutter, a detent on the shutter, and a pivoted latch adapted to be thrown into and out of the path of the 65 said pin, for the purposes set forth.

4. In a shutter mechanism, a rotating shutter, an oscillating pneumatic engine having a piston and piston-rod, the latter being attached eccentrically to the shutter, for the 70 purposes set forth.

5. In a shutter mechanism, a rotating shutter, an oscillating pneumatic engine having a piston and piston-rod, the latter being attached eccentrically to the shutter, and a 75 spring within the cylinder, for the purposes set forth.

6. In a shutter mechanism, an apertured base-plate, a shutter pivoted centrally there- 80 to, an oscillating pneumatic engine supported on the base-plate, the piston-rod whereof is eccentrically attached to the shutter, duplicate pivoted latches attached to the base-plate on either side of the engine, and duplicate 85 pins and detents or stops on the shutter adapted to engage with the said latches respectively, for the purposes set forth.

7. In a shutter mechanism, an apertured base-plate, a shutter pivoted centrally there- 90 to, an oscillating pneumatic engine supported on the base-plate, the piston-rod whereof is eccentrically attached to the shutter, duplicate pivoted latches attached to the base-plate on either side of the engine, duplicate pins and detents or stops on the shutter adapted 95 to engage with the said latches respectively, and a spring within the cylinder, for the purposes set forth.

8. In a shutter mechanism, a pivoted shutter having at or near its edge a detent or stop, 100 a latch adapted to engage with said detent, and provided with a spring-finger, which engages with a stop upon the shutter and which exerts a thrusting action upon the shutter upon the release of the latch from its detent, 105 for the purposes set forth.

Signed at New York, in the county of New York and State of New York, this 26th day of February, A. D. 1897.

WILLIAM V. ESMOND.

Witnesses:

PHILLIPS ABBOTT,
 E. SIMPSON.