

No. 671,781.

Patented Apr. 9, 1901.

L. K. SNELL.
EXPOSURE TIMER.

(Application filed July 16, 1900.)

(No Model.)

Fig. 1.

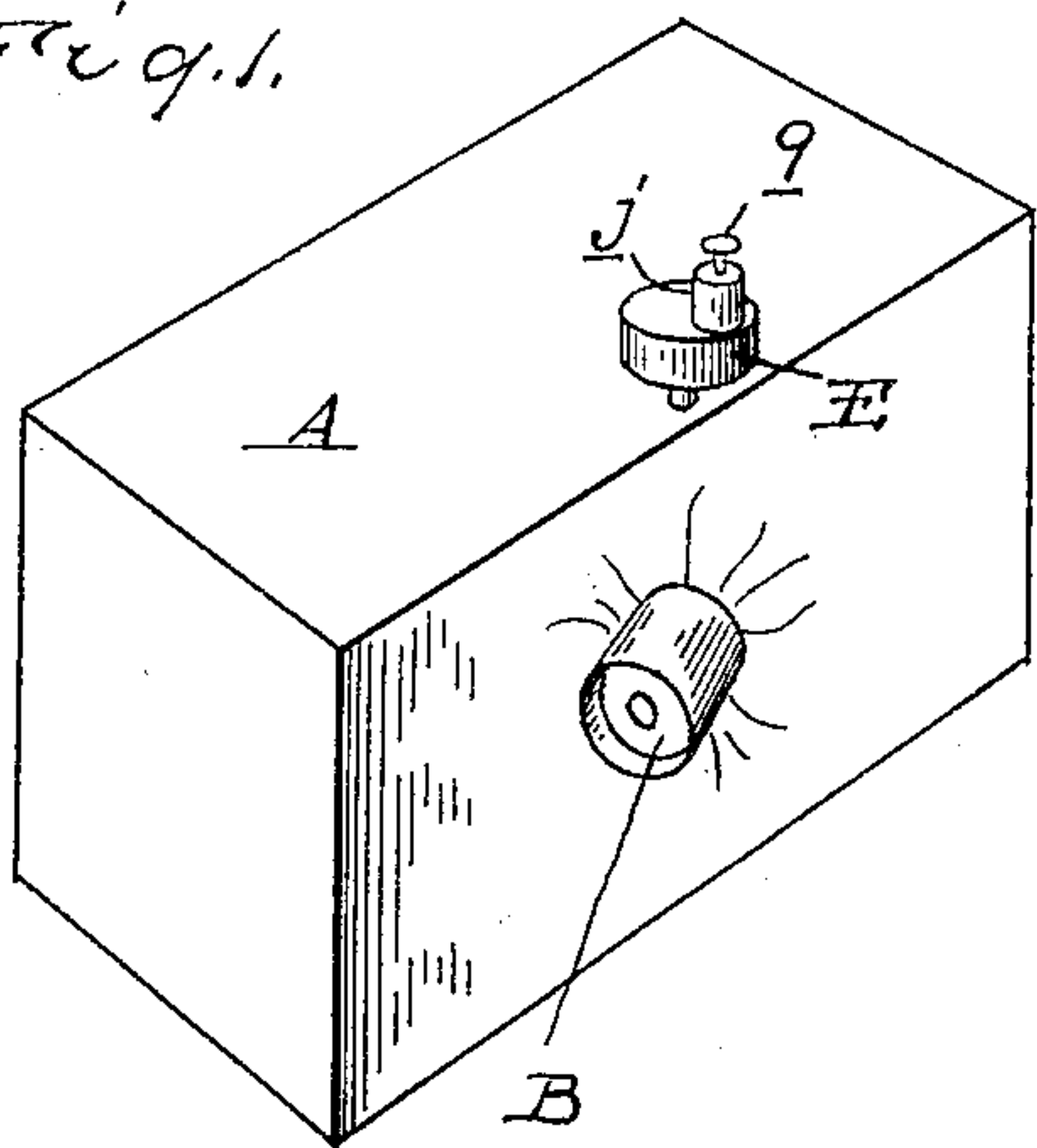


Fig. 2.

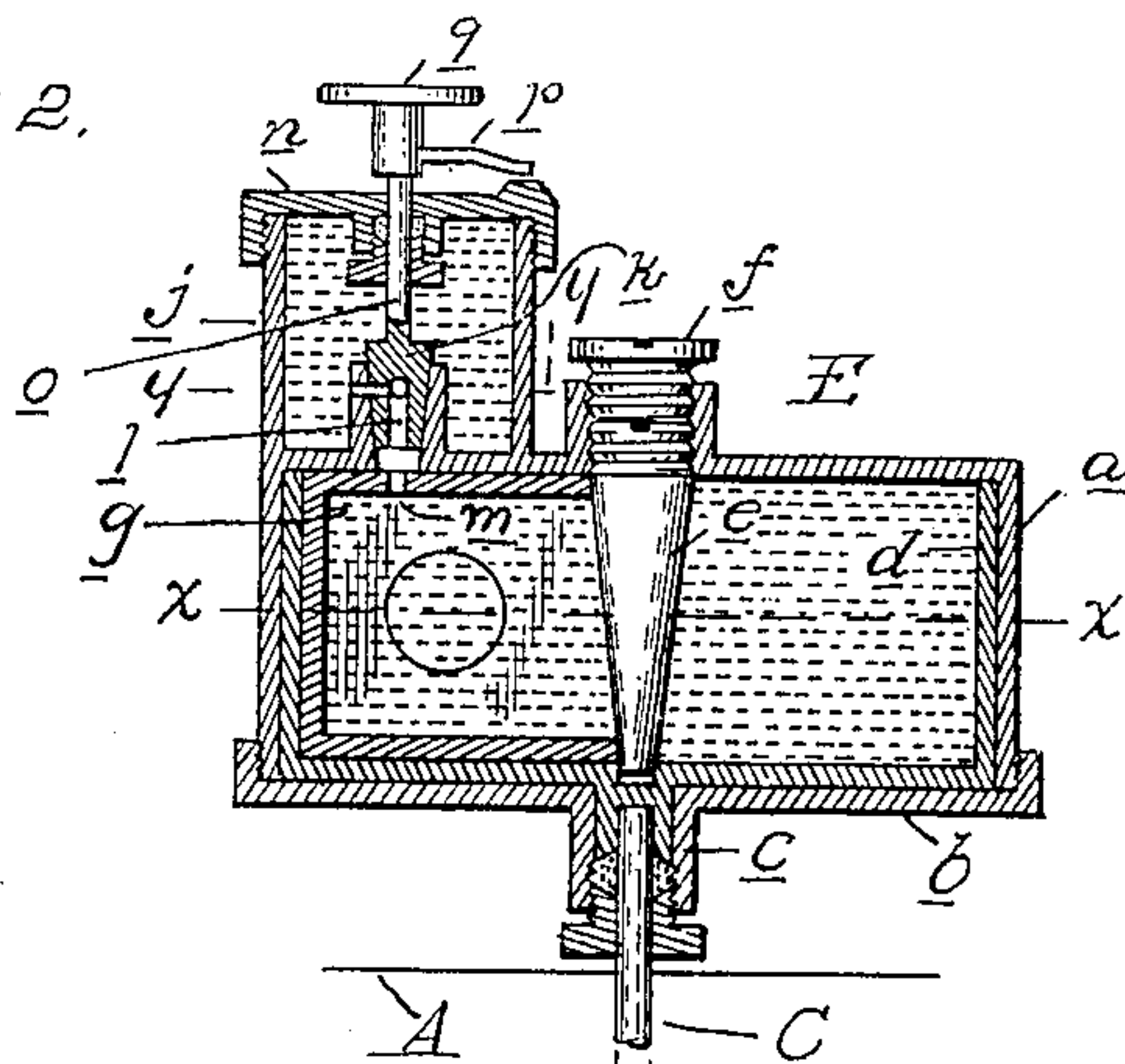


Fig. 3.

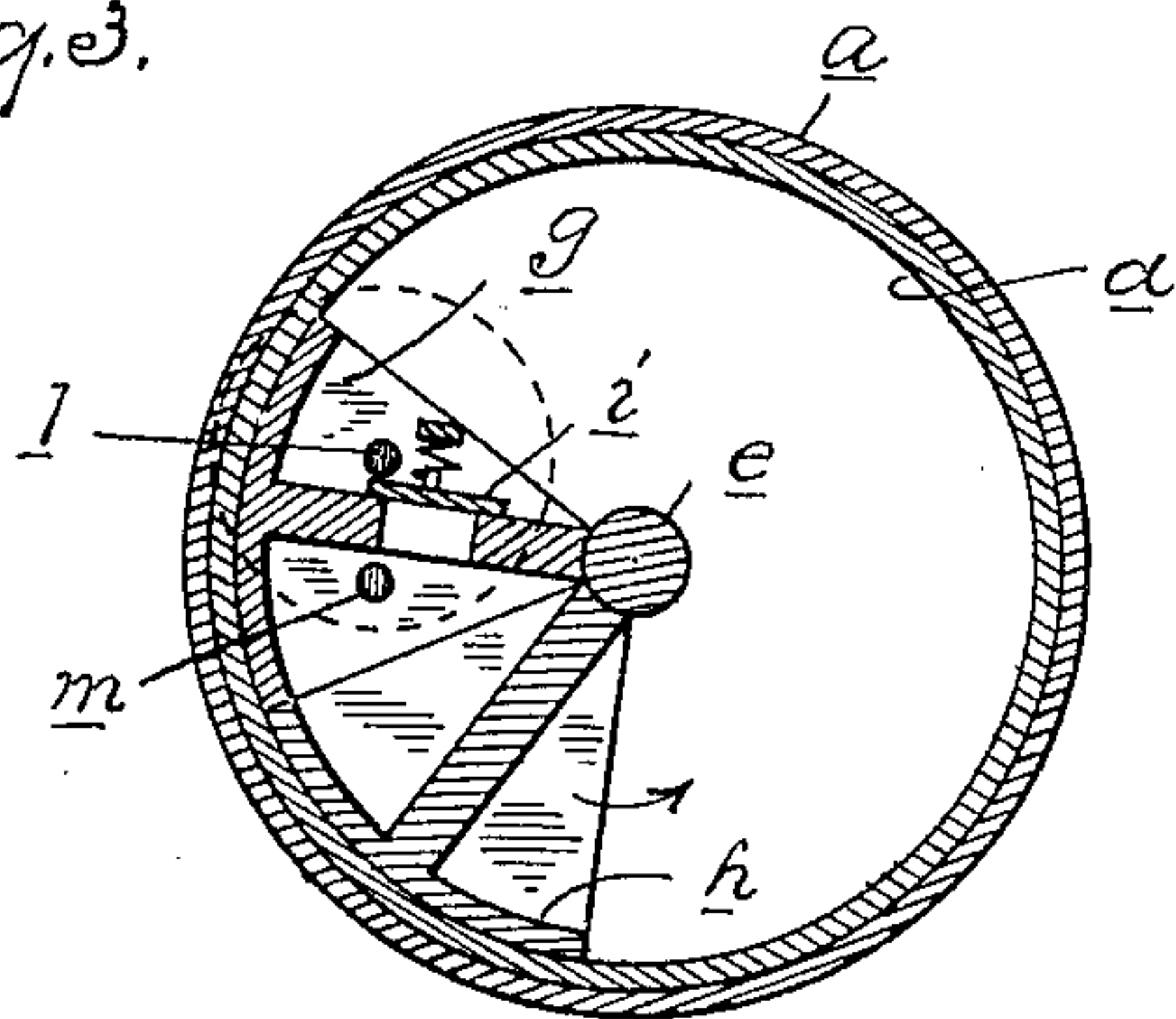


Fig. 4.

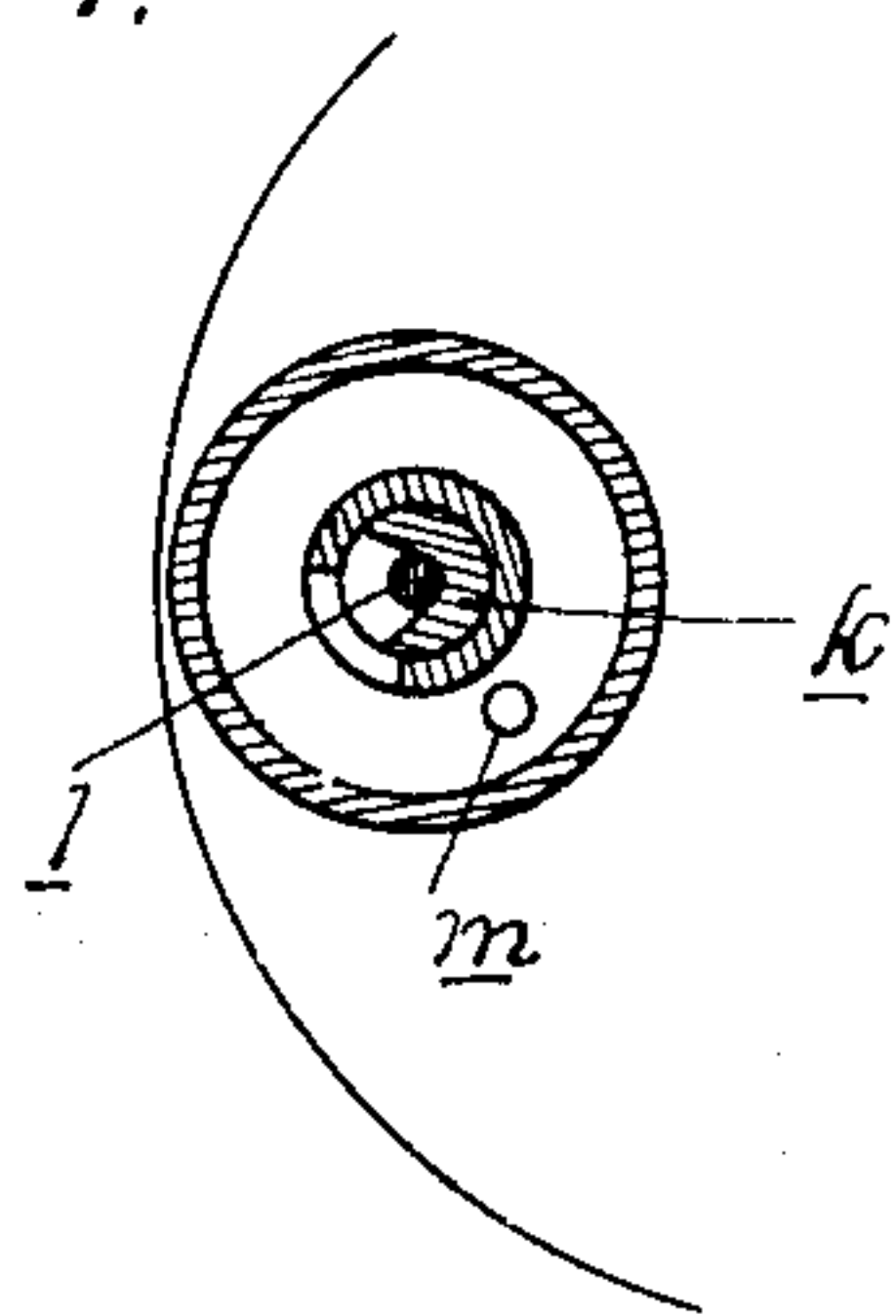
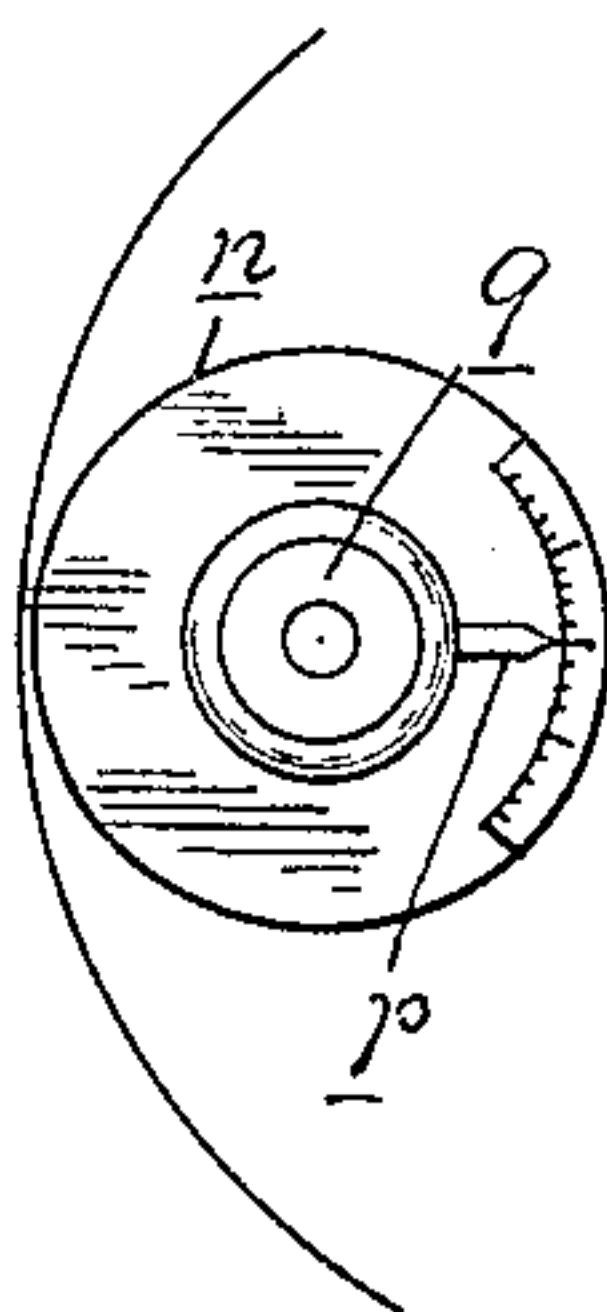


Fig. 5.



Witnesses
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EXPOSURE-TIMER.

SPECIFICATION forming part of Letters Patent No. 671,781, dated April 9, 1901.

Application filed July 16, 1900. Serial No. 23,766. (No model.)

To all whom it may concern:

Be it known that I, LYLE K. SNELL, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Exposure-Timers, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to exposure-timers for cameras, and is especially designed for use in connection with cameras of that type in which the lens rotates through a limited angle. With cameras of this class the exposure is made by the rotation of the lens in relation to the film or sensitive plate, the movement of said lens being imparted from a spring or other actuating device. For practically instantaneous exposures the tension of the spring alone governs the time interval, but where it is desired to give an exposure of greater length it is necessary to provide means for governing the rotation of the lens. At the same time it is essential that the movement be uniform and without jar or vibration.

It is the object of the invention to obtain a device which will fulfil the necessary conditions as above set forth; and to this end the invention consists in the peculiar construction of a rotary dash-pot connected to the rotating member of the camera and adapted to retard its speed.

The invention further consists in certain details of construction, as more fully hereinafter described, and specifically set forth in the claims.

In the drawings, Figure 1 is a perspective view of a camera to which the timing device is applied. Fig. 2 is a vertical longitudinal section through the timing device. Fig. 3 is a horizontal section on line *x x*, Fig. 2, looking upward. Fig. 4 is a section on line *y y*, Fig. 2. Fig. 5 is a plan view of the valve-setting device.

A is the camera-box, provided with the lens B, which is mounted upon a rotating member, such as the shaft C, and is provided with an actuating-motor, such as the spring D, these members forming no part of the present invention.

E is the exposure-timer, comprising, essentially, a rotary dash-pot, which, as shown in the drawings, is of the following construction:

a is a cylindrical casing secured in any convenient position to the camera-box and arranged in axial alinement with the shaft C. This cylinder is preferably provided with a removable cap *b*, having a central stuffing-box *c*, through which the shaft C passes into the cylinder. Within the casing *a* is arranged a rotary cylindrical casing or piston *d*, which is connected to the shaft C and adapted to rotate therewith. *e* is a tapering pin passing through the axis of the cylinders *a* and *d* and longitudinally adjustable by means of a threaded engagement with the casing *a* at one end, a lock-nut *f* being provided for holding it in any position of adjustment. Between the pin *e* and the inner wall of the casing *d* are arranged two abutments *g* and *h*, the former being secured to the casing *b* and the latter to the casing *d*. These abutments are preferably in the form of V-shaped segments and are adapted to form a practically liquid-tight joint with the casing and the pin *e* on all sides. One of the abutments, such as *g*, is provided with a check-valve *i*, controlling an aperture therethrough and adapted to permit a free flow of liquid in one direction therethrough, but to prevent said flow in the other direction. Above the casing *a* is arranged a casing *j*, containing a rotary valve *k*, governing a port *l*, connecting the casing *j* with the chamber within the casing *a* on one side of the abutment *g*. *m* is a port connecting the interior of the casing *j* with the chamber in the casing *a* on the opposite side of the abutment *g*. The casing *j* is provided with a suitable cap, such as *n*, through which the stem *o* of the valve *k* passes, and connected to this stem, without the casing, is an index *p*, extending in proximity to suitable scale or markings upon the cap *n*. The stem is also provided with a knob or operating-handle *q*, by means of which the valve may be set at any desired point.

The construction being as described, in the operation of the device the chambers within the casings *j* and *a* are filled with a suitable liquid, such as oil. The lens is then set into its position preparatory to the making of an exposure, in which position the abutment *h* will be turned against the abutment *g*, as shown in Fig. 3, and the spring D will be placed under tension. To start the rotation of the lens, the shaft C is released from its

retaining-catch, (not shown,) which will permit the spring D to rotate the shaft, lens, and casing *d* in the direction indicated by the arrow, Fig. 3. In this movement the pressure of the rotary abutment *h* against the liquid will force the latter through the port *l* and valve *k* into the chamber of the casing *j*, from which it will pass through the port *m* back again into the chamber of the casing *a* on the opposite side of the abutment *g*. This will permit of the travel of the abutment *h*; but inasmuch as the port *l* may be restricted to any degree the speed of the movement may be varied as desired. The movement of the abutment *h* is, however, perfectly uniform from start to finish, whether the speed be fast or slow, for the reason that the restriction of the port *l* remains the same during the whole movement. In resetting the lens the liquid within the casing *a* can pass freely through the check-valve *i* instead of being obliged to pass again through the restricted port *l*. In order to provide adjustment to compensate for any slight wear in the device, the pin *e* is made tapering, so that it may be set up against the abutments *g* and *h* and locked by the nut *f*.

What I claim as my invention is—

1. The combination with a rotary exposing apparatus for cameras and an actuating-motor therefor, of a rotary dash-pot directly connected to said rotary exposing apparatus and regulating the speed thereof.
2. The combination with a rotary exposing apparatus and an actuating-motor therefor, of a rotary piston connected to said rotary exposing apparatus, a casing having a segmental fluid-holding chamber in which said piston travels, a by-pass connecting opposite ends of said chamber and means for variably restricting said by-pass.

3. An exposure-timer for cameras, comprising a casing, a rotary piston thereon, a stationary abutment, dividing the space within said casing into two chambers on opposite sides of said piston connected by a restricted port, and means for varying the restriction of said port.

4. An exposure-timer for cameras, comprising a casing, a rotary piston therein, a stationary abutment dividing the space within said cylinder into two fluid-chambers on opposite sides of said piston, a check-valve governing a port connecting said chambers and an adjustable valve governing a restricted port between said chambers.

5. An exposure-timer, for cameras comprising a casing, a rotary piston and a stationary abutment therein, dividing the space within said casing into two fluid-compartments having a restricted connecting-port and an axially-arranged tapering pin forming a bearing against the inner ends of said piston and abutment and longitudinally adjustable within the casing, for the purpose described.

6. An exposure-timer for cameras comprising a cylindrical casing, a rotary piston and a stationary abutment therein, dividing the space within said casing into two chambers, a casing above said cylindrical casing containing a chamber connected to the chamber on one side of said stationary abutment, and having a port connected to the chamber on the opposite side of said abutment, a valve for restricting said port, and an operating-stem for said valve passing without said casing.

In testimony whereof I affix my signature in presence of two witnesses.

LYLE K. SNELL.

Witnesses:

JAMES WHITTEMORE,
H. C. SMITH.