

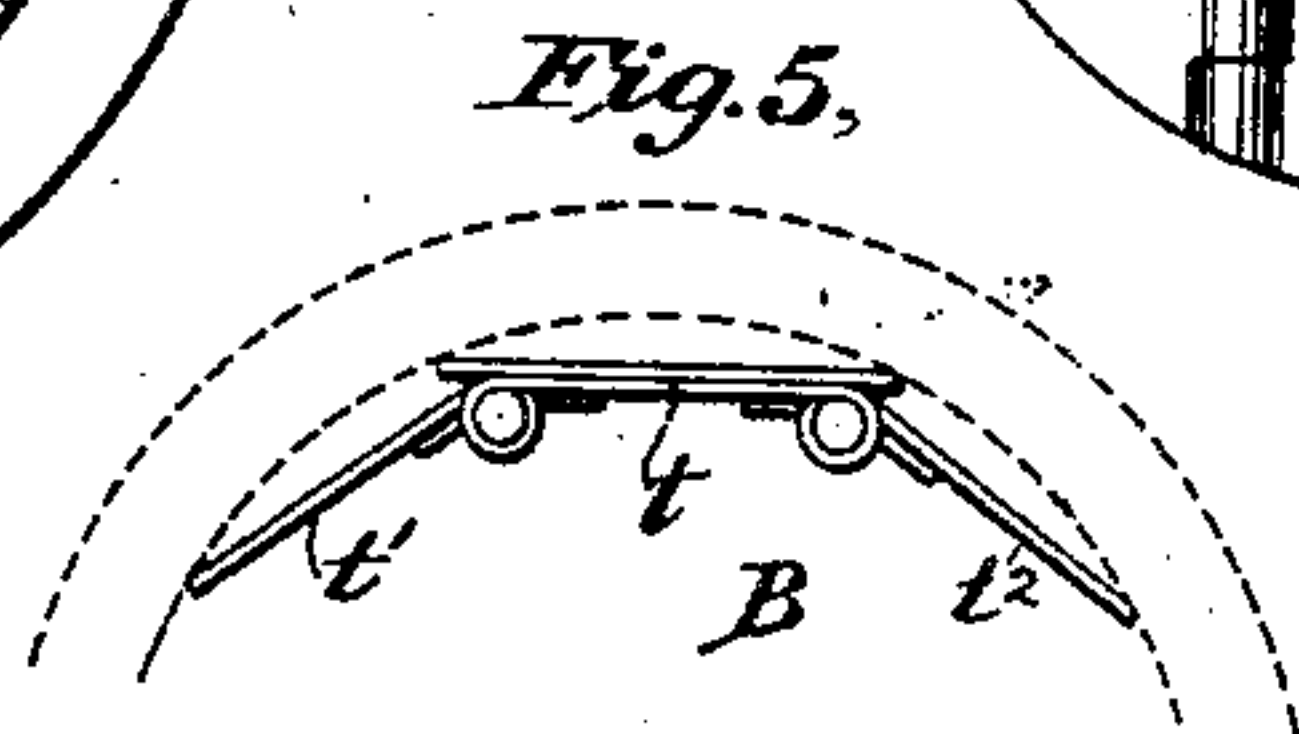
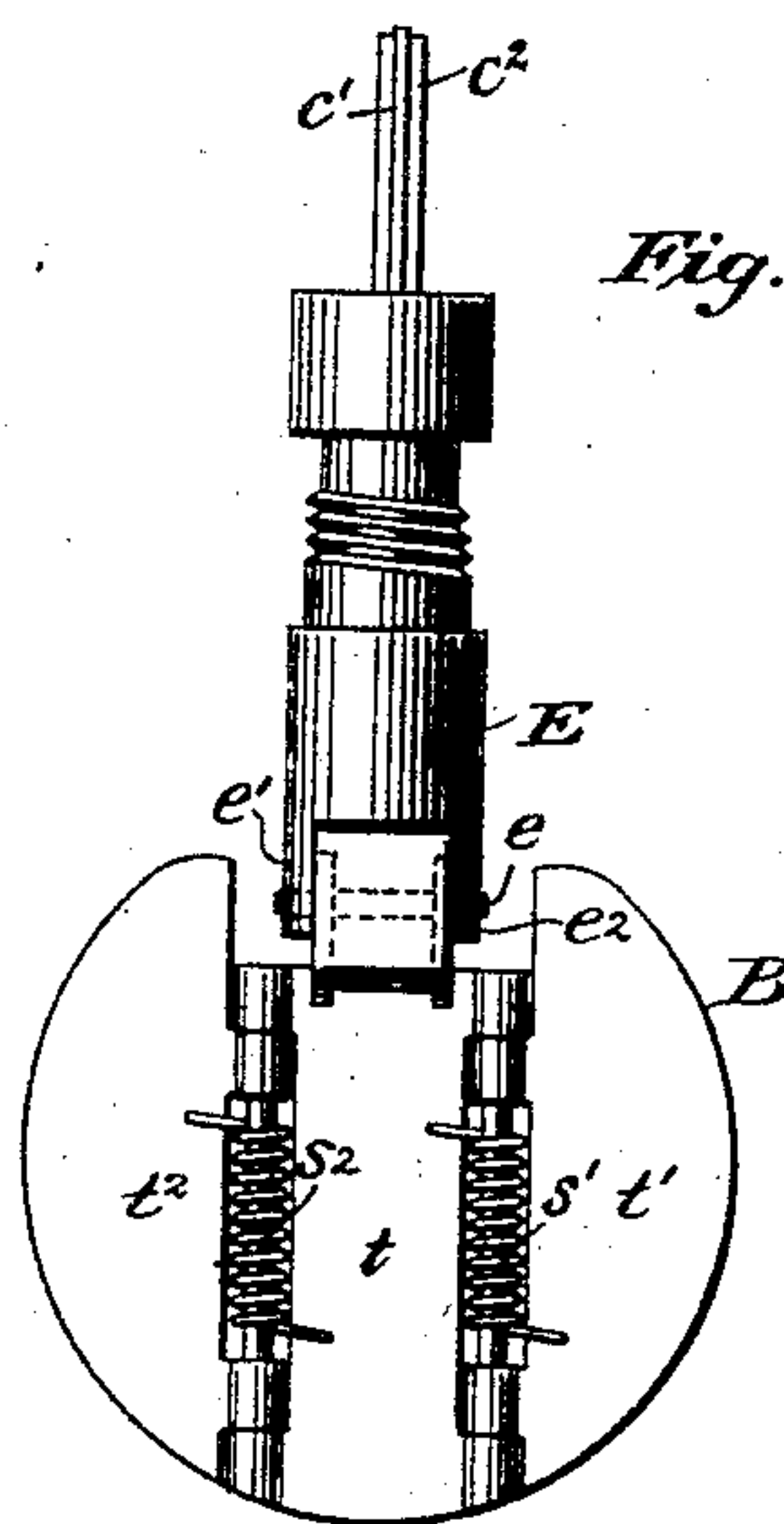
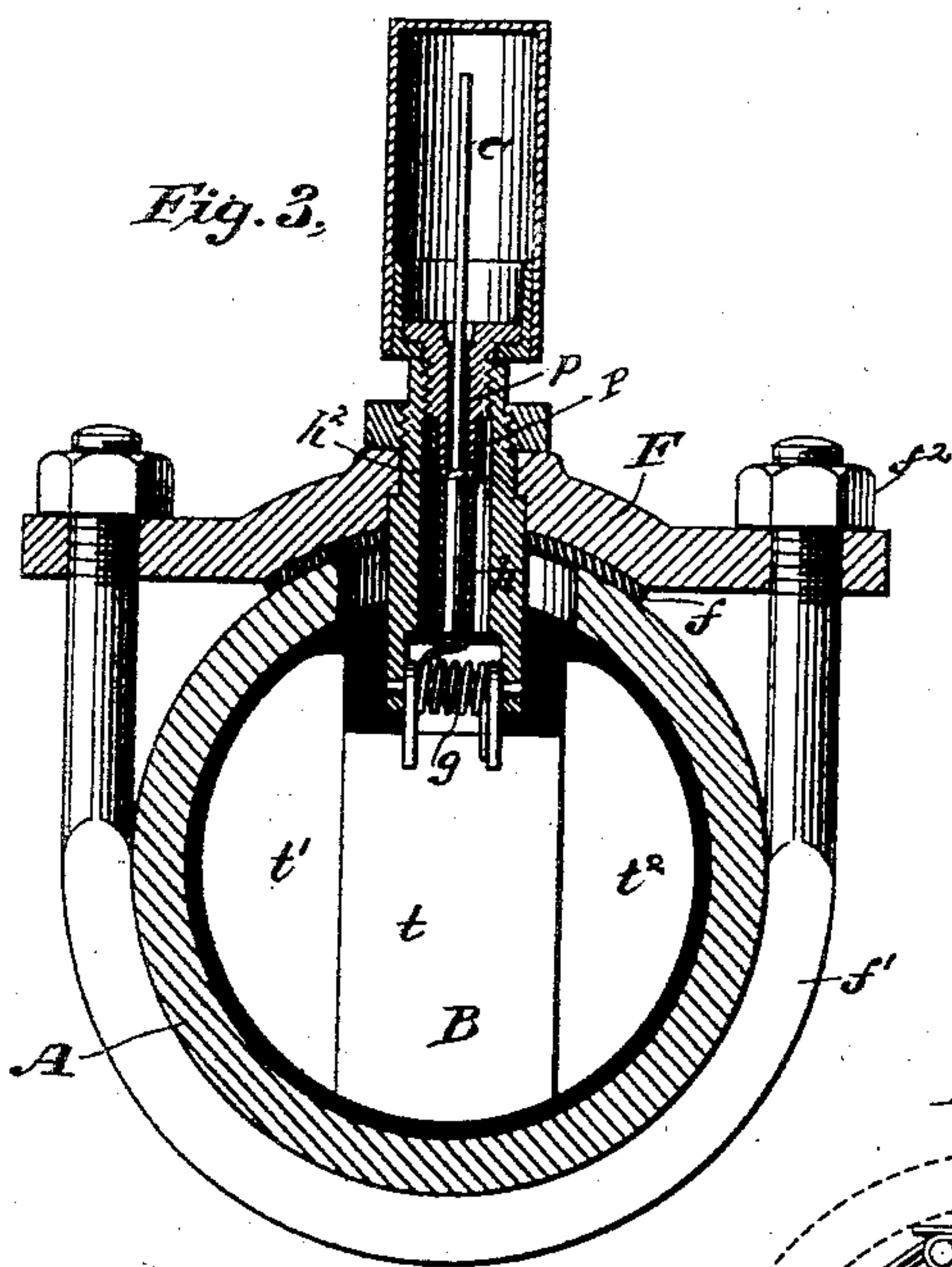
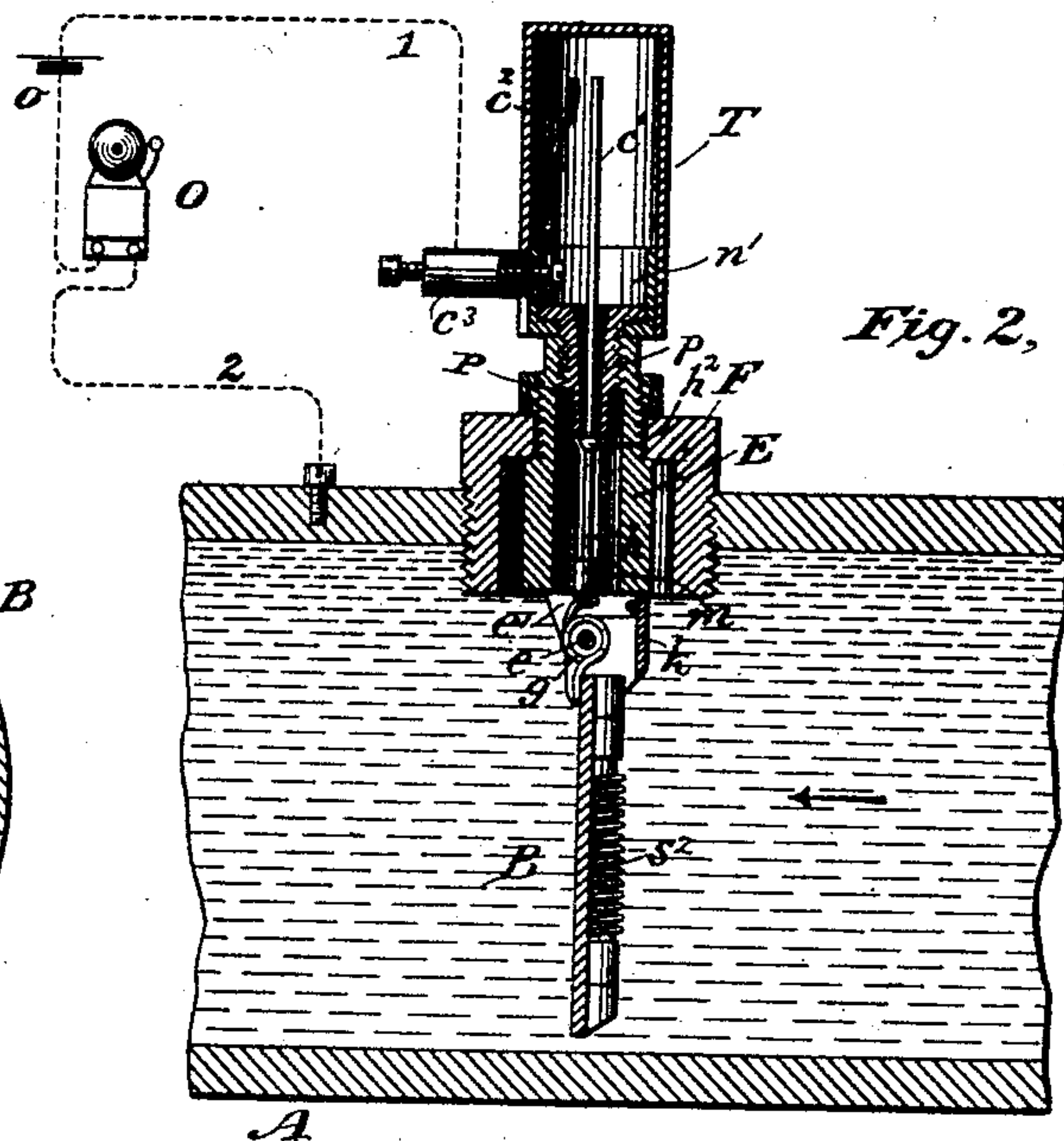
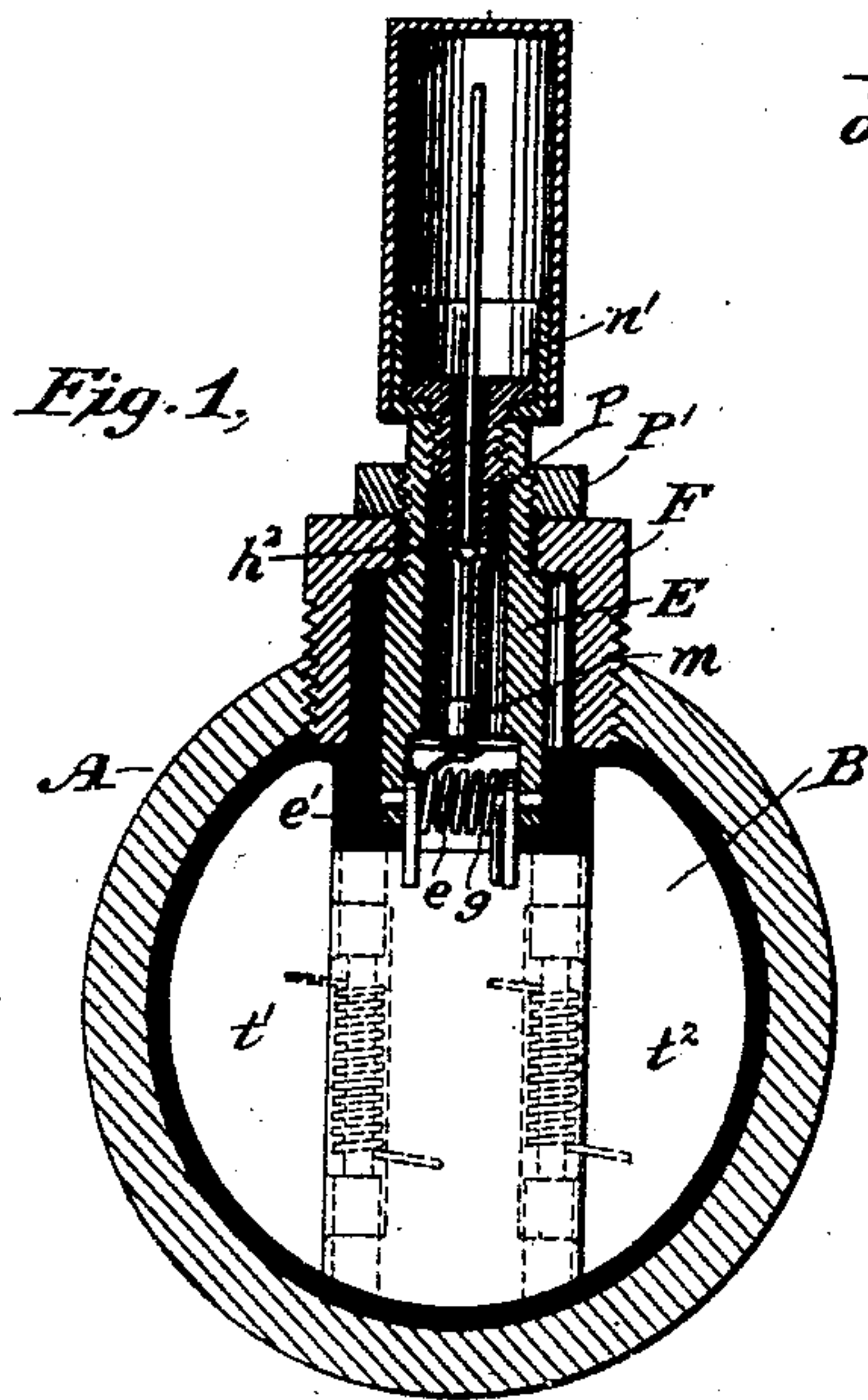
(No Model.)

2 Sheets—Sheet 1.

**M. W. GROVESTEN & F. G. JAHN.**  
**ELECTRIC CIRCUIT CLOSING DEVICE.**

No. 384,570.

Patented June 12, 1888.



Witnesses.  
Geo. W. Brock.  
Edward Thorpes

*B* *12*  
Inventors,  
M. W. Crockett,  
Fred. G. Jahn.  
By their Attorneys  
Pope & Quomb & Terry.

(No Model.)

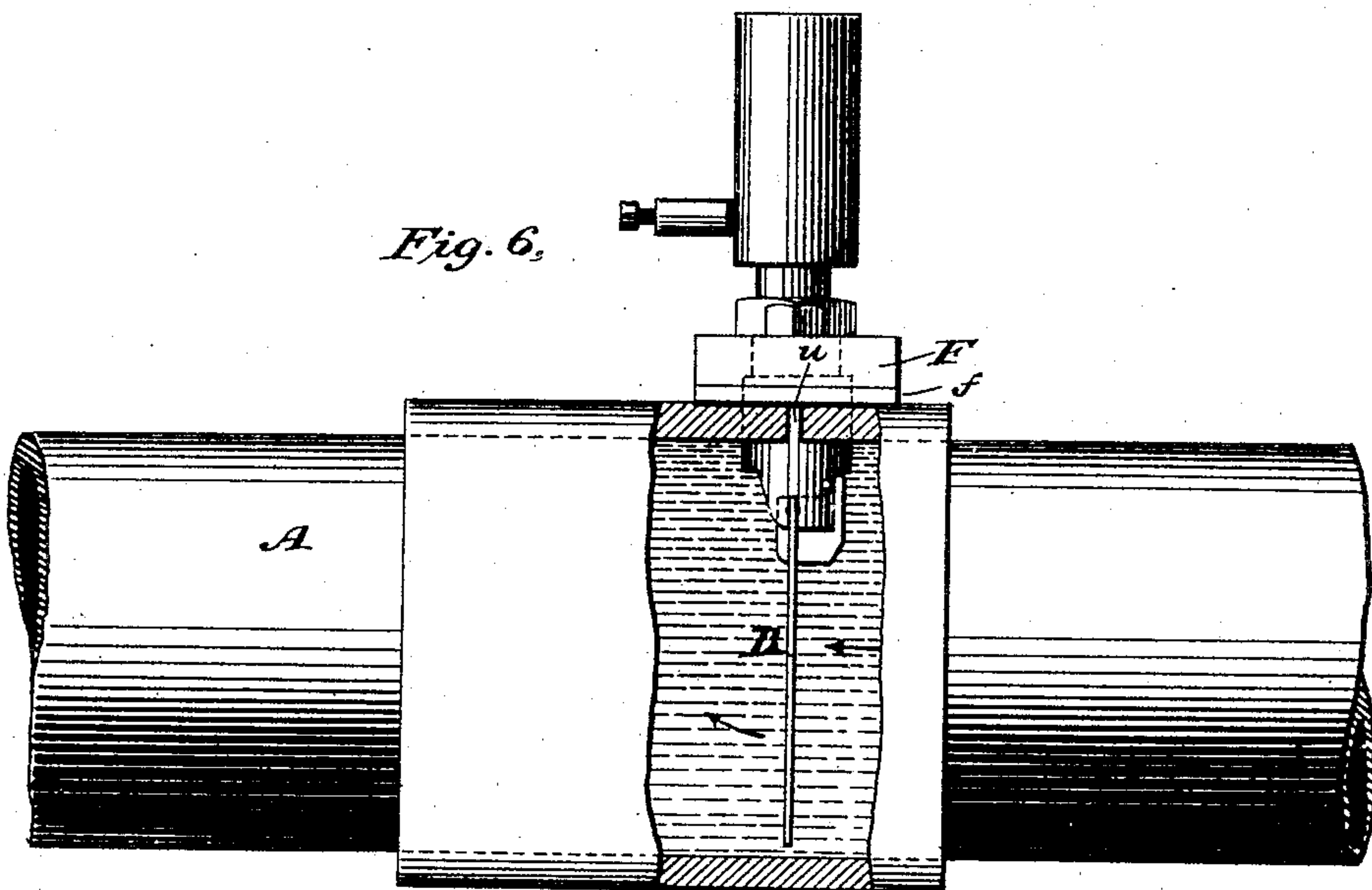
2 Sheets—Sheet 2.

M. W. GROVESTEN & F. G. JAHN.  
ELECTRIC CIRCUIT CLOSING DEVICE.

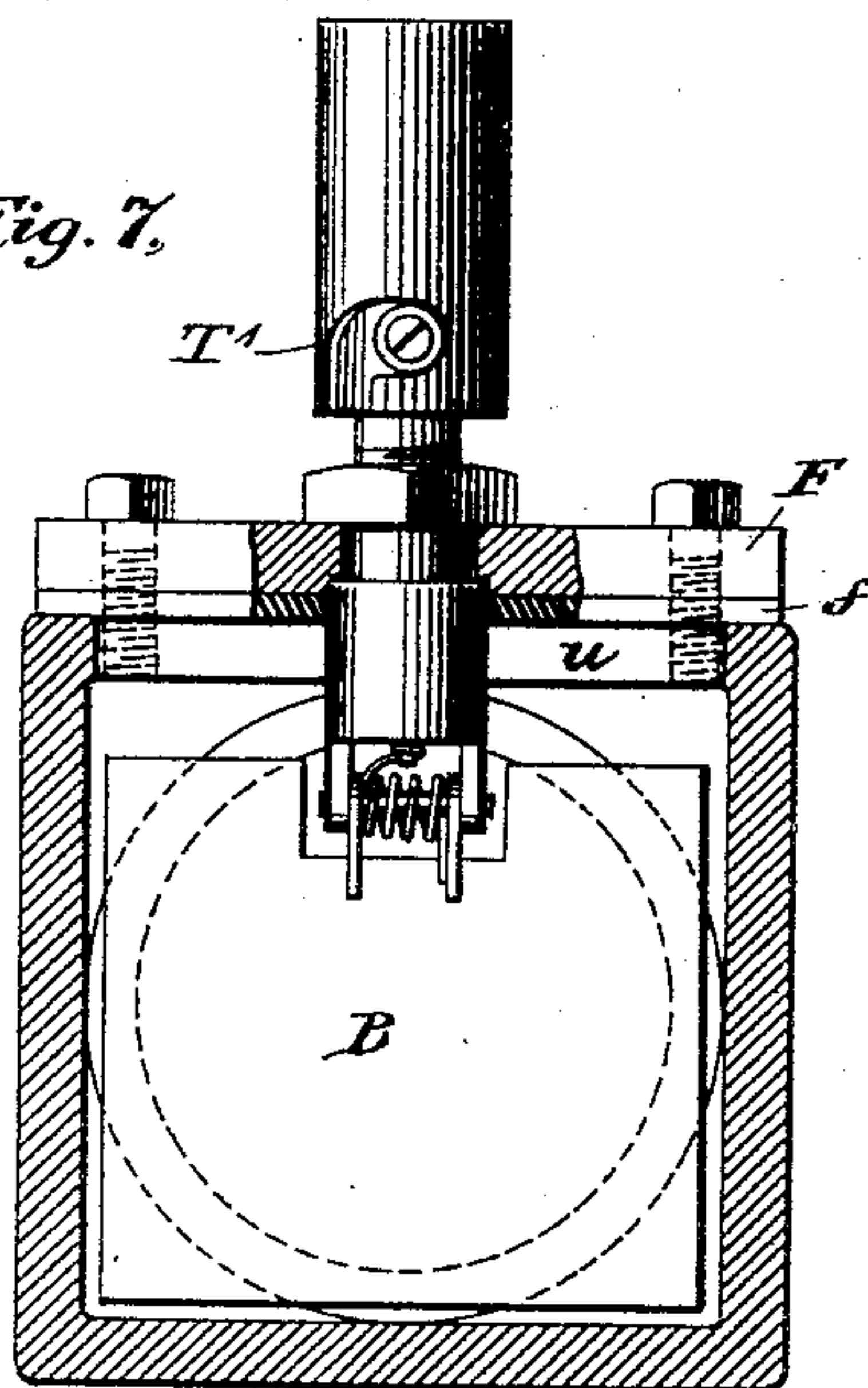
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*Fig. 6,*



*Fig. 7,*



Witnesses.  
*Geo. W. Dreck.*  
*Eugene J. Reilly.*

Inventors.  
*M. W. Grovesten.*  
*Fred. G. Jahn.*  
By their Attorneys  
*Pope, Edgcomb & Terry.*



# UNITED STATES PATENT OFFICE.

MILTON W. GROVESTEEN AND FREDERICK G. JAHN, OF NEW YORK, N. Y.

## ELECTRIC CIRCUIT-CLOSING DEVICE.

SPECIFICATION forming part of Letters Patent No. 384,570, dated June 12, 1888.

Application filed February 24, 1888. Serial No. 265,133. (No model.)

*To all whom it may concern:*

Be it known that we, MILTON W. GROVESTEEN and FREDERICK G. JAHN, citizens of the United States, residing in New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Circuit-Closing Devices, of which the following is a specification.

The invention relates to the construction of devices for communicating motion through the walls of a chamber, reservoir, or tube designed to contain any gas or fluid.

The object of the invention is to provide convenient and efficient means for securing a lateral movement of an arm, point, or lever outside of the chamber, tube, or reservoir, through the instrumentality of a fluid or gas moving within the same, and preventing any escape of the fluid or liquid therefrom. To accomplish this, a packing or joint is provided which prevents the passage of gas or fluid, and at the same time permits of the required movement of the lever, point, or arm. The movements occasioned outside of the chamber may be employed for various purposes—such, for instance, as controlling the connections of an electric circuit, operating a pneumatic device, or any suitable mechanical apparatus.

The invention will be described more especially as employed for controlling the connections of an electric circuit; but it may be employed for other purposes without departing from the spirit of the invention.

The general plan of the invention is to place within a pipe, tube, reservoir, or chamber which conveys or is to convey a gas or fluid a movable vane or wing which normally stands at rest in such a position as to more or less completely close the opening thereof. When the fluid or gas flows through the pipe or chamber, the vane is turned, and it causes a lever, which extends outside of the chamber through a tubular flexible packing, to be moved laterally. This lever may, if desired, carry a circuit-closing point adapted to play against a suitable contact-point. The circuit-closing and contact points may constitute the terminals of an electric circuit employed for operating any suitable signaling apparatus or other electrical devices.

In the drawings, Figure 1 is an end view, partly in section; and Fig. 2, a cross-section of a device employed for carrying out the invention. Fig. 3 is a reverse view of a modification. Figs. 4 and 5 illustrate certain details; and Figs. 6 and 7 are respectively a side and an end view of a modified form.

Referring to the figures, A represents a tube or pipe—such, for instance, as may be employed in an automatic sprinkler system—and this pipe may be normally filled with a fire-extinguishing fluid, which is released at various points when the temperature has risen sufficiently to render it dangerous. It is evident, however, that the tube may be employed in other systems of apparatus for various other moving fluids or gases. As the fluid flows through the pipe in the direction indicated by the arrows, a vane or wing, B, which partially or completely closes the area or opening through the tube, is swung in the direction of the flow of the fluid. This causes an arm, *h*, to be moved laterally, and this arm may carry, as shown in this instance, a circuit-closing point, *c'*, which will be pressed against an insulated contact-point, *c*<sup>2</sup>. These two points constitute the terminals of an electric circuit, the point *c*<sup>2</sup> being connected by a conductor, 1, with one pole of a battery, *o*, while the point *c'* is connected by a conductor, 2, through an electromagnet or annunciator device, O, with the other pole of the battery.

The vane is supported upon an axis, *e*, the ends of which may be carried in arms *e'* and *e*<sup>2</sup> of a tube, E. This tube extends through a plug, F, Figs. 1 and 2, or a plate, F, Fig. 3. The plug in Figs. 1 and 2 may be screwed into a suitable opening cut in the pipe A, or the plate F, Fig. 3, may be clamped over an opening in the tube A. The vane is inserted through this opening, and a packing of rubber or other suitable material, *f*, surrounds the opening and is pressed between the plate and the tube A, the plate being held in place by a staple or clamp, *f'*, and nuts *f*<sup>2</sup>, or in any other convenient manner.

The tube E is fitted tightly into the plate F, so that a fluid-tight joint is formed. A set-nut, P', may surround the tube E. A spring, *g*, surrounds the axis *e*, and one end passes be-



hind the vane, tending to push it in the direction to close the area of the pipe A. A shoulder or arm, *h*, carried upon the vane engages with the tube E, or a shoulder or pin carried thereby, and prevents the vane from moving beyond a position at right angles with the length of the tube A. One end of the arm *h*, which carries the circuit-closing point *c'* and extends through the tube E, is engaged by the remaining end of the spring *g*, and the parts are so adjusted that the spring normally tends to hold the point *c'* away from the point *c*.

When, however, the vane is turned upon its axis against the tension of the spring, it will move the point *c'* against this point *c*.

The arm *h* extends also through a tube, *p*, which sets into a cap, *n'*. A shoulder or lug, *h'*, upon the rod *h*, at the inner end of the tube *p*, serves as a fulcrum. It is evident that the opening formed for the arm *h* must be of sufficient size to allow it to move freely, and it is necessary that this opening should be closed fluid-tight, while the inner end of the arm is allowed to pass freely into the pipe A. For this purpose a short flexible tube, *P*, which may be of rubber or other suitable yielding or flexible material, is employed as a seal or packing between the tube *p* and the arm *h*. This is securely cemented or fastened to the arm, as shown at *m*, and it fits tightly upon the tube *p*, and may be sealed thereto if necessary. This device permits a sufficient movement of the arm *h* with reference to the tube *p*, and at the same time secures a tight joint between the two parts. The length of the tube may be varied as found necessary; but it should be of such length as to allow sufficient relative movement between the two parts.

It is frequently desired to insert a device of the character described into a pipe of a system which has been already set up, and to avoid making a large opening into the pipe the vane may be constructed with wings *t'* and *t''*, which fold back upon the central part, so that the entire device may be inserted through a small opening. For this purpose the wings *t'* and *t''* are pivoted or hinged upon the central portion, *t*, and suitable springs, *s'* and *s''*, tend to hold the wings forward parallel with the central portion, by the overlapping edges of which they are engaged, and thus prevented from moving beyond the required position. It will be noticed that the wings fold in such direction that the pressure of the fluid tends to spread them. This construction is of advantage also for the purpose of allowing the valve to open to a greater extent in a round pipe in which it is fitted, for as the vane approaches the side of the pipe near which it is pivoted the wings are allowed to fold back, thus conforming somewhat to the curved surface of the interior of the pipe. (See Fig. 5.)

A cap or thimble, *T*, may be employed for covering the points *c'* and *c*. This is conveniently attached by a bayonet-joint, *T'*, Fig. 7, in connection with the insulated binding-post *c'*, carrying the point *c*.

In Figs. 6 and 7 a modification is illustrated in which the vane is placed in a square or rectangular chamber, being inserted through the slot *u* at the top. It is shown as being of such width and size as to cover the entrance into the chamber. This vane is shown as being solid or of one piece without the wings, and, as the portion of the chamber toward which it turns is flat, it will lie close against this side, thus opening the entire passage to the flow of the fluid.

We claim as our invention—

1. The combination of a movable vane, an arm actuated thereby, a chamber or conduit containing the vane, said arm extending without the chamber, and a flexible tubular packing intervening between the arm and the chamber through which said arm extends.
2. The combination of a movable arm, a vane for giving a lateral movement to the arm, a support for the vane through which the arm extends, and a flexible tubular packing intervening between the arm and the support.
3. A circuit-closing device consisting of a pivoted vane or wing adapted to be placed in a chamber or conduit, a circuit-closing point mechanically coupled therewith and actuated thereby, a contact-point therefor, and a flexible packing between the circuit-closing point and the support of the vane.
4. A circuit-closing device consisting of a pivoted vane, a circuit-closing point mechanically coupled therewith and actuated thereby, a contact-point therefor, and a support for the circuit-closing point consisting of a flexible tube.
5. A circuit-closing device consisting of a pivoted vane, a circuit-closing point mechanically coupled therewith and actuated thereby, a contact-point therefor, a flexible packing between the circuit-closing point and the support of the vane, consisting of a flexible tube one end of which is sealed to the circuit-closing arm and the other to the support of the vane.
6. The combination of a movable vane, an arm or lever one end of which is engaged by or connected with said vane, a hollow post through which said lever extends, a lug upon the lever at the end of the hollow post affording a fulcrum, and a flexible tubular packing intervening between said arm and said post, substantially as described.
7. A circuit-closing attachment which consists of a vane, *B*, contained in the tube *A*, the spring normally holding the vane in a given direction, the stop opposed to the spring, the movable circuit-closing arm *h*, the cup *n'*, through which it extends, the flexible coupling or packing between the arm and cup, and a contact-point applied to the circuit-closing arm, substantially as described.
8. In a circuit-closing device, a vane or valve having wings folding in a given direction, and a circuit-closing arm or points actuated by means of the vane.
9. The combination, with an electrical at-



tachment for a chamber or conduit, of a circuit-closing point outside of the chamber or conduit, a device within the chamber or conduit for actuating the same, and a flexible  
5 tubular packing through which a movable mechanical connection is formed with the circuit-closing device.

In testimony whereof we have hereunto sub-

scribed our names this 18th day of February, A. D. 1888.

MILTON W. GROVESTEEEN.  
FREDERICK G. JAHN.

Witnesses:

S. WOOD MCCLURE,  
GEO. H. McDERMOTT.