

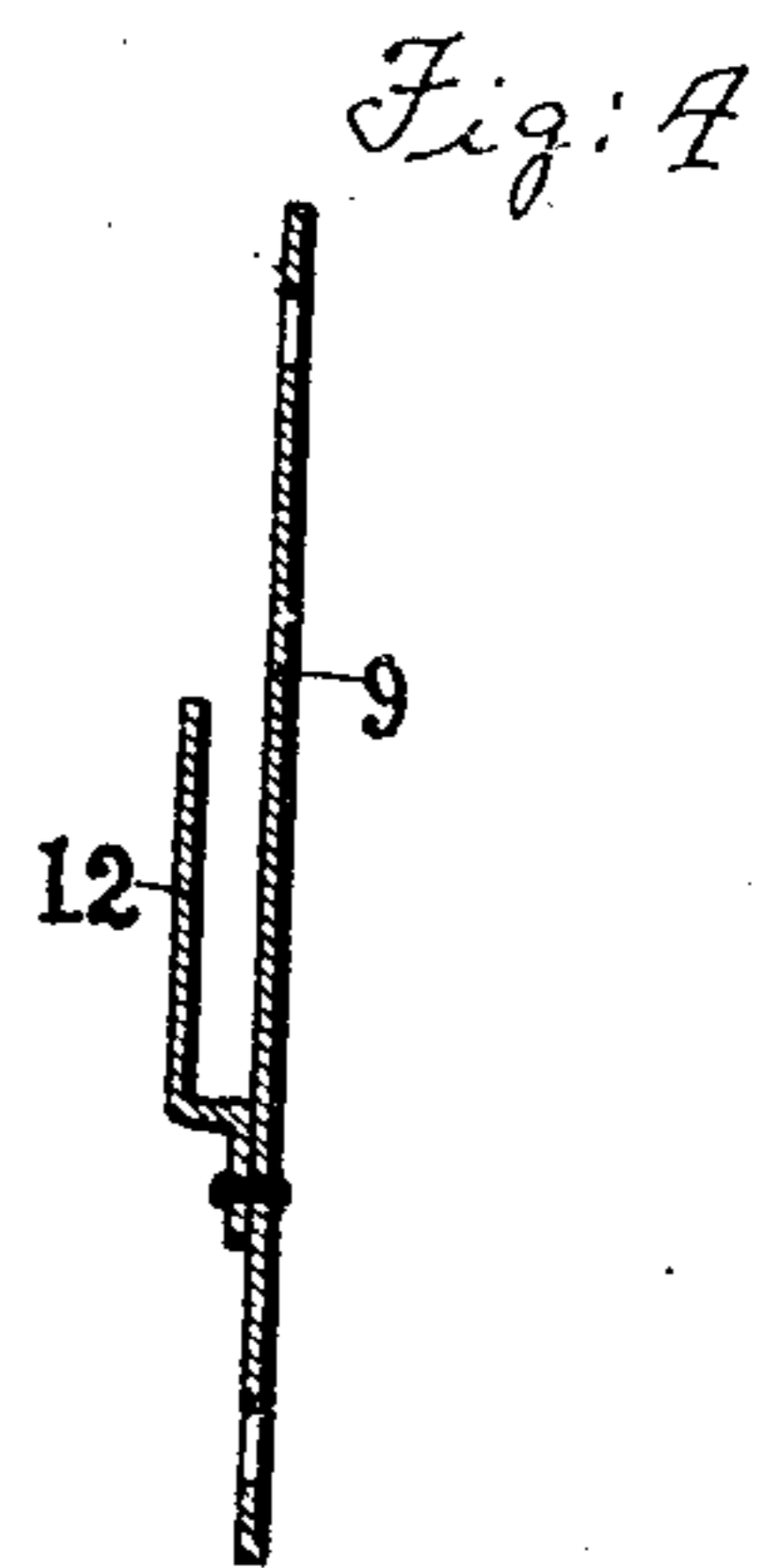
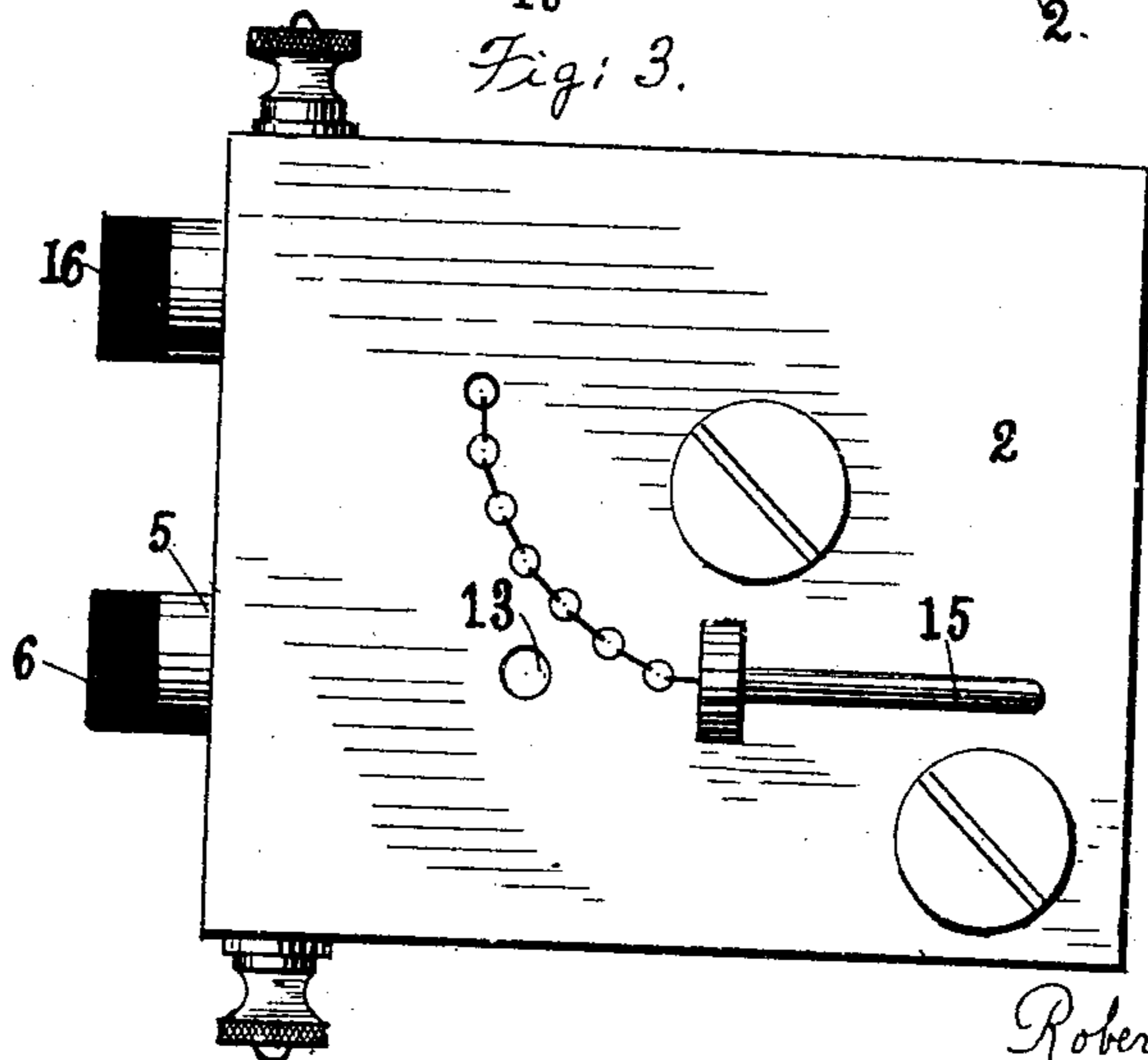
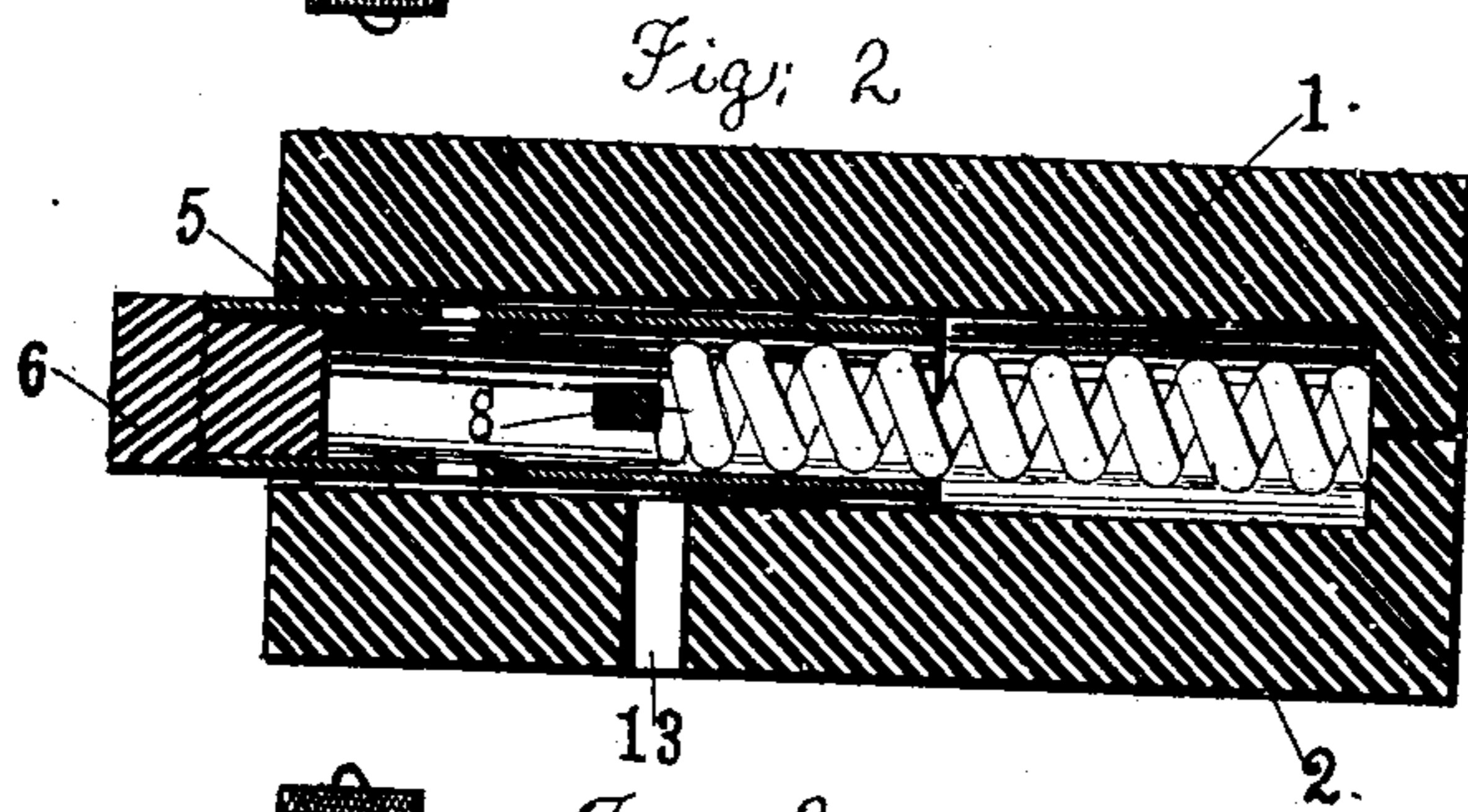
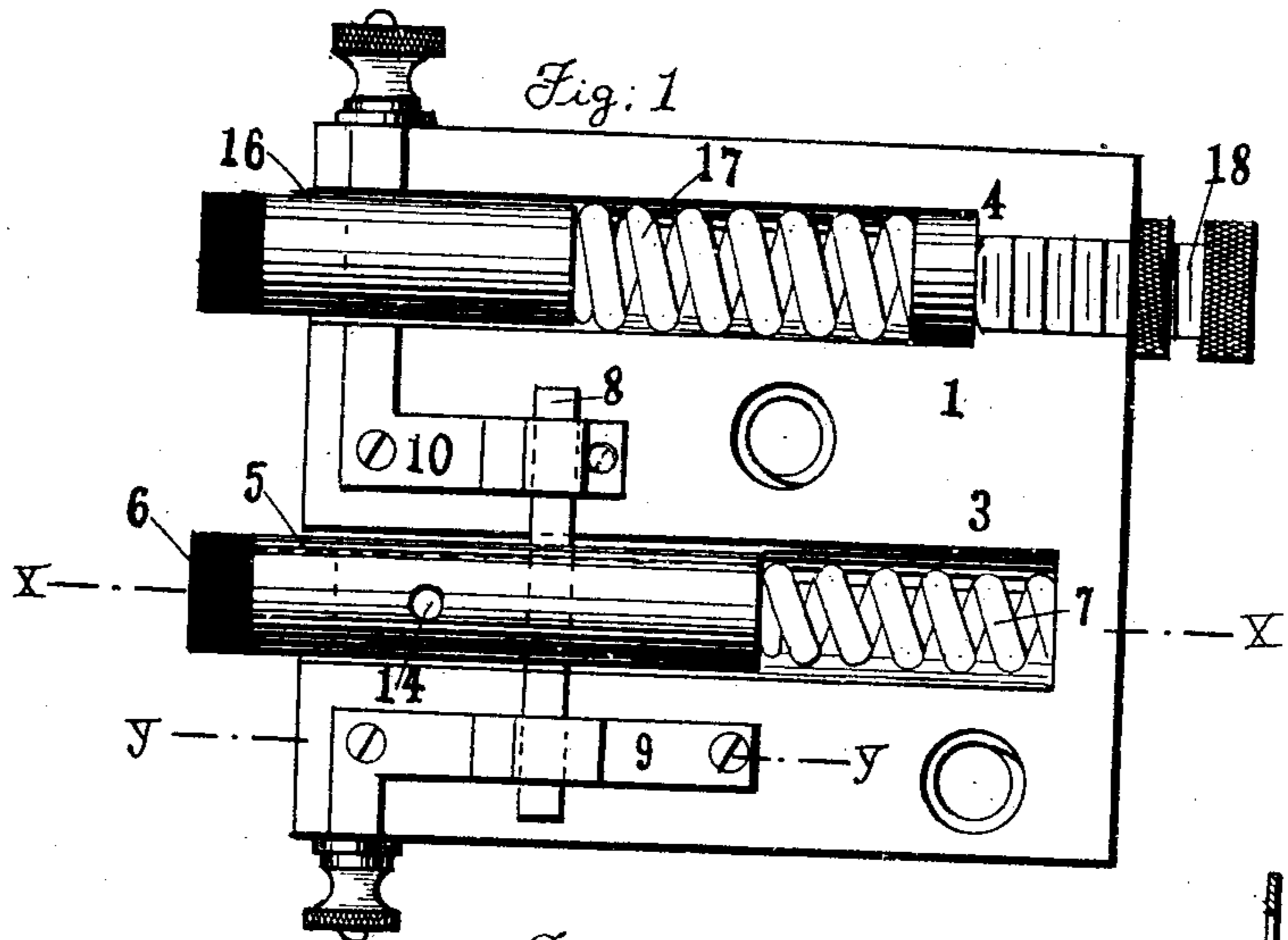
R. P. LUMLEY & H. G. HILLMAN.

CIRCUIT CLOSER.

APPLICATION FILED MAR. 29, 1907. RENEWED JULY 30, 1909.

956,118.

Patented Apr. 26, 1910.



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UNITED STATES PATENT OFFICE.

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CIRCUIT-CLOSER.

956,118.

Specification of Letters Patent.

Patented Apr. 26, 1910.

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To all whom it may concern:

Be it known that we, ROBERT P. LUMLEY and HENRY G. HILLMAN, the latter a subject of the King of Great Britain and the former a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Circuit-Closers, of which the following is a specification.

Our invention relates to circuit closers of the plunger type, and more particularly to door- and gate-operated devices which are adapted for use with safety elevator systems, burglar alarms and the like.

One of the principal objects of our invention is to produce a circuit closer or switch which will be simple and strong and adapted to withstand the severest usage.

Another object of our invention is to provide a switch the contacts and conducting parts of which are thoroughly insulated and protected, so that the switch may be specially adapted for elevator and other uses where the switch is required to be mounted on steel or other metallic girders or framework.

A further object of our invention is to provide a switch such that the operating parts may be removed intact for the purpose of replacing worn parts, simply by removing a part of the casing on which the parts are secured.

Further objects of our invention will more fully appear from the following description taken in connection with the accompanying drawings, in which—

Figure 1 is a face view of the inner surface of the base plate with the operating and contacting parts secured thereto; Fig. 2 is a sectional view on the line $x-x$ of Fig. 1; Fig. 3 is a plan view looking down upon the top of the complete switch assembled; and Fig. 4 is a sectional view on the line $y-y$ of Fig. 1.

Referring to the drawings, a base plate 1 and cover 2 are each formed of hard fiber so that they may be directly secured to any metallic surface without danger of grounding the circuits. The base plate 2 has a groove or channel 3 formed therein, in which a contact-carrying plunger is adapted to slide back and forth. The plunger is preferably formed of a metallic tube 5 provided with a cap or plug 6, of insulating material, and with a cross contact bar 8 of conducting

material which is secured to the tube preferably by transversely slotting the same and securing the cross contact in the slot. This bar, as shown, is preferably arranged to take the thrust of a spring 7 which rests against the cross bar at one end and preferably against the rear end of the channel or groove 3 at its other end. Upon the inner surface of the base plate are also mounted a pair of contact clips 9 and 10 with which the cross bar 8 slidably engages to complete the circuit. The contact clips are shown in Fig. 4 as consisting of long and short contact members 9 and 12 riveted together at one end and connected by suitable means to binding posts. In the form shown, the contact 9 being longer than the contact 12, the bar 8 will always be in contact with the longer contact, the circuit being made and broken on the shorter of the contacts, so that one surface of the cross contact will always be clean and in good condition.

The cover is suitably cored out to form with the base plate 1 a cavity or chamber for the operating and contacting parts, so that when the cover is screwed down on the base plate, the contact-carrying plunger is held securely within the groove 3, so that it will be guided in its movements back and forth under the operation of the spring 7 and the door with which it is to be used.

The switch as shown may be very cheaply constructed, and has been found in practice to be exceedingly durable.

While the projecting end of the contact plunger may be in the form of any suitable insulating cap, we prefer to construct the plunger of an insulating rod or plug over which is driven a metallic tube, as shown, the rod extending any suitable distance into the tube and projecting partly beyond the same to prevent contact between the tube and the metallic gate or door with which it is to be used. By thus insulating the projecting tube of the plunger, we are enabled to secure the cross bar directly to the metallic tube, thus obviating the necessity of insulating this contact from the plunger, which insulation is not only comparatively costly, but it does not permit of as strong a structure as where the cross arm 8 is directly connected to the tube. If desired, a second plunger 16 as shown may be provided in a second groove 4 preferably formed in the base plate, and having a pow-

erful spring 17 with a suitable adjusting screw 18 for the purpose of forcing the door or gate open in case it is not securely latched by the operator before his car leaves the landing.

It is sometimes desirable, when elevator safety appliances get out of order, or on certain other occasions, to render such appliances ineffective in controlling the elevators, and for this purpose, we have provided means for locking the plungers out of contacting position so that the control circuit may be broken at any gate or landing whenever desired, and for this purpose, we have provided a hole 13 in the cover plate adapted to register with a hole 14 in the plunger tube when the plunger is forced back out of contacting position, so that when a suitable pin 15 is passed through the registering holes 13 and 14, the plunger is held out of operation.

With the contact parts and casing constructed as herein described, the former are securely inclosed within a suitable cavity or chamber formed between the two parts of the casing, and since the projecting end of the plunger is insulated from contact with any engaging gate or door, the only exposed parts of the switch are the binding posts for connecting suitable leads thereto. Switches thus constructed may be placed directly upon metal beams or girders and subjected to the hardest usage without danger of short circuiting or grounding, and they require no insulation between any of the contacting and moving parts.

Obviously, various changes and modifications may be made in our invention without departing from the spirit of the same, and we do not wish to be understood as limiting ourselves to any specific construction and arrangement of contacts and plungers other than as indicated in the appended claims. Obviously, any suitable form of contact clips may be used and it is also obvious that the auxiliary door-opening plunger 16 may be omitted from our switch, if desired, and we wish to be understood as covering all such modifications in the appended claims, unless otherwise specified.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is:

1. In a circuit closer, the combination of a casing comprising a base plate and a cover, both of insulating material one of said casing members provided with a groove in its inner surface extending through one end of said member, a longitudinally movable plunger of substantially the diameter of said groove, projecting partly beyond the casing, a cross contact piece secured to the plunger, a pair of contact clips mounted on the inner surface of the grooved member and between which clips the cross contact

piece slidably engages, binding posts carried by the grooved member and connected with the clips, a spring within the groove between the plunger cross-contact piece and the rear of the casing for thrusting the plunger in one direction, the other casing member being suitably cored out to form with the first casing member a chamber for accommodating the contacting and operating parts, said second member acting to hold the plunger in its groove, and means for detachably securing said casing members together, whereby the cover may be removed without disturbing the operating and contacting parts.

2. In a circuit closer, a casing, a sliding plunger projecting beyond the casing at one end and comprising a metallic tube having a non-conductive plug carried at the projecting end thereof and extending partly within and partly beyond the same for preventing contact with the outer end of the tube, said tube having an opening therein, a cross bar contact member secured in said opening, stationary contacts mounted on a part of the casing and with which said cross contact member slidably engages, and a spring abutting against the cross bar at one end and against the casing at its other end for thrusting the plunger in one direction.

3. In a circuit closer, the combination of a casing comprising a cover formed of hard fiber and a base plate also formed of hard fiber and having a groove formed in its inner face, a plunger movably mounted within the groove and projecting partly beyond the casing, said plunger comprising a metallic tube with a plug of insulating material at the outer end thereof, a cross contact arm secured to said tube, a pair of contact clips also mounted on the inner surface of said base plate, one pair on each side of the groove, with which clips said cross contact piece slidably engages, a spring within the groove between the rear end thereof and the cross contact piece on the plunger for moving the latter in one direction, binding posts mounted on the base plate and connected with said contact clips, and means for detachably securing the cover to the base plate, whereby the cover may be removed without disturbing the operating and contacting parts.

4. In a circuit closer, the combination of a casing, a plunger slidable in said casing, a cross bar on said plunger, contacts with which said bar is adapted to engage, a spring for moving said plunger in one direction, an auxiliary plunger in said casing, and a spring adapted to thrust said auxiliary plunger forward, for the purpose set forth.

5. In a circuit closer, the combination of a casing, a plunger slidable in said casing and projecting partly beyond the same, a cross

bar on said plunger, contacts with which said bar is adapted to engage, a spring for moving said plunger in one direction, an auxiliary plunger in said casing, a spring adapted to thrust said auxiliary plunger forward for the purpose set forth, and means for varying the tension of said spring.

In testimony whereof we have affixed our signatures in presence of two witnesses.

ROBERT P. LUMLEY.
HENRY G. HILLMAN.

Witnesses:

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