

(No Model.)

R. VARLEY, Jr.
ELECTRIC CIRCUIT CLOSER.

No. 464,134.

Patented Dec. 1, 1891.

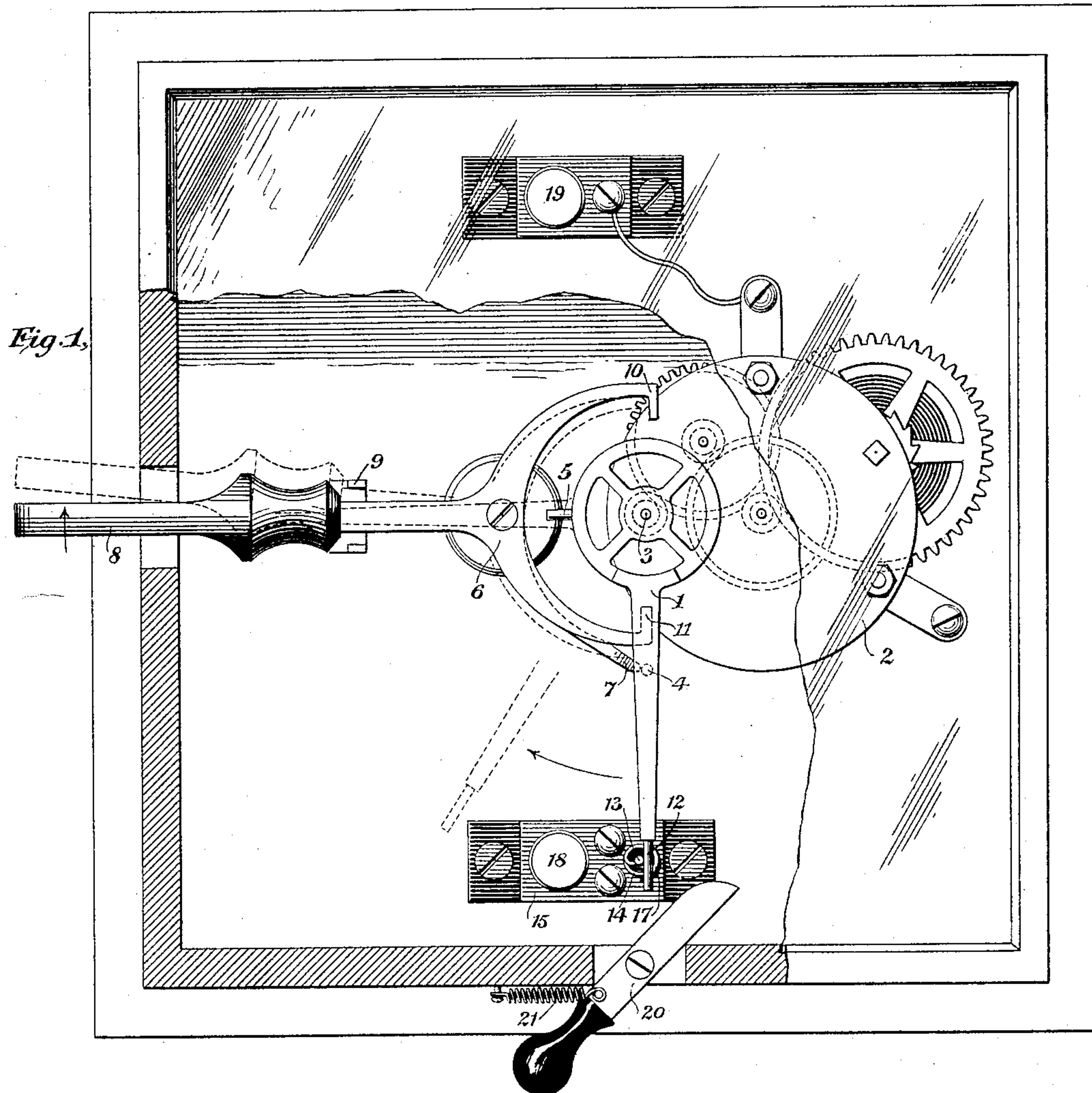
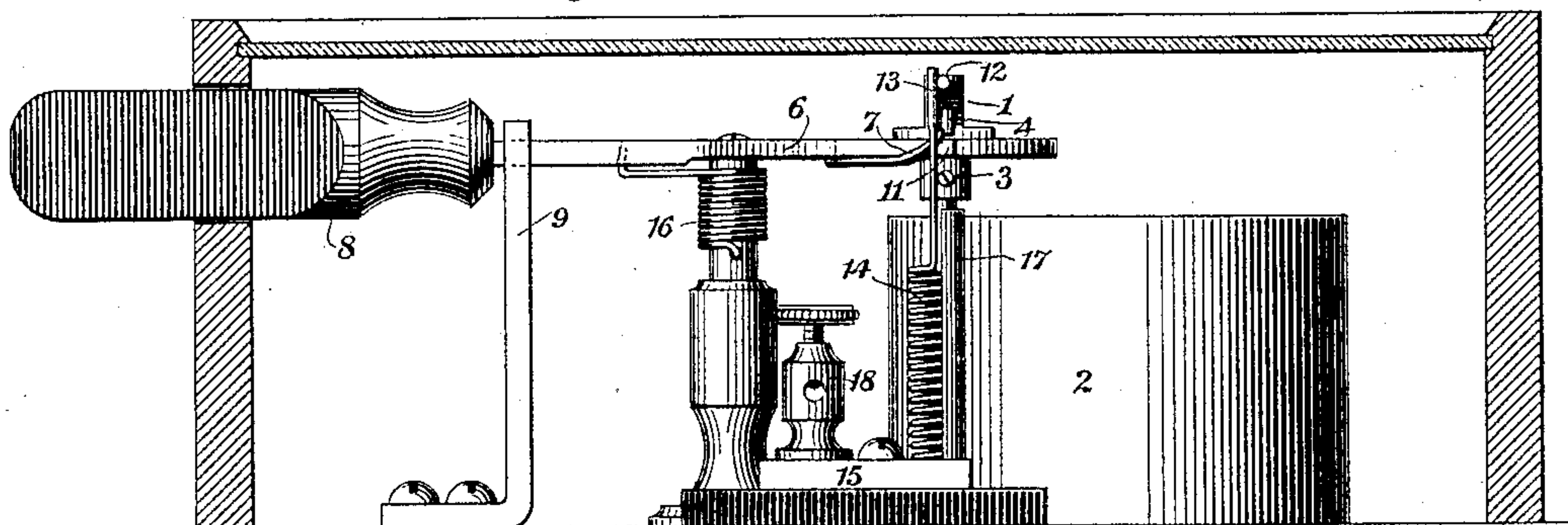


Fig. 2,



Witnesses
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UNITED STATES PATENT OFFICE.

RICHARD VARLEY, JR., OF ENGLEWOOD, NEW JERSEY.

ELECTRIC-CIRCUIT CLOSER.

SPECIFICATION forming part of Letters Patent No. 464,134, dated December 1, 1891.

Application filed February 10, 1891. Serial No. 380,969. (No model.)

To all whom it may concern:

Be it known that I, RICHARD VARLEY, JR., a citizen of the United States, residing at Englewood, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Electric-Circuit Closers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to circuit-closers of a type in which a very brief closure of the circuit or a prolonged closure may be made at will. The device may be applied to any circuit in which either or both of these requirements may be found, but is of special service in developing faults in insulated wire by my "flash-test" method, a description of which is found in an application for patent filed by me on the 10th day of February, 1891, Serial No. 380,970. In such method a high-tension current is admitted to the coil to be tested, the coil forming one terminal of the circuit and a tank of water in which it is immersed forming the other. Wherever a fault exists in the wire a flash occurs, due to a disruptive discharge between the two sides of the circuit. In exploring a coil for such faults it is important that in the first test the current should be admitted to the coil only for a brief interval of time, inasmuch as if the circuit remains closed for any considerable interval the arc formed at a fault will fuse the insulation at the fault and will also injure the neighboring spirals of the coil. If, however, the current is admitted only for a very brief instant, it may be applied frequently without doing any material damage to the wire. It is therefore preferable in practice to test the coil first by making a very brief closure of the circuit, and if no flash occurs to afterward make a longer closure to develop such faults as are due to a thin covering of insulating material or other fault which requires a longer application of current for its development.

It is therefore the object of this invention to make a circuit-closer by which an instantaneous closing and opening of the circuit may be produced or a prolonged closure at the will of the operator.

The invention consists of a power-driven

circuit-closing device normally held in check, capable of being released by the operator and arrested at a point in its travel where it will close the circuit or of being permitted to pass by such point, thereby closing the circuit only during the instant of its passage.

The several features of novelty in detail will be indicated in the claims appended to the specification.

In the accompanying drawings, which illustrate the invention, Figure 1 is a plan-view of an instrument embodying my invention, part of the glass cover of the case being broken away to better illustrate the operative parts. Fig. 2 is a side elevation of the instrument, the case being shown in section.

The device comprises a spring-actuated circuit-closing arm 1, driven by an ordinary spring clock-train 2, said arm tending to revolve about a center of motion 3. The arm and the boss or hub of which it forms an extension carry pins 4 5, one of which, as 5, co-operates with the teeth of a pallet 6, which lie in the plane of motion of the pin 5 and which arrest it in a position at right angles to that indicated in full lines in the drawings. The other pin 4 co-operates with a projection 7, mounted upon one side of the pallet, which projection will arrest the arm in the position shown in full lines in the drawings, provided the pallet be held in a certain position. A controlling-handle 8, projecting through an opening in the case of the instrument, enables an operator to shift the pallet to one side or the other. A stop 9 arrests motion of the lever at the proper point on either side. When shifted to the position indicated in dotted lines, the projection 7 will be thrown clear of the pin 4, and the arm will be revolved by the clock-train until the pin 5 strikes upon the tooth 10 of the pallet. In this position the arm 1 will occupy a horizontal position in the drawings. If now the lever be depressed, the tooth 10 will be raised from the pin 5, and the arm will shift a half-turn to the right, pin 5 striking upon tooth 11. If the handle 8 be raised and arrested at its median position, as illustrated in full lines in the drawings, the pin 5 will clear the tooth 11, and the arm 1 will swing until the pin 4 strikes upon projection 7. In this position a platinum tip 12, mounted upon the

end of the arm, engages a similar platinum tip 13, fused or riveted upon the end of a spiral spring 14, fixed to a metallic plate 15, which forms a terminal of the circuit. The circuit is now closed and will remain closed as long as the arm 1 remains in the position indicated in full lines. If, however, the handle be shifted to either side, or if the hand be taken off from it, a spiral spring 16 will tip the pallet sufficiently to free pin 4 from the obstruction and permit the arm 1 to travel another quarter-rotation.

In order to make an instantaneous closure of the circuit, the pallet is rocked until the arm 1 occupies a horizontal position pointing to the right, when the handle 8 will be depressed to its lower limit. If the handle be then raised to its upper limit, the pallet will be tilted sufficiently to hold projection 7 out of the path of pin 4, and the arm will have a continuous sweep for a half-revolution, the tip 12 striking the tip 13 in transit and bending the spring 14 slightly in the direction of movement. During this closure an arc will tend to follow the platinum tip 12, and therefore the arm 1 is made of a sufficient length to give the tip a long sweep sufficient to prevent the arc following it and fusing the platinum. A pocket 17 is placed behind the spring 14 to prevent vibration.

The terminals of the circuit are connected to the binding-posts 18 19, the latter of which is connected with the frame of the clock-movement and through it with the arm 1. The former is connected with the plate 15, upon which the spring 14 is mounted.

After a prolonged closure it sometimes happens that there will be more or less adhesion between the platinum contacts 12 13 by reason of the heat of the current. On the side of the case, therefore, is mounted a lever 20, the free end of which is normally held away from the spring 14 by a coil-spring 21, but which may be shifted so as to strike the upper end of the spring and forcibly detach it from the tip 12 of the arm 1. By reason of the tension of the spring 16 tending to tilt the pallet to one side the circuit-closing arm can never remain by accident in a position where the circuit will be closed, for the instant the hand is removed from the handle 8 the spring tilts it and releases the pin 4, when the clock-work is permitted to act and shift the arm until the pin 5 arrests it in a horizontal position.

The operative parts of the circuit-closer are mounted upon a hard-rubber base, so that there may be as little leakage as possible. The handle 8, which operates the pallet, is of hard rubber to secure the operator against accidental shock.

By this device the circuit may be closed for a period lasting only a fraction of a second or may be closed for a longer period, as may be desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A circuit-closer comprising a power-driven arm, circuit-terminals connected by the arm on reaching a definite point in its path of travel, detents for arresting the arm during or after connection of the terminals, and a controlling device for bringing either detent into action at will.

2. A circuit-closer comprising a power-driven revoluble arm forming one terminal of the circuit, a contact in the path of travel of the arm forming the other terminal of the circuit, detents for arresting the arm during or after contact, and a controlling device for bringing either detent into action at will.

3. A circuit-closer comprising a power-driven revoluble arm forming one terminal of the circuit, a contact in the path of travel of the arm forming the other terminal of the circuit, a detent for arresting the arm while in contact, an auxiliary detent for arresting the arm beyond acting distance of the contact, and a controlling device for bringing either detent into action at will.

4. In a circuit-closer, the combination of a revoluble arm forming one terminal of the circuit, an elastic contact in the path of the arm, a stop to prevent vibration of the contact after the arm passes, and detents controlled by an actuating-lever for arresting the arm during engagement with the contact or at a definite point in its path of travel after a momentary contact has been made.

5. In a circuit-closer, the combination of a power-driven circuit-closing arm, a contact in its path of travel, a detent for arresting the arm while in engagement with the contact, and an insulated lever for forcibly separating the arm from the contact when they fuse together.

6. In a circuit-closer, the combination of the power-driven circuit-closing arm, a contact in its path of travel, detents for arresting the arm during engagement with the contact or at other points in its path of travel, a controlling-lever for the detents, and means for automatically shifting the lever, so as to open the circuit when the operator releases the lever.

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

RICHARD VARLEY, JR.

Witnesses:

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