

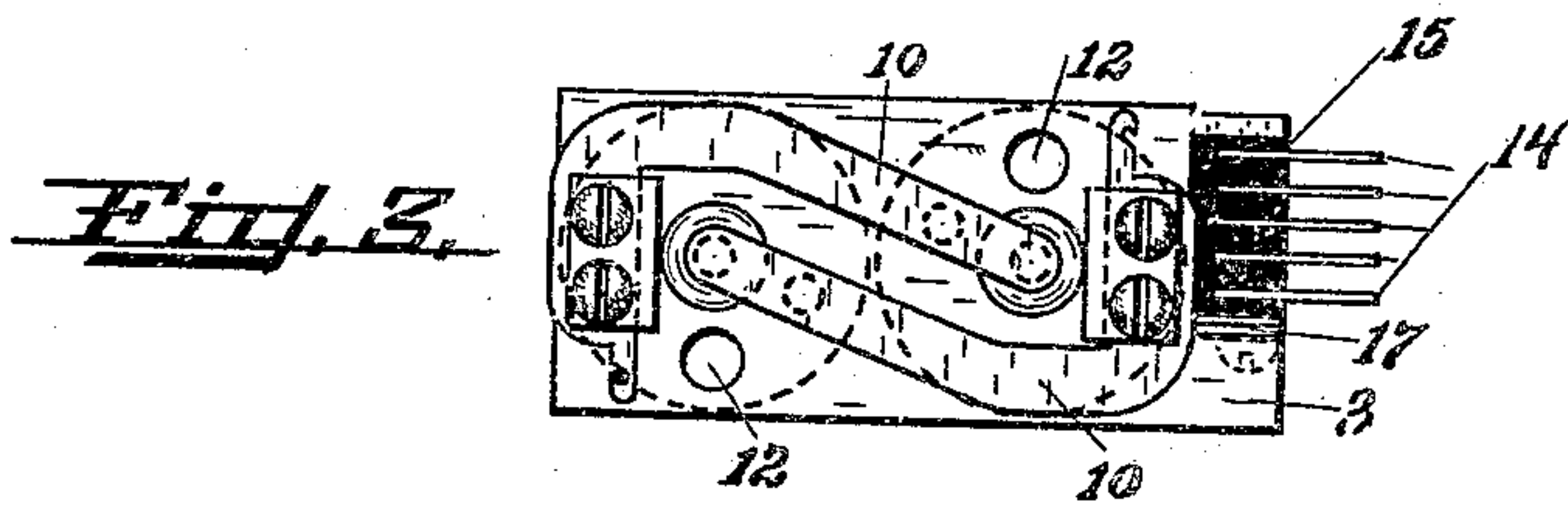
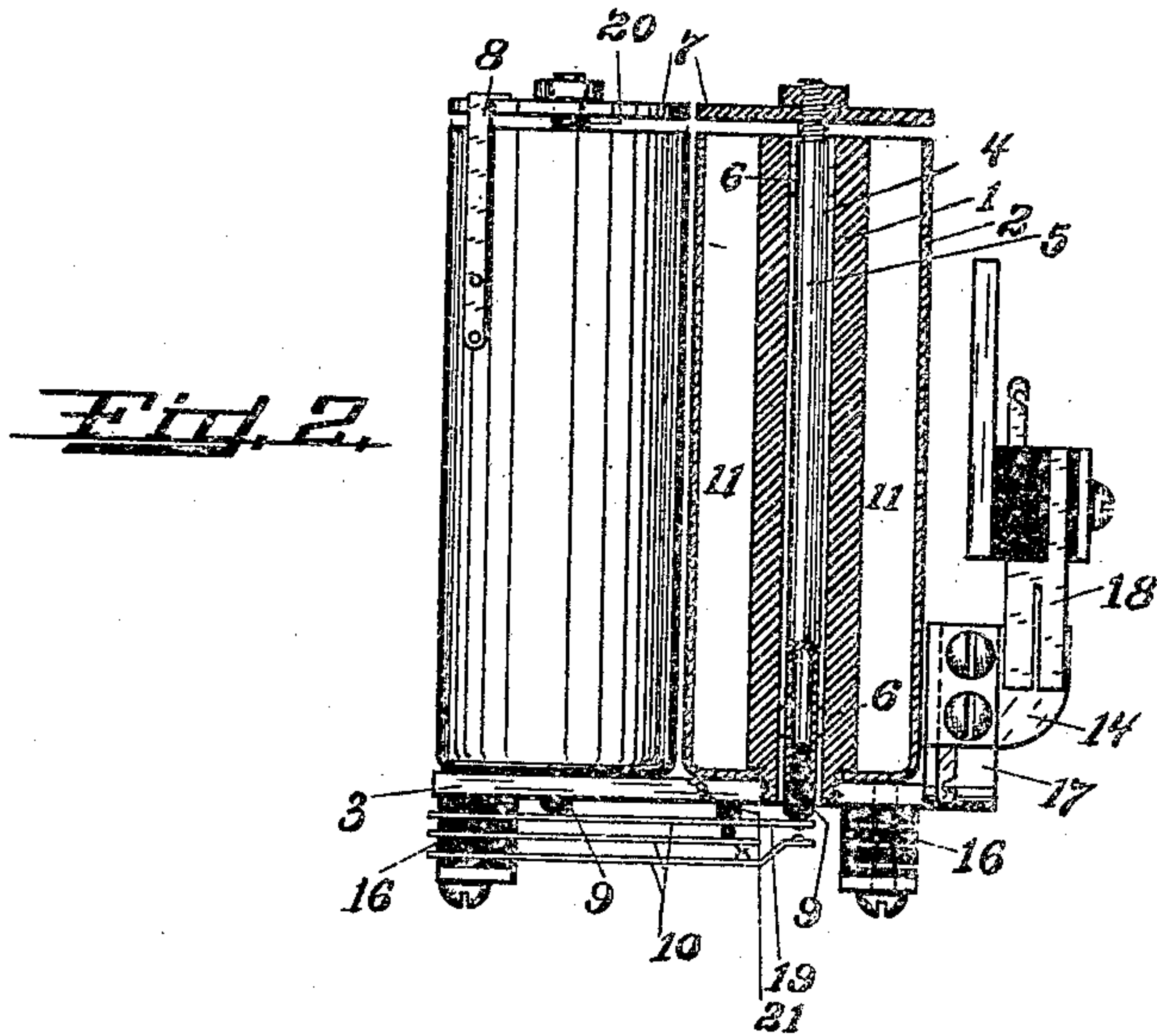
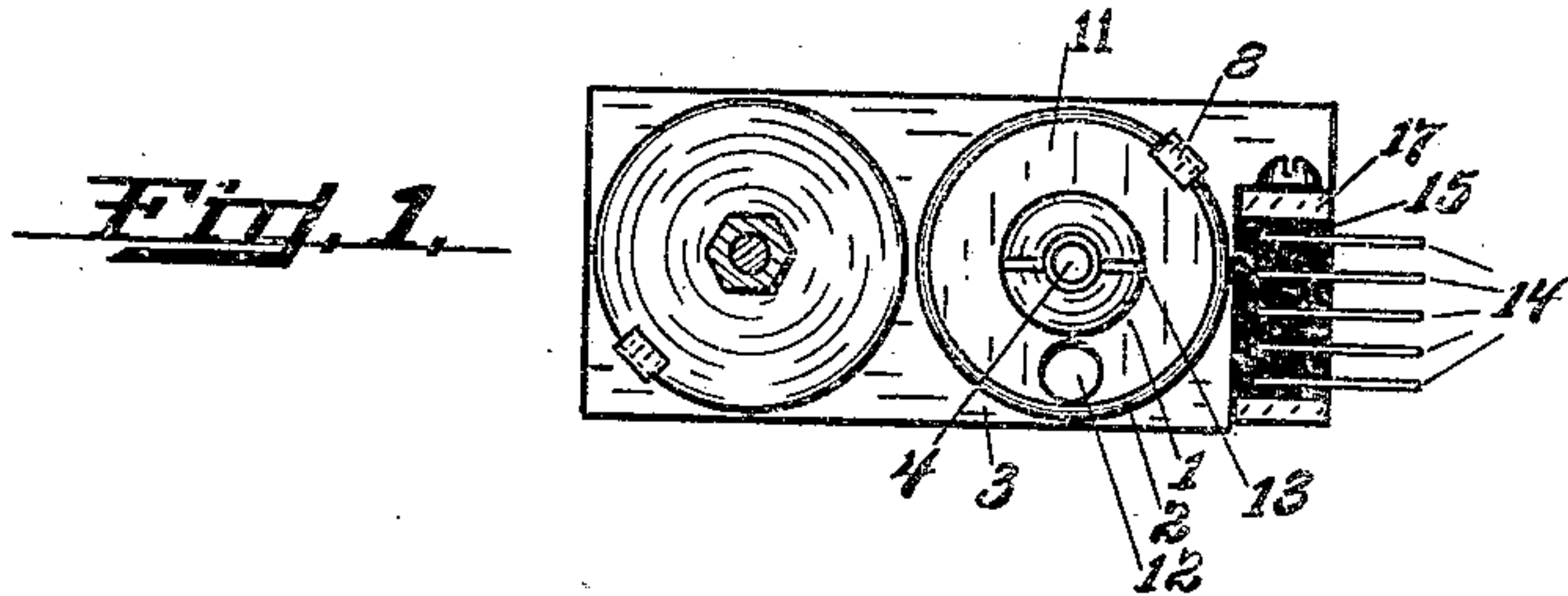
A. E. STEVENS.

RELAY.

APPLICATION FILED MAR. 16, 1908.

951,623.

Patented Mar. 8, 1910.



WITNESSES:

E. F. Uniac.
J. V. Dakin.

INVENTOR

Alton E. Stevens.

BY

Charles F. Redwood.
his ATTORNEY

UNITED STATES PATENT OFFICE.

ALTON E. STEVENS, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR TO INTERNATIONAL ELECTRIC COMPANY, OF FALL RIVER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

RELAY.

951,623.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Original application filed January 9, 1907, Serial No. 351,481. Divided and this application filed March 16, 1908. Serial No. 421,430.

To all whom it may concern:

Be it known that I, ALTON E. STEVENS, a citizen of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Relays, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to details of construction of relays, particularly of the class such as is used in telephone systems, principally as "line" and "cut-off" relays, either in a manual or an automatic system.

This invention is shown and described, but not claimed, in application No. 351,481, filed by me January 9, 1907, of which this present application is a division.

Of the objects of my invention, the following are the most prominent: 1st. To construct a relay which is efficient, and, at the same time, readily accessible for repairs, replacing faulty winding, etc. 2nd. To construct a relay which is compact, and occupies as small an amount of space as is possible. 3rd. To provide a construction which permits of relays, such, for instance, as a "line" and a "cut-off" relay, being readily combined in pairs. 4th. To provide a construction in which a "line" and a "cut-off" relay, combined in a unit, are self contained, and may be readily removed or replaced in their respective circuits, without disturbing connections. 5th. To provide a construction in which all parts of such combination are readily accessible.

In the drawings illustrating the principle of my invention and the best mode known to me of embodying the same, Figure 1 is a rear elevation of a line and cut-off relay unit, one of the armatures having been removed; Fig. 2 is a plan, one of the relays being in longitudinal section; and Fig. 3 is a front elevation of the unit.

Each of the relays illustrated, consists of a core 1, and a shell 2, each being of metal capable of becoming magnetized. The core 1 extends through the end of the shell 2, and is screwed into a support or plate 3, thereby clamping the core and shell to the support. A hole 4 extends through the core 4, to receive a rod or tube 5, the said hole 4 being bushed at each end, 6; the bushing

forming a bearing for the rod 5; and the rod fitting loosely in the said bushings. A disk of magnetic metal 7 is adjustably secured to one end of the rod; the said disk forming the relay armature; the movement of the said armature, and hence the rod, being limited by a spring back-stop 8, which is secured to the shell 2. A plug of insulating material 9 is fitted to the free end of the rod 5, and is designed to engage and operate contact springs, as 10. A suitable winding is placed on the core 1 and inside of the shell 2, in the space 11; the ends of the wire being led out through a hole 12, Fig. 3, through the shell 2 and support 3 to the face of the said support. This winding is preferably a solenoid, which may be readily slipped into place when the armature 7 and rod 5 are removed to facilitate the repairs of a faulty winding. As very little strength is required in the rod 5, a tube may be substituted therefor, resulting in a lighter moving element; the rod or tube being preferably of a non-magnetic metal. It will be evident that when an electric current is sent through a winding on the core 1, an efficient electromagnet results, with both poles presented to the disk armature 7, one pole being presented by the core 1, and the other by the shell 2, the said armature becoming thereby attracted, and, by moving the rod through the core, causing the required work to be accomplished at the free end of the rod.

The contact springs 10, Fig. 3, operated by the rods, are mounted on the face of the plate 3, which serves as a support for the two relays; the springs of a line relay being shown in Fig. 2. To obtain the required length of springs, operated by each relay, they are mounted adjacent to the other relay, and the springs are removably secured in slotted blocks of insulation 16. A slot 13 is convenient to assemble the relays, as a circular wrench with a piece to engage the slot, may be fitted over the core, whereby the core may be readily screwed into the support, or may be removed therefrom. The magnet coils and relay springs of the two relay units may be inter-connected, and the leading-out wires from the relay unit terminated in points of a jack 14; the said points being held in slots in a block of insulating material 15, which is secured to a bent piece 17 of

the plate 3. The coöperation of the said jack with a corresponding female jack 18, permanently secured to a proper support on which the relays are to be mounted, and
 5 connected to the proper circuits, serves as a convenient means for inserting or removing the relay unit from its associated circuits. Normally, one of the contact springs, as 19, Fig. 2, serves to return the rod and
 10 armature to normal position. If, however, a quicker or stronger return is necessary, a spiral compression spring, as 20, may be mounted on the rod and have a bearing on the bushing 6 and the disk 7, thus tending to
 15 force the said disk from the bushing. A piece of insulating material 21 is set into the plate 3, and extends through the spring 19, which rests, with tension, upon a shoulder of said piece; the next spring resting,
 20 with tension, upon the extension of the said piece, to preserve the adjustment of the springs.

The above described construction accomplishes all of the objects of my invention,
 25 and I desire to protect the same in the broadest manner legally possible.

What I claim is:—

Two relays mounted side by side, and secured to a common base; each relay being composed of a shell and a core of magnetic
 30 material; a removable solenoid for said core; a hole longitudinally through said core; a suitable opening in said shell through which may be led electrical connections for said
 35 solenoid; a rod of non-magnetic material, free to be moved in said hole; an armature secured to the free end of said rod; the opposite end of said rod protruding from said
 40 core; two sets of contact springs; each set of contact springs being operated by its individual relay armature and rod, and being adjacent to the other relay; and jacks, for
 45 electrical connections; all designed for the purpose of combining the entire apparatus in a self contained removable unit.

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

ALTON E. STEVENS.

Witnesses:

FRANCIS J. V. DAKIN,
 E. F. UNIAC.