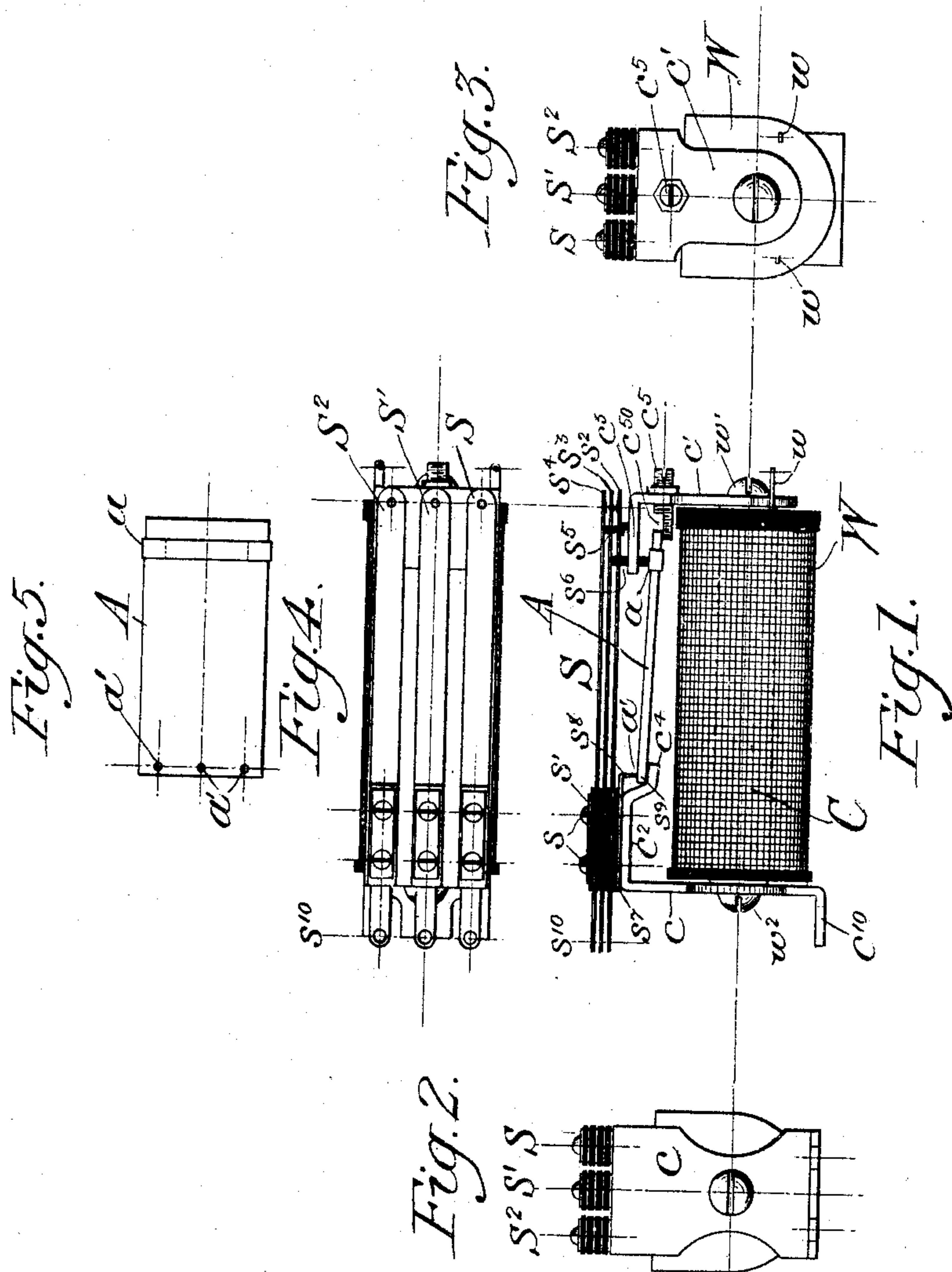


B. G. DUNHAM.
ELECTROMAGNET.
APPLICATION FILED JUNE 4, 1906.

978,992.

Patented Dec. 20, 1910.



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UNITED STATES PATENT OFFICE

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ELECTROMAGNET.

978,992.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BERT G. DUNHAM, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Electromagnets, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to electromagnets and particularly to the type which is used with an electric relay in a telephone exchange system, and it has for an object the provision of a magnet which has quickness and certainty in action, is inexpensive to manufacture and is durable in use.

To this and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a side view of a magnet constructed in accordance with my invention. Fig. 2 is a rear end view. Fig. 3 is a front end view. Fig. 4 is a top view, and Fig. 5 is a detail view of the armature.

In the preferred embodiment herein shown a core C is surrounded by the winding W which has its terminals *w* at the front end of the magnet, and to the front and the rear end of the core C are respectively secured, as for instance, by screws *w'* and *w''* pole pieces *c'* and *c''*, which extend upwardly and thence toward each other as at *c'''* and *c''''* respectively, over the coil and in the same plane, the extension *c'''* being as at *c''''* depressed or bent at its end toward the winding W to provide a seat for one end of the armature A. The armature A is held on the seat by a plurality of depending spring fingers *s* having attaching portions *s'* secured in a manner to be described and projecting into depressions or seats *a'* in the upper surface of the armature to permit the armature to complete the magnetic circuit by swinging at its free end which extends beneath the pole piece extension *c'''* and is provided with an anti-sticking device in the form of a band *a* of brass or other non-magnetic material.

The limit of movement of the armature is controlled by an adjusting device in the form of a screw *e* working through the pole

piece *c'* above the winding and having one-half of its diameter cut so as to produce a flat surface which supports the armature and the edges of which when the screw is rotated engage the armature to raise it, a lock nut on the screw acting to hold the latter against movement.

Although the armature may be employed for the control of any suitable device, in the present instance three make and break devices S, S' and S'' are shown as controlled thereby and each comprises three contact springs *s''*, *s'''* and *s''''*, secured to the extension *c''* with insulating material between them by screws *s* and *s'* which also serves to retain the attaching portion *s'* of the spring *s''* before mentioned. These contact springs have terminals *s''''* and extend parallel to the core C to the other pole of the magnet, where the upper and lower ones *s''* and *s''''* are secured to one of the shouldered studs *s'''*, while the intermediate one *s'''* is apertured so as to move freely about the said stud to permit it to alternately engage springs *s''* and *s''''* upon the energization and deenergization of the magnet, the intermediate one receiving its motion from the armature A which is connected thereto by one of the studs *s'''* passing through apertures in extension *c'''* and in spring *s''*. The device is preferably supported at its rear end only by a foot *e''* bent rearwardly from pole piece *c*.

From the foregoing it will be noted that I have provided an electromagnet having a positive action, a small time constant and in which the armature while having its ordinary movement in no wise interfered with, is strongly and effectively supported against accidental displacement and at the same time is provided with adjusting means which permits its movement to be varied to agree with an instrument which it is to control.

I claim as my invention:

1. In an electromagnet, the combination with a core and a winding therefor, pole pieces secured to the ends of the core, and having ends extending toward each other on one side of the winding and arranged in the same plane, one of said pole pieces having its extremity offset toward the core and an armature resting in the offset and extending beneath the end of the other pole piece.

2. In an electromagnet, the combination

with a core and a winding therefor, of pole pieces secured to the ends of the core and extending toward each other on one side of the winding, one of said pole pieces being
5 provided with a depression, and an armature seated in the depression and extending beneath the other pole piece.

3. In an electromagnet, a pole piece, an armature resting against and supported on
10 the upper surface of the pole piece, and a spring holding the armature seated therein while permitting the pivotal movement of the latter.

4. In an electromagnet, a pole piece, an armature resting on the pole piece and provided with a depression, and a spring depending into the depression to hold the armature on the pole piece.

5. In an electromagnet, the combination
20 with a core, of pole pieces at the ends of the core, one of said pieces extending toward the other at one side of the core and provided with a depression, an armature resting in the depression, and a spring secured to the
25 pole piece and having a depending end engaging and holding the armature in the de-

pression to permit a pivotal movement of the armature.

6. In an electromagnet, the combination with pole pieces, and a pivoted armature, of
30 an adjusting device comprising a screw having a flat surface upon which the armature may lie and the edges of which when the screw is rotated cause the raising of the armature. 35

7. In an electromagnet, a core, pole pieces at the ends of the core extending toward each other, an armature pivotally connected to one pole piece and extending beneath the other, and an adjusting device comprising a
40 screw mounted on the last mentioned pole piece and having a flat surface upon which the armature may lie, the edges of which when the screw is rotated causing the raising of the armature. 45

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

BERT G. DUNHAM.

Witnesses:

JOSEPH R. WEBSTER,
GEORGE R. RAINES.