No. 787,905. PATENTED APR. 25, 1905.

E. DUCRETET.

TELEGRAPHIC RELAY.

APPLICATION FILED APR. 10, 1901.

3 SHEETS—SHEET 1.

Fig. 1.

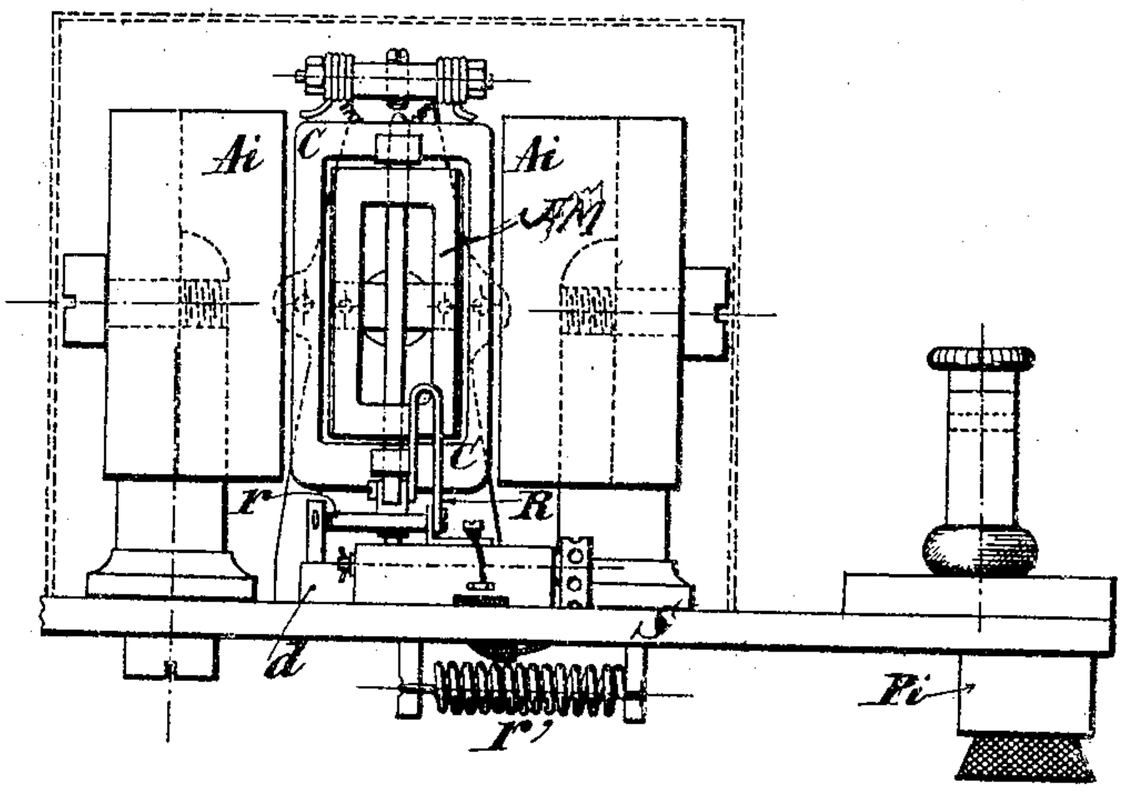


Fig. 4.

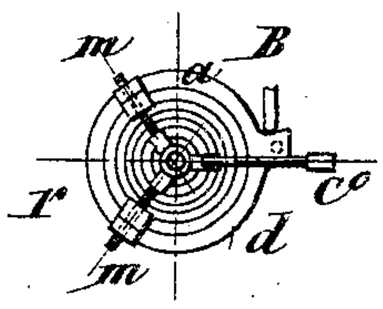


Fig. 5.

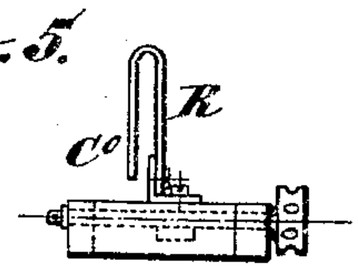


Fig. 3.

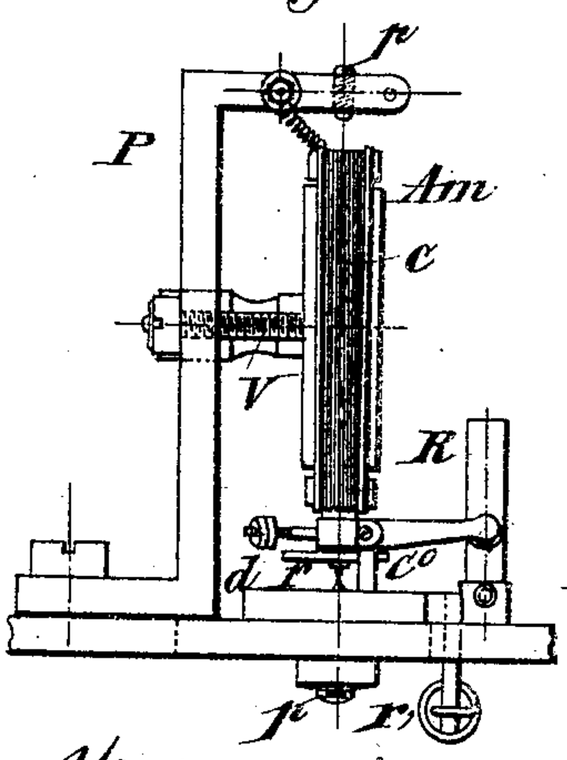
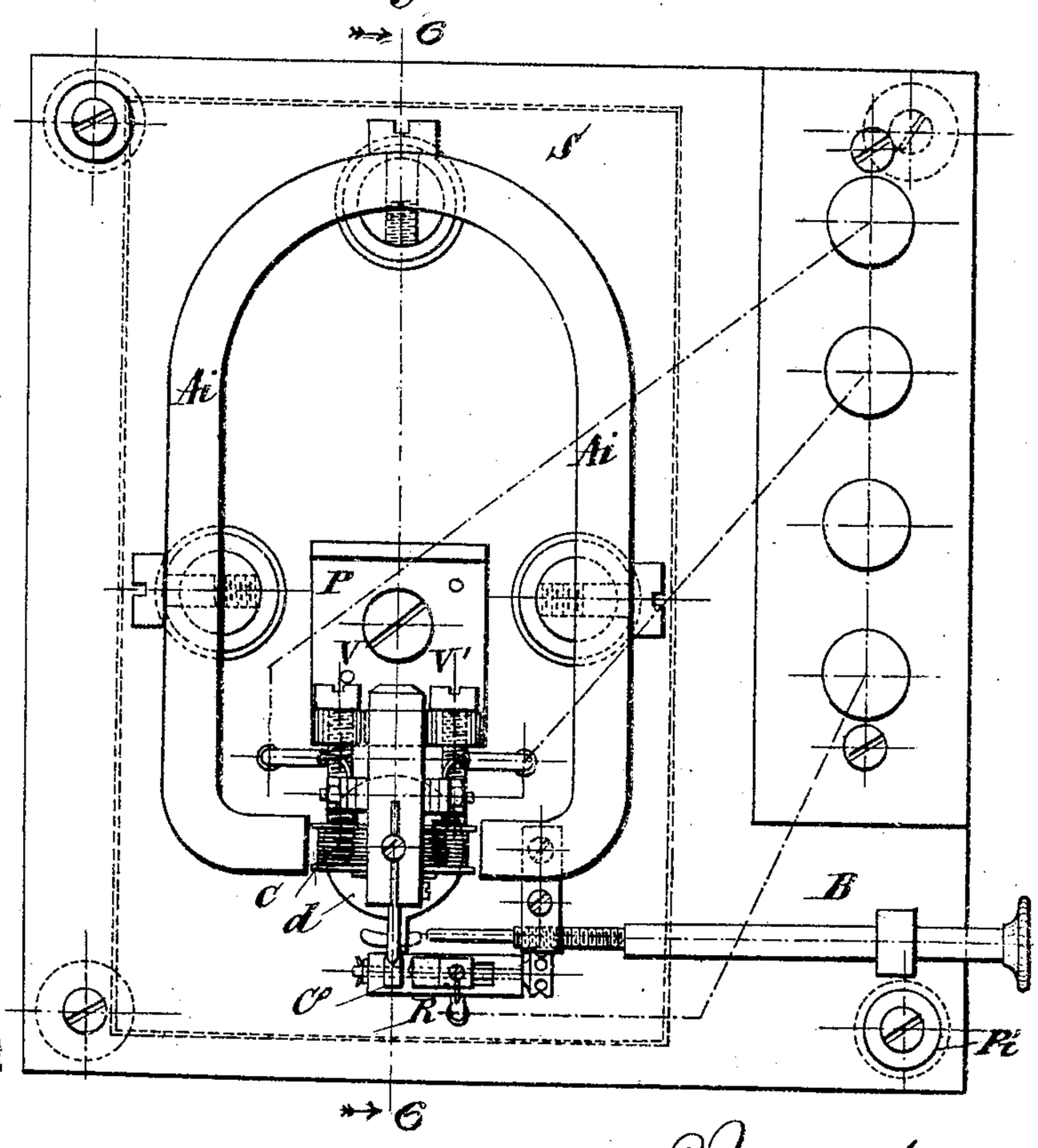


Fig. 2.



Witnesses

W. K. Baillie

C. E. Wentworth

Inventor.

Eugène Ducretet

By Munn & Poulter,

attorneys.

No. 787,905. PATENTED APR. 25, 1905.

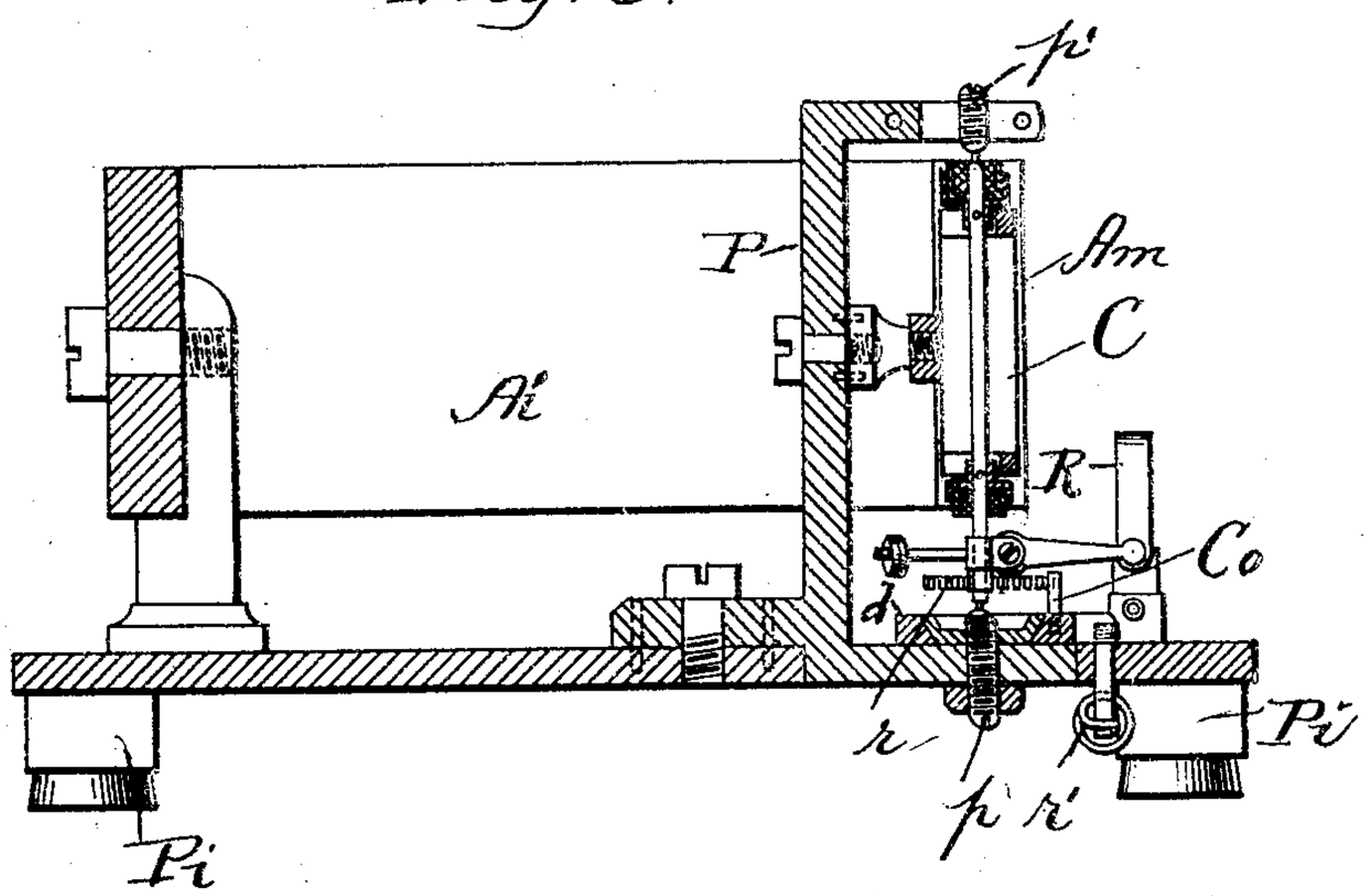
E. DUCRETET.

TELEGRAPHIC RELAY.

APPLICATION FILED APR. 10, 1901.

3 SHEETS—SHEET 2.

Fig. 6.



Witnesses
H. K. Bowen
[illegible]

Inventor
Eugène Ducretet,
By Wm. E. Boulter
Attorney

No. 787,905. PATENTED APR. 25, 1905.

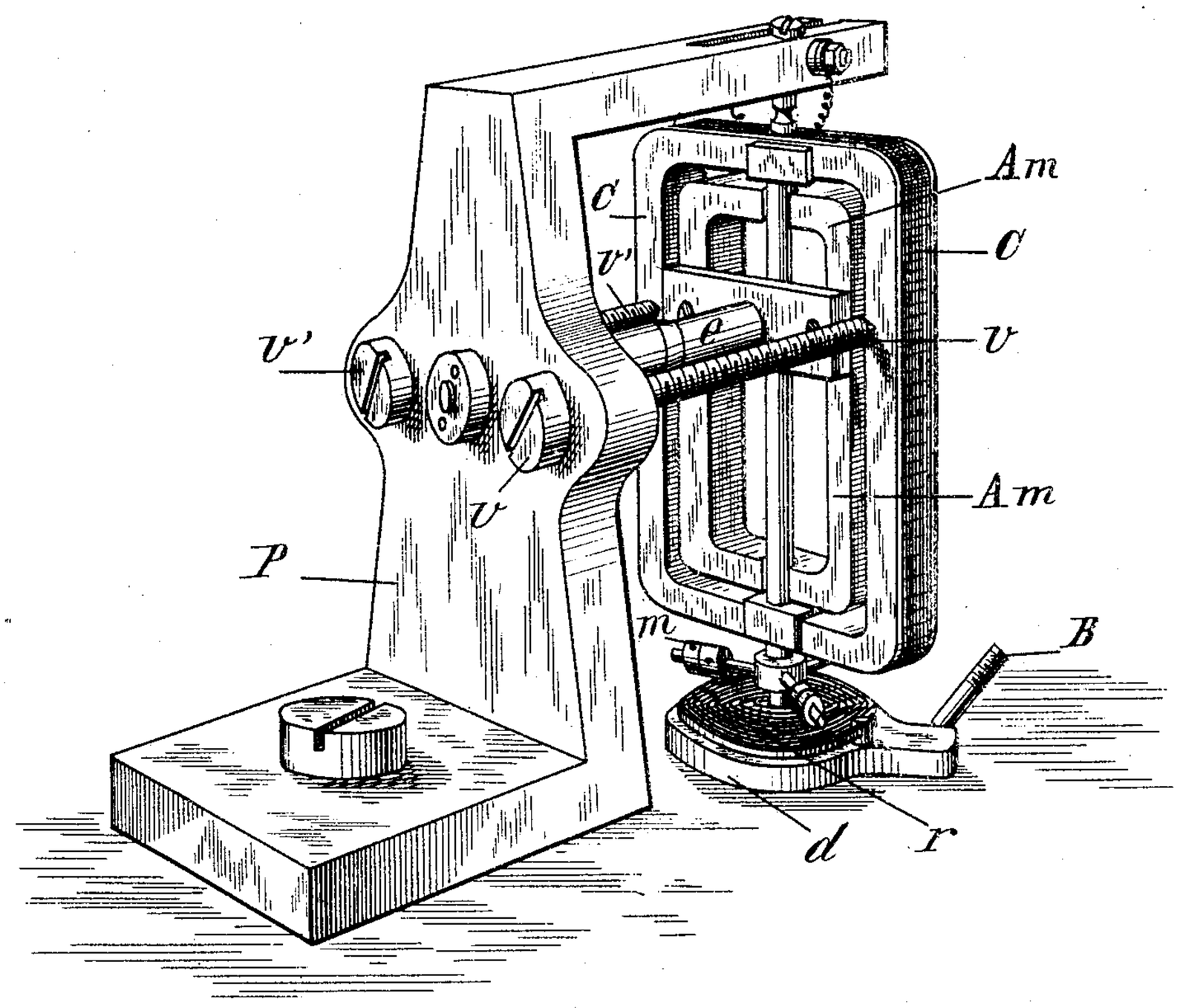
E. DUCRETET.

TELEGRAPHIC RELAY.

APPLICATION FILED APR. 10, 1901.

3 SHEETS—SHEET 3.

Fig. 7.



Witnesses:

W. K. Boulter

Inventor:

Eugène Ducretet.

By Dyer & Boulter

Attorney.

No. 787,905. Patented April 25, 1905.

UNITED STATES PATENT OFFICE.

EUGÈNE DUCRETET, OF PARIS, FRANCE.

TELEGRAPHIC RELAY.

SPECIFICATION forming part of Letters Patent No. 787,905, dated April 25, 1905.

Application filed April 10, 1901. Serial No. 55,207.

To all whom it may concern:

Be it known that I, EUGÈNE DUCRETET, a citizen of the French Republic, residing at Paris, France, have invented certain new and useful Improvements in Telegraphic Relays, of which the following is a specification.

The principle of frame-relays or relays having a changeable circuit in a magnetic field is known. It is similar to that of the siphon-recorder of Sir W. Thompson and the movable frame-galvanometers known under the name of "Deprez d'Arsonval," (shown in Maxwell, 1873,) in which the magnetic field is produced either by means of a permanent magnet or by means of an electromagnet. The suspension of the movable frame is then obtained either by twist-wires or by a pivoted spindle actuated by a coiled spring or any other antagonistic spring. This antagonistic motion should be in all cases opposed to the electric current which passes through the movable circuit and which produces its displacement in the magnetic field.

This present invention relates to improvements in the details of magnetic relays as heretofore constructed, the object being to obtain increased sensitiveness and to greatly facilitate the regulation of the principal parts of the relay, as shown in the accompanying drawings.

Figure 1 is an elevation of my improved device. Fig. 2 is a plan view. Figs. 3, 4, and 5 are detail views. Fig. 6 is a section on the line 6 6 of Fig. 2 looking in the direction of the arrows. Fig. 7 is a perspective view of the device.

The permanent magnet A*i* is formed of a steel blade placed as shown in Figs. 1 and 2, forming at its polar ends a homogeneous magnetic field in which is placed the movable frame C. This movable frame C is provided with a fixed interior piece of iron A*m*. It is the ballistic effect or projective force of this movable frame which produces the contacts of the relay at R. The movements of the movable frame are very slight in this magnetic field. The piece A*m* is placed inside the movable frame C. This fixed frame concentrates the lines of force of the poles of the magnet A*i*, between which moves the frame C under the influence of the current which circulates in the wire wound on the movable frame C.

R is the flexible contact on which the movable contact C*o*, controlled by the spindle of the movable frame, acts. The arched form of spring R insures a good electrical contact between the spring and the contact C*o*. The guide which supports this spring permits of a good and rapid regulation of the relay.

The antagonistic spiral spring *r*, controlled by the movable frame, is fastened to a disk *d*, which revolves on its center and the movement of which is supplied by a spring *r'*, Figs. 1 and 3, against the stop of the set-pin B. The stretching-spring *r'* draws the stop of the disk *d* onto the stop of the regulating-rod B, controlled from outside the relay. This arrangement facilitates the regulation (even from the outside of the relay-box) of the required tension of the antagonistic spiral spring *r*. A guard or cover may be provided for the pin B to be used when the regulation is finished.

A single mass or several masses *m m* are provided to balance the movable frame C, Figs. 3 and 4.

The whole apparatus is mounted on a bridge P, which comprises the two set-screws *v v'*, regulating the motions of the movable frame C. This manner of mounting allows the regulation of the whole device with or without the magnet. The apparatus and the magnet are thus independent of each other.

S is the base or stand on which the apparatus rests. This base may be of any form that will provide against vibration.

A flexible contact is obtained by means of a spring R, Fig. 5. The contact is formed at C*o*. This portion is very accessible and is movable on a small slide, which facilitates the regulation of the electric contacts of the relay. The latter is fastened to the movable frame and contacts with R at C*o*.

The processes intended to prevent the occurrence of sparks at the breaking of contacts of the relay are already known, so that it is unnecessary to describe them.

Fig. 7 shows plainly the bridge P, carrying the set-screws *v v'* for regulating the motions

of the movable frame C, and to which bridge is secured a rod *e*, upon which is fixedly secured the frame A*m*.

The casing which covers the relay is furnished with a small window, which allows the motions of the movable frame and of the contacts to be observed. This casing can be quickly taken off. Under the socket feet fitted with springs or india-rubber P*i* lessen the effect of the shocks.

Any suitable metal—such as gold, silver, platinum, or the like—may be used for making the contacts.

The ends of the fine conducting-wire, which is wound on the movable frame C by means of small flexible coils and of insulated stops, extend to the outside binding-screws + and —, Fig. 2.

p p' designate screws serving as bearings for the pin of the movable frame C.

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

1. In a sensitive telegraphic relay a rigid metallic plate, the rotatable disk *d*, a movable frame, a spring arranged to act upon the said disk, an antagonistic spring, and a regulating-screw controlling the antagonistic spring by means of said disk to give the required sensitiveness to said frame.

2. In a sensitive telegraphic relay the combination of a rigid metallic plate, a rotatable disk, a spring coöperating therewith, a movable frame, a regulating-screw for controlling said spring through the medium of said disk to give the required sensitiveness to said frame, a magnet of a form to place said frame in a homogeneous and powerful magnetic field.

3. In a magnetic or telegraphic relay, the combination of a movable frame, the spindle thereof, the antagonistic spring controlling said spindle, a rotatable disk controlling said spring and a regulating-screw whereby the sensitiveness may be adjusted as required.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

EUGÈNE DUCRETET.

Witnesses:

EDWARD P. MACLEAN,

GEORGE E. LIGHT.