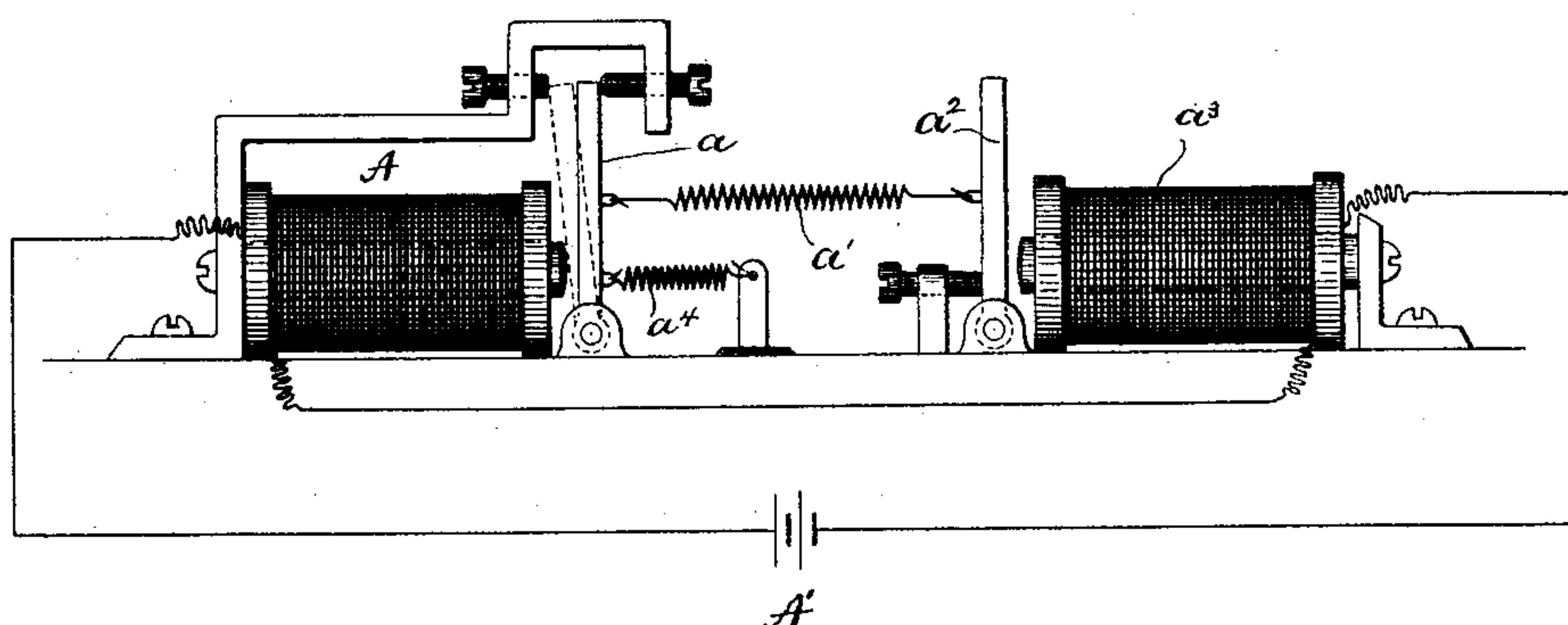


(No Model.)

W. S. RICHARDS.
ELECTRICALLY ADJUSTING RELAY.

No. 482,137.

Patented Sept. 6, 1892.



Attest:
Geo. T. Smallwood.
A. D. Harrison

Inventor:
W. S. Richards
by night Brown Crossley
Atty.

UNITED STATES PATENT OFFICE.

WALTER S. RICHARDS, OF NATICK, ASSIGNOR OF ONE-HALF TO GEORGE B. JAMES, OF BOSTON, MASSACHUSETTS.

ELECTRICALLY-ADJUSTING RELAY.

SPECIFICATION forming part of Letters Patent No. 482,137, dated September 6, 1892.

Application filed September 14, 1891, Serial No. 405,626. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. RICHARDS, of Natick, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electrically-Adjusting Relays, of which the following is a specification.

In telegraphic receiving-instruments great difficulty is often experienced in keeping the relay adjusted so as to respond to the sudden changes in current strength of the line-circuit.

As now commonly practiced the armature of the relay has connected to it a spring, the tension of which is regulated by a set-screw, and in practice it frequently happens that the relay has to be adjusted many times in a substantially short space of time.

My present invention has for its object to provide apparatus, as will be described, whereby the tension upon the spring is adjusted automatically by the current strength. In accordance with my invention the line-relay has connected in circuit with it an electro-magnet having its armature connected to the armature of the relay by a spring. The armature of the electro-magnet has a greater range of movement away from its magnet than the armature of the relay, so that when a weak current is passing through the electro-magnet its armature will not be attracted and the tension upon the spring connecting the two armatures is relieved or lessened; but when a current of normal strength is passing through the electro-magnet its armature is attracted and the spring is elongated, thereby increasing the tension upon the same.

The particular features of my invention will be pointed out in the claim at the end of this specification.

The drawing represents in diagram an electrical circuit containing a relay provided with an electrical adjusting apparatus embodying my invention.

A represents a relay, which may be of any usual or well-known construction, it being included in an electric circuit containing the

battery A'. The relay A is provided with the armature a , joined by an adjusting-spring a' to the armature a^2 of an electro-magnet a^3 , having a substantially central pole-piece, in front of which the armature a^2 is pivoted. The armature a^2 has a wider range of movement away from its magnet than the armature a of the relay, so that the armature a^2 will be unaffected by weak currents, but will be within the influence of the electro-magnet a^3 when a current is passing through the same. When the armature a^2 is withdrawn from its magnet a^3 , the tension of the spring a' upon the armature a of the relay is very slight, so that the latter is free to respond to weak currents in the line-circuit; but when the circuit is of normal strength the armature a^2 is attracted by its magnet a^3 and the spring a' is elongated and placed under increased tension, thereby requiring a stronger pull from the relay to attract the armature a . The electro-magnet a^3 is connected in circuit with the relay A, and it will be seen that the strength of the current flowing over the line automatically regulates the tension of the spring a' , and thereby automatically regulates the adjustment of the relay.

I claim—

In an electric circuit, the combination, with a relay located in said circuit and its armature, of an electro-magnet included in the same circuit with the relay and provided with an armature pivoted outside of the electro-magnet and located in front of the pole-piece of the said electro-magnet, and a spring connecting said armatures, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 5th day of September, A. D. 1891.

WALTER S. RICHARDS.

Witnesses:

C. F. BROWN,
A. D. HARRISON.