

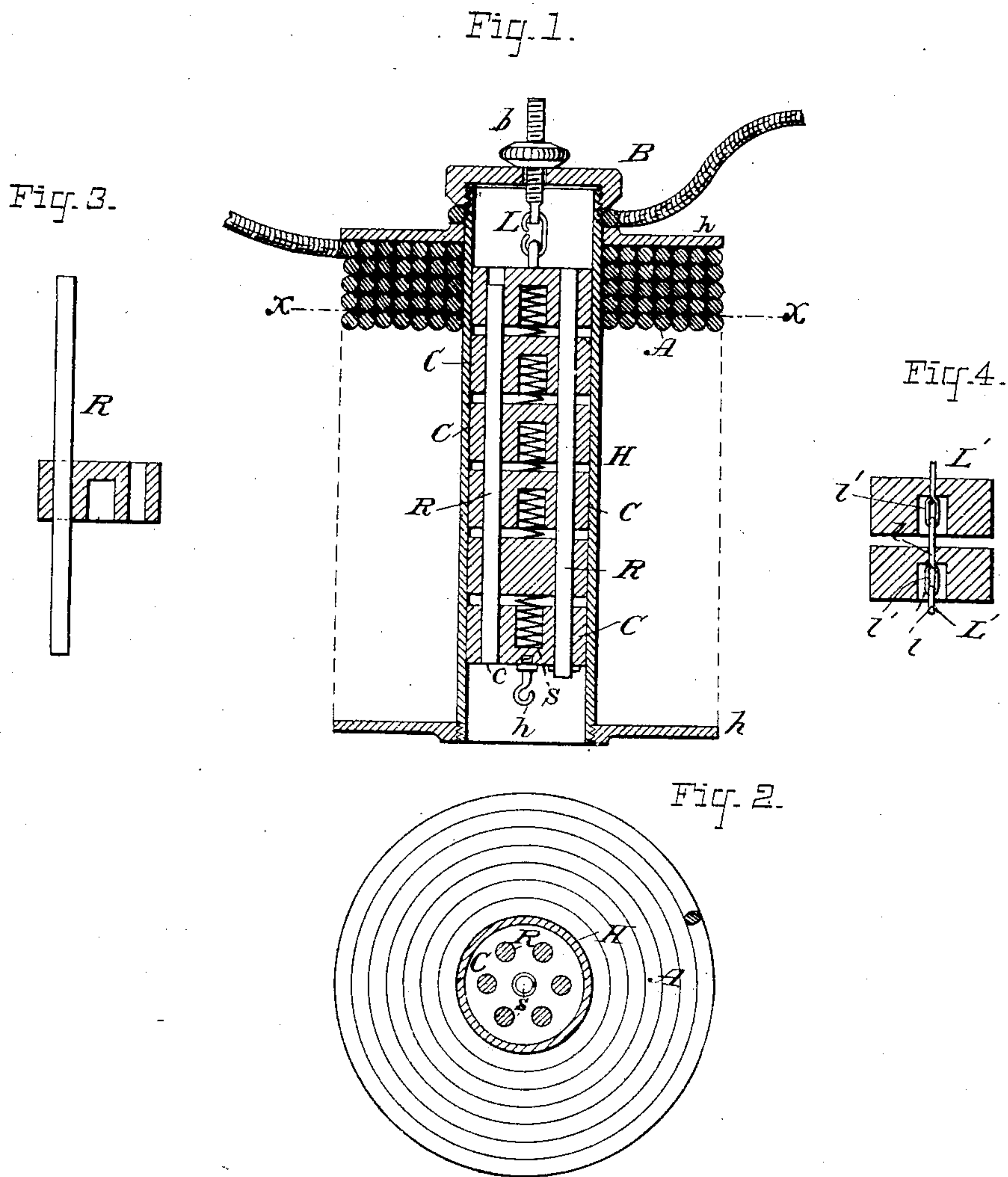
(No Model.)

A. G. WATERHOUSE.

ELECTRO MAGNET.

No. 254,743.

Patented Mar. 7, 1882.



ATTEST:

Julian A. Hurdle.
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INVENTOR:

Adison G. Waterhouse

UNITED STATES PATENT OFFICE.

ADDISON G. WATERHOUSE, OF NEW YORK, N. Y., ASSIGNOR TO THE UNITED STATES ELECTRIC LIGHTING COMPANY, OF SAME PLACE.

ELECTRO-MAGNET.

SPECIFICATION forming part of Letters Patent No. 254,743, dated March 7, 1882.
Application filed August 1, 1881. (No model.)

To all whom it may concern:

Be it known that I, ADDISON G. WATERHOUSE, of the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Electro-Magnets, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to an improved form of electro-magnet especially applicable to electric-lamps.

The object of my invention is to obtain a greater range of motion in the armature or core of the electro-magnet employed with lamps of this kind, and to attain this movement without loss of magnet attraction.

In the drawings hereto annexed, Figure 1 is a sectional view of my improved form of magnet; Fig. 2, a section taken through the line $x x$ of Fig. 1; Fig. 3, a sectional view of a detached portion of the said magnet; Fig. 4, a modification of the same shown in section.

The letter H represents a cylindrical casing, of brass or non-magnetic metal, having flanges h , between which is wound the coil A, constituting the coil of the main magnet of an ordinary electric-arc lamp. The casing H is closed by a cap, B, through which passes an adjusting-screw, b , carrying by a link, L, a number of cylindrical blocks, C, of soft iron, which are formed of such diameter as to fit closely in the casing H. Through all the blocks are formed perforations in the same vertical line. In the said perforations are passed rods R R', one of which is secured to the upper block of the series, and passes loosely through the remainder. It is provided at its end with a stop. The other rod is secured to the lower block and passes freely through the remainder. The blocks are connected with each other by spiral springs, which are placed within suitable recesses in the bottom of each block and attached to the top of the one below. When the current is passed through the coil A the blocks are magnetized and drawn up with great force, the range of motion being equal to the sum of the distances between the several blocks. Rods R R' serve

to keep the blocks in the same relative position, preventing them from turning the latter; also acting to limit the movement of the whole number.

Instead of being connected by springs, as shown in Fig. 1, the arrangement shown in Fig. 4 may be adopted. In this the springs S are supplanted by a number of links, L, formed of straight portions l and loops l' . When the blocks or sections are drawn up in this case they slide over the straight portions of the chain l' . In this case no bars are required, such as are needed when the sections are connected by springs. The hook h' serves as a means of connection with a movable portion of the lamp—such as the clamp connected with the carbon-holder—or with a train of gears which is raised into contact with a fixed detent.

The adaptation of this magnet with an electric lamp being the same in all respects with that of other forms of magnets, it is not illustrated in the present case. It may be stated, however, that the coil A, instead of being composed entirely of coarse wire included in the main circuit, may be composed partly of coarse wire in the main circuit with a superposed layer of fine wire, forming part of the shunt or derived circuit around the lamp.

I am aware that a sectional core for electromagnetic helices is not broadly new. In all cases of which I am aware, however, the several sections of the core have been connected by links attached to the sides of the sections. This necessitates an increased separation between the coils and the core, which weakens the attractive power of the core and allows considerable play. By my construction the connections are contained entirely within the core and permit the sections to fit more snugly in the metal casing upon which the helix is wound.

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

1. An electro-magnet consisting of a helical core of non-magnetic metal, having a series of coils wound thereon, in combination with a core composed of independent sections of

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suspended at short distances apart by means
of connections passing through the sections,
which allow the sections to be drawn together
when magnetized, substantially as described.
5 2. The combination of helix A, cylindrical
case H, of non-magnetic metal, the cap B, ad-
justing-screw d , and a core composed of a num-
ber of independent sections connected together,

as described, and suspended by a link, l , from
the screw d , as set forth.

In testimony whereof I have hereunto set
my hand this 19th day of July, 1881.

ADDISON G. WATERHOUSE.

Witnesses:

CLAYTON KNEELAND,
PARKER W. PAGE.