

A. HAHL.
ELECTROMAGNETIC SIGNAL APPARATUS.

No. 112,242.

Patented Feb. 28, 1871.

Inventor:
Augustus Hahl,
By Hill & Ellsworth
Attys.

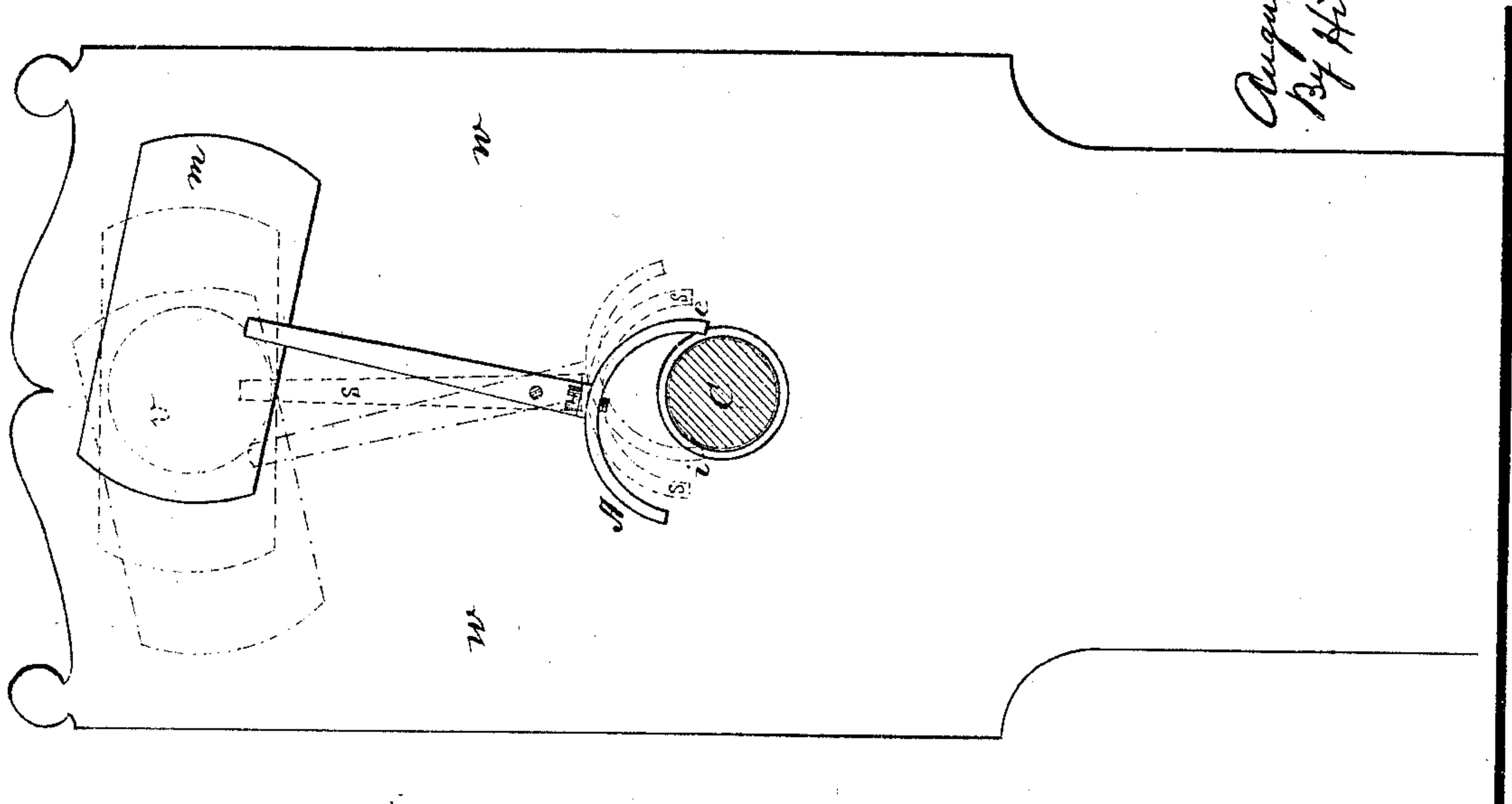


fig. 2.

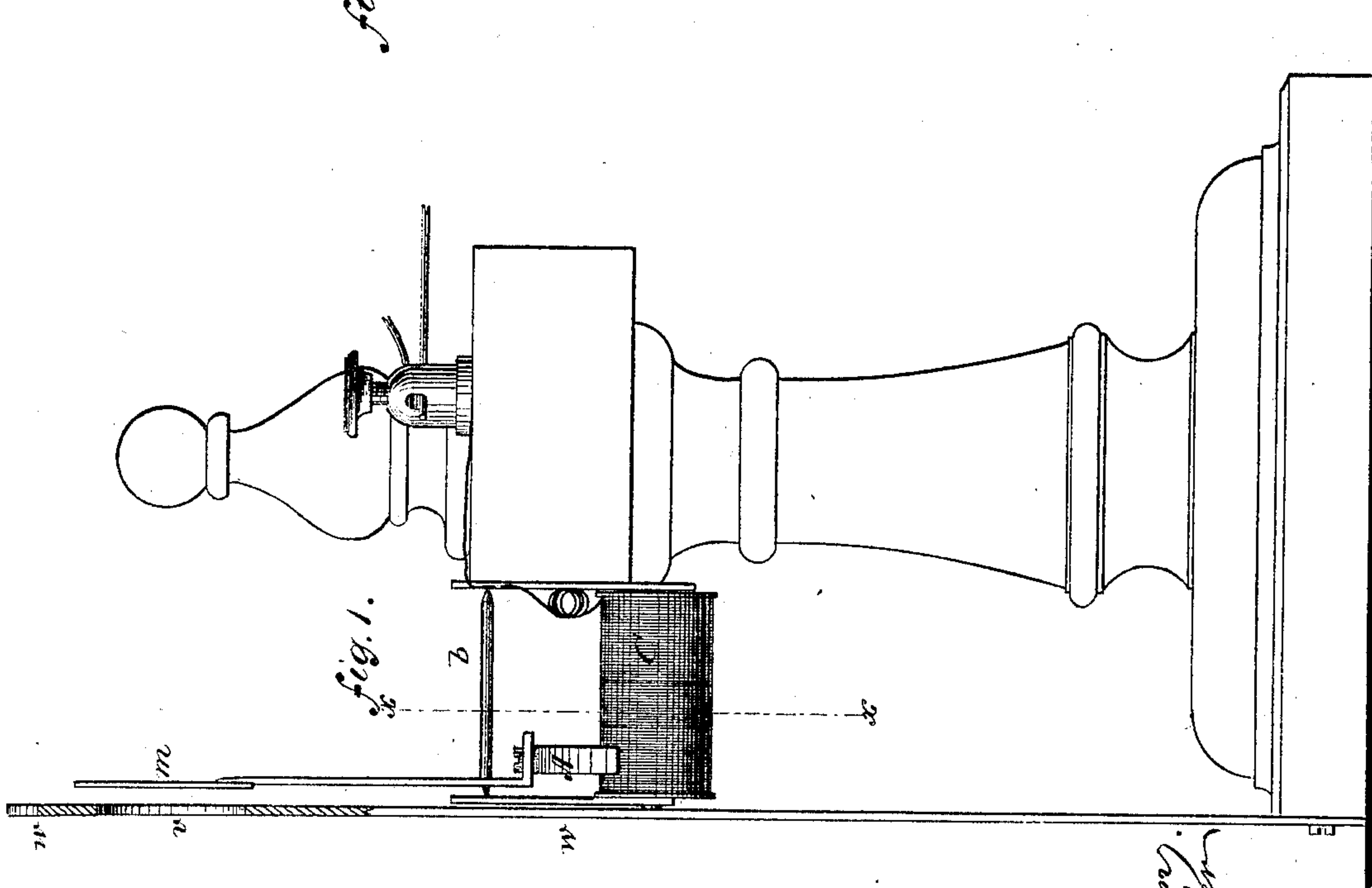


fig. 1.

Witnesses:
Victor Hagmann
John S. Fowler

United States Patent Office.

AUGUSTUS HAHL, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR
TO "THE ELECTRIC CLOCK AND BELL COMPANY," OF SAME PLACE.

Letters Patent No. 112,242, dated February 28, 1871.

IMPROVEMENT IN ELECTRO-MAGNETIC SIGNAL APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, AUGUSTUS HAHL, of Washington, in the District of Columbia, have invented certain Improvements in Electrical Apparatus; and I declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, in which—

Figure 1 is a side elevation; and

Figure 2 is a vertical section in line *xx* of fig. 1.

Similar letters of reference indicate like parts.

This invention is an improvement in the electrical apparatus employed in connection with hotel indicators and for other purposes, and consists in the combination of a fixed helix and a movable permanent magnet, as hereinafter described, whereby the position of the magnet, and of a signal connected therewith, may be reversed at pleasure by simply reversing the electric current, without necessity for a second helix.

In all apparatus for a similar purpose heretofore in use two helices have been employed, with an iron bar suspended between them and capable of moving toward either.

The electric current sent through one of them causes it to attract the bar and move it from its position, and to reverse the movement of the bar the current must be changed to the other helix.

In my apparatus, although only a single helix is employed, yet the bar may be swung to either side by the direct force of the electric current.

In the drawing—

C represents the helix, and

A, a bent steel magnet, suspended from a pivot, *b*, so as to bestride the coil, as shown in fig. 2.

By sending the electric current in one direction through the coil the magnet will be deflected so that one of its poles will rest against the side of the helix, as shown at *e*, while by changing the direction of the current the other pole of the magnet will be attracted to the helix, as seen in dotted lines at *i*.

The bent magnet embracing the helix is believed to be the best form, for the reason that as thus constructed the current acts on both of the poles at once, and thereby with increased force, and also for the reason that the helix itself forms a stop which limits the movement of the magnet and keeps it within reach of the influence of the currents.

Any permanently magnetized bar may, however, be

employed instead of the curved bar, and, when suspended at the side of the helix so that one pole shall be near it, will be alternately attracted and repelled as the current is sent in one direction or the other.

The drawing illustrates the practical application of the apparatus to a hotel indicator; *m* being a signal attached to the magnet or pivot, so as to move when the latter moves; and *w* being the face of the box or case through which, by means of suitable aperture, *v*, the signal may be seen.

If desired the bent arms of the magnet may be weighted, or suitable springs can be applied to the rod that connects the magnet to the signal, so that when no current passes through the coil the signal will automatically assume the vertical intermediate position shown in dotted lines at *s s* in fig. 2.

Similar springs or weights might, if preferred, be employed instead of the reversed electric current, for the purpose of reversing the position of the magnet and signal.

I have referred to the helix as being fixed and the magnet as being movable, but if the magnet was fixed and the helix movable I regard it as the mechanical equivalent thereof and as equally embraced in my invention.

I am aware that for the purpose of philosophical experiments movable permanent magnets have been brought into connection with fixed coils in the manner herein described, so that by reversing the current one of them might be caused to swing in one direction or the other, but I am not aware that any application of this principle has ever been made to the arts. I do not claim the principle, but

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of a movable permanent magnet and a fixed coil, arranged and operating as described, with a slotted or perforated plate or case, *w*, and a movable signal, *m*, as shown, whereby the reversal of a single current is caused to reverse the position of the signal with relation to the apertures *v* in the plate or case, substantially as set forth and for the purpose specified.

AUGUSTUS HAHL.

Witnesses:

L. HILL,

JOHN S. FOWLER.