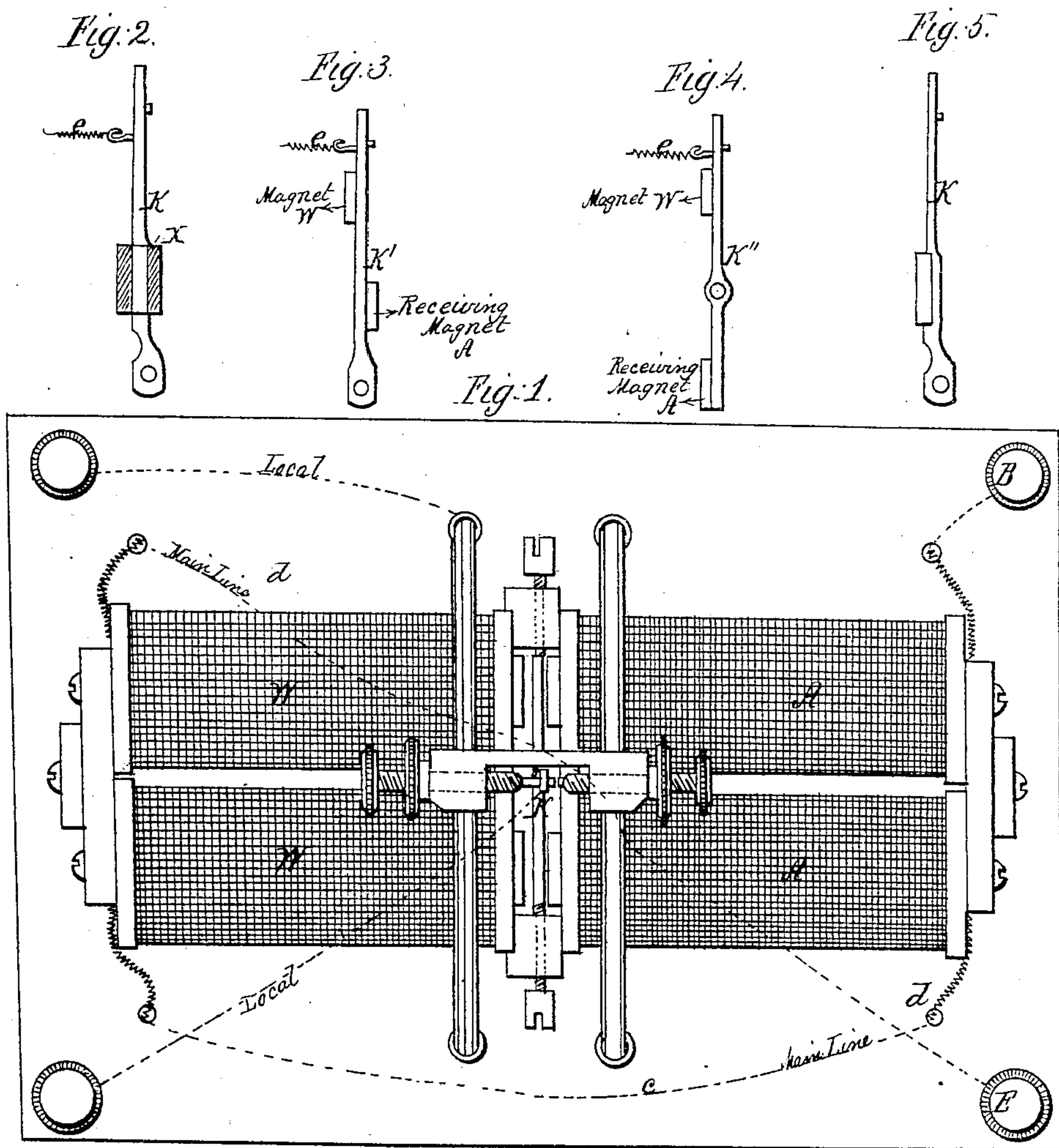


W. G. BROWNSON.
RELAY MAGNET.

No. 67,160.

Patented July 30, 1867.



Witnesses;
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WALTER G. BROWNSON, OF WELLSVILLE, OHIO.

Letters Patent No. 67,160, dated July 30, 1867.

IMPROVEMENT IN RELAY MAGNETS.

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, WALTER G. BROWNSON, of Wellsville, in the county of Columbiana, and State of Ohio, have invented a new and improved Self-Adjusting Telegraphic Relay Instrument; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a top or plan view of the instrument.

Figure 2, a vertical sectional view of an improved "armature" for the same.

Figures 3 and 4, side elevations of forms or arrangements of armatures; and

Figure 5, a section of the ordinary armature.

By means of this my invention I render the freedom of action or sensitiveness of the armature and lever of the relay instrument or "receiving magnet" in a telegraphic apparatus dependent upon the force of the electric current in the main line of the circuit alone, so that the relation of the two shall be constant and uniform, a weakness in the current increasing the sensitiveness of the armature lever in closing the local circuit, and *vice versa*.

The nature of my invention consists in counterbalancing the attraction of the receiving magnet upon the armature, to close the local circuit either by means of a second magnet, excited by the same electrical current as the first, and so placed in relation to the armature as to attract the same in a direction opposite to that of the receiving magnet, or by placing the same between the poles of the receiving magnet itself. The armature-lever which opens and closes the local circuit is thus balanced upon its pivot between the attractive forces of the two magnets, or of the two poles of a single magnet, and by placing the armature nearer one of the poles, or nearer the receiving magnet than to the other, or by employing magnets of different power, the armature-lever may be adjusted to the very nicest degree of sensitiveness, and when so adjusted in the instrument will thereafter uniformly maintain its adjustment, whatever may be the degree of intensity in the electric current of the main line, from the fact that this same current influences alike both points of attraction between which the armature-lever is adjusted.

In the accompanying drawings I have illustrated my improved "relay," as constructed with a pair of electro-magnets of equal size and magnetic power, A and W, arranged opposite to each other on a suitable support. Between the two is placed an armature-lever, K, figs. 1 and 5, such as is commonly used in such instruments, and which is pivoted and provided with battery connections to open and close a local circuit in the usual manner. The primary adjustment of this armature-lever is obtained by placing it more or less near to the receiving magnet A, as in the ordinary forms of "relays," its distance from the second magnet W being made so much greater than from said receiving magnet A, as to give to the former the exact degree of superior attractive power. The automatic disconnection of the local circuit is insured when the armature is uninfluenced by a current from the main line by means of a spring, *e*, figs. 2 and 3, or by so balancing the armature-lever on its pivot as that the superior gravity of one side thereof shall cause it to fall back of its own weight against the insulated point *s*, fig. 1, when not attracted by the operation of the main-line current. The main current of the line entering at post B, and passing through the receiving magnet A, is carried by a suitable connecting wire, indicated by dotted lines *c*, under the instrument to the second magnet W, and, passing through the same, is returned by a second connecting wire, *d*, to the post E. The current of electricity excites both magnets with equal force, so that the attractive power of both is uniformly the same. If, then, the current in the main line be weakened by any disturbing causes, rendering it necessary that the armature-lever K should vibrate more freely, the counter-attraction of the second magnet W upon said lever K, which controls its vibration, is weakened in a corresponding degree, allowing the needed freedom of vibration. The adjustment of the armature is thus perfectly automatic, and constantly accommodates itself to the force of the electric current in the main line. Instead of placing the armature between opposite magnets, I contemplate placing it between the opposite poles of a single magnet, excited by the main-line current, obtaining its operation by approaching it more nearly to the one pole than to the other. I contemplate, also, using double armatures with the lever K, as illustrated by the sectional fig. 2, as a substitute for the single armature shown in fig. 5, separating the two faces by a strip of wood, gutta percha, brass, or other material, *x*, not attractive to magnetic influence. Although

I prefer to use magnets, A W, of nearly equal power in constructing my instruments, still, magnets differing in power may be used by properly adjusting the distance of each from the armature, and, consequently, their attractive influence thereon. In some cases it may be preferable to make the adjusting magnet W much smaller than the receiving magnet A. In such cases, in order to render the instrument compact, I prefer to place the adjusting magnet W nearer the upper end of the armature-lever than to increase its distance from the receiving magnet A, using an armature-lever, K', arranged, as illustrated in fig. 3, with the armature-plates on opposite sides thereof at proper distances apart. In another form of my "relay" I place both magnets side by side, or above one another, and use an armature-lever, K'', vibrating upon an axis pivoted between the armature-plates thereon, which are so arranged so to be opposite the magnets, both being on the same side of the lever, however, as illustrated in fig. 4 of the drawings.

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

The use of one or more adjusting or counterbalance magnets W, in combination with the armature-lever K of a telegraphic "relay" instrument, and its receiving magnet or magnets A, when said adjusting magnet or magnets are excited simultaneously with the receiving magnet by the same electrical current, the whole operating substantially in the manner and for the purpose herein set forth.

W. G. BROWNSON.

Witnesses:

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