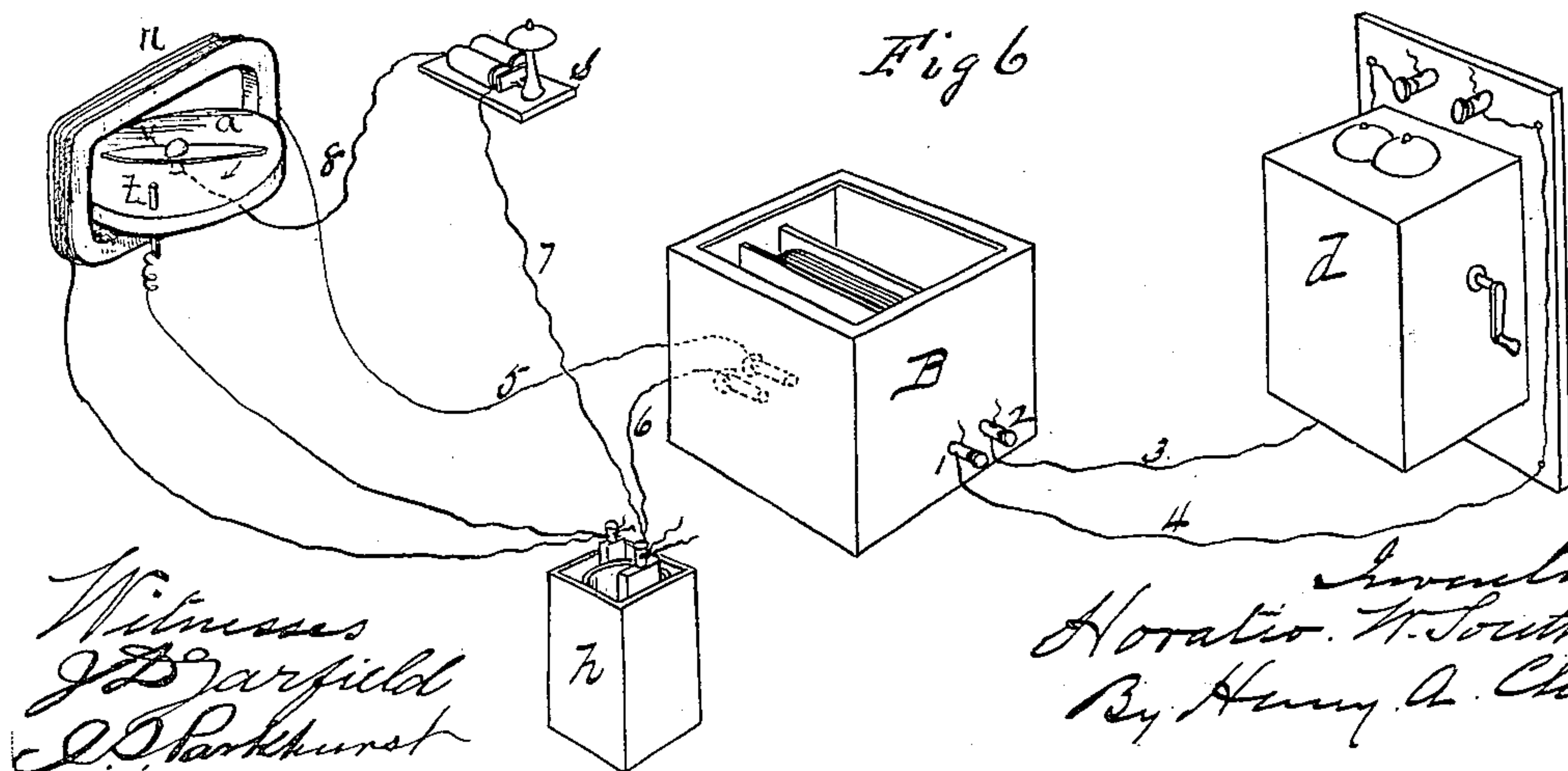
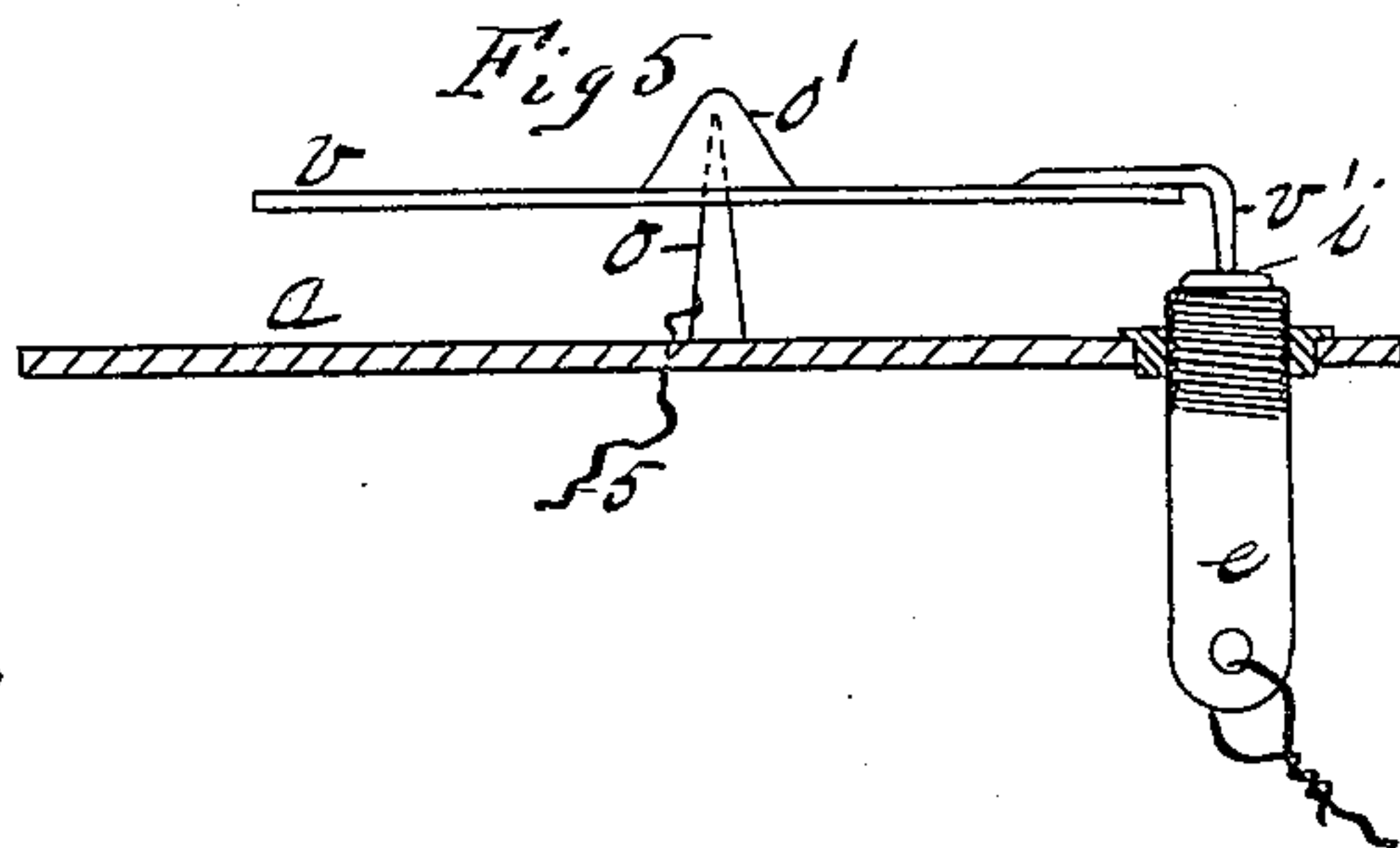
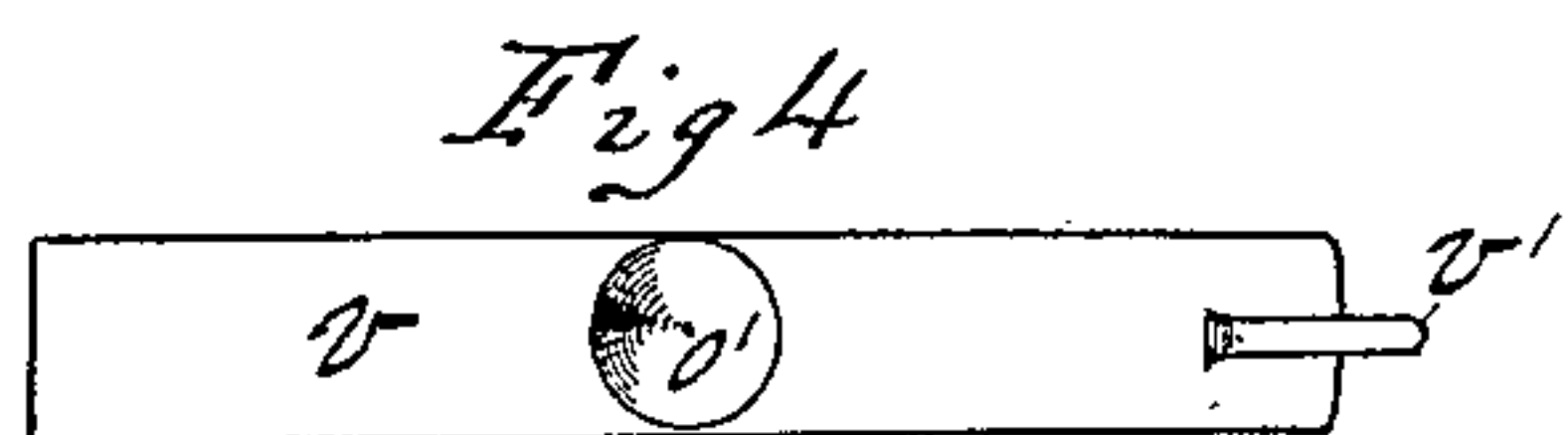
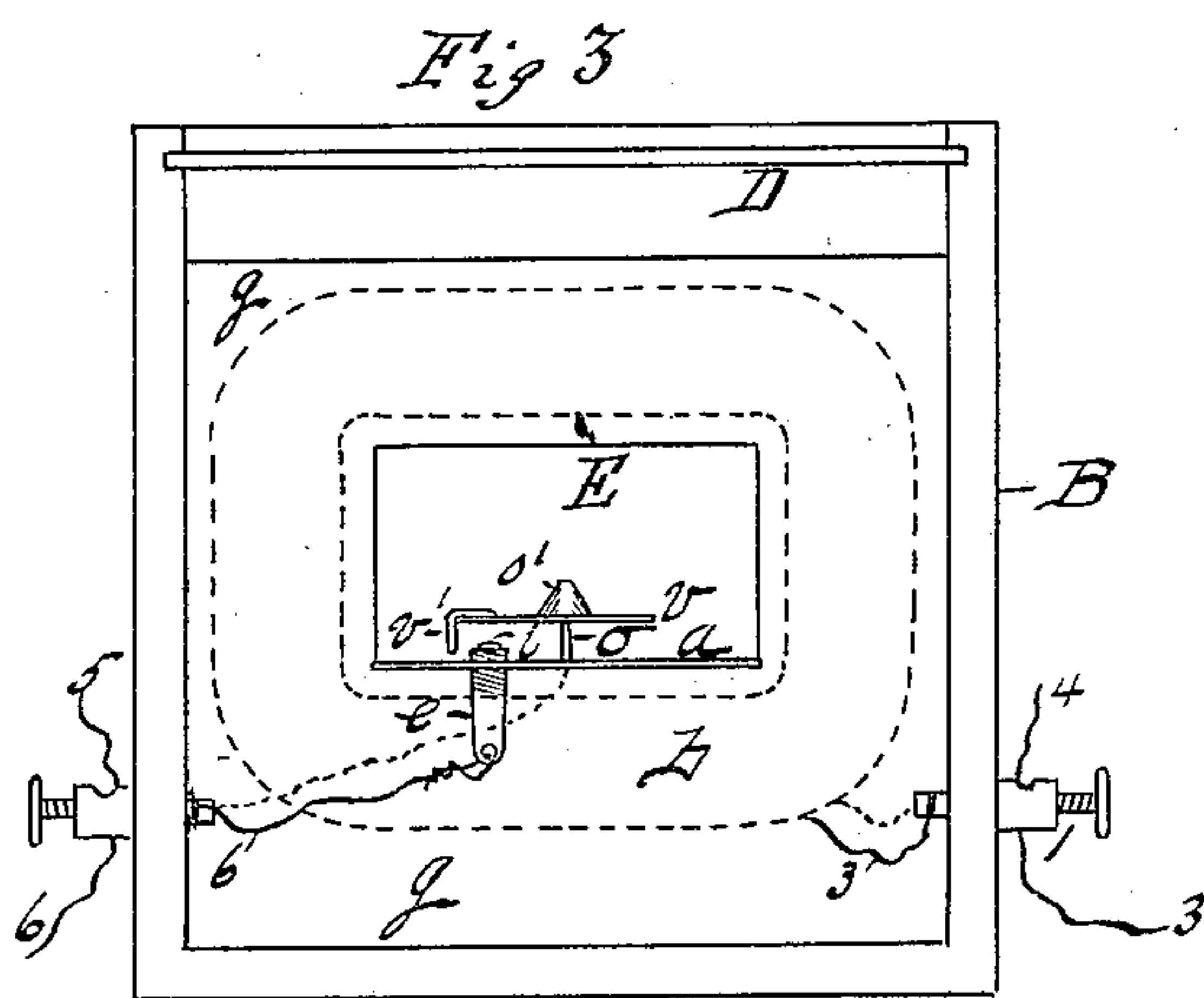
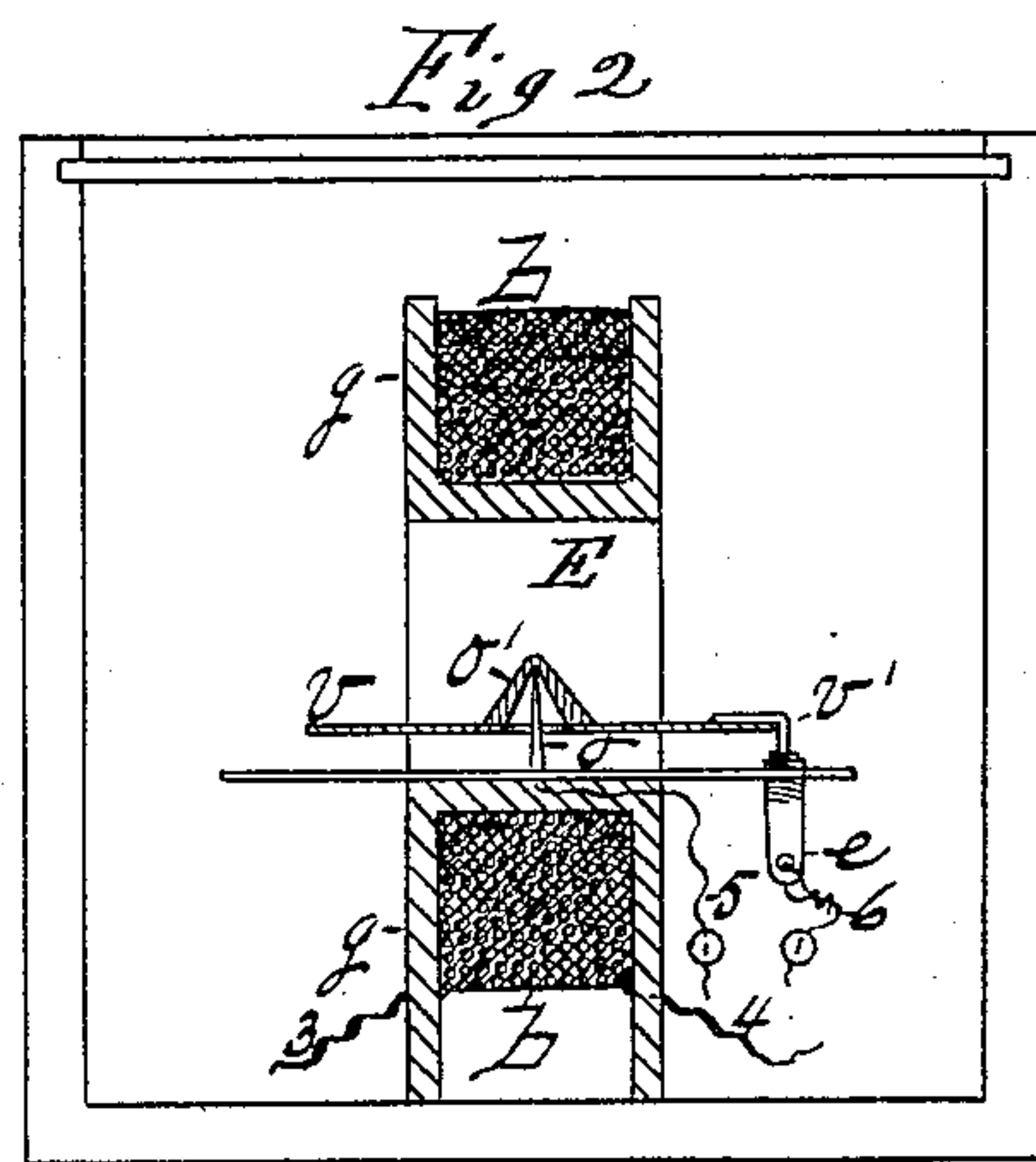
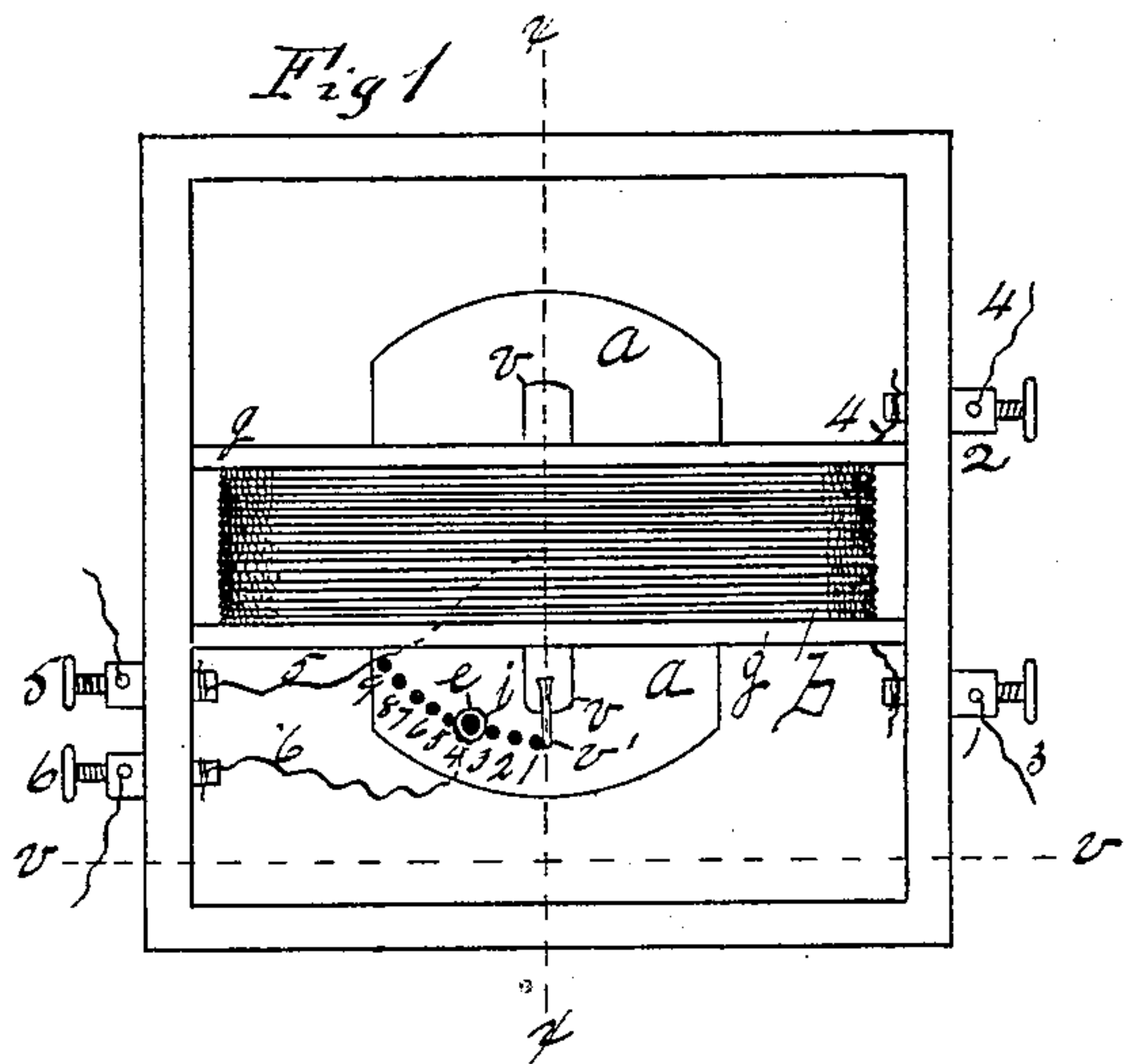


(Model.)

H. W. SOUTHWORTH.
ELECTRIC SIGNALING APPARATUS.

No. 262,252.

Patented Aug. 8, 1882.



Witnesses
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HORATIO W. SOUTHWORTH, OF SPRINGFIELD, MASSACHUSETTS.

ELECTRIC SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 262,252, dated August 8, 1882.

Application filed July 28, 1881. (Model.)

To all whom it may concern:

Be it known that I, HORATIO W. SOUTHWORTH, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Electric Signaling Apparatus, of which the following is a specification.

This invention relates to apparatus for transmitting electric signals, the object being to enable the operator to so control the electric currents which he may send over a line-wire with which one or a series of call-boxes may be connected that he can cause any particular alarm-bell on the line to be rung without exciting the others to action.

In the drawings forming part of this specification, Figure 1 is a plan view of an electrical signal-box constructed according to my invention. Fig. 2 is a transverse section of the same through the line *x x*, Fig. 1. Fig. 3 is a section through the line *v v*, Fig. 1, the outline of a coil of wires being shown in dotted lines thereon. Fig. 4 is a plan view of a magnetic needle used in this apparatus. Fig. 5 is a side elevation of said needle, the post upon which it swings, a mercury-cup, and the dial-plate in section. Fig. 6 represents the manner of connecting this apparatus with a magneto-box, a battery, and an alarm-bell.

In the drawings, B is a box inclosing the apparatus.

g is a rectangular-shaped bobbin, of wood or other insulating material, and having a rectangular opening, E, Figs. 2 and 3, through it.

b is a coil of wires wound on bobbin *g* and surrounding the opening E therein, the ends 3 and 4 of the wire wound on said bobbin being connected to the screw-posts 1 and 2 in the side of box B. Said bobbin is secured on its edge in said box, as in Fig. 2, and a dial-table, *a*, is secured on the lower side of and within the opening E in said bobbin. A metallic post, *o*, pointed on its upper end, is set centrally in said plate or table *a*, to which a connecting-wire, 5, attached to the screw-post 5 in box B, is secured.

A magnetic needle, *v*, (shown in enlarged form in Figs. 4 and 5,) and having a centrally-located hollow conical cap, *o'*, on it, is suspended on the point of the post *o*, and has a

downhanging platinum point, *v'*, attached to one end thereof, and thus suspended said needle may vibrate horizontally over the face of said table *a*. In a radial line on said table *a* is formed a series of spots, opposite numbers from 1 to 9, as in Fig. 1, and in each table of each box is set a mercury-cup, *e*, opposite the figure on the table which designates or corresponds to the number of the box, each box on a line having a different number, and said mercury-cup has a wire-connection with post 6 in box B. A drop of mercury, *i*, is placed in a cavity in the upper end of the cup *e*.

The above-described elements of said apparatus are inclosed in box B, and a glass cover, D, placed thereon to permit of observing the movements of needle *v* when the machine is being operated. Wires 3 4, Fig. 6, connect the magneto-box *d* with coil *b* in box B, through posts 1 2; but it is obvious that a battery may be substituted for said box *d*. The box B, when set for use, is arranged so that the needle *v* will point north and south on a line across the table *a*, (represented by the line *x x*, Fig. 1.) The wires 5 and 6, through screw-posts of like numbers in box B, are connected, as aforesaid, to the needle-post *o* and to the mercury-cup *e*, and the said wires, outside of said box, are connected to the two poles of a local battery, *h*, and have an alarm-bell, *s*, in their circuit. All the needles of the various call-boxes in a circuit included in the lines 3 4 are made alike, and all are surrounded by the coils *b*, identically alike; but the mercury-cups are differently set.

The operation of my improvements is as follows: Upon turning the crank of the magneto-box *d* a current is created which circulates through the coil *b*. Said current circulating in said coil deflects the magnetic needle *v* and causes it to swing over the dial-table *a*, and when the platinum point *v'* comes in contact with the mercury drop *i* in the metallic cup *e* a connection will be made between the poles of the local battery *h*, and bell *s* will ring. Since all the needles *v* and coils *b* connected in a circuit are identical, it is obvious that the operator at the calling-station can tell from the position of the needle in his own box what is the position of all the other needles on the circuit as he sends the current through

coils *b*. Therefore to make the needle in some other box swing its platinum point to a mercury-cup standing, say, at figure 2 in table *a*, so as to call that box, he has only to cause his own needle to point to that number by either turning the crank of the magneto-generator *d* at a proper speed, or by interposing in a battery, if one be connected, instead of box *d*, proper resistances. As soon as his needle stands at figure 2 all the needles of the circuit will soon follow, and the box having a mercury-cup set at figure 2 will cause its alarm-bell to ring, as above described, while all the other bells in the circuit will remain silent. As soon as the operator interrupts the current just now passing through coils *b* of the boxes all the needles simultaneously swing back to zero, and are ready to be worked again.

When it may be desirable to avoid slight strokes of the local bell *s*, produced by the swinging of the needle past the end of cup *e* to a point beyond and slightly touching as it passes, the arrangement illustrated in Fig. 6 is adopted. The current of the local battery, instead of going directly to the alarm-bell *s*, circulates through a similar galvano-coil, *n*, to coil *b*, only much smaller and simpler, and a brass pin, *t*, standing in table *a*, takes the place of cup *e*, touching which the needle *v* therein makes connections with the bell. The needle of this second galvano-coil is very heavy and slow, so that during the short time that the needle in box *B* may be in connection in swinging over the cup *e*, or during unintentional os-

cillations, the current will not suffice to at once swing said heavy needle so as to make a local-battery connection with the bell. By said arrangement, as in Fig. 6, the local current is divided into two branches, one running around the second coil and the other to the alarm-bell *s*. As soon as the circuit made by the unison of the platinum point *v'* and the mercury *i* in cup *e* is interrupted the needle of the coil in box *n* swings back to zero, and the bell will cease ringing.

What I claim as my invention is—

1. The combination of a series of instruments in a circuit, each having an electric signaling apparatus, magnetic needle *v*, coil *b*, and contact-point or mercury-cup *e*, the cups being set in different positions in the different instruments, and means, substantially as described, for sending an electric current through all of said coils simultaneously, substantially as set forth.

2. In combination with a device for sending an electrical current, a series of instruments in a circuit, each having a coil, needle *i*, mercury-cup *e*, the cups being set in different positions in the different instruments, and a battery, *h*, connected with said needle and cup, and the alarm-bell *s* in circuit with the needle, cup, and battery, substantially as set forth.

HORATIO W. SOUTHWORTH.

Witnesses:

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