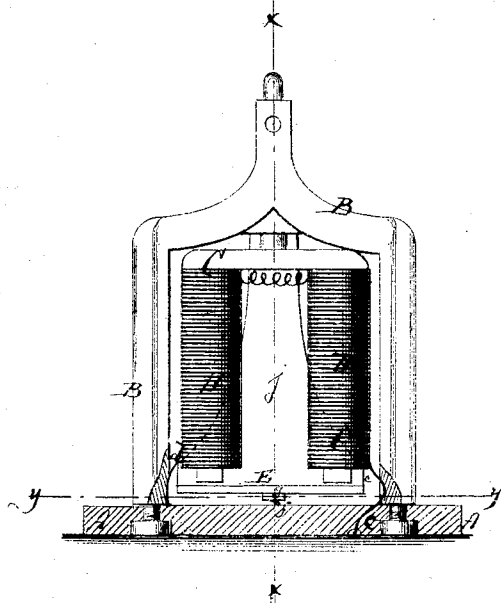


L.L. Duerden. Electric Instr. &c.

117268 *Fig. 1.*



PATENTED JUL 25 1871

Fig. 2.

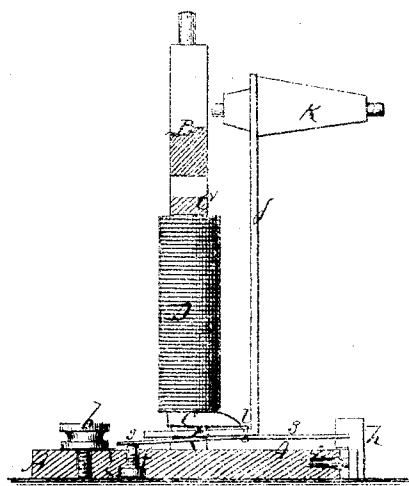


Fig. 3.

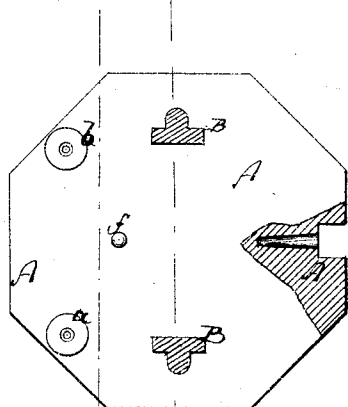
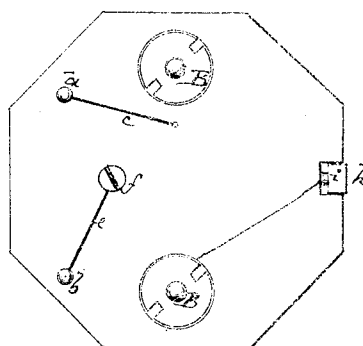


Fig. 4.



WITNESSES:
John Becker
Wm. H. C. Smith.

INVENTOR
L. L. Duerden.

per *Wm. H. C. Smith*
Attorneys.

UNITED STATES PATENT OFFICE.

LAWRENCE L. DUERDEN, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN ELECTRO-MAGNETIC INSTRUMENTS.

Specification forming part of Letters Patent No. 117,268, dated July 25, 1871.

To all whom it may concern:

Be it known that I, LAWRENCE L. DUERDEN, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Electrical Instrument; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 represents a front elevation, partly in section, of my improved electrical instrument. Fig. 2 is a vertical transverse section of the same taken on the plane of the line *x x*, Fig. 1. Fig. 3 is a horizontal section of the same taken on the plane of the line *y y*, Fig. 1. Fig. 4 is an inverted plan view of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to a new electrical apparatus of very simple construction, which can be used as a toy or for the instruction of children, but also as a sounding or telegraph instrument. My invention consists in improving electric instruments, as hereinafter fully described and then clearly pointed out in the claims.

A in the drawing represents the bed-plate or bottom of the instrument. To it are secured the binding-cups *a b* for receiving the wires from the battery. B is the pillar projecting from the bed A for holding the horseshoe-magnet C, around the arms of which the wire D is coiled. I prefer to make the pillar forked at its lower end, so that the horseshoe will be between its standards, as shown. A wire, *c*, leads from the cup *a* to one standard of the pillar B, thence to the coil D, and finally from the coil to the other standard of the pillar, as at *d*. The cup *b* connects by a wire, *e*, with a pin, *f*, which passes through the bed A.

E is the armature held against the poles of the horseshoe. It is secured upon a spring, *g*, which projects backwardly from the armature. A block, *h*, at the rear end of the spring, carries a conical projecting pin, *i*, which enters a socket in the bed A, constituting the support of the armature. An arm, *j*, projects upwardly from the armature, and has a hammer, *k*, at its upper end. The spring *g* rests with its forward portion on the pin *f*, and serves, therefore, to conduct the current from the wire *c* and pin *f* to the armature and magnet.

The armature will vibrate without interruption when the cups *a b* are connected with the battery. When, instead of to the cup *b*, one wire of the battery is secured to the pillar and the current of electricity alternately broken and established, the armature will be made to vibrate or strike at desired intervals to use its hammer as a sounder or for telegraphic purposes in the well-known manner.

The armature in its motion swings or rather tilts on its point *l* of contact with the feet or surface of the magnet, and has no lateral pivot, as heretofore. The friction of and on said pivots is thereby avoided, and as good a motion obtained by the flexibility of the spring.

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

1. The arrangement of pin *i*, block *h*, spring *g*, pin *f*, arm *j*, and hammer K in the electric instrument, as and for the purpose specified.

2. The pillar B, bifurcated and arranged upon the bed-plate to hold the magnet between its forks, as described.

LAWRENCE L. DUERDEN.

Witnesses:

GEO. W. MABEE,
ALEX. F. ROBERTS.