

W. L. VOELKER.

TELEPHONE.

No. 315,862.

Patented Apr. 14, 1885.

Fig. 1.

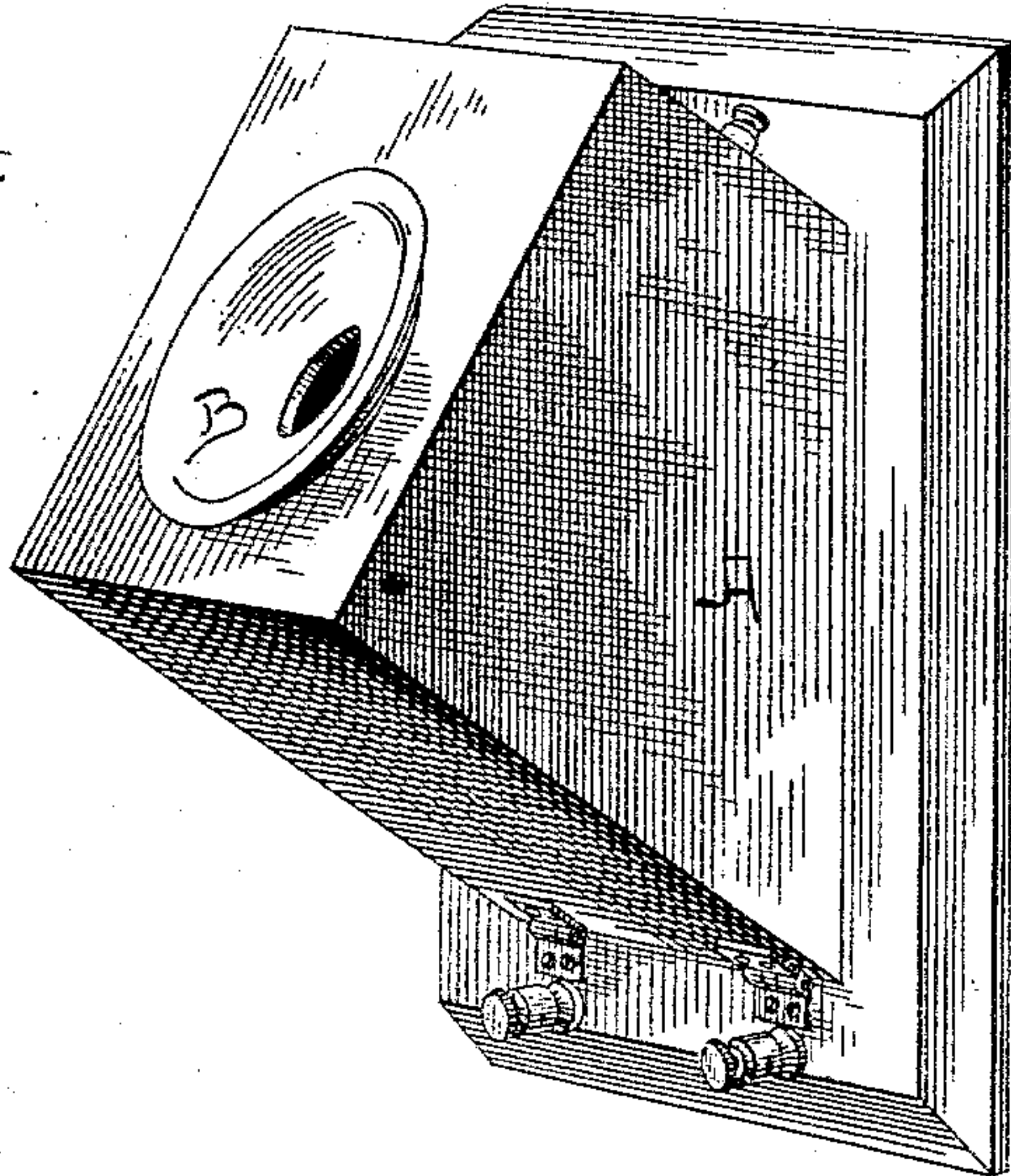


Fig. 2.

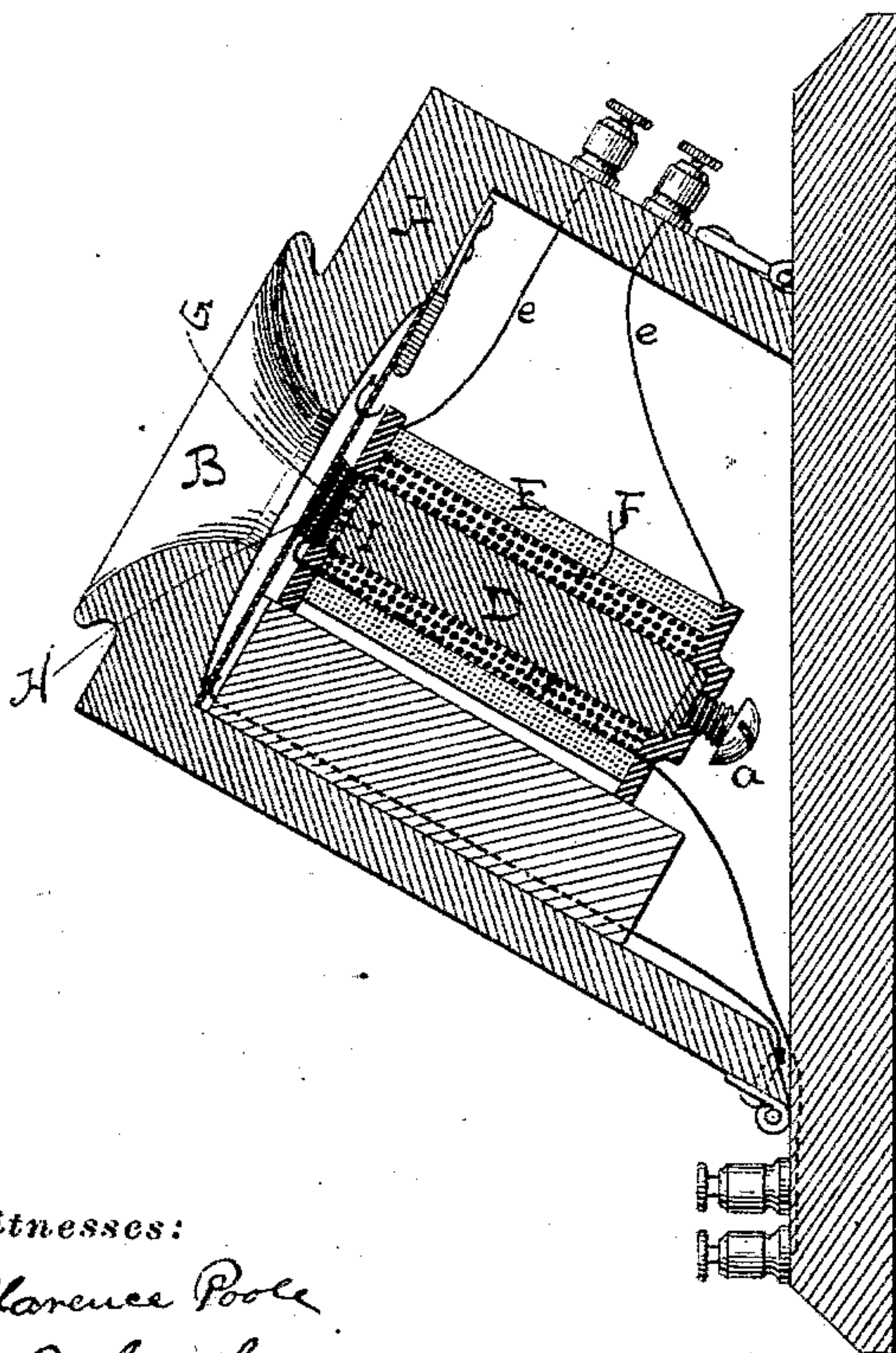
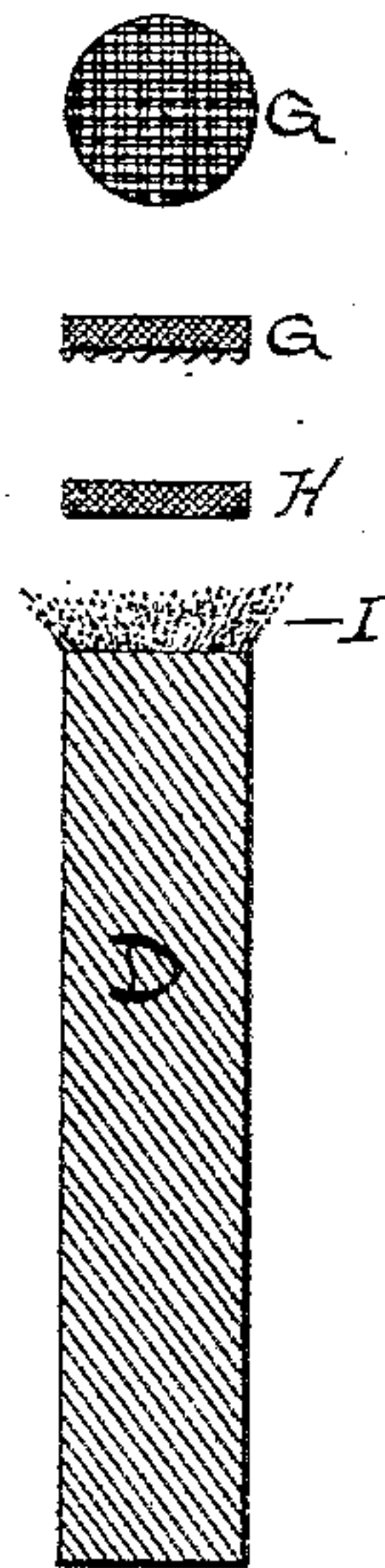


Fig. 3.



Witnesses:

Clarence Poole  
A. B. Smith

Inventor:

William L. Voelker  
By his atty R. D. Smith

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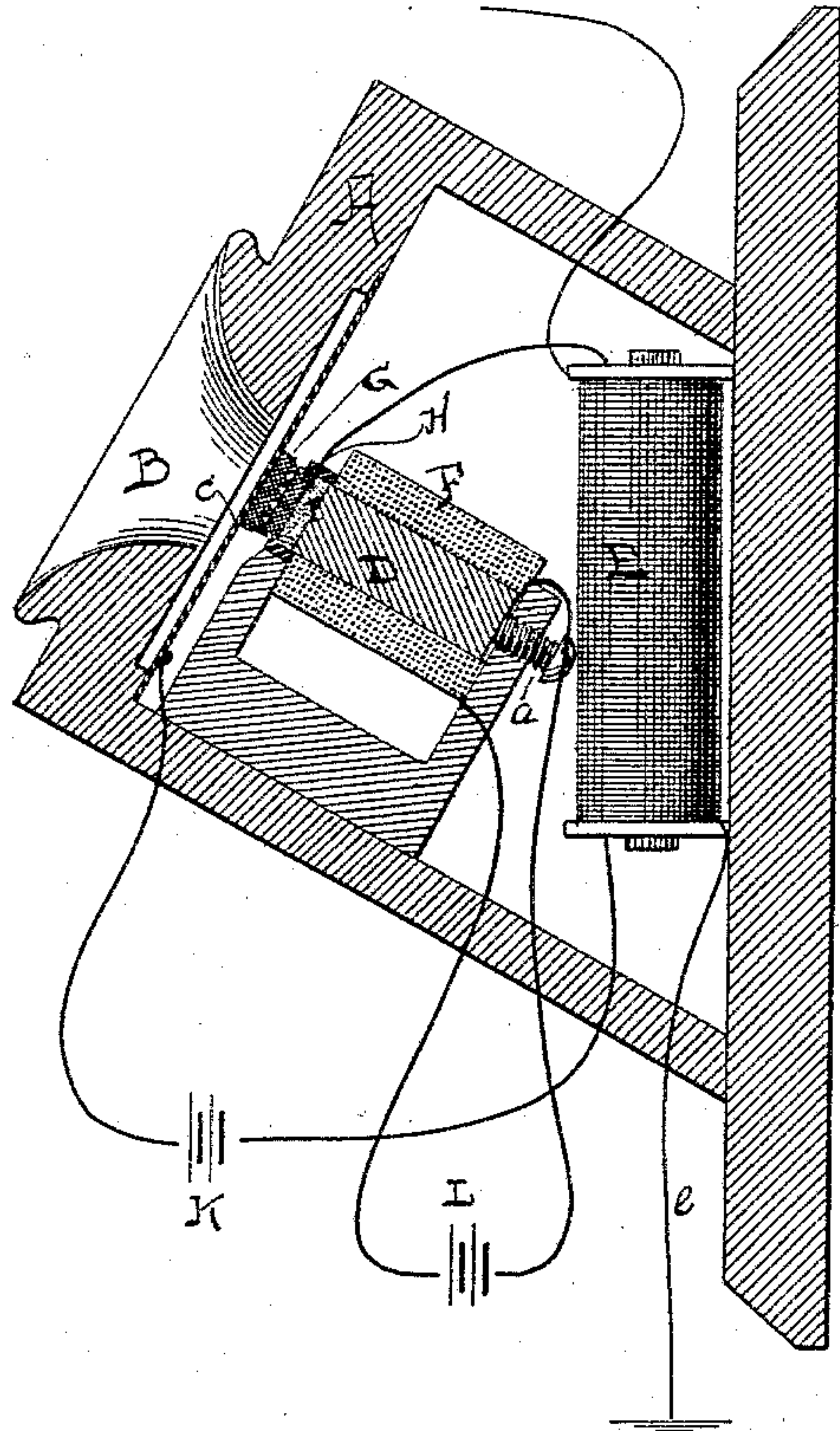
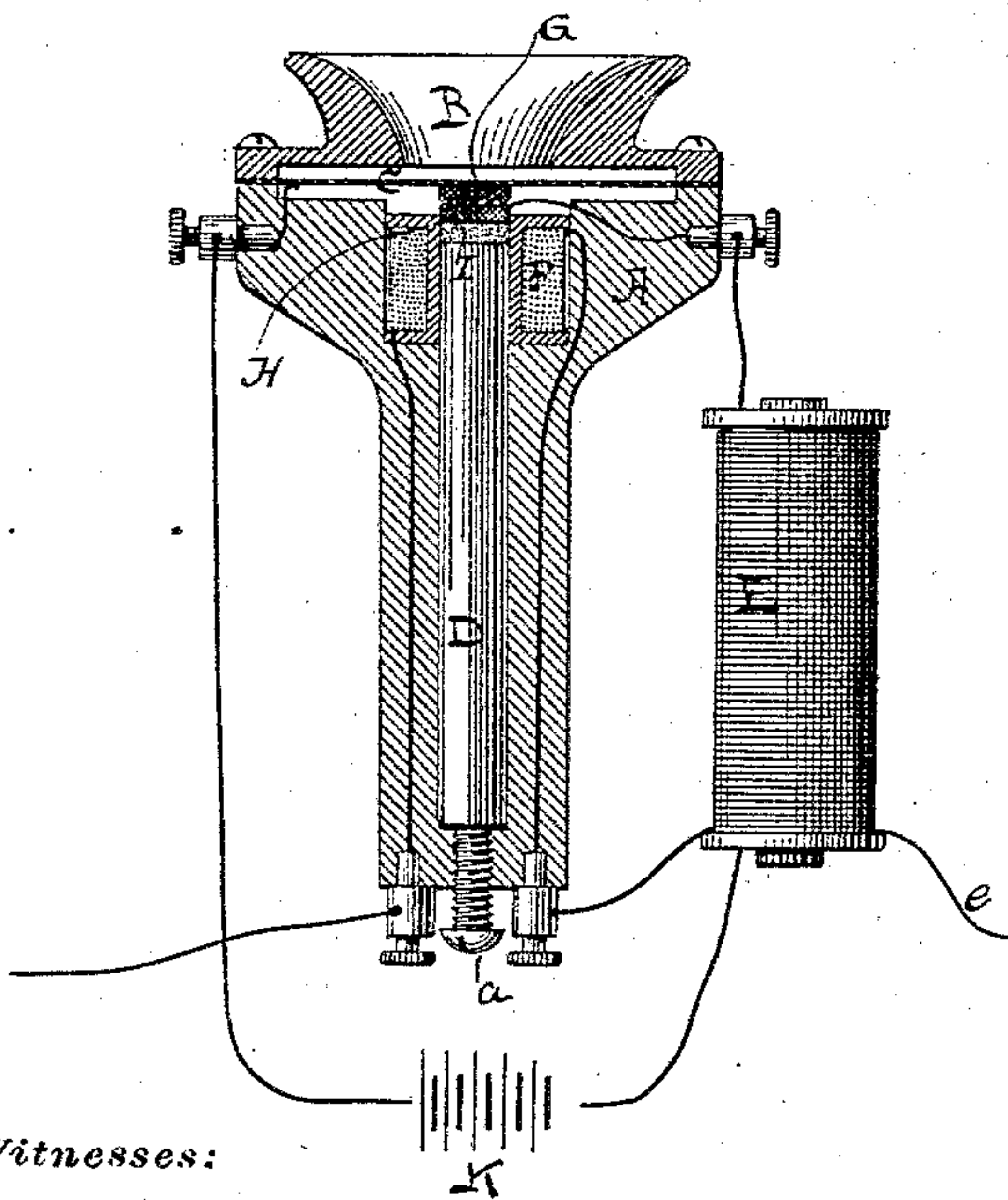


Fig. 4.

Fig. 5.



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# UNITED STATES PATENT OFFICE.

WILLIAM L. VOELKER, OF MORTON, PENNSYLVANIA, ASSIGNOR TO JOHN H. IRWIN, OF SAME PLACE.

## TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 315,862, dated April 14, 1885.

Application filed December 6, 1879.

*To all whom it may concern:*

Be it known that I, WILLIAM L. VOELKER, of Morton, in the county of Delaware, State of Pennsylvania, have invented new and useful Improvements in Telephones; and I do hereby declare that the following is a full and exact description of the same.

The conditions under which an electric current is enabled to take cognizance of delicate vibrations produced by the impact of sound-waves, and, by means of a proper receiver, reproduce said vibrations and sound-waves, are at present understood to be comprised under several classes having different modes of action, though productive of analogous results. These classes have been recognized by the Patent Office by the grant of Letters Patent.

In this invention the telephonic effect is the result of an adjustment of contact, at present impossible of tangible expression, and only to be attained by experiment. It can only be maintained in effective condition by an elastic connection which shall render the contact self-adjusting under the varying conditions of temperature, &c., to which such an instrument is ordinarily exposed.

My invention relates, principally, to electrodes which are supported by an elastic cushion of finely-divided iron or other material capable of magnetism, maintained in effective condition by the attractions and repulsions of its particles when in a magnetized condition.

Other minor points of structure will be pointed out in the specification.

That others may more fully understand my invention, I will particularly describe it, having reference to the accompanying drawings, wherein—

Figure 1 is a perspective view of my apparatus arranged in a convenient form as a transmitter. Fig. 2 is a longitudinal section of the same. Fig. 3 shows in detached section the magnetic core, the magnetic cushion, and the carbon disks. Fig. 4 is a longitudinal section showing the interior sectional arrangement with detached induction-coil; and Fig. 5 shows, in longitudinal section, the instrument arranged in portable form.

As in other electrical telephones, the transmitter is short-circuited with a local battery,

and a secondary or induced current traverses the line; and I also prefer to employ an electro-magnet, instead of a permanent magnet, to maintain the magnetism of my metallic cushion.

A is the surrounding frame-work of my telephone, which may be of such form as fits it particularly for stationary or portable use, substantially as shown in the figures.

B is the ordinary mouth-piece, and C is the metallic diaphragm now ordinarily used.

D is a magnet which may be permanent or temporary, but I prefer it to be temporary.

E is an induction-coil which may be wound over the primary F of the electro-magnet core D, as shown in Fig. 2, or it may be separate and detached therefrom, as shown in Figs. 4 and 5. The magnet D is longitudinally adjustable by means of a set-up screw, *a*, or other suitable device, as usual. These general features are not essentially different from those in ordinary use in telephones.

The first peculiarity of my telephone is the solid electrode G, made of hard carbon, which is now recognized as having a peculiar power of resistance to adapt it to purposes of a telephonic electrode. This electrode G is in contact with the diaphragm, and the opposite electrode, H, rests upon a mass, I, of iron filings or other metal capable of magnetism, and in a finely-divided condition, and this mass I rests in turn upon the top of the magnet D. Excited by the magnetism of the magnet D, each of these metallic particles becomes itself a true magnet, and they arrange themselves strictly in accordance with their polarity, attracting or repelling each other, and forcibly resisting any compacting force with a force equal to the resultant of the magnetic forces of the several particles, and form a fibrous magnetic cushion with elasticity of exceeding delicacy.

The circuits are as follows: Battery K takes in a short circuit the electrodes of the transmitter and the primary of the induction-coil E. The secondary wire *e* from said induction-coil forms the line-wire, as shown in Figs. 4 and 5, but in Fig. 5 the line-wire also includes the coils of the magnet D. The battery L energizes the temporary magnet D, as shown

in Fig. 4. When, as shown in Fig. 2, the temporary magnet D also bears the secondary coil E, one battery suffices.

5 In Fig. 3 of the drawings two views of an electrode are designated by the letter G, which electrode has its contact-face scored in lines crossing each other at right angles. I disclaim, however, the invention of this particular construction of electrodes.

10 Having described my invention, what I claim as new is—

A fibrous magnetic cushion composed of magnetized metallic particles to support one of the electrodes of a telephone, substantially as set forth.

WILLIAM L. VOELKER.

Witnesses:

J. H. IRWIN,  
F. A. WAIT.