

(No Model.)

V. W. BLANCHARD.

ELECTRO MAGNET.

No. 267,138.

Patented Nov. 7, 1882.

Fig. 1.

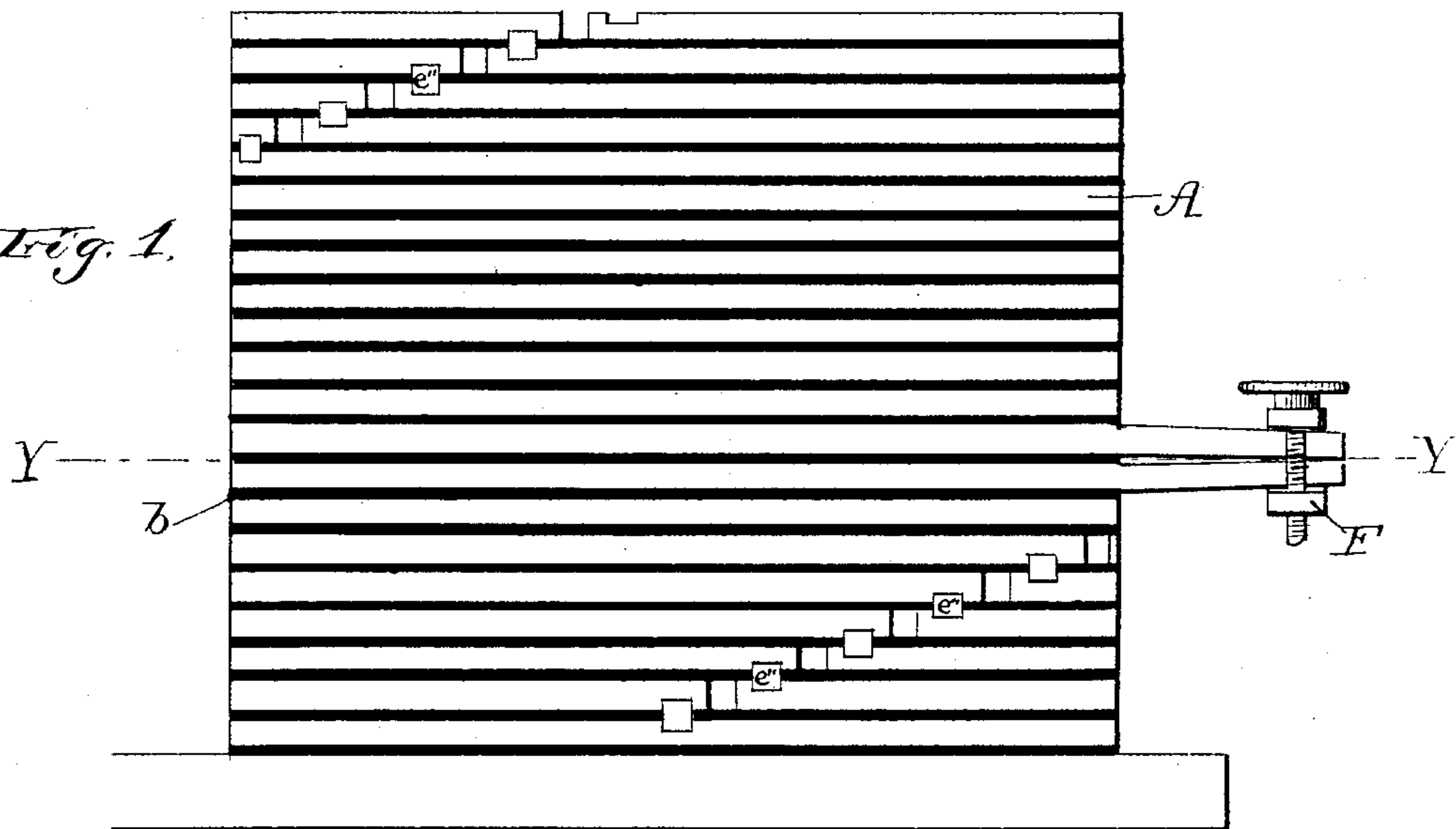


Fig. 2.

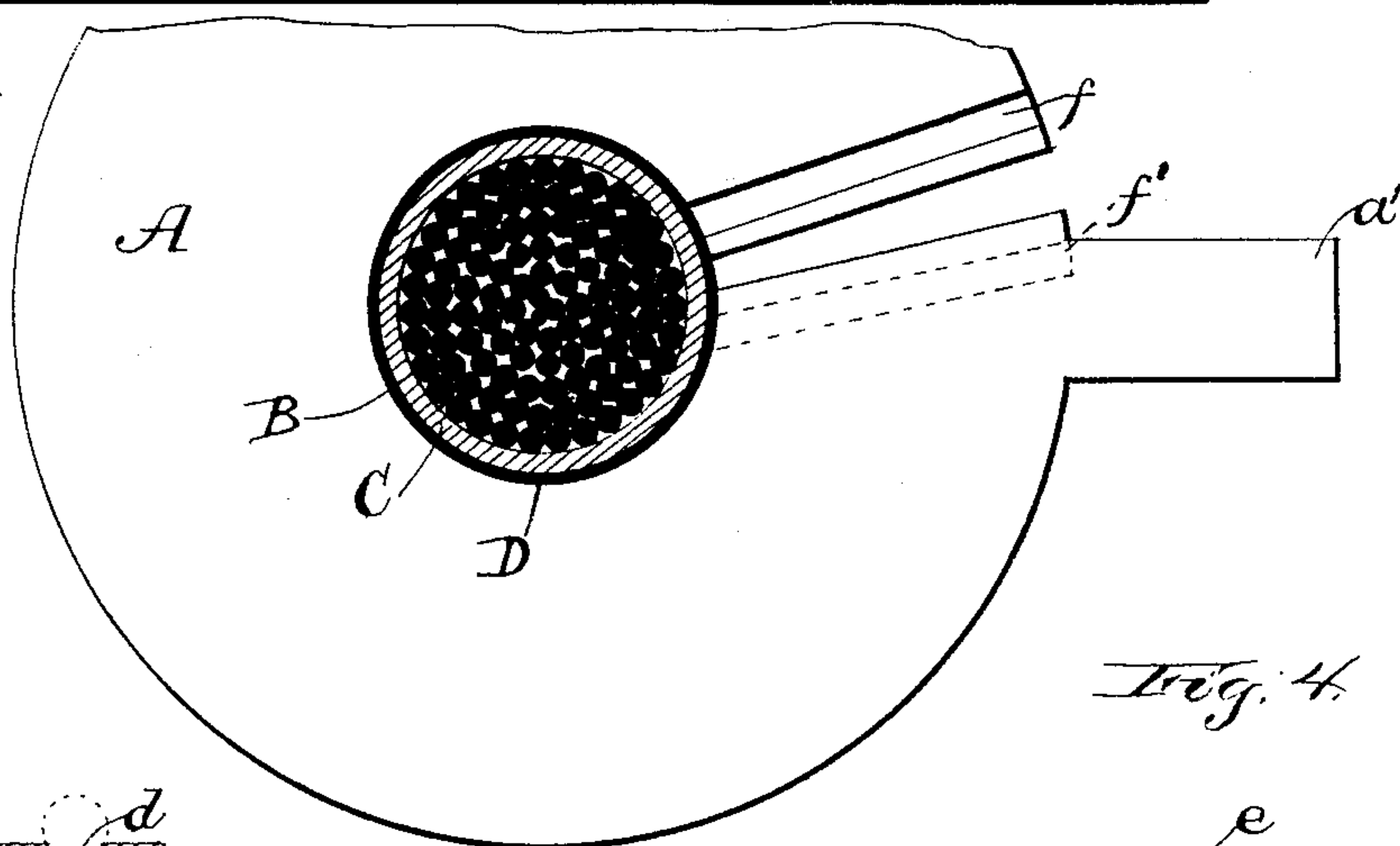


Fig. 3.

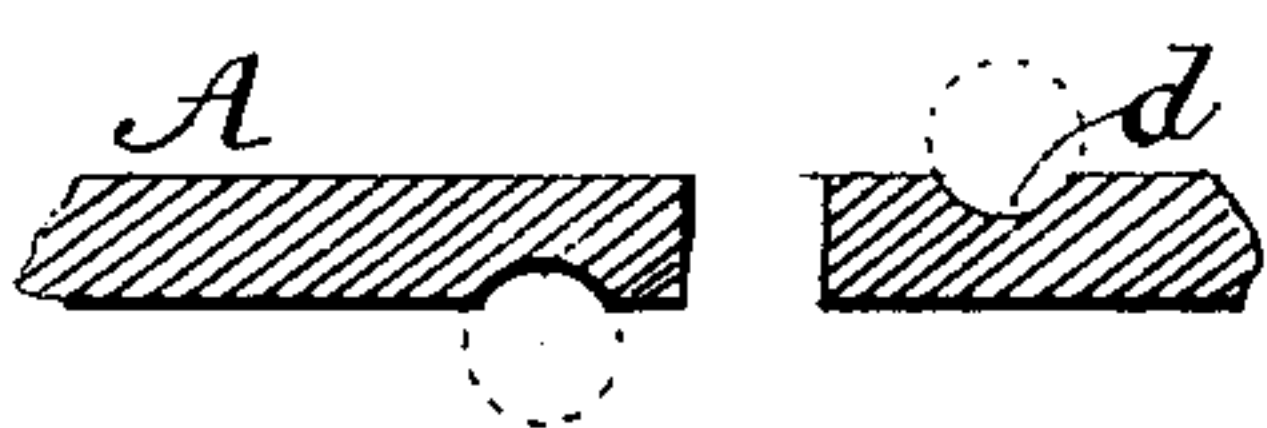


Fig. 4.

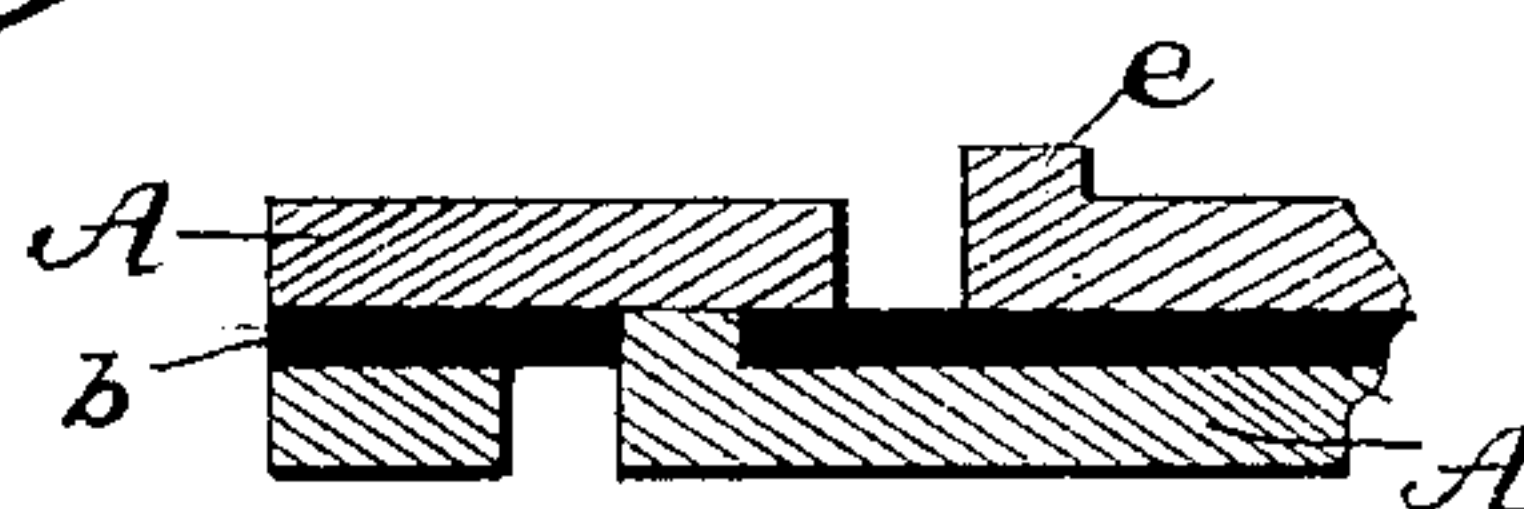


Fig. 5.

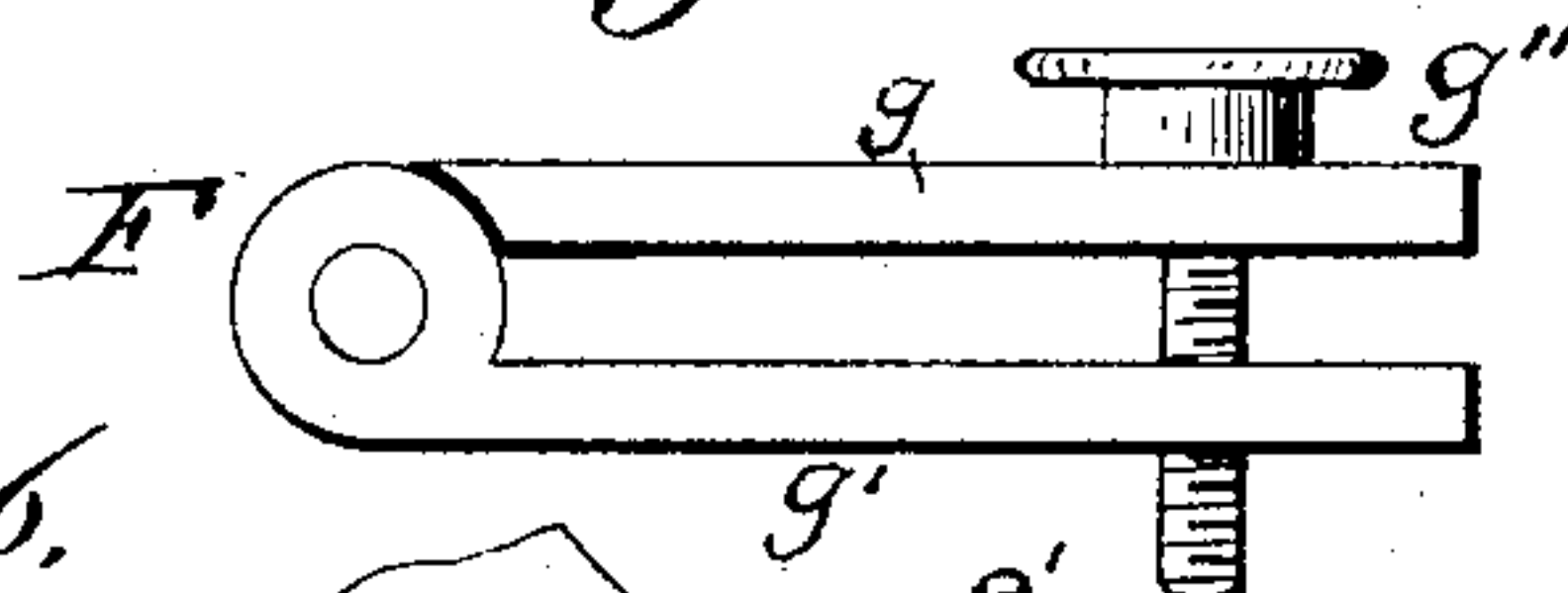
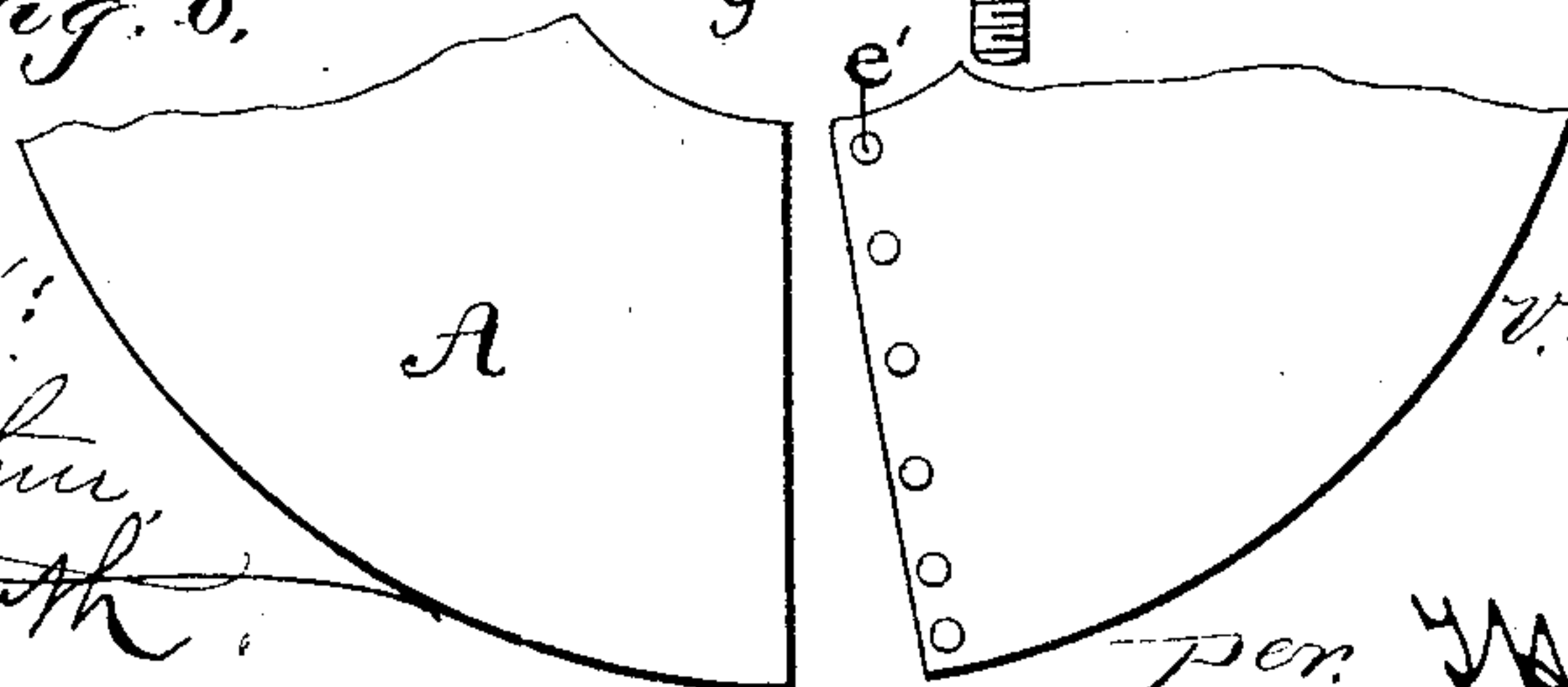


Fig. 6.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## ELECTRO-MAGNET.

SPECIFICATION forming part of Letters Patent No. 267,138, dated November 7, 1882.

Application filed July 31, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, VIRGIL W. BLANCHARD, of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Magnets; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to improvements in "electro-magnets," in the construction and arrangements of which I use copper plates instead of the wire common for that purpose, and by means of the hereinafter-described system of connections and insulation I am enabled to utilize fully the entire surface of the plates and to readily and conveniently employ any desired portion of the magnetic force with the most satisfactory results.

In the accompanying drawings, in which similar letters indicate corresponding parts, Figure 1 shows a portion of the magnet in front elevation. Fig. 2 is a sectional view through the body of the magnet on line Y Y of Fig. 1. Figs. 3, 4, 6 are detail views of modes of connecting the plates; and Fig. 5 is a side elevation of the coupler.

In the drawings, A represents my improved magnet, which is constructed as follows: The core is composed of a bundle of soft-iron wires, C, forced tightly into a soft-iron tube, B, which is insulated from its environment by a layer of asbestos paper, D, or its equivalent. Upon the core so constructed, or constructed of one piece of iron, I place insulated disks of sheet-copper, which may be of any desired thickness, each formed with a central aperture the size of the insulated core, and having a slit extending radially from the central aperture to the edge of the disk. This slit is formed with the cylindrical grooves *d* along its opposite edges on opposite sides of the sheet of metal; or, if preferred, the metal necessarily removed to form the slit may be turned up to form a lip on one side of the slit; or a number of pins may be fixed to one edge of the slit instead of the turned-up lip. To facilitate the use of any desired length of magnet without altering their structure or position, a number of the said copper plates are provided with lugs *a'*, by means

of which and the coupler F, consisting of two strips of metal, *g g'*, hinged at one end and provided with a tightening-screw, *g''*, at the other, any number of sections of one entire magnet may be connected and put into or out of use.

By making the couplers F of varying sizes the internal resistance of the magnet may be increased or diminished in the portions to which they are applied.

Between each two of the metal disks A is placed an insulating-disk, *b*, preferably of asbestos paper, which said insulating-disks are similar in size and slitted as are the disks A. The copper and paper disks alternate along the core, and in order to distribute the weight of pins or strips equally the said connections are arranged in the form of a continuous spiral from end to end of the completed magnet, the object being to break the joints and provide sufficient space between the joints of the plates for the insertion of the pins or plugs *e''* in the grooves *f f'*, the plates being so placed on the core that the groove on the upper side of one plate, the opening in the insulating-disk, and the groove in the lower side of the next copper plate will register. In case the disk A has the lip *e* formed at the edge of the slit, the lip will take the place of the plugs and touch the under side of the upper copper disk, the insulating-disk being appropriately placed, thereby forming the desired connection, and, if desired, strips of insulating material may be inserted to fill the radial slits in the plates when used without separate connecting-pins.

A current entering at either end of a magnet constructed as described would be obliged to traverse the entire surface of each plate, thus utilizing them to their fullest extent, and by thus arranging the plates a magnet is produced in which the internal or essential resistance is reduced to the minimum, and in which all the parts are in exactly the same relation to the core, which cannot be the case with continuously-coiled wire.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An electro-magnet composed of alternating slitted disks of copper and insulating material arranged upon a core composed of soft-iron wires inclosed within an insulated soft-



iron tube, said plates being continuously connected, substantially as described.

2. The centrally-perforated radially-slitted metal disks A, formed with grooves  $f f'$ , substantially as shown and described.

3. The disks A, provided with projecting ear  $a'$ , in combination with the coupler F, insulating-disks  $b$ , and a magnetic core, substantially as shown and described.

10 4. The centrally-apertured radially-slitted

insulating-disks, in combination with metal disks A and the core of an electro-magnet, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two 15 witnesses.

VIRGIL W. BLANCHARD.

Witnesses:

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