(No Model.)

S. BERGMANN.

Device for Adjusting the Armatures of Electro Magnets.

No. 233,967. **Patented Nov. 2, 1880.**

Fig. 1.

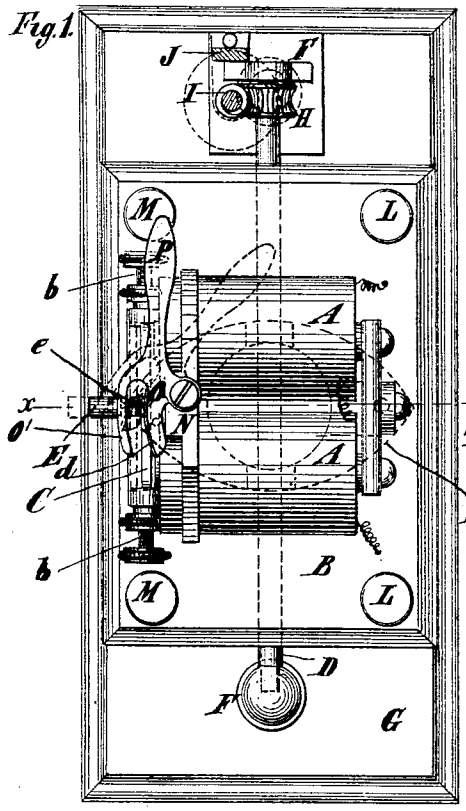


Fig. 3.

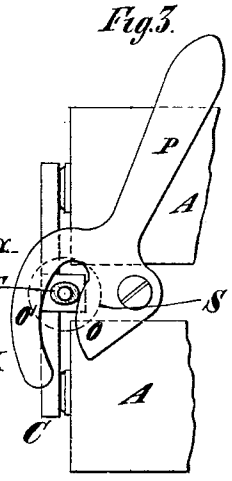
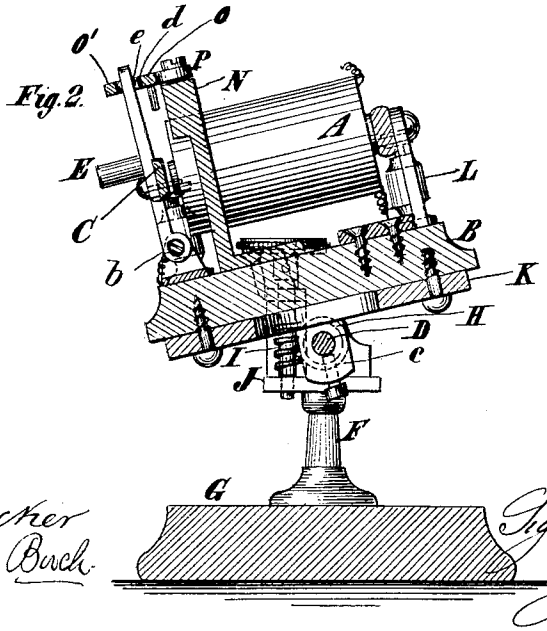


Fig. 2.



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SIGMUND BERGMANN, OF NEW YORK, N. Y.

DEVICE FOR ADJUSTING THE ARMATURES OF ELECTRO-MAGNETS.

SPECIFICATION forming part of Letters Patent No. 233,967, dated November 2, 1880.

Application filed July 23, 1880. (No model.)

To all whom it may concern:

Be it known that I, SIGMUND BERGMANN, of the city, county, and State of New York, have invented certain new and useful Improvements in Devices for Adjusting the Armatures of Magnets, of which the following is a specification.

My invention consists in the combination of a magnet, an armature therefor, and adjustable eccentric bars, preferably carrying a contact point or points for varying the position of the armature relatively to the magnet, whereby the adjustment may be effected easily and expeditiously.

It also consists in the combination, with a magnet and an armature therefor, of bars, between which the armature vibrates, and means for adjusting the length of the throw or vibration of the armature.

In the accompanying drawings, Figure 1 is a plan or top view of an instrument embodying my invention. Fig. 2 is a central vertical section thereof, taken at the plane of the dotted line *x x*, Fig. 1; and Fig. 3 is a plan of the portion of the instrument illustrating the means for adjusting the throw or vibration of the armature.

Similar letters of reference designate corresponding parts in all the figures.

A designates an electro-magnet, and B a stand on which it is mounted.

C designates an armature arranged on a lever supported at the lower portion by journals fitting in bearings *b*, so that it can vibrate toward and from the electro-magnet.

The stand B is shown as provided on the under side with lugs or bearers *c*, which are rigidly affixed to a rock-shaft, D, whereby the stand may be tilted or adjusted into different positions to cause the armature, when not attracted by the electro-magnet, to be retracted with more or less force by gravity. Preferably the armature is provided with a weight, E, to enable gravity to act more effectively upon it. The shaft D is shown as supported by pillars F, erected on a base-piece, G, adapted to be stood on a table or other support. If desirable, the stand B may be hinged at one end or other part in lieu of being affixed to and supported by the shaft D. Any suitable means for adjusting the stand B may be employed. For this purpose I have shown a worm-wheel, H, arranged on the shaft D, and engaging with a worm or screw, I, arranged in a frame, J, attached to one of the pillars F, so as to preclude any but a rotary movement of the worm or screw I. By turning the worm or screw the shaft D is partially rotated and the stand, electro-magnet, and armature are tilted.

The stand B has applied to its under side a frame, K, from which the lugs or bearers *c* extend.

The instrument, as shown, is designed for a relay-magnet for controlling the closing of a local circuit for operating a sounder. The main or line circuit extends from the binding-posts L through the coils of wire on the electro-magnet, and the local circuit extends from the binding-posts M through the frame N, supporting the electro-magnet, and through the armature-lever. This local circuit is made and broken by contact-points *e* and *d*, arranged, respectively, one on the armature-lever and the other on one of two arc-shaped bars, O O′, which extend from a lever, P, pivoted to the frame N. Of course I do not confine my invention to use with an electro-magnet employed as a relay, as it is useful for other purposes.

The two arc-shaped bars embrace the armature-lever between them, and in this example of my invention the lever from which they extend is so pivoted in place that the said bars will be eccentric to the armature-lever, and will, when moved or adjusted, vary the position of the armature relatively to the electro-magnet. These bars are shown as parallel, and the one, O′, may be made adjustable relatively to the other, to vary the length of the throw of the armature-lever between them. The contact-point *e* on armature-lever between the bars O O′ is of platinum or other suitable material, and the contact-point *d* on the opposite bar, O, consists of a facing of platinum or other suitable material. On the reverse side of the armature-lever is a piece of rubber, which, when the armature is retracted, comes in contact with the face of the bar O′, which thereupon arrests the movement of the armature.

In Fig. 3 I have shown means for adjusting the length of the throw or vibration of the armature without making either of the bars O O′

adjustable relatively to the other. In this example of my invention the end of the armature is provided with an elliptical tip, T, which may be turned by means of a knob or hand-piece, S, or otherwise, to present its wider or narrower portion to the bars, or, in other words, to bring its major or minor axis more nearly at right angles to the bars, to afford the armature less or greater throw or movement between the bars. I have shown no electrical contact-points on the armature or the bars in this form of my invention; hence the bars here form mere stops for the armature. This tip may, however, be a contact-point. One of the bars may be faced with india-rubber, and the other bar may be made to constitute another contact-point, as in Figs. 1 and 2.

It will be seen that by my invention I provide a simple and desirable means for adjusting the position of the armature relatively to the electro-magnet and for regulating the length of the throw of the armature. The outer ends of the bars O O′ may be connected, and they need not be arc-shaped so long as they are eccentric to or, in other words, susceptible of movement eccentrically to or out of the line of the movement of the armature.

I do not here claim as of my invention an electro-magnet, an armature therefor, either with or without a weight, and means for changing the position of the armature, or of the armature and electro-magnet, so that gravity may act to retract the armature; neither do I claim the combination of an electro-magnet, an armature, and means for tilting said armature; neither do I claim the combination of an electro-magnet, an armature, a stand therefor, and means for tilting the stand, armature, and electro-magnet, so that gravity may act to attract the armature; neither do I claim the combination, with the magnet, armature, and stand, of a shaft, a worm-wheel, and a worm or screw for tilting the stand and holding it in position when tilted.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a magnet, an armature therefor, and adjustable eccentric bars for varying the position of the armature relatively to the magnet.

2. The combination of a magnet, an armature therefor, and adjustable eccentric bars for adjusting the armature relatively to the magnet, said bars carrying one or more contact-points, whereby the armature serves to make and break an electric circuit.

3. The combination of a magnet, an armature therefor, and adjustable eccentric bars for varying the position of the armature relatively to the magnet, and carrying one or more contact-points, in connection with which the armature makes and breaks an electric circuit, said bars, in adjusting the armature, preserving the relation between the contact point or points carried by them and the contact point or points on the armature.

4. The combination, with a magnet and an armature therefor, of eccentric bars, between which the armature vibrates, and means for adjusting the length of the throw or vibration of the armature.

5. The combination, with a magnet and an armature therefor, of stops for limiting the throw or vibration of the armature and an elliptical tip for the armature, serving to adjust the length of its throw between the stops.

6. The combination of the electro-magnet A, the armature C, the eccentric arc-shaped bars O O′, and the lever P.

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Witnesses:
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