No. 839,000. PATENTED DEC. 18, 1906.

E. B. JACOBSON.

VIBRATOR.

APPLICATION FILED DEC. 19,1905

Fig. 1.

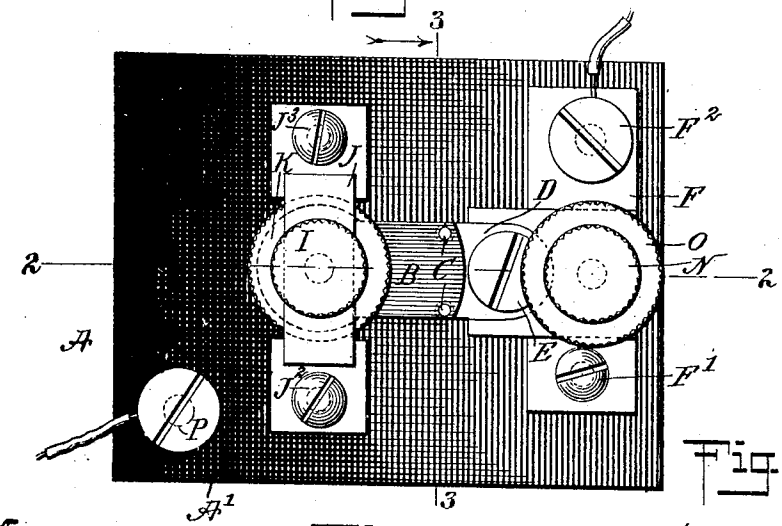


Fig. 5.

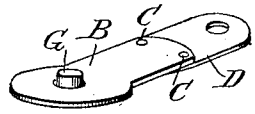


Fig. 4.

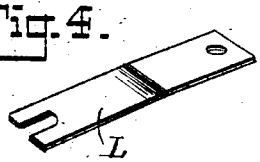


Fig. 2.

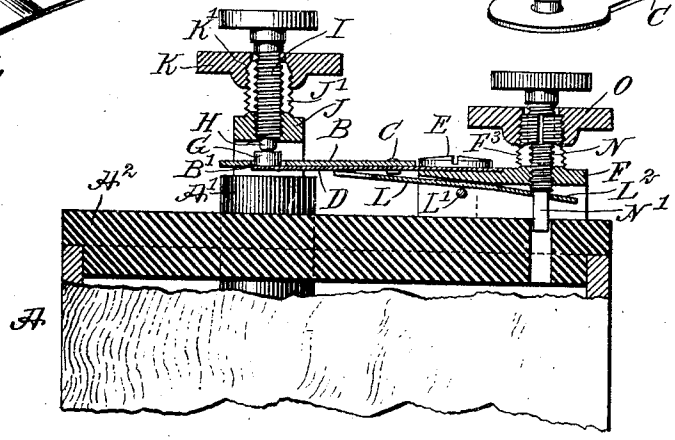
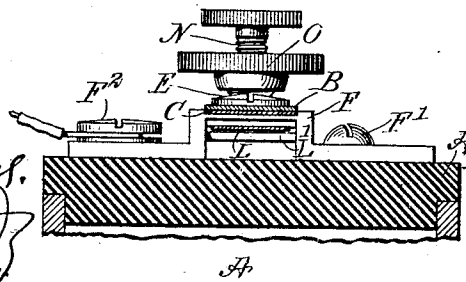


Fig. 3.



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VIBRATOR.

No. 839,000. Specification of Letters Patent. Patented Dec. 18, 1906.

Application filed December 19, 1905. Serial No. 292,504.

To all whom it may concern:

Be it known that I, EDWARD BYRON JACOBSON, a citizen of the United States, and a resident of Pittsfield, in the county of Berkshire and State of Massachusetts, have invented a new and Improved Vibrator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved vibrator for use in induction-coils, Ruhmkorff coils, spark-coils, gas-engine ignition-coils and like coils, and devices employed in high-tension electrical work, the vibrator being arranged to prevent sticking of the contact-points, to allow minute adjustment and secure locking of the parts after the desired adjustment is made, to insure quick response, and to avoid waste of the platinum and of electric current.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improvement. Fig. 2 is a sectional side elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a transverse section of the same on the line 3 3 of Fig. 1. Fig. 4 is a perspective view of the reinforcing-spring for the armature-lever, and Fig. 5 is a perspective view of the armature-lever.

The induction or other coil A, on which the improved vibrator is applied, is provided with a core A′, formed of the usual bundle of soft-iron wires and operating in conjunction with an armature B, fastened by rivets C or like devices to a main spring D, secured by a screw E to a bracket F, fastened by screws F′ and F^2 to the top A^2 of the casing of the coil A, the said top being made of hard rubber or other insulating material. On the forward or free end of the main spring D is secured a contact-point G, extending freely up through an opening B′, formed in the forward end of the armature B, and the said contact-point G operates in conjunction with an adjustable contact-point H, secured to or formed on the lower end of a screw-rod I, screwing in a boss J′, formed on the bridge J, secured by screws J^2 and J^3 to the top A^2 of the coil-casing A. The boss J′ is split in the direction of its length and is threaded exteriorly, and on the said boss J′ screws a clamping-nut K for clamping the members of the boss J′ firmly onto the screw-rod I, so as to securely lock the latter in place after the same has been screwed up or down in the boss J′ to bring the contact-point H in proper relation to the contact-point G.

By reference to Fig. 2 it will be seen that the clamping-nut K has an interior bevel K′, engaging the outer beveled end of the boss J′, so that when the nut K is screwed down the members of the boss J′ are forced inwardly in firm contact with the screw-rod I to lock the same in place, as previously mentioned. When the nut K is partly unscrewed on the boss J′, then the members thereof by their own resiliency release the screw-rod I, so that the latter can be screwed up or down in the boss to bring the contact-point H in proper relation to the contact-point G, as above explained. When the desired adjustment is made, the nut K is screwed down for securely locking the screw-rod I against movement.

The under side of the main spring D is engaged and pressed on by the free end of an auxiliary spring L, passing over a cross-bar L′, secured in the bracket F, and the rear end of the said auxiliary spring L is provided with an aperture L^2 for the passage of the reduced end or pin N′ of a screw-rod N, screwing in a boss F^3, forming part of the bracket F and similar to the boss J′—that is, split in the direction of its length. By screwing the screw-rod N up or down more or less tension is given to the auxiliary spring L, resting on the bar L′ as a fulcrum, and the said screw-rod N after the desired tension is given to the auxiliary spring L is locked in place by a clamping-nut O, screwing on the boss F^3, and similar to the nut K.

By reference to the drawings it will be seen that the rear end of the armature B is fastened by the rivets C to the main spring D at a point between the free end of the main spring D and its point of attachment to the bracket F, and the free end of the auxiliary spring L engages the under side of the main spring D at the point between the free end of the main spring and its point of attachment. By this arrangement freezing or sticking of the contact-points G and H is rendered im-

possible, owing to the fact that the armature B is independent of the main spring D at the forward or free end, and hence at the time of a break the armature B is allowed to swing a little beyond or higher than the free end of the main spring D and when contact is again made then the armature B descends with considerable force and breaks the connection between the points G and H, thus making it impossible for the contact-points G and H to freeze or stick. It will also be noticed that by the arrangement described a semi-hammer blow is given to the contact-point G, and the force of this semihammer blow can be minutely regulated by adjusting the screw-rods I and N, as above explained. The auxiliary spring L has its strength so proportioned in relation to the number of threads per inch on the screw-rod N that it can only be adjusted to consume a maximum of electric current at which the coil will do its best work, especially when the coil is used on a gas-engine or like machine. It will also be noticed that by the use of the screws I and N ample provision is made for taking up wear, and at the same time sufficient friction is obtained by the use of the nuts K and O to insure the retention of the screw-rods I and N in their adjusted positions.

By mounting the armature B on the main spring D and engaging the latter by the auxiliary spring L, as previously described, and shown in the drawings, a very quick response of the armature is obtained, and the vibrator is consequently well adapted for use on motor-car engines.

The wasting of platinum contact-points in vibrators as heretofore constructed is due to the position the platinum contact-points occupy on the armature. It will be noticed that in the vibrator shown and described the platinum contact-point G is mounted on the spring D and projects through the aperture B′ in the armature B, and hence the spring D acts as a cushion. By this arrangement the otherwise severe mechanical action of the contact-point G relative to the contact-point H is completely eliminated, and the double movement of the armature B and spring D has a tendency to a great extent to eliminate the electrolytic effect of the current upon the platinum contact-point.

It is understood that the usual electrical connections are made between the vibrator and the primary and secondary wires of the coil, and the screw F^2 serves as a binding-post for one line-wire, the other line-wire being connected to the binding-post P.

From the foregoing it will be readily seen that the vibrator is extremely economical in the use of platinum for the contact-points. The electric-current economy of the vibrator described is due in a large measure to the cushioned main spring D, also to the speed and impulsiveness of the armature B. In other words, the responsive power of the vibrator does not rest solely on the contact-point. A further reason for the economy in the electric current is that the vibrator cannot be adjusted to consume more than the maximum of electric current required to do the best work and give the best results in the engine on which it is to be used.

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

1. A vibrator comprising a main spring, an armature secured on the main spring, and a contact-point on the main spring and projecting freely through an aperture in the armature.

2. A vibrator comprising a spring for attachment at one end to a fixed support, and an armature overlying the free end of the said spring and secured thereto at its rear end at a point between the fixed and free ends of the spring.

3. A vibrator comprising a spring for attachment at one end to a fixed support, an armature overlying the free end of the said spring and secured thereto at its rear end at a point between the fixed and free ends of the spring, and a contact-point on the free end of the spring and extending freely through an aperture in the said armature.

4. A vibrator comprising a main spring, an armature secured on the main spring, a contact-point on the main spring, and an auxiliary spring engaging the said main spring.

5. A vibrator comprising a main spring, an armature secured on the main spring, a contact-point on the main spring, an auxiliary spring engaging the said main spring, and means for regulating the tension of the said auxiliary spring.

6. A vibrator comprising a spring for attachment at one end to a fixed support, an armature overlying the free end of the said spring and secured thereto at its rear end at a point between the fixed and free ends of the spring, a contact-point on the free end of the spring and extending freely through an aperture in the said armature, and an auxiliary spring engaging with its free end the said main spring at a point between the said contact-point and the attachment of the said armature.

7. A vibrator comprising a spring for attachment at one end to a fixed support, an armature overlying the free end of the said spring and secured thereto at its rear end at a point between the fixed and free ends of the spring, a contact-point on the free end of the spring and extending freely through an aperture in the said armature, an auxiliary spring engaging with its free end the said main spring at a point between the said contact-point and the attachment of the said armature, and means for regulating the tension of the said auxiliary spring.

8. A vibrator comprising a main spring, an armature on the main spring, a contact-point on the main spring, an adjustable contact-point opposite the contact-point on the main spring, and an auxiliary spring engaging the said main spring.

9. A vibrator comprising a main spring, an armature secured on the main spring, a contact-point on the main spring and projecting through an aperture in the armature, an adjustable contact-point opposite the said armature contact-point, and means for securing the adjustable contact-point in place.

10. A vibrator comprising a main spring, an armature secured on the main spring, a contact-point on the main spring, an adjustable contact-point opposite the said armature contact-point, means for locking the adjustable contact-point in place, an auxiliary spring engaging the said main spring, and means for regulating the tension of the said auxiliary spring.

11. A vibrator comprising a spring for attachment at one end to a fixed support, an armature overlying the free end of the said spring and secured thereto at its rear end at a point between the fixed and free ends of the spring, a contact-point on the free end of the spring and extending freely through an aperture in the said armature, an auxiliary spring engaging with its free end the said main spring at a point between the said contact-point and the attachment of the said armature, and a tension-regulating device for the said auxiliary spring consisting of a screw-rod having a point engaging the said spring, a split boss in which screws the said screw-rod, and a clamping-nut screwing on the said boss to clamp the latter against the said screw-rod.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD BYRON JACOBSON.

Witnesses:
JONATHAN HAIGHT,
EDWARD T. SCULLY.