No. 783,207. PATENTED FEB. 21, 1905.

A. A. KENT.

VIBRATOR FOR INDUCTION OR SPARK COILS.

APPLICATION FILED NOV. 8, 1904.

Fig 1.

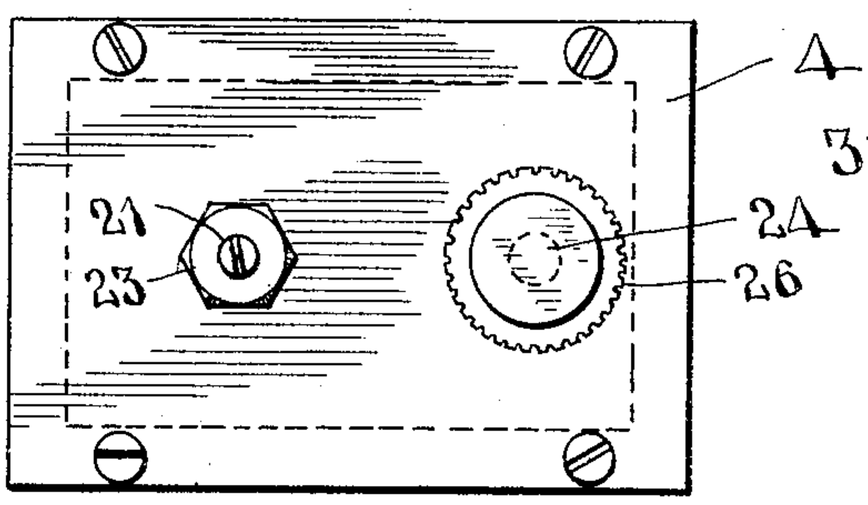


Fig 2.

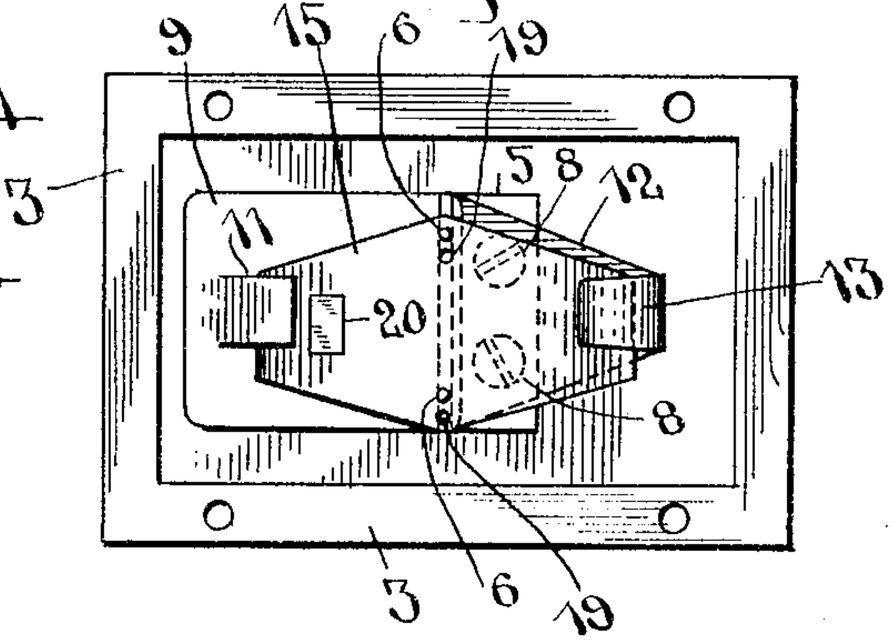


Fig 3.

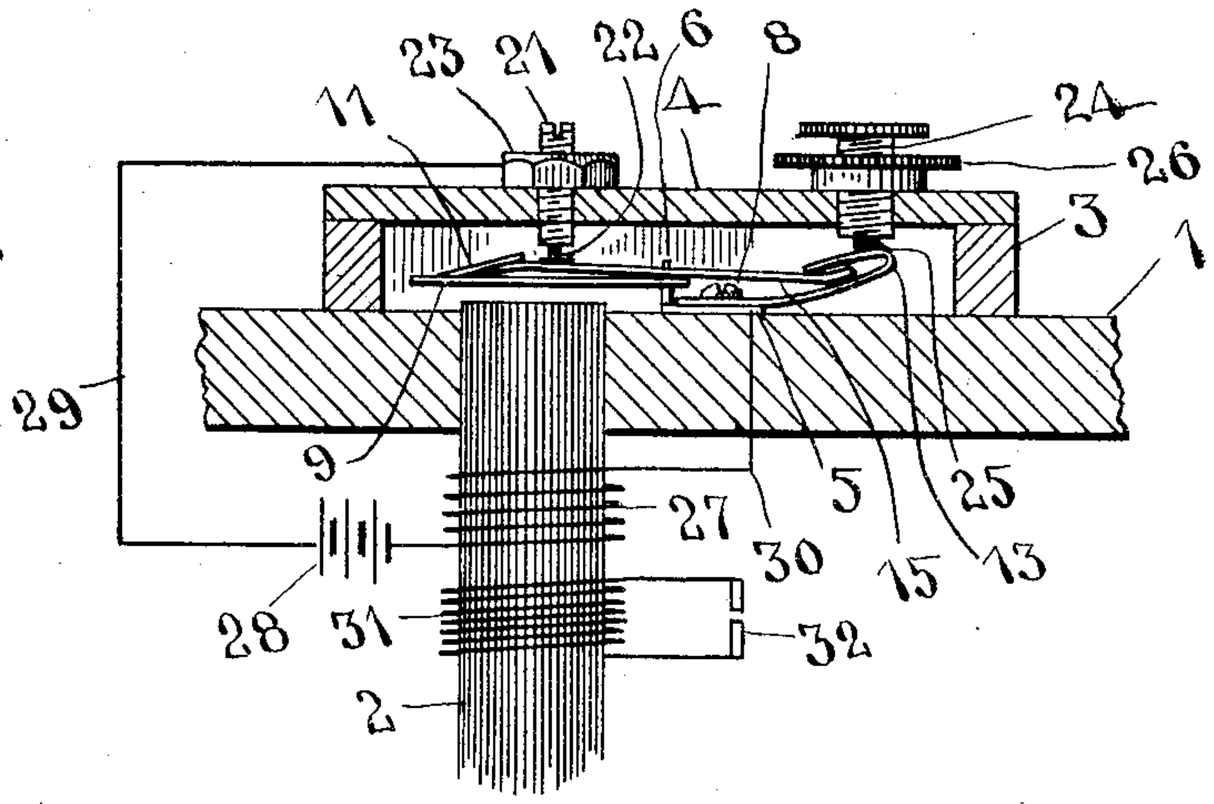


Fig 4.

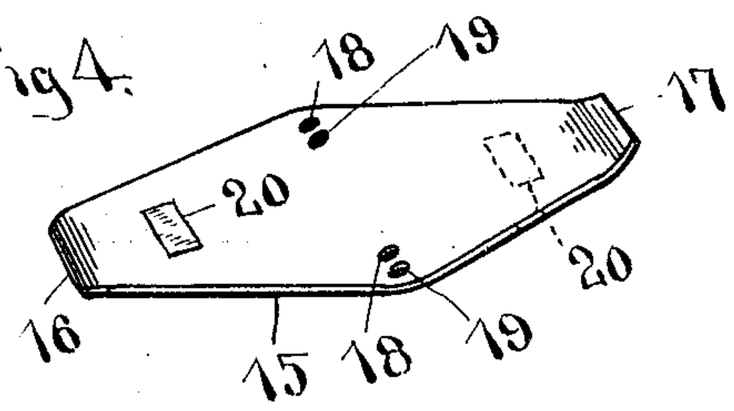


Fig 5

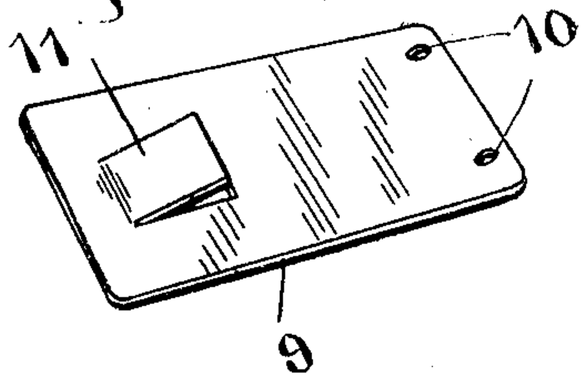


Fig 6.

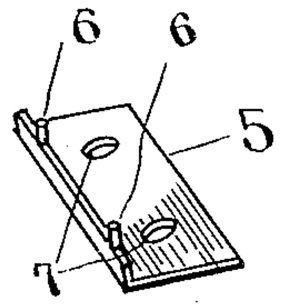
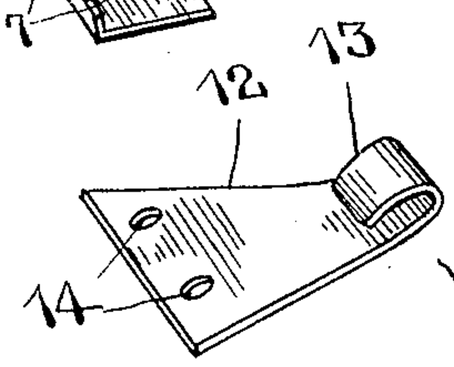


Fig 7.



WITNESSES:

John T. Grady

Alexander Dunk.

INVENTOR:

Arthur A. Kent

by Edw. W. Vaill Jr.

ATTORNEY:

No. 783,207. Patented February 21, 1905.

UNITED STATES PATENT OFFICE.

ARTHUR A. KENT, OF PHILADELPHIA, PENNSYLVANIA.

VIBRATOR FOR INDUCTION OR SPARK COILS.

SPECIFICATION forming part of Letters Patent No. 783,207, dated February 21, 1905.

Application filed November 8, 1904. Serial No. 231,862.

To all whom it may concern:

Be it known that I, ARTHUR ATWATER KENT, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Vibrators for Induction or Spark Coils, of which the following is a full, clear, and complete disclosure.

The object of my invention is to provide such a construction in vibrators for induction or spark coils that the same will be reliable in action, easy of adjustment, simple and inexpensive to manufacture, and of great durability.

My invention is particularly applicable to spark-coils used in connection with explosive-engines where it is required to have a reliable and efficient means for igniting the mixtures of air and gas or vapor.

In the adaptation of explosive-engines to motor-vehicles and automobiles the requirements in the construction of vibrators are particularly exacting. The jarring of the vehicle and engine tend to produce vibrations which readily disarrange the parts of a delicate vibrator and render its action variable and unreliable, while the constancy of use and the usual inaccessibility of the parts of the machine demand that the parts of a vibrator be of great durability, easily renewed, and of such a nature as to require little or no attention after once placed in position and adjusted. My present invention accomplishes these objects and results in a most efficient and satisfactory manner.

Briefly my invention embodies a vibrating member or armature which is magnetically acted upon by the core of the inductor or spark coil. Said armature is removably pivoted upon a suitable fulcrum and is yieldingly held in position by means of a leaf-spring which contacts with an adjustable contact-screw and is given the requisite tension by means of a tension pin or screw. Said spring is preferably adjustably pivoted upon the same fulcrum with the armature and may also be retained in position by other means hereinafter to be described.

For a full, clear, and exact description of one embodiment of my invention reference may be had to the following specification and to the accompanying drawings, forming a part thereof, in which—

Figure 1 is a plan view of my improved vibrator assembled. Fig. 2 is a plan view thereof, but showing the top of the casing removed. Fig. 3 is a central longitudinal sectional view through the casing. Fig. 4 is a detailed perspective view of the leaf-spring. Fig. 5 is a detailed perspective view of the armature. Fig. 6 is a detailed perspective view of the fulcrum, and Fig. 7 is a similar view of the means for engaging the end of the leaf-spring.

Referring to the drawings, the numeral 1 indicates one side or end of the casing, usually of wood, inclosing the spark or induction coil, of which 2 is the core. Mounted upon said casing is a second casing or box composed of the sides 3 and a cover 4. Upon the casing 1 is also mounted the fulcrum-support 5, which carries a pair of pivot-pins 6 6. The base-plate of said fulcrum is provided with screw-holes 7, which are adapted to receive screws 8, which hold said fulcrum in position. The armature 9 consists of a preferably rectangular piece of thin magnetic metal and is provided adjacent one end with two holes 10, adapted to be placed over the pivot-pins 6, and adjacent its opposite end is provided with a punched or sheared-up tongue 11.

A plate 12, having tapering sides and a hooked end 13, is provided with screw-holes 14 and is preferably retained in position by the screws 8, as shown in Fig. 3.

The leaf-spring 15 for giving the requisite tension to the armature 9 comprises a thin piece of sheet metal, preferably of phosphor-bronze, and is symmetrical in outline. Said outline is preferably substantially diamond or lozenge shape having square ends which are slightly curved in opposite directions, as indicated at 16 and 17. On the shorter axis or diagonal are placed two pairs of small holes 18 and 19, one hole of each pair being arranged adjacent opposite edges of the plate, and the holes of each pair are the same distance apart as are the pivot-pins 6 of the fulcrum 5. Upon opposite sides of said spring 15 and adjacent opposite ends are secured small elongated pieces 20, of platinum-foil or other

durable material. In assembling the parts thus far described the holes 10 of the armature 9 are first placed over the pins 6 and then one pair of holes, such as 18 of the spring 15, also placed over said pins 6. At the same time one end, 17, of the spring 15 is inserted into the hook 13 and its other end, 16, placed between the tongue 11 and the plate of the armature 9. The parts are then in position to have the cover 4 of the box or casing placed in position.

The cover 4 is provided with two screw-threaded holes through which pass the screws 21 and 24. The screw 21 is provided with a point 22, of platinum or other durable and infusible material, and is held in position by means of a set-nut 23. The screw 24 is provided with an insulating-point 25, of hard-rubber fiber or other similar material, and is adapted to contact with the hook 13 of the plate 12. Said screw is also held adjustably in position by a set-nut 26.

When the cover 4 is in position, the platinum point 22 will contact with one end of the rectangular pieces of platinum-foil 20. The contact-screw 21 is electrically connected with one terminal of the primary winding 27 of the induction-coil through the battery 28 and lead 29, while the other terminal of said winding is connected with the fulcrum-plate 5 through the lead 30. The secondary winding 31 of the induction-coil is connected in the usual way with suitable spark-terminals 32.

It will now be seen that the rapidity of the vibrations of the armature 9 may be controlled by adjusting the tension of the spring 15 by means of the contact-screw 21 and the thumb-screw 24. Should the platinum point 22 cause too great a depression to be worm in the piece of platinum-foil 20, the spring 15 may be placed so that the pivot-pins 6 will pass through the pair of holes 19 instead of the holes 18, which will bring the other end of the piece of platinum-foil 20 opposite said platinum contact-point 22. Furthermore, should both ends of the same piece of platinum-foil become worn from continued use the spring may be reversed and the platinum-foil on the opposite side placed opposite the contact-point 22. This feature of construction will therefore give four times the amount of wear that a single piece of foil would do without the capability of adjustment.

It will now be seen by the construction above described that I have produced a vibrator that consists of a small number of parts, is compact, and easily adjustable and removable, while at the same time there are no delicate connections likely to become easily disarranged.

Having thus described this form of my invention, it will be seen that changes may be made in the form, proportion, and arrangement of parts without departing from the spirit and scope of my invention; but

What I claim, and desire to protect by Letters Patent of the United States, is—

1. In a vibrator, an armature, a plate to which said armature is attached so as to vibrate therewith, a fulcrum intermediate the ends of said plate and projections adjacent each end of said plate to produce a flection thereof and to hold the same upon said fulcrum.

2. In a vibrator, an armature, a spring operatively connected with said armature, a fulcrum for said spring having pins for holding the latter removably in position, and projections for holding said spring in flectional engagement with said fulcrum and pins.

3. In a vibrator, an armature, a spring having holes centrally thereof and connected with said armature, a fulcrum for said spring having pins projecting therefrom, an adjustable contact adapted to engage the end of said spring which carries said armature, and a projection adapted to produce a pressure on the opposite end of said spring for holding said spring in engagement with said fulcrum and pins, in coöperation with said contact.

4. In a vibrator, a pivoted armature, a spring carried by the pivots of said armature and operatively connected with said armature, an adjustable screw having a contact-point adapted to engage said spring and adjustable means for producing a pressure on the opposite end of said spring.

5. In a vibrator, a vibratable armature, a leaf-spring connected with said armature, a fulcrum for said spring, said spring being symmetrical in shape on opposite sides of said fulcrum and having small contact-pieces secured on its opposite surfaces adjacent its ends and a contact-screw adapted to engage either of said contact-pieces.

6. In a vibrator, a vibratable armature, a leaf-spring connected with said armature, an elongated contact-piece secured thereto, a fulcrum for said spring, a contact-point adapted to engage said contact-piece, and means for retaining said spring in a plurality of positions on its fulcrum.

7. In a vibrator, a vibratable armature, a contact member connected with said armature, a contact-piece carried by said member, a contact-point adapted to engage said contact-piece, and means for adjustably holding said contact member in a plurality of different positions to cause said contact-point to engage different parts of said contact-piece.

8. In a vibrator, a vibratable armature, a leaf-spring connected with said armature, pins for retaining said spring in position, said spring having a plurality of pairs of openings adapted to engage said pins and being symmetrical in outline in relation to said openings, contact-pieces carried on opposite sides of said spring adjacent its ends, and a contact-point adapted to engage either of said contact-pieces.

9. In a vibrator, a vibratable armature, a

leaf-spring connected with said armature, a fulcrum for said spring, a contact-point adapted to engage said spring adjacent one end thereof, and an adjustable tension-screw adapted to act upon said spring on the opposite side of said fulcrum from said contact-screw.

10. In a vibrator, a vibratable armature of sheet metal, a leaf-spring adapted to hold said armature yieldingly in position, said armature having a sheared-up lip beneath which the end of said spring is adapted to be held.

11. In a vibrator, a vibratable armature, a leaf-spring connected therewith at one end, a fulcrum for said spring, a flexible plate having a hook at one end adapted to engage the other end of said spring and means for producing a pressure between said hook and spring.

12. In a vibrator, the combination with a vibratable armature and tension-spring, of pivot-pins loosely engaged thereby, a removable cover, a contact-screw adapted to engage said armature and carried by said cover and a projection also carried by said cover and engaging said spring to give the requisite tension thereto, the removal of said cover leaving said armature and spring free to be removed.

13. In a vibrator, the combination with a vibratable armature and tension-spring, of a fulcrum having pivot-pins which pass through openings in said armature and spring, a removable cover, a contact-screw carried by said cover and adapted to engage said armature, a projection also carried by said cover and adapted to engage said spring on the opposite side of said fulcrum from said contact-screw to give the requisite tension to said spring, the removal of said cover leaving said armature and spring free to be removed.

In witness whereof I have set my hand this 7th day of November, A. D. 1904.

ARTHUR A. KENT.

Witnesses:
JOHN T. GRADY,
EDW. W. VAILL, JR.