No. 836,659. PATENTED NOV. 20, 1906.

E. C. WILCOX.

INDUCTION COIL APPARATUS.

APPLICATION FILED APR. 14, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

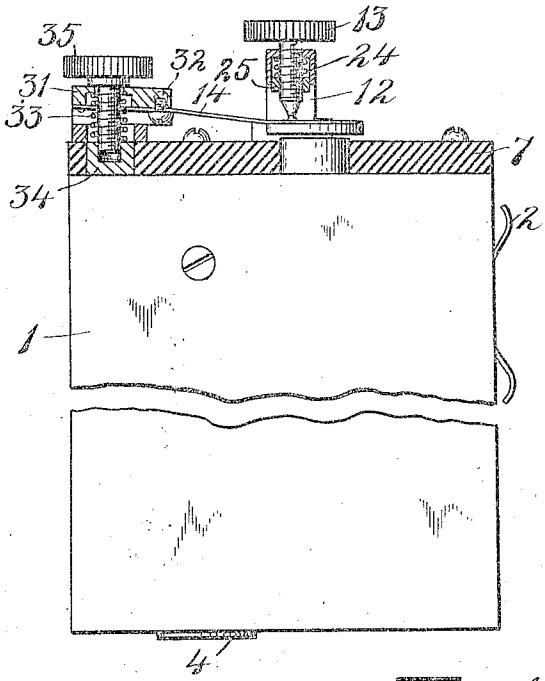


Fig. 2.

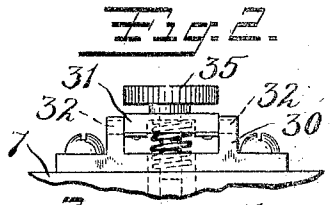


Fig. 3.

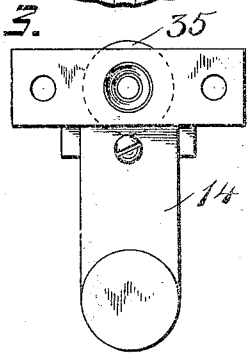


Fig. 4.

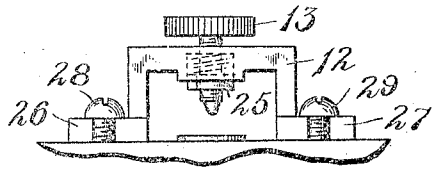
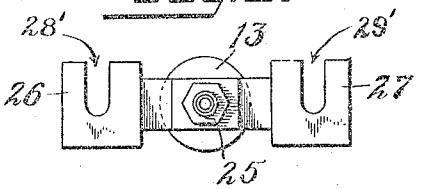


Fig. 5.



Witnesses

Chas. A. Peard

H. B. Willcox.

Inventor

Ernest C. Wilcox

By his Attorneys

Bartlett Brownell & Mitchell

No. 836,669. PATENTED NOV. 20, 1906.

E. C. WILCOX.

INDUCTION COIL APPARATUS.

APPLICATION FILED APR. 14, 1906.

2 SHEETS—SHEET 2.

Fig. 6.

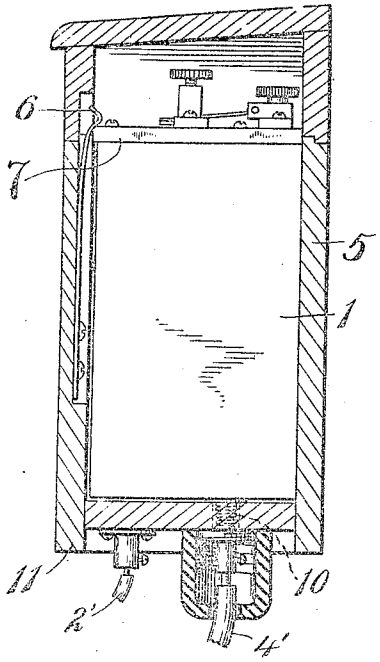


Fig. 7.

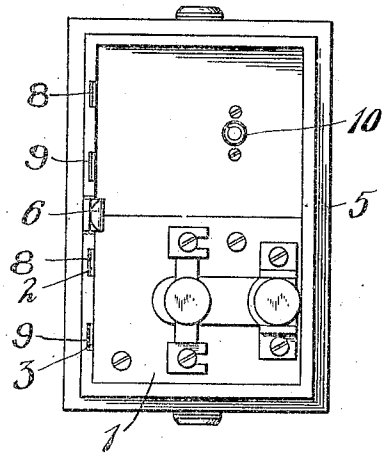
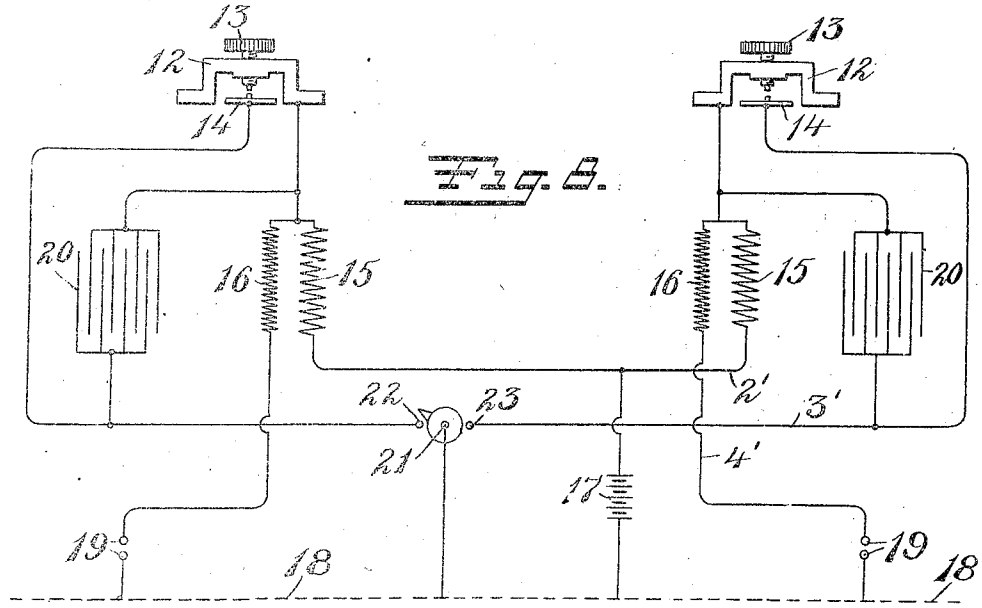


Fig. 8.



Witnesses

Inventor

ERNEST C. WILCOX

By his Attorneys

UNITED STATES PATENT OFFICE.

ERNEST C. WILCOX, OF MERIDEN, CONNECTICUT.

INDUCTION-COIL APPARATUS.

No. 836,659. Specification of Letters Patent. Patented Nov. 20, 1906.

Original application filed June 2, 1905, Serial No. 263,418. Divided and this application filed April 14, 1906. Serial No. 311,696.

To all whom it may concern:

Be it known that I, ERNEST C. WILCOX, a citizen of the United States, residing at Meriden, Connecticut, (whose post-office address is the same,) have invented certain new and useful Improvements in Induction-Coil Apparatus, of which the following is a full, clear, and exact description.

My invention relates to improvements in electric apparatus, and particularly to induction-coils for sparking devices.

The object of the invention is to provide a simple compact apparatus the parts of which may be readily assembled and disassembled and which may be readily adjusted and which, nevertheless, is not subject to accidental variation in adjustment due to vibration.

The invention consists of improvements the principles of which are illustrated in the accompanying two sheets of drawings.

Briefly described, it may be said to comprise the employment of apparatus arranged to be assembled in units, each unit having the usual primary and secondary coils, together with a vibrator. The parts of the vibrator are peculiarly constructed to facilitate adjustment when desired and to insure permanency of adjustment.

The parts are so constructed that in ordinary use there is no danger of the connections being interfered with by water leaking in at the base.

This application is a divisional one from Serial No. 263,418, filed by me June 2, 1905.

Figure 1 is a side view of what may be termed a "unit" of my apparatus, comprising the casing which contains the primary and secondary of the induction-coil and the condensers, as is customary, and showing the parts of the vibrator mechanism in vertical section. Fig. 2 is a fragmentary view showing the rocker or vibrator-arm support. Fig. 3 is a view of the under side of the same. Fig. 4 is a view of the bridge carrying the adjustable contact-screw for the vibrator. Fig. 5 is a view of the under side thereof. Fig. 6 is a vertical section of a casing for containing a pair of units and showing one of the units in place. Fig. 7 is a plan view of the casing with the other unit in place. These casings may, however, be provided for any number of units. Fig. 8 is a diagram illustrating the circuits to be employed for a pair of units connected to the sparking apparatus of an internal-combustion engine.

Referring more particularly to the drawings, 1 indicates a box or casing for an individual unit containing the primary and secondary windings and condenser. This has two spring contacts or terminals 2 and 3 for the primary winding and a contact-terminal 4 for the secondary winding, one of the terminals 2 or 3 serving also as a second terminal for the secondary.

5 represents a casing adapted to contain a plurality of induction units. For convenience in conveyance the induction units are slipped into the casing and held therein by a spring-clip 6, which snaps over the edge of the top plate 7, the plate being preferably of insulating material. When the boxes 1 are in place, their spring-terminals 2 and 3 engage conducting-strips 8 and 9, located in grooves in the inner wall of the casing 5. The terminal 4 at this time rests in electrical contact with the spring 10, secured in the bottom of the casing. Simple binding-posts are provided on the bottom of the casing 5 for affording connections with the circuit-wires 2′, 3′, and 4′. 11 is a depending flange from the side wall of the box 5, which acts as a skirt or protector for the connections, so as to preclude the entrance of water, which might short-circuit and ruin the instrument.

In the diagram in Fig. 8, 12 represents the bridge of the contact device, having an adjusting contact-point screw 13 and a vibrator-arm 14. 15 and 16 are the primary and secondary windings of the induction-coil. 17 is a battery. 18 represents a ground—for instance, the frame of an engine. 19 represents the sparking plug of an engine connected to the frame or having one element a part thereof and also connected to the secondary of the induction-coil. The battery is connected between the primary winding and the frame, and the condenser 20 is shunted or bridged with the contact device or vibrator. I have shown the apparatus connected for a two-cylinder engine, so that duplicates of all the parts thus far described are provided with the exception of the battery. A second battery may, however, be provided, if desired, with suitable switching devices. 21 represents a commutator for engaging the points 22 and 23 and completing the circuits for the two induction-coils alternately, as is customary. The parts of the vibrator often work loose when in operation, owing to the repeated minute vibrations, and to prevent

this it is customary to provide clamping screws or nuts. I have provided, however, a construction which affords an adjustable frictional resistance. This is shown particularly in Figs. 1, 4, and 5. The bridge 12 is provided with a vertical tapped hole and a notched recess concentric therewith on the under side. Within this recess is located a spring 24. 25 is a nut of the regular or prismatic form—for instance, hexagonal—which has a screw-threaded or tapped hole and is prevented from rotary movement by engagement with the correspondingly-formed recess in the bridge. The spring 24 presses against the upper wall of the recess and the nut 25, and thus causes a frictional engagement or pressure between the threads of the contact device 13 and the tapped opening in the bridge 12, which is sufficient to prevent the breaking loose of the contact-screws. It will be noted, however, that the contact-screw may be adjusted when desired in the ordinary method. The resistance to turning, however, may be varied by varying the initial tension of the spring 24, which is effected by varying the relative position of the nut 25 with regard to the bridge 12 when the contact-screw 13 is inserted. The feet 26 and 27 of the bridge 12 are provided with open-ended slots 28′ and 29′ for convenience in attachment to the top plate 7 and detachment therefrom when it is necessary to obtain access to the contact-points for the purpose of cleansing, &c., it being simply necessary to loosen the screws 28 and 29 slightly.

For convenience in adjusting the initial tension of the vibrator-arm or armature I have provided the construction shown in Figs. 1, 2, and 3. 30 is a bracket or base secured to the top plate 7. 31 is a block pivoted in the base at 32 and to which the vibrator-arm 14 is rigidly attached. The vibrator-arm is formed of spring-steel or other flexible material suitable for the purpose. 33 is a spring the upper end of which engages with the recess in the arm of the pivot-block 31 and the lower end of which passes through an opening in the base 30 and engages with the socket 34. 35 is a thumb-screw whose threaded shank takes into a tapped hole in the socket 34. By adjusting this screw 35 the block 31 may be tilted on its axis, the spring 33 always acting to hold the rear of the block up. This holds the parts in their proper position and yet permits a very simple adjustment. The advantages of such a construction will be apparent to those who are skilled in this art.

What I claim is—

1. In an induction-coil apparatus, a casing adapted to receive the primary and secondary windings, connecting-terminals located beneath the bottom of said casing, and a depending protecting skirt or flange carried by said casing and laterally surrounding a part of said terminals.

2. In an induction-coil apparatus, a vibrator comprising an armature member, a bridge member, a recess in said bridge and an adjustable contact-screw passing through a tapped hole in said bridge and through said recess, a spring located in said recess, a threaded nut having a portion seated in said recess, and prevented from rotation relative to said bridge, said screw passing through said nut and being held through the pressure of said spring.

3. In an induction apparatus, a bridge having a tapped portion, a contact-screw operable therein, a tapped nut engaging said screw and prevented from rotation relative to said bridge, and a spring engaging said nut.

4. In an induction apparatus, a bridge, a rotatable and longitudinally-movable contact member, separate means for affording a continuous and uniform frictional resistance to the movement of said contact member, and means for adjusting the initial amount of said resistance.

5. In an induction apparatus, a coil-box, a bridge having slotted feet, screws for removably securing said feet to said box, an adjustable contact-screw carried by said bridge, and a vibrator coacting with said contact-screw.

6. In an induction apparatus, a base, a vibrator-arm pivoted therein, an adjusting-screw coacting with a portion of said arm back of said pivot, and a spring normally opposing the action of said screw.

7. In an induction apparatus, a vibrator comprising a base member, an arm pivotally carried thereby, an adjusting-screw passing through the rear of said arm and a spring surrounding said screw and pressing against said arm.

8. In a vibrator for an induction apparatus, a socket, a base member, a vibrator carried by said base member, a screw passing through said vibrator-arm and taking into said socket, and a spring for opposing the action of said screw.

9. A vibrator for an induction apparatus comprising the combination of a tapped socket, a base member having a passage therethrough, a block carried by said base member and having a passage therethrough, an adjusting-screw passing through said block and base and taking into said socket, and a spring surrounding said screw.

10. In a vibrator for an induction apparatus, the combination of a base, a vibrator-arm carried by said base, a screw engaging a portion of said arm and a spring surrounding said screw and pressing against said arm to oppose the action of said screw.

ERNEST C. WILCOX.

Witnesses:
J. L. Wood,
L. R. Thompson.