S. D. LIVINGSTON.

INDUCTION COIL.

APPLICATION FILED JAN. 10, 1920.

1,370,502. Patented Mar. 1, 1921.

Fig. 1.

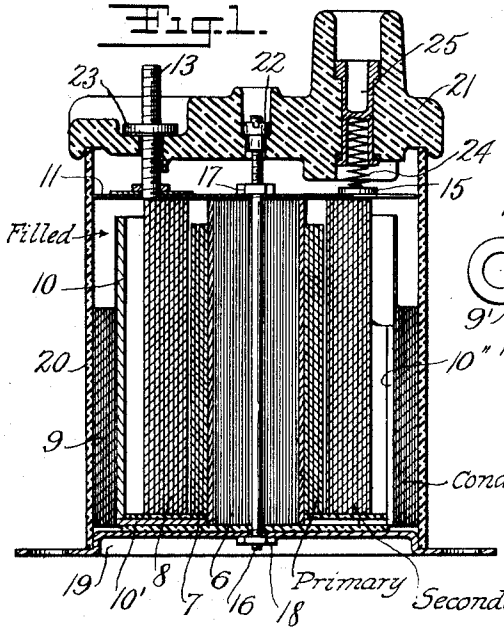


Fig. 2.

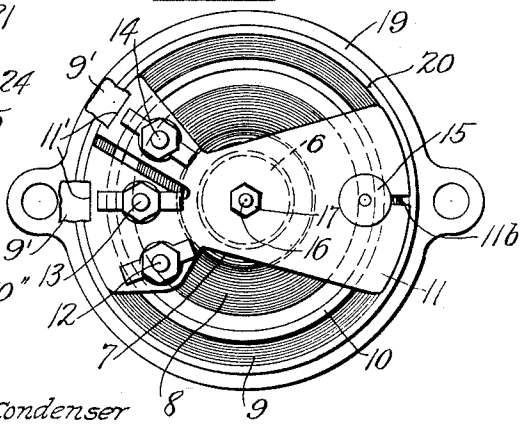


Fig. 3.

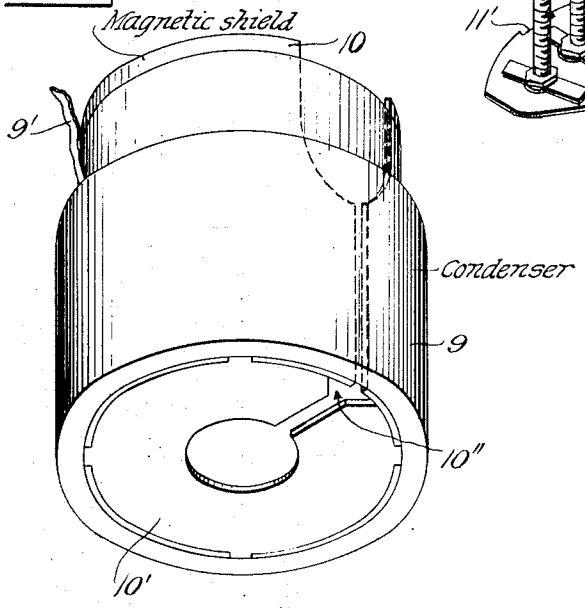


Fig. 4.

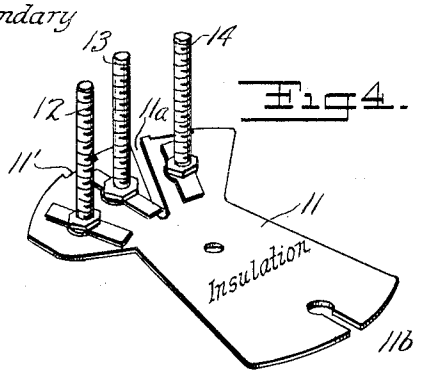
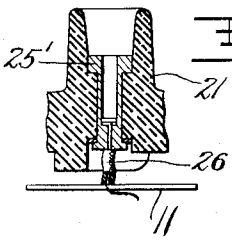


Fig. 5.



Inventor

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By his Attorneys.

UNITED STATES PATENT OFFICE.

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INDUCTION-COIL.

1,370,502. Specification of Letters Patent. Patented Mar. 1, 1921.

Application filed January 10, 1920. Serial No. 350,670.

To all whom it may concern:

Be it known that I, STANLEY D. LIVINGSTON, a citizen of the United States of America, residing at Meriden, Connecticut, have invented a new and useful Induction-Coil of which the following is a specification.

My invention relates particularly to a combined induction coil and condenser.

My main object is to provide a compact and efficient device which can be easily manufactured and assembled at a minimum cost.

The invention in its preferred form relates to improvements in the assemblage of the parts of an induction coil and condenser.

Figure 1 is a vertical sectional view of a device embodying the improvements of my invention, but omitting the substance which fills the space not occupied by the core, coils, shield and condenser, and attached parts.

Fig. 2 is a plan view of the same with the outer head removed.

Fig. 3 is a perspective view of the magnetic shield and condenser.

Fig. 4 is a perspective view of the inner insulating plate which carries three of the circuit terminals or binding posts, and which locks the fourth terminal.

Fig. 5 is a sectional view of modified detail.

The core 6 may be formed in any suitable manner as for instance, as a bundle of longitudinally extending wires. The primary coil 7 is wound directly on this core and may be of any suitable construction.

The secondary coil 8 may be of any suitable construction and is preferably wound separately and slipped over the core and primary coil after winding. I prefer that the secondary shall surround the primary as this produces a maximum efficiency for a minimum amount of wire.

The condenser 9 may be of any suitable construction, and is wound directly on a magnetic shield or shell 10, which is provided with a magnetic end plate 10′. This shell and the end plate are preferably open along one side, as at 10″, to prevent interference with the proper action. This construction forms a substantial support for the condenser, and shields the condenser from any effect of the coils. On the other hand, the magnetic shield in conjunction with the magnetic core 6 concentrates the effect of the primary coil so as to produce a maximum efficiency in the secondary coil.

The parts thus far described are readily made and assembled in the arrangement shown with the wire ends at the top. A plate 11 preferably of insulating material is provided with binding posts or terminals 12, 13 and 14, which are suitably secured to the plate and handled as a unit in connection therewith. The primary wires, one of the secondary wires, and the condenser ends are connected to the lower ends of these posts, for instance, by soldering. Notches such as 11′ may be provided for the condenser ends 9′, and a slot such as 11^a may be provided for one of the coil ends. In the opposite end of the plate 11 is another slot 11^b adapted to receive the other secondary wire, and thus lock a terminal washer 15 for the same. When the coils and condenser have been assembled, they may be handled as a unit and simultaneously impregnated with a suitable insulating compound. A tie bolt or rod 16 passes through the core 6, and is provided with nuts 17 and 18 for securing the parts to the base plate 19.

When the parts thus far described have been assembled in the insulating casing 20, the remainder of the space within the casing is filled with a suitable insulating compound having the proper dielectric properties, and which permanently holds the parts in their proper relation. The head 21 may be formed of any suitable insulating material, such for instance as porcelain, and provided with passages for the binding post 12, 13 and 14, and the upper end of the tie bolt 16. The head is held in place by a nut 22 which screws on to the upper end of the tie bolt. Clamp nuts such as 23 may be provided for each binding post to engage the external circuit wires of the system. A spring 24 is carried by the head for engagement with the terminal washer 15, and a socket 25 is provided for a plug for connecting with the spring 24. The external connections may therefore be made in the manner customary in ignition practice.

Instead of using the washer 15 and spring 24 the secondary wire may be inserted

through and secured in the socket 25′ as shown in Fig. 5. The wire is preferably insulated by a tube 26.

I claim:—

1. The combination of, a core, a primary coil wound thereon, a secondary coil surrounding the primary coil, a magnetic shield having a magnetic bottom plate, a condenser wound on said shield, said core and coils being surrounded by said shield and a casing for said parts.

2. The combination of a core, coils surrounding said core, a magnetic shield closed at the bottom and open along one side said coils being within said shield and a condenser wound on the outside of said shield and a casing for said parts.

3. The combination of a core, coils and a condenser surrounding said core, a casing for said parts including a removable cover having passages, an inner plate, binding posts secured thereto and connected to the coils and condenser and extending through said passages for connection outside to circuit wiring.

4. The combination of a core, coils thereon, a magnetic shield surrounding said coils and having a magnetic bottom, a condenser outside of said shield, a plate on the upper end of said coils, coil and condenser terminals carried thereby, a bottom plate, and a tie bolt securing said parts together.

5. In an induction coil construction, the combination of a core, wire coil windings thereon, an insulating plate secured to said core, and binding posts carried by said insulating plate, said plate having positioning notches for the ends of the coil wire.

6. An induction coil construction comprising a core, a wire coil winding thereon, an insulating plate secured to said core, a binding post carried by said plate, and a contact washer carried by said plate, said plate having notches adjacent said post and adjacent said washer for ends of the coil wire.

7. An induction coil construction, comprising a core, a coil winding around said core, an insulating plate secured to said core and having a notch in one edge thereof, and a terminal washer connected to one end of the coil over said notch, said end of said coil being positioned in said notch.

8. The combination of a core, coils thereon, an insulating plate having positioning notches for the wire ends, terminals for said coils carried by said plate, a casing for said parts including a cover and a tie bolt for securing said cover, plate and core in place.

9. The combination of a core, coils thereon, a shield outside of said coils, a condenser outside of said shield, an insulating plate having positioning notches for the coil and condenser ends, terminals carried by said plate adjacent said notches and a casing for said parts through which at least one of said terminals project and a contact carried by said casing engaging one of said terminals.

10. The combination of primary and secondary coils, a condenser, an insulating plate having positioning notches for the wire and condenser ends, binding posts carried by said plate near some of said notches, a terminal washer at one of the other notches, and a casing for said parts.

11. As an article of manufacture, an insulating plate for a coil and condenser, binding posts carried thereby adapted to have coil and condenser ends secured thereto, said plate having a notch for positioning a coil end.

12. The combination of primary and secondary coils, inner and outer magnetic elements therefor, an insulating plate, secured to said coils, terminals carried by said plate and connected to said coils, a casing surrounding the bottom and side of said coils and projecting above the outer ends thereof, insulating material filling the spaces between said coils and said casing and a cover secured to said casing and having passages through which some of said terminals extend and a contact carried by said cover engaging the other terminal.

13. In a construction of the character described, the combination of a magnetic core, primary and secondary coil windings surrounding said core, a magnetic shield surrounding said coil windings and having a magnetic bottom plate at one end of said windings, a condenser outside of said shield, a metallic base plate, a non-metallic casing wall, an insulating cover, said cover, casing wall and base plate inclosing all the other parts, and means for securing the cover and base plate together.

STANLEY D. LIVINGSTON.