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J. W. ALLEN

2,159,120

ELECTRICAL APPARATUS

Original Filed Oct. 13, 1930

Fig. 2.

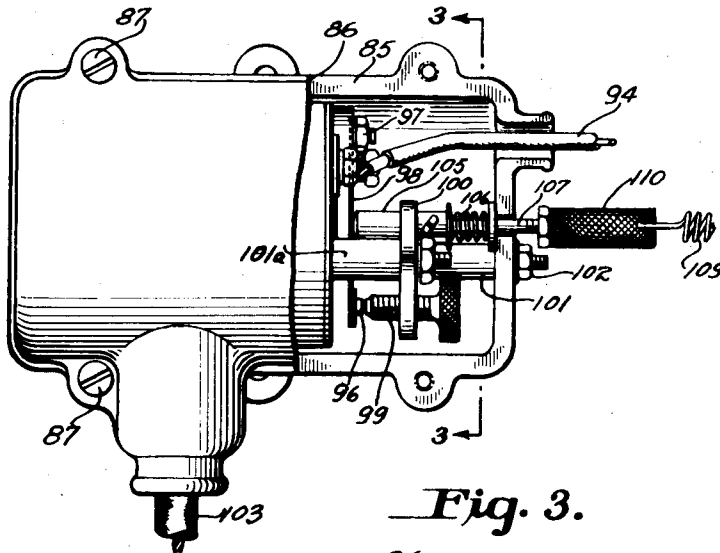


Fig. 3.

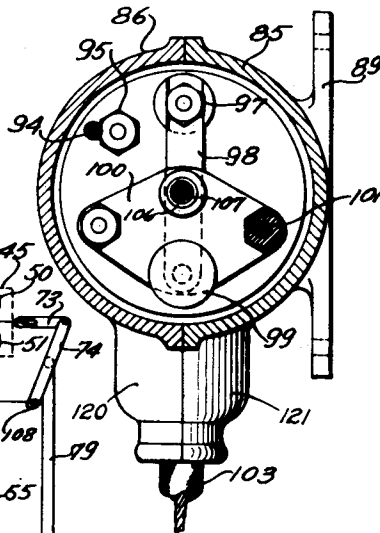
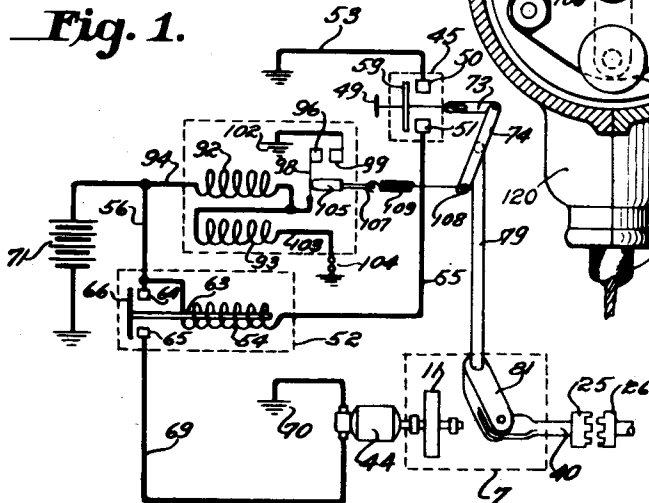


Fig. 1.



UNITED STATES PATENT OFFICE

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ELECTRICAL APPARATUS

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488,495. Divided and this application April 3,
1937, Serial No. 134,905

6 Claims. (Cl. 175-361)

This invention relates to induction coils and more particularly to the construction thereof and to the supporting and housing means therefor.

Induction coils for use in the ignition systems of internal combustion engines should be capable of operation at relatively high voltages without at the same time setting up an objectionable condition of interference with the proper operation of signaling or communicating apparatus customarily employed on the same vehicle as that which houses the internal combustion engine, and operating upon currents or other electrical energy of radio frequency; and it is an object of the present invention to provide an induction coil so constructed and housed that it will be capable of operation at relatively high voltages without the setting up of any such objectionable condition as that above indicated.

Other features of the invention reside in the specific combinations and association of parts, considered both electrically and physically, as will appear more fully from the following description, when read with reference to the accompanying drawing. It is to be understood, however, that the drawing is for the purpose of illustration only and is not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawing,

Fig. 1 shows, partially in diagram and partially in central section, the invention applied to an ignition system of an internal combustion engine;

Fig. 2 is a view in elevation, with part of the housing broken away to reveal the energization controlling means; and

Fig. 3 is a transverse sectional view along line 3-3 of Fig. 2.

Referring to the drawing, and particularly to Fig. 1, the invention is therein shown embodied in an induction coil consisting of a primary winding 92 wound upon a suitable core and a secondary winding 93 wound upon the primary winding 92, but separated therefrom by an insulating wrapper (as shown in my original application No. 488,495, filed October 13, 1930). A spring contact 98 lies within the range of the magnetic field of the coil 92, 93 and is adapted to be drawn toward the core, thus creating a gap between the contact post 98 on one end of the spring 98 and an adjacent contact post 99 which, as shown, is in the form of an adjustable screw threadedly engaging a metal plate 100 mounted on a screw 102, within a spacer sleeve 101, which serves to ground the circuit

through the longitudinally mating metallic casing sections 85, 86 enclosing the parts above enumerated, and operating to shield the said parts against the sending out of electro-magnetic disturbances which may interfere with radio equipment located adjacent the said parts.

Within the metallic casing 85, 86 is a sleeve of suitable insulating material cooperating with end plates, likewise of insulating material (as shown in my original application, above identified), to completely enclose the coils above referred to, except for conductor openings. There is one such opening in the forward end plate to allow passage therethrough of a conductor terminating in a terminal screw 97 serving for attachment of one end of the spring contact or armature 98 above referred to.

One end of casing 85 is shown as apertured centrally (Fig. 2) to permit a rod 107 to pass into the casing for operative connection with a pin 105 of insulating material. As shown, one end of the pin 105 normally abuts the resilient armature 98, and in response to the urge of a spring 106 acts to maintain said armature 98 flexed rearwardly sufficiently to separate contact 98 from the contact post 99, the pin 105 being supported for sliding movement by any suitable means, preferably the bracket 109 previously described. Any suitable means may be provided for withdrawing the pin 105 by the exertion of a pull on the end of the rod 107 to thereby overcome the pressure of the spring 106. As shown, such means takes the form of a flexible link, the tension of which is controlled by the coil portion 109 thereof, and the ends of which are connected respectively to the rod 107, as indicated at 110, and to one arm 74 of a bell crank (Fig. 1) constituting part of an engine cranking clutch actuating mechanism of a type disclosed and claimed in my co-pending application Serial No. 488,495, filed October 13, 1930, of which the present application is a division. The other arm 73 of the bell crank is shown as manually operable through the instrumentality of a plunger 49 having the added function of controlling the joinder of contacts 50 and 51 in the circuit to the electric starting motor 44. For claims to the motor energizing and clutch actuating functions of the plunger 49, either per se or in combination with the ignition controlling function thereof, reference is to be had to my co-pending application above identified or some other division thereof; the claims herein being to the induction coil structure per se.

From the foregoing it will be apparent that

upon application of an outward pull on the plunger 49 the connecting rod 107 of the ignition coil will be pulled to the right, as viewed in Fig. 1, by means of the connection with the bell crank 74, thereby permitting the spring armature 98 to move the contact 96 into engagement with contact 99 and thus place the parts in condition for electromagnetic actuation by reason of the flow of current from battery 71 to the primary winding 92, to begin the process of alternate breaking and making of the primary circuit, with resultant high tension impulses in the secondary circuit, to provide a shower of fuel igniting sparks across the gap 104.

As shown best in Fig. 3, the sections 85 and 86 of the casing have mating extensions 120, 121, respectively, which are held (by suitable means 87) in abutting relationship along a plane of the axis of conductor 103.

Although the invention has been described in connection with a specific embodiment and application, to wit, fuel ignition, the principles involved are susceptible of numerous other applications which will readily occur to persons skilled in the art. The invention is therefore to be limited only as indicated by the scope of the appended claims.

What is claimed is:

1. In a device of the class described, in combination with a sectional housing having two registering semi-cylindrical sections, a coil consisting of primary and secondary windings disposed within said housing, and means to electrically connect said secondary winding with a current consuming device, said last named means including a current conducting wire, an insulating covering for said wire, and an outwardly extending boss integral with and projecting radially from said housing to enclose and protect said conductor and its insulating covering.

2. In a device of the class described, in combination with a housing having two registering semi-cylindrical sections, a coil consisting of primary and secondary windings disposed within said housing, and means to electrically connect said secondary winding with a current consuming device, said last named means including a current conducting wire, an insulating covering for said wire, and means disposed radially of said

housing to enclose and electrostatically shield said conductor.

3. In a device of the class described, in combination with a housing having two registering semi-cylindrical sections, a coil consisting of primary and secondary windings disposed within said housing, and means to electrically connect said secondary winding with a current consuming device, said last named means including a flexible current conductor extending from said housing, and means integral with said housing for protecting said conductor.

4. In a device of the class described, in combination with a housing having two registering semi-cylindrical sections, a coil consisting of primary and secondary windings disposed within said housing, and means to electrically connect said secondary winding with a current consuming device, said last named means including a flexible current conductor extending from said housing, and means disposed radially of said housing for protecting said conductor.

5. In a device of the class described, in combination with a sectional housing, a coil consisting of primary and secondary windings disposed within said housing, and means to electrically connect said secondary winding with a current consuming device, said last named means including a flexible current conductor extending from said housing, and means disposed radially of said housing for protecting said conductor, said protecting means including a centrally split conductor housing, one half of which is integral with one section of said coil housing, the other half being integral with the second section of said coil housing.

6. In a device of the class described, in combination with an induction coil, a substantially cylindrical housing for said coil, having two semi-cylindrical sections joining along a plane passing through the coil axis, said coil consisting of primary and secondary windings, and means to electrically connect the secondary winding with a current consuming device, said last named means including a current conducting wire entering said housing along the plane of joinder of the housing sections.

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