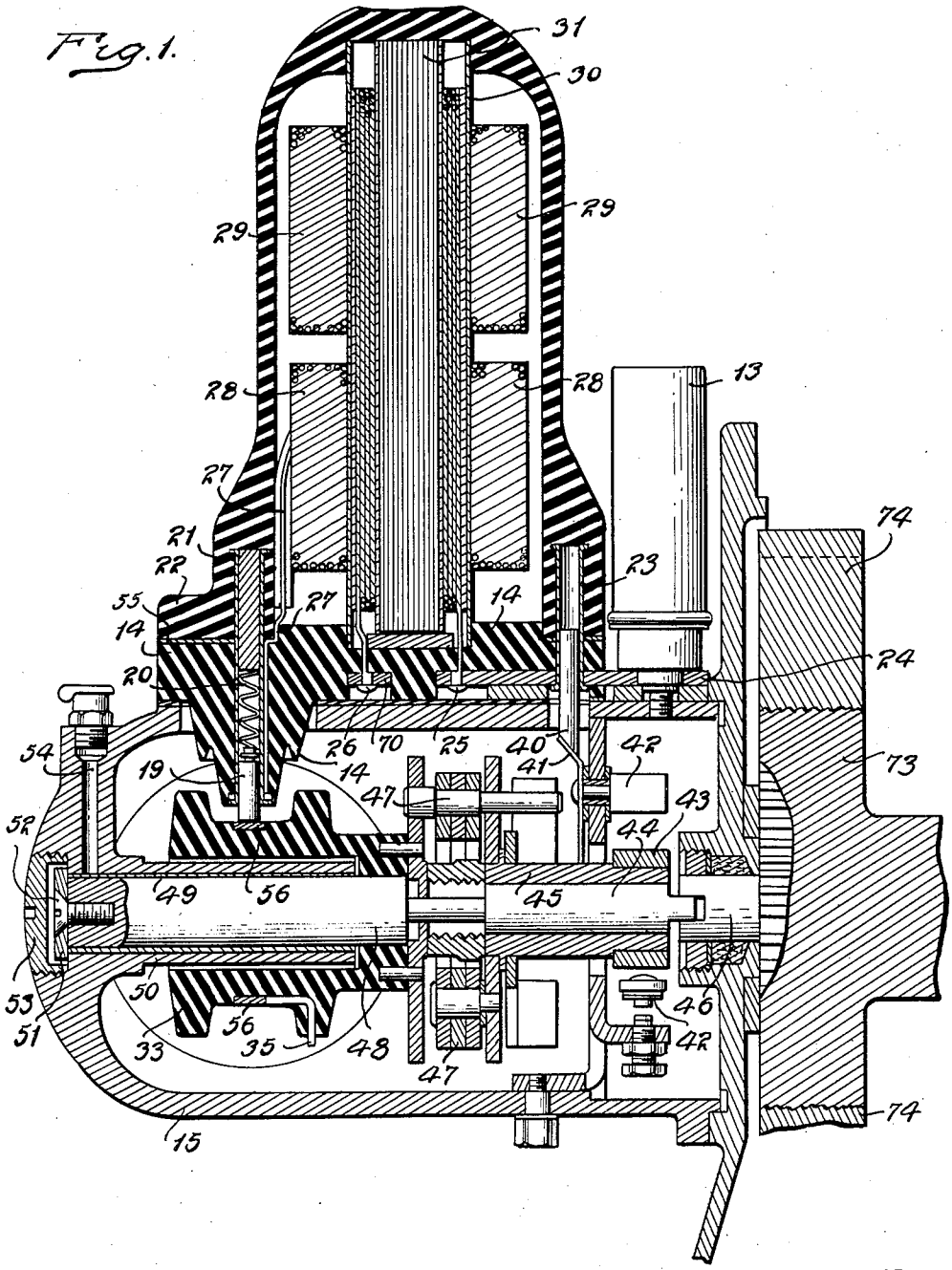
Oct. 9, 1934. M. MALLORY 1,976,178

IGNITION COIL AND DISTRIBUTOR ASSEMBLY

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Fig. 1.



INVENTOR.
MARION MALLORY.
BY
ATTORNEY.

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Fig. 2.

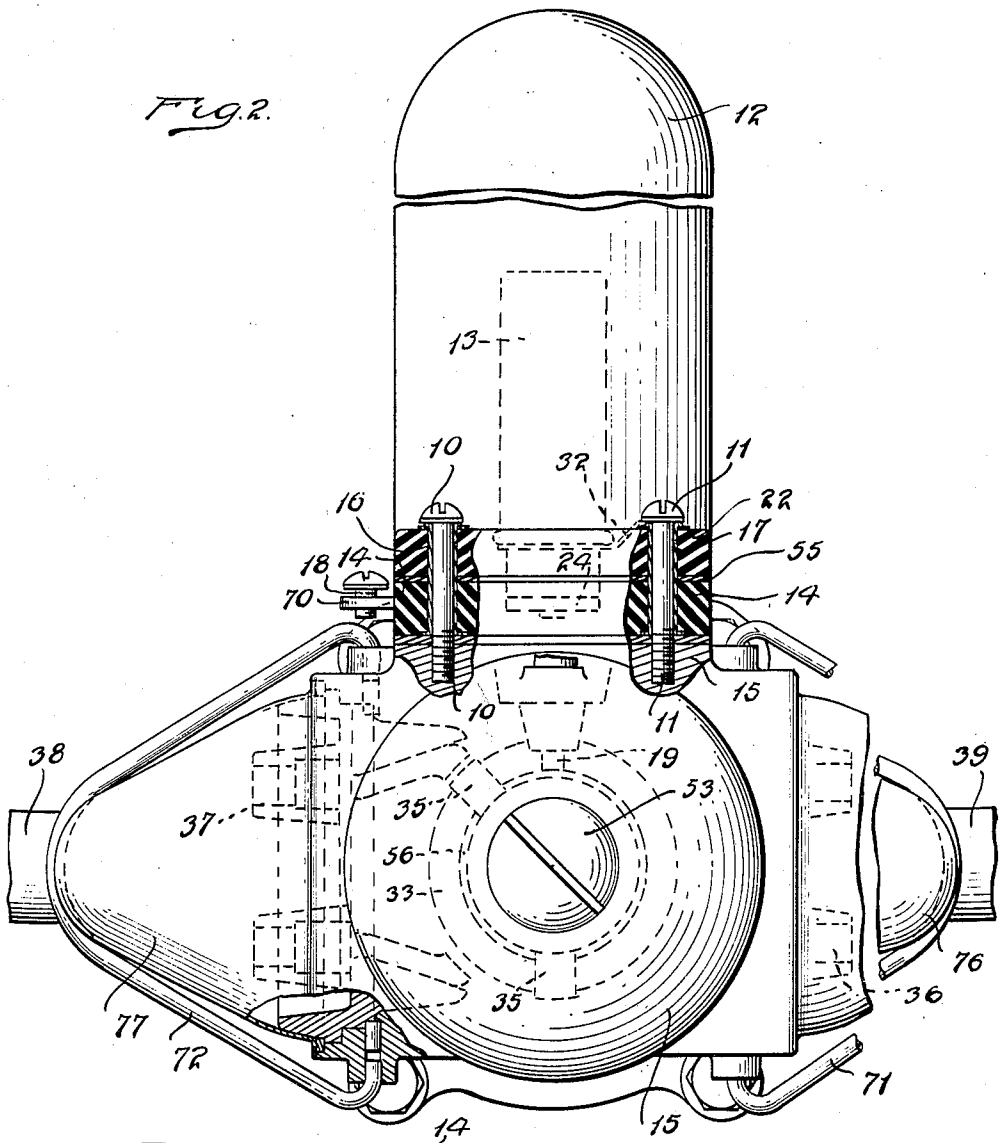
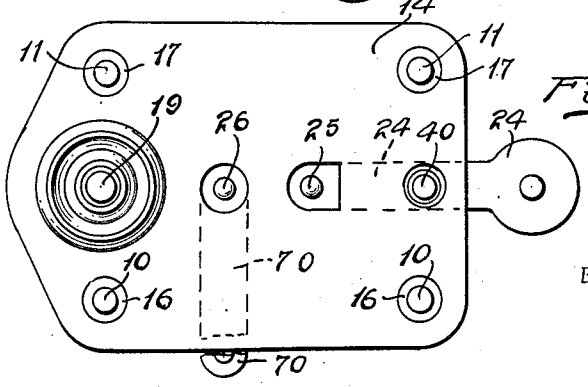


Fig. 3.



INVENTOR.
MARION MALLORY.
BY
ATTORNEY.

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IGNITION COIL AND DISTRIBUTOR ASSEMBLY

Marion Mallory, Detroit, Mich., assignor to Mallory Research Company, Toledo, Ohio, a corporation of Delaware

Application January 4, 1934, Serial No. 705,241

11 Claims. (Cl. 123—148)

The object of this invention is to solve the problem of attaching a coil to a combined distributor of high tension and circuit breaker for low tension electricity for an internal combustion engine, so that the coil may be attached and removed with the least possible number of operations and so that the action of attaching the coil to the distributor automatically connects both the high and low tension circuits of the coil to the high tension distributor and to the low tension circuit breaker, and the removal of the coil automatically breaks these connections.

An additional problem is to provide for the location of the condenser, which is required to protect the circuit breaker points.

Fig. 1 shows the distributor, circuit breaker, coil and condenser in cross-sectional elevation.

Fig. 2 shows the distributor in elevation as viewed from the left of Fig. 1 with a partial section to illustrate the means for attaching the coil to the distributor.

Fig. 3 is a plan view looking up on the bottom of the coil.

In the figures:—

10 and 11 are the screws for holding the coil assembly 12, the base of the condenser 13, and the coil base 14 to the distributor housing 15. (Fig. 1.)

Two tubular rivets 16 and 17 surround the screws 10 and 11, and a primary terminal 70 for the coil 12 is molded into the base 14 and receives a binding screw 18. A high tension carbon brush terminal 19 and its spring 20 is guided in a tubular rivet 21, which tube extends from the outer housing 22 of the coil 12 to and through the coil base 14. A fourth tubular rivet 23 serves to hold support 24 for the condenser 13, and is, of course, connected to the primary circuit 25—26 of the coil 12. In a similar manner, the high tension carbon brush 19 is connected through the tube 21 with the high tension turns 27, 28, 29 of the coil assembly 12. It will be noted that the low tension turns 30 surround the laminated core 31. Now, the tube 17 also acts as a ground connection for the condenser 13 through the wire 32. The case 15 constitutes the ground for the screws 11. All these tubes (Fig. 1) 16, 17, 21 and 23 are of metal and are spun over at their ends so as to be securely anchored in the coil casing 22, which is of molded insulated material (Bakelite) which is poured into a mold in which these four tubes are inserted.

33 is the distributor, itself, also made of molded insulated material (Bakelite) with a collector ring 56, having high tension terminals 35, which distribute the current to the high tension cables 38—39, which are connected to the discs 36—37.

Inside the tube 23 is fastened the conductor 40, which is the low tension terminal for the coil 12 and corresponds to the high tension terminal 19. A flat spring contact 41 connects a conductor 40 with the circuit breaker 42, which is of a well known type and need not be described in detail. This circuit breaker is operated by a cam 43 mounted on a sleeve 45, in its turn mounted on a shaft 44, which is driven by the engine cam shaft 46. The sleeve 45 and cam 43 are driven from the shaft 46 and 44 by the governor 47, and the details of which are no part of this invention.

The shaft 48 is an extension of the shaft 46—44, and on shaft 48 is mounted the distributor 33. A bearing 49 on a projection 50 serves to maintain the shaft 48 and the distributor 33 reasonably concentric within the casing 15. A washer 51 retained by the screw 52 retains the shaft 48 from endwise play. A plug 53 conceals the washer 52 and serves to retain the lubricant admitted through the duct 54 to the bearing 49.

It is obvious from an examination of the construction thus provided that both the high and low tension terminals 19 and 40 are automatically made and broken whenever the coil 12 is bolted to or removed from the distributor casing 15. Further, when the base 14 is assembled with the coil casing 22, the tubular rivets 16, 17, 21 and 23 are spun over so as to clamp the condenser base 24 to the coil base 14, and the coil base 14 to the coil case 22. A coil sealing gasket 55 may be permitted to make a tight job of the operation of riveting up the coil with its base 14.

The low tension circuit is as follows:—

The current enters from an ammeter to an ignition switch, and then through a resistance unit (not shown) to the terminal 70, (Fig. 2) which is provided with a screw 18 so that the low tension wire can be securely held in contact therewith. The terminal 70 is moulded into the base 14 of the coil 12. The current then flows to the terminal 26 (Fig. 1) of the low tension winding 30. The current leaves the low tension winding at 25 (Fig. 1) and flows through the conducting piece 24, also moulded into the base 14. The current then flows to the condenser 13; one side of which is grounded through the conductor 32 (see Fig. 2) to the screw 11, which grounds the condenser into the base 15. The other side of the condenser is grounded intermittently through the circuit breaker 32 as follows:—

Current flows through the conductor 24 to the rivet 23, thence through the conductor 40, to a spring connection 41, which delivers the current to the circuit breaker 42.

The engine cam shaft 46 is driven by the gear 73, which is provided with teeth 74 molded thereon. The high tension discs 36—37 are protected by the covers 77 and 76 which are held in place by means of the bails 72 and 71.

What I claim is:—

1. In a combined high tension distributor, low tension circuit breaker, coil and condenser, a casing containing the distributor and circuit breaker, a coil base carrying the coil and condenser, means for mechanically connecting the base to the case comprising a tubular rivet adapted to clamp the base to the coil, a screw bolt adapted to pass through the tubular rivet and to bolt coil and base to the said casing.

2. In a combined high tension distributor, low tension circuit breaker, coil and condenser, a casing containing the distributor and circuit breaker, a coil base carrying the coil and condenser, means for mechanically and electrically connecting the base to the casing comprising a tubular rivet adapted to clamp the base to the coil, a screw bolt adapted to pass through the tubular rivet to bolt the coil and base to the said casing, a second tubular rivet also adapted to bolt the base to the coil, a high tension terminal in the coil connected to said rivet, a yieldable means mounted inside said rivet constitutes a brush for the high tension discharge from said coil, a collector ring on said distributor adapted to engage with said brush.

3. In a combined high tension distributor, low tension circuit breaker, coil and condenser, a casing containing the distributor and circuit breaker, a coil base carrying the coil and condenser, means for mechanically and electrically connecting the base to the casing comprising a tubular rivet adapted to clamp the base to the coil, a screw bolt adapted to pass through the tubular rivet to bolt the coil and base to the said casing, a coil, a high tension terminal in the coil connected to said rivet, a yieldable means mounted inside said rivet constitutes a brush for the high tension discharge from said coil, a collector ring on said distributor adapted to engage with said brush, a third tubular rivet mounted in said coil and passing through said base, a low tension terminal in the coil connected to said rivet, a terminal mounted within said rivet, yieldable means for connecting said terminal with the said circuit breaker.

4. In a combined high tension distributor, low tension circuit breaker, coil and condenser, a casing containing the distributor and circuit breaker, a coil base carrying the coil and condenser, means for mechanically and electrically connecting the base to the casing comprising a tubular rivet adapted to clamp the base to the coil, a screw bolt adapted to pass through the tubular rivet to bolt the coil and base to the said casing, a second tubular rivet mounted in said coil and passing through said base, a low tension terminal in the coil connected to said rivet, a terminal mounted within said rivet, yieldable means for connecting said terminal with the said circuit breaker.

5. In a combined high tension distributor, low tension circuit breaker, coil and condenser, a casing containing the distributor and circuit breaker, a coil base carrying the coil and condenser, inserts moulded in said base and connected to said condenser and to said coil, means for clamping the base to the coil and for clamping both to the casing.

6. In a combined high tension distributor low tension circuit breaker, coil and condenser, a casing containing the distributor and the circuit breaker, a coil housing made of insulating material, a coil base also made of insulating material, a plurality of tubular rivets moulded into said coil housing and passing through and riveted to said base, a screw bolt adapted to pass through one of said rivets, a high tension terminal located in one of said rivets and a low tension terminal located in one of said rivets, said terminal being connected to the low and high tension circuits of said coil, said terminals being adapted to contact with said distributor and circuit breaker.

7. In a combined high tension distributor, low tension circuit breaker, coil and condenser, a casing containing the distributor and circuit breaker, a coil housing of molded insulating material, a coil base made of moulded insulating material, a metal insert in said base adapted to act as a support for an electrical connector to said condenser, a tubular rivet passing through said metal insert and said base and extending in and embedded in said coil housing, a primary terminal to said coil connected to said insert, a low tension terminal located inside said tubular rivet, means for clamping said coil and housing and coil base to said casing, means for electrically connecting said coil and condenser to said circuit breaker, means for grounding said condenser to said casing.

8. An ignition coil and base therefore comprising a coil casing of moulded insulating material, a coil therein having one high and two low tension terminals, a separate base also of moulded insulating material, a high tension brush holder moulded therein, a high tension brush mounted in said holder, two low tension terminals also moulded into said moulded base, one of said terminals projecting from said base to form a low tension connection for the outside source of current, the other terminal projecting therefrom to form a support for a condenser.

9. An ignition coil and base therefore comprising a coil casing of moulded insulating material, a coil therein having one high and two low tension terminals, a separate base of moulded insulating material, hollow rivets moulded into said coil casing and riveted to said base, a low tension terminal mounted in one of said hollow rivets, a high tension brush mounted in another, said rivets being connected to the low and high tension circuits of said coil.

10. An ignition coil and base therefore comprising a coil casing of moulded insulating material, a coil therein having one high and two low tension terminals, a separate base of moulded insulating material, hollow rivets moulded into said coil casing and riveted to said base, a condenser support moulded into said base and making an electrical contact with one of said rivets and with one of the low tension terminals of said coil, a low tension terminal mounted in said rivet, a high tension brush mounted in another rivet, said rivet being connected to the high tension terminal of said coil, means for admitting electricity to the other low tension terminal of said coil.

11. An ignition coil and base therefore comprising a coil casing of moulded insulating material, a coil therein having one high and two low tension terminals, a separate base also of moulded insulating material adapted to be riveted to said coil casing, a high tension brush support moulded into said base, two low tension terminals moulded into said base, one of said low tension terminals being adapted also to serve as a condenser support.

MARION MALLORY.