Feb. 2, 1926. 1,571,638

O. N. OLSON

SPARK COIL TERMINAL

Filed Jan. 12, 1925

Fig. 1

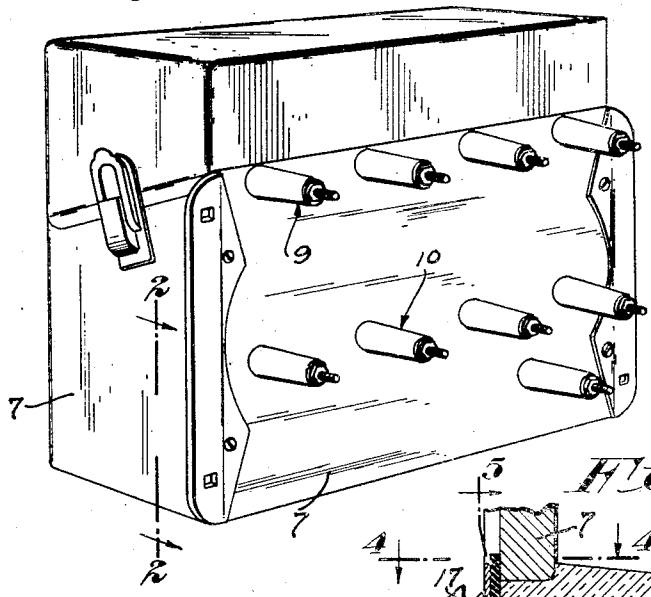


Fig. 5

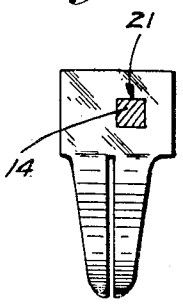


Fig. 3

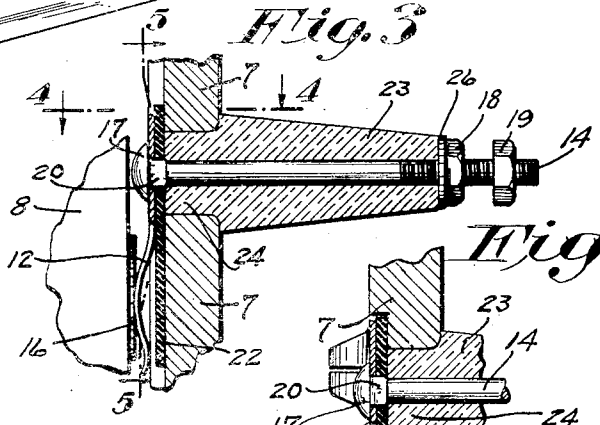


Fig. 4

Fig. 2

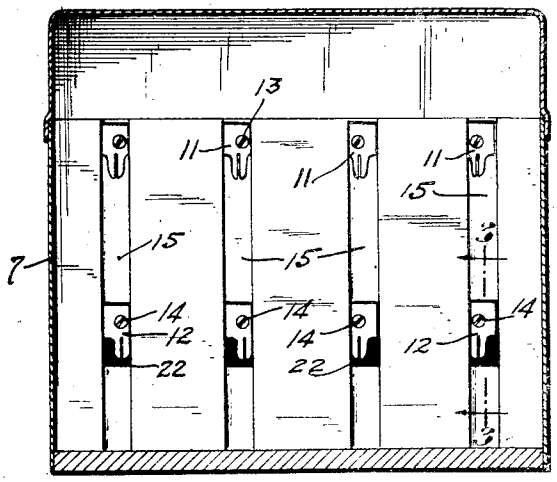
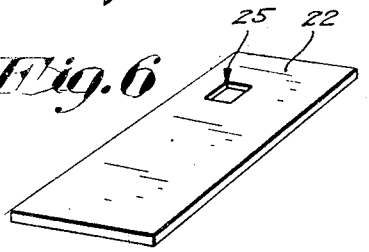


Fig. 6



Inventor

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UNITED STATES PATENT OFFICE.

OLE N. OLSON, OF CHICAGO, ILLINOIS.

SPARK-COIL TERMINAL.

Application filed January 12, 1925. Serial No. 1,942.

To all whom it may concern:

Be it known that I, OLE N. OLSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spark-Coil Terminals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to improve the insulation for the spark coil terminals used in the ignition system of Ford automobiles.

To the above end, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a perspective view of a spark coil box of the type used in the ignition system of a Ford automobile and has the invention embodied therein;

Fig. 2 is a view principally in vertical section taken on the line 2—2 of Fig. 1;

Fig. 3 is a detail view principally in section, taken on the line 3—3 of Fig. 2, on an enlarged scale, and also showing a fragment of one of the spark coils;

Fig. 4 is a fragmentary detail view, principally in section, taken on the line 4—4 of Fig. 3;

Fig. 5 is a face view of one of the spring finger contacts with its terminal bolt sectioned on the line 5—5 of Fig. 3; and

Fig. 6 is a perspective view of one of the insulating plates.

Of the parts of the standard equipment of the ignition system of a Ford automobile illustrated, the numeral 7 indicates the box for the four spark coils 8, only one of which is shown, and the numerals 9 and 10 indicate, respectively, as entireties the primary terminals and secondary terminals. The entire box 7 and its cover are formed from sheet metal with the exception of the back of the body of said box which is of wood and has mounted thereon the terminals 9 and 10.

These terminals 9 and 10 have spring finger contacts 11 and 12, respectively, held in position by terminal bolts 13 and 14, respectively, which extend through bores in the back of the box 7. There are four primary terminals 9 arranged in a horizontal row, and a like number of secondary terminals 10 correspondingly arranged and located directly below said primary terminals. In the inner face of the back of the box 7 are formed four vertical channels 15 in which the contact fingers 11 and 12 lie and are free to yieldingly move toward and from said back. The contact fingers 12 yieldingly engage secondary contacts 16 on the spark coils 8, only one of which is shown.

The terminal bolts 14 have on their inner ends, heads 17, and applied to their outer end portions are jam nuts 18 and binding nuts 19 which have screw-threaded engagement therewith. These pairs of nuts 18 and 19 co-operate in securing the secondary terminal cables, not shown, to the terminal bolts 14. The bodies of the terminal bolts 14, adjacent to their heads 17, are formed square in cross section, as indicated at 20, and extend through correspondingly formed holes 21 in the bodies of the contact fingers 12.

Primarily, the terminal bolts 14 extend through bores of substantially the same diameters in the wooden back of the box 7, and have direct contact therewith, and insulating sleeves are mounted on the terminal bolts 14 and extend between the outer face of the back of the box 7 and the jam nuts 18. The heads 17 of the bolts 14 to hold the bodies of the contact fingers 12 clamped on the bottoms of the channels 15 and in direct contact with the wooden back of the box 7.

By reference to Fig. 2, it is important to note that the terminal bolts 13 and 14 do not extend through the wooden back of the box 7 at the transverse centers of the channels 15. The terminal bolts 13 and 14, in the two right-hand channels 15, are offset to the left from the transverse centers of said channels; and the bolts 13 and 14, in the two left-hand channels 15, are offset to the right from the transverse centers thereof.

It has been found that there is considerable and sometimes entire leakage of the high tension current, intended for the spark plugs in the ignition system of a Ford automobile, from the high tension contact fingers 12 and terminal bolts 14 to the wooden back of the box 7 with which they directly engage. This leakage, of course, is greater in

wet or damp weather and causes a weak spark, missing of explosion in the cylinders, fouling of the spark plugs and irregular running of the engine.

To overcome this deficiency in an ignition system of the type referred to, I provide reversible insulating plates 22 of fibre or other suitable insulating material to be interposed between the contact fingers 12 and the wooden back of the box 7, and insulating sleeves 23 having on their inner ends reduced bushings 24 to take the place of the insulating sleeves heretofore referred to. These insulating sleeves 23 and their bushings 24 are integrally formed from porcelain or other suitable insulating material. Each insulating plate 22 has formed in its upper end portion a square hole 25 offset from the transverse center thereof and of the same size as the holes 21 so as to receive the square body portion 20 of the respective terminal bolt 14.

In embodying my invention in the secondary terminals 10, the original insulating sleeves are removed from the terminal bolts 14 and said bolts removed from the wooden back of the box 7 to permit the insulating plates 22 to be applied to said bolts. The bores in the wooden back of the box 7 are then rebored to a size to receive the bushings 24. The terminal bolts 14 are then reinserted through the enlarged bores in said back, and the insulating plates 22 and contact fingers 12 placed in the channels 15 with said insulating plates resting on the bottom of said channel to insulate the contact fingers 12 from said wooden back. The insulating sleeves 23 are then applied to the terminal bolts 14 and said bushings 24 inserted in the bores in the wooden back of the box 7. The nuts 18 and 19 are then reapplied to the terminal bolts 14 in their proper order, and fibre washers 26 are interposed between the nuts 18 and the outer ends of the insulating sleeves 23.

Under the tightening action of the jam nuts 18, the co-operating pairs of contact fingers 12 and insulating plates 22 are clamped together and onto the bottom of the channels 15 by the bolt heads 17 and afford bases of resistance for said bolts. This same tightening action of the jam nuts 18 tightly presses the inner ends of the insulating sleeves 23 onto the outer face of the wooden back of the box 7 and the inner ends of the bushings 24 against the insulating plates 22. Before the secondary terminals 10 are reassembled, the longitudinal edge portions of the contact fingers 12 are trimmed so that they do not engage the sides of the channel 15.

Obviously, the angular engagement between the contact fingers 12 and the insulating plates 22 with the squared body portions 20 of the terminal bolts 14, positively holds the cooperating pairs of said contact fingers 12 and insulating plates 22 in assembled relation. Also the engagement of the insulating plates 22 with the sides of the channels 15 holds said plates from edgewise movement and in turn they hold the terminal bolts 14 from turning. It is, of course, understood that the angular engagement between the contact fingers 12 and the insulating plates 22 with the body portion 20 of the terminal bolts 14 may take various different forms.

It is important to note that the terminal bolts 14 from the secondary contact fingers 12 to the jam nuts 18 are entirely encased and insulated from the wooden back of the box 7 by the insulating plates 22, sleeves 23 and bushings 24. As the bushings 24 are integrally formed with the insulating sleeves 23, there is no chance for water or moisture to work therebetween to the terminal bolts 14, and as previously stated, the jam nuts 18 press the inner ends of the insulating sleeve 23 against the outer face of the wooden back of the box 7 with such force as to form a moisture-proof joint therebetween.

What I claim is:

1. The combination with a spark coil and a box having in the inner face of one of its sides channels and terminal bolt holes extending through the bottom of said channels, said holes being located transversely off center in one direction in certain of said channels and in an opposite direction in the other channels, and reversible duplicate insulating plates adapted to be laid in said channels, each of said plates having a terminal bolt hole that is off center, and arranged to be brought into alignment with the holes in the bottoms of the channels.

2. The combination with a spark coil and a box having in the inner face of one of its sides channels and holes for terminal bolts having angular body sections, said holes extending through the bottoms of said channels and being located transversely off center in one direction in certain of said channels and in an opposite direction in the other channels, and reversible duplicate insulating plates adapted to be laid in said channels and held thereby against transverse edgewise movement, each of said plates having a terminal bolt hole that is off center and arranged to be brought into alignment with the holes in the bottoms of said chamber, the holes in the insulating plates being of such shape as to receive the angular body portions of said bolts and hold the same from turning.

3. The combination with a spark coil and box therefor, of a terminal for the spark coil including a bolt extending through a bore in one of the sides of the box, a contact finger applied to the inner end of the bolt, an insulating plate interposed between the contact finger and the respective side of the box, said contact finger and insulating plate having

coincident holes from which the bolt projects and with which they have angular interlocking engagement to positively hold the contact finger and insulating plate in assembled relation on the bolt, and an insulating sleeve on the outer end of the bolt having on its inner end a reduced bushing extending through said bore to the insulating plate.

4. The structure defined in claim 3 in further combination with means on the box for holding the insulating plate from edgewise movement.

5. The combination with a spark coil and box therefor, of a terminal for the spark coil including a bolt extending through a bore in one of the sides of the box and having a headed inner end, a nut having screw-threaded engagement with the outer end portion of the bolt, a contact finger applied to the inner end of the bolt, an insulating plate interposed between the contact finger and the respective side of the box, said contact finger and insulating plate having coincident holes through which said bolt projects and with which they have angular interlocking engagement to positively hold the contact finger and insulating plate in assembled relation and from turning on the bolt, and an insulating sleeve on the bolt between the nut and the box and having on its inner end a reduced bushing extending through said bore to the insulating plate.

6. The structure defined in claim 5 in which said box has in its inner face a channel in which said insulating plate lies and is held thereby against edgewise movement.

7. The combination with a spark coil and a box therefor said box having in the inner face of one of its sides vertical channels, a bore extending through the respective side of the box from the bottom of each of said channels, certain of said bores being offset to the right from the transverse centers of the respective channels and certain others of said bores being offset to the left from the transverse centers of the respective channels, bolts extending through said bores and having headed inner ends, nuts having screw-threaded engagement with the outer end portions of the bolts, contact fingers applied to the inner ends of the bolts, insulating plates interposed between the contact fingers and respective side of the box and which lie in said channels, said contact fingers and insulating plates having coincident holes through which the bolts project and with which they have angular interlocking engagement to positively hold the contact fingers and insulating plates in assembled relation and from turning on the bolts, said insulating plates being held by the channels against edgewise movement, the holes in the insulating plates being offset from their transverse centers, whereby they may be reversed and used in any one of the channels, and insulating sleeves on the bolts between the nuts and box and having on their inner ends reduced bushings extending through said bores to the insulating plate.

In testimony whereof I affix my signature.

OLE N. OLSON.