Sept. 24, 1963 A. S. OLSEN 3,104,658

IGNITION SYSTEM COVERING

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Fig. 1

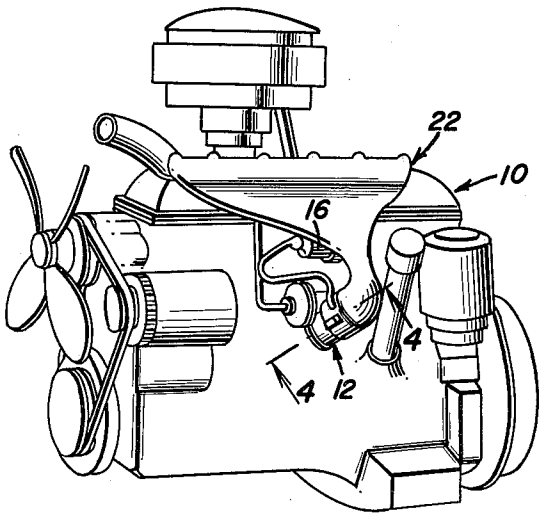


Fig. 2

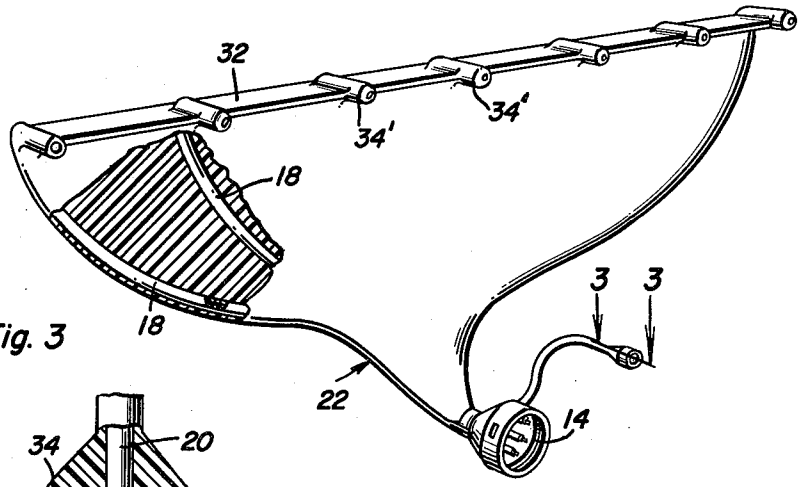
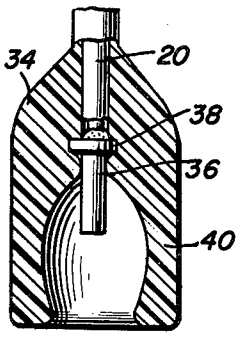


Fig. 3



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Fig. 5

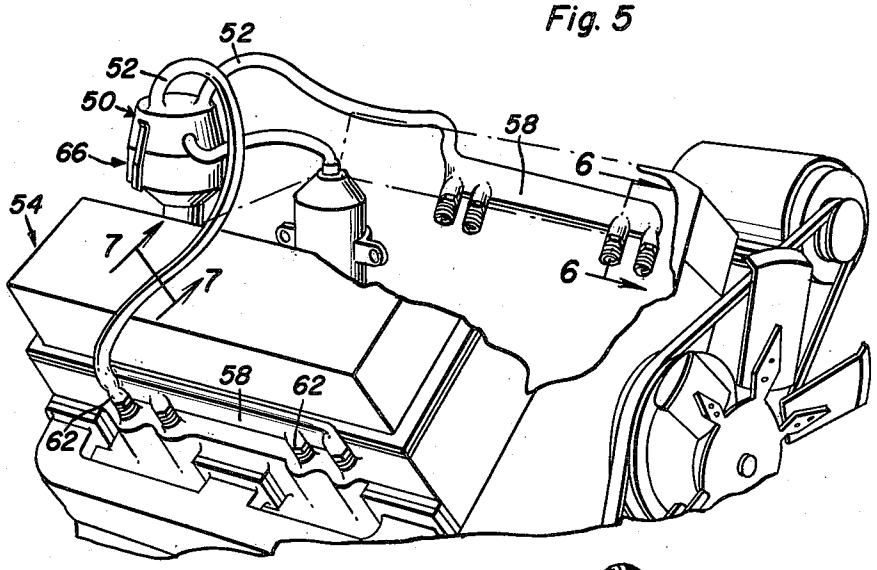


Fig. 6

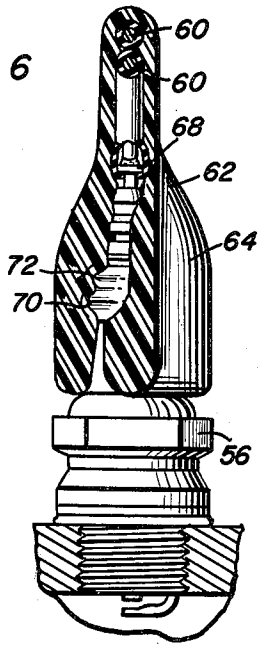


Fig. 4

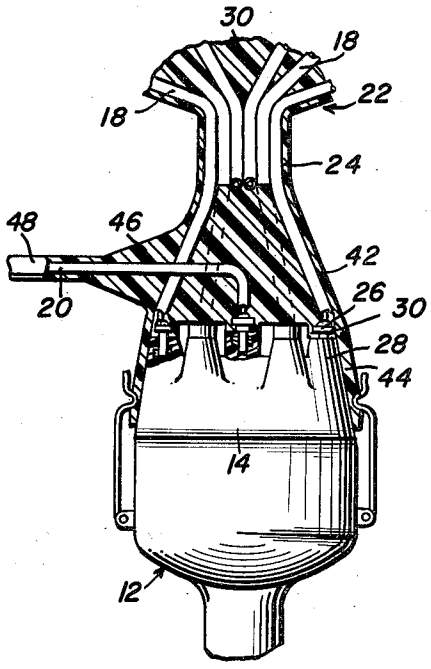
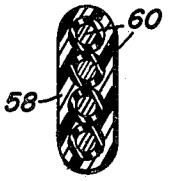


Fig. 7



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United States Patent Office 3,104,658 Patented Sept. 24, 1963

3,104,658

IGNITION SYSTEM COVERING

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Filed Oct. 4, 1961, Ser. No. 142,848
3 Claims. (Cl. 123—148)

This invention relates to a novel and useful ignition system covering and more specifically to an ignition system covering adapted to be constructed in a manner to form a one-piece replacement unit of an ignition system distributor cap, a plurality of spark plug wires each operatively connected at one end to an appropriate terminal in the cap, and a coil wire operatively connected at one end to an appropriate terminal in the distributor cap.

The ignition system covering of the instant invention is specifically designed to provide a replacement unit for portions of an internal combustion engine ignition system which need to be replaced as a portion of the normal upkeep of an internal combustion engine. In this manner, the owner of the internal combustion engine may with little difficulty replace the distributor cap, coil and spark plug wires and the spark plugs of an internal combustion engine.

In many instances when a non-skilled mechanic attempts to replace the distributor cap, spark plug and coil wires and the spark plugs of an internal combustion engine the timing of the internal combustion engine is changed resulting from the mechanic not properly connecting the terminals of the distributor cap to the designated spark plugs by means of the spark plug wires. If any of the spark plug wires are crossed, at least two of the spark plugs will fire out of time and this of course results in poor and rough operation of the internal combustion engine. Most vehicle owners who attempt to make minor repairs to the internal combustion engines of their vehicles do not know the proper firing order of the cylinders of the internal combustion engine nor do they know an effective manner of determining the correct positioning of the distributor cap on a distributor. Although most distributor caps are provided with means for properly orientating the cap relative to the distributor, these orientating means can be overlooked and it is possible to secure the distributor cap to its associated distributor in reverse position.

The ignition system covering of the instant invention is also constructed in a manner whereby the covering itself acts as a wiring harness and thereby normally resiliently retains the spark plug wires in proper orientation to each other and in a given pattern to properly route the spark plug wires from the distributor to the spark plugs.

The ignition system covering of the instant invention covers substantially all of the exposed surfaces of the distributor cap and the coil and spark plug wires and defines resilient socket means at the ends of the coil and spark plug wires remote from the distributor cap for embracingly engaging the correct terminals of the coil and spark plugs of an internal combustion engine. In this manner, even the most unskilled mechanic may readily change the distributor cap and coil and spark plug wires of a vehicle ignition system without running a chance of the spark plugs being crossed and the timing of certain of the spark plugs being other than that which is proper.

The main object of this invention is to provide a waterproof ignition system covering for the distributor cap and coil and spark plug wires of an internal combustion engine which will substantially eliminate all possibility of the ignition system failing because of moisture entering the distributor cap or water shorting out the spark plugs.

A further object of this invention, in accordance with the immediately preceding object, is to provide an ignition system covering which will enable easy replacement of the distributor cap and coil and spark plug wires of an internal combustion engine without danger of any of the spark plug wires being crossed.

A further object of this invention is to provide an ignition system covering which will itself act as a wiring harness and properly route the spark plug wires from the distributor cap to the spark plug wires of an internal combustion engine.

A final object of this invention to be specifically enumerated herein is to provide an ignition system covering which will conform to conventional forms of manufacture, be of simple construction and easy to install so as to provide a device that will be economically feasible, long lasting and relatively trouble-free for the unskilled mechanic to use in replacing the effected component parts of a vehicle ignition system.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of a conventional form of internal combustion engine shown with the ignition system covering of the instant invention operatively mounted thereon;

FIGURE 2 is an enlarged perspective view of the ignition system covering with parts thereof being broken away and shown in section;

FIGURE 3 is an enlarged fragmentary sectional view taken substantially on the plane indicated by section line 3—3 of FIGURE 2;

FIGURE 4 is an enlarged fragmentary sectional view taken substantially upon the plane indicated by the section line 4—4 of FIGURE 1;

FIGURE 5 is a fragmentary perspective view of a further and different type of internal combustion engine shown with a modified form of the ignition system covering operatively connected thereto;

FIGURE 6 is an enlarged fragmentary sectional view taken substantially upon the plane indicated by section line 6—6 of FIGURE 5; and

FIGURE 7 is an enlarged sectional view taken substantially upon the plane indicated by section line 7—7 of FIGURE 5.

Referring now more specifically to the drawings the numeral 10 generally designates a conventional form of internal combustion engine which is provided with one bank of cylinders and has a plurality of spark plugs servicing those cylinders and disposed in a straight line. The internal combustion engine 10 includes a distributor generally referred to by the reference numeral 12 and a distributor cap 14. The engine 10 also includes a coil 16 and a plurality of spark plug wires 18 extend between the distributor cap 14 and the spark plugs (not shown). Additionally, a coil wire 20 extends between the distributor cap 14 and the coil 16.

With attention now directed to FIGURES 2 through 4 of the drawings it will be noted that the covering of the instant invention is generally designated by the reference numeral 22 and is of one piece construction. The covering 22 may be constructed of any flexible and somewhat resilient waterproof material such as neoprene.

The covering 22 includes a first portion 24 which is flexible and is relatively thin and houses the portion of the spark plug wires 18 adjacent but slightly spaced from the distributor cap 14. Each of the ends of the spark plug wires 18 adjacent the cap 14 is provided with a terminal member 26 which is snugly received in an appropriate socket 28 formed in the distributor cap 14. The terminal member 26 includes a diametrically enlarged por-

tion 30 and each of the terminal members 26 is secured within the corresponding socket 28 formed in the distributor cap 14. The first portion 24 of the covering 22 is flexible and thus the distributor cap 14 may be orientated a limited amount relative to the remainder of the covering 22.

A second portion or plate 30 of the covering 22 is generally trangular or fan-shaped and the spark plug ends of the spark plug wires 18 extend through the second portion 30 of the covering 22 in fan-like manner. The end of the covering 22 remote from the distributor cap 14 has a straight rib-like and relatively thick reinforcing member or bracing member comprising a flange 32 formed integrally therewith and this bracing member 32 projects laterally from the second portion 30 of the covering 22. The second portion 30 and the bracing member 32 are constructed of thick enough material in order to stiffen the covering 22 throughout these portions and the bracing member 32 includes enlarged bracing portions in the form of sleeves 34' through which the ends of the spark plug wires 18 remote from the distributor cap 14 extend. The ends of the spark plug wires 18 remote from the distributor cap 14 are also provided with terminal members (not shown) in the sleeves 34' for engagement with the spark plugs.

It will be noted that the covering 22 includes a generally cup-shaped socket or base portion 42 on the apex of the portion 30 which extends between the flexible portion 24 and the distributor cap 14. This base portion is heavily constructed and is stiff in comparison to both the first and second portions 24 and 30. The socket or base portion 22 includes a skirt portion 44 which encloses substantially all of the outer surfaces of the distributor cap 14 and the base portion 42 also includes a lateral extension 46 through which the coil wire 20 projects. The lateral extension 46 terminates at its outer end in a flexible portion 48 of the covering 22 which extends to the free end of the coil wire 20. With attention now directed to FIGURE 3 of the drawings it will be noted that the portion 48 is provided with a bracing portion 34 and that the end of the coil wire 20 remote from the distributor cap 14 includes a terminal member 36 provided with a diametrically enlarged portion 38. The bracing portion 34 also includes a flexible portion 40 adapted for embracing engagement with the terminal of the coil 16.

With attention now directed to FIGURES 5 through 7 of the drawings there will be seen a modified form of covering generally referred to by the reference numeral 50 which is substantially identical to the covering 22 with the exception that there are two flexible first portions 52 provided. The internal combustion engine for which the covering 50 is specifically adapted is generally referred to by the reference numeral 54 and includes two banks of spark plugs 56. The spark plugs 56 of each bank are disposed in a straight line and the second stiff portion of the covering 50 includes a pair of bracing members 58 each of which has four spark plug wires 60 passing therethrough. The second portions 58 also include bracing portions similar to bracing portions 34 which are referred to by the reference numeral 62 and which are laterally directed away from the bracing member 58. The spark plug end of the corresponding spark plug wire 60 extends through each of the bracing portions 62 and each bracing portion 62 also includes a flexible portion 64 adapted to embracingly engage the free end of the associated spark plug 56.

With attention now directed to FIGURE 6 of the drawings it will be noted that the ends of the sprak plug wires 60 remote from the portion of the covering 50 adjacent the distributor 66 of the internal combustion engine 54 are each also provided with diametrically enlarged portions which are referred to by the reference numeral 68.

It is to be understood that the portion of the covering 50 disposed about the distributor cap (not shown) carried by the distributor 66 is substantially identical to the

base portion 42 of the covering 22 with the exception being that two flexible portions of the covering 50 extend from the distributor 66.

It may be observed from FIGURE 6 of the drawings that the flexible portions 64 are each provided with grooves 70 for receiving the ribs 72 of the spark plugs 56 and it is of course understood that the flexible end portions 40 carried by the cover 22 are also constructed in a manner to conform to the terminal of the coil 16 and the exposed ends of the associated spark plugs (not shown).

The coverings 22 and 50 are each constructed of any suitable flexible waterproof material such as neoprene as previously set forth in order that the covering will not be adversely affected by heat, acid, moisture, oils, grease, dust and dirt, etc. The coverings 22 and 50 form a one-piece replacement unit for numerous component parts of an internal combustion engine ignition system thereby enabling all of these component parts to be replaced at one time and without the possibility of certain of the spark plug wires of an internal combustion engine being crossed as a result of being replaced without sufficient care given to their proper positioning relative to each other. Additionally, the coverings insure double insulation and protection for the coil and spark plug wires about which they are disposed, the diametrically enlarged end portions 30, 38 and 68 provide means for interlockingly engaging the corresponding covering with opposite ends of the coil and spark plug wires to prevent these wires from shifting within and relative to the coverings.

The coverings 22 and 50 may each readily be formed by various methods such as injection, compression or cold molding and as these methods are conventional, it is not deemed to be necessary to discuss them further herein. However, it is to be noted that each of the coverings 22 and 50 is formed after all the wires, both the coil and spark plug wires are inserted in their proper positions in the corresponding distributor cap.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. An ignition system replacement unit for internal combustion engines of the type comprising a series of spark plugs and a distributor including a cap, said unit comprising a generally triangular, substantially stiff plate of insulating material, a generally cup-shaped socket on the apex of the plate for receiving the cap, a right-angularly extending flange integral with the base portion of the plate, elongated transverse sleeves integral with said flange, said sleeves lying in the plane of the flange and projecting from the free longitudinal edge thereof for receiving the spark plugs, and conductor wires embedded in the plate and extending between the socket and the sleeves for electrically connecting the distributor cap to the spark plugs, said plate including a flexible integral neck on its apex connecting the socket to said plate whereby said socket may be orientated to facilitate its application to the cap.

2. An ignition system replacement unit for internal combustion engines of the type including a series of spark plugs and a distributor comprising a removable cap having a plurality of outlet sockets, said unit including a generally triangular, essentially stiff plate of insulating material, a lateral, right angular flange integral with the base portion of the plate and extending the length thereof, elongated transverse sleeves formed integrally with the flange at longitudinally spaced points thereon, said sleeves lying in the plane of the flange and projecting from the

free longitudinal edge thereof for receiving the spark plugs, a socket on the apex portion of the plate for receiving the distributor cap, conductor wires embedded in the plate and extending from the second-named socket to the sleeves for electrically connecting the distributor to the spark plugs, a reduced, flexible, integral neck receiving the wires therethrough and connecting the socket to the plate whereby said socket may be readily orientated for application to the cap, and terminals in the second-named socket on one end of the conductor wires and engageable in the outlet sockets.

3. The combination of claim 2, said sleeves being

resilient and including circumferentially grooved inner walls conformable to the spark plugs and adapted to frictionally grip same.

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