

A. LOOMIS.
IGNITION APPARATUS FOR HYDROCARBON ENGINES.
APPLICATION FILED DEC. 27, 1907.

1,011,977.

Patented Dec. 19, 1911.

2 SHEETS-SHEET 1.

Fig. 1.

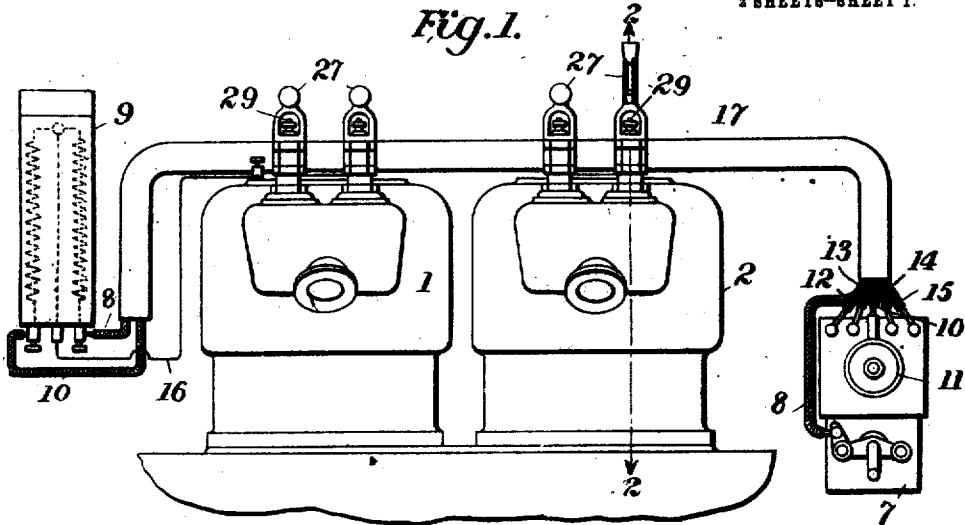


Fig. 2.

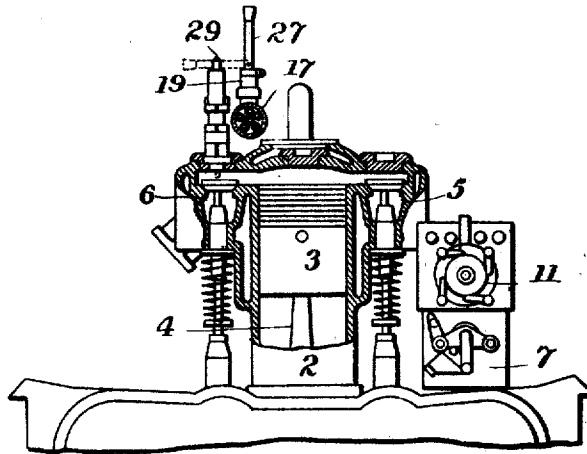
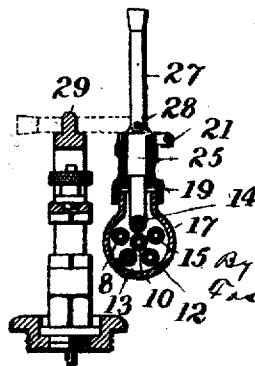


Fig. 3.



Witnesses

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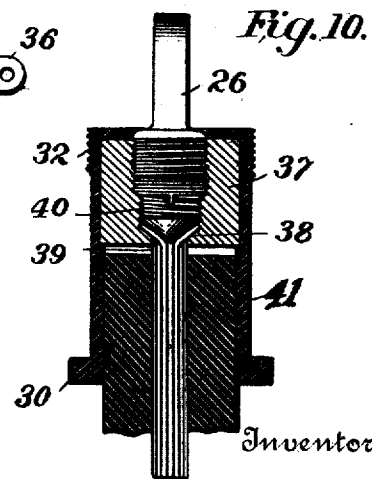
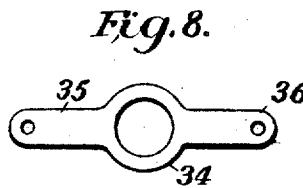
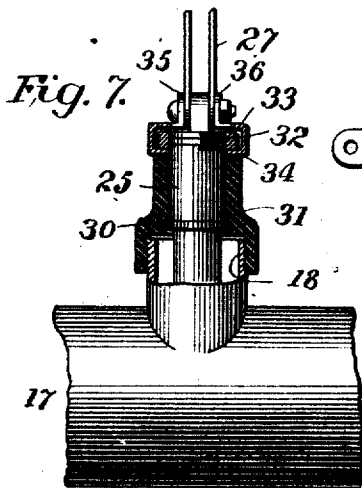
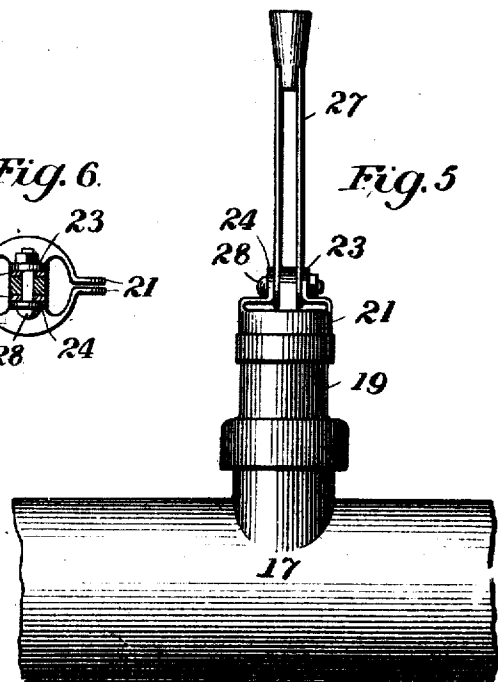
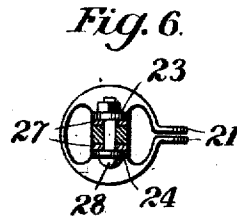
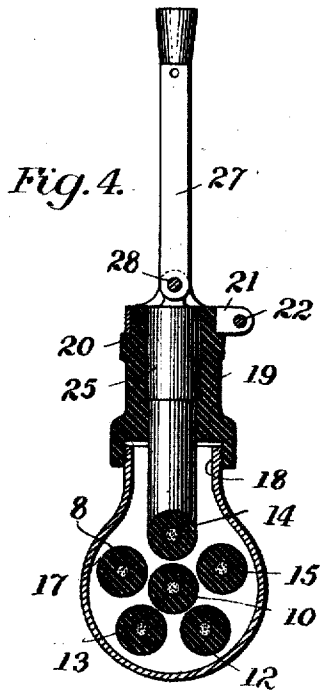
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2 SHEETS-SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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IGNITION APPARATUS FOR HYDROCARBON-ENGINES.

1,011,977.

Specification of Letters Patent.

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Application filed December 27, 1907. Serial No. 408,231.

To all whom it may concern:

Be it known that I, ALLEN LOOMIS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Ignition Apparatus for Hydrocarbon-Engines, of which the following is a specification.

This invention relates to improvements in the ignition apparatus of multiple cylinder hydrocarbon engines for motor vehicles. Its objects are to provide neat, convenient and compact means for housing and supporting the high tension conductors which supply current to the various spark plugs of the engine cylinders. To this end I employ a single tube for containing all of the conducting wires and provide convenient means for leading off the current from the various wires to the spark plug.

The invention will be understood from the following description taken in connection with the accompanying drawings.

In the drawings—Figure 1 is a side elevation of the cylinders of a four cylinder engine showing my invention applied thereto; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a detail partly in section showing a spark plug having my novel supporting means in proper position adjacent thereto; Figs. 4, 5 and 6 are enlarged detail views of the housing, terminal and switch; Figs. 7, 8 and 9 are detail views of a modification; and Fig. 10 is an enlarged view of the terminal which receives the end of a conducting wire.

In the drawings 1, 2 indicate two cylinder casings each comprising a pair of cylinders of a four cylinder hydrocarbon engine.

3 represents one of the pistons, 4 a connecting rod, 5 an exhaust valve, and 6 an inlet valve for the explosive mixture.

A magneto 7 suitably geared to be run by the engine supplies current for the ignition devices. The low tension current passes through a conductor 8 to a coil or transformer in box 9, and the high tension current passes through a conductor 10 to a distributor 11 driven by the engine, by means of which it is distributed to the several cylinders and the sparks properly timed. The current from the distributor passes to the cylinders through conductors 12 to 15 inclusive. The high and low tension circuits are completed through a ground wire 16

which connects the coil with the engine or other part of the machinery. The conducting wires above mentioned are insulated and all of them pass into a tube 17 which extends over the engine cylinders in proximity to the spark plug, and thus these wires are supported out of sight and in a very small space. The tube 17 may rest on the engine cylinders or may be supported in any suitable way. Opposite each spark plug the tube or housing 17 is provided with an opening surrounded by the screw threaded collar 18 formed integral with the tube. A holder 19 is secured to the collar 18 and this holder is preferably cylindrical in form and composed of insulating material such as hard rubber. In the form shown in Figs. 4 to 6 the outer surface of the holder is offset near its upper end forming a shoulder 20 upon which rests the split ring 21, the ends of which are adapted to be clamped together by a bolt 22 which binds the ring firmly upon the holder. This ring has perforated ears 23, 24 which extend upwardly and inwardly from the ring to form supports for the switch arm as hereafter described. The interior of the holder 19 is substantially cylindrical in shape and receives a terminal member 25 which makes contact with one of the conductors and which has upon its upper end an eye bolt 26 which has its opening in line with the openings in the ears 23, 24. A knife switch 27 has its two blades secured between the eye bolt 26 and the ears 23, 24 by the bolt 28 passing through the parts. As shown in Fig. 3 the housing and holder are in such position that the switch 27 is adapted to be brought down upon the ends of the spark plug 29 so as to complete the electrical connection between the conductor and the plug.

The form of the holder and terminal shown in Fig. 7 is slightly different from that of Fig. 4 in that the terminal here is composed of an outer cylindrical portion having a circumferential flange 30 near its bottom to engage a shoulder 31 formed on the interior of the holder 19, and this tube is also provided with screw threads 32 near its upper end. A nut 33, is adapted to be screwed on the threads 32, and a disk 34 is placed around said tube below the nut and is clamped between that nut and the top of the holder 19. This disk, as shown in Fig. 8, has side ears 35, 36 which are bent up over

the top of the terminal and into position adjacent the eye bolt 26 for the purpose of supporting the switch.

The interior construction of the terminal shown in Fig. 4 is the same as that shown in Fig. 7. As shown in Fig. 10 the terminal embodies the outer cylindrical casing 41 which is preferably composed of insulating material such as hard rubber, but which may be made of brass or other material. A cylindrical core 37 composed of brass or other conducting material fits within the upper part of the tube, and this core is provided with a central screw threaded opening which is preferably made of two diameters and the lower end of which is tapered as shown at 38. The opening through the tapered portion 38 is made of proper size to receive the end wires 39 of one of the conductors and it will be noted that the casing 41 is preferably of such size that the end of one of the conductors including the insulation thereon will fit within it. A short pointed screw 40 is inserted in the central opening of the core 37 and as shown operates to spread the ends of the wires composing the conductor 39 and hold them in close contact with the inclined surface 38 thus making good electrical connection between the conductor 39 and the core 37. The eye bolt 26 is screwed into the upper end of the core and therefore makes electrical connection therewith.

Having thus described my invention, what I claim is:

1. In an ignition system for hydrocarbon engines for motor vehicles, the combination with a plurality of engine cylinders, of a spark plug on each cylinder, a plurality of separate insulated conductors, a tube containing said conductors passing in proximity to said spark plugs and having an opening opposite each plug, a holder secured to said tube at each of said openings, a terminal member within each holder making electrical contact with one of the conductors, and pivoted switch arms supported by said holders in position to make contact with the spark plugs thereby making electrical connection between the terminals and plugs.

2. In an ignition system for hydrocarbon engines for motor vehicles, the combination with a plurality of engine cylinders, of a spark plug on each cylinder, a plurality of separate insulated conductors, a tube containing said conductors passing in proximity to said spark plugs and having an opening opposite each plug, a holder secured to said tube at each of said openings, a terminal member within each holder making electrical contact with one of the conductors, an eye bolt secured in said terminal member and extending above the top of the holder, a supporting ring secured to said holder and having perforated ears extending upon the sides of said eye bolt, and

a knife switch secured between said ears and eye bolt in position to engage a spark plug.

3. In an ignition system for hydrocarbon engines for motor vehicles, the combination with a plurality of engine cylinders, of a spark plug on each cylinder, a plurality of separate insulated conductors, a tube containing said conductors passing in proximity to said spark plugs and having an opening opposite each plug, a holder secured to said tube at each of said openings, a terminal member within each holder making electrical contact with one of the conductors, an extension from said terminal member projecting above the holder and having a hole therethrough, a ring secured to the holder and having perforated ears extending up by the side of said extension, and a knife switch pivotally secured to said ears and extension.

4. In an ignition system for hydrocarbon engines for motor vehicles, the combination with a plurality of engine cylinders, of a plurality of separate insulated conductors, a tube containing said conductors passing in proximity to said cylinders the said tube being provided with an opening opposite each cylinder, a holder secured to said tube over each opening, a terminal member within each holder, switches secured to said holders having electrical connection with said terminal members.

5. In an ignition system for hydrocarbon engines for motor vehicles, the combination with a plurality of engine cylinders, of a plurality of separate insulated conductors, a tube containing said conductors passing in proximity to said cylinders the said tube being provided with an opening opposite each cylinder and with a screw-threaded collar for each opening, a screw-threaded holder engaging each of said collars, a terminal member within each holder, and means for securing a conductor to each of said terminal members.

6. In an ignition system for hydrocarbon engines for motor vehicles, the combination with engine cylinders provided with spark plugs, of a tube placed in proximity to said plugs and having openings adjacent thereto, conductors within said tube, a holder secured over the said openings in the tube, a conducting core within said holder having an opening therethrough adapted to receive the end of one of the conductors, means for securing the end of a conductor in the lower end of said opening, and an extension of said terminal secured in the upper end of said opening and projecting above the top of the holder.

7. In an ignition system for hydrocarbon engines for motor vehicles, the combination with engine cylinders provided with spark plugs, of a tube placed in proximity to said plugs and having openings adjacent thereto,

conductors within said tube, a holder secured over each opening in the tube, a cylindrical conducting core within said holder having a longitudinal screw-threaded opening through its center which opening is tapered at the bottom to a size to fit the conductor, a short pointed screw fitting in said opening and engaging the end of the conductor, and a screw-threaded eye bolt secured in the upper end of said opening and projecting above the holder.

8. In an ignition system for hydrocarbon engines for motor vehicles, the combination with engine cylinders, of a tube adapted to contain conductors adjacent said cylinders and having openings therein, a holder adapted to be secured over each opening

in said tube, a tubular casing within said holder having an inturned flange at the top, a conducting core fitting within the upper part of said casing and having a central screw-threaded opening therethrough with a contracted lower end, a pointed screw fitting in said opening and adapted to approach the contracted portion thereof, and an eye bolt screwed into the upper part of the opening and projecting above the top of the tubular casing.

In testimony whereof I affix my signature in presence of two witnesses.

ALLEN LOOMIS.

Witnesses:

MILTON TIBBETTS,

L. C. TENNEY.