

M. B. CRIST.
IGNITION MEANS FOR INTERNAL COMBUSTION ENGINES.
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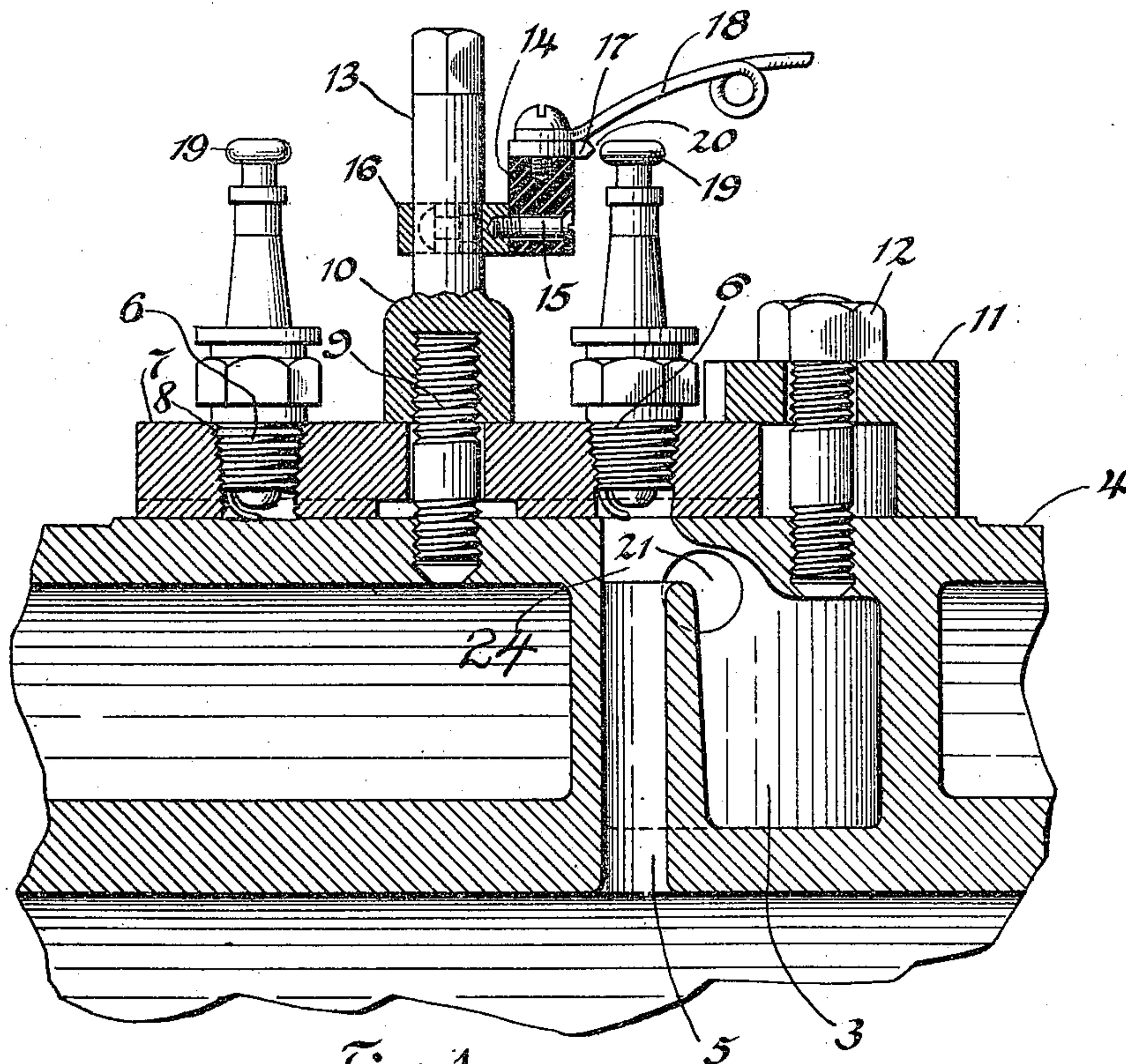


Fig. 1.

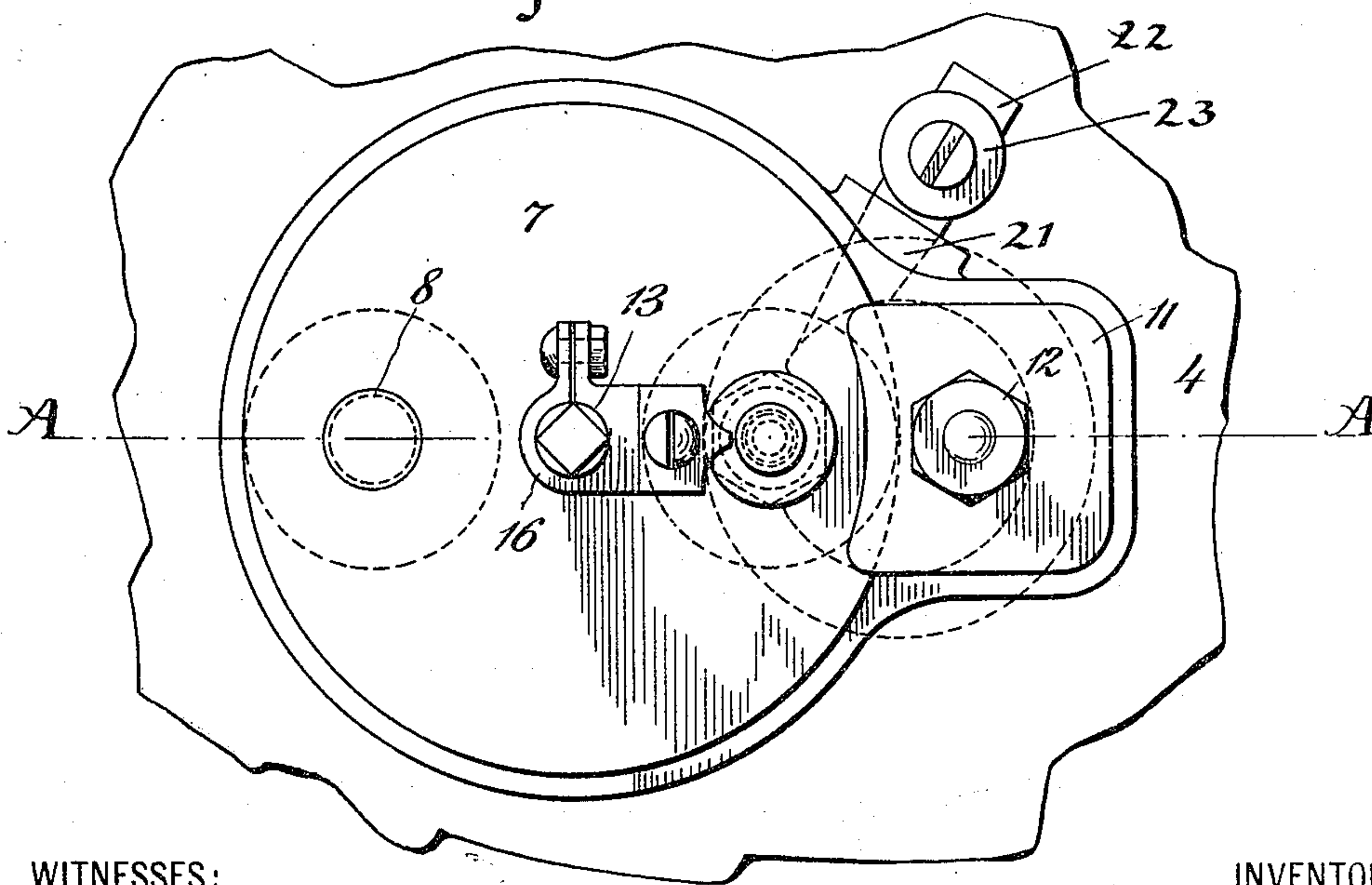


Fig. 2.

WITNESSES:

G. L. Ryder.

E. J. McCallister

INVENTOR

Mark B. Crist

BY

W. S. Green

ATTORNEY

UNITED STATES PATENT OFFICE.

MARK B. CRIST, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE MACHINE COMPANY, A CORPORATION OF PENNSYLVANIA.

IGNITION MEANS FOR INTERNAL-COMBUSTION ENGINES.

975,512.

Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed February 15, 1906. Serial No. 301,228.

To all whom it may concern:

Be it known that I, MARK B. CRIST, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have made a new and useful Invention in Ignition Means for Internal-Combustion Engines, of which the following is a specification.

This invention relates to internal combustion engines and more particularly to ignition means therefor.

The object of this invention is the production of a simple and effective apparatus to be used in connection with internal combustion engine jump spark devices. This and other objects I attain in an apparatus embodying the features herein described and illustrated.

In the single sheet of drawing accompanying this application and forming a part thereof, Figure 1 is a sectional elevation along the line A A of Fig. 2, illustrating an apparatus embodying my invention. Fig. 2 is an end view of the device shown in Fig. 1 in connection with a portion of a cylinder of an internal combustion engine.

An ignition chamber 3 is formed within the head portion 4 of an engine cylinder and is connected with the interior of the cylinder or working or combustion chamber by a firing tube 5 in which is arranged a high voltage jump-spark or ignition plug 6. The plug 6 is mounted on a circular disk or carrier 7 which is provided with two or more tapped holes 8, adapted to receive spark plugs 6. The disk 7 is pivotally mounted and is capable of turning about a central stud bolt 9 which is secured to the head portion of the cylinder, and which is so arranged that any one of the holes 8 may be caused to register with an aperture 24 in the cylinder wall which communicates with the firing tube 5. With such an arrangement a new plug may be set over the aperture and be brought into communication with the ignition chamber through the firing tube without stopping the engine.

The disk or carrier 7 is held securely in place by a special nut 10 secured to the stud bolt 9 and by a clamp 11, which is held in place by the stud bolt and nut 12.

The nut 10 is provided with an upwardly extending finger 13 to which is clamped a fiber terminal-block 14. The terminal-block is secured by a screw 15 to a clamp 16 which

is mounted on the finger 13. The terminal plug is provided with a high voltage terminal 17 to which a wire 18, leading from a secondary coil or some other source of high voltage, is connected. The metal frame of the engine is connected to the other lead of the high voltage source and therefore forms a terminal in the high voltage circuit. The arrangement is such that in causing a spark to jump across the plug gap the high voltage current must also jump across a gap 20 between the terminal 17 and the head portion 19 of the igniter plug.

The current producing the ignition spark is led from the high voltage generator through the lead 18, into the terminal 17, across the gap 20, and into the plug. Under these conditions the operator can readily see by noting the spark at the gap 20 if the high voltage current is jumping properly in the igniter plug and since the high voltage terminal is secured to the nut 10 which holds the disk 7 in place, a spark cannot jump across the terminals of the ignition plug while the cover 7 is loose, nor can a premature explosion occur in the engine during the operation of changing the plug, because with any appreciable widening of the gap 20 the high voltage current will start to jump across a safety gap which must be provided in the circuit and the ignition plug and its connections are then exterior to the high voltage circuit.

A passage 21 connects the firing tube 5 with the atmosphere and is connected to a pipe 22 which is provided with a cock 23 adapted to close or open the passage. By opening the cock 23 the compression or combustion in the cylinder will cause a blast to pass over the terminals of the igniter plug which will remove any moisture or soot tending to impede or hinder the sparking.

The passage 21 is of sufficient cross sectional area to thoroughly scavenge the ignition chamber 3 and for this reason a pure explosion charge will reach the plug and the action of the compression will force the charge of the explosive mixture up against the plug and down into the ignition chamber 3.

The joint between the disk 7 and the walls of the ignition chamber 3 is ground and made absolutely tight and since it is necessary to loosen the bolt 10 before the disk 7 can be revolved, there will be no danger of

an explosion during the operation of inserting a new plug into the firing tube 5.

Other forms and arrangements can be utilized and still fall within the limits and scope of this invention. For instance, the ignition chamber 3 may be of any size or shape and may be independent of the head portion of the engine cylinder and various means may be utilized for mounting the disk 7 and changing the ignition plugs.

Having described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. In combination with an internal combustion engine, a spark plug mounting disk provided with a plurality of openings adapted to receive spark plugs and means for locking said disk in different positions, said means carrying a terminal support for said igniter plugs.

2. In high voltage ignition apparatus for internal combustion engines, a spark plug, a mounting disk for said spark plug, a locking means for said disk and a terminal support for said ignition apparatus carried by the locking means.

3. In combination with a cylinder of an internal combustion engine, an ignition system, a plurality of spark plugs, a movable mounting member for said plugs, and locking means for said member, carrying a terminal in said ignition apparatus.

4. In combination with an internal combustion engine, an ignition chamber, a cylinder, a firing tube connecting said ignition chamber and cylinder, a movably mounted carrier provided with holes for two or more spark plugs, two or more spark plugs mounted in said carrier, an aperture provided in said cylinder walls and placed so as to successively communicate with each of said spark plugs as said movable carrier is rotated, a pivot stud about which said movable carrier is rotatable, a lock nut for said carrier on said pivot stud, provided with a cylindrical top, and a terminal for said spark plug secured by non-conducting material to

said lock nut in such a position that when said movable carrier is locked the terminal closes the electric circuit of said spark plug and when said carrier is released by said lock nut said terminal is moved to break the electric circuit.

5. In combination with an internal combustion engine, an ignition chamber, a cylinder, a firing tube connecting said ignition chamber and cylinder, a movably mounted carrier with holes for two or more spark plugs, two or more spark plugs mounted in said carrier, an aperture provided in said cylinder walls and located so as to successively communicate with each of said spark plugs as said movable carrier is rotated, a pivot stud about which said movable carrier is rotatable, a lock nut for said carrier, and a terminal for said spark plug secured to said lock nut in such a position that when said movable carrier is locked the terminal closes the electric circuit of said spark plug and when said carrier is released by said lock nut said terminal is moved to break the electric circuit.

6. In combination with an internal combustion engine, an ignition chamber, a cylinder, a firing tube connecting said ignition chamber and said cylinder, a movably mounted carrier provided with holes for two or more spark plugs, two or more spark plugs mounted on said carrier, an aperture provided in said cylinder walls and located so as to successively communicate with each of said spark plugs as said movable carrier is rotated, a pivot about which said movable carrier is rotatable, a lock nut for said carrier and an electric ignition circuit into which the spark plugs are interchangeably moved by rotating said carrier.

In testimony whereof, I have hereunto subscribed my name this 13th day of February, 1906.

MARK B. CRIST.

Witnesses:

CHARLES W. MCGHEE,
E. W. MCCALLISTER.