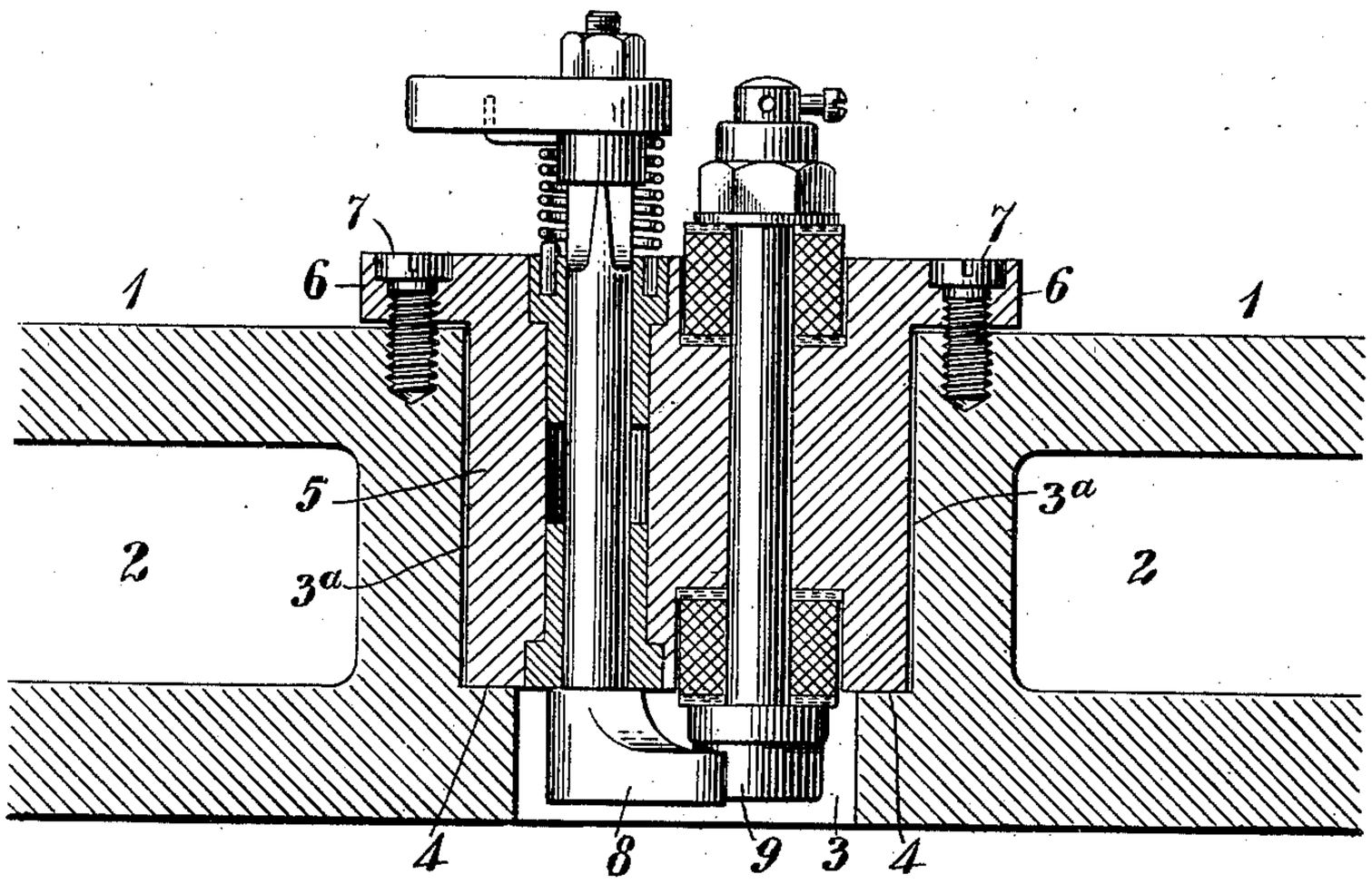
No. 671,718. Patented Apr. 9, 1901.

W. A. BOLE.

SPARKING IGNITER FOR EXPLOSIVE ENGINES.

(Application filed May 23, 1900.)

(No Model.)



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SPARKING IGNITER FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 671,718, dated April 9, 1901.

Application filed May 23, 1900. Serial No. 17,770. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. BOLE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Igniting Apparatus for Gas-Engines, of which the following is a specification.

My invention relates to internal-combustion or explosive-gas engines, and particularly to the apparatus employed for igniting the charges of explosive mixture supplied to the cylinders of such engines.

The object of my invention is to provide a simple and efficient means whereby the temperature of the igniting apparatus may be kept within such limits as will prevent explosions at undesired periods and will also insure longer life for the igniting apparatus than has been possible with the apparatus heretofore employed. In order to secure these results, I reduce to a minimum both the amount of surface of the igniter apparatus that is exposed to the heat produced by the explosions and the distance through which the heat must be conducted in order to reach the cooling-water.

In the accompanying drawing, which is a sectional view through a portion of one of the cylinder-heads of a gas-engine, the cylinder-head 1 is provided with cooling-chambers 2, which chambers are supplied with cold water in order to keep down the temperature to safe limits. At the bottom of the upper cylinder-head 1 and between chambers 2 is an open recess 3, communicating at its upper end with a recess 3^a of larger diameter, that extends to the upper side of the cylinder-head. A ledge 4 is thus provided at the inner end of the recess 3^a, which has a smooth plane surface. Within the recess 3 is located a plug 5, having a flange 6 at its outer end, that projects over the adjacent portions of the cylinder-head and is fastened thereto by means of screws 7. The plug 5 serves as a support for the igniter-electrodes 8 and 9, the inner ends, which are provided with sparking-points, being located in the recess 3. The coöperative relation between the electrodes and the plug and the insulating and actuating means for the electrodes may be of any approved character, and since these features do not specially pertain to my present invention a detailed description thereof is deemed to be unnecessary.

The inner end of the cylindrical portion of the plug 5 is seated upon the ledge 4 and preferably makes a ground-joint fit therewith. It will be seen that with this construction and arrangement the sparking-points of the igniter are located within a comparatively restricted space and that a minimum amount of surface of the igniter-plug is exposed to the direct action of the ignited mixture.

In the igniting apparatus of this general character that was employed prior to my invention the ground-joint was made between the flange 6 and the portion of the cylinder-head with which it engaged, and the entire inner face of the plug was exposed to the direct heating action of the ignited charges. Since ready insertion and removal of the plug makes a loose fit between it and its recess desirable, the all-metal path for conducting the heat to the water in the cooling-chambers 2 was through the entire length of the plug and through the flange 6 in the old structure, whereas in my present structure the ground-joint at 4 provides a short and direct conducting-path for the heat from the chamber 3 to the cooling-water in chambers 2. This construction has been found to be important and valuable in practice.

I claim as my invention—

1. In a gas-engine, a cylinder-head having a restricted igniter-recess at its inner side and a communicating recess of larger diameter, in combination with a metal plug provided with igniter-electrodes and seated upon and making a ground-joint fit with the ledge located at the junction of the two recesses.

2. In a gas-engine, a cylinder-head having water-chambers, a restricted igniter-recess located in proximity thereto, a relatively large recess communicating with said igniter-recess, in combination with a metal plug provided with igniter-electrodes and having a ground-joint connection with the ledge formed at the junction of the two recesses, said plug being of greater length and less diameter than the recess in which it is located.

3. In a gas-engine, a cylinder-head having water-chambers, a relatively wide recess extending inward from its outer side and a narrow recess extending from the inner end of the wide recess to the inner side of the head, in combination with a metal plug provided with igniter-electrodes and loosely fitted into said wide recess but making a ground-joint fit with the base of said recess, and means for removably clamping the plug against said base.

In testimony whereof I have hereunto subscribed my name this 21st day of May, 1900.

WILLIAM A. BOLE.

Witnesses:
S. B. DUSINBERRE,
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