

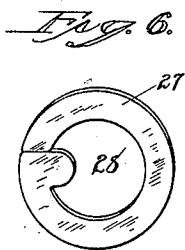
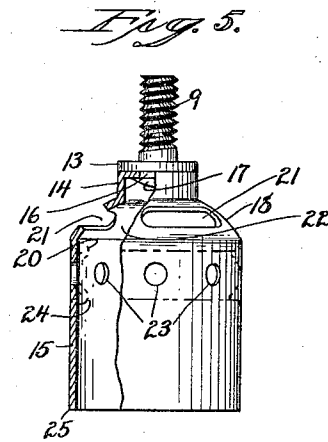
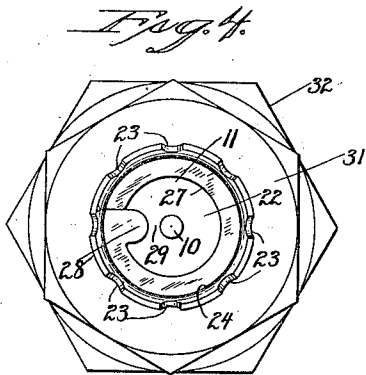
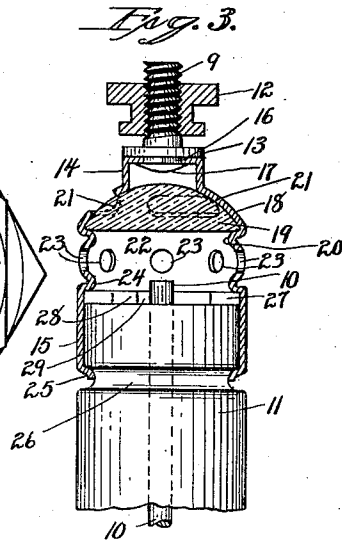
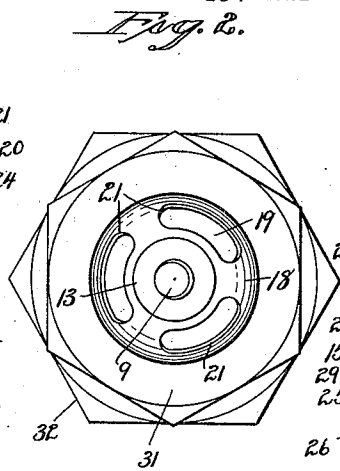
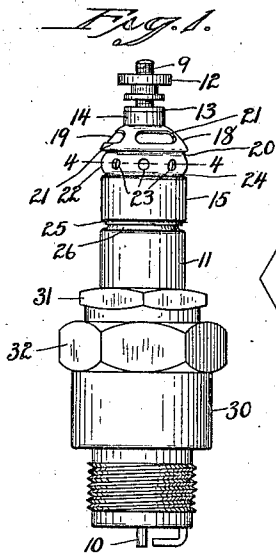
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W. H. BURT

VISIBLE SPARK PLUG

Filed Feb. 16, 1921



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UNITED STATES PATENT OFFICE.

WILLIAM H. BURT, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE CHASE COMPANIES INC., OF WATERBURY, CONNECTICUT, A CORPORATION.

VISIBLE SPARK PLUG.

Application filed February 16, 1921. Serial No. 445,352.

To all whom it may concern:

Be it known that I, WILLIAM H. BURT, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Visible Spark Plugs; and I do hereby declare the following, when taken in connection with the accompanying drawings and the characters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this application, and represent, in—

Fig. 1 a view in side elevation of one form which a spark-plug embodying my invention may assume.

Fig. 2 an enlarged plan view thereof.

Fig. 3 an enlarged broken view of the upper end thereof partly in vertical central section and partly in elevation.

Fig. 4 an enlarged view in transverse section on the line 4—4 of Fig. 1.

Fig. 5 a detached view of the terminal-cap partly in side elevation and partly in vertical section.

Fig. 6 a detached view of the feed-ring.

Fig. 7 a detached edge view of the lens.

My invention relates to an improvement in that class of visible spark-plugs in which the terminal-screw is located directly above and in line with the electrode, so as to permit the socket-wrench employed for installing and removing the plug to be axially passed down over the plug and lifted off the same, the object being to produce a simple, convenient and effective plug of the character described, constructed with particular reference to fewness of parts, compactness, attractive and workmanlike appearance and non-liability to be injured in use. With these ends in view, my invention consists in a visible spark-plug having certain details of construction and combination of parts as will be hereinafter described and pointed out in the claims.

In carrying out my invention as herein shown, I locate the terminal-screw 9 directly above and in line with the electrode 10, which passes through the center of the insulating core 11 of the plug. The said screw 9, which mounts the terminal-nut 12, is provided at its lower end with an integral annular bearing-flange 13, which corresponds in diameter to and rests directly upon the flat upper face of the circular

mounting-boss 14 forming the upper end of the one-piece sheet-metal terminal-cap 15. The lower end of the said screw 9 is formed with a short square shank 16, which passes through a corresponding square hole in the center of the flat face of the mounting-boss 14, whereby the screw is held against rotation. The projecting end of the said shank 16 is upset upon the inside of the boss to form a head 17, by means of which the screw is firmly held in place in line with the electrode 11.

The said mounting-boss 14 is made integral with and rises from the center of a domical lens-chamber 18, in which a plano-convex lens 19 is confined by an inwardly-struck knurl 20, formed at the lower edge of the said chamber the rounding upper wall of which is provided, as shown, with three equally spaced segmental observation-openings 21, located at one side of the central longitudinal axis of the plug, through which the observer looks downward through the lens 19 into the sparking-chamber 22, also forming a part of the terminal-cap and having a plurality of lateral ventilating-openings 23, through which the ozone escapes to prevent the discoloration of the flat lower face of the lens. At its lower edge the said sparking-chamber is formed with an inwardly-struck knurl 24, which merges into the body of the cap 15, which is firmly secured upon the core 11 by spinning its lower edge 25 into an annular groove 26 in the said core. The knurl 24 aforesaid rests upon the upper face of the edge of a flat sheet-metal feed-ring 27, the lower face of which rests directly upon the flat upper face of the insulating core, as clearly shown in Figure 3, the said ring being thus held firmly between the core and the knurl 24. The feed-ring itself is formed with inwardly extending sparking-point or electrode 28, between which and the projecting upper end of the electrode 10 a sparking-gap 29 is formed. The spark produced by the passage of the current between the point 28 and the electrode 10 in either direction, according to circumstances, illuminates the sparking-chamber 22 and is visible through the ventilating-openings 23 thereof and also through the observation-openings 21, which permit the observer to look directly downward into the sparking-chamber through the lens 19, which closes

the observation-openings to the passage of dirt and foreign substances and also to some extent magnifies the spark and the end of the electrode, so that its condition may be at any time readily noted.

The core 11 is mounted in the plug-body or shell 30 by means of a check-nut 31 of the usual character. The upper end of the body is formed with the faces 32 of an integral nut by means of which the body is screwed into and unscrewed from the engine. For this purpose the socket-wrench (not shown) employed may be passed axially over the plug on account of the location of the terminal-screw 9 in line with the electrode 10, whereas, when the said screw is mounted in a clip offsetting from the plug and therefore out of line with the electrode, as has heretofore been done in visible spark-plugs provided with closure glasses, the socket-wrench cannot be axially passed over the top of the plug and removed in the same manner, but must be applied laterally, as it were.

I claim:

1. A visible spark-plug having a sparking-chamber, a lens-chamber located directly above the said sparking-chamber and provided with observation-openings arranged to permit an observer to look downward through them into the said sparking-chamber, and a lens located in the said lens-chamber the said observation-openings whereof are located at one side of the vertical axis of the plug.

2. In a visible spark-plug, the combination with an insulating core, of an electrode located therein, a terminal-cap having a lens-chamber provided with observation-openings located at one side of the vertical axis of the plug and with a ventilated sparking-chamber located directly below the said lens-chamber, and a convex lens located in the said lens-chamber and forming the upper wall of the sparking-chamber, the interior of which is visible through the observation-openings in the said lens-chamber.

3. In a visible spark-plug, the combination with an insulating core, of an electrode located therein, a terminal-cap applied to the core, provided with a terminal-screw located in line with the said electrode and formed with a ventilated sparking-chamber and with a lens-chamber containing observation-openings located at one side of the vertical axis of the plug, and a lens located in the said lens-chamber.

4. In a visible spark-plug, the combination with an insulating core, of an electrode mounted therein, a terminal-cap mounted upon the core, provided with a terminal-screw located in line with the said core, and formed with a lens-chamber having observation-openings located at one side of the ver-

tical axis of the plug, with a sparking-chamber having ventilating-openings and with two inwardly-struck knurls, a lens located in the lens-chamber and held in place by one of the said knurls, and a feed-ring resting upon the top of the core and held in place thereupon by the other of the said knurls.

5. In a visible spark-plug, the combination with an insulating core, of an electrode located therein, a terminal cap positioned upon the said core and formed with a mounting-member located at its upper end, with a lens-chamber located below the said mounting-member and having observation-openings, and with a ventilated sparking-chamber located below the said lens-chamber; a terminal screw mounted in the said mounting-member in line with the axis of the plug, and a lens located in the said lens-chamber the observation-openings whereof are positioned to permit the electrode to be viewed at an angle with respect to the terminal-screw.

6. In a visible spark plug construction, a porcelain body member, a central electrode mounted therein, a conducting disk forming a spark gap with the upper end of said electrode, a metal cap comprising an enclosed top and continuous sides, an annular rib encircling the said sides and resting upon the disk to clamp the same to said body, said cap having a terminal flange crimped into a groove in the surface of the porcelain, a window suspended in the cap and spaced from the disk, the central portion of the top of the cap being spaced from said window and having a terminal binding post riveted therethrough.

7. A visible spark plug comprising a porcelain body member, a central electrode mounted therein, a conducting disk forming a spark gap with the upper end of said electrode, a metal cap comprising an enclosed top and continuous sides, an annular rib encircling the said sides and resting upon the disk to clamp the same to the body, a second annular rib spaced from the first named rib, said cap having a terminal flange crimped into a groove in the surface of the porcelain, a window suspended between said second annular rib and the top of the cap, the periphery of said top being provided with observation openings and the central portion thereof being spaced from said window and having a terminal binding post riveted thereto.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WILLIAM H. BURT.

Witnesses:

EDNA BRENNAN,
W. R. GRIERSON.