

Dec. 15, 1925.

1,566,240

W. WALTER

PROTECTIVE CASING FOR RESERVE SPARK PLUGS

Filed Feb. 27, 1925

FIG. 1.

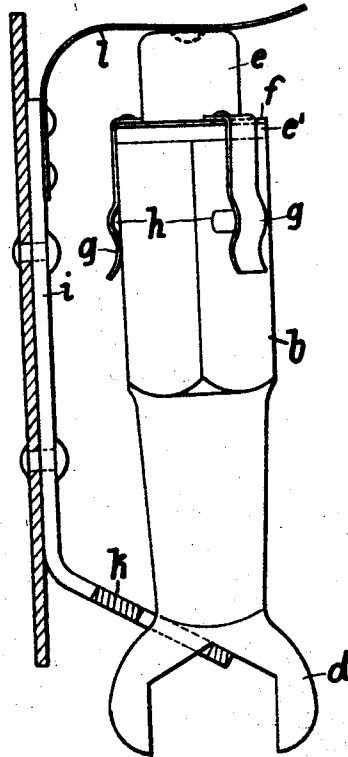


FIG. 2.

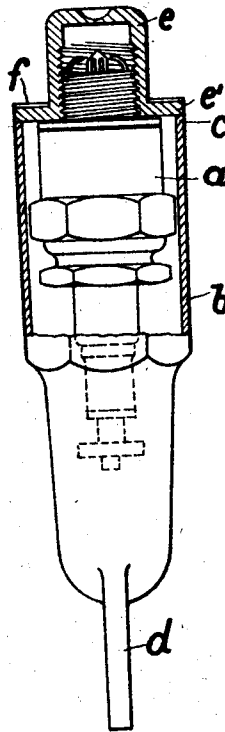
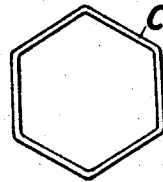


FIG. 3.



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## UNITED STATES PATENT OFFICE.

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PROTECTIVE CASING FOR RESERVE SPARK PLUGS.

Application filed February 27, 1925. Serial No. 12,184.

*To all whom it may concern:*

Be it known that I, WILHELM WALTER, a citizen of the German realm, residing at Heidelberg, Germany (whose post-office address is 19 Blumenstreet, Heidelberg, Germany), have invented certain new and useful Improvements in a Protective Casing for Reserve Spark Plugs (for which I have filed an application in Germany Oct. 3, 1923, No. W. 64734 I/46 c<sup>3</sup>), of which the following is a specification.

Interruptions of service in combustion machines, especially in motor vehicles, are mostly due to the sooting of the spark-plugs or another defect of the latter. In addition to this it will be mostly a single spark-plug of the same cylinder which repeatedly fails to work. It is therefore of great value for the driver of the vehicle to have a reserve spark-plug readily at hand in order to exchange the same with the one that has become defective, without however unpacking the entire set of tools, thus reducing the interruption of travel to the smallest time possible. It is known to provide spark-plugs with a protective cap and carry the same as a reserve in the tool-box; in this case, however, it is inconvenient to replace a defective spark-plug, because the reserve spark-plug and the wrench must separately be taken out of the tool-box, which is in most cases located at some distance from the motor and ordinarily in locked condition. Moreover, the spark-plug to be replaced is very hot and cannot well be taken off without the use of a heat-insulating piece of stuff, waste, or the like.

The object of this invention is to render the exchange of a spark-plug especially for the rider of the vehicle as simple as possible, and to provide a spark-plug for this purpose which is united with a wrench for taking off the old spark-plug and mounting a new one in order to enable the driver to perform without inconvenience the exchanging of the spark-plug within a part of a minute, after having lifted the motor-hood for recognizing the cylinder which fails to work. For this purpose, according to this invention, there is provided a protective casing for the reserve spark-plug, said casing being formed at its orifice as a socket-wrench and at its free end as an open wrench for the spark-plug. By so constructing the reserve spark-plug, the same will be readily at hand together with

a wrench, since it may easily be carried by the driver in one of his pockets. Also the protective casing together with the reserve spark-plug may be mounted within a holding device which, for instance, is provided in immediate proximity to the motor, such as at the dashboard. By this arrangement the driver will be enabled to quickly and completely unscrew the hot defective spark-plug either by means of the open wrench or the socket-wrench which are provided at the protective casing, as well as to insert the new spark-plug, without taking any implement or tool out of the locked tool-box, that is to say within a very small time. This is of great importance, especially on the road.

In the drawing an example of the protective casing for the spark-plug according to this invention is shown, Fig. 1 being a side-view, Fig. 2 a vertical central section partly in front-view, and Fig. 3 a view taken on the orifice of the casing.

For keeping a spark-plug in reserve according to this invention, there is provided a casing *b* of angular cross section, which is formed at its orifice as a socket-wrench with a hexagonal opening *c* and at the opposite and closed end of its handle as an open or forked wrench *d* fitting the hexagonal part of the spark-plug. In order to keep the spark-plug in safe position within the casing *b* there is provided in the usual manner a protective cap *e*, which, however, is equipped with a flange *e'*, closing the orifice *c* of the casing, so that the spark-plug *a* will be protected against being soiled on its remaining part and kept safely in position. Also the fact that the cross-sectional shape of the body corresponds with the shape of the nut portion of the spark-plug, the casing has the effect of preventing the threaded portion of the plug from unscrewing from the cap *e*. A clip, which may consist of an annular part *f* and resilient tongues *g* fastened thereon, is placed over the cap *e* in such a manner that the tongues *g* will snap over the ribs *h* on the casing *b*, so that the spark-plug is kept in position within said clip and casing. The resilient tongues *g* may also be directly fastened upon the protective casing *e*.

In this manner the reserve spark-plug together with its protective casing may be kept in the pocket or otherwise in immediate proximity of the motor in order to be readi-

ly at hand. It is advantageous to keep the same in position ready for use within a proper holding device in the manner of a fire-extinguisher. A device of this kind may, for instance, consist of a clip *i* which is fastened on the motor casing or at the dashboard, said clip being equipped with a supporting arm *k* for inserting one prong of the open wrench *d*, and a spring *l* which serves for keeping the cap *e* in position by means of a knob and a corresponding depression on the cap *e*. In this manner the reserve spark-plug together with the tool for substituting the same for the defective spark-plug will be in a condition permitting to readily grip the same with the hand. In like manner the protective casing together with the reserve spark-plug may be fastened on the motor vehicle by means of clips similarly to the well-known holding devices for air-pumps.

I claim:

1. An emergency spark-plug carrying device adapted to be mounted on a support, comprising a casing having an open end for receiving the body of the plug and a closed end adapted for engagement with a support, and a spark-plug carrying cap member detachably fitted to the open end of the casing and also adapted to engage with the support.

2. An emergency spark-plug carrying device adapted to be mounted on a support, comprising a casing having an open end and a closed end adapted to engage with a support, ribs formed on the outside of the casing adjacent the open end thereof, a spark-plug carrying cap adapted to close the open end of the casing and also adapted to engage with a support, and clip means carried by the cap for engaging with the ribs on the body.

3. An emergency spark-plug carrying device adapted to be mounted on a support, comprising a hollow casing having a portion of angular cross-section corresponding to the angular faces of the nut portion of the spark-plug to be housed therein, and also having a closed end adapted to engage with a support, a cap adapted to engage with a support and being provided with an internally threaded socket for carrying the threaded part of the spark-plug and said spark-plug being held in the socket against unscrewing due to the aforesaid angular shape of the casing, and means carried by the cap for engaging with the casing to hold the cap thereon.

In testimony whereof I have signed my name to this specification.

WILHELM WALTER.