E. HANNI.

SPARK PLUG PRESSURE INDICATOR.

APPLICATION FILED NOV. 6, 1915.

1,204,013.

Patented Nov. 7, 1916.

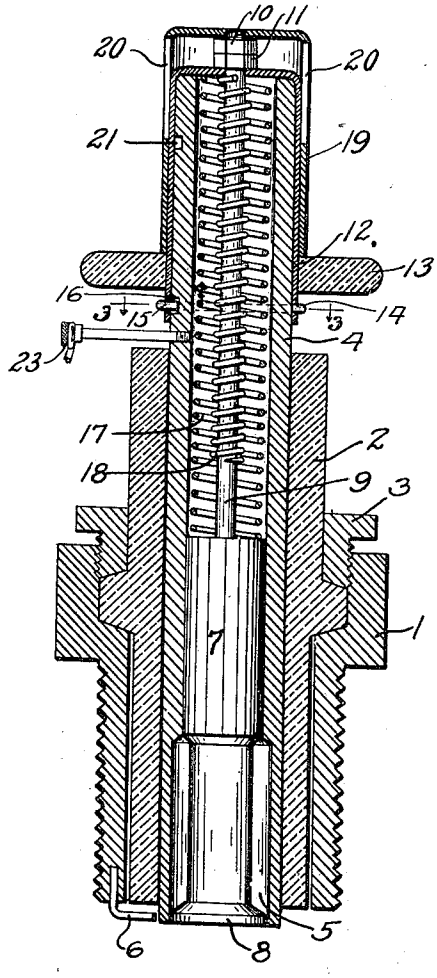


Fig. 2.

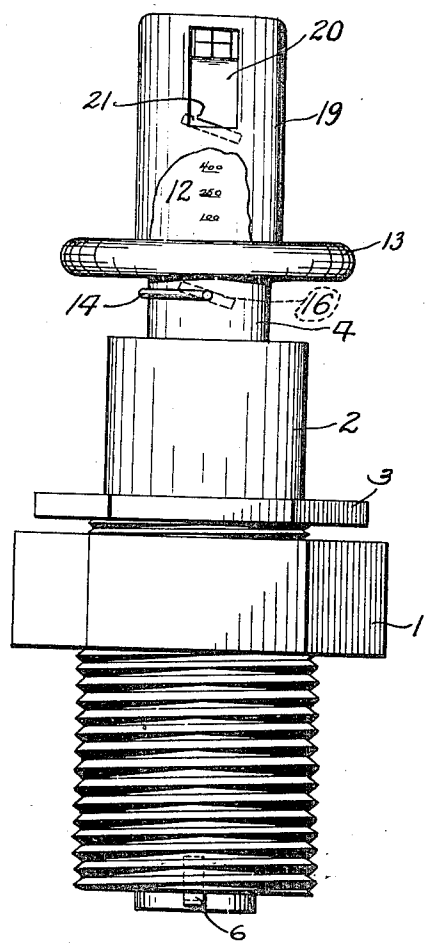


Fig. 1.

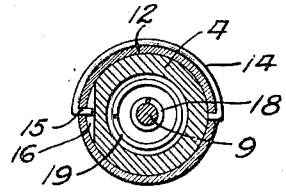


Fig. 3.

INVENTOR.
ERNEST HANNI

BY
Carlos P. Griffin.
ATTORNEY.

UNITED STATES PATENT OFFICE.

ERNEST HANNI, OF SAN FRANCISCO, CALIFORNIA.

SPARK-PLUG PRESSURE-INDICATOR.

1,204,013. Specification of Letters Patent. Patented Nov. 7, 1916.

Application filed November 6, 1915. Serial No. 60,163.

To all whom it may concern:

Be it known that I, ERNEST HANNI, a citizen of the United States, residing at San Francisco, in the county of San Francisco, State of California, have invented a new and useful Spark-Plug Pressure-Indicator, of which the following is a specification in such full and clear terms as will enable those skilled in the art to construct and use the same.

This invention relates to a pressure indicator spark plug for explosion engines, the object of which is to provide means whereby the pressure in the cylinders at the times of compression and expansion may be ascertained to enable the user to see whether the engine is working properly.

It will be understood by those skilled in the art that the gas engine must have adequate compression in order to deliver the power it should and it must also have a sufficiently high pressure at the time of explosion to deliver the power such an engine is intended to produce. The first of these considerations is dependent upon the tightness of the piston rings and the tightness of the valves, while the second consideration may be more or less dependent upon the same consideration plus the adequacy of the ignition apparatus. This invention, therefore, provides means whereby both of these factors may be conveniently tested.

An embodiment of the invention is shown in the drawing in which the same reference numeral is applied to the same portion throughout, but I am aware that there may be many modifications thereof.

Figure 1 is a side elevation of the complete spark plug, Fig. 2 is a vertical sectional view through the spark plug, and Fig. 3 is a horizontal sectional view showing the means whereby the cap within which the springs are mounted is held down when a test is to be made.

The numeral 1 indicates a common form of spark plug in which is placed the flanged porcelain tube 2, said porcelain tube having a collar 3 for holding it in place within the spark plug. The porcelain tube 2 is formed over the metal tube 4 and baked thereon in the manufacture so that the two parts will be air and gas tight. The tube 4 has an enlarged portion 5 at its lower end and it extends through the porcelain tube 2 far enough to enable the spark point 6 to come close enough to give the necessary spark.

Mounted within the tube 4 is a piston 7, said piston having an enlarged end 8 adapted to be seated on the seat at the top of the chamber 5. On the upper end the piston has a rod 9 connected therewith with two lock nuts 10 and 11 on its upper end. The tube 4 has a cap 12 thereon, which cap is provided with a porcelain insulating ring 13 to enable the user to operate the same without danger of receiving a shock while the engine is being operated, and said cap 12 is provided with a spring partly encircling it, which spring has a tip 15 capable of passing into an inclined slot 16 to hold the cap down tightly in the position illustrated in Fig. 2.

The rod 9 has a light spring 17 surrounding it and a shorter and heavier spring 18 also surrounding it, the object being to give the user an opportunity to observe whether the compression is working properly in the first movement of the piston 7, while a further movement compressing the heavier spring will take place when the explosion occurs.

The cap 12 is suitably numbered to indicate the pressures and it has another cap 19 loosely mounted thereon and held in a given position by means of friction so that when a test is to be made the cap 19 is pushed down and the amount it rises will show whether or not the explosion pressure is as high as it should be. The first explosion will, of course, push the cap 19 up to its fullest height, but thereafter the observer can see whether or not the upper end of the rod 9 goes as high upon compression as it should by looking through openings 20 in opposite sides of the cap 19. When the spark plug is not to be used for testing the cylinder pressure the cap 12 is raised and the tip 15 is put into the notch 21 near the top of the tube 4 in order to release the pressure on one spring and move both of the springs as far away from the hot engine cylinder as possible. The spark plug has any suitable connection 23 for connecting the high tension magneto wires therewith. It is also to be noted that there is no danger of leakage for the valve 8 seats on the tube 5 and the pressure thereon always tends to seat it closer.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States, is as follows, express reservation being made of permissible modifications:

1. In a device of the class described, a spark plug having an insulating bushing, an electrode and a threaded bushing adapted to be screwed into an opening in the explosion engine cylinder, a piston therein having a flange on its lower end, said flange forming with that portion of the plug in which it is slidable a valve to prevent the egress of exploded gas, a spring bearing upon said piston, and means to raise or lower the piston and spring whereby the piston may be used to determine the pressure within the explosion cylinder or may have its flange seated upon that portion of the plug within which it is movable.

2. In a device of the class described, a spark plug having an insulating bushing, an electrode and a threaded bushing adapted to be screwed into an opening in the explosion engine cylinder, a piston having a flange at its lower end, which flange forms with the plug a valve to prevent the egress of gas, a light spring bearing on said piston and permitting a given movement thereof, a second heavier spring adapted to bear upon the piston when it has moved through that portion of its total possible movement, and a cap frictionally held in contact with the plug for determining the pressures within the engine cylinder.

3. In a device of the class described, a spark plug having an insulating bushing, a hollow electrode and a threaded bushing adapted to be screwed into an opening in an explosion engine cylinder, a piston movable in the hollow electrode and having a flange forming a valve at the lower end thereof, a spring bearing upon the piston, and a movable cap adapted to be raised by the piston to show the amount of pressure and compression in the cylinder.

In testimony whereof I have hereunto set my hand this 28″ day of October, A. D. 1915.

ERNEST HANNI.