May 3, 1932. P. NEMETH 1,856,883

SPARK INDICATING DEVICE FOR COMBUSTION MOTORS

Filed Sept. 8, 1930

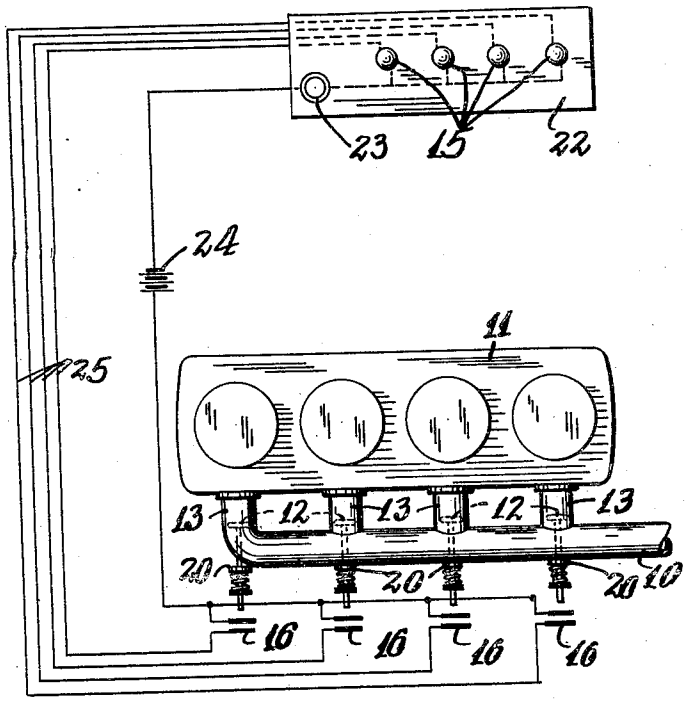

FIG 1

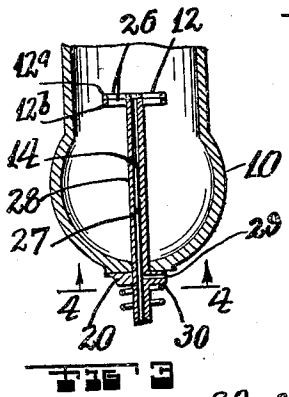

FIG 3

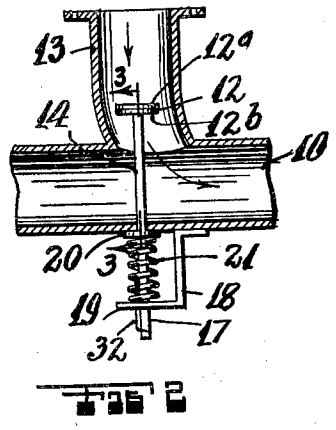

FIG 2

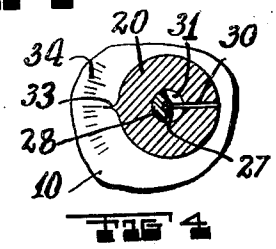

FIG 4

INVENTOR
Paul Nemeth
BY Zoltan A. Polacsek
ATTORNEY

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UNITED STATES PATENT OFFICE

PAUL NEMETH, OF FLUSHING, NEW YORK

SPARK INDICATING DEVICE FOR COMBUSTION MOTORS

Application filed September 8, 1930. Serial No. 480,379.

This invention relates to new and useful improvements in a spark indicating device for combustion motors.

The invention has for an object the provision of a device of the class mentioned which is of simple durable construction, dependable in use and efficient in action, and which can be manufactured and sold at a reasonable cost.

The invention proposes a transverse disc in each of the inlets from the cylinders of a motor to its manifold, stems supporting said disc and slidably extending through said manifold to the exterior, means for resiliently urging said stems inwards, and a signaling system having an individual signal for each of said cylinders and including switches in the path of movements of the outer ends of said stems for selectively operating said signals upon extension of the stem.

The invention also proposes means for changing the cross sectional areas of said discs for noting the relative operation of the cylinders.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:—

Fig. 1 is a plan view of a motor equipped with a device according to this invention, the wiring thereof being schematically shown.

Fig. 2 is an enlarged fragmentary horizontal view of a portion of the manifold shown in Fig. 1.

Fig. 3 is a fragmentary sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary sectional view looking in the direction of the line 4—4 of Fig. 3.

The spark indicating device for combustion motors is shown in use with an exhaust manifold 10 of a combustion motor 11 and comprises a transverse disc 12 in each of the inlets 13 from the cylinders of the motor 11 to the said manifold 10, stems 14 supporting said discs 12 and slidably extending through said manifold 10 to the exterior, means for resiliently urging said stems inwards, and a signaling system having an individual signal 15 for each of the cylinders of the motor 11 and including switches 16 in the paths of movements of the outer ends 17 of the stems 14 for selectively operating said signals 15 upon extensions of the stems 14.

The combustion motor 11 may be of any type and design, and is shown for illustration purposes to be a four cylinder motor. A disc 12 is shown in each of the four outlets 13 from the four cylinders of this motor and four signal lamps 15 have been illustrated for indicating each of the four cylinders. The means for resiliently urging the stems 14 inwards comprises brackets 18 attached upon the manifold 10 and formed with ends 19 slidably receiving the stems 14. Flanges 20 are mounted upon the stems 14 and coaxial springs 21 act between the flanges 20 and the bracket ends 19 so as to normally urge the stems inwards. The springs 21 should be of such design that their strengths normally maintain the stems 14 in the inward position except at such periods when the exhaust valves from the cylinders open and a discharge of exhaust gas takes place through the outlets 13 to the manifold 10. Then these springs should give so that the stems move slightly outwards for closing the switches 16.

The signaling system before referred to is shown on the drawings to comprise a panel 22 which may be attached upon a dash board of a motor vehicle provided with the motor 11, or upon the wall of a room in the event that the engine 11 is of the stationary type. The lamps 15 are mounted upon the panel 22 so that at all times they may be clearly visible. A switch 23 is also mounted upon the panel 22 and is connected in the signaling system so that the circuit may be broken through the lamps in the event that this is desirable. The signaling system may be understood and traced by noting that a battery 24 is provided in a line which connects in parallel with the various lamps 15 and in parallel with one of the terminals of the switches 16. This line may be called the power line. A plurality of re-

turn lines 25 are provided, and these lines selectively connect with individual lamps 15 and with the other terminals of individual switches 16 so that when any one of the switches 16 is closed a circuit exists through one of the lamps for illuminating the particular lamp. The stems 14 are arranged in line with the switches 16 so that upon extension such switches are closed.

A means is also provided for changing the cross sectional areas of the discs 12 for noting the relative operations of the various cylinders of the engines. This means comprises adjacent disc sections 12^a and 12^b formed with openings 26 alignable with each other in one relative position of the discs and of such sizes so that in another relative position of the discs passage of the gases is restrained. The disc 12^a is attached upon a rod 27 extending through the bore of a tubular member 28 attached on the disc 12^b. The rod 27 and tubular member 28 constitute the stem 14 previously referred to. A knob 29 is rotatively mounted upon the tubular member 28 and supports a pin 30 extending through a radial slot 31 formed in the tubular member 28 and connects with a rod 27 in the tubular member. The arrangement is such that the knob 29 may be turned for turning the rod 27 so as to turn the disc 12^a relative to the disc 12^b. In order to prevent rotation of the tubular member 28, a key 32 is arranged to project from the tubular member and engage in a key slot formed in the bracket 18. A pointer 33 projects from the knob 29 and shows upon a scale 34 arranged upon the manifold 10 so that from the exterior the different opened positions of the openings 26 may be known.

In operation of the device, the knobs 29 of the various cylinders are turned so as to open the passage through the disc 12 as desired. Then as the exhaust valves from the different cylinders open, the exhaust gas will pass through the outlets 13 and move the stems 14 outwards so as to cause the ends of the stems to act against the switches 16 and close the circuits through the lamps 15. Each of the lamps may be watched, and as they light it will be known that the various cylinders are exhausting properly. This is particularly true if the openings 26 are properly adjusted. They should be so adjusted that in the event that ignition does not take place in one of the cylinders and this particular cylinder exhausts unburnt gas, the velocity or pressure of this exhaust gas should not be strong enough to move the stem for closing the switch. It will then be known that the particular cylinder is not functioning properly. The relative functionings of the different cylinders may be compared with each other by gradually setting the knobs to points whereby the switches just close. Comparisons may then be made, and it will be seen whether all of the cylinders are functioning with the same efficiencies or whether certain ones are less efficient than the other ones. If large discrepancies are shown, then investigation regarding the ignition system is necessary.

While I have shown and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:—

1. In a device of the class described, a transverse disc for mounting in each outlet from the cylinders of a motor to the manifold, stems supporting said discs and slidably extending through said manifold to the exterior, means for resiliently urging said stems inwards, said means for resiliently urging said stems inwards comprises brackets attached on said manifolds and having overhanging ends slidably supporting said stems, flanges on said stems, and expansion springs acting between said overhanging ends and said flanges.

2. In a device of the class described, a transverse disc for mounting in each outlet from the cylinders of a motor to the manifold, stems supporting said discs and slidably extending through said manifold to the exterior, means for resiliently urging said stems inwards, said means for resiliently urging said stems inwards comprises flanges fixed on said stems and resilient means acting against said flanges.

3. In a device of the class described, a transverse disc for mounting in each outlet from the cylinders of a motor to the manifold, stems supporting said discs and slidably extending through said manifold to the exterior, means for resiliently urging said stems inwards, and means for changing the cross sectional areas of said discs for noting the relative operation of said cylinders, comprising adjacent disc sections constituting said disc and formed with apertures alignable in one relative position and out of alignment in another, and means for adjusting the relative aligned position of said disc sections, comprising a tubular member connected with one disc section, a rod connected with the other disc section and extending within said tubular member, a knob on the tubular member, and a pin between said knob extending through a radial slot of said tubular member and connected with said rod.

4. In a device of the class described, a transverse disc for mounting in each outlet from the cylinders to the manifold of a combustion motor, and means for changing the cross sectional areas of said discs for noting the relative operation of said cylinders, com-

prising adjacent disc sections formed with alignable apertures, a tubular member connected with one disc section, a rod connected with the other disc section and extending within said tubular member, and means for revolving said rod relative to said tubular member.

In testimony whereof I have affixed my signature.

PAUL NEMETH.