C. R. SHORT.

VALVE ACTUATING DEVICE FOR HYDROCARBON MOTORS.

APPLICATION FILED APR. 21, 1917.

1,330,913. Patented Feb. 17, 1920.

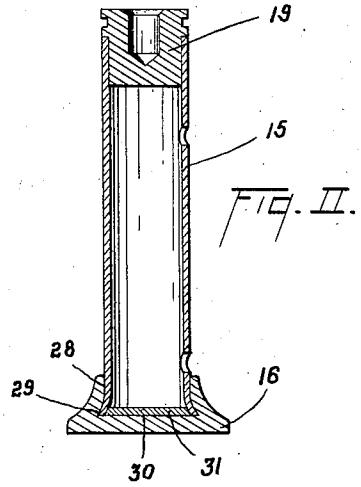


Fig. II.

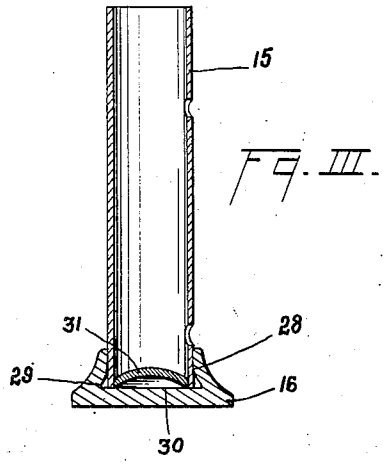


Fig. III.

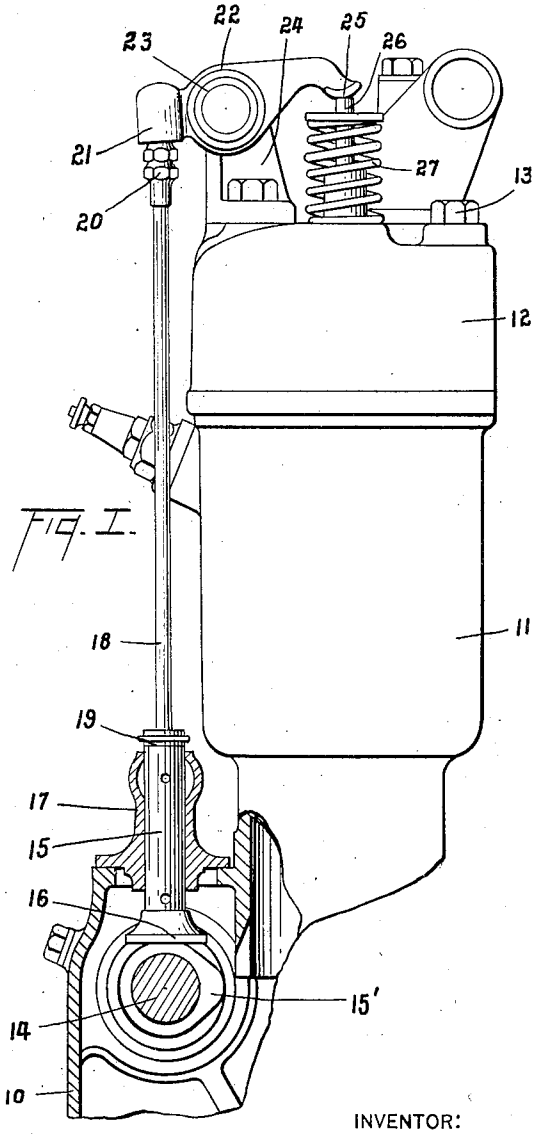


Fig. I.

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UNITED STATES PATENT OFFICE.

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VALVE-ACTUATING DEVICE FOR HYDROCARBON-MOTORS.

1,330,913. Specification of Letters Patent. Patented Feb. 17, 1920.

Application filed April 21, 1917. Serial No. 163,753.

To all whom it may concern:

Be it known that I, CHARLES R. SHORT, a subject of the King of Great Britain, and resident of Detroit, Wayne county, State of Michigan, have invented certain new and useful Improvements in Valve-Actuating Devices for Hydrocarbon-Motors, of which the following is a specfication.

This invention relates to hydrocarbon motors and particularly to an improved valve actuating mechanism therefor.

One of the objects of this invention is to provide a built-up tubular tappet construction, which possesses a maximum of strength with a minimum of weight.

Another object of this invention is to provide a tappet, having an intermediate tubular portion formed of a softer metal and having a contact portion of relatively hard metal suitably secured thereto.

These and other objects will more clearly appear from the following description taken in connection with the accompanying drawings which form a part of this specification, and in which:

Figure 1 represents an end elevation, with portions broken away, of a hydrocarbon motor, embodying a preferred form of my invention;

Fig. 2 is a transverse vertical section of the tappet illustrated, in elevation, in Fig. 1; and

Fig. 3 illustrates a sectional view of the arrangement of the tubular portion of the tappet, its contact piece and the securing plug assembled prior to securing these parts together.

Referring to the drawings, 10 illustrates a crank case on which may be arranged a cylinder block 11 having a head 12, detachably secured thereto, as by bolts 13.

A shaft 14 provided with a plurality of cams 15′, is mounted in any well known manner in the crank case. A tubular tappet member 15 having a hardened contact piece 16 may be slidably mounted in a guide sleeve 17, which is secured to the upper portion of the crank case 10. A valve rod 18 is adapted to have its lower end fitted in the tappet plug member 19, and to have its upper end 20 adjustably connected with the end 21 of a rocker arm 22, which is supported on a shaft 23, journaled in a boss 24. The other end 25 of the rocker arm is adapted to abut against the upper end of a stem 26 of a puppet valve member. A spring 27 is adapted to yieldingly close the valve member.

The tappet previously referred to, comprises a tubular member 15, which is initially open at both ends. The lower end is adapted to be fitted in a hardened steel contact member 16, which has its interior diameter 28 enlarged or flared out as at 29, toward its closed end 30. These parts may be fastened together by inserting a spherical flexible disk 31, known as a "Hubbard plug", and then flattening it out after it has been placed in the position illustrated in Fig. 3, the lower end of the tubular member 15 being flared by this flattening process, so that its walls conform with the interior walls of the contact piece 16.

The tubular member may then be completed by inserting in its upper end, a cylindrical plug member 19, which may then be suitably secured as by a pressed fit or by spot welding it to the tubular member.

While I have described, and will specifically claim, what I deem to be a preferred embodiment of my invention, it will be obvious to those skilled in the art, that various modifications and changes may be made without departing from the spirit and scope hereof.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a device of the class described, the combination of an open ended tubular member and a cylindrical cap adapted to be arranged over one end thereof and having a flared interior, the adjacent portion of said tube being flared outwardly, complementary to said cap interior, and a disk fitting against the interior bottom of said cap and filling the area thereof between the flared end of said tube.

2. In a device of the class described, the combination of an open ended tubular member and a cap adapted to be arranged over one end thereof, said cap having a flared interior, the end of said member being flared outwardly to fit against said cap interior, and a disk fitting against the interior bottom of said cap and filling the area thereof between the flared end of said tube.

3. In a device of the class described, the combination of an open ended tubular mem-

ber and a cap adapted to be fitted over one end thereof, said cap having an enlarged interior diameter adjacent its closed end, said tubular member having its end flared outwardly against the walls of said enlarged portion, and a disk fitting against the interior bottom of said cap and filling the area thereof between the flared end of said tube.

4. In a device of the class described, the combination of a tubular member, a cap having its interior flared outwardly toward its closed end, said cap being adapted to be fitted over one end of said tubular member, the end of said member being flared outwardly against the walls of said flared portion of the cap, and a plug insertible through and arranged between the flared walls of said tubular member.

5. In a device of the class described, the combination of a metallic tubular member, a hardened steel cap having its interior flared outwardly toward its closed end, said tubular member being adapted to be fitted in said cap and having a flared portion complementary to the flare in said cap, and a disk fitting against the interior bottom of said cap and filling the area thereof between the flared end of said tube.

6. In a device of the class described, the combination of a metallic tubular member, a hardened steel cap having its interior flared outwardly toward its closed end, said tubular member being adapted to be fitted in said cap and having a flared portion complementary to the flare in said cap, and a plug insertible through and fitted in the flared portion of said tubular member.

7. A valve tappet, comprising a metallic tubular member, a plug suitably secured in one end thereof, a hardened steel cap fitted over the opposite end of said member and having its interior flared outwardly toward its closed end, said tubular member having one end flared outwardly against the flared portion of said cap, and a plug fitted against the flared portion of said tubular member.

8. A valve tappet, comprising a metallic tubular member, a plug suitably secured in one end thereof, a hardened steel cap fitted over the opposite end of said member and having its interior flared outwardly toward its closed end, said tubular member having the same end flared outwardly against the flared portion of said cap, and a plug fitted to one end of the flared portion of said tubular member.

9. The method of forming a two piece tube, having one end thereof closed, which consists of the insertion of a cylindrical tubular member in a cap, the interior of which is flared outwardly toward its closed end, inserting a dished disk in the end of said tube contained within said cap, and then flattening said disk and spreading the walls of the tubular member against said flared portion.

10. A method of forming a two piece tube, having one of its ends closed, which consists of inserting one end of a tubular member into a cap, the interior of which is flared outwardly toward its closed end, then inserting a spreading member through said tube to the closed end thereof, and then spreading the walls of the tube against the flared portion of said cap.

In testimony whereof I affix my signature.

CHARLES R. SHORT.