

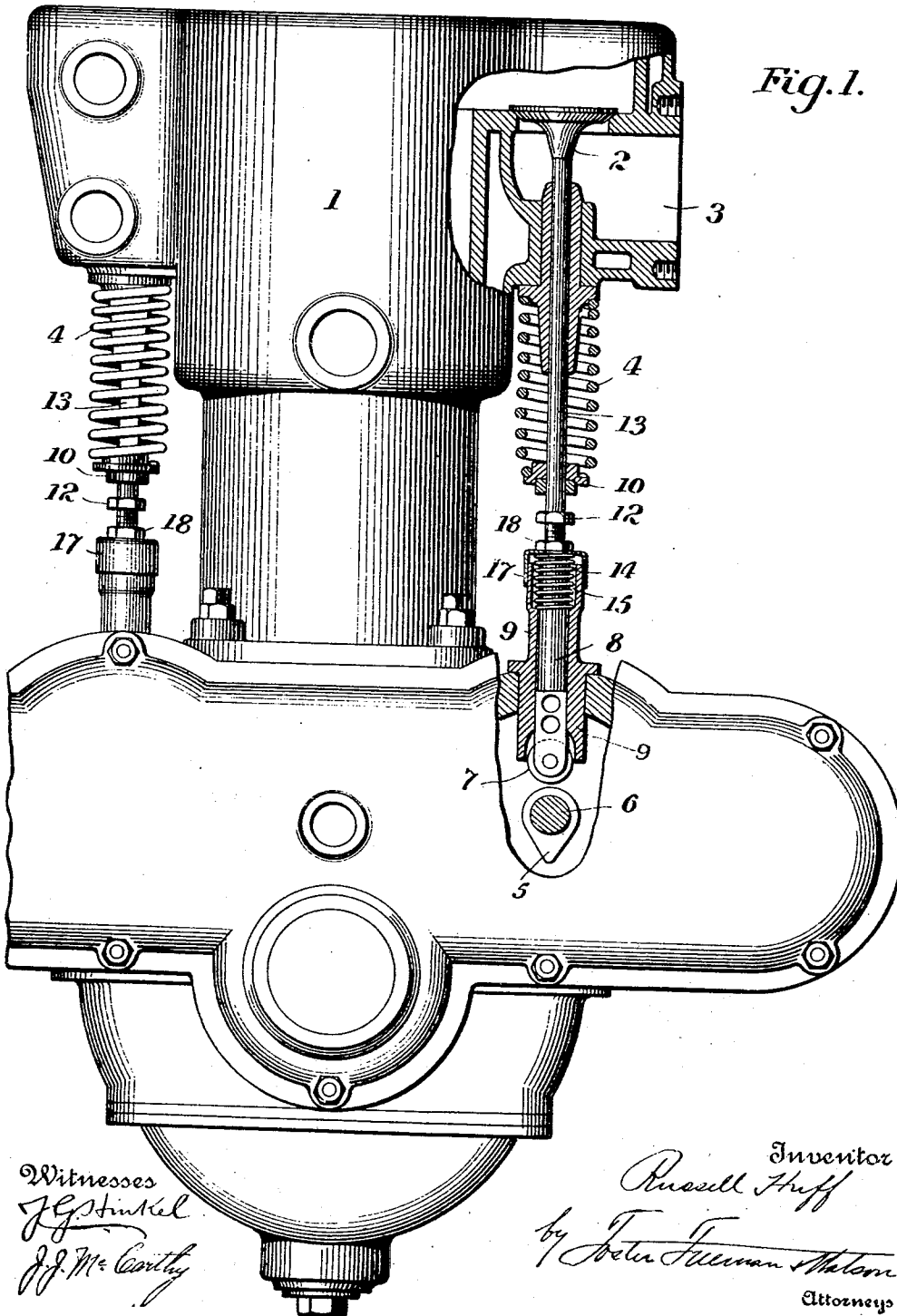
R. HUFF.
VALVE MECHANISM FOR HYDROCARBON ENGINES.
APPLICATION FILED MAR. 26, 1907.

1,111,462.

Patented Sept. 22, 1914.

2 SHEETS-SHEET 1.

Fig. 1.



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Fig. 2.

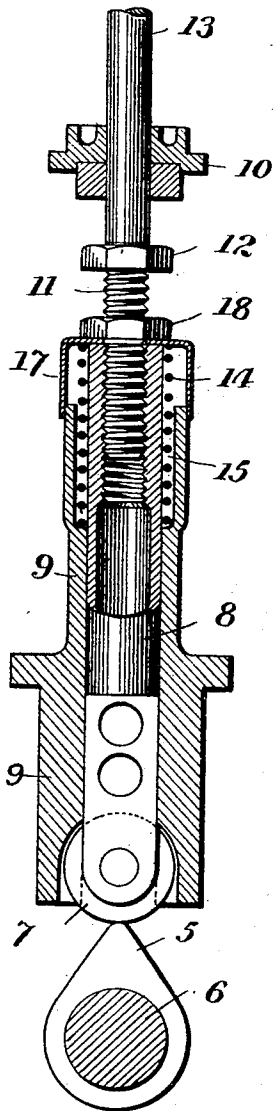


Fig. 3.

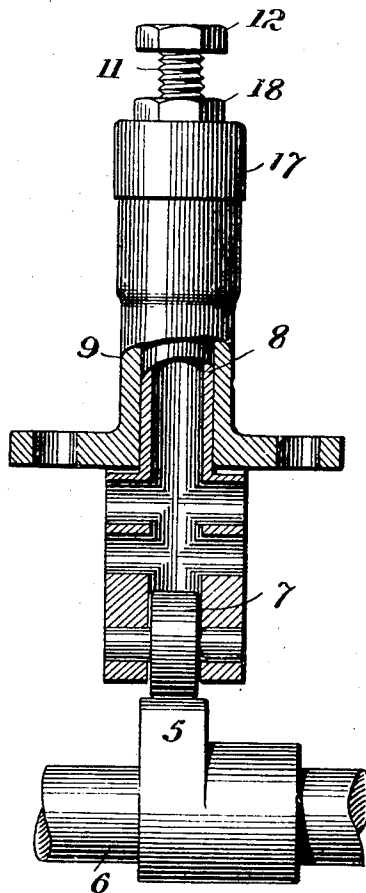
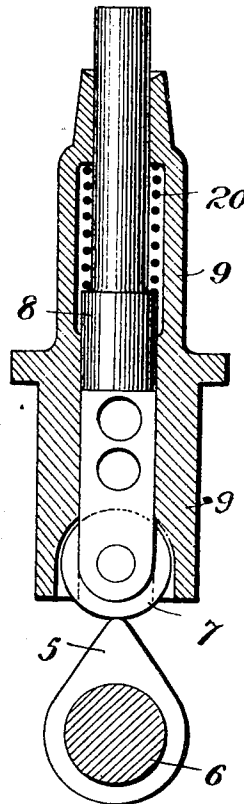


Fig. 4.



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UNITED STATES PATENT OFFICE.

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VALVE MECHANISM FOR HYDROCARBON-ENGINES.

1,111,462.

Specification of Letters Patent. Patented Sept. 22, 1914.

Application filed March 26, 1907. Serial No. 364,723.

To all whom it may concern:

Be it known that I, RUSSELL HUFF, a citizen of the United States, and resident of Detroit, Wayne county, State of Michigan, have invented certain new and useful Improvements in Valve Mechanism for Hydrocarbon-Engines, of which the following is a specification.

The present invention relates to improvements in valve mechanism for hydrocarbon engines and particularly to the construction of the parts by which said valve is opened.

The invention will be described in connection with the accompanying drawings, in which,

Figure 1 is a view, partly in section, of the cylinder of a hydrocarbon explosive engine having a valve mechanism constructed in accordance with the present invention; Fig. 2 is a sectional view of a portion of the valve mechanism on an enlarged scale; Fig. 3 is a side elevation, partly in section, of parts shown in Fig. 2; Fig. 4 illustrates a slightly modified form of the invention.

Referring to the drawings, 1 designates the cylinder of an explosive engine and 2 a valve controlling a passage 3 leading into said cylinder. The valve is normally held against its seat or in position to close the passage 3 by a suitable spring 4, and a cam 5 on a shaft 6 is adapted to periodically move the valve in opposition to said spring to open the passage 3.

It is customary to provide a roller 7 against which the cam 5 will act, said roller being suitably connected with the valve stem. In the construction shown in the drawings, this roller is carried by a holder 8 the lower portion of which is rectangular in cross section, said holder being mounted to reciprocate in a suitable guide 9 attached to the engine frame.

As shown the guide for the roller holder extends some distance within the casing of the engine frame, the inner end of said guide being substantially in the same plane as the axis of the roller. By this arrangement there is provided a relatively long bearing surface between the rectangular portion of the roller holder and the walls of the correspondingly shaped passage in said guide.

By making the roller holder 8 of the form

shown, that is, by providing it with straight flat surfaces on opposite sides and providing corresponding surfaces on the guide 9, the tendency of the cam 5 to tip or tilt said holder when reciprocating it is reduced to a minimum and thereby the wear on all parts of the holder is substantially uniform.

The spring 4 surrounds the valve stem being arranged between the engine frame and a suitable collar 10 secured on said stem, and as above stated, said spring acts to normally hold the valve closed and to return it to such position after it has been moved from its seat by the action of the cam 5 on the roller 7.

The roller holder constitutes a continuation of the valve stem although it is formed separately therefrom and said holder is held in such relation to the valve stem that the contact of the cam 5 with the roller 7 will act to shift the valve as desired.

It has been found desirable to so arrange the parts between the valve and cam 5 that the valve may be seated under the pressure of the heavy spring 4 without transmitting excessive pressure to the cylindrical part of the cam. If the full pressure of such spring 4 is exerted upon the cam, the valve would not be properly seated at all times, especially after the engine had been running sufficiently long to heat the parts, the extent of heating of one part being different from that of another. Therefore according to the present invention a gap or space is provided between the valve and cam when the valve is seated.

In the embodiment of the invention shown in Figs. 1 to 3, the roller holder 8 is provided at its outer end with an internally threaded socket in which is screwed a screw 11, having a nut 12 at its outer end and the free end of the valve stem 13 abuts against this nut, said holder being held in this position by a weak coiled spring 14 arranged within a suitable socket 15 adjacent the outer end of the guide 9 for said roller holder. Said spring 14 is arranged between the inner end of the socket in the guide 9 and a cap 17, held in position on the screw 11 by a nut 18. As shown, the cap 17 is of such dimensions as to surround the open end of the socket 15 at all times and effect-

ally prevent the entrance of dust thereto. By adjusting the nut 18 the location of the cap 17 may be varied. Referring to Fig. 1, it will be seen that by this construction the roller 7 is held out of contact with the cylindrical portion of the cam 5 when the valve 2 is seated and the nut 12 at the outer end of the roller holder 8 is in contact with the valve stem so that the latter will be moved longitudinally when the projecting portion of the cam 5 comes in contact with said roller. It will thus be seen that the stem 13 and holder 8 move together as one unit, the holder 8 being always pressed upwardly against the stem 13.

If desired, the same result, that is, the providing of a gap or space between the valve stem and the cylindrical part of the roller or parts in contact therewith when the valve is closed, may be accomplished by providing for a separation of the adjacent ends of the valve stem and roller holder, as shown in Fig. 4. In this construction the spring 20 within the guide 9 for the roller holder 8 acts to constantly hold the roller 7 in contact with the cam and the length of the valve stem 13 is such that it does not contact with the outer end of said roller holder when the valve is seated. With this construction when a projecting part of the cam 5 comes into engagement with the roller 7 the roller holder 8 is forced outwardly across the space separating it from the valve stem 13 and the latter is then moved to unseat the valve.

It will be noticed that the inner end of the guide 9 for the roller holder 8 is recessed or forked and that the roller projects within said recess or fork at all times, both when in engagement with the cam 5 and when the valve is closed as shown in Fig. 1.

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

1. In a hydrocarbon engine, the combination of a valve having a stem connected therewith, a member adapted to engage the outer end of said stem, a cam adapted to reciprocate said member, and a spring adapted to hold said member against the end of said stem.

2. In a hydrocarbon engine, the combination of a valve having a stem connected therewith, a member of adjustable length adapted to engage the outer end of said stem, a cam adapted to reciprocate said member, and a spring adapted to hold said member in engagement with said stem.

3. In a hydrocarbon engine, the combination of a valve having a stem connected therewith, a member arranged in axial alignment with said stem and having a screw adjustably connected therewith and adapted to engage the outer end of said stem, a cam

for reciprocating said member, and a spring adapted to hold said screw in engagement with said stem.

4. In a hydrocarbon engine, the combination with a valve, a cam, a roller arranged in the path of the cam, means for moving the valve in one direction as the roller is engaged by the cam, and a spring for moving the valve in the opposite direction, of means for holding the roller out of contact with the cam at all times except when engaged by the rise thereon.

5. In a hydrocarbon engine, the combination with a valve, a cam, a roller arranged in the path of the cam and adapted to operate the valve, connections between the valve and the roller constructed and arranged so that the movement of the roller toward the cam is limited by the seating of the valve and the roller is normally held out of contact with the cam.

6. In a hydrocarbon engine, the combination with a valve, a rotatable cam, a roller supported by a reciprocating holder, and adapted to be engaged by said cam, means for transmitting movement from the roller holder to the valve to move the latter in one direction, and a spring for moving the valve in the opposite direction, of a spring adapted to hold the roller out of contact with the cam when the valve is closed.

7. In a hydrocarbon engine, the combination of a valve, a spring surrounding the stem of the valve between an abutment thereon and the engine frame, a rotatable cam, a roller, and a holder for the roller, and means arranged to keep the holder in contact with the valve stem, the combined length of the valve stem and roller holder being less than the distance between the valve seat and the body of said cam, whereby the roller will be held out of contact with the cam when the valve is closed, the movement of the roller toward the cam being limited by the seating of the valve.

8. In a hydrocarbon engine, the combination of a valve, a rotatable cam, a roller arranged in the path of the said cam, a reciprocating holder for said roller, means for transmitting movement from said roller holder to the valve to open the latter, a spring for closing the valve, and a coiled spring surrounding the holder between an abutment thereon and the engine frame and adapted to hold the roller out of contact with the cam when the valve is closed.

9. In a hydrocarbon engine, the combination of a valve, a rotatable cam, a roller arranged in the path of the cam, a holder for the roller, a guide on the engine for the roller holder having a socket at its outer end, a cap mounted on the roller holder and closing the outer end of the socket therein, a coiled spring surrounding the holder within said socket and holding the roller out of

contact with the cam when the valve is closed, means for transmitting movement from the roller holder to the valve to open the latter, and a spring for closing the valve.

- 6 10. In a hydrocarbon engine, the combination of a valve, a rotatable cam, means between the valve and cam and adapted to be reciprocated by the latter to open the valve, a spring for closing the valve, and means for
10 holding said reciprocating element out of contact with the cam when the valve is closed.

11. In a hydrocarbon engine, the combination of a valve, a cam, a roller support
15 having a roller in the path of the cam, a forked guide extending on opposite sides of the roller support and having curved recesses to receive the roller, the bearing sur-

faces of said fork extending along the holder to the axis of the roller when the latter is 20 on the lowest point of the cam.

12. In a hydrocarbon engine, the combination of a valve, a cam, a roller support having a roller in the path of the cam, a guide for the roller support comprising a 25 forked body portion exteriorly cylindrical in form and forming internal flat bearing surfaces, and an attaching flange secured to the body portion.

In testimony whereof I affix my signature 30 in presence of two witnesses.

RUSSELL HUFF.

Witnesses:

ALLEN LOOMIS,
VINCENT LINK.