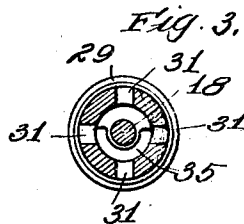
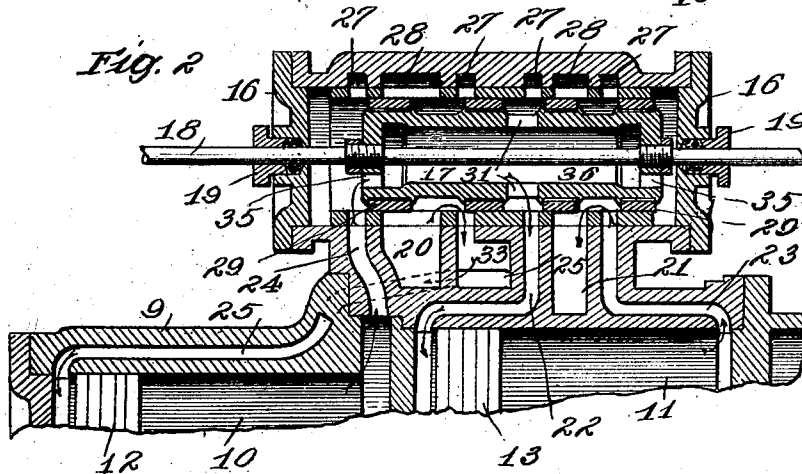
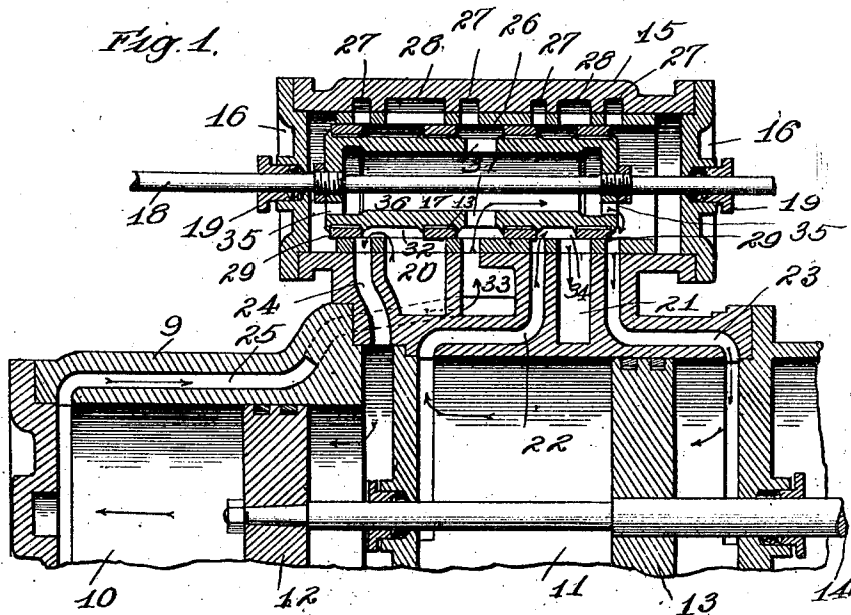


J. C. ROMICK, JR.
VALVE MECHANISM.
APPLICATION FILED MAY 31, 1912.

1,045,441.

Patented Nov. 26, 1912.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN C. ROMICK, JR., OF TRAEER, IOWA.

VALVE MECHANISM.

1,045,441.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN C. ROMICK, Jr., a citizen of the United States, and residing at Traer, in the county of Tama and State of Iowa, have invented certain new and useful Improvements in Valve Mechanism, of which the following is a specification.

This invention relates to improvements in valve mechanism for compound engines.

10 An object of the invention is to provide a valve mechanism for compound engines either of the one cylinder or multiple cylinder type and employed with a peculiar engine construction which utilizes in a low pressure chamber the steam from the high pressure chamber before reaching the engine exhaust.

20 A further object is to provide a slide valve in connection with a high and low pressure chamber so constructed that the steam acting from all sides renders the same a balance valve, the steam offering no resistance to the free movement thereof.

25 A still further object is to provide a slide valve for controlling in one position the entrance of live steam at one side of the high pressure piston and conduct the steam from the other side thereof to a low pressure chamber and of reversing the steam connections by a different positioning of the valve.

35 With these general objects in view and others that will appear as the nature of the invention is better understood, the same consists in the novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

40 In the drawings forming a part of the application and in which like designating numerals refer to corresponding parts throughout the several views:—Figure 1 is a central vertical longitudinal sectional view of the device showing a slide valve in one position. Fig. 2 is a similar view showing the slide valve in its extreme opposite position, and, Fig. 3 is a vertical transverse central sectional view of the slide valve member alone.

50 Referring in detail to the drawings, and in which but one cylinder 9 is shown while any number desired may be employed, the high pressure chamber 10, it is noted, is similar and of less diameter than the low pressure chamber 11, said chambers being provided respectively with accurately fitted

reciprocating pistons 12 and 13 each slidably-mounted therein and rigidly secured to the single piston rod 14. Mounted adjacent to said cylinder and connected thereto by the housing 100 is the valve casing 15 tubular in form with the terminal heads 16 inclosing a likewise tubular longitudinally movable slide valve 17 rigidly mounted upon the actuating valve rod 18, the latter passing through the stuffing boxes 19 centrally positioned in each head.

A steam chest, not shown, communicates with the live steam chamber 20 and through the operation of the slide valve in connection with the chamber passages 24 and 25 of the housing, said live steam is alternately conducted to the high pressure chamber 10 at opposite sides of a high pressure piston 12 and operates to actuate said piston therein. The exhaust chamber 21 within said housing communicating with an exhaust outlet not shown is given communication through ports 22 and 23 with the low pressure cylinder 11 and alternately upon opposite sides of the low pressure piston 13 therein through the actuation of said slide valve and whereby the partially spent steam so conducted from the high pressure chamber 10 operates for further influencing the actuation of the piston rod and piston.

Within the casing 15 the lining thereof 26 is provided with openings respectively alining with the passage 24, chamber 20, passage 25, 22, chamber 21 and passage 23, said openings being through the bottom of said lining while similar openings are provided through the top thereof in connection with the annular flanges 27 communicating with the passages 24, 25, 22 and 23 and the further annular passages 28 communicating with the chambers 20 and 21.

The tubular valve member 17 is provided with exterior packing rings 29 positioned at each end thereof while at intermediate points similar packing rings 30 are employed spaced apart and positioning the openings 31 therebetween to the interior of the valve. Between said packing rings the exterior of the valve is also cut-away forming together with the packing rings annular passages 32, 33 and 34 around the valve when the same is operatively positioned in the casing. Besides the annular openings 31 to the interior of the valve, each end of the latter has a substantially semi-circular opening 35 thereip.

In the operation of the engine, it being noted that the valve rod 18 is reciprocated in an opposite direction to the piston rod 14, the direction of movement of the motive fluid may be traced in Fig. 1 by the arrows when the valve is at the extreme left hand position. From the live steam chamber 20 the same passes to the passage 24 through the adjacent annular space 32 and thereby communicates with the high pressure chamber 10 at the rear of its piston 12, thus forcing the same outwardly as indicated. Said movement of the high pressure piston forces the partially exhausted steam at the outer end of that chamber through the passage 25 and the annular space 33 and opening 31 to the interior chamber 36 of the valve and from whence it is conducted through the end opening 35 and the passage 23 to the rear end of the low compression chamber and in a position to operate behind the low pressure piston 13, thus assisting to move the same and the piston rod 14 outwardly. This described movement of the low pressure piston 13 forces the exhaust steam which is ahead of the same outwardly through the passage 22, and the annular passage 34 into the exhaust chamber 21 and from whence it is communicated to the atmosphere. The pistons having thereupon assumed their outermost positions and the slide valve its extreme right hand position as shown in Fig. 2 of the drawings, the passage of the motive fluid under these conditions is also readily traced. The live steam chamber 20 communicating through the passage 25 ahead of the high pressure piston 12 in its cylinder 10 tends to force the same inwardly and expel the partially exhausted steam rearwardly thereof through the passage 24, the valve end passage 35 and thence through the valve chamber 36 and its outlet passages 31 and the annular passage 33 to the passage 22 and into the low pressure chamber 11 in front of its piston 13. Such action forcing the low pressure piston inwardly exhausts the spent gases through the passage 23 and the annular passage 34 of the valve to the exhaust chamber 21 and from whence such gases finally reach the atmosphere.

From this description, the operation of the slide valve in affording communication for the partially exhausted motive fluid from opposite sides of the high pressure piston to the alternating sides of the low pressure piston and thence to the atmos-

phere, will be apparent as well as the resultant in accomplishing constant uniform impulses at corresponding sides of both pistons.

While the forms of the invention herein shown and described are what are believed to be preferable embodiments thereof, it is nevertheless to be understood that minor changes may be made in proportion, form, size or details of construction without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. A valve mechanism comprising a valve casing, said casing having passages there-through, a tubular reciprocating valve in said casing, packing rings spaced apart and exteriorly arranged upon said valve forming annular passages therearound and said valve having perforations therein adapted for allowing a passing of fluid therethrough.

2. A valve mechanism comprising a housing, a valve casing mounted upon said housing, said housing and casing having continuous passages communicating with the interior of said housing, said housing also having a live steam chamber and an exhaust steam chamber, each communicating with the interior of said casing, a tubular reciprocating valve in said casing, packing rings spaced apart and exteriorly arranged upon said valve forming annular passages therearound and said valve having perforations therein adapted for allowing a passing of fluid therethrough to said passages.

3. A valve mechanism comprising a housing, a valve casing mounted upon said housing, said housing and casing having passages communicating with the interior of said casing, said housing also having a live steam chamber and an exhaust steam chamber, each communicating with the interior of said casing, a tubular reciprocating valve in said casing, packing rings spaced apart and exteriorly arranged upon said valve forming annular passages therearound and said valve having perforations therein adapted for allowing a passage of fluid therethrough.

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

JOHN C./ROMICK, Jr.

Witnesses:

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