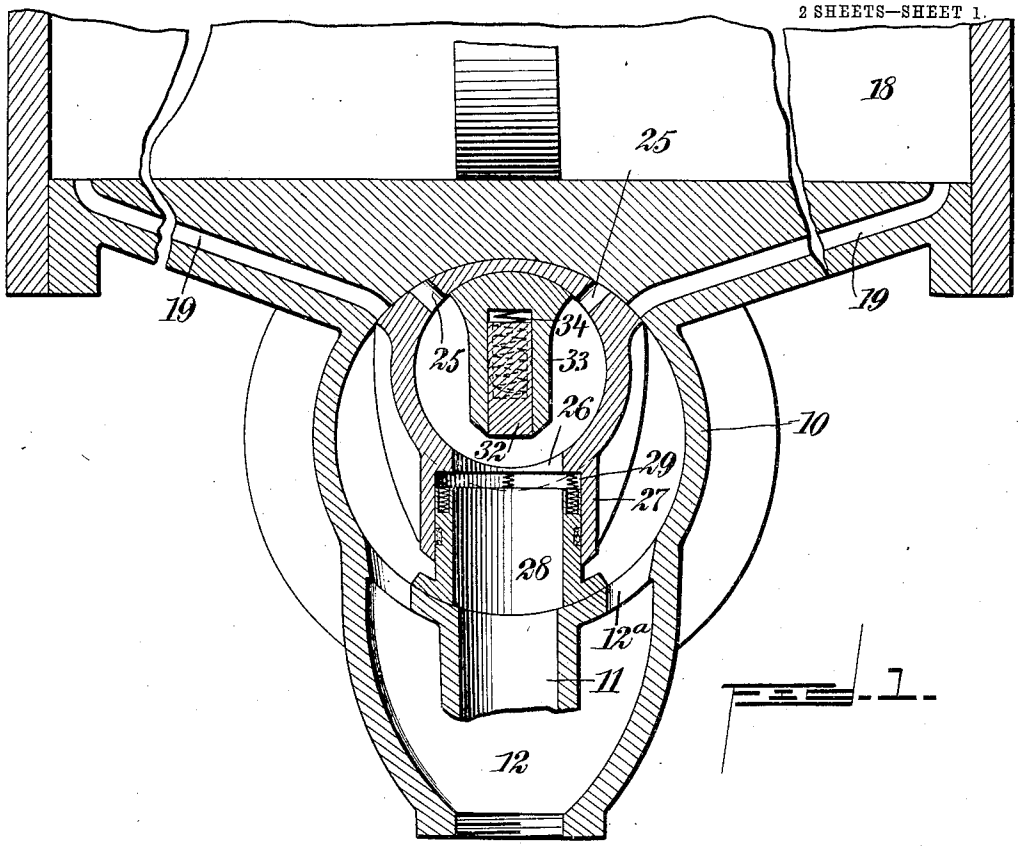
No. 791,957. PATENTED JUNE 6, 1905.

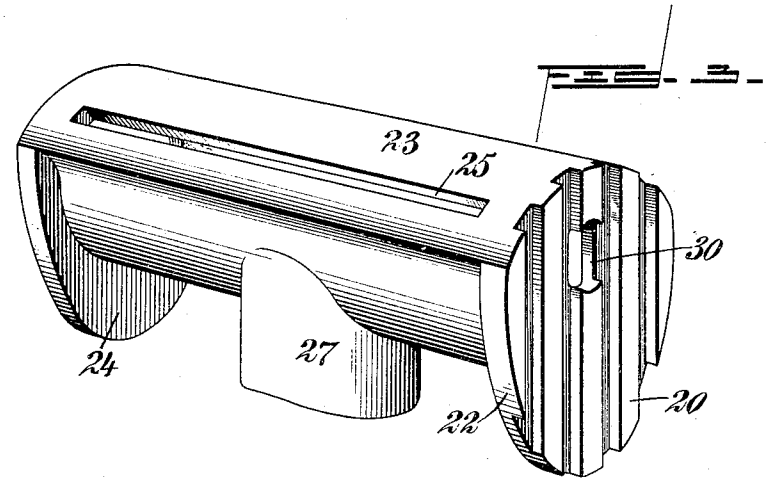
T. G. VAN SANT.

ROTARY VALVE.

APPLICATION FILED SEPT. 22, 1904.

2 SHEETS—SHEET 1.





WITNESSES:

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Isaac B. Owens.

INVENTOR

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ATTORNEYS

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2 SHEETS—SHEET 2.

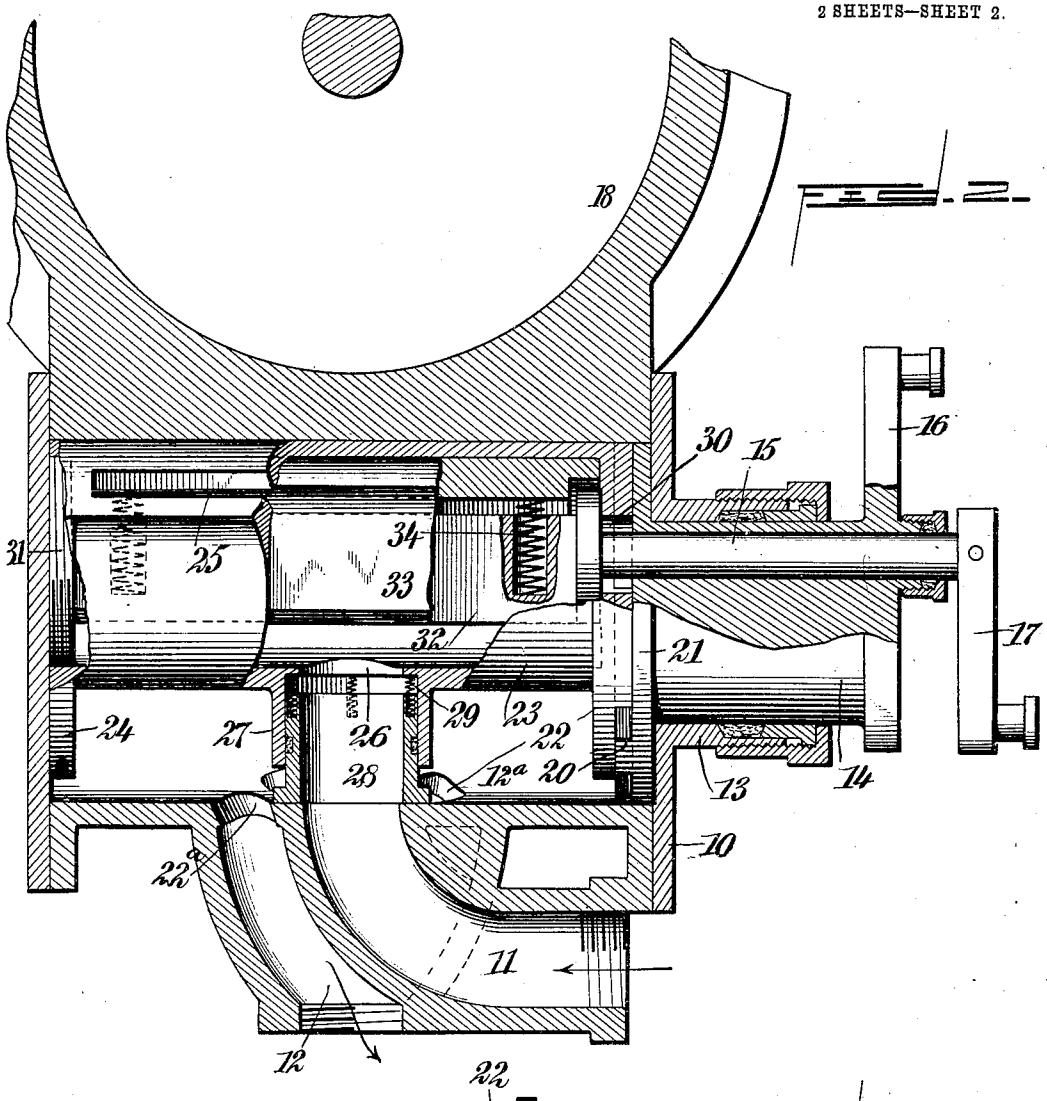


FIG. 2.

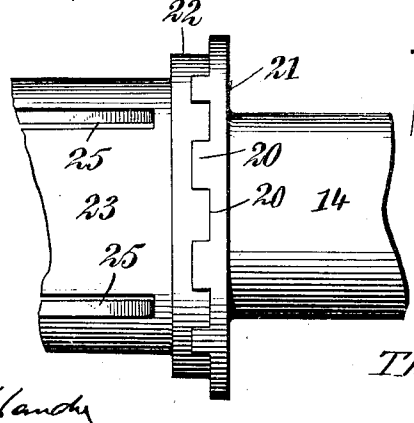


FIG. 4.

WITNESSES:

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No. 791,957. Patented June 6, 1905.

UNITED STATES PATENT OFFICE.

THOMAS GRIFFITH VAN SANT, OF PARAGOULD, ARKANSAS.

ROTARY VALVE.

SPECIFICATION forming part of Letters Patent No. 791,957, dated June 6, 1905.

Original application filed April 11, 1904, Serial No. 202,564. Divided and this application filed September 22, 1904. Serial No. 225,460.

To all whom it may concern:

Be it known that I, THOMAS GRIFFITH VAN SANT, a citizen of the United States, and a resident of Paragould, in the county of Greene and State of Arkansas, have invented a new and Improved Rotary Valve, of which the following is a full, clear, and exact description.

The invention relates to a valve mechanism for steam and other elastic-fluid engines; and the invention resides particularly in an improved rotary valve, by means of which steam may be admitted to and exhausted from the engine-cylinder.

The invention is intended especially for use with the rotary cut-off forming the subject of my prior patent, No. 778,088, dated December 20, 1904, of the application on which said patent issued my present application is a division.

Reference is had to the accompanying drawings, which illustrate, as an example, the preferred embodiment of my invention, in which drawings like characters of reference indicate like parts in the several views, and in which—

Figure 1 is a section taken across the valve mechanism longitudinally of the engine-cylinder. Fig. 2 is a section taken longitudinally of the valve mechanism and across the engine-cylinder. Fig. 3 is a detail perspective view of the main valve, and Fig. 4 is a detail showing the interlocking connection between the main valve and its stem.

The cylinder of the engine is provided with a valve-case 10, having a live-steam port 11 and an exhaust-port 12, as shown. The valve-case 10 is also provided with a stuffing-box 13, in which is mounted a relatively enlarged stem 14 of the main valve. This stem carries eccentrically the independently-rockable stem 15 of the cut-off valve. The stems 14 and 15 are respectively provided with crank-arms 16 and 17. The crank-arm 16 is adapted to be connected with a fixed eccentric driven in time with the engine movement, so as to give the main valve a constant movement, as will hereinafter fully appear. The crank-arm 17 is adapted to be connected with a loose eccentric controlled by a suitable governor, so that the movement of the arm 17, and consequently of the cut-off valve, may be varied to vary the period of cut-off, as will also fully appear hereinafter.

The cylinder 18 of the engine has the usual ports 19 leading to the ends thereof and communicating with the valve-chest 10. The exhaust-steam port 12 passes from the chest 10 through openings 12^a, surrounding the live-steam or inlet port 11. The main-valve stem 14 is connected to the main valve by interengaged ribs and grooves 20, formed on a flange 21 on the inner end of the stem and a corresponding flange 22, formed on the adjacent end of the main valve 23. Said valve 23 lies within the valve-chest and has a flange 24 at the end opposite the flange 22, the latter flange bearing against the adjacent end or head of the chest 10. The main valve 23 is hollow and is formed with two ports 25, extending longitudinally therein and adapted, respectively, to register with the ports 19. The valve 23 is also formed with a port 26, centrally located and surrounded by a boss 27, formed on or fastened to the valve and loosely containing a sleeve 28. The sleeve is flanged at its outer end and is adapted to register with the inlet or live-steam port 11, the flange at the outer end of the sleeve matching with the inner surface of the valve-chest 10 to form a steam-tight joint and yet to allow the free rocking of the main valve, whereby to cause the ports 25 alternately to register with the ports 19. The valve 23 is kept yieldingly on its seat and the flange of the sleeve 28 in proper contact with the inner surface of the valve-chest by means of expansive springs 29, bearing between the valve and the sleeve, and within the boss 27, as shown best in Figs. 1 and 2. It accordingly follows that steam passing through the inlet-port 11 and sleeve 28 will enter the valve 23 and be distributed first to one side and then to the other of the piston by the alternate action of the ports 25 and 19. At the end of the main valve adjacent to the stem 14 thereof is formed an opening 30, registering with the opening in the stem 14, receiving the stem 15, but larger than said opening, so that the cut-off-valve

stem 15 may project through the opening 30 without interfering with the lateral movement of the valve 23 relative to said stem. At the end of the valve 23 opposite the opening 30 a head or closure 31 is screwed or otherwise fitted, as indicated best in Fig. 2.

The cut-off valve comprises a bar 32, rigidly connected to the stem 15 and straddled by a saddle-like cut-off valve proper, 33. Said valve is pressed upon the concentric inner side of the valve 23 by means of a spring or springs 34, acting between the bar 32 and valve 33. The cut-off valve when in inactive position lies intermediate the ports 25, and upon the operation of the cut-off it moves from one side to the other of said inactive position to cover one or the other of said ports 25.

In the operation of the valve mechanism when the cut-off is inactive the valve 23 rocks from side to side, alternately connecting the ports 25 and the ports 19. When one port is so connected, the valve will have moved past the opposite port, and consequently live steam will be passing through the first-mentioned port and exhaust-steam will be escaping from the second-named port, the exhaust-steam passing around the side of the main valve 23 and out through the orifices 12^a and exhaust-port 12. During these operations of the main valve the cut-off valve, if inactive, moves bodily with the main valve and does not interfere with the passage of the steam through the ports 25. Upon the operation of the cut-off valve, however, it moves from one side to the other of its inactive position independently of the rocking of the main valve, and in this manner steam will be cut off before the main valve reaches its cut-off position. The proper movement of the cut-off valve is brought about by the loose eccentric operating it and the governor controlling the same, the fixed eccentric giving the main valve a constant movement, and therefore an unchanged lead, compression, and exhaust, and the operation of the cut-off valve is automatically started or modified, according to the speed of the engine. The movement of both eccentrics compounded through the large main-valve stem 14 produces an accelerating cut-off and an unchanged lead, compression, and exhaust similar to that found in the commercial Corliss and Buckeye engines. The eccentrics for operating the two valve-stems and the governor controlling the loose eccentric have not been here illustrated. They may be of any sort—for example, those disclosed in my copending application, Serial No. 202,564, filed April 11, 1904.

Various changes in the form, proportions, and minor details of my invention may be resorted to at will without departing from the spirit and scope thereof. Hence I consider myself entitled to all such variations as may lie within the terms of my claims.

Having thus described the preferred embodiment of my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with a valve-case having steam-distributing ports and having a steam-inlet port and exhaust-ports surrounding the inlet-port, of a hollow rotary valve mounted in the case and having ports coacting with the distributing-ports of the case, a sleeve mounted to slide radially in the valve and communicating with the interior thereof, said sleeve engaging the inner wall of the case and registering with the inlet-port, and a spring acting between the valve and sleeve and tending to spread them for the purpose specified.

2. The combination with a valve-case having steam-distributing ports and a steam-inlet port, and exhaust-ports lying around the inlet-port, of a hollow rotary valve mounted in the case and having ports coacting with the distributing-ports of the case, means connecting said hollow valve with the inlet-port of the valve-case to permit the passage of the live steam from the inlet-port through said means and through the valve to the distributing-ports of the valve-case, the exhaust-steam passing around the valve and out said exhaust-ports, and means for operating the valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS GRIFFITH VAN SANT.

Witnesses:
E. J. SMITH,
W. J. LE ROY.