

No. 708,750.

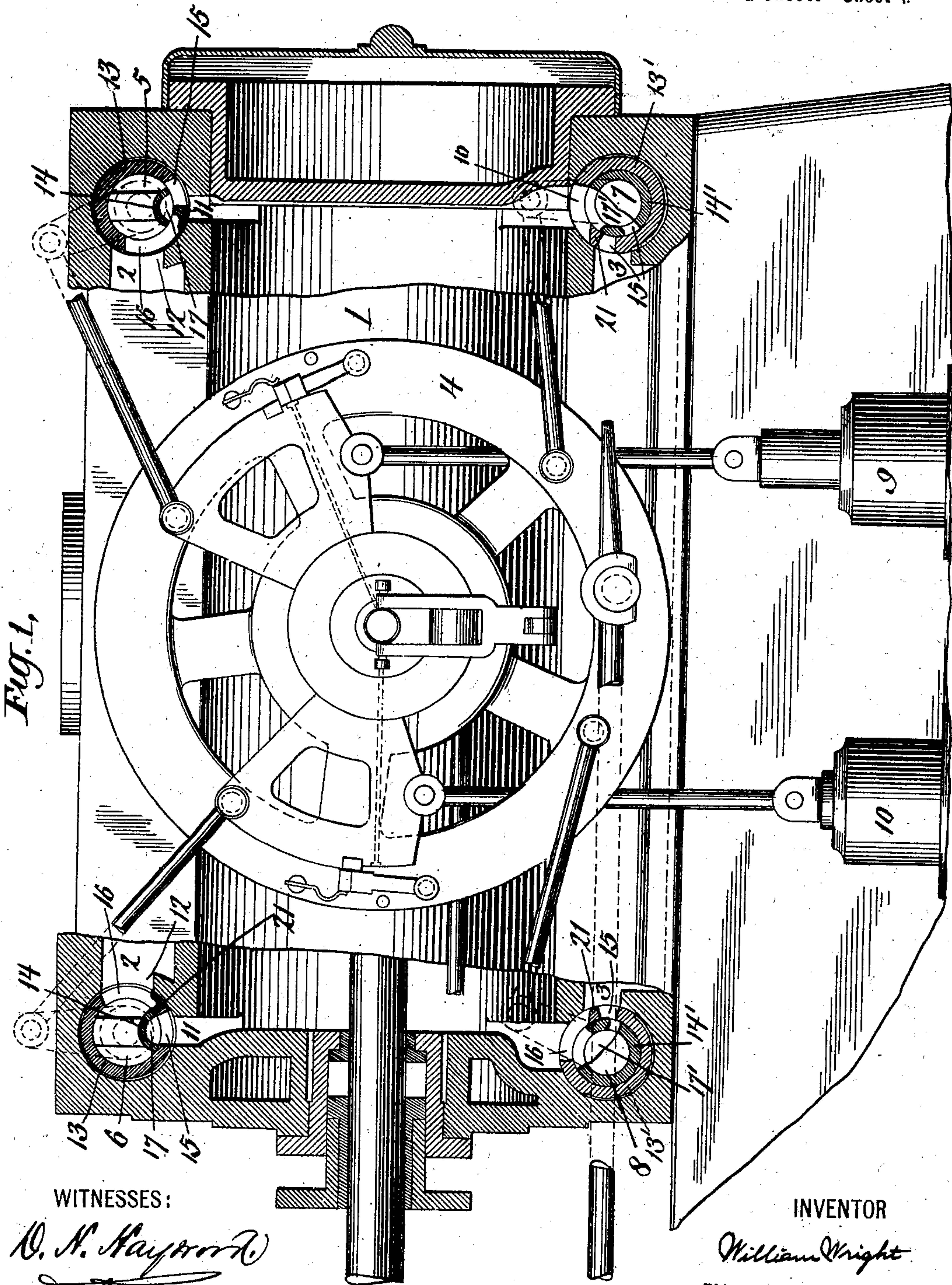
Patented Sept. 9, 1902.

W. WRIGHT.
VALVE FOR STEAM ENGINES.

(Application filed Jan. 4, 1899. Renewed May 17, 1902.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

R. N. Haywood
Harry S. Marshall

INVENTOR

William Wright
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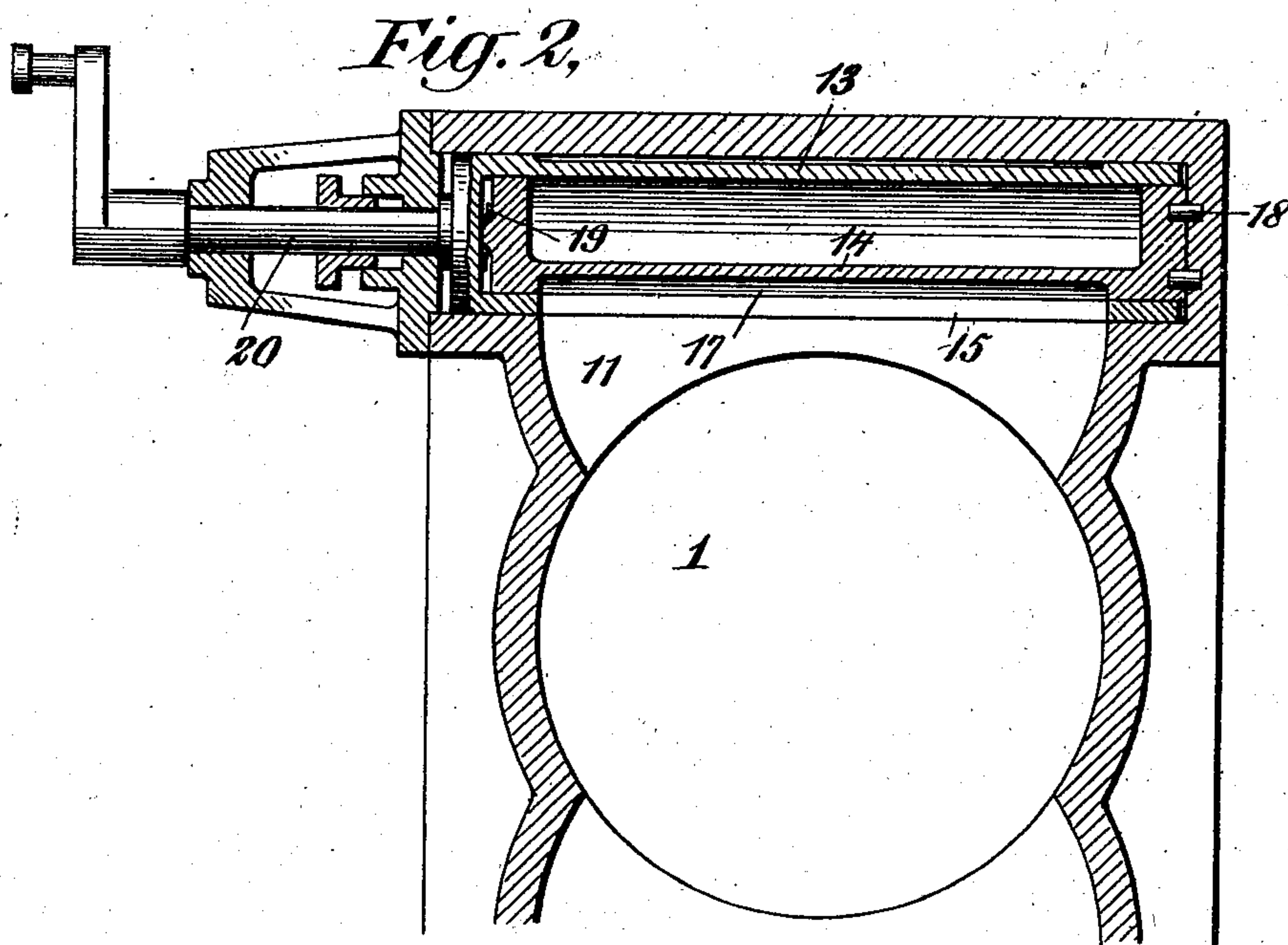
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WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM WRIGHT, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MARY E. WRIGHT, OF BROOKLYN, NEW YORK.

VALVE FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 708,750, dated September 9, 1902.

Application filed January 4, 1899. Renewed May 17, 1902. Serial No. 107,844. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WRIGHT, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city of New York, and State of New York, have invented certain new and useful Improvements in Valves for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to valves, and particularly to improvements in rotary valves of the type commonly employed in Corliss and other drop cut-off steam-engines.

My invention consists in the novel construction of the valve and in the novel combination, construction, and arrangement of the parts.

The objects of my invention are to obtain large area of port-opening when the valves are first opened without excessive travel of the valves, to provide a valve possessing this advantage and which may be substituted for the valves of engines already built without changing the valve-seats of such engines, and to make the valve as simple, durable, and inexpensive as possible. These objects are attained in the invention herein described, and illustrated in the drawings which accompany and form a part of this specification, in which the same reference-numerals indicate the same or corresponding parts, and in which—

Figure 1 is a side elevation and partial section of the cylinder and valve-gear of a Corliss engine, the ends of the cylinder and the valves being shown in section; and Fig. 2 is a vertical transverse section of the engine-cylinder through the center of one of the valve-chambers.

As the steam-valves of Corliss and other drop cut-off engines are ordinarily constructed steam is admitted through but a single opening in the valve. Since the valve of necessity opens gradually, the port-opening at the beginning of each stroke is comparatively small and can be made sufficient for the purpose only by giving the valve excessive travel. There is also considerable wear of the edges of the ports, due to tipping of the valve toward that edge at which steam enters. The valve herein described is so

constructed as to provide two openings for the admission of steam, opening simultaneously, and so providing ample port-opening at the beginning of each stroke without excessive valve travel. The valve is also constructed that it may be substituted in engines already built for rotary valves of other types without altering the valve-seats of such engines.

In the drawings, 1 designates the engine-cylinder; 2, its steam-chest; 3, its exhaust-receiver; 4, the wrist-plate of the valve-gear; 5 and 6, steam-admission valves, and 7 and 8 exhaust-valves. The valve-gear is of the type covered by a companion application for Letters Patent of even date herewith, but need not be particularly described, as it operates the valves in the same manner as former drop cut-off valve-gears of the Corliss type, tripping the steam-admission valves at the point of cut-off as determined by the governor of the engine and permitting suitable valve-closers or vacuum-ports 9 and 10 to close the valves so tripped. In the valve-chamber of each of the admission-valves is a port 11, leading to the interior of the engine-cylinder, and an opening 12, connecting said valve-chamber with the steam-chest 2. Each valve consists of a hollow cylinder 13, turned true inside as well as outside, within which is a stationary port-closer 14, seated on the inner surface of such cylinder 13. Each of the valve-cylinders 13 has a port 15, registering with the cylinder-port 11, and in proximity thereto a second port 16, and the port-closer 14 has in its face a recess 17, adapted to connect the ports 15 and 16 of the cylinder 13 when the valve is open by overlapping the bridge 21, separating said ports. The port 16 of the valve may register with the opening 12, which connects the valve-chamber with the steam-chest 2, or if other means be provided for admitting steam to the interior of the cylinder 13 the port 16 may be a simple recess in the inner surface of the cylinder 13. The port-closer 14 has its bearing in the valve-cylinder 13, but is prevented from turning by dowels 18, Fig. 2, fitting within recesses in the rear end of the valve-chamber, and at the other end of the port-closer there may be a spring-washer 19 to press said port-closer toward the rear end of the valve-chamber. The

valve-cylinder 13 is closed at its front end and is provided with a valve-stem 20, passing through a suitable stuffing-box and carrying a crank-arm, by which said valve-cylinder 5 may be rotated back and forth.

In Fig. 1 valve 5 is shown in its open position and valve 6 in its closed position. When one of the valves is closed, the port 15 in its rotating cylinder 13 is completely covered and closed by the port-closer 14. To 10 open the valve, its cylinder 13 is rotated to one side. Steam then passes from the interior of the cylinder 13 around one edge of the port-closer 14 and through the port 15 into the engine-cylinder port 11 and also through 15 the port 16 of the cylinder 13 around the other edge of the port-closer and through the recess 17 therein into the port 15 of the cylinder 13 and so into the engine-cylinder port 20 11. These two openings for the admission of steam open simultaneously, and therefore afford ample port-opening for the admission of steam at the beginning of the stroke with much less valve travel than that which it is 25 necessary to provide in order to enable a single-ported valve to provide an equal amount of port-opening at the beginning of the stroke.

The cylinder 13, with its port-closer 14, may be inserted into the valve-chambers of engines already built and provided with single-ported valves of the ordinary type without 30 any change in the ports or valve-seats. The only change required in the engine is the boring of dowel-holes in the rear end of each valve-chamber to receive the dowels of the 35 port-closers 14, and this may be done very readily while the engine is in place.

It will be noted that there can be no wear of the edges of the port 15 due to tipping of 40 the port-closer, for the steam presses equally on both sides of said port-closer when the port 15 is open.

The exhaust-valves differ somewhat in construction from the steam-valves, their construction being such that the pressure of 45 steam in the cylinder tends to keep them tight, whereas the steam or admission valves are so constructed that the pressure of steam from the steam-chest tends to keep them 50 tight. Each exhaust-valve consists of a cylinder 13', having within it a port-closer 14'. The port-closer, however, is not recessed, but has a passage or port 17', and the angle subtended on the outer side of the cylinder 13 55 by the bridge of metal 21, separating the ports 15 and 16 of cylinder 13, is the same as the angle subtended by the portion of the port-closer 14 of the admission-valve which overlaps the admission edge of the port 15—that 60 is to say, the lap of the valve is the same in both cases. The exhaust-valve at the left-hand or front end of the cylinder is shown in the open position. Steam may pass from the port 16 directly into the exhaust-receiver 3 65 and also from port 16 through ports 17' and 15 into the exhaust-receiver.

It is not necessary that the movable mem-

bers of either of the valves herein described—viz., the members 13 or 13'—be a complete 70 cylinder. It may have merely enough metal on each side of the port 15 to provide bearing for the port-closer and to provide the required amount of lap in the exhaust-valve; but I prefer that the moving member 13 shall be 75 cylindrical, as shown.

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

1. The combination of a valve-seat, valve, 80 and stationary port-closer, the valve and valve-seat having coacting ports adapted to permit the passage of fluid past the port-closer in one position of the valve, and the port-closer adapted to close a valve-port in one position of the valve, and having a port com- 85 municating with said valve-port and arranged to be opened by the valve when the latter moves to its open position, whereby the port in the port-closer forms an additional channel for the passage of fluid. 90

2. The combination of a cylindrical valve-chamber, a hollow cylindrical valve within the same, and a stationary port-closer within the valve, said valve and valve-chamber hav- 95 ing coacting ports adapted to permit the passage of fluid past the port-closer in one position of the valve, and the port-closer adapted to close a valve-port in one position of the valve, and having a port communicating with 100 said valve-port and arranged to be opened by the valve when the latter moves to its open position, whereby the port in the port-closer forms an additional channel for the passage of fluid.

3. The combination of a valve-seat, valve, 105 and stationary port-closer, the valve and valve-seat having coacting ports adapted to permit the passage of fluid past the port-closer in one position of the valve, and the port-closer adapted to close a valve-port in one position of the valve, and having a recess which 110 communicates with said port and spans a portion of the valve on one side of said port when the valve moves to its open position, thereby affording an additional channel for the 115 passage of fluid.

4. The combination of a cylindrical valve-chamber having admission and exit ports, a hollow cylindrical valve within said chamber likewise having admission and exit ports, and 120 a stationary port-closer within said valve adapted to close one of the ports thereof in one position of the valve, and having a recess which communicates with said port so closed and spans the space between the ports of the 125 valve when said valve moves to its open position, thereby affording an additional channel for the passage of fluid.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 130

WILLIAM WRIGHT.

Witnesses:

H. M. MARBLE,

J. C. SPRINGSTEEN.