

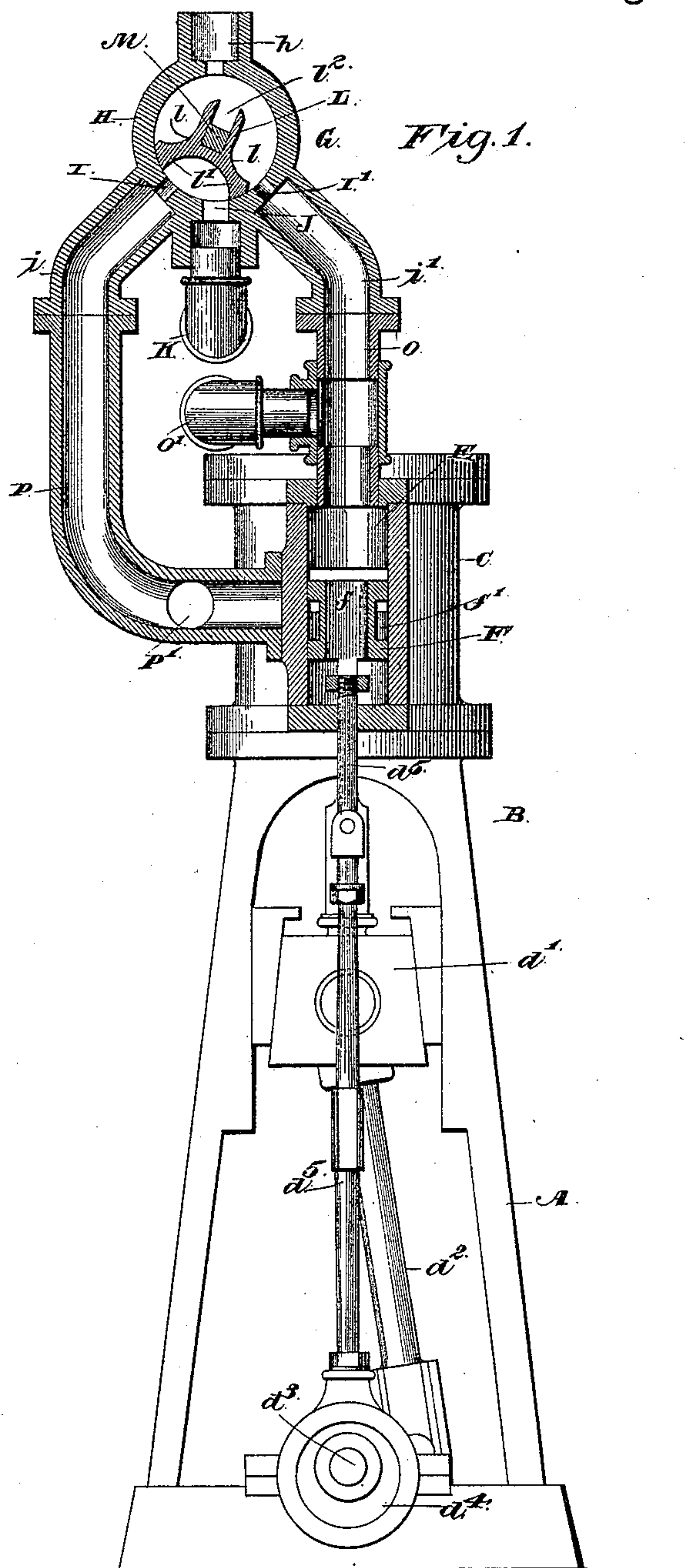
(No Model.)

2 Sheets—Sheet 1.

J. CLARK.
REVERSING VALVE.

No. 481,162.

Patented Aug. 23, 1892.



Witnesses

M. E. Fowler
D. P. Wolhaupter

Inventor

James Clark

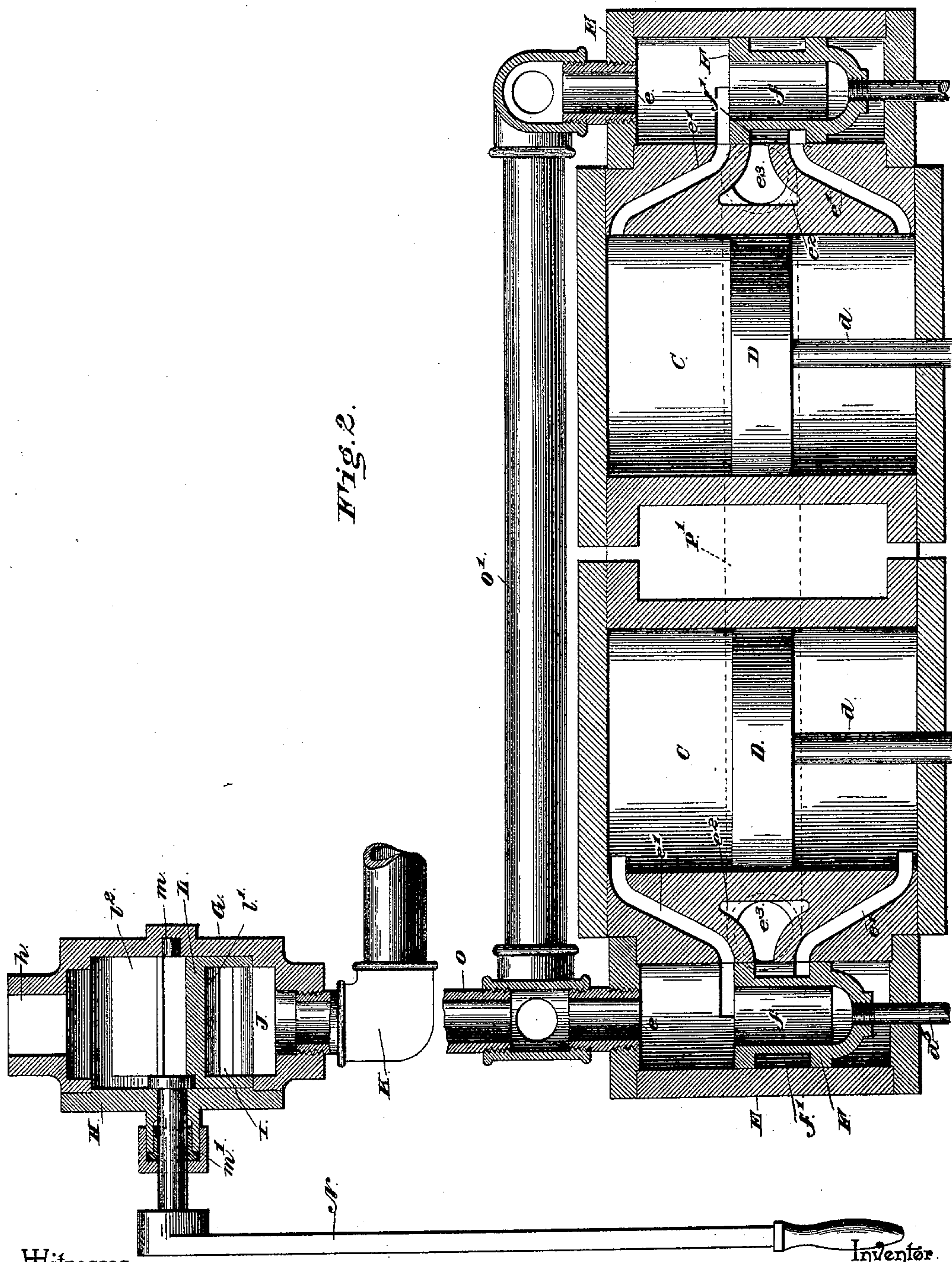
By his Attorneys,

C. A. Snow & Co.

2 Sheets—Sheet 2.

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Witnesses

Inventor

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By his Attorneys,

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UNITED STATES PATENT OFFICE.

JAMES CLARK, OF MEDINA, NEW YORK.

REVERSING-VALVE.

SPECIFICATION forming part of Letters Patent No. 481,162, dated August 23, 1892.

Application filed December 31, 1891. Serial No. 416,696. (No model.)

To all whom it may concern:

Be it known that I, JAMES CLARK, a citizen of the United States, residing at Medina, in the county of Orleans and State of New York, have invented a new and useful Reversing-Valve, of which the following is a specification.

This invention relates to reversing-valves; and it has for its object to provide a valve and connections therewith whereby the same shall be adapted for use in connection with ordinary steam-engines of the piston or slide-valve type for reversing, stopping, and starting the same through the medium of a single valve.

In this use my invention is especially applicable for use in engines employed for operating hoisting devices in which it is necessary to reverse, stop, and start the engine frequently. The valve is especially adapted for use in connection with hollow piston-valves as illustrated in the accompanying drawings, although, as stated, any balanced slide-valve may be used in connection therewith and the same result as effectively attained.

With these and many other objects in view, which will readily appear as the nature of the invention is fully understood, the same consists in the construction, novel combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view through one of the cylinder steam-chests of a double-cylinder hoisting-engine and my improved reversing and cut-off valve connected therewith. Fig. 2 is a longitudinal sectional view through both cylinders and cylinder steam-chests and my improved valve connected therewith.

Referring to the accompanying drawings, A represents the ordinary bed or framework of a double-cylinder hoisting-engine, and arising from the same are the standards B, supporting the parallel vertical cylinders C, within which work the ordinary pistons D, carrying the piston-rods d , extending beneath said cylinders and connected with the usual sliding cross-heads d' , working in said standards. The usual swinging crank-arms d^2 are pivoted to said cross-heads and operated thereby and connected with the usual cranks upon

the power-shaft d^3 , carrying ordinary eccentrics d^4 upon each end thereof and which actuate the vertical eccentric rods d^5 . Upon each side of each of the cylinders C are located the cylinder steam-chests E, provided at their upper ends with the steam-openings e and communicating with the usual alternate exhaust and steam ports e' , communicating with each cylinder above and below the pistons therein, and said steam-chests are also provided with the intermediate steam-port e^2 between said ports e' and communicating with the ordinary central exhaust e^3 , which in the present invention may be used interchangeably with the steam-openings e for supplying the steam-chests with live steam or exhausting the same, according to the movement of the throttle-valve used in connection therewith. Sliding within said steam-chests are the hollow piston-valves F, each of which is provided with the central channel f and the annular grooves f' , turned in the peripheries thereof, and said valves are each connected with the opposite eccentric arms d^5 , as illustrated in the drawings, and which are operated by eccentrics on opposite ends of the power-shaft d^3 to alternately control said valves to regulate the supply of steam to and from the cylinder.

Located above the engine just described, or above any other form of engine of a similar type, is my improved two-way throttle-valve G. The casing H of the valve G is preferably cylindrical in shape, and forms a steam-chest for receiving the live steam through the upper inlet h in the top thereof, and for directing the same through the proper channels, to be described, according to the direction in which it is desired to move the engine. The said casing is provided in the bottom thereof with the opposite steam-ports I and I', respectively communicating with the conducting-pipes i and i' , extending beneath and outwardly from said casing at an angle of forty-five degrees thereto, in order to allow for directing steam through one conducting-pipe while the opposite pipe over the opposite opening of said casing is receiving the exhaust from the engine, and conducting the same through the exhaust-port J, located in the bottom of the valve-casing and communi-

cating with the exhaust-steam pipe K, which discharges the exhaust-steam into the air or returns it to the boiler in the usual manner.

Mounted within the cylindrical valve-casing H and oscillating therein is the two-way turning plug L, which is triangular in shape and provided with the concaved sides l and the opposite regulating-wings l' , that are adapted, as the said valve is turned by the operator, to either close both of the steam-ports I and I', respectively, or to allow one to conduct live steam while the other is receiving the exhaust, or a reversal of the operation, according to the option of the engineer. The upper portion of the turning plug L, extending above and intermediate of the opposite wings l' , is provided with the squared seat or recess l^2 , which receives the squared portion of the operating-shaft M, journaled at m in one side of the valve-casing and extending through the stuffing-box m' , at the opposite side of said casing, and operated by the throttle-lever N, keyed to the outer end thereof, and thus providing means for the ready manipulation of the valve.

By ordinary steam-piping O the conducting-pipe i' is connected with the steam-opening e in the top of the steam-chest E adjacent thereto, and the steam-opening e in the opposite steam-chests is also connected with said conducting-pipe by means of the steam-piping O', coupled to the piping O. Thus when the steam is directed through the conducting-pipe i' the same simultaneously passes into the heads or upper ends of said steam-chests. The opposite steam-conducting pipe i is connected by means of the piping P and P' with the exhaust-openings e^3 of each cylinder, so as to either direct the steam centrally into each steam-chest at the same time or to receive the exhaust from the same, according to the disposition of the throttle-valve controlling said steam-pipes. It is thought that the operation and use of my improved throttle will now be apparent as used in connection with the hollow piston-valve herein described. Steam being admitted at h into the valve-casing or valve-steam chest when the throttle is turned, so as to leave a free passage for the entering steam through the port I', and at the same time throws the port I and the exhaust-port j into communication on account of the concaved bottom or side of the throttle between the opposite wings thereof, the said steam passes into the conducting-pipe i' and into the top of each steam-chest. Entering said steam-chests the live steam passes through the channel f therethrough and thus distributes itself throughout the chest, so that as the valves F reciprocate therein it will pass alternately into the opposite steam-ports e' above and below the pistons to operate the same. It will be seen that while the steam in the steam-chests is passing through one of the ports e' , either above or below the pis-

tons, the other port is uncovered by the annular groove in said sliding valves and thus allows the steam to exhaust through said grooves and into the central exhaust-openings e^3 , and from thence through the pipes P and P' through the port I and out through the exhaust-port j and exhaust-pipe into the atmosphere. It is thought to be equally apparent that when it is desired to reverse the motion of the engine it is simply necessary to turn said throttle-valve to the opposite position to uncover the port I. The steam will now pass from the boiler directly to the exhaust-openings of the ordinary cylinder, and will thus be fed to the annular groove in the sliding hollow piston-valves, which will thus take the steam at the center of the steam-chests instead of at the ends, and thereby reverse the motion of the engine. The ends of the sliding valves S now become the cut-offs for the exhaust, which finds its way from each of the steam-ports e' through the hollow valve and out of the ends of the steam-chests. From thence the steam passes through the pipes O and O', through the port I', and through the bottom of the central exhaust-port of the valve-casing H. By putting the lever N in a vertical position both of the ports I and I', respectively, are covered, and thus stop the engine. The various uses of this throttle-valve are now thought to be quite apparent.

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

In a reversing-valve, the combination, with opposite steam-chests having central and end steam-ports and hollow annularly-grooved valves moving in said chests, of a cylindrical valve-casing supported above and away from said steam-chests and having opposite bottom alternating exhaust and steam ports, and a central piped exhaust-port between said opposite alternating ports, piping O and O', connecting one of said alternating ports with the end ports of both steam-chests, piping P and P', connecting the opposite port with the central ports of said steam-chests, an oscillating two-way plug mounted within said casing and provided with concaved sides and bottom forming opposite regulating-wings moving over said alternating ports to connect either one of the same with the piped exhaust, and an upper squared seat or recess intermediate of said wings, an operating-shaft journaled in said casing and having a squared portion resting in said seat, and a lever connected to said shaft, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES CLARK.

Witnesses:

FRED L. DOWNS,
JAMES KEARNEY.