(No Model.)

H. T. CLARKE.

REVERSING VALVE.

No. 456,886. Patented July 28, 1891.

Fig. 1.

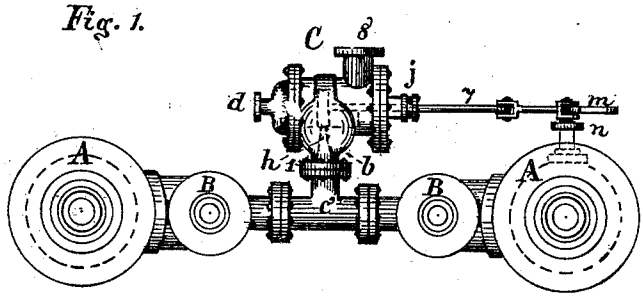


Fig. 2.

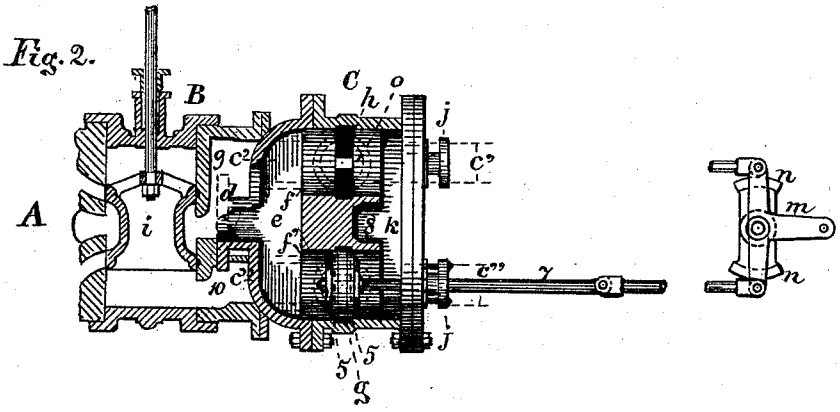
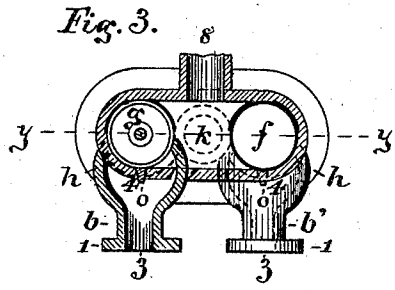


Fig. 3.



Witnesses:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HARRY T. CLARKE, OF PORTLAND, OREGON, ASSIGNOR TO THE PORTLAND IRON WORKS, OF SAME PLACE.

REVERSING-VALVE.

SPECIFICATION forming part of Letters Patent No. 456,886, dated July 28, 1891.

Application filed April 1, 1891. Serial No. 387,285. (No model.)

To all whom it may concern:

Be it known that I, HARRY T. CLARKE, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Reversing-Valves, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

The object of my invention is to overcome the objectionable features of the reversing-valves heretofore in use in twin engines intended to be constantly reversed.

The essential features, in addition to the usual requirements, of a valve designed to accomplish such continuous reversing are a short stroke or movement, an absolute steam-tight fit of the valve on its seat, so that the same will completely throttle the steam when set on its neutral point, while at the same time the valve must move freely so as to be easily controlled and be quick to respond to the hand of the operator. If the valve has too long a stroke or movement, or does not move easily, its action, of course, is not under control, and it is then an annoyance to the operator such as will retard the work on hand; while, if the reversing-valve does not fit absolutely steam-tight, the efficient working of the engines is lost, the distribution of the live steam is no longer under complete control, and such a defect is necessarily attended with imminent danger, for, should the live steam leak into either of the ports of the engines while the same are at a standstill, the engines might be caused to start up suddenly and threaten life and limb. These are some of the common defects found in reversing-valves, and to remedy the same I construct my reversing-valve as shown in the drawings, in which—

Figure 1 is a side elevation showing my invention combined with the main valves B and piston-cylinders A, of which an end view is seen. Fig. 2 is a partial sectional view on the line *y y* of Fig. 3, also showing a sectional view of one of the main valves B used in conjunction with my invention, and Fig. 3 is a partial vertical section of my invention.

Like letters and figures refer to like parts.

C is the valve-chamber, mounted by means of the flanged ends 1 of the steam-conducts *b b'* on the flanged top of the steam-supply pipes *c' c''*, leading from the ports 9 10 of the main valves.

d is the steam-inlet to the steam-chamber *e*, connecting the steam passage-ways *f f'*, constituting the cylindrical seats for the steam-balanced piston-valves *g*, sliding over the ports *h*. The construction of the latter is as appears, merging from a pipe end 3 into a semi-globular form 4, and thence into a concave rectangle, so as to extend half-way around the valve and thus afford a sufficient steam-area. The piston-valves *g* are rendered absolutely tight by being provided with snap-rings 5, said rings being prevented from slipping into the ports *h* by providing bridges *o*.

My reversing-valves operate at right angles to the main valves, the latter being hollow cylindrical slide-valves *i*, operated from a single shaft. The valve-stems 7 extend through the glands *j*. *k* is the exhaust-passage connecting the steam passage-way or cylindrical valve-seats *f f'* with the exhaust-conduct 8. The valve-stems 7 are connected by suitable connections with a T-crank *m*, pivotally supported on a fulcrum *n*, thus affording suitable means for moving said reversing-valves *g* simultaneously in opposite directions. The action of the said reversing-valves *g* is apparent. As seen in the drawings, the valve there shown is placed at its neutral point. Operating the T-crank *m* in either direction would cause said valve to clear the port *h*, giving the steam either ingress or egress, and the movement of the other valve would be reciprocal, with an opposite effect. In reversing the engines, the live steam is thus first gradually cut off and then gradually readmitted into the desired port.

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

1. The combination of the main valves of twin-cylinder engines with reversing-valves constructed as described, consisting substantially of a valve-chamber C, the steam-conducts *b b'* of which are connected with the ports of said main valves, the said valve-chamber C being provided with a steam-chamber *e* and steam passage-ways or cylindrical

valve-seats f f', connected thereby on one end and connected on the other end by an exhaust-chamber k with the exhaust-conduct 8, the ports h, the bridges o, the steam-tight balanced piston-valves g, and suitable operating mechanism therefor, substantially as and for the purposes set forth.

2. The combination of the valve-chamber C, the steam-conducts b b', connecting the same with the ports of the main valves of twin-cylinder engines, said valve-chamber C being provided with a steam-chamber e and steam passage-ways or cylindrical valve-seats f f', connected thereby on one end, and connected on the other end by an exhaust-chamber k with the exhaust-conduct 8, the ports h, bridges o, steam-tight balanced piston-valves g, and means for operating the latter, substantially as and for the purposes set forth.

HARRY T. CLARKE.

Witnesses:
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