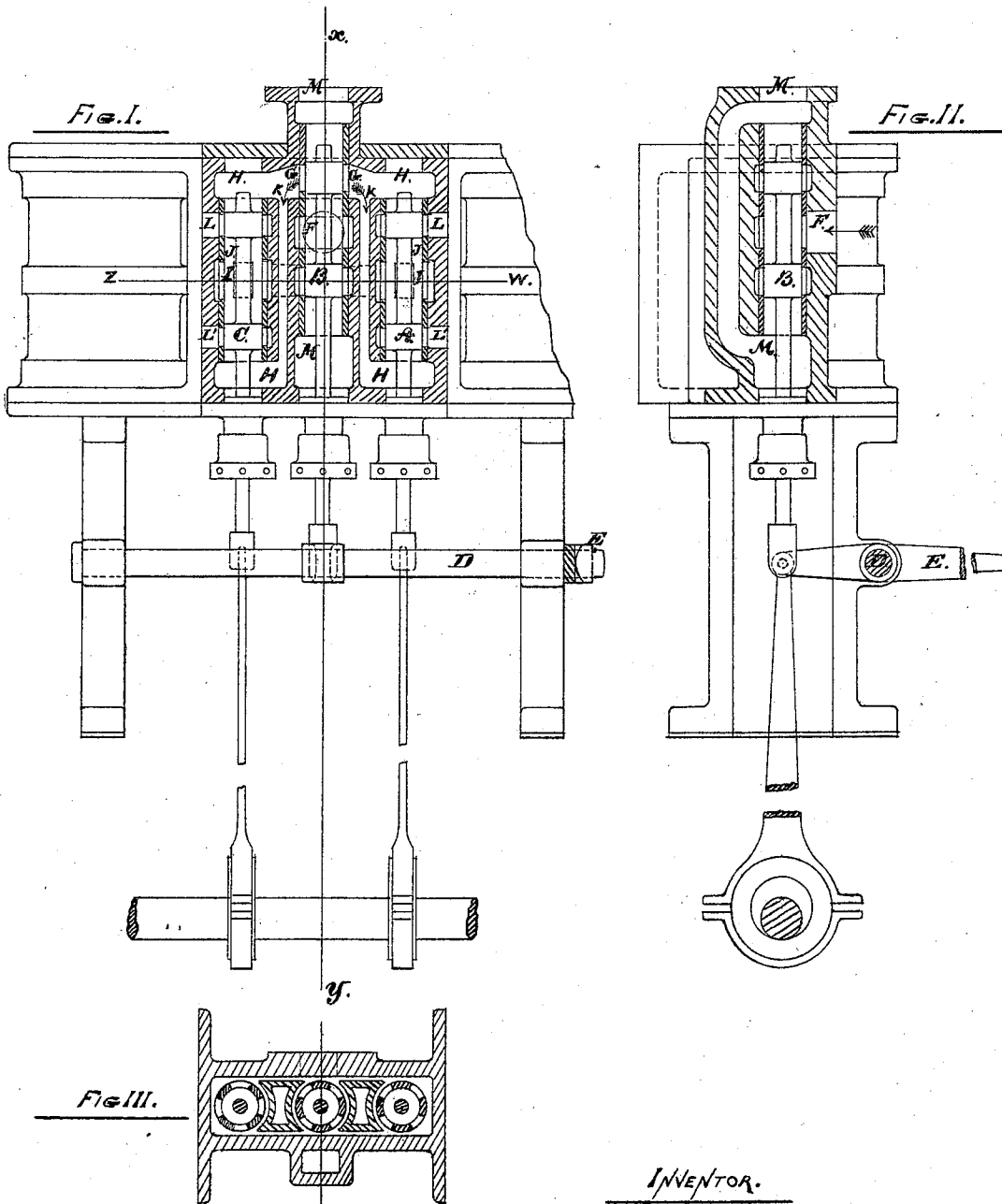


W. GLEN.

Balanced-Valves for Steam-Engines.

No. 141,218.

Patented July 29, 1873.



WITNESSES.

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per
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UNITED STATES PATENT OFFICE.

WILLIAM GLEN, OF TORONTO, CANADA.

IMPROVEMENT IN BALANCED VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **141,218**, dated July 29, 1873; application filed March 14, 1873.

To all whom it may concern:

Be it known that I, WILLIAM GLEN, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, engineer, have invented certain Improvements in Balanced Valves for Steam-Engines, of which the following is a specification:

My invention relates to an improved balanced engine-valve, designed for the purpose of dispensing with a link motion, while at the same time all the advantages of "links" are secured in a simpler and cheaper manner.

Figure 1 is a front view or plan of a double engine with my improved valve shown in section. Fig. 2 is a sectional view through *xy*. Fig. 3 is a sectional view through *zw*.

In illustrating my invention I have chosen to show it as applied to a double-cylinder engine, the valve-casing being a plain box-shaped casting with the cylinders bolted on each side. There are three double-ended piston-shaped valves, A, B, and C—A and C being the cylinder-valves, and B the throttle. The former are worked in the usual manner by the eccentrics and rods, as shown. The valve-stem of the latter is connected to an arm on the rocker-shaft D operated by the starting-lever E, as may be understood by reference to Fig. 2. The arrangement of the ports necessitates brass or other linings for the valve-chests, as will be understood by any mechanic.

I now wish to draw your attention to the internal arrangement of my valves, which is, of course, the foundation of my invention.

F is the steam-pipe hole. G are steam-ports communicating with the outside steam-chambers H. I are other steam-ports communicating with the inside steam-chambers J through cored passage.

In Fig. 1 the valve B is shown closing both steam-ports G and I; but it will easily be understood that by pressing the starting-lever E down the valve B would naturally be forced up, admitting the steam, through the ports G, into the outside chambers H, where it enters the valve-chests, as indicated by arrows

K; and, as the valves A and C are worked in the usual manner the steam is admitted into the cylinders through the ports L and L' alternately, as each port is opened to the steam-chamber H by the aforesaid motion of the valves. When the steam is thus admitted it exhausts into the inside chamber J, and from thence through the ports I, which are, of course, open, out through the exhaust-port M.

Now, to reverse the engine, press the starting-lever E up, which reverses the aforesaid position of the valve B, and connects the steam-pipe F with the inside steam-chamber J, through the steam-ports I, and the motion of the valves A and C going on, as before described, the steam is admitted into the cylinders from the inside chamber J and exhausted into the outside steam-chamber H, from which it escapes out through the ports G, as any mechanic examining Fig. 1 will readily understand.

Thus, by the application of my invention, an engine may be made reversible without the expensive addition of a link motion, and the valves A and C are balanced reversible, because the steam can be admitted on whichever side of the piston desired by the arrangement of the inside and outside steam-chambers, as described, and balanced, because when the steam is admitted into either chamber it will act oppositely on the double-ended piston-shaped valves A and C, and, as the areas of the surfaces which would be acted upon simultaneously are equal, an equilibrium is secured.

What I claim as my invention is—

The combination of the chambers M J H with the valves A B C and ports G I L L', when constructed and arranged for operation substantially as shown, and for the purpose set forth.

Toronto, March 1, 1873.

WM. GLEN.

Witnesses:

DONALD C. RIDOUT,
WM. SHEPPARD.