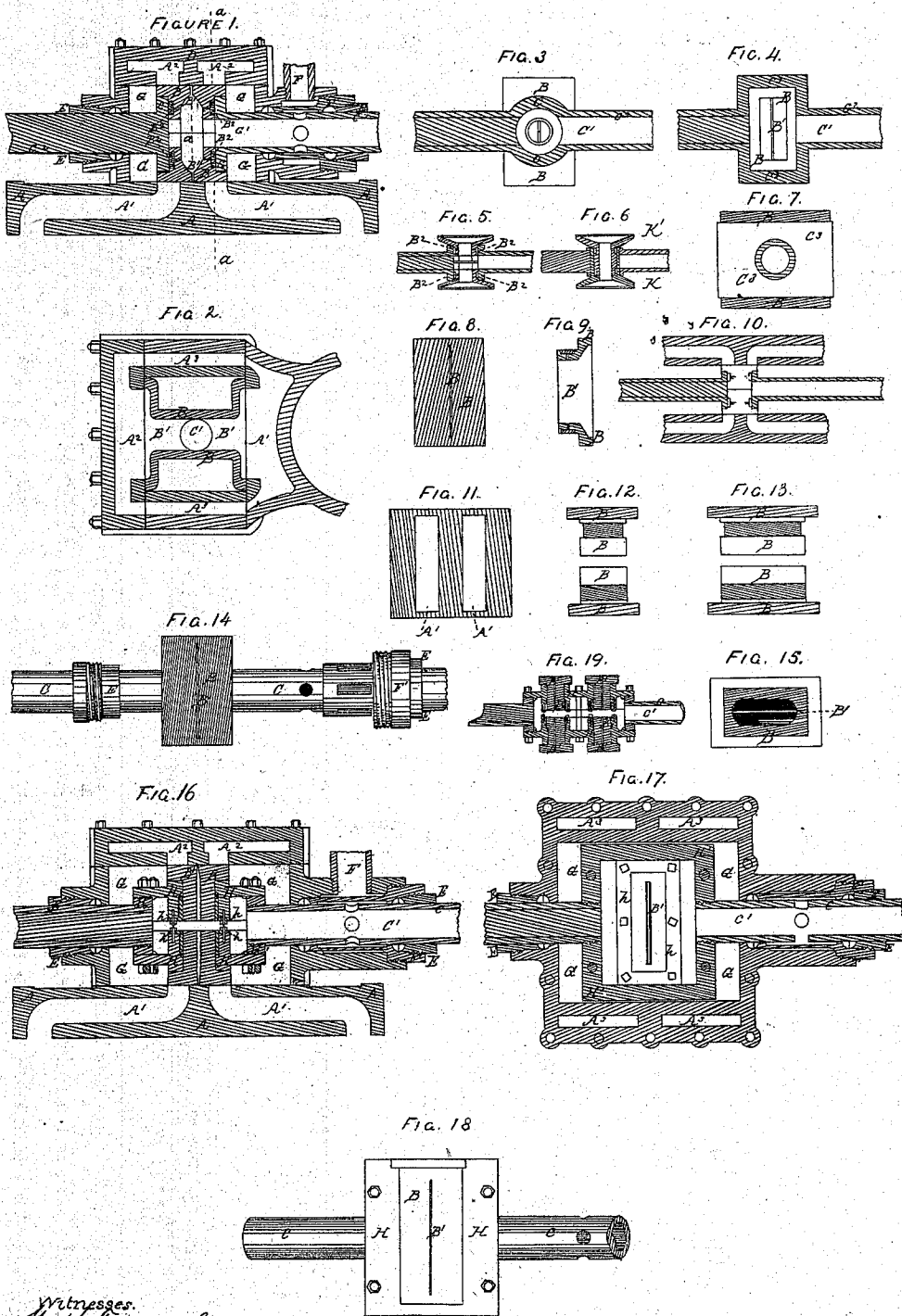


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Improvement in Slide-Valves for Steam-Engines.

No. 115,298.

Patented May 30, 1871.



Witnesses.
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IMPROVEMENT IN SLIDE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 115,298, dated May 30, 1871.

I, ISAAC WILLIAM FORBES, of La Porte, in the county of La Porte and State of Indiana, have invented certain Improvements in Slide-Valves for Steam or Air Engines, of which the following is a specification:

This valve receives steam in its middle through the stem, and the steam passes through it into ports corresponding. The outer ends of the valve just cover the ports when the valve is in its center. The moment that it is moved either way from that it commences to exhaust on the side from which it is moved in the steam-chest, and so through the exhaust-pipe designed for the same. Where live steam would be used with the common valve in the steam-chest, in this valve exhaust steam passes through and out.

Description of the Accompanying Drawing.

Figure 1 is a longitudinal central section of my double equilibrium female slide-valve, showing steam-chest, ports, stuffing-boxes, a double stuffing-box, and induction-pipe. Fig. 2 is a section of the same, shown in the dotted lines *a a*. Fig. 3 is a longitudinal central section of a valve-stem with one valve fitted in, showing one method of constructing the stem, with the stem bored out to receive the valve which is turned to fit the same. Fig. 4 is a longitudinal central section of a valve-stem with valve fitted underneath, showing another method of constructing the stem; this stem is mortised out and the back or piston of the valve made to fit accordingly. Fig. 5 is a longitudinal central section of a stem and valves divided in opposite quarters from that in Figs. 3 and 4, and on smaller scale from that of the former figures. Fig. 6 is a longitudinal central section of a double valve, stem, and valves of the same size of Fig. 5, showing another method of constructing the same. Fig. 7 is an end view of a stem, frame, and valves inserted therein. Fig. 8 is a view of that part of the valve which plays over the seat. Fig. 9 is a longitudinal central section of Fig. 8. Fig. 10 is a longitudinal central section of a double or twofold valve, designed to be used for a double engine when both engines are to run alike. Fig. 11 is the valve-seat and ports. Fig. 12 shows end views of two valves, the upper one with the packing-band removed, the

lower one with it on. Fig. 13 shows a side view of the same valve, the upper having the packing-band removed, the lower one with it on. Fig. 14 is a top view of a valve, valve-stem, gland, and double gland. Fig. 15 is the inside view of a valve. Fig. 16 is a longitudinal central section of a double equilibrium female slide-valve, and showing another method of constructing it. Fig. 17 is a longitudinal central section of a valve, valve-stem, and steam-chest, divided in opposite quarters from that in Fig. 16. Fig. 18, the valve, valve-frame, and the valve-stem as it belongs in the steam-chest. Fig. 19 is a longitudinal central section of a quadruple valve, constructed in the manner shown in Figs. 16 and 17, and on a smaller scale.

In the drawing, *A A* is a portion of the steam-cylinder, through which the steam-passages proceed from the ports to the cylinder; *A¹ A¹*, steam-passages; *A² A²*, steam-ports in chambers in the steam-chest, which convey the steam round the sides of the same into the cylinder; *A³ A³*, steam-passages through the sides of the steam-chest into the ports in the cylinders from the ports in the steam-chest cover. *B B* are valves. These valves have shanks or pistons upon that portion which fits in their frame. *B¹ B¹* are steam-passages through the valves. *B² B²* are steam-packing rings similar to those used in pistons for the purpose of preventing the passage of steam between the valve and its frame. *C C* are bosses on valve-stem, bored out to receive the valve which forms the frame; *C¹*, steam-passage through valve-stem; *C²*, valve-stem; *C³*, the valve-stem, which has a square mortise through the same. *E E* are glands. *F* is an induction-steam pipe. *F¹* is gland and stuffing-box. *G G* steam-chest through which exhaust steam passes into exhaust-pipe. *h h* are glands used in place of the steam-packing ring. *H H* are the two sides of the valve-frame, with stuffing-boxes dressed out for the purpose of receiving stuffing and glands to form a steam-tight joint between the valves and frame. In the place of bands *H' H'* two sides, *H H*, may have a flange upon each half of the tight joint, and bolted together, which will have the same effect as bands *H' H'*, and receive the valve-stem in the same way.

In Fig. 6 the valve K differs from those shown in the other figures in that the shank or piston is much longer and fits in its mate K', with steam-packing rings to prevent the leakage of steam between the two valves.

Claims.

1. The valve or valves B B, valve-frame C C, and steam-passages B¹ B¹ C¹, substantially as and for the purpose described.

2. The valves B B, in combination with H H and H' H', substantially as and for the purpose described.

3. The valves B B, in combination with valve-stems C² and bosses, substantially as described.

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Witnesses:

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