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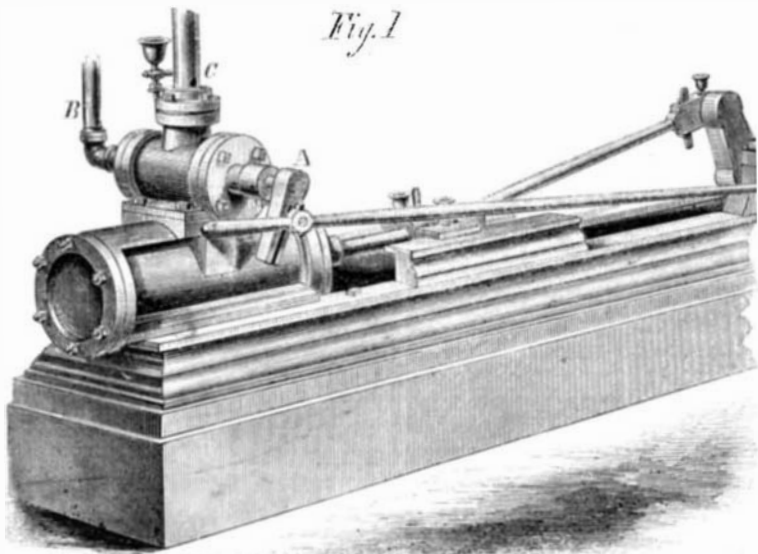
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Fig. 3 shows the upper, or exhaust side of the valve, and the recess, I, for the purpose of counterbalancing the upward pressure of the valve. There are small openings admitting the steam from the inside of the valve to these recesses. If the sum of the area of both these recesses exactly corresponds to the area of the main opening in the underside of the valve, it is evident that the valve will be balanced. It is found on actual experiment that the valve works as easy under pressure, the surfaces being exactly right, as it does without any pressure. The valve on a six-horse power engine, at work under sixty-five pounds of steam, was worked with the thumb and finger.



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working parts are not subject to heavy pressure. It may be applied to engines of any ordinary device, without alteration in the valve motion, link, or any part of the engine proper.

Fig. 1 represents an engine with the valve attached. This engine formerly had on a slide valve. No alteration has been made in the cylinder or valve seat. There are flanges cast on the under side of the valve socket, whereby it is bolted to the old valve seat. The arm, A, attached to the valve stem takes the eccentric rod by which the valve is worked. The position of the pin in which the rod hooks may be varied by means of a slot in the arm, thus varying the oscillation of the valve. B is the steam, and C is the exhaust pipe.

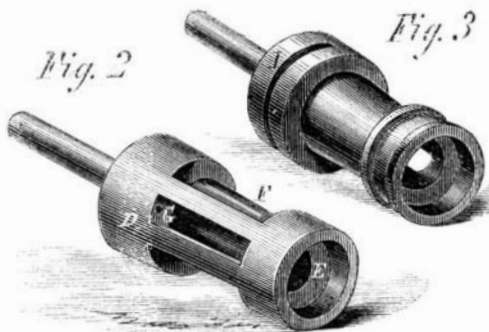


Fig. 2 represents the valve isolated, chiefly to show the opening, D, which communicates alternately with corresponding openings in the valve-chest, leading to the opposite ends of the cylinder. Steam is admitted at E; the valve being cast hollow communicates alternately with the opposite ends of the cylinder through D, and exhausts over the valve, at F.

The valve is made tapering, so as to wear to a fit. It is held in place by steam pressure, and is without a set-screw; there is not a screw or bolt exposed to the action of the steam. The steam passes through the small opening at G, into a thin chamber at the head of the valve, made by a washer being slipped on to the stem. The area of this end being greater than that of the opposite end, the pressure is just enough greater to hold the valve in its place. The washer not fitting steam-tight, there is allow-

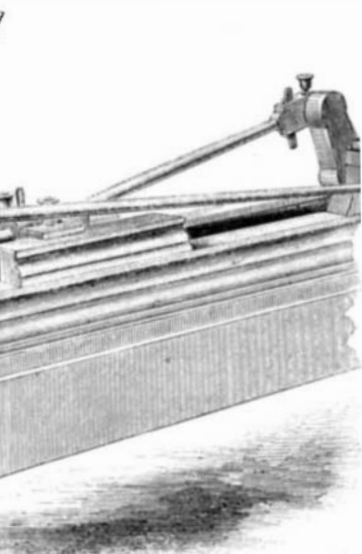
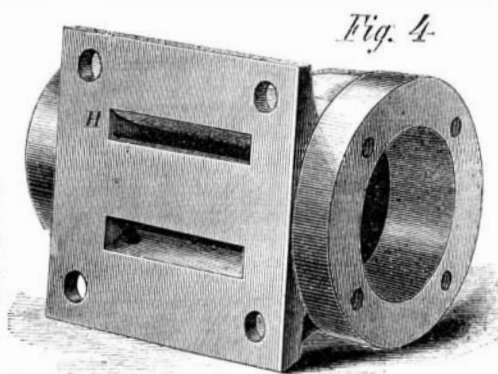


Fig. 4 shows the under side of the valve chest, the flanges with bolt holes, and more particularly the openings, H H, which communicate with openings leading to opposite ends of the cylinder.



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