W. R. GLUYAS.

Balanced Slide-Valve.

No. 205,541. Patented July 2, 1878

Fig. 1

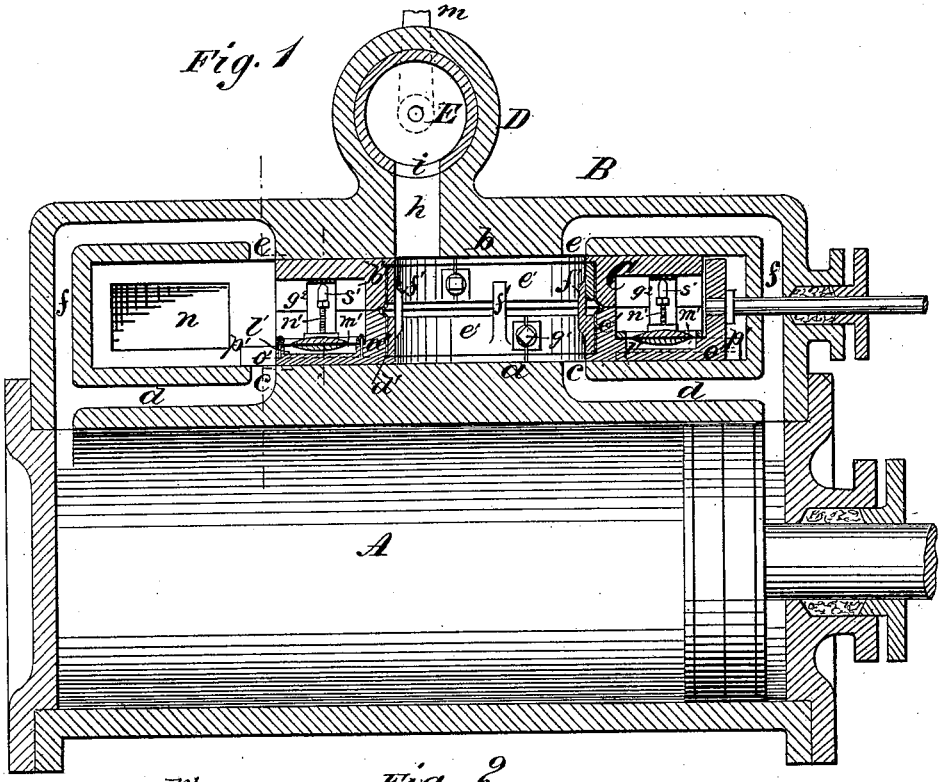


Fig. 2

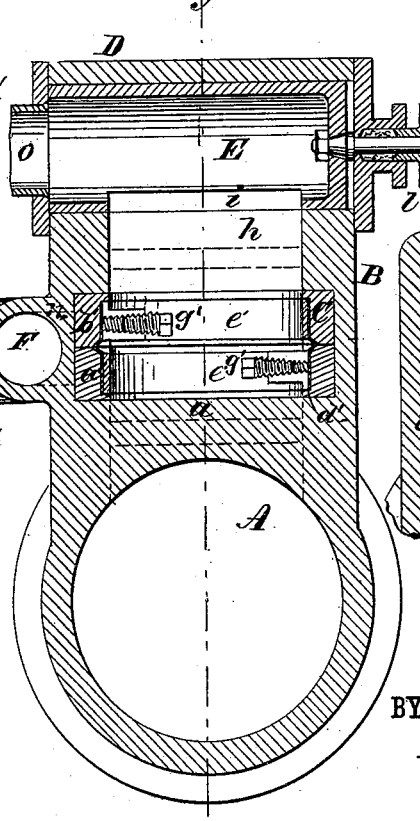


Fig. 3

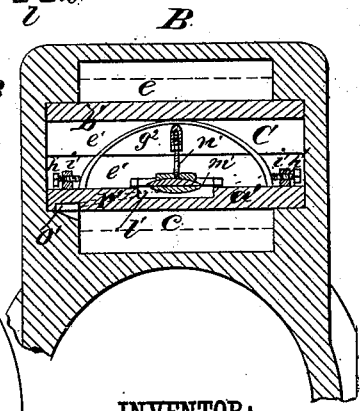
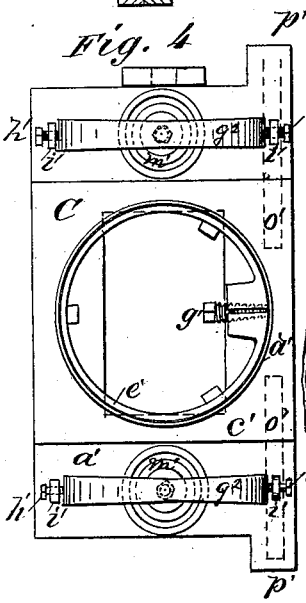


Fig. 4



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WALTER R. GLUYAS, OF CERRO GORDO, ILLINOIS.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. **205,541**, dated July 2, 1878; application filed December 26, 1877.

To all whom it may concern:

Be it known that I, WALTER R. GLUYAS, of Cerro Gordo, in the county of Piatt and State of Illinois, have invented a new and Improved Engine-Valve, of which the following is a specification:

Figure 1 is a longitudinal section of an engine-cylinder and valve-chest containing my improvements, taken on the line *x x* in Fig. 2. Fig. 2 is a transverse section taken through the center of the cylinder and valve-chest. Fig. 3 is a transverse section taken on line *y y* in Fig. 1. Fig. 4 is a detail plan view of the valve.

Similar letters of reference indicate corresponding parts.

My invention relates to the class of engine slide-valves known as "balanced valves;" and it consists in the construction and arrangement of the parts of the valve and ports and passages in the valve-chest and cylinder, whereby the valve is relieved from pressure and friction, so that little power is required to move it.

In the drawing, A is the engine-cylinder having the valve-chest B, in which is placed the slide-valve C. The valve-chest contains two valve-seats, *a b*, one on the cap of the chest and the other on the body of the cylinder. In the valve-seat *a*, formed on the body of the cylinder, there are two ports, *c*, communicating with the ends of the cylinder by passages *d;* and in the valve-seat *b*, in the cap of the chest, there are two ports, *e*, directly opposite the ports *c*, which communicate with the passages *d* by passages *f*. Upon the cap of the steam-chest there is a cylindrical chamber, D, communicating with the valve-chest by the single port *h*.

In the chamber D there is a hollow cylindrical valve, E, closed at one end and open at the other, and having a slot, *i*, in one side, which corresponds in width and length to the port *h*. To the closed end of this valve a spindle, *k*, is attached, which extends outward through the stuffing-box *l* at the end of the chamber D, and is provided with an arm, *m*, which is connected with an eccentric on the main engine-shaft. A steam-supply pipe, *o*, communicates with the end of the chamber D, and delivers steam through the open end of the valve E to its interior. This valve is designed to cut off steam at the required point in the stroke.

Exhaust-ports *n* are formed at the ends of the steam-chest, in one of its sides, which communicate with an exhaust-receiver, F, that is provided with a suitable pipe for conducting away the escape-steam.

The slide-valve C consists of the two main portions a^1 b', each having faces closely fitted to their seats. The face of the portion a' moves upon the seat *a*, and the face of the portion b' moves upon the seat *b*. In the face of each portion of the valve there is a central rectangular opening, which is of the same width as the ports *h e*, and is as long as the distance from the outside of one of the ports *e* to the outside of the port *h*.

Upon the back of each portion of the valve there is a square projection, c', which is bored out to receive a thin metallic hoop or ring, *d*, which projects equally into each half of the valve, and has a central V-shaped circumferential fold or rib, projecting outward. This hoop is held in its place by two cast-iron rings, e', which are each provided with fingers f', which overlap the other, and are each drilled and tapped on a radial line to receive the tapering screws g^1. The rings are split through the holes in which these screws are placed, so that when the screws are screwed in the rings will be expanded so as to hold the hoop d'. The fingers f' carry the upper half of the valve, the lower half only being connected with the valve-rod.

At the back of the portion a^1 of the valve, at the sides of the portion c', there are semi-elliptical springs g^2, which rest upon the back of the portion a^1, and press against the back of the portion b', and tend to force the two parts of the valve apart.

Set-screws h' pass through ears i', that project from the back of the part a^1, and bear against the ends of the springs g^2. A recess, l', is formed in the back of the part near each end of the valve, and over each recess is placed a diaphragm, m', from the center of which a threaded stud, n', projects. Upon the end of this stud there is an internally-threaded sleeve, s', which is made square upon the outside to receive a wrench. The end of this sleeve

touches the back of the spring g^2 at its point of contact with the back of the part b'. The recesses l' are always in communication with the ports c, there being a slot, o', (shown in dotted lines in the drawing) in the face of the valve, at each side of its center, which is as long as the stroke of the valve and the width of the ports taken together.

A projection, p', is formed on each end of the valve to cover the port when it is exposed by the valve from the slot o'. A passage, r', (shown in dotted lines) extends to the recess l'. The two parts of the valve are kept on their seats by the springs g^2 and by the pressure of steam under the diaphragm m'. The pressure of the springs is constant, and only sufficient to keep the valves to their seats without reference to the steam-pressure, while the pressure exerted by the diaphragms varies with the pressure of steam in the cylinder.

The fold in the hoop d' admits of moving the two parts of the valve toward or away from each other as much as may be required for their adjustment. Steam enters the steam-chest through the cut-off valve E and port h, and passes through the center of the valve, and through the ports e e and passages d f, to one end of the cylinder. Steam escapes through the passages d f and ports e e to the steam-chest at the end of the valve, whence it passes through the port n to the exhaust-receiver F. The valve is moved by an eccentric in the usual way, and, as it is relieved from steam-pressure, but little power is required to operate it. Friction and wear are to a great extent avoided, and, by the peculiar arrangement of ports and passages, a free exhaust is secured.

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

1. The combination, with valve having projections e', of the ring d', projecting into each half of valve, having an outward circumferential rib, and held by rings e', having the overlapping fingers f', as and for the purpose set forth.

2. The split rings e', having fingers f', and tapering adjusting-screws g^1, for expanding the hoop d', as herein specified.

3. The combination, with valve having ears i, recess l', and diaphragm m', of the springs g^2, resting on portion a^2 and against the back of portion b', the screws h', the threaded stud n', and the squared sleeve s', as and for the purpose specified.

4. The diaphragms m', in combination with the part a^1, having passages o' r', for forcing the two parts of the valve apart, as herein shown and described.

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Witnesses:

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