(No Model.)

2 Sheets—Sheet 1.

W. T. REASER.

BALANCED SLIDE VALVE.

No. 263,809. Patented Sept. 5, 1882.

Fig. 1.

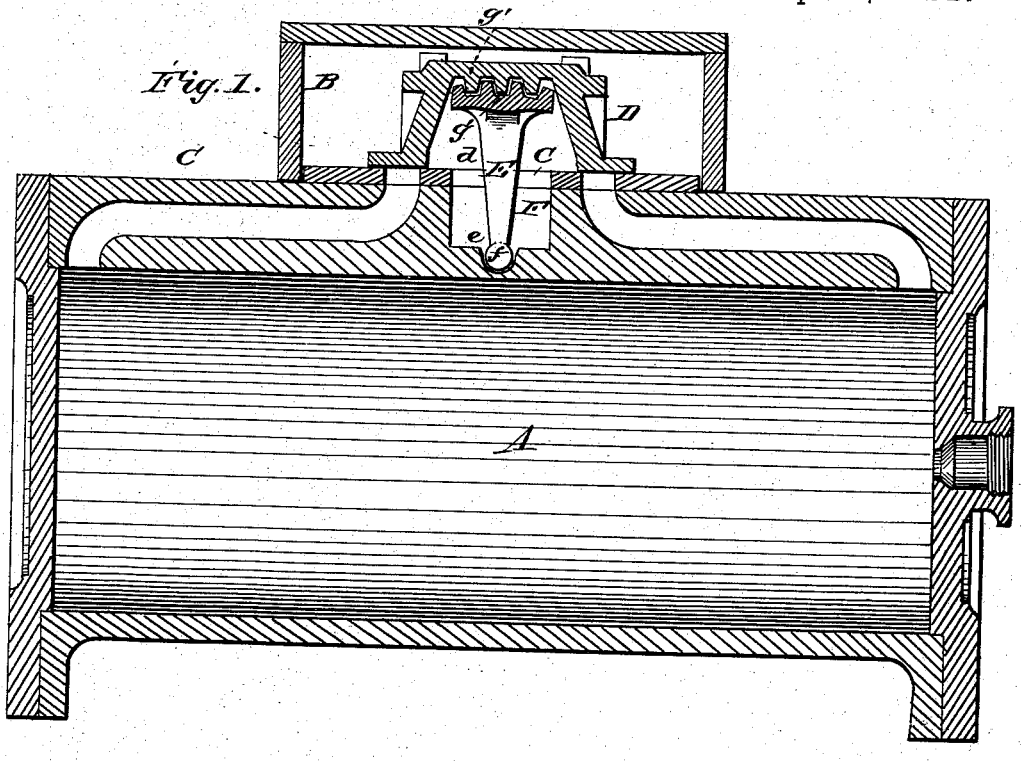
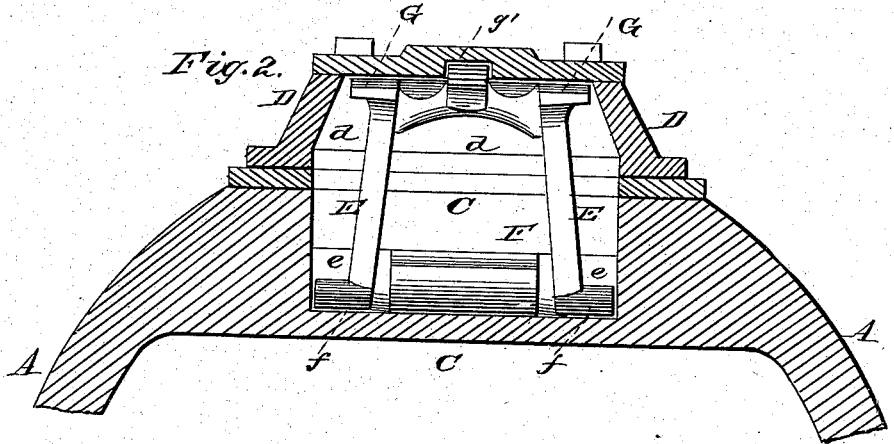


Fig. 2.



WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

W. T. REASER.

BALANCED SLIDE VALVE.

No. 263,809. Patented Sept. 5, 1882.

Fig. 3.

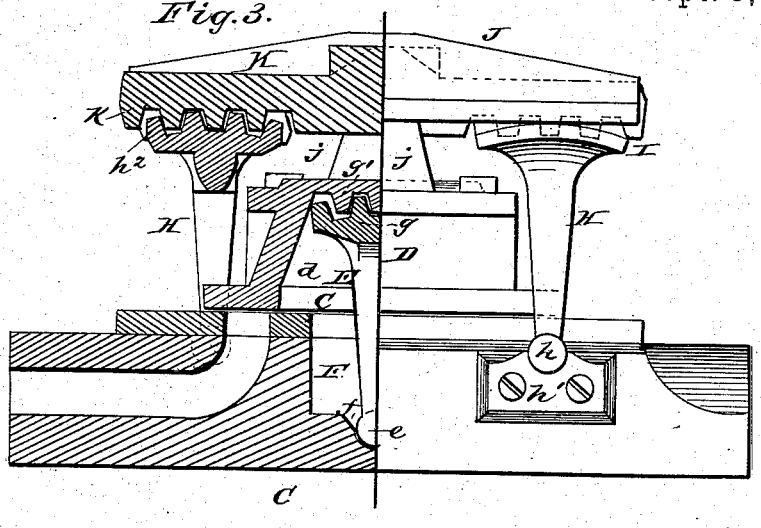
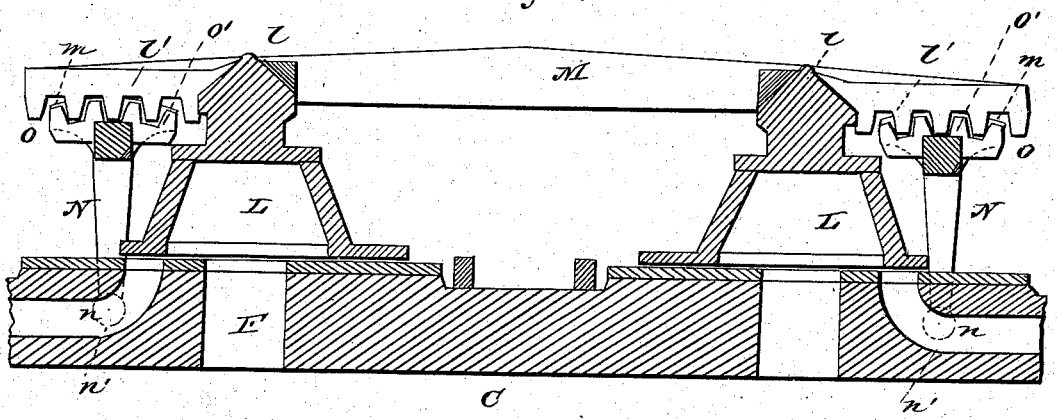


Fig. 4.



WITNESSES

Fred. L. Dieterich.

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UNITED STATES PATENT OFFICE.

WARREN T. REASER, OF MADISON, WISCONSIN.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 263,809, dated September 5, 1882.

Application filed January 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, WARREN T. REASER, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Balanced Slide-Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in means especially designed for lessening or removing the friction between a slide-valve and its seat, resulting from the downward pressure upon such valves of steam or other fluids, or to complete a more perfect and complete "balanced slide-valve;" and to this end the invention consists in the novel features of construction and combination and arrangement of parts, all as will be hereinafter fully described, and specifically designated in the claims.

Referring to the accompanying drawings, Figure 1 represents a vertical and longitudinal section of a cylinder, steam-chest, and valve of a steam-engine embodying one of my essential improvements; Fig. 2, a vertical and transverse central section of the same. Fig. 3 is a side elevation, partly in section. Fig. 4 is a vertical longitudinal section.

In the drawings, A represents the cylinder, B the steam-chest, C the valve seat or seats, and D the slide valve or valves, of a steam-engine.

E represents a bail or yoke having short journals *e e*, resting or fitting in bearings *f f*, arranged in the bottom wall of the central part, F, of the valve-seat C. This bail or yoke is provided on its upper face with sectoral plates or rocking bearings G G, which are arranged to fit in the exhaust-port *d* of the valve D, and thereby support the valve, the upper interior wall of said exhaust-port resting on said plates or rockers G G, and which wall is flat or horizontal, so that the valve always moves on a straight horizontal line, with the bearing-points of the plates or rockers, therefore, always on a vertical line with the fulcrum of the bail or yoke in whatever position the valve may occupy in its forward and backward or reciprocating movement, said bail or yoke being of sufficient height as to raise the valve off its seat, or at least as much as is necessary to avoid friction.

In order to always insure of the proper working of the plates or rockers G G as the valve is moved forward and backward, or in reference to the movement of the valve, the bail or yoke is provided with a series of cog-teeth, *g*, on its upper face and at the center thereof, which mesh with a similar set of cog-teeth, *g'*, formed in the upper interior wall of the exhaust-port of the valve.

The above-described construction, while securing a uniform movement of the valve and its supporting bail or yoke, also sustains the valve in its proper position relative to the valve-seat. The valve is also supported at its ends by bails or yokes H H, having the journals *h*, supported in bearings *h'*. These bails or yokes are also provided with rockers or sectoral plates I I, upon which rest horizontal bars *i i*, connected by a cross-bar, J, secured to vertical supports *j j*, projecting from the top of the valve D, all as clearly shown in Fig. 3.

These bails or yokes H H are provided with cog-teeth h^2, which mesh with cog-teeth *k* on the projecting ends of a rod, K, secured to the valve, (and which may form the rod for operating the valve,) so that the bails or yokes will be moved uniformly with the valve, similar to the movement and for the same purpose as the cog-teeth of the bail or yoke E and the valve D.

In Fig. 4 I have shown the bails and yokes applied to a double valve or two valves, L L. These valves are provided with cross-bars *l l*, connected at their ends by horizontal bars M M, which rest on the rockers or sectoral plates *m m* of the bails or yokes N N, having their journals *n n* supported in bearings *n' n'*. The cross-bars *l l* are provided with outwardly-projecting bars *l' l'*, having cog-teeth *o*, adapted to mesh with cog-teeth *o'* on the bails or yokes N N, which insure of their being moved uniformly with the valves in a similar manner to the bails or yokes H H and E. The cog-teeth as arranged with relation to the bails or yokes and the valve or valves insure the proper re-

lationship of the same and the sectoral plates or rockers.

By the hereinbefore-described devices for supporting the valve or valves economy in expenditure of power necessary to drive the valve or valves is obtained, while lessening to a great extent the wear between the valve or valves and their seats with consequent saving of steam, and in relieving the valve-eccentrics from wear and strain.

The importance and value of the above-named results being so well known to persons conversant with the use of steam-engines, it is deemed unnecessary to further elaborate upon them.

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

1. The combination, with a valve-seat and a sliding valve, of interior and exterior rocking bearings for supporting said valve, substantially in the manner as and for the purpose specified.

2. The combination, with the valve and valve-seat, of a bail or yoke supported in bearings formed in the port F, and having sectoral plates or rockers upon which the upper wall of the exhaust-port *d* of the valve rests, and thereby supporting the valve, substantially in the manner as and for the purpose herein shown and described.

3. The combination, with the valve-seat and valve having cog-teeth formed in the upper wall of the exhaust-port *d*, of a bail or yoke journaled in the port F, and having cog-teeth and sectoral plates or rockers, substantially in the manner as and for the purpose herein shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WARREN T. REASER.

Witnesses:
E. A. HAYES,
R. M. BISHFORD.