(No Model.)

W. T. REASER.

BALANCED SLIDE VALVE.

No. 273,892. Patented Mar. 13, 1883.

Fig. 1.

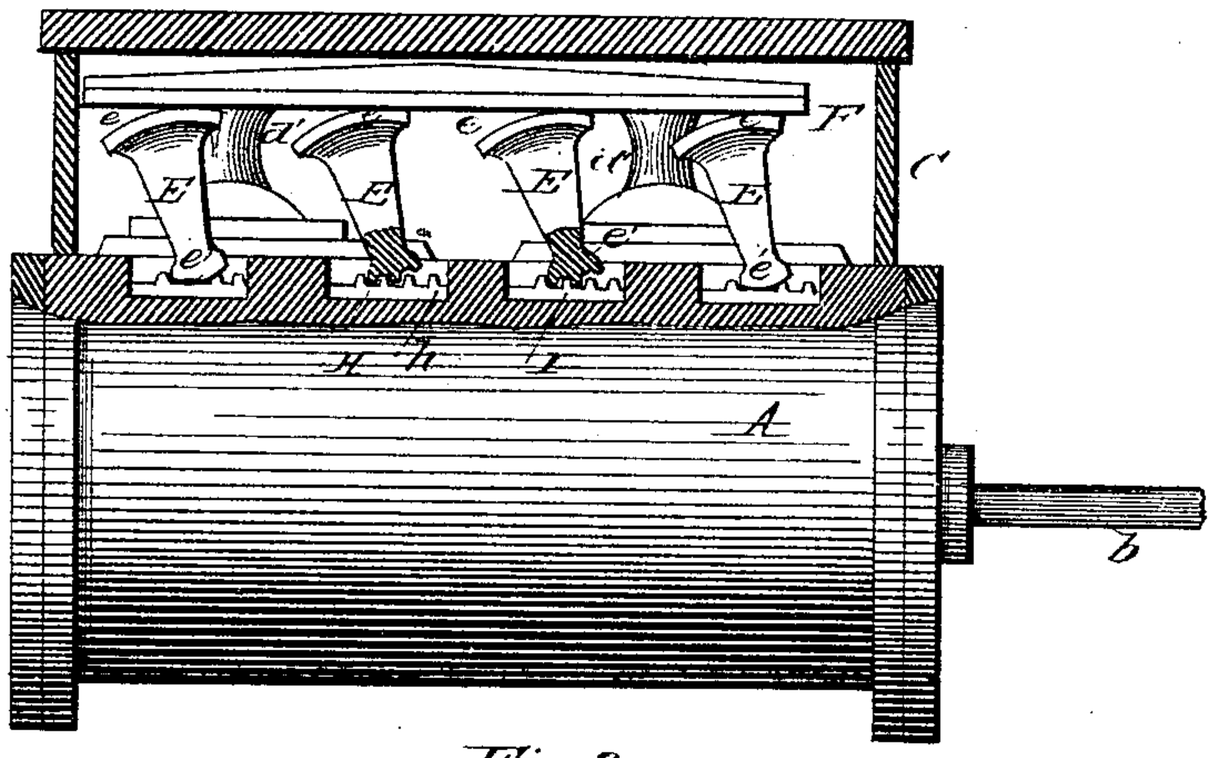


Fig. 2.

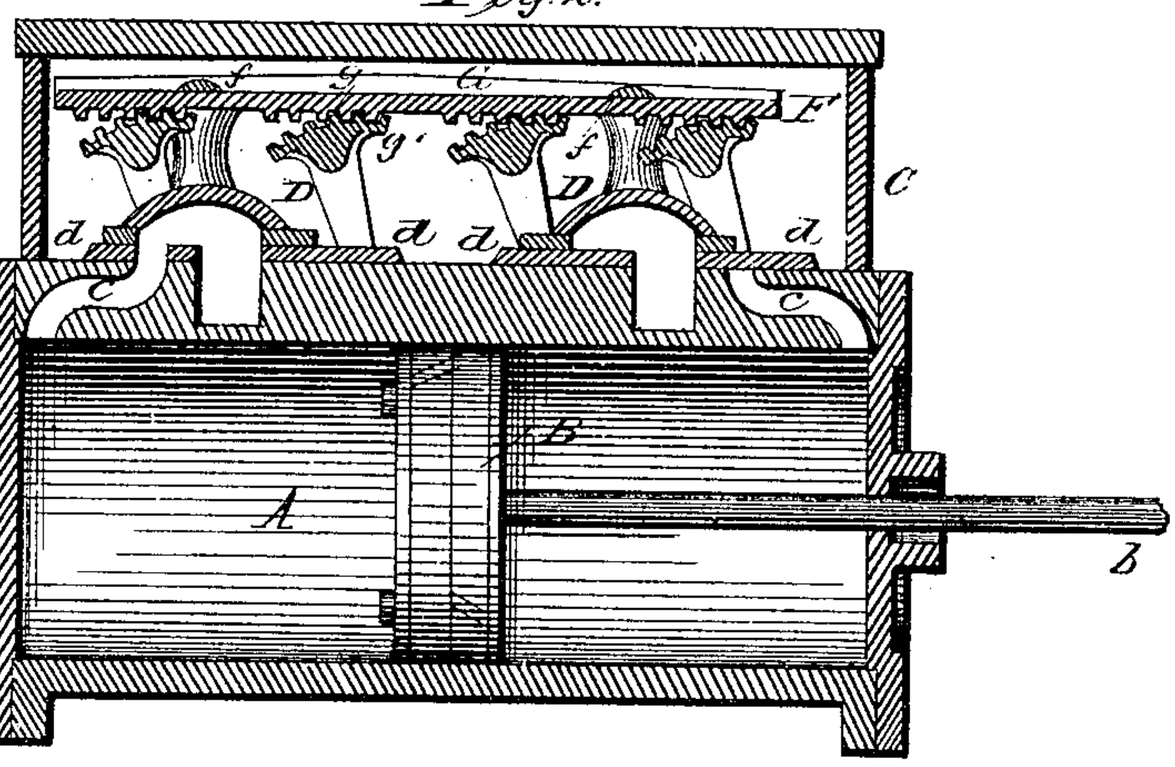


Fig. 3.

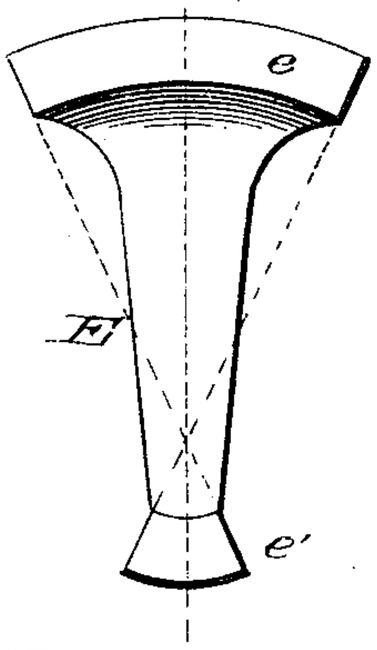
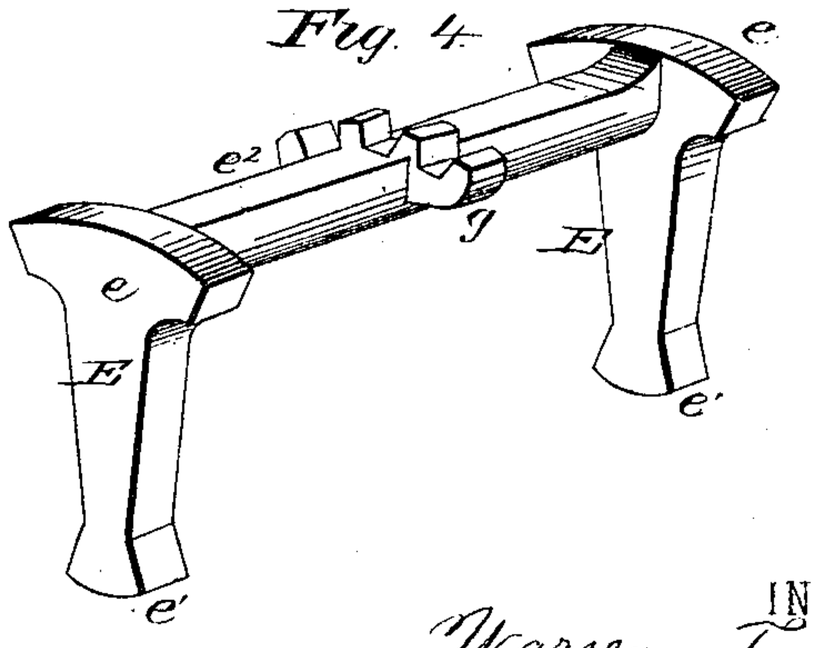


Fig. 4.



WITNESSES:

Fred. L. Dieterich

J. G. Hinkel

INVENTOR.

Warren T. Reaser

By DeWitt C. Allen

ATTORNEY.

UNITED STATES PATENT OFFICE.

WARREN T. REASER, OF MADISON, WISCONSIN.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 273,892, dated March 13, 1883.

Application filed September 28, 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.

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 liquids, or to produce a more perfect and complete "balanced" slide-valve; and to this end the invention consists in novel features of construction, and combination, and arrangement of parts, all as will be hereinafter fully described, and set forth in the claims hereto annexed.

Referring to the accompanying drawings, Figure 1 represents a side elevation, partly in section, of my improvements as applied to the class of steam-engines employing double valves; Fig. 2, a longitudinal vertical central section of the same; Figs. 3 and 4, enlarged detail views to be hereinafter referred to.

In the drawings, A represents the usual steam-cylinder; B, the piston; *b*, the piston-rod; C, the steam-chest; *c c*, steam-ports; D D, the slide-valves, and *d d* the valve-seats, of the class of steam-engines employing double valves.

E E represent vibrating supports for carrying the slide-valves, which supports are provided, at their upper ends, with segmental or rocking bearings *e*, and at their lower ends with segmental or rocking bearings *e'*, the upper bearings, *e*, being cut from a circle of about three times the diameter of the circle from which the lower bearings, *e'*, are cut, as more clearly shown in Fig. 3, for a purpose to be hereinafter described.

Upon the bearings *e* rest horizontal plates F F, connected by cross-bars *f f*, secured to vertical supports *d' d'*, projecting from the tops of the valves D D, all as clearly shown in Fig. 2. The vibrating supports E E, with their bearings *e* and *e'*, are arranged in pairs on the outer and opposite sides of the slide-valves, and are connected together near their upper ends by cross-bars e^2. (See Fig. 4.) These cross-bars e^2 are provided with toothed segments *g*, which mesh with the cog-teeth *g'*, formed on the under side of the central longitudinal bar, G, secured to the cross-bars *f f*, and which bar G may form the means for operating the slide-valves. The lower bearings, *e'*, of the vibrating supports E are provided on their outer or under sides with toothed segments H, which mesh with toothed bars *h*, secured to the horizontal plates I. The toothed segments and toothed bars always insure uniform movement or working of the valves, while retaining them in their proper positions relative to their valve-seats.

By having the segmental or rocking bearings at the upper ends of the valve-supports cut from a circle of greater diameter than the bearings at the lower ends of said supports, as before described, the upper and lower bearings are nearer on a perpendicular when the valves are moved to their extreme throw in either direction, and the upper bearing traveling three times the distance the lower bearing travels with less friction and wear on the gearing mechanism, thereby moving much easier, requiring less power, while lessening to a greater extent the friction and consequent wear between the slide-valves and their seats when four vibrating supports are used in connection with double-valved steam-engines. The rocking segmental bearings support the valves in such manner that I am enabled to dispense with lubricating of the valve-seats.

My improvements are also applicable to single valves and their seats.

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

1. The combination, with a slide-valve and its seat, of vibrating supports having segmental or rocking bearings at their upper and lower ends, the upper bearings, *e*, being cut from a circle of larger diameter than the lower bearings, *e'*, said bearings being arranged outside and on opposite sides of the valve, and adapted to move along with it, substantially in the

manner as and for the purpose herein shown and described.

2. The combination, with the sliding valves and valve-seats of double-valved engines and means for connecting the valves, of vibrating supports arranged in pairs and having segmental or rocking bearings at their upper and lower ends, the upper bearings, *e*, being cut from a circle of larger diameter than the lower bearings, *e'*, substantially as specified.

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

WARREN T. REASER.

Witnesses:

E. A. HAYES,

LOUIS CHYNOWETH.