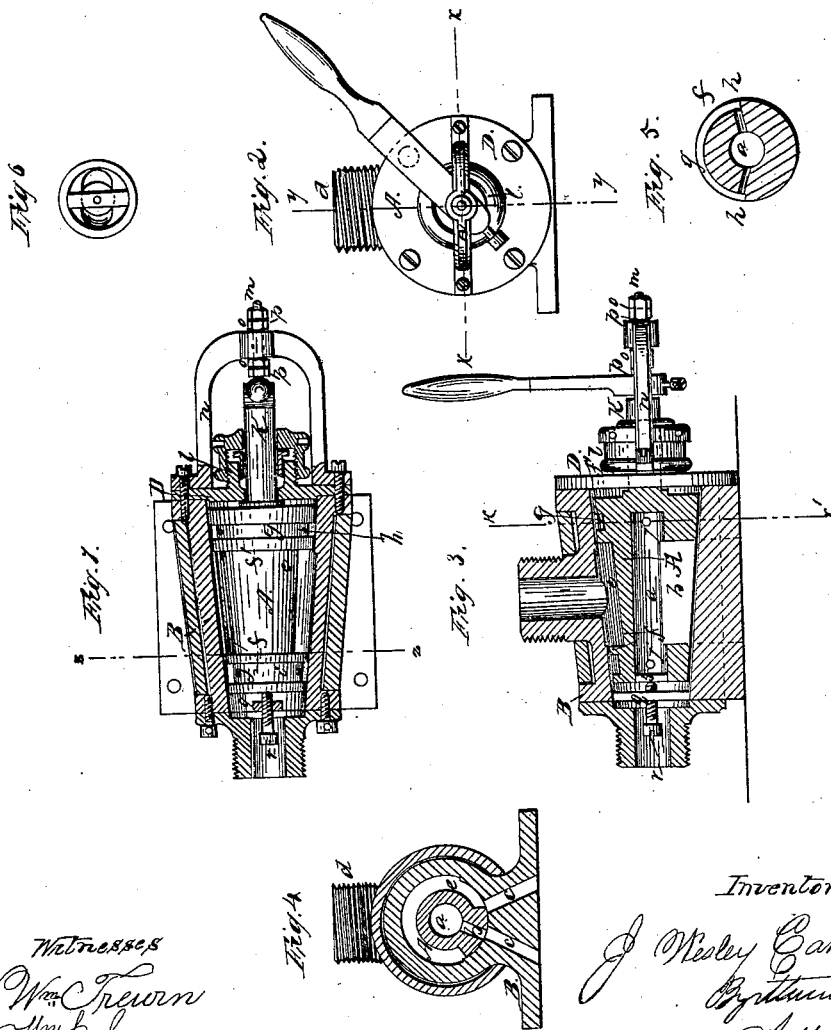


J. W. Carhart,
Rotary Steam Valve.

N^o 53,410.

Patented Mar. 27, 1866.



Witnesses
Wm. Brown
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UNITED STATES PATENT OFFICE.

JOHN W. CARHART, OF TROY, NEW YORK.

IMPROVEMENT IN BALANCE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 53,410, dated March 27, 1866.

To all whom it may concern:

Be it known that I, J. WESLEY CARHART, of Troy, in the county of Rensselaer and State of New York, have invented a new and Improved Steam-Valve; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to accompanying drawings, forming part of this specification, in which—

Figure 1 represents a horizontal section of this invention in the line *xx*, Fig. 2 indicating the plane of section. Fig. 2 is an end view of the same. Fig. 3 is a vertical central section of the same, the line *yy*, Fig. 2, indicating the plane of section. Fig. 4 is a transverse vertical section of the same, taken in the plane indicated by the line *zz*, Fig. 1. Fig. 5 is a transverse vertical section of the plug detached, the plane of section being indicated by the line *x'x'*, Fig. 3. Fig. 6 is an end view of the plug detached.

Similar letters of reference indicate corresponding parts.

This invention relates to certain improvements in that class of valves on which patents have been granted to me November 29, 1864, and July 25, 1865.

The improvements which form the subject-matter of this present invention consists, first, in a recess in the upper portion of the thin end of the plug, said recess being made to communicate with the steam-space of the valve in such a manner that the valve is equally balanced at its thin end as well as at its thick end; second, in the application of a yoke over the thick end of the valve, in combination with a screw extending from the shank or end of the valve and provided with suitable nuts, in such a manner that the valve can be adjusted and kept tight without removing the head of the shell; third, in the application of a set-screw in the thin end of the shell and bearing on a cross-bar in the thin end of the valve in such a manner that the position of the valve in the shell can be adjusted at pleasure; fourth, in placing the plug between two adjustable centers in such a manner that its position in the shell can be adjusted with the greatest accuracy, and all unnecessary friction can be avoided.

A represents a plug, made of brass, iron, or any other suitable material, and fitted into a shell, B, as shown in Figs. 1 and 3, of the drawings. The plug is conical and it is bored out from its thin end so as to form a cavity, *a*, from which a channel, *b*, extends through the side of the plug, as shown in Figs. 3 and 4. By turning the plug so that the channel *b* coincides with one of the ports *c c'* in the bottom plate of the shell B, the steam which enters through a hole in the small head of the shell into the cavity *a* in the plug has access to either end of the cylinder, and by turning the plug the steam is changed. The communication between the exhaust-pipe *d* in the shell and the ports *c c'* is effected by a recess, *e*, in the central part of the plug, and occupying an arc of three hundred degrees, more or less, as seen in Fig. 4.

If the valve is turned so that the channel *b* coincides with the port *c*, the port *c'* communicates through the recess *e* with exhaust-pipe *d*, and by reversing the valve the steam is admitted through the port *c'*, and it exhausts through the port *c*.

The recess *e* is situated between the collars or projections *f f'*, one at the large end of the plug and one at its small end, and in order to balance the upward pressure of the steam on the large end, the projection or collar *f'* is provided with a recess, *g*, which communicates through holes *h* with the cavity or steam-space *a*, as described in my Patent No. 48,902, dated July 25, 1865.

In the same manner I have also balanced the thin end of the plug by a recess, *i*, in the collar *f*, said recess being made to communicate with the steam-space *a* through small holes *j*. From the large end of the plug extends a stem, *k*, through a stuffing-box, *l*, in the head D, which closes the large end of the shell, and from the end of this stem extends a screw, *m*, through a yoke, *n*, which is firmly secured to the head D, as shown in the drawings.

Nuts *o*, fitted on the screw *m* and placed on the inside and outside of the yoke, serve to adjust the plug in the desired position, and suitable jam-nuts *p* prevent the nuts *o* from unscrewing spontaneously.

The thin end of the shell B is provided with a cross-bar, *q*, which is tapped to receive the

set-screw *r*. The pointed end of this set-screw bears on a cross-bar, *s*, secured in the thin end of the valve, as shown in Fig. 3, and by the action of this set-screw the thin end of the valve is held in position.

What I claim as new, and desire to secure by Letters Patent, is—

1. The recess *i* in the thin end of the plug-valve A, constructed and operating substantially as and for the purpose described.

2. The arrangement of the screw *m*, yoke *n*, set-screw *r*, and cross-bar *q* with the plug-valve A and shell B, constructed and operating substantially as and for the purpose set forth.

The above specification of my invention signed by me this 3d day of October, 1865.

J. WESLEY CARHART.

Witnesses:

M. M. LIVINGSTON,

O. D. MUNN.