J. F. Allen,

Steam Slide Valve.

No. 35,068. Patented Apr. 29, 1862.

Fig. 2.

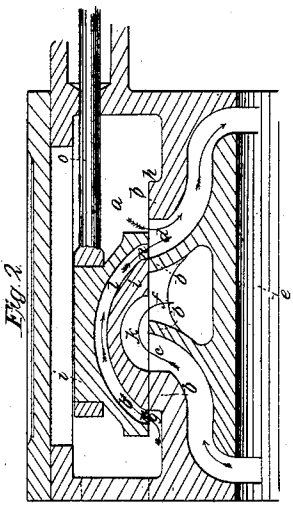


Fig. 4.

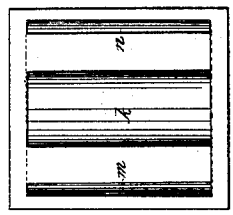


Fig. 1.

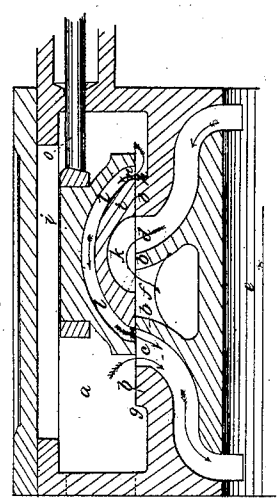
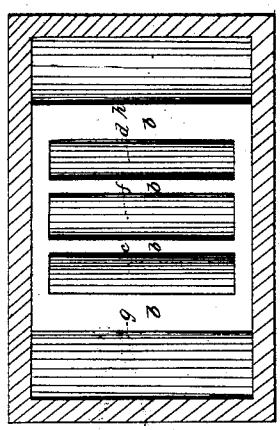


Fig. 3.



Witnesses

Horace Andrews

C. B. Richards

Inventor

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UNITED STATES PATENT OFFICE.

JOHN F. ALLEN, OF NEW YORK, N. Y.

STEAM-ENGINE.

Specification of Letters Patent No. 35,068, dated April 29, 1862.

To all whom it may concern:

Be it known that I, JOHN F. ALLEN, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal section of the upper part of a steam cylinder, with its steam chest and passages, and a slide valve; illustrating my invention, Fig. 2 is a similar view of the same parts, with the valve in a different position, Fig. 3 represents a horizontal section of the steam chest showing a plan view of the valve seat, and Fig. 4 shows a plan view of the under side of the valve (*i*.)

Similar letters of reference denote the same parts in the several figures.

My invention relates to a modification of the construction and mode of operation of those slide valves, termed "cup valves," which are employed in steam engines, to perform the double office of admitting steam to the cylinder, and of releasing the same; having for its object, an increase of the area of passage way for the ingress of steam, which is opened or closed by a given movement of the valve.

To this end my said invention consists, in the employment of a valve, constructed substantially as hereinafter clearly described, in combination with a seat which is so arranged relatively to the valve, that two passage-ways from the steam chest into one end of the cylinder are opened and closed by the movement of the valve, substantially in the manner hereinafter set forth.

To enable others skilled in the art to make use of my invention, I will proceed to a description thereof.

In the accompanying drawings, *a* is the steam chest, *b* the valve seat, and *c* and *d* two ports or passages leading therefrom to the rear and front ends of the steam cylinder (*e*), respectively. *f* is the exhaust, or eduction passage. These three aforesaid passages may be in form and relative location the same as in customary practice, where cup valves of ordinary form are employed, as is the case in most locomotives. The valve seat (*b*) is elevated above the bottom of the chest, and terminates at *g* and *h*, at equal distances from the ports *c* and *d*, respectively.

i is a slide valve, having in its face an exhaust cup or cavity (*k*), which cavity is of ordinary form and location, and performs its functions in the usual manner.

In the valves (*i*) I form a duct or passage (*l*), which passes over or around the exhaust cup, and is independent of it. The two ends (*m*) and (*n*), of this duct, open on the face of the valve at equal distances in front of and behind the exhaust cup (*k*), respectively. The distance between the ends (*m* and *n*), of the passage *l*, should be at least so great that the said passage cannot, at any time, open communication between the ports *c* and *d*. The reduction of the "lap" of the valve is therefore limited.

The extreme length of the valve (*i*) must be such as to afford sufficient sliding surface between its ends and the ends (*m* and *n*) of the passage *l*, to pack steam tight when these parts are on the seat, but these surfaces must be less in width than the ports (*c* and *d*), by the amount necessary for the said ports to be opened for the entry of steam.

The valve (*i*) receives motion in the usual way, by a rod (*o*). The positions of the edges (*g* and *h*), of the seat, are such, relatively to the ports *c* and *d*, that when the valve is moved forward, so that its rear end uncovers the port *c*, the front end (*n*) of the passage (*l*,) will overhang the front edge (*h*) of the seat, about as far as the end of the valve has opened the port (*c*) (see Fig. 1); whereby steam can enter the rear end of the cylinder, both past the end of the valve, and also, at the same time, through the passage or duct (*l*), in the valve; and these two passages, for the entry of steam into the one end of the cylinder, will be opened and closed nearly simultaneously by the movements of the valve. By reason of the symmetrical form of the valve and seat, when the valve (*i*) is so moved back as to admit steam to the front end of the cylinder, steam enters the port *d* both past the front end of the valve, and also through the passage *l*, by the rear end *m* of the said passage overhanging the rear edge *g* of the seat; as is shown by Fig. 2.

My invention may be applied, in cases where it is desired to make use of a separate cup valve for each end of the cylinder; for

which application the form of the valve can be the same as that already described, and needs no further explanation.

The greatest value of my invention is obtained in its application to engines which are furnished with a "link motion", or other cut off gear which gives to the valve a movement, comparatively slow at the points of cut off; as the increased area of port closed by a slight movement of the valve, which is attained by my said invention, lessens the waste which the slow closing of the port occasions by wire-drawing the steam.

It will be observed, that, my invention relates in no way to any modification of the action of cup valves in their exhaust functions, and I therefore disclaim any forms or arrangements of cup valves, which have for their aim to open double passages for the egress of steam from the cylinder: but

What I claim as my invention, and desire to secure by Letters Patent is:

A cup slide valve, having formed in it a passage which is independent of the exhaust cup, and which opens on the face of the valve in front of and behind the said exhaust cup, in combination with an elevated seat, or one of equivalent form; when the said valve and seat are so arranged relatively to each other, that at, proper times, two passages are opened for the entry of steam into either end of the cylinder, substantially in the manner and for the purposes hereinbefore set forth.

In testimony whereof, I have hereunto set my hand this 4th day of April 1861.

JOHN F. ALLEN.

In presence of—
HORACE ANDREWS,
C. B. RICHARDS.