

H. Spengler.
Steam Balanced Valve.

Nº 50,746.

Patented Oct. 31, 1865.

Fig. 1.

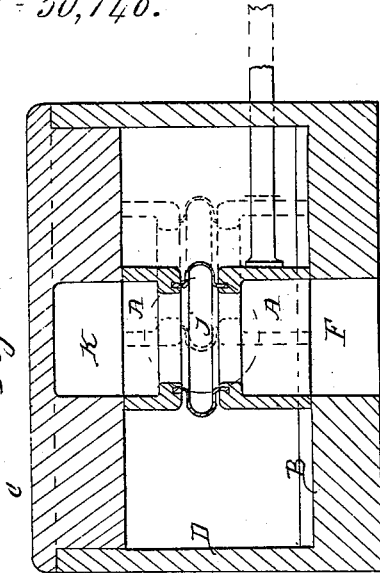


Fig. 4.

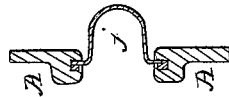


Fig. 2.

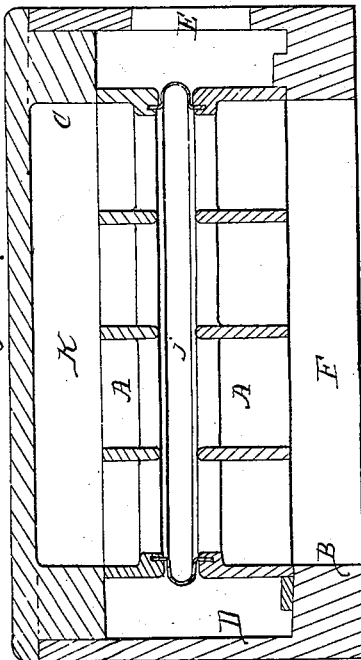
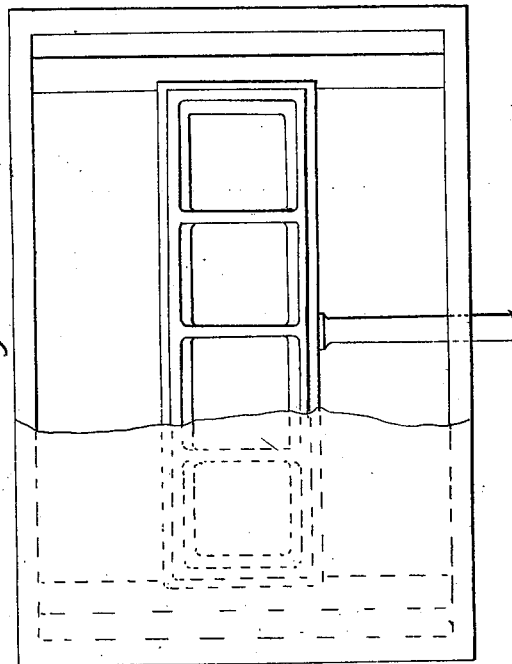


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY SPENGLER, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SLIDE-VALVES.

Specification forming part of Letters Patent No. 50,746, dated October 31, 1865.

To all whom it may concern:

Be it known that I, HENRY SPENGLER, of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Balanced Slide-Valves for Steam-Engines; and I do now declare that the following is an exact description thereof, reference being had to the annexed drawings, making a part of this specification.

In the drawings, the same letters refer to identical parts.

Figure 1 is a transverse section made near the valve-stem. Fig. 2 is a longitudinal section made through the center. Fig. 3 is a plan view with part of the cover of the steam-chest. Fig. 4 is an enlarged section, showing the packing or joint in the valve.

The nature of my improvement consists in constructing the valves of steam-engines of four sides open through the middle, affording a free passage for the steam through the valve, the perpendicular sides of the valve being fitted accurately upon their edges above and below to the top and bottom of the steam-chest, and made steam-tight and kept, under all circumstances, in perfect adjustment by the expansion and contraction of an elastic metallic spring, inserted in and composing a part of the body of the valve, and having opposite to the port a shallow supplementary port in the steam-chest bonnet, which, in connection with the cored portion of the valve, permits the free passage of the steam equally above and below the valve when open, by means of which arrangement the pressure of the steam against the valve is made equal from all directions, and creates no friction in its movements, the valve being perfectly balanced, and by the introduction of the steam through an opening below and another above of the same area, in consequence of the cored opening through the valve, it is only necessary to move the valve one-half of the width of the port to secure a full opening.

To enable others skilled in the art to make and use my invention, I will proceed to explain its construction and operation.

I construct the steam-chest in the ordinary manner. In large engines I recommend the location of the cylinder-ports at the extremi-

ties of the cylinder. This steam-chest is covered with a bonnet, C. In this bonnet are cast the supplementary ports K, which are chambered recesses opposite to and of the same shape and size of area as the main ports, and of a depth not less than half the width of the port.

A A is the valve. This is cast in two similar parts, cored so as to leave such partitions as may be necessary to give lateral support to the sides. The valve is made with four quadrilateral sides, and open above and below through the center, and is finished upon its upper and lower surfaces to work on corresponding surfaces on the steam-chest. These two parts are united by the metallic spring j, composed of a sheet of any elastic metal formed to the shape shown in the drawings, and attached to the two parts of the valve above and below by any of the approved methods of making a steam-joint.

The valves are attached and operated as other slide-valves.

In the construction of the elastic joint j it is necessary to provide for sufficient force to always maintain a steam-tight joint between the bearing-surfaces of the valve and the valve-seats upon the steam-chest. This may be done either by the elasticity of the metal composing the joint or by so altering its shape as to add to the elasticity of the metal the force of the pressure of the steam upon the joint.

The action and direction of the steam passing from the port F is indicated by the arrows in Fig. 1.

Having fully explained the nature and operation of my invention, I do not claim as my invention the mere interposition of a yielding substance or packing between two similar valve-faces working between parallel surfaces; nor do I claim simply ports through a valve, for such are much used where cut-offs are employed; nor do I claim a mere duplicate valve-seat in connection with a slide-valve having ports and faces on both sides; but

What I claim as my invention, and seek to secure by Letters Patent, is—

1. The within-described valve, when so arranged as to permit the steam to pass to the cylinder around its upper and lower edges, by which arrangement a full area of opening

is made by slightly more than one-half the motion usually given to such valves, substantially as described.

2. The combination of the ports in the valve A with the port F and supplementary port K, substantially as and for the purpose set forth.

3. Arranging the within-described valves

between two parallel seats when such seats are duplicates the one of the other, substantially as shown and described.

HENRY SPENGLER.

Witnesses:

JOHN S. HOLLINGSHEAD,
CHAS. SIKKEN.