R. U. CHADWICK.

COMBINED DISCHARGE AND VACUUM VALVE.

APPLICATION FILED MAR. 14, 1917.

1,229,885. Patented June 12, 1917.

Fig. 1.

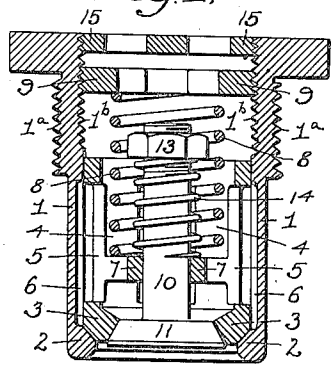


Fig. 7.

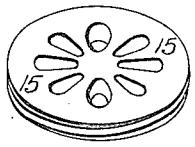


Fig. 6.

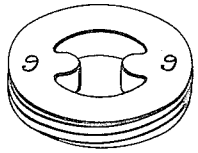


Fig. 2.

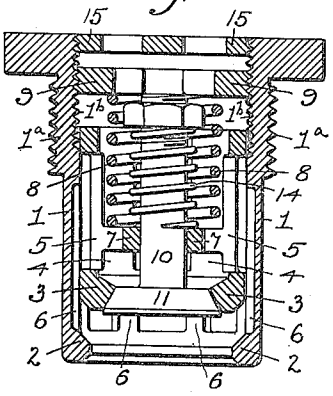


Fig. 5.

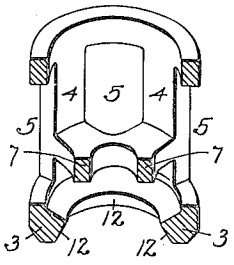


Fig. 3.

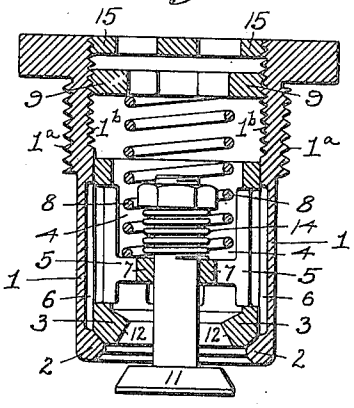
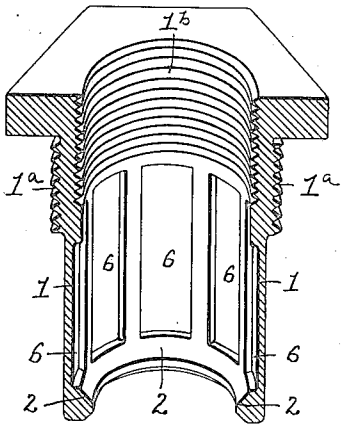


Fig. 4.



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UNITED STATES PATENT OFFICE.

RICHARD U. CHADWICK, OF PHILADELPHIA, PENNSYLVANIA.

COMBINED DISCHARGE AND VACUUM VALVE.

1,229,885. Specification of Letters Patent. Patented June 12, 1917.

Application filed March 14, 1917. Serial No. 154,808.

To all whom it may concern:

Be it known that I, RICHARD U. CHADWICK, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Combined Discharge and Vacuum Valves, of which the following is a specification.

My invention relates to that type of discharge and vacuum valve forming the subject of my U. S. Letters Patent No. 659,578, of October 9, 1900, and has as its objects the construction of a valve of that nature in such a way as to render it more compact, easier and more economical to manufacture, and more efficient in operation.

These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical sectional view of a valve constructed in accordance with my invention, the parts thereof being shown in the positions normally occupied by them;

Fig. 2 is a similar view in which the parts are shown in the position assumed by them when the valve is acting as a discharge valve;

Fig. 3 is a similar view with the parts shown in the positions assumed by them when the valve is acting as a vacuum valve;

Fig. 4 is a perspective sectional view of the valve casing;

Fig. 5 is a similar view of one of the elements of the valve, and

Figs. 6 and 7 are perspective views of other elements thereof.

This valve is designed especially for use in connection with the steam-heated cylinder of a drying machine, being for the purposes of permitting, on one hand, the discharge of steam from the cylinder when pressure within the same passes a predetermined point, and, on the other hand, of permitting inflow of air to the cylinder should the formation of a partial vacuum therein pass a predetermined point.

The valve will be described with this use in view, although there are other uses to which it may be put.

Referring to the drawings, the casing of the valve is shown at 1, this casing having formed thereon an external thread 1^a to be screwed into a threaded opening in the head of the cylinder and an internal thread 1^b, the purpose of which will be hereinafter described. The inner end of the casing 1 is so shaped as to present a seat 2 for a valve 3, this valve 3 being formed at the inner end of a barrel 4 which is slidably mounted within the casing 1 and in the side walls of which are formed openings 5.

In the inner face of the casing 1 are formed a plurality of longitudinal or spiral grooves 6, through which, when the valve 3 is raised from its seat 2, as shown in Fig. 2, steam will pass from the interior of the cylinder around said valve. Steam which passes around this valve will enter the barrel and through the openings 5 in the side wall of the same and pass out through the outer end thereof.

Extending transversely across the barrel 4 is a bridge 7 which serves as a bearing for the inner end of a coiled spring 8, the outer end of which bears against the inner face of an adjusting ring 9 screwed into the internally threaded portion of the casing 1. The action of this spring 8 is to normally hold the valve 3 in upon its seat 2 and the tension of the spring may be so adjusted, through the positioning of the ring 9, as to determine the amount of pressure permitted within the cylinder before the valve 3 will be raised from its seat to permit escape of steam around the same.

Passing through the bridge 7 and guided therein is a post 10 upon the inner end of which is a valve 11 seated against a seat 12 formed in the inner face of the valve 3.

The outer end of the post 10 is threaded for the reception of an adjusting nut 13 and interposed between the lower face of this nut and the bridge 7 is a coiled spring 14 which surrounds the post 10 and serves to normally hold the valve 11 against its seat 12.

When a sufficient degree of partial vacuum forms within the cylinder this valve 11 is pulled inwardly from its seat against the tension of the spring 14, as shown in Fig. 3, thereby admitting a flow of outside air into the cylinder. The degree of partial vacuum at which the valve 11 acts is determined by the tension imparted to the spring 14 by means of the adjusting nut 13.

In order to lend an attractive finish to the outer face of the valve casing and to prevent ready tampering with the inside thereof I close the outer end of the opening in the casing with a perforated cap 15 screwed into the threaded portion 1^b. This

cap, if screwed in until it is in engagement with the outer face of the ring 9, serves as a lock-nut to hold said ring in place.

I claim:—

The combination, in a combined discharge and vacuum valve, of a casing open at its ends, a barrel slidably mounted within and guided by the walls of said casing, a discharge valve formed at the inner end of said barrel and adapted to a seat within said casing, a vacuum valve adapted to a seat on the inner face of said discharge valve, springs for normally maintaining said valves against their seats, said springs being located within said barrel and so disposed that they will at no time interfere with a free flow of fluid through the casing from end to end, means whereby the tension of said springs may be adjusted, said means and said springs being readily accessible from the outside when the valve is in position, said barrel being provided with openings in its sides and said casing having grooves in its inner face, these openings and grooves coöperating to permit free flow around said discharge valve and through said barrel when said discharge valve is lifted from its seat.

In testimony whereof, I have signed my name to this specification.

RICHARD U. CHADWICK.