UNITED STATES PATENT OFFICE.

JULIAN KENNEDY, OF PITTSBURG, PENNSYLVANIA.

HOT-BLAST VALVE.

SPECIFICATION forming part of Letters Patent No. 644,927, dated March 6, 1900.
Application filed November 18, 1897. Serial No. 856,442. (No model.)

To all whom it may concern:

Be it known that I, JULIAN KENNEDY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Hot-Blast Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly broken away, of my improved valve in raised position. Fig. 2 is a vertical section showing the valve in closed position. Fig. 3 is a top plan view of the apparatus, and Fig. 4 is a detail sectional view showing the shaft-mounting.

My invention relates to hot-blast valves, and is designed to provide a novel and efficient means for cooling the valve-seat and the cover-plate of its casing, as well as to improve the means for raising and lowering the valve. It also is designed to prolong the life of the valve itself.

In the drawings, 2 represents the valve-casing having booted to its lower end ring 3 and the seat-ring 4 for the valve. 5. The seat-ring is provided with an annular cavity 6, to which leads a suitable supply-pipe, and from this cavity extends the connecting-pipe 7, which is arranged to direct the water from the valve-seat upwardly to the central upper surface of the cover-plate 8. This plate is preferably of general convex form and is provided with a series of stepped annular rings 9 at different levels and arranged to form open water-containing channels. From the outer channel leads the outlet-pipe 10. The valve proper, 5, is preferably made of a steel casting and is shaped so as to conform as nearly as possible to the shape of the inner face of the cover-plate, so that when in raised position it will be water-cooled by radiation to this cold plate, with which it is in close proximity throughout. The valve-rod 11 projects upwardly through the cover-plate, and to an eye 12, secured at its upper end, is fastened the end of a chain 13, which extends over a small pulley 14 and is provided at its other end with a counterweight 15. The shaft 16 of the pulley 14 is provided at its other end with a larger chain-wheel 17, over which extends the hand-operated endless chain 18. The shaft 16 is supported by end bearings of a sleeve 19, one portion of which is enlarged and turned smooth upon its exterior, so as to fit neatly within the bore of a clamping-casting 20. This casting 20 is also provided with another bore at right angles to the above-described bore and arranged to surround and grip the machined outer portion of a tubular bracket 21, which is secured to the side of the stove and carries the shaft and parts supported thereon. This gripping-casting is provided in its upper and lower parts with slots parallel with the bores and extending thereinto, so that by means of suitable bolts 22, extending through lugs 23 upon this casting, the portions of the sides of the bore may be clamped firmly about the tubular elements contained therein. The sleeve 19 is provided with an annular space around the central portion of the shaft and arranged to contain oil or a suitable lubricant, a feed-hole, with a closing-plug 24, leading into the oil-space.

In order to prevent the liability of the valve proper being stopped in an intermediate position by the attendant in opening the same, I arrange the counterweight 15 and its connecting-chain so that the parts will nearly counterbalance the valve when lowered to its seat, the height of the chain extending from the valve-rod up to the pulley, which is added to the weight of the valve and stem in this position being nearly or quite counterbalanced by the weight. This chain is made of sufficient weight so that when the valve is moved upwardly a major portion of its stroke by the hand-chain sufficient weight will be transferred and added to the counterweight to insure the pulling of the valve to its uppermost position in close contact with the cover-plate.

I preferably provide upon the upper part of the valve-stem a yielding ring or disk 25, which is held within a suitable ring 26, this yielding ring being so located that it will contact with a central boss upon the cover of the casing as the valve reaches its seat. Consequently when the pressure is admitted to the valve-chamber over the valve it will tend to flatten the valve and draw down the yielding disk upon the cover-plate, which will thus seal the joint as well as carry a portion of the load upon the valve.
The advantages of my invention will be apparent to those skilled in the art. Since an efficient cooling of the valve-seat and the cover-plate is obtained by the shifting weight of the chain attached to its rod and the sealing of the valve-rod when the valve is lowered to its seat is obtained by a simple, neat, and effective construction.

It is evident that the cover-plate may be constructed with any desired number of projecting rings, depending on the number of water channels or pools desired, though in course of arrangement, this is employed at the outer portion of the circumference, it should be carried considerably higher than that shown, so as to cause the water to rest over all portions of the plate. The yielding ring for the sealing of the valve-rod may be applied to the central boss upon the cover plate instead of to the valve-rod, as shown, it then contacting with a suitable ring upon the valve-rod and securing the same sealing effect.

Many variations in the form and arrangement of the parts will suggest themselves to those skilled in the art without departing from my invention, since What I claim is—

1. In hot-blast valves, a valve-chamber having walls of non-heat-conducting refractory material, a vertically-moving horizontally-seating disk valve therein, and a metal cover-plate through which the valve-stem extends, said plate covering the top of the valve-chamber and being arranged to hold a pool of water over a major part of its area.

2. In hot-blast valves, a valve-chamber having walls of non-heat-conducting refractory material, a vertically-movable valve therein arranged to fit upon a horizontal seat in the lower part of the chamber, a plate covering the top of the valve-chamber and through which the valve-stem extends, said plate being arranged to hold a pool of water over a part of its area, and means for supplying water to, and drawing it from the pool.

3. The combination with a valve-casing containing a vertically-movable valve, of a water-cooled valve-seat in the lower portion of the chamber, a cover-plate for the chamber having a water-cooling reservoir, and a connection between the water-cooling cavity in the seat and the said reservoir.

4. In hot-blast valves, the combination with a valve-chamber having non-heat-conducting refractory side walls, of a water-cooled cover-plate of good heat-conducting material thereof, and a horizontally-seating metal valve, said valve being of substantially the same contour as the lower face of the cover, so as to be water-cooled by this cover when in raised position.

5. The combination with a valve-chamber having a cover, of a valve having a rod extending through a hole in the cover, a collar upon the rod arranged to come in close proximity to the upper portion of the cover when the valve is lowered to its seat, and a packing adapted to be compressed between the collar and the cover when the valve is closed.

6. The combination with a valve-chamber having a cover, of a valve having a rod extending through this cover, and a collar upon the rod provided with a yielding packing arranged to contact with the cover when the valve is closed and thus seal the valve-rod.

7. The combination with a bracket, of a casting having a bore arranged to receive the bracket, means for clamping this portion of the casting about the bracket in any adjusted position, said casting having another bore extending at an angle to the first-named bore, an adjustable sleeve in the latter bore, mechanism for clamping the sleeve in its adjusted position, a shaft extending through the sleeve and carrying a pulley, and a hot-blast valve having a flexible connection extending over the pulley.

8. The combination with a valve-casing having a water-cooled cover shaped to hold a pool of water over a major part of its area, of a horizontally-seating valve shaped to substantially the same contour as the inner face of the cover, and a counterweight having a flexible connection with the valve, this connection being arranged to vary the counterbalancing effect in different positions of the valve.

9. In hot-blast valves, a valve-chamber having side walls of non-heat-conducting material, a plate covering the top of the chamber and arranged to hold a pool of water upon its intermediate portion above this chamber, and means for feeding water to this pool.

In testimony whereof I have hereunto set my hand.

JULIAN KENNEDY.

Witnesses:
F. E. GAITHER, C. E. MACKOWN.