L. B. HOWARD & G. W. DENIEF.

VALVE OR CUT-OFF.

APPLICATION FILED AUG. 14, 1907. RENEWED DEC. 14, 1911.

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2 SHEETS—SHEET 1.
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LAURENCE B. HOWARD AND GEORGE W. DENIEF, OF LYNN, MASSACHUSETTS.

VALVE OR CUT-OFF.


1,039,059. Application filed August 14, 1907, Serial No. 388,546. Renewed December 14, 1911. Serial No. 665,748.

To all whom it may concern:

Be it known that we, LAURENCE B. HOWARD and GEORGE W. DENIEF, citizens of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Valves or Cut-Offs, of which the following is a specification.

This invention relates to valves or cut-offs of the general type disclosed in our prior patent No. 666,439, granted Sept. 17, 1907, wherein means are provided for detachably mounting the valve and its seat to permit convenient renewal or repairs of these and the coating parts of the valve without disturbing the valve casing, and also for securing tight joints between the parts of the valve to effectually prevent leakage.

The object of the present invention is to improve the valve structure referred to and to provide a construction whereby the parts may be assembled and disassembled in a more ready and convenient manner, whereby the joint between the bonnet or head, casing and cap may be adjusted without releasing the cap, and whereby the valve seat may be easily and quickly withdrawn from the partition by manipulation of the valve cage.

With these and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:

Figure 1 is a central vertical longitudinal section through a valve or cut-off constructed in accordance with the invention.

Figure 2 is a horizontal section on line 2—2 of Fig. 1. Figure 3 is a side elevation of the valve cage or barrel. Figure 4 is a top plan view of the valve. Figure 5 is a similar view of the valve seat.

Referring now more particularly to the drawings, the numeral 1 designates a valve casing having inlet and discharge branches 2 and 3, a partition 4 separating said branches and formed with a beveled seat receiving opening 5 and, an upwardly extending flange or neck 6 externally screw threaded and provided with an internal shoulder 7, a beveled joint face 8 and diametrically opposite vertical grooves 9, formed in its thickened surface below the shoulder and opening at their upper ends through the same. The neck is arranged above the seat receiving opening 5 in the partition and its lower portion conforms substantially in dimensions with the area of the upper enlarged portion of said opening.

A detachable valve seat 10 fits snugly within the receiving opening 5 and has a beveled outer face to tightly engage the beveled wall of the opening. Said seat is also provided with an upwardly extending flange 11 provided with a series of outwardly extending or radial segmental lugs 12 overhanging the body of the seat to produce intervening receiving grooves 13 open at their ends for communication with the spaces 14 between the adjacent ends of the respective lugs. The valve seat is carried by and detachably connected with a cage or barrel 15, comprising an upper vertical body portion 16 adapted to approximately snugly fit within the lower portion of the neck 6 and provided with a plurality of depending wings or arms 17, spaced to provide intervening ports 18, said arms having a spaced arrangement equivalent to the spaced arrangement of the spaces 14 between the lugs 12 of the valve seat and being provided at their lower end with transverse grooves 19 for interlocking engagement with the lugs. In applying the valve seat to the cage or barrel, the parts are relatively disposed to seat the lower ends of the arms or wings 17 into the spaces 14, 9 and then by imparting a partially rotary movement to the seat or cage the lugs 12 will be brought into interlocking engagement with the grooves 19, the lower shoulders of which will seat within the grooves 15 13. By reverse rotary movement the seat and cage may be disconnected, as will be readily understood. Diametrically disposed upon the body 10 of the cage are lugs 20 adapted to fit within the grooves 9 to hold the cage against rotation when fitted within the valve casing, while permitting it to have a vertical up and down or sliding movement. One of these lugs 20 and the coating groove 9 are preferably wider than the other lug and groove to permit the cage to be inserted in a determined manner only into the casing, whereby it may always be fitted in the casing in such manner that neither one of the arms or wings will lie in the path of the water flowing from the inlet connection to the port in the valve seat.
A head 21 is provided to close the top of the barrel or cage, to occupy the neck 6 above the shoulder 7 and to cooperate with said shoulder in the manner hereinafter described. This head is formed with a depending flange 22 externally screw threaded to engage internal threads on the body 16 of the valve cage or barrel and with a beveled point face 23 to form with the corresponding face 8 of the neck an intervening V-shaped recess. A cap nut 24 is employed to close the neck and confine the parts of the valve mechanism in position, said cap being provided with a depending internally threaded flange 25 to engage the neck and having its body portion extending inwardly to overlie the head 21 and formed with a V-shaped or triangular annular joint flange 26 to fit into the aforesaid V-shaped recess and effect a tight closure of the joint between the neck and head to effectually prevent liability of the escape of fluid from the casing through the neck. A dome portion 27 rises from the body of the cap and is externally of angular form for the application of a wrench and provided in its top with a circular opening 28.

The head 21 is integral with the lower end of and forms a part of a bonnet 29 which extends upwardly through the cap and is formed with an annular flange 30 to snugly fit within the opening 28. The upper end of the bonnet is externally screw threaded to receive a gland nut 31 adjustably confining therein suitable packing 32. Below said threaded portion and above the flange 30 the bonnet is formed with an angular surface 33 for the application of a wrench.

A valve 34 is provided to engage the seat 10 and control the port thereof and is detachably connected with the lower end of a stem 35, said valve being beveled to seat upon the beveled rim edge of the flange 11. As shown in Fig. 4, the valve is formed upon its upper surface with a substantially U-shaped boss 36 having a groove 37 communicating with the socket or space 38 bounded thereby, said groove and socket being adapted to receive a head 39 formed upon the valve stem and the lower portion of said stem, as indicated in Fig. 1, by which the stem is swivelled to the valve. This construction also provides a connection by which the valve may be slipped onto and off the stem by a lateral or radial movement, thus permitting of the ready renewal of an old valve and application of a new one, as will be easily understood. The stem is formed with a thread 40 engaging a corresponding thread on the head and base of the bonnet through which the stem passes, the stem also extending upwardly through the packing 32 and gland nut 31 and being provided at its upper end with an operating handle 41 clamped in position thereon by a nut 42.

In the operation of assembling the parts, the stem is first applied to the bonnet and head, the valve is next fitted upon the lower end of the stem and the barrel or cage end 70 engaged with the threaded flange 22, after which the valve seat is connected with the cage, the parts thus far described fitted into the valve casing, the cap brought into operative position and screwed upon the neck, and the handle 41 finally applied to the upper end of the valve stem. When the parts are thus fitted in position the lugs 20 on the cage or barrel are seated in the grooves or recesses 9 by which the cage is held from rotation 80 but is fitted to slide vertically, so that, after the cap has been fully screwed on, upon applying a wrench to the portion 33 and turning the bonnet in a counter-clockwise direction the head 21 will be drawn upward until its seat face 28 tightly engages the joint flange 26, while at the same time the valve cage or barrel will be moved downward to force the valve seat 10 tightly into the receiving opening 5. It will thus be understood that by a rotary movement of the bonnet to the left the valve seat may be firmly applied in position and the head 31 simultaneously adjusted to effect with the cooperating parts 8 and 26 a tight closure between the neck, cap and head.

By the general construction described, it will be understood that the valve and valve seat may be conveniently disconnected to permit of their removal and the application of a new valve and seat whenever occasion requires in a convenient manner without removing or in any manner disturbing the valve casing, which may remain applied in the line of piping while repairs are being made. By simply turning the stem 35 in one direction or the other, the valve 34 will be moved toward or from its seat and in its up and down movements will be inclosed by the depending wings of the cage or barrel. It will be understood of course that upon removing the screw cap, the cage or barrel may be turned by means of the bonnet to disconnect it from the valve seat to permit the bonnet, cage, stem and valve to be re 115 moved for convenient inspection of the interior of the casing or the valve seat. When it is desired to remove the valve seat with the parts above described the bonnet is gripped by a wrench and turned clockwise 120 until, through its threaded connection with the cage, it is screwed down into engagement with the shoulder 5, whereupon, as it can no longer descend, its continued motion will result in an upward traveling movement of the cage, which will pull upon and extract the valve seat from its receiving opening 5. This operation allows a tightly wedged
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Having thus fully described the invention, what is claimed is:

1. In a valve or cut-off, a valve casing having inlet and exhaust ports, a partition formed with an opening, and a neck provided with vertical grooves, one of said grooves being wider than the other, a valve seat adapted to fit within said opening, a cage having spaced depending arms forming intervening ports detachably connected with said seat and provided with lugs, one wider than the other, to engage the respective grooves, said lugs having a specified arrangement relative to the arms, a head having a threaded engagement with the cage, a cap fitted upon the neck and holding the head in applied position, a bonnet carried by the head and extending through the cap, the neck and head being formed with beveled surfaces and the cap with a beveled projection to fit down between and engage said surfaces, a valve stem adjustably mounted in the bonnet and head, a valve carried by said stem, and a shoulder upon the neck to limit the downward movement of the head.

2. In a valve or cut-off, a valve casing having inlet and exhaust ports, a partition formed with an opening, and a neck provided with vertical grooves, one of said grooves being wider than the other, a valve seat adapted to fit within said opening, a cage having spaced depending arms forming intervening ports detachably connected with said seat and provided with lugs, one wider than the other, to engage the respective grooves, said lugs having a specified arrangement relative to the arms, a head having a threaded engagement with the cage, a cap fitted upon the neck and holding the head in applied position, a valve stem adjustably mounted in the head, and a valve detachably connected with said stem.

In testimony whereof we affix our signatures in presence of two witnesses.

LAURENCE B. HOWARD.
GEORGE W. DENIEF.

Witnesses:
SABINA W. McDERMOTT,
JOSEPH L. BARRY.