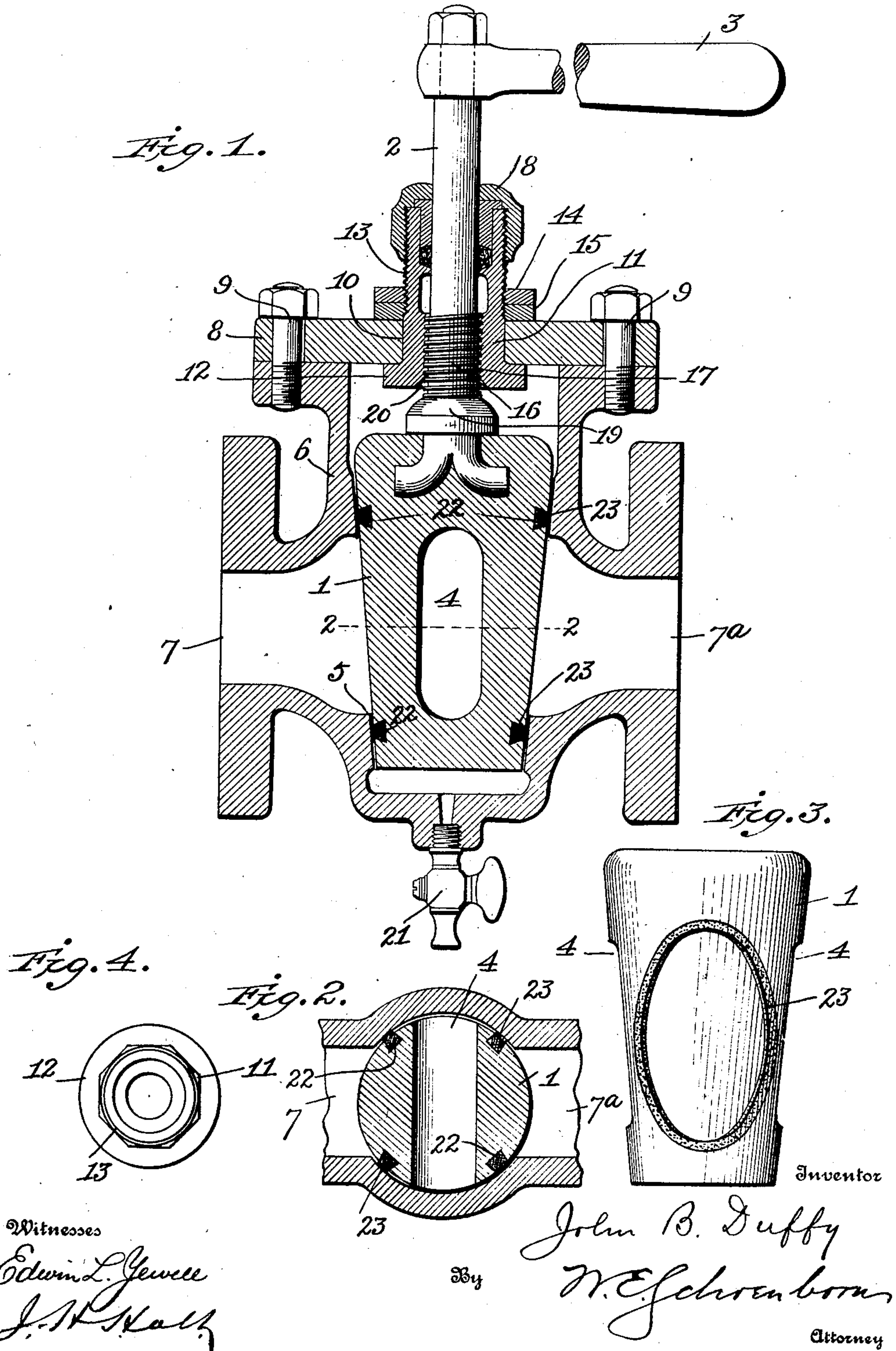


No. 862,143.

PATENTED AUG. 6, 1907.

J. B. DUFFY.  
BLOW-OFF COCK FOR STEAM BOILERS.

APPLICATION FILED NOV. 24, 1906.





# UNITED STATES PATENT OFFICE.

JOHN B. DUFFY, OF INDIAN ORCHARD, MASSACHUSETTS.

## BLOW-OFF COCK FOR STEAM-BOILERS.

No. 862,143.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed November 24, 1906. Serial No. 344,847.

*To all whom it may concern:*

Be it known that I, JOHN B. DUFFY, a citizen of the United States, residing at Indian Orchard, in the county of Hampden and State of Massachusetts, have  
5 invented certain new and useful Improvements in Blow-Off Cocks for Steam-Boilers, of which the following is a specification.

My invention relates to turning plug valves or cocks of the class which are particularly adapted for use in  
10 connection with steam boilers.

The objects of my invention are first; to construct an arrangement of the operating mechanism for the valve so that the turn plug is moved away from its seat when the valve is opened thereby avoiding any possi-  
15 bility of sticking, or grinding action between the seat and plug, and more especially to prevent the inner edges of the inlet and outlet of the valve seat and next to the turn plug from cutting or destroying the packing strips on the plug when the same is turned for opening.  
20 the valve. Second; other objects and advantages of construction and operation which will readily appear from the hereinafter detailed description and mode of operation.

To this end my invention consists of features of construction and relative arrangement of the elements  
25 which will be hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying one sheet of drawing in which similar reference characters indicate the same parts in  
30 the several views, Figure 1, is a vertical sectional view of a valve embodying the several features of my invention; Fig. 2, is a lateral section of the turn plug on line 2-2, of Fig. 1; Fig. 3, is a side elevation of the plug removed from the body or shell; and Fig. 4, is a plan  
35 view of the bushing engaged by the stem of the valve.

In the practice of my invention I provide a cock or valve 1, which is preferably of plug form and any suitable material, and is formed integral with or secured to a stem or spindle 2, which is adapted to receive at  
40 its outer or upper end a handle 3, wrench or other appliance by which it may be given a quarter-turn to move the valve from open to closed position, and vice versa. Said stem or spindle 2 is forked at its lower end and may be made of steel and placed in the mold  
45 when the body part of the plug 1 of cast iron or semi-steel is cast about it in the mold in order to insure greater strength and wearing properties. The plug 1, which in the instance shown is tapered, is provided with a straightway port 4 and is fitted to turn in a correspond-  
50 ingly-bored seat 5 in a valve body or shell 6, having at its opposite ends openings or nozzles 7, 7<sup>a</sup>, which may be either flanged, as shown or threaded for connection with pipes between which communication is to be controlled by the valve.

8 is a cap which is securely held to flanges at the up- 55 per or open end of the valve or shell 6 by means of stud bolts 9, 9. Said cap 8 is provided at its center with a regular many sided opening or hole 10, preferably octagon in shape which is adapted to receive a similarly sided or shaped bushing 11 (see Fig. 4) having  
60 the lower circular flanged section 12 and the upper or outer circular threaded section 13.

14, 15 are lock nuts for securely and non-rotatably holding the bushing 11 in the opening 10 and to the cap 8. The stem 2 for turning the plug 1 passes through  
65 the bushing 11 and is provided with threads 16 which engage corresponding threads 17 on the inner sides of the bushing 11. The upper or outer end of the bushing is provided with the usual stuffing box 18 and gland arrangement in order to insure a perfectly tight joint  
70 between the plug spindle 2 and bushing, and is so formed or constructed that it may be readily taken apart to renew the packing.

19 is a self packing collar placed on the plug spindle 2 between the threaded section 16 and the plug 1 and  
75 has its upper side inclined at forty-five degrees and adapted to seat itself into a correspondingly cut out section or depression 20, in the lower side of the bushing 11. Said collar 19 prevents the plug 1 from being raised too far and at the same time acts as a packing  
80 to prevent any steam or water from escaping by way of the spindle opening.

21 is a pet cock adapted to drain off any water of condensation, dirt or sediment which may collect in the chamber below the plug valve and seat, and also to  
85 detect whether or not the valve leaks.

22 are retaining grooves on the outer surface and opposite sides of the plug and are substantially oval in shape (see Fig. 3). Said retaining grooves are oppo-  
90 sitely disposed from the port openings in the plug and surround the inlet and outlet openings in the shell or body of the valve when the cock or plug is in its closed position. Said grooves may be of any desired shape, preferably dove-tail in cross section as shown, so as to firmly retain strips of packing 23 which material is not  
95 affected by the high heat and influence of steam. I have found asbestos or vulca-bestos, Jenkins packing, copper poured into the groove and turned off, and superheated steam Babbitt metal, to give excellent results. This packing is placed in the retaining grooves  
100 22 to such an extent that when the spindle or stem 2 is turned so as to seat the valve, the section of packing projecting from the grooves is firmly pressed against the valve seat 5 and holds the side of the plug about one-thirty second of an inch from its seat and at the  
105 same time makes a perfectly steam-tight and durable joint.

The operation of the invention is as follows: Whe .



it is desired to open the valve and bring the port 4 in the plug 1 in alinement with the openings 7 and 7<sup>a</sup> of the body 6, the handle 3 is given a quarter turn. In the first turning of the spindle 2 the threads 16 on said spindle engage the threads 17 of the bushing 11, and cause the plug 1 to be slightly raised from the seat 5, and cause the packing strips 23 to be entirely freed from the valve seat 5 and prevent the inner edges of the openings 7, 7<sup>a</sup>, from cutting or destroying the packing strips 23 when the plug is turned, and on further turning the spindle or handle 3 through ninety degrees the port 4 is brought in register with the openings 7 and 7<sup>a</sup> and the valve acts as blow-off. On reversal of the above operations the valve is closed and the packing 23 is firmly brought against the valve seat 5 thereby making a perfectly tight joint. The direction in which the handle points quickly indicates to a person whether the valve is entirely shut off or open or to what extent it is open or closed.

When it is desired to renew the packing 23 in the oval grooves 22, all that is necessary is to remove the cap or cover 8 together with the valve spindle 2 and plug 1 connected therewith, when access can be had to the packing and the same removed from the grooves 22. After the packing has been inserted in the grooves the plug 1 can be inserted back into the valve body 6 and the cap replaced in the position as indicated in Fig. 1.

From the foregoing detail description and mode of operation of the invention it will be seen that I have devised a blow-off cock in which the plug or its packing during its opening or closing operations has at no time a grinding or cutting action with the valve seat and also that the arrangement of removable packing in the grooves insures a perfectly tight joint at all times and can be easily repaired or inspected, and furthermore all the objects recited in the statement of invention are efficiently carried out and fully attained.

Having now fully described my invention what I

claim as new and desire to secure by Letters Patent is as follows.

1. A blow-off cock for boilers or the like comprising a valve body having a valve seat and inlet and outlet openings, a plug resting in said valve seat and having a port adapted to register with the inlet and outlet openings and packing grooves in its outer surface oppositely disposed from the port openings, and surrounding the inlet and outlet openings when the cock is closed, packing retained in and projecting from said grooves, and means for turning and raising said plug from the valve seat and entirely freeing the projecting packing from the valve body.

2. A blow-off cock for boilers or the like comprising a valve body having a valve seat and inlet and outlet openings, a plug resting in said valve seat and having a port adapted to register with the inlet and outlet openings and packing grooves in its outer surface oppositely disposed from the port openings and surrounding the inlet and outlet openings when the cock is closed, packing retained in and projecting from said grooves, a cap for the body, a spindle passing through the cap and connected with the plug for turning the same, a packing collar inserted on the spindle between the plug and cap, and means combined with the valve spindle for raising said plug for entirely freeing the projecting packing from the valve body when the spindle is turned.

3. A blow-off cock for boilers or the like comprising a valve body, having a valve seat and inlet and outlet openings, a plug resting in said valve seat and having a port adapted to register with the inlet and outlet openings, and packing grooves in its outer surface oppositely disposed from the port openings and surrounding the inlet and outlet openings when the cock is closed, packing retained in and projecting from said grooves, a cap for the body provided with an opening, an internally threaded bushing immovably supported in said opening and held to the cap, a stem having one end connected with the plug and the other end exterior of the body, said stem having threads engaging the threads of the bushing whereby as said stem is turned the plug is raised from the seat and the projecting packing of the plug is entirely freed from the valve seat.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. DUFFY.

Witnesses:

KARL R. HODGES,  
HUGH H. HEALEY.