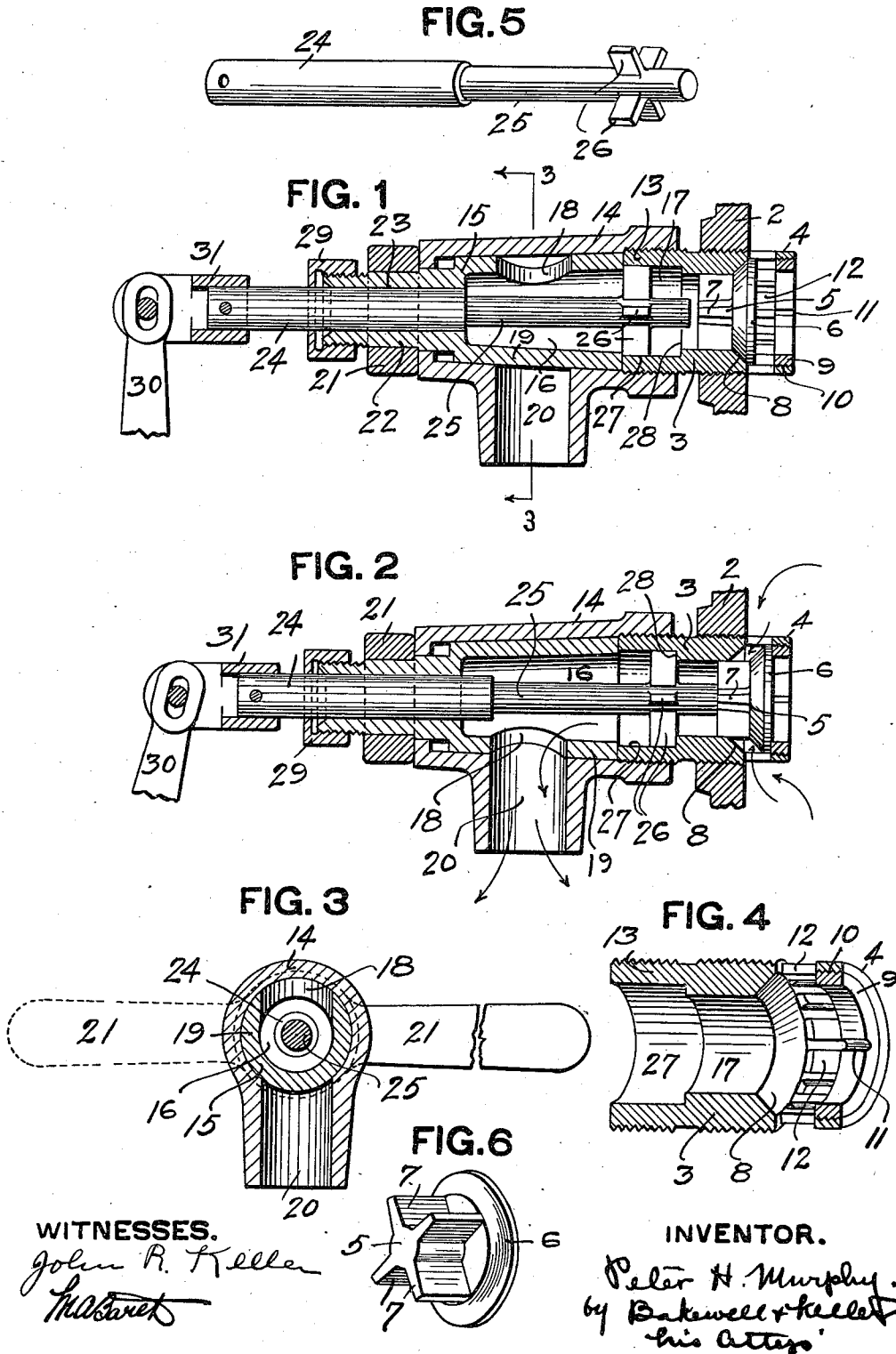


P. H. MURPHY.
BLOW-OFF VALVE.
APPLICATION FILED JUNE 4, 1910.

1,013,426.

Patented Jan. 2, 1912.



UNITED STATES PATENT OFFICE.

PETER H. MURPHY, OF PITTSBURGH, PENNSYLVANIA.

BLOW-OFF VALVE.

1,013,426.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed June 4, 1910. Serial No. 564,973.

To all whom it may concern:

Be it known that I, PETER H. MURPHY, of the city of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Blow-Off Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to blow-off valves or cocks, and is particularly adapted to the blowing off of locomotive boilers. It is not infrequently the case in the wrecking of a locomotive, to have the blow-off cock broken off, allowing thereby the water and steam to escape from the boiler and scald the engine-men.

The primary object of my invention is to obviate the above-mentioned trouble, and it consists in the combination and arrangement of parts as will be hereinafter more fully described.

I will now describe my invention, referring to the accompanying drawings, so that others skilled in the art to which it appertains may understand and construct the same.

Figure 1 is a longitudinal sectional view of a blow-off valve embodying my invention, the main valve or plug cock being shown in closed position; Fig. 2 is a similar view showing the plug cock in open position; Fig. 3 is a section on the line 3—3 of Fig. 1; Fig. 4 is an enlarged sectional perspective view showing the check valve casing and cage; Fig. 5 is a perspective view of the longitudinal shiftable rod or stem carried by the main valve or plug cock and adapted to shift the check valve from its seat; and Fig. 6 is a similar view of the check valve.

In describing my invention, the reference numeral 2 may indicate the shell of a locomotive boiler. Mounted so as to extend within the shell, as shown, preferably by a screw-threaded connection, is the valve casing 3 having at its inner end the cage 4 carried by which is the check valve 5 which may be of the usual construction; the valve having the disk 6 and spacer or guide arm 7. This inner end of the casing 3 has the seat 8 which normally receives, preferably under the boiler pressure, the disk 6 of the check valve. The cage 4 is provided with the valve retainer ring 9, which, by suitable screw-threaded connection, as indicated at 10, is removably mounted within the end of

the cage as is clearly shown in Fig. 4. To effect screwing of the ring 9 into and out of engagement with the cage 4, the ring may be provided along its inner face with the suitable recesses or depressions 11 for the reception of a screw-key or wrench. Lateral apertures or ports 12 in the valve cage permit of the passage of the water from the boiler when the check valve has been brought into abutment with the ring 9, or to the blow-off position as shown in Fig. 2, and as will be described hereinafter. By mounting the check valve in this manner, the cage prevents the same from being damaged or injured in the cleaning of the boiler.

In engagement with the outer threaded end 13 of the check valve casing 3 is the casing 14 of the main valve which may comprise substantially an ordinary turning-plug. However, in my invention, the plug 15 of the cock is cored out from the end, forming the chamber 16 which communicates with the central bore or chamber 17 of the check valve casing 3 and is provided with the opening or port 18 formed in the wall 19 thereof and which is adapted to register with the discharge port or nozzle 20 of the casing 14 when the plug has been turned to open or blow-off position as shown in Fig. 2. The plug may be provided with the suitable turning handle 21 carried by the shank 22.

The plug 15 is centrally bored, as at 23, to receive the longitudinally shiftable rod 24, having the reduced portion 25 which passes through the chamber 16 of the plug and extends into the chamber 17 of the check valve casing 3 and is provided with the centering or guiding arms 26 which are received by the annular enlargement 27 of the chamber 17. This rod 24 is adapted to be shifted into unseating abutment with the check valve 5, as shown in Fig. 2, for blowing off the boiler. The shoulder 28 formed by the annular enlargement 27 serves to limit the travel of the rod 24 as shown in Fig. 2, and thus prevent injurious ramming of the check valve 5 against the retainer ring 9 of the valve cage when the rod is advanced to unseat the check valve; the diametrical length of the guide arms 26 is preferably greater than the diameter of the bore or chamber 16 at the respective end of the plug so that the end face of the plug, which is preferably in seating abutment with the end face of the extension 13 of the check

valve casing, serves to limit the return stroke of the rod 24, as shown in Fig. 1.

If desired, the suitable gland 29, for packing of the rod 24, may be carried by the shank 22 of the plug 15. The purpose of reducing the rod, as at 25, is to avoid restriction of the valve chambers through which it passes. A slotted link or lever arrangement 30, leading from the running board of the locomotive (not shown) may, through the medium of the suitable head 31, have connection with rod 24 for operative longitudinal shifting of the rod in the blow-off of the boiler; the head 31 being fixedly carried by the free end of the rod, as shown.

The operation of my improved blow-off valve will be readily understood: The check valve 5 is normally held seated, as shown in Fig. 1, preferably by the boiler pressure. With the plug 15 of the main valve or cock turned to open position, as shown in Fig. 2, blowing of the boiler may be had by advancing the rod 24 into abutment with and so as to unseat the check valve 5, as shown in Fig. 2. Such unseating of the valve 5 will allow the water to pass from the boiler, through the lateral ports 12 of the valve-cage into the chambers 17 and 16 of the casing 3 and plug-cock 15 respectively, to the discharge port or nozzle 20 of the main valve casing. As stated above, the blowing of the valve may be accomplished by suitable link arrangement from the running board of the locomotive, thus obviating the necessity of the enginemen going on the ground to blow the boiler.

Should the valve be broken off in the wrecking of the locomotive, it will be apparent that the fracture would occur at a point close to the outside of the boiler shell, in the thin small diameter casing 3, and, by reason of the absence of positive connection of the rod 24 with the check valve 5, the latter would not be disturbed but would remain seated, preventing thereby the escape of the water from the boiler with consequent liability to scalding of the enginemen.

The advantages of my invention will be appreciated by those skilled in the art.

My improved valve is simple and durable in construction and effective in operation.

The two valves give double protection against leakage; obviously, the main valve may be removed to allow of grinding of the plug; and the device may be drained by the plug cock after blowing off, to prevent freezing.

It will be apparent that changes may be made in the construction shown without departing from my invention and I do not desire to limit myself thereto.

While I have stated that the reference numeral 2 may indicate a boiler shell, it will be apparent that it may also be representative

of other structures to which my improved blow-off valve would be applicable.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a blow-off valve, the combination of a valve casing adapted for connection with a boiler and having a chamber communicating therewith provided with a discharge port, a valve normally seated therein to close the chamber and so disposed as to lie wholly out of the zone of fracture of the casing and to operate substantially within the water-line of the boiler, a second valve controlling the discharge port, a rod reciprocally carried by the second valve for shifting the first-named valve from its seat to open position, and means for limiting the forward operative stroke of the rod; said limiting means being associated with the inner terminal portion of the rod.

2. In a blow-off valve, the combination of a valve casing adapted for connection with a boiler and having a chamber communicating therewith provided with a discharge port, a valve normally seated therein to close the chamber and so disposed as to lie wholly out of the zone of fracture of the casing and to operate substantially within the water-line of the boiler, a plug-cock casing associated with the first named casing, a plug in the second mentioned casing and terminally bearing against the first named casing, a reciprocable rod carried by the plug, and means associated with the first named casing and the end of the plug for limiting reciprocatory movement of the rod.

3. In a blow-off valve, the combination of a check valve, a casing therefor adapted for connection with a boiler, the valve thereof being so disposed as to lie wholly out of the zone of fracture of the casing and to operate substantially within the water-line of the boiler, a plug-cock casing attached to the casing of the check-valve, a conical plug in the second casing having a central bore, a reciprocable rod fitting the bore of the plug and adapted to shift the check-valve from its seat, and guide-arms carried by the rod and lying within the check-valve casing and adapted to abut, with outward movement of the rod, against the end of the plug.

4. In a blow-off valve, the combination of a check-valve, a casing therefor adapted for connection with a boiler, the valve thereof being so disposed as to lie wholly out of the zone of fracture of the casing and to operate substantially within the water-line of the boiler, a plug-cock casing attached to the casing of the check-valve, a conical plug in the second casing having a central bore, a reciprocable rod fitting the bore of the plug and adapted to shift the check-valve from its seat, guide-arms carried by the rod and lying within the check-valve casing and adapt-

ed to abut, with the outward movement of the rod, against the end of the plug, and a stuffing-box for the rod carried by the plug.

5 5. In a blow-off valve, the combination of a check-valve, a casing therefor adapted for connection with a boiler, the valve thereof being so disposed as to lie wholly out of the zone of fracture of the casing and to operate substantially within the water-line
10 of the boiler, a plug-cock casing attached to the check-valve casing, a plug in the second mentioned casing abutting against the check-valve casing and having an axial bore com-

municating with the check-valve casing, a reciprocable rod carried by the plug and adapted to shift the check-valve from its seat, and guide-arms for centering the rod and lying within the check-valve casing and adapted to abut with outward movement of the rod, against the end of the plug. 15 20

In testimony whereof, I have hereunto set my hand.

PETER H. MURPHY.

Witnesses:

M. H. MAINWARING,
A. A. POTTS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."