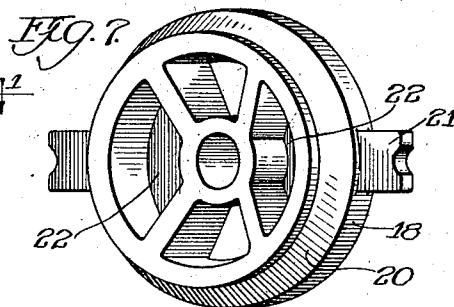
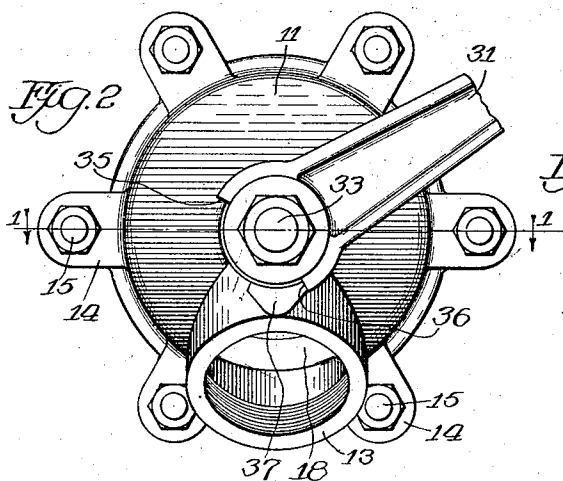
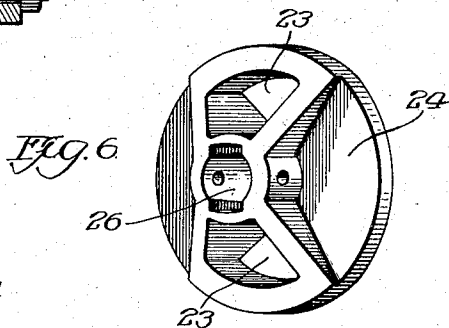
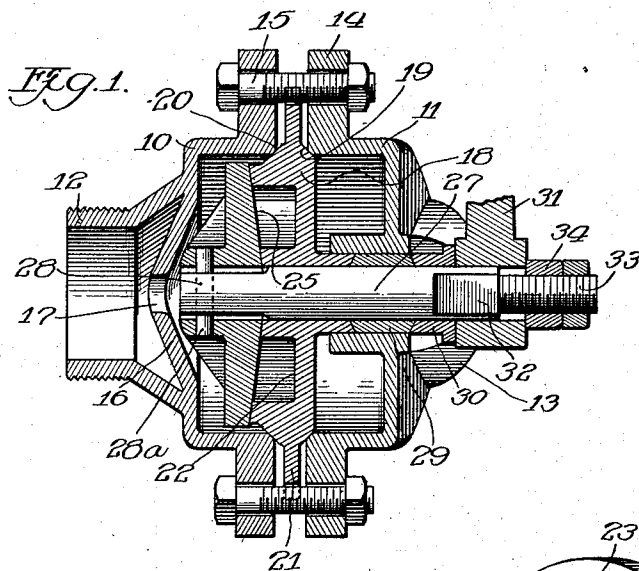


F. G. DUNBAR.
BLOW-OFF VALVE.
APPLICATION FILED JULY 26, 1915.

1,199,769.

Patented Oct. 3, 1916.
2 SHEETS—SHEET 1.



Witnesses:

Ed. G. Johnson
W. J. Murray

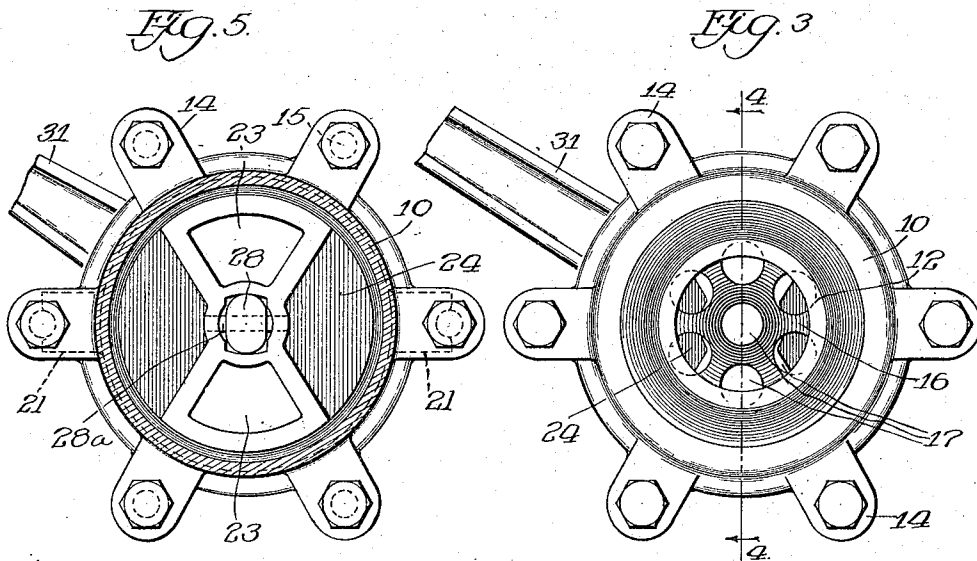
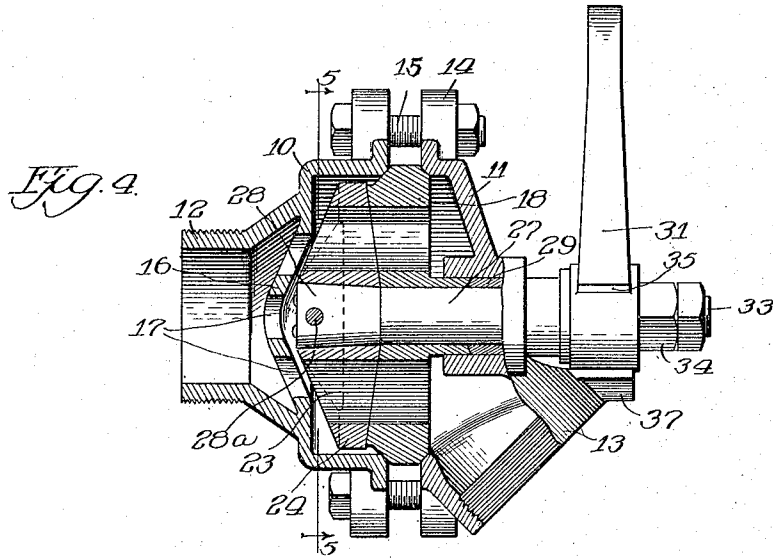
Inventor:

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By C. C. Kuthers
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Witnesses:
Ed G. Driscoll
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Inventor:
Frank G. Dunbar
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UNITED STATES PATENT OFFICE.

FRANK G. DUNBAR, OF CHICAGO, ILLINOIS, ASSIGNOR TO SARGENT COMPANY, A CORPORATION OF ILLINOIS.

BLOW-OFF VALVE.

1,199,769.

Specification of Letters Patent.

Patented Oct. 3, 1916.

Application filed July 26, 1915. Serial No. 41,878.

To all whom it may concern:

Be it known that I, FRANK G. DUNBAR, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Blow-Off Valves, of which the following is a specification.

My invention relates to valves and has particular reference to a novel blow-off valve particularly intended for use in connection with locomotive boilers. Valves for use in this connection must be of such construction as to withstand most difficult conditions. It will be understood that locomotive blow-off valves are located at the lowest point in the boiler in or near the mud ring and are intended to provide for the discharge of accumulated sediment and to stir up or cause a commotion in the water in the boiler. It will be understood, of course, that the pressures necessarily imposed are high and that the presence of mud and scale causes difficulties in the operation of the valves heretofore in use. In some of the types of valves now in use the valve member is located in the plane of the side sheet and therefore the opening necessarily made for the valve member must be large in order to permit the valve to be entered therein. Because of the fact that in modern practice the stay-bolts are located rather closely together such construction prevents the use of a valve of sufficiently large size to care for the conditions which are met. It will be understood also that even in valves of a preferred type the parts become worn and require relatively frequent repair.

An object in the present construction is to provide means whereby the valve member may be readily removed and replaced, all within a short period of time.

A further object is to provide a two-part casing, one part of which may be a permanent fixture in the boiler and which need not be removed when repair of the active valve parts is necessary.

A further object is to provide in such permanent part a cast screen having apertures which prevent the entrance of large obstructions into the valve and therefore preventing its closing. In such cases, of course, the entire pressure of the boiler is blown out and the engine is dead. Such obstructions are not uncommon, stay-bolts sometimes finding

their way into the water legs and having a tendency to be blown out with the mud.

A further object is to provide an entirely separate seat and valve member, the seat being located between the two halves of the casing and being readily removable upon the separation of the two halves of the casing.

A further object is to provide means for causing self grinding of the seat during its operation, the result being secured in the present form by dishing the seat.

A further object is to make provision for protecting the active face of the seat from damage due to the cutting action of the steam and sand which is discharged through the opening with a high velocity. In the present construction the active faces of the valve and seat are entirely covered when the valve is open. In connection with such feature I provide pockets in the face of the seat within which mud may accumulate and which is adapted to be blown out when the valve is open. This provision prevents the clogging of the valve when the boiler has not been blown out for some longer period of time than usually found necessary.

The invention will be more readily understood by reference to the accompanying drawings, wherein,

Figure 1 is a horizontal section through a valve constructed in accordance with my invention, the section being taken on the line 1—1 of Fig. 2; Fig. 2 is an end elevation of the device; Fig. 3 is an end elevation taken from the opposite side to that of Fig. 2; Fig. 4 is a section on the line 4—4 of Fig. 3; Fig. 5 is a section on the line 5—5 of Fig. 4; Fig. 6 is a perspective view of the valve, and, Fig. 7 is a perspective view of the seat.

Referring more particularly to the drawings, it will be seen that I provide a casing composed of two halves 10, 11, the former being provided with a nipple 12, and the latter with an outlet 13. The nipple 12 is adapted to be screwed into the boiler sheet and it will be seen that the size of the outlet opening is limited only by the space between adjacent stay-bolts and that the size of the valve itself is not dependent upon the spacing of the stay-bolts. The two halves of the casing are provided with apertured ears 14, and the bolts 15 are utilized to secure the two halves together. In the portion 10, which is intended as a permanent fixture in

the boiler, I provide a web or diaphragm 16 having openings 17 therein, which members act as a screen to prevent loose stay-bolts, etc., from entering the valve casing.

5 Mounted between the two halves of the casing is the brass seat 18, having inclined faces 19, 20, which are contacted by similar faces on the two halves of the casing and as the casing is constructed of steel and the
10 seat of brass, a tight joint may readily be secured. The seat, as shown in Fig. 1, is provided with diametrically opposite lugs 21, having notches therein which engage bolts 15, and act to prevent rotation of the seat.
15 In the body of the seat 18, I provide recesses 22, as best shown in Figs. 1 and 7, which recesses are in communication with the boiler when the valve is in its closed position, these recesses registering with
20 similar recesses 23, in the valve member 24, best shown in Figs. 1 and 6. It will also be noted that the active faces of the valve and its seat are completely covered when the valve is in either open or closed position
25 and therefore that there is no opportunity for cutting or wearing of such faces by the grit discharged through the valve when the boiler is being blown out. The valve member 24, may likewise be constructed of brass
30 and consists essentially of a disk, the inner surface 25 of which is convexed to correspond to the concavity of the seat. As shown in Fig. 6, I have provided two through openings 23 in the valve member,
35 which register with the openings through the seat when the valve is in open position, the metal of the disk at each side of the opening covering the faces of the seat when the valve is in open position. The valve
40 member is provided with an axial opening 26, which is slightly conical in outline at least in one dimension, as best shown in Figs. 4 and 6. The valve stem 27 is flattened and enlarged near its end, as indicated
45 at 28, and is held in the valve by a pin 28^a. Inasmuch as the stem is intended to fit the valve rather loosely, provision is made for a connection having substantially universal movement. This assures a perfect fit be-
50 tween the valve and seat without expensive operations or the necessity for extensive grinding when a new valve or seat is installed. The capacity for universal movement between the valve and the end of the stem is best shown in Fig. 5. As shown in
55 Fig. 1, the stem passes through the seat and through the outer half of the casing and is made steam tight by inserting the packing 29, between the parts, a nut 30, bearing
60 against the packing on the outside. The operating lever 31, is fitted on the squared end 22, of the stem with capacity for longitudinal movement. The threaded extension

33, of the stem accommodates a nut 34, and by means of this nut the valve is forced 65 against its seat, the packing is compressed to make a steam tight joint and the operating lever is secured in place. This provides for extreme simplicity in construction with a mechanism easy in dismantling for re- 70 pairs it being only necessary to remove the nut 34, and the bolts 15, in order to completely dismantle the valve. This may be done in a very few minutes as compared to the several hours necessary for the dis- 75 mantling and assembling of the valves now commonly in use. On the operating lever 31, I provide shoulders 35, 36, which are adapted to contact opposite sides of a stop 37, secured to the casing 11. These limit 80 the movement of the lever and provide means whereby the operator may note that the valve is fully closed and fully opened. It is essential that this provision should be made in order that after the valve is opened 85 no portion of the seat may be in the line of discharge of the steam through the valve.

I claim:

1. In a valve, the combination of a casing and a removable valve member, said mem- 90 ber being provided with oppositely disposed peripheral bearing faces and including a lateral flange the edge of which is inclined toward the axis of the member, said valve member being provided with alternate 95 through openings and recesses, substantially as described.

2. In a valve, the combination of a two-part casing, a seat member held between said two parts, a valve member in the form of a 100 disk and rotatable on the face of said seat member, a stem loosely connected to said valve member and passing through said seat member, an operating handle connected to said stem, packing between said seat mem- 105 ber and said handle, and a nut engaging said handle and said stem and adapted to compress said packing and force said valve against said seat, substantially as described.

3. In a valve, the combination of a two- 110 part casing, one part of which is provided with a nipple and a perforated web which extends across the passage through and is integral with said nipple member, a valve seat held between said two parts, and a 115 radial valve member co-acting with said seat member each of the apertures in said web being of a less size than the opening through said seat, substantially as described.

Signed at Chicago, Illinois, this 22 day 120 of July, 1915.

FRANK G. DUNBAR.

Witnesses:

MINNIE AILWORTH,
P. W. RAYMOND.