F. M. SNYDER.

BLOW-OFF VALVE.

APPLICATION FILED MAR. 19, 1910.

993,726.

Patented May 30, 1911.

FIG. 1.

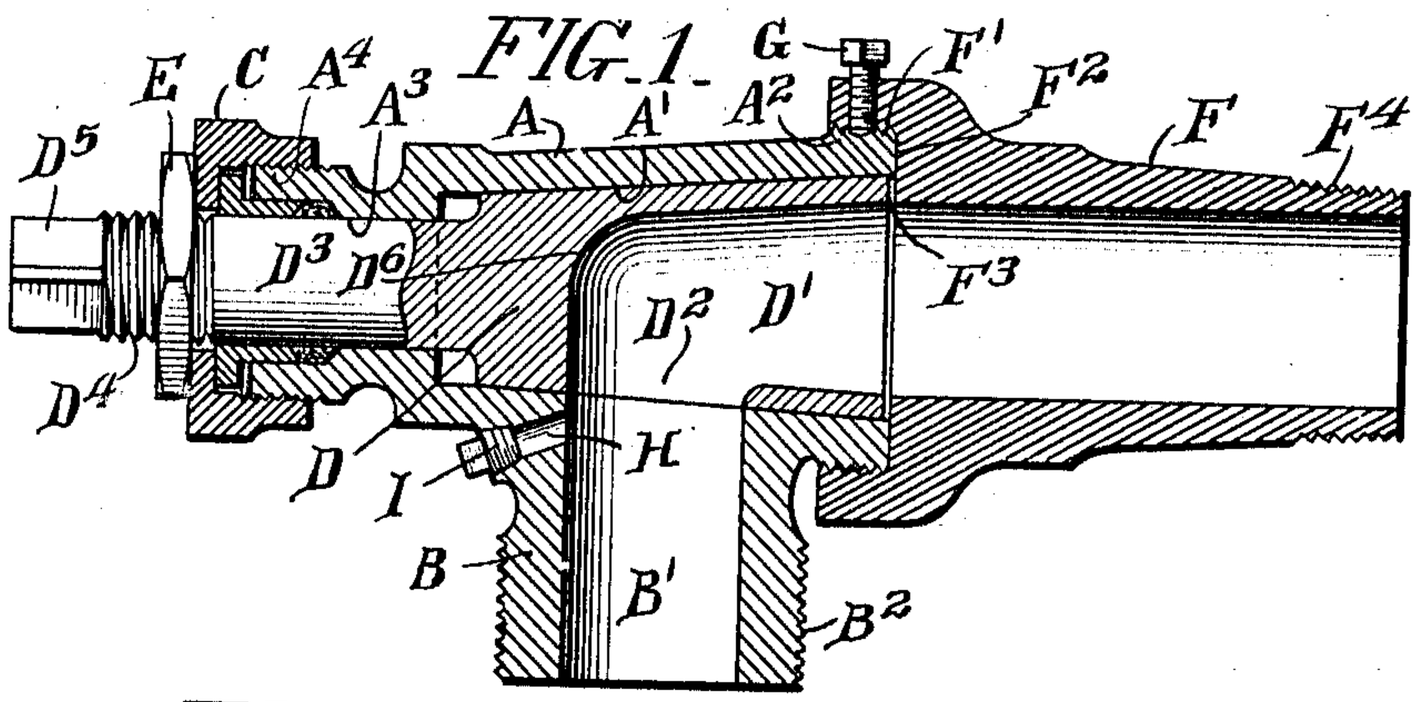
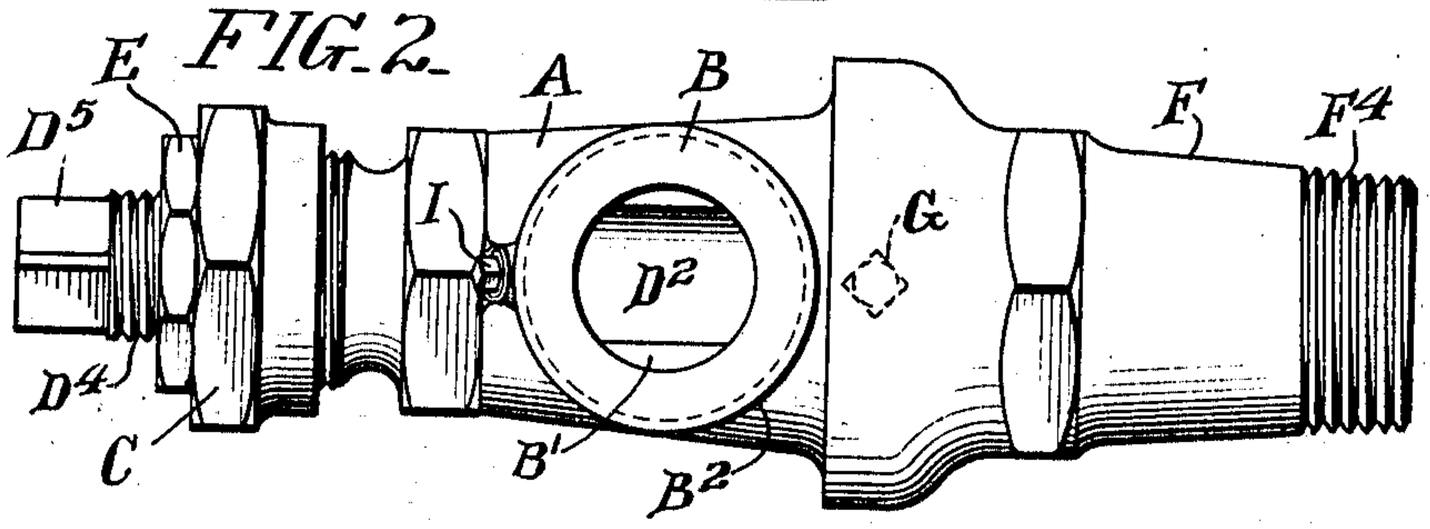


FIG. 2.



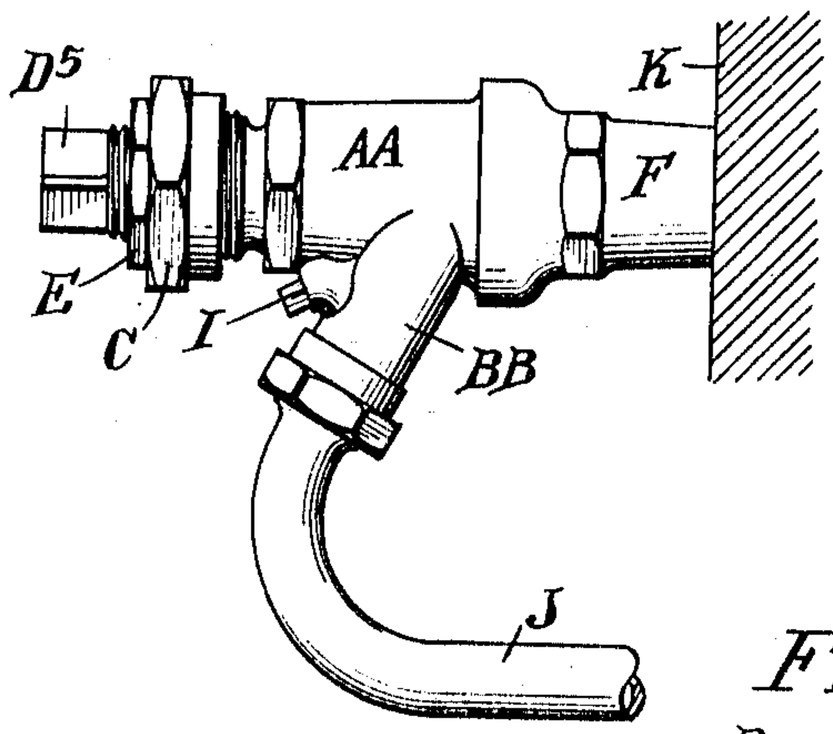
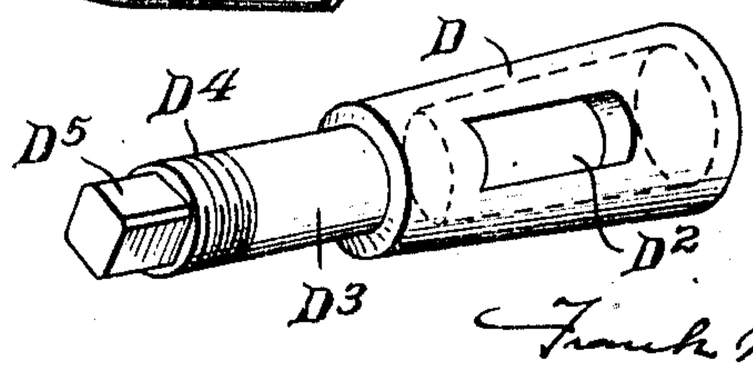


FIG. 3.

FIG. 4.



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BLOW-OFF VALVE.

993,726. Specification of Letters Patent. Patented May 30, 1911.

Application filed March 19, 1910. Serial No. 550,502.

To all whom it may concern:

Be it known that I, FRANK M. SNYDER, a citizen of the United States, residing in Cresson, in the county of Cambria, in the State of Pennsylvania, have invented a certain new and useful Improvement in Blow-Off Valves, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

The invention consists in certain features of construction and arrangement of a valve particularly adapted for use as a blow off valve through which mud, scale, or other sediment, collecting in the bottom of the mud drum of a locomotive or other boiler may be blown out from time to time.

The general object of the invention is to provide a valve for the purpose specified, characterized by its durability and effectiveness and by its simplicity in construction, and the relatively low cost at which it can be manufactured.

More particularly, one specific and important object of the invention is the production of a valve for the purpose specified with provisions whereby when sediment, deposited in the valve or adjacent the valve inlet in the receptacle to which the valve is connected, collects to an amount sufficient to choke the discharge, the sediment may be dislodged and the discharge started in a simple and expeditious manner and without subjecting the attendant to any liability of being scalded or otherwise injuriously affected when the discharge following the dislodgment of the sediment occurs.

Another object of the invention is to so construct and arrange a conical plug valve for the purpose specified that the boiler or like pressure on the inlet side of the valve may be effectively utilized in a simple and direct manner to hold the valve proper snugly against its seat.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described several forms in which the invention may be used.

Of the drawings, Figure 1 is a sectional elevation of one form of valve constructed in accordance with the present invention. Fig. 2 is an inverted plan view of the valve shown in Fig. 1. Fig. 3 is an elevation illustrating the construction and mode of use of a valve differing slightly in form from that shown in Figs. 1 and 2, and Fig. 4 is a perspective view of a rotatable valve member or valve proper.

In the drawings, and referring first to the construction shown in Figs. 1, 2 and 3, A represents the main valve casing member. In the member A is formed a conical cavity A′ open at its base and forming a valve chamber receiving, and substantially filled by, the conical plug valve D. The stem D^3 of the latter passes through the opening A^3 formed in the end wall of the casing member A at the smaller end of the chamber A′. The outer end A^4 of the casing member A, is spaced away from the stem D^3 to provide space for a packing, and the portion A^4 is externally threaded to receive the cap C^3 forming the outer end of a stuffing box construction. A nut E, screwed on to the threaded portion D^4 of the valve stem D^3, bears against the end of the cap C and forms a positive but adjustable stop holding the valve member D against movement axially inward. The outer end D^5 of the valve stem is shaped to receive a handle or wrench, by means of which the valve may be rotated. The valve casing member A is also provided with a lateral extension B having a passage B′ formed in it which opens at a point intermediate of the ends of the chamber A′. The valve D is formed with a cavity D′ extending in from its base and with a lateral port D^2 by which this cavity is brought into communication with the passage B′ when the valve is turned into the position shown in Figs. 1 and 2.

In the construction illustrated, the inner end of the casing member A is externally threaded and is screwed into an internally threaded socket F′ formed in the end of a tubular member F which is externally threaded to permit it to be screwed into the wall of the mud drum, boiler leg, or the like, with which the valve is used. As shown, the end of the casing member A makes a tight joint with the shoulder F^2 of the member F, and only a slight space I^3 is provided between the base of the valve D and the shoulder F^2. This space is sufficient however, to permit the full steam pressure

to act axially against the base of the valve D and to permit the valve, after the nut E is loosened, to be moved axially inward, as by a hammer blow, to loosen the valve in case the latter sticks from jamming or corrosion. Preferably, as shown, the bore of the member F is of substantially the same diameter as, and is substantially coaxial with, the mouth of the cavity D′ in the valve member D.

As shown in Figs. 1 and 2, the lateral extension B of the casing member A, extends at right angles to the axis of the valve chamber and is externally threaded at B^2 to receive the usual pipe connection.

The construction shown in Fig. 3 differs from that shown in Figs. 1 and 2 only in the immaterial features that the extension B B, corresponding to the extension B of the construction first described, does not extend perpendicularly from the axis of the valve chamber, and is internally threaded to receive the discharge spout K. The discharge spout is usually in practice directed away from the side at which the attendant stands in operating the valve, as is shown clearly in Fig. 3. Material in the nature of sediment deposits in the valve chamber D′, or in the connection F, or in the adjacent portion of the chamber K (see Fig. 3), to which F is connected, in sufficient amounts to entirely or partially choke the discharge through the valve when the latter is opened. To prevent difficulty from this cause I provide a passage H formed in the casing member A adjacent the junction of the body of the latter with the extension B, and so disposed that a flexible wire or rod may be passed through it into the valve cavity D′ through the port D^2, and if necessary into or through the member F into the receptacle K to which the valve is connected. By manipulating the wire or rod thus inserted, the sediment may be easily dislodged sufficiently to permit it to be blown out, as is well known to those skilled in the art. The boiler, at the time the blowing out operation starts, is usually under the working pressure or at least under a substantial steam pressure. When the discharge begins practically all of the matter discharged passes out of the valve casing through the passage B′ and but little, if any, steam or hot water or sediment will escape through the passage H′ and the discharge, if any, which occurs, through the passage H, will not partake of the nature of a jet. In consequence the attendant is safe from liability of being scalded or otherwise injuriously affected when the discharge begins following the dislodgment of the sediment by the instrument inserted through the passage H. The curved wall D^6 at the inner end of the cavity D′, serves to some extent as a deflector, assisting in causing the discharge to take place axially through the passage B′. The lower end of the passage H is ordinarily closed as by a screw plug I.

Aside from the obvious advantage had with my present invention because of the provisions for easily dislodging the sediment choking up the discharge, without taking the apparatus apart, it will be apparent to those skilled in the art that the valve construction as a whole is simple and durable, and highly effective for the purpose for which it is primarily devised. The boiler pressure tends at all times to force the valve member D snugly into contact with the wall of the conical chamber A′ in which it is received.

While I prefer to provide the stuffing box around the stem D^3, my practical use of the valve indicates that such a stuffing box is not really necessary to prevent leakage along the stem. I consider the stuffing box advantageous however on account of the frictional resistance which it offers to the rotative movement of the valve, and the consequent protection which it gives against the valve jarring open under the shock to which such a valve may be subjected, particularly when used on a locomotive boiler.

While, in accordance with the provisions of the statutes, I have herein illustrated and described the best forms of my invention now known to me, it will be apparent to those skilled in the art that some change in the form of the apparatus disclosed may be made without departing from the spirit of my invention, and that certain features of the invention may be used without a corresponding use of other features.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is,

1. A blow off valve comprising in combination, a casing formed with a valve chamber and with a lateral outlet passage leading away from said chamber, in combination with a valve member located in said chamber and formed with a cavity opening at one end of the valve member, and with a lateral port adapted to be moved by the rotation of the valve member into and out of the position in which it establishes communication between said outlet passage and the valve cavity, said casing being formed also with a passage opening into said outlet passage through which an instrument may be passed through the mouth of said outlet passage and said port into the cavity of the valve member to dislodge sediment choking the discharge through the valve.

2. A blow off valve comprising a casing formed with a conical valve chamber opening at and tapering away from the inlet side of the valve, and with a lateral outlet passage leading away from said chamber, in combination with a rotatable valve member comprising a conical portion fitting in said

chamber and formed with a cavity D′ open at the base of the conical portion and with a lateral port D² leading away from the inlet end of said cavity and moved into and out of the discharge position in which it registers with said outlet passage by the rotation of said valve member, the inner end wall of said cavity being curved to deflect the discharge in an axial direction through said lateral port and passage when the valve is in the discharge position, said casing being formed also with a passage opening into said outlet passage through which an instrument may be passed through the mouth of said outlet passage and said port into and through the said cavity in the valve member to dislodge sediment choking the discharge through the valve.

3. A blow off valve comprising a casing formed with a conical valve chamber opening at and tapering away from the inlet side of the valve, and formed also with a lateral outlet passage leading away from said chamber, in combination with a rotatable valve member formed with a conical portion fitting in said chamber and having a cavity in it, open at the base of the conical portion and being formed also with a lateral port moved into and out of the position in which it establishes communication between said cavity and said lateral outlet passage when the valve is rotated, said valve casing being formed also with a passage opening into said lateral outlet passage in a line which extends through the mouth of the last mentioned passage and said port in the valve into the cavity in the latter.

4. A blow off valve comprising a casing formed with a conical valve chamber opening at and tapering away from the inlet side of the valve, and formed also with a lateral outlet passage leading away from said chamber, in combination with a rotatable valve member formed with a conical portion fitting in said chamber and having a cavity in it, open at the base of the conical portion, and being formed also with a lateral port moved into and out of the position in which it establishes communication between said cavity and said lateral outlet passage when the valve is rotated; said valve casing being formed also with a passage opening into said lateral outlet passage in a line which extends through the mouth of the latter passage and the port in the valve into the cavity in the latter and means for closing said passage.

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Witnesses:
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