

G. B. FROST & D. MORGAN.  
VALVE.

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935,597.

Patented Sept. 28, 1909.

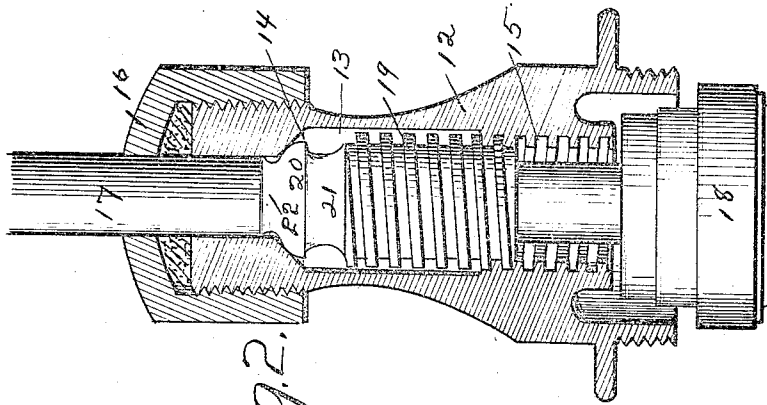


Fig. 2.

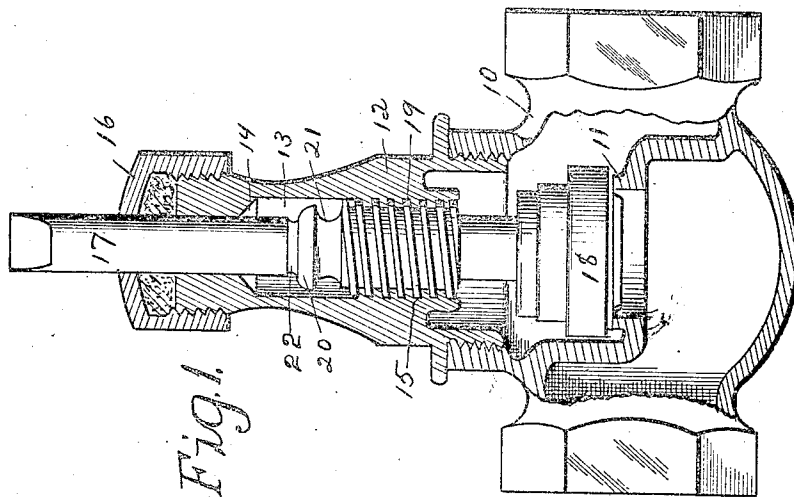


Fig. 1.

Witnesses  
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# UNITED STATES PATENT OFFICE.

GEORGE B. FROST AND DANIEL MORGAN, OF DES MOINES, IOWA.

## VALVE.

925,597.

Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed August 31, 1907. Serial No. 390,953.

*To all whom it may concern:*

Be it known that we, GEORGE B. FROST and DANIEL MORGAN, citizens of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Valve, of which the following is a specification.

Our invention relates to that class of valves in which the valve is opened or closed by movement of the valve stem to and from the valve seat, such, for instance, as the ordinary globe valve in general use. In valves of this class, when the valve is raised from its seat, the material flowing through the valve is usually prevented from escaping around the valve stem by means of a stuffing box; and in the event that the stuffing box should leak, there is often considerable difficulty in renewing the packing material, without first relieving the pressure on the interior of the valve casing, because when the valve casing is, for instance, filled with steam under pressure, an operator, upon removing the packing material might be injured by the escaping steam.

Our object is to provide a valve of this class, of simple, durable and inexpensive construction, so arranged that when the valve is moved to position at its limit away from the valve seat, the passage-way from the interior of the valve casing to the stuffing box will be closed so that the packing material may be readily removed and replaced without permitting the escape of material from the valve through the bonnet around the valve stem.

More specifically, it is our object to provide a device of this kind having a seating member formed on the valve stem, and a seat formed in the valve bonnet and so shaped and arranged as to be self-cleansing, and also so arranged that any sediment that may accumulate on said seating member will be moved either upwardly or downwardly relative to the contact point of the seating member so that such sediment will not interfere with the perfect seating of the seating member against its seat.

Our invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claim and illustrated in the accompanying drawings, in which—

Figure 1 shows a vertical central sectional

view of a globe valve embodying our invention. Fig. 2 shows an enlarged vertical sectional view of the valve stem, the bonnet and the stuffing box embodying our invention.

Referring to the accompanying drawings, we have used the reference numeral 10 to indicate the valve casing provided with a valve seat 11. This casing is of the ordinary construction, and of itself forms no part of our present invention. Mounted in the casing 10 is a bonnet 12 having an opening extending longitudinally through it. The upper portion of said opening is of a size to receive a valve stem, and permit the valve stem to move freely through it. Near the upper end of the bonnet is an enlarged cylindrical chamber 13 having at its top a concave seat 14 formed with sides extending from the narrow opening in the top of the bonnet to the larger chamber beneath said opening. The lower portion of the interior of the bonnet is formed with a screw thread 15, and screwed to the top of the bonnet 12 is a stuffing box 16 of the ordinary kind.

The valve stem comprises a body portion 17 having on its lower end a valve 18 of the ordinary kind, designed to co-act with the valve seat 11. This valve stem projects through the bonnet 12 and has a screw threaded portion 19 to engage the screw threads 15. It is also provided near its upper end with a seating member 20, which has a rounded surface designed to engage the seat 14. Below the seating member 20 we have formed an annular recess 21, and above the seating member 20 we have formed a second annular recess 22, both of said annular recesses being smaller in diameter than the portions of the valve stem in which they are formed.

In practical use, and assuming the parts to be assembled as shown in Fig. 1, and assuming further that it is desired to remove the stuffing box 16, then the operator rotates the valve stem in a direction required for moving it upwardly until the rounded portion of the seating member 20 engages the valve seat 14. When this is done, a tight joint is provided that will close the passage-way from the interior of the valve casing to the stuffing box. It frequently happens that sediment or incrustation is formed upon the seat 14, and also the rounded seating member 20, and this material would of course prevent a perfect seating of the seating member 20. However, the said seating

member 20 is brought against its seat with a rotary movement when the valve stem is turned, and, hence, the sediment of incrustation will be broken loose. Our object in making the seating member 20 rounded, is to form a contact point on said seating member that is comparatively small and from which the sediment or incrustation may easily be broken loose. When this sediment or incrustation has been broken loose, it will likely be forced upwardly by pressure from the interior of the valve casing and, hence, by providing the annular recess 22, this material may enter said recess and will not prevent a perfect seating of the seating member 20, which would be prevented if no outlet or escape were provided for the sediment or incrustation that has been broken loose from the contact point of the seating member, and then forced above said contact point.

The annular recess 21 below the seating member 20 is for the purpose of receiving and holding any incrustation or sediment that may fall below the seating member, and to prevent same from gathering or becoming deposited in the screw threads of the valve seat, where it would be detrimental as it would tend to prevent the turning of the valve stem.

We claim as our invention.

In a device of the class described, the combination of a valve casing having a valve seat therein, a bonnet mounted on the valve casing and formed with a valve stem opening, screw threaded at its lower portion and having at its top a seat with sides tapered upwardly and inwardly, a stuffing box at the top of the bonnet, a valve stem having a screw threaded portion designed to be seated in the screw threaded portion of the bonnet and also having above the screw threaded portion a seating member having a rounded engaging portion designed to engage the sides of said seat and also having above the seating member an annular recess designed, when the valve is closed, to stand in position above the seat and also having below the seating member a second annular recess above the screw threaded portion of the valve, said valve stem also having at its lower end a valve to engage the valve seat in the valve casing, for the purposes stated.

Des Moines, Iowa, Feb. 9, 1909.

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Witnesses:

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