No. 829,316. PATENTED AUG. 21, 1906.

R. E. BALL.

MINERAL GATE.

APPLICATION FILED JUNE 14, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

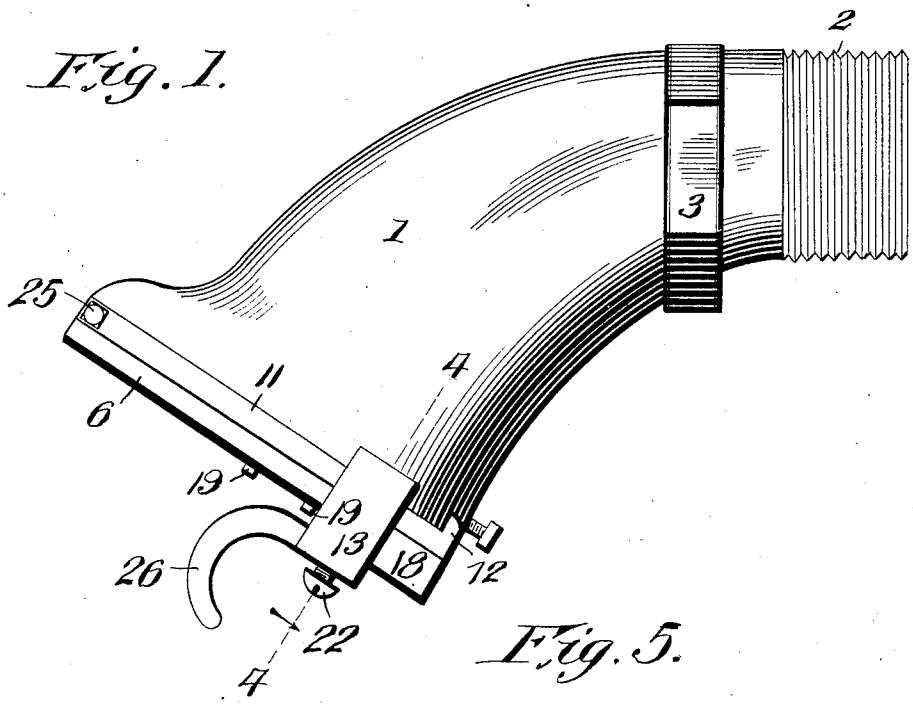


Fig. 5.

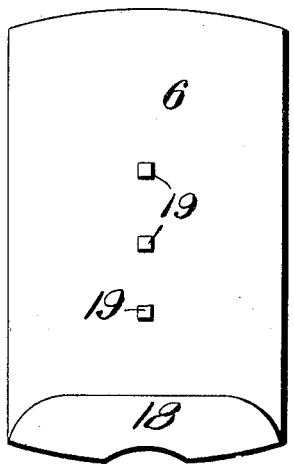
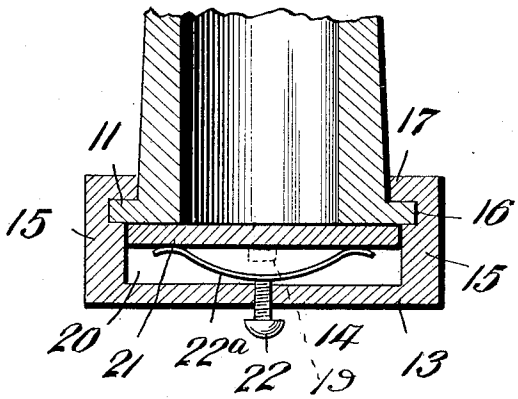


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 2.

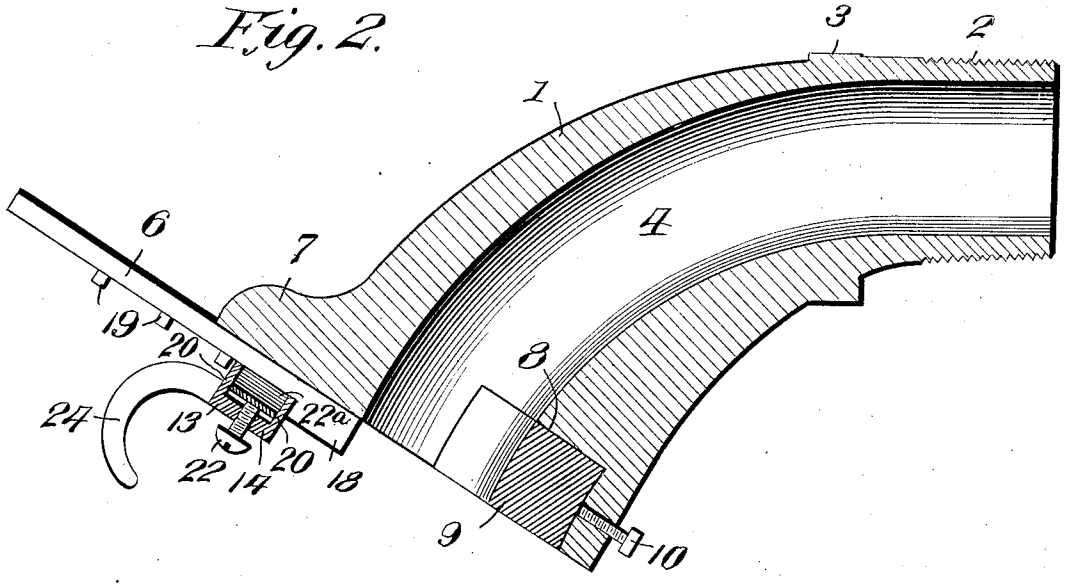
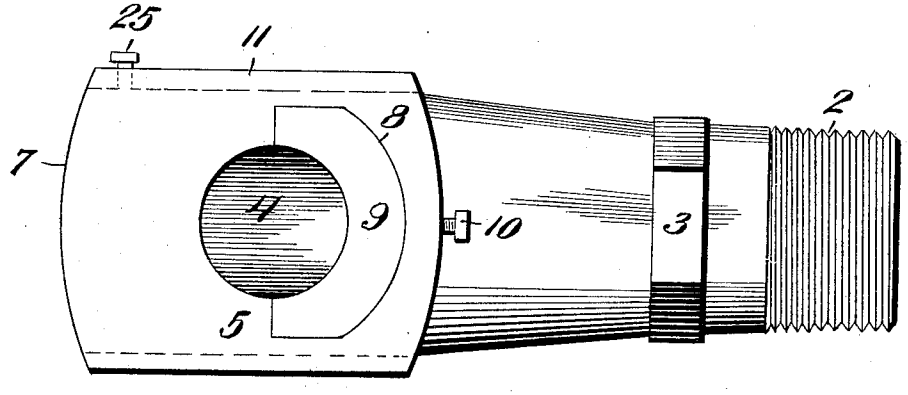


Fig. 3.



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MINERAL-GATE.

No. 829,316. Specification of Letters Patent. Patented Aug. 21, 1906.

Application filed June 14, 1905. Serial No. 265,290.

To all whom it may concern:

Be it known that I, RUFUS E. BALL, a citizen of the United States of America, residing at Prosperity, in the county of Jasper and State of Missouri, have invented new and useful Improvements in Mineral-Gates, of which the following is a specification.

This invention relates to a novel and improved mineral gate or valve for controlling the discharge of minerals from steam jig-tanks, the object of the invention being to provide a valve of this character which is simple of construction, reliable and efficient in use, and adapted to effectually withstand the wear to which valves of this type are subjected by the action of the outflowing mineral, and, further, to provide a mineral-valve in which provision is made for securely retaining the valve-gate in closed position and adjustably mounting the same to compensate for wear and permit of its ready renewal when occasion requires. The valve may, however, be employed for various uses, and especially in places where devices of this kind are subjected to excessive wear.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the improved valve, showing the sliding gate closed. Fig. 2 is a longitudinal section of the same, showing the gate opened. Fig. 3 is a bottom plan view of the body of the valve. Fig. 4 is a section through the head of the valve-body, the gate, and the guiding and adjusting clamp, taken on the line 4 4 of Fig. 1; and Fig 5 is an outer side elevation of the sliding gate.

Referring now more particularly to the drawings, the numeral 1 designates the body of the valve, which is generally of conventional form, being provided with an exteriorly-threaded inner or inlet end 2, adapted to be screwed into the outlet-opening of the jig-tank, and a polygonal portion 3 adjacent thereto for the application of a wrench or similar tool to apply and remove it. The body is outwardly and downwardly curved from the said inlet end and is formed with a correspondingly-shaped axial outlet-passage 4. In order to withstand the wear and tear to which the valve-body is subjected by the abrading action of the outflowing mineral, I make the body of some suitable hard chilled metal and depart from conventional constructions by gradually increasing the thickness of the walls of the body toward its outlet end, thus adapting it to be used for a considerable period before discardure is required. This construction causes the production of a head 5 of increased area at the outlet end of the body, the outer face of said head being arranged obliquely to the end 2 and finished to form a smooth seat for the sliding valve-gate 6. The area of the head is further increased by forming the body at its outlet end with an upward extension or prolongation 7, whose outer surface is flush with and prolongs the length or extent of the seat-face. Formed in the head at the base of the outlet-passage 4 a recess or socket 8, coextensive with the lower half of the outlet end of said passage, and in this recess or socket is inserted a segmental wear-strip 9, composed of some hard highly-endurable metal, thus forming a hardened lip or wear-surface at the point where the metal discharges to protect the body of the valve from the excessive wearing action of the metal at such point. This wear-strip is held in position by a set-screw 10 and when worn may be readily removed and a new strip substituted therefor. By this means the body of the valve will be relieved to a large extent from the abrading action of the outflowing metal, and its period of usefulness will thereby be considerably prolonged.

The head 5 is provided at its side edges with guide-flanges 11, formed at their lower ends with inwardly-extending stop-lugs 12. Slidably engaging these flanges is a valve-attaching device or clamp 13, comprising a yoke having its body portion 14 extending transversely across the head and its arms 15 projecting inwardly and formed with guide-recesses 16, engaging the flanges 11, and inwardly-extending flanges or extensions 17, which engage and ride upon the inner faces of the flanges 11, thus slidably connecting the yoke thereto, the downward movement of the yoke on the flanges 11 being limited by the stop-lugs 12. The space between the arms 15 of the yoke is sufficient to receive the gate 6, which is in the form of a plate adapted to fit closely against the seat-face of the head and to be adjusted and clamped in adjusted position by the yoke. This valve-plate is provided at its lower end with an outer rib or thickened portion 18, which serves as a bottom stop to hold the valve in engagement with the yoke and also as a reinforce to thicken the lower end of the valve to adapt it to more effectually sustain the wear thereon caused by the action of the outflowing metal

as the valve is being moved to its open position. Above the rib 18 the valve-plate is provided on its outer side with a series of holding-lugs 19, said lugs and ribs being spaced equidistantly apart to an extent sufficiently to receive the body portion of the yoke in the spaces between them. The said body portion of the yoke is formed with upper and lower inwardly-extending flanges 20, forming a chamber 21 to receive a bowed pressure-spring 22, having its ends arranged to bear against the outer surface of the gate and hold it seated against the seat-face of the head 5. The tension of this spring and its consequent pressure on the valve-plate may be regulated by a set-screw 22, carried by the yoke.

Owing to the fact that the lower end of the valve-plate contacts with the hardened wear-strip 9 and is also subjected to the abrading action of the outflowing metal at the outset in its opening movement, it will be readily understood that this portion of the valve is rapidly worn away, and it is necessary when sufficient wearing away has occurred to adjust the valve downward on the yoke to adapt its lower end to come when closed farther below the upper face of the wear-strip to obviate any liability of leakage from imperfect contact between the same. Thus when the lower end of the valve becomes worn upon detaching the valve and yoke from the head the valve may be slipped farther downward until the lower and middle lugs of the set of lugs 19 come below and above the respective upper and lower flanges 20 of the yoke to lock the plate thereto, so that when these parts are reapplied the valve when closed will seat downward to a further extent on the face of the head 5, thus maintaining a perfect closing contact with said face. In this manner the valve may be repeatedly adjusted to a variety of positions, according to the number of lugs used, so that it may be employed for a considerable period before it becomes necessary to discard the same and substitute a new valve-plate. In the initial application of the valve to the yoke the body of the yoke lies between the rib 18 and lower lug 19, thus connecting the valve with the yoke for adjustment to open and close the passage 4. To facilitate the adjustment of the yoke and valve, a suitable grip or handle 24 is applied to the body of the yoke.

In order to limit the upward movement of the valve and prevent possible disconnection of the same from the head 5, a stop-screw 25 is provided upon one of the flanges 11, with which the yoke 13 is adapted to contact when the valve is raised to its fully-open position. This screw may be detached when it is desired to remove the yoke and valve for the purpose of adjusting the latter to compensate for wear or to substitute a new valve therefor. The extension or prolongation 7 increases the length or depth of the seat-face of the head 5 to the necessary extent to compensate for the wide range of adjustability of the valve, as will be readily understood.

By the construction above described a valve is provided in which the portions most subject to wear are adapted to readily sustain the abrasive action of the outflowing metal for a comparatively long period and to be renewed or adjusted when occasion requires to render the valve-body susceptible of continued use, thus obviating the necessity of discarding the valve-body at the end of the ordinary period of use and adapting it to be employed for a much longer period before its discardure is necessary. A valve of this type will therefore render longer service and be less expensive of installation in the long run than valves of ordinary construction, an item of importance in this particular industry.

Having thus described the invention, what is claimed as new is—

1. In a valve of the character described, the combination of a valve-body provided with an outlet-passage and a seat-face, a valve-carrier slidably mounted upon the body, a valve adjustable upon the carrier in the plane of the seat-face to vary its seating action, and spring means upon the carrier to hold the valve in contact with the valve-body.

2. In a valve of the character described, the combination of a valve-body provided with an outlet-passage and a valve-seat, an adjustable valve-carrier, a valve adjustable upon the valve-carrier in the plane of the seat-face to vary its seating action, and spring means on the valve-carrier for holding the valve against the seat.

3. In a valve of the character described, the combination of a valve-body provided with a valve-seat an outlet-passage and guide members, a yoke slidably engaging said guide members, a gate carried by the yoke and provided with spaced projections to adjustably connect it therewith whereby said gate may be adjusted in the plane of the valve-seat, a bowed pressure-spring carried by the yoke to hold the valve in seating position, and means mounted upon the yoke for regulating the pressure of said spring.

4. In a valve of the character described, the combination of a valve-body provided with a valve-seat an outlet-passage and guide members, a yoke slidably engaging said guide members, provided with a chambered portion, a valve upon the yoke adjustable in the plane of said seat, a bowed pressure-spring within said chambered portion to engage and hold the valve in seating position, and means for regulating the pressure of said spring.

5. In a valve of the character described,

the combination of a valve-body provided with an outlet-passage and a seat-face, a yoke slidably mounted on the body, a valve proper adjustable upon the yoke in the plane of the seat-face, and spring means on the yoke for forcing the valve in engagement with the seat-face.

6. In a valve of the character described, the combination of a valve-body provided with an outlet-passage and guide members, a yoke slidably engaging said guide members, a gate carried by the yoke and provided with spaced projections to engage the yoke-body and adjustably connect it therewith, and a pressure-spring carried by the yoke to hold the valve in seating position.

7. In a valve of the character described, the combination of a valve-body provided with an outlet-passage and guide members, a yoke slidably engaging said guide members, a gate carried by the yoke and provided with spaced projections to engage the yoke-body and adjustably connect it therewith, a pressure-spring carried by the yoke to hold the valve in seating position, and means for regulating the pressure of said spring.

8. In a valve of the character described, the combination of a valve-body provided with an outlet-passage and a seat-face, a valve-carrier adjustably mounted upon the body to move in alinement with said seat-face, a valve proper adjustably mounted upon the carrier in the plane of the seat-face to vary its seating action, and spring means on the carrier for holding the valve in engagement with the seat-face.

9. In a valve of the character described, a valve-body having an outlet and a seat-face, a carrier mounted thereon for movement in the plane of the seat-face, a valve proper adjustable on said carrier in the plane of the seat-face, and means on the carrier for holding the valve proper in seating position.

10. In a valve of the character described, a valve-body provided at its outlet end with a thickened bottom wall formed with a segmental recess communicating with the bore of the body and having shoulders at the ends thereof, a segmental wear-piece fitting in said recess and lying flush with the wall of the bore, and a fastening-screw carried by the body and impinging against the wear-piece to hold the ends thereof clamped against said shoulders.

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

RUFUS E. BALL.

Witnesses:

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THOS. E. WILSON.