D. F. LEPLEY.

VALVE SEAT FOR MINE PUMPING CONDUITS.

APPLICATION FILED APR. 27, 1916.

1,216,144. Patented Feb. 13, 1917.

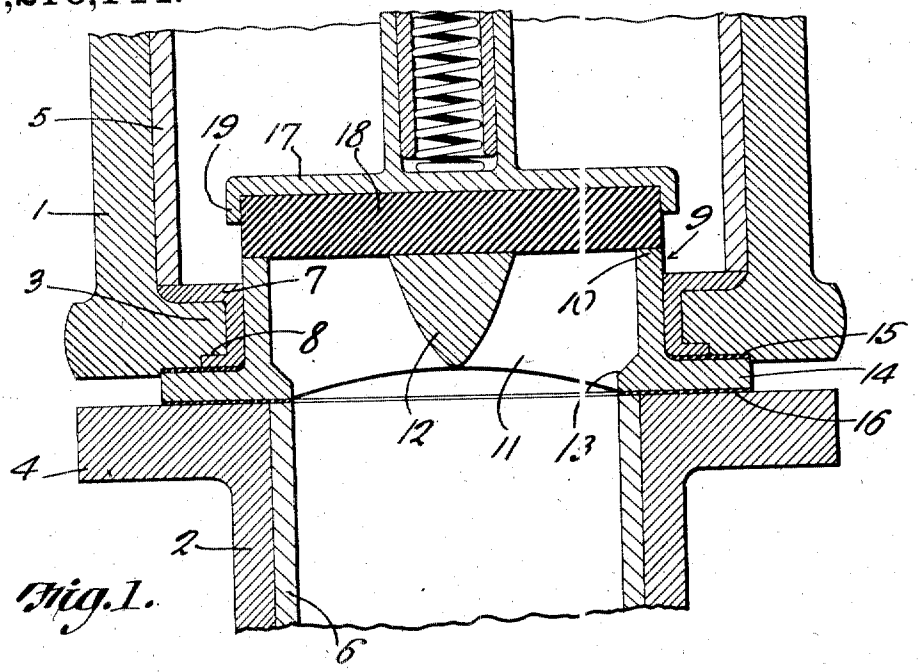
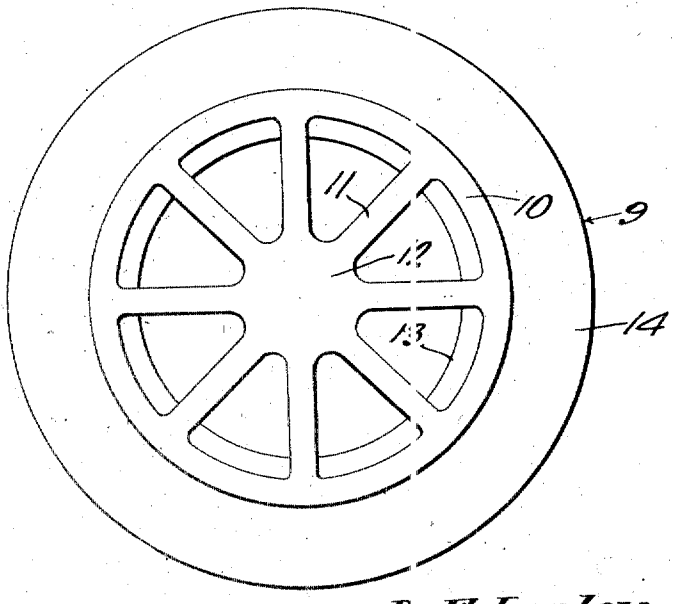


Fig. 1.

Fig. 2.



Witnesses

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VALVE-SEAT FOR MINE-PUMPING CONDUITS.

1,216,144. Specification of Letters Patent. Patented Feb. 13, 1917.

Application filed April 27, 1916. Serial No. 93,938.

To all whom it may concern:

Be it known that I, DANIEL F. LEPLEY, a citizen of the United States, residing at Connellsville, in the county of Fayette and State of Pennsylvania, have invented a new and useful Valve-Seat for Mine-Pumping Conduits, of which the following is a specification.

The present invention appertains generally to valve structures, and relates more particularly to a valve seat for use in the pumping conduit or barrel of a mine pump.

Heretofore, bronze valve seats have been used in mine pumping conduits, but it has been found very difficult to provide such bronze valve seats as to stand the service, especially in certain localities, due to the presence of acids and other matter in the water pumped from the mine, which attack ordinary bronze valve seats, producing rough edges or surfaces which cut the face of the rubber valve. The valve thus becomes ineffective, and must be replaced, requiring considerable expense in the upkeep of the mine pump.

It is the object of this invention to provide a valve seat constructed of Babbitt metal or equivalent material, which is capable or withstanding or resisting the attacks of the water pumped from the mine, and which is so constructed and mounted in place on account of the use of the Babbitt metal, as to resist the pressure given to bear thereon by the valve and head of water above it and to eliminate a shearing strain on the valve seat. By reason of the fact that Babbitt metal is used for the formation of the valve seat, it has been found necessary to so design the valve seat or grid as to resist the heavy pressure imposed upon it, and to provide means for properly supporting the valve seat in order to prevent the displacement or injury thereof.

Babbitt metal is chosen in preference to any other for the construction of the valve seat, since it has been found that no kind of sulfur water, such as pumped from mines, has the slightest effect on Babbitt metal, so far as deterioration of the seat is concerned, and a Babbitt metal valve seat will last for an indefinite period without showing appreciable wear.

It is also the object of the invention to provide a device of the nature indicated which is of simple and inexpensive construction, which can be readily applied to mine conduits or pumping barrels, and which will serve its office in a thoroughly satisfactory and practical manner.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawing, wherein:—

Figure 1 is a vertical diametrical section through the valve seat and accompanying parts.

Fig. 2 is a plan view of the improved valve seat.

In Fig. 1 there is illustrated a fragmental portion of an upright pumping conduit or barrel, such as used in a mine, embodying the sections 1 and 2. The lower end of the section 1 is provided with an inturned flange or lip 3, and the upper end of the lower section 2 is provided with an outturned flange 4. In carrying out the present invention, the section 2 is made of smaller diameter than is ordinarily the case, whereby the valve seat hereinafter referred to is properly supported. The sections 1 and 2 are provided with wood or equivalent linings 5 and 6 to protect the cast iron or equivalent material from which said sections are formed, which is common practice.

The lip 3 is protected by a lead or equivalent liner 7 which overlaps the top of the lip 3 and fits under the lining 5 to prevent the water from reaching the upper surface of the lip 3 or the inner surface of the section 1 behind the lining 5. The liner 7 overlaps the inner edge of the lip 3, and its lower edge is fitted within a rabbet 8 with which the lower surface of the lip 3 is provided. The liner 7 in incasing the lip 3 will prevent the water from reaching it.

The valve seat, or what is known in the art as a "grid" is designated generally by the numeral 9, and is constructed of Babbitt metal. This valve seat embodies an upright ring 10 fitted snugly within the liner 7, and a spider 11 integral with said ring 10, the upper edges of the arms of the spider being flush with the upper edge of the ring 10 to provide the face of the valve

seat. The spider 11 has an inverted conoidal hub 12 which does not impair the upward flow of the water through the openings between the arms of the spider. The ring 10 is provided at its lower edge with an inturned annular lip 13 flush with the lower edge of the ring to rest upon the upper end of the lining 6, the internal diameter of the section 2 being practically the same as the internal diameter of the ring 10, whereby said ring will be upheld or supported by the section 2, in order that the valve seat will be held firmly in place to resist the heavy pressure imposed upon it, and the lip 13 in overlapping the upper end of the lining 6 will assist in protecting it from the water. The upper edge of the ring 10 projects above the liner 7, and the ring 10 is provided flush with its lower edge with an outstanding annular flange 14 sandwiched between the lip 3 and flange 4, whereby to clamp said flange of the valve seat between the sections of the conduit or barrel. The valve seat is thus clamped in place, and the spider 11 serves to uphold the valve seat to prevent it being crushed or distorted due to the water pressure above it.

A rubber or equivalent gasket 15 is disposed between the upper surface of the flange 14 and the lower edge portion of the liner 7 and lower face of the lip 3, to protect the parts and to provide a tight closure or seal, and a similar gasket 16 is disposed between the lower surface of the flange 14 and the upper surface of the flange 4 and upper end of the lining 6, to provide a tight joint, and to prevent the water from passing over and behind the upper end of the lining 6.

The valve 18, which is of disk-shape, is composed of rubber or equivalent material and is seatable upon the valve seat or grid 9, said valve 18 being secured to the lower surface of a disk 17 which has a marginal depending flange 19 overlapping the periphery of the valve.

The present structure has actually been used with extraordinary success, working entirely satisfactory under water heads up to 600 to 700 feet perpendicular. The structure is practically acid proof, and gives highly efficient and satisfactory service.

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

1. A valve seat for mine pumping conduits constructed of Babbitt metal or equivalent material and comprising a ring having a spider therein and a lower outturned flange.

2. A valve seat for mine pumping conduits constructed of Babbitt metal or equivalent material and comprising a ring having a spider therein, a lower outturned flange and a lower inturned lip.

3. In a structure of the character described, the combination with the upper and lower sections of a mine pumping conduit and linings for said sections, of a valve seat constructed of Babbitt metal or equivalent material supported by the lower section and having a spider therein and a lower outturned flange clamped between said sections, and a valve seatable upon said seat, said seat being supported by the lower section and having a portion overlapping the lining thereof.

4. In a structure of the character described, the combination of upper and lower sections of a mine pumping conduit, linings for said sections, a valve seat constructed of Babbitt metal or equivalent material embodying a ring having a spider therein, a lower outturned flange clamped between said sections and a lower inturned lip overlapping the upper end of the lining of the lower section, the internal diameter of the lower section being practically the same as that of said ring, whereby said ring is supported firmly by said lower section, and a valve seatable upon said seat within the upper section.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

DANIEL F. LEPLEY.

Witnesses:
EDITH HARRIS,
R. S. MATTHEWS.