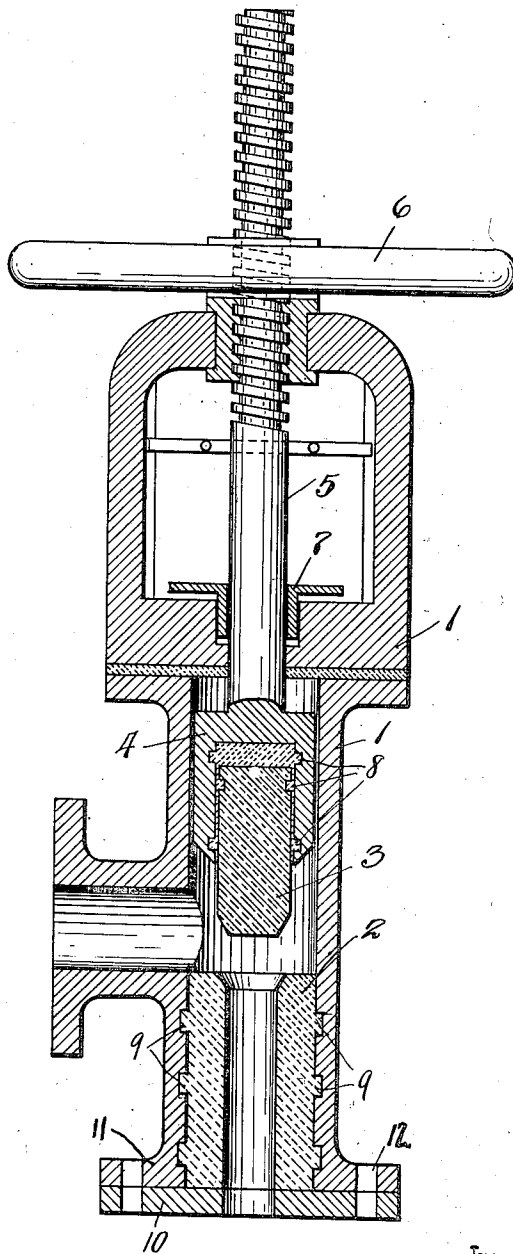


R. T. EVANS & W. G. NORD.
ACID VALVE.

APPLICATION FILED OCT. 19, 1911.

1,057,717.

Patented Apr. 1, 1913.



WITNESSES:

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ROBERT T. EVANS AND WALTER G. NORD, OF YOUNGSTOWN, OHIO.

ACID-VALVE.

1,057,717.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed October 19, 1911. Serial No. 655,597.

To all whom it may concern:

Be it known that we, ROBERT T. EVANS and WALTER G. NORD, citizens of the United States, and residents of Youngstown, county of Mahoning, State of Ohio, have jointly invented a new and useful Improvement in Acid-Valves; of which the following is a specification, the principle of the invention being herein explained and the best mode in which we have contemplated applying that principle, so as to distinguish it from other inventions.

Our invention relates to valve mechanism of the type used in handling chemicals, such as strong acids, which cause a rapid corrosion of the usual metals employed in the ordinary valve mechanism.

To the accomplishment of these and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying our invention, such disclosed means constituting, however, but one of the various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—the figure is a central longitudinal section through our improved valve mechanism illustrating the construction and arrangement of parts.

In the figure the valve casing 1 is shown having three chambers, in one of which is disposed a valve seat 2 and in another a stopper 3 for closing said seat, the third chamber being the inlet chamber.

The stopper is held in a cup-like terminal 4 of the reciprocating member 5 which is mounted in the valve casing and is threaded at the upper end, adapting it to be reciprocated by a hand-wheel 6. To prevent the introduction of acid into the upper part of the casing in which it would attack the threading on the reciprocable member, we place a washer 7 around the same in the casing, thereby preventing any such action. The valve seat 2 will be formed of any suitable acid resisting soft metal, such as lead. The lead seat is held firmly in place in the casing by means of grooves 9 which are cut in the sides of the casing. The lead enters the same, providing a simple and effective means for holding the seat in place. The stopper 3 will be made of porcelain, glass, or other acid resisting material and will be held in the cup 4 by means of lead or other suitable

material which is poured into the cup-like member around the stopper 3. Grooves 8 on the inner face of the cup-shaped member and the outer face of the stopper will be filled with the lead, and the stopper will thus be held firmly in the cup-shaped member. The latter will necessarily be made of an ordinary metal, and may be coated with paraffin or like preparation, which will prevent any corroding action by the acid. In like manner that part of the member 5 which enters the valve chamber proper will be coated with paraffin to prevent the action of the acid.

The stopper of porcelain or glass will, of course, be considerably harder than the lead of the seat, and the grinding action of the stopper in seating will tend to keep the seat true, thus preventing any leakage due to the slight action of the acid on the lead.

The seat will be of a considerable length extending for the whole length of one of the chambers of the casing, and the stopper is so mounted in the second of these chambers that it may be reciprocated a distance equal to the length of this seat, thus permitting of the engagement of the seat by the stopper at all times irrespective of the wear on the seat. In this way the valve is adapted to last a long time, since it can close at all times until the seat is worn for its whole length. The grinding action of the stopper in seating will of course, always keep the closure tight. As the seat wears away and the stopper follows down the seat, it will be evident that the cup-like terminal 4 of the reciprocating member will also contact the seat, and that further wear of the seat can only take place if the stopper and the cup-like terminal together are adapted to wear away the seat. The material of which the cup is constructed is adapted to wear away the seat as well as the stopper 3. In this way the stopper is adapted to seat the whole length of the seat.

The valve casing is formed with an outwardly extending flange 11. We use a companion flange 10 which extends inwardly and is of the same inside diameter as the lead seat. This prevents the lead from slipping down and is attached to the flange 11 by bolts inserted in the apertures 12 in said two flanges.

We are aware that various valves have been constructed to be used with acids, but they have generally been made with a lead

seat and a lead stopper which will obviously not give the results which are claimed for our construction.

The advantage of always having a tight closure, obtained by having a very deep seat which is being constantly ground by the action of the stopper will be apparent.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

We therefore particularly point out and distinctly claim as our invention:—

1. An acid valve, comprising a seat of soft acid-resisting material, a reciprocally mounted member adapted to be reciprocated a distance substantially equal to the depth of said seat, and an acid-resisting stopper harder than said seat, whereby said soft seat is kept true by the grinding action of said harder stopper in seating, said stopper being reciprocated to adapt it to the wearing away of said seat, thereby utilizing substantially the whole of the same.

2. In a valve casing having a plurality of chambers, the combination of a seat of acid-resisting material extending substan-

tially the whole length of one of said chambers; a reciprocally mounted member adapted to contact said seat irrespective of the wear of the same, whereby said valve may be closed until said seat is substantially destroyed; and an acid-resisting stopper harder than said seat attached to said member.

3. In a valve casing having a plurality of chambers, one of said chambers having internal grooves in the walls thereof, the combination of a seat of soft acid-resisting material extending the whole length of said grooved chamber, such material filling said grooves, thereby securely retaining said seat in place, a member reciprocally mounted in another of said chambers; and a porcelain stopper attached to said member and adapted to contact said seat irrespective of the wear of the same, whereby said valve may be closed until said seat is substantially destroyed.

Signed by us this 16th day of October, 1911.

ROBERT T. EVANS.
WALTER G. NORD.

Attested by—

WM. HIRT,
W. H. WILSON.