

C. E. HUXLEY.
VALVE.

APPLICATION FILED SEPT. 17, 1904.

Fig. 1

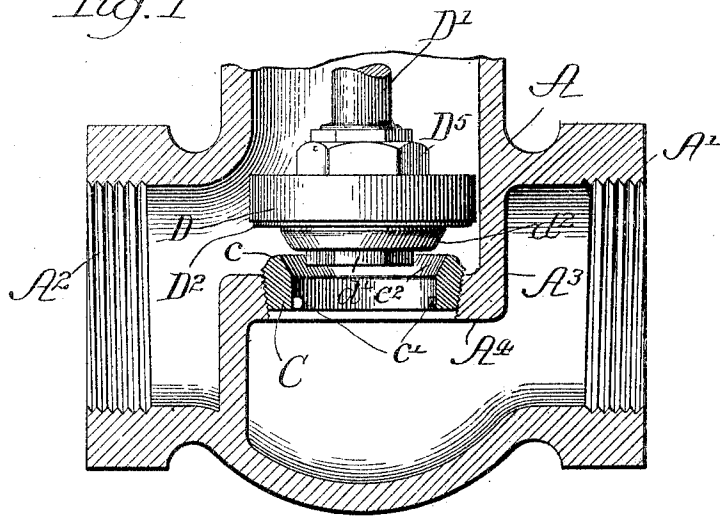


Fig. 2

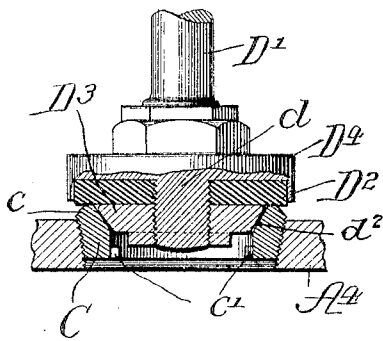


Fig. 3

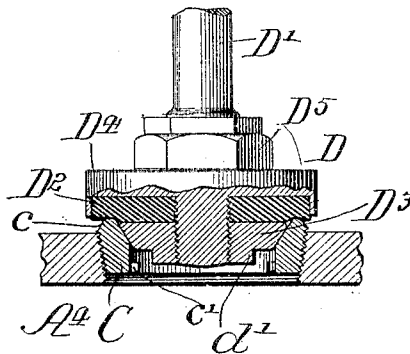
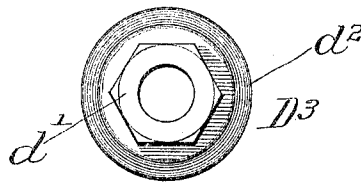


Fig. 4



Witnesses
B. G. Barnett
W. Hall.

Inventor:
Charles E. Huxley
by Roder Brown
his Attys.

UNITED STATES PATENT OFFICE.

CHARLES E. HUXLEY, OF CHICAGO, ILLINOIS.

VALVE.

No. 802,642.

Specification of Letters Patent.

Patented Oct. 24, 1905.

Application filed September 17, 1904. Serial No. 224,803.

To all whom it may concern:

Be it known that I, CHARLES E. HUXLEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in valves of that class in which the seat is formed on a ring which is removably fitted in an opening in the bridge or other part of the valve-casing; and the invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a fragmentary detail sectional view taken axially through the valve-seat, showing my invention applied thereto. Fig. 2 is a sectional view taken through the valve-seat and closure, showing the closure in its preliminarily-closed position. Fig. 3 is a view similar to Fig. 2, showing the valve completely closed. Fig. 4 is a bottom plan view of the nut which constitutes the means for clamping the yielding part of the closure in place and also forms part of a metal joint-valve closure, as well as a stop for the closing movement of the closure.

As shown in the drawings, A designates a valve-casing provided with branches A' A², adapted for connection with the fluid-conveying pipes, and between the branches with an angular partition A³. In the horizontal part or bridge A⁴ is formed an opening to receive a valve-seat ring C, the upper margin c of which constitutes in this instance the valve-seat. Said seat-ring is held in said opening by means of exterior screw-threads on the ring engaging the interior screw-threads of the opening in the bridge. In the present instance said seat-ring is tapered, being made widest at its upper end to correspond with the complemental taper of the opening in the bridge.

D designates as a whole a valve-disk or closure which is movable toward or from the valve-seat to open the valve. Said valve-closure is formed on or attached to the lower end of a rotative stem D', which in the complete structure has screw-threaded engagement with the casing, whereby rotation

thereof imparts endwise movement to the stem and closure to move the latter toward and from the seat. Said ring is provided on its interior surface, as herein shown, with projections c', adapted for engagement by a suitable tool, by means of which the seat-ring is turned into and out of place. The closure D embraces a flat disk D¹, which is provided in its under face with an annular opening to receive a yielding disk-like member or packing D², which latter extends below the level of the lowermost part of the disk and being therefore adapted to be first seated on the marginal or seat portion c of the valve-seat ring to close the valve. The said disk D¹ and packing or yielding member of the closure are fastened to the stem by being centrally apertured and fitted over the screw-threaded stud d, which extends axially downwardly from the closure or disk, said parts being clamped in place between a nut D³, having screw-threaded engagement with said stud d, and a nut or shoulder D⁵, fixed to the stem above the disk D¹. Said nut D³ is provided with a polygonal lower end d', by which it may be engaged with a suitable tool, as a wrench, for clamping the same upon the yielding packing portion D² of the closure. Said nut is provided with an annular exteriorly-tapered portion d² above the polygonal part d' thereof, which is adapted to pass into and engage a complemental interior tapered portion c² of the valve-seat ring. The larger or upper end of said nut D³ is made of greater external diameter than the smallest internal diameter of the ring C, so that should said nut become loosened or detached from the lower end of the valve-stem d it cannot fall through the ring and into that part of the casing connected with the branch A' thereof.

In the use of the valve when the valve-closure is first turned down against its seat the yielding packing D² first strikes the upper margin or seat portion c of the annular ring C, and said yielding portion is made of such composition that a reasonably-tight fluid-tight joint may be formed between said parts suitable for low-pressure liquids. If, however, the closure be turned farther down on its seat, the annular tapered portion d² of the closure strikes against the metallic interior annular tapered portion c² of the seat-ring and constitutes a stop which not only prevents the upper margin or seat c of said seat-ring forcing the yielding portion of the closure out of position, but also constitutes a

metallic joint the presence of which, in connection with the joint formed between the upper margin of the seat-ring and the yielding portion of the closure, constitutes a fluid-tight joint between said parts adapted to high-pressure work.

In the use of valves of this character where the closure is designed to or by reason of its structure does move toward the annular seat-ring without a positive stop between seat and closure the yielding part of the closure becomes distorted, so that after a short time the joint between said parts is fatally impaired. Such turning down of the valve-closure against the valve-seat often occurs by reason of a careless use of the valve or use thereof by an inexperienced person. With my construction, on the other hand, the valve-closure may be turned downwardly sufficiently against the seat-ring to provide a necessary fluid or steam tight joint between said parts, and before the force or pressure of the closure against said annular seat of the seat-ring is sufficient to distort said yielding part of the closure the annular tapered face of the nut D^3 , constituting a part of the closure, comes into contact with the interior annular tapered part c^2 of said seat-ring, and thereby not only prevents further descent of the valve-closure, and thus avoiding distortion of the valve-packing, but also the forcing together of said tapered parts of the nut and seat-ring constitutes an additional metallic joint or closure which produces a reliable closure for high-pressure work. It is to be observed that the metallic part of the disk D^4 or the annular flange or rim d^3 , constituting a retaining-flange for the packing D^2 , is of such diameter as to prevent said rim from coming into contact with the seat-ring.

The construction described constitutes a very reliable fluid-tight closure for valves which may, if intelligently used, be used both for low and high pressure work and the construction of which prevents a careless use of the valve from distorting or impairing the same.

A further important advantage of the construction before referred to is the impossibility of clamping-nut falling through the seat-ring should said nut become accidentally detached. It will be observed as an economical feature of the construction that the clamping-nut itself constitutes part of the closure for high-pressure work and a prevention against impairment of the yielding part of the closure.

It is obvious that structural changes may be made in the valve without departing from the spirit of the invention, and I do not wish to be limited to such specific details except as hereinafter made the subject of specific claims.

I claim as my invention—

1. In a valve, a seat-ring and a closure

movable toward and from the seat-ring, said closure embracing a relative soft face adapted to engage a seat on said ring, and a nut made of a harder material for clamping said softer part of the closure in place and formed to constitute a stop to prevent the closure being turned down upon its seat in a manner to distort said softer part of the closure.

2. In a valve, a seat-ring having an annular marginal seat and within the latter a tapered annular seat and a closure embracing a relative soft face adapted to engage said marginal seat on said ring, and a nut made of a harder material for clamping said softer part of the closure in place and formed to constitute a stop to prevent the closure being turned down upon its seat in a manner to distort said softer part of the closure, and also formed to constitute a tapered closure located in advance of said softer part and adapted to engage said annular tapered seat of said seat-ring.

3. In a valve, an annular seat-ring on which is formed an annular seat and a closure movable toward and from the seat, said closure embracing a relatively soft face adapted to engage the seat and a nut for clamping said face of the closure in place and made of an external diameter greater than the internal diameter of said seat-ring.

4. The combination with a valve-casing provided with an opening in a part located between the induction and eduction ports thereof, and a valve-closure movable toward and from said opening, of a valve-seat ring in said opening, the upper margin of which constitutes the valve-seat, said closure being provided on its lower face with a yielding face adapted for engagement with the annular ring and with an axial screw-threaded stud, and a nut engaging said stud for clamping the yielding part of the closure in place and being made of such size as to prevent its passing through the seat-ring.

5. The combination with a valve-casing provided with an opening in a part located between the induction and eduction ports thereof, and a valve-closure movable toward and from said opening, of a valve-seat ring in said opening, the upper margin of which constitutes the valve-seat, and provided inside said valve-seat with a tapered, annular valve-seat, said closure being provided on its lower face with a yielding part adapted for engagement with the marginal seat, and below the yielding part with an exteriorly-tapered rigid part which is adapted to engage the complementally-tapered seat in the valve-seat ring, said parts being so arranged or related that the yielding part of the closure first strikes the margin of the seat-ring and thereafter said tapered portion of the closure engages the interiorly-tapered portion of the valve-seat ring.

6. The combination with a valve-casing,

provided with an opening located in the part between the induction and eduction ports of the valve, and a valve-closure movable toward and from said opening, of a seat-ring 5 fitted in said opening, the upper margin of which constitutes the valve-seat, and provided inside of said valve-seat with an inwardly and downwardly tapered annular portion constituting a second seat, said closure 10 comprising a disk provided on its lower face with an annular recess, a yielding packing-ring in said recess, a screw-threaded stud extending downwardly from said closure, and a nut having screw-threaded en- 15 gagement with said stud for holding the packing in place and provided with an exteriorly-tapered portion in advance of the packing adapted to engage the interiorly-tapered portion of the seat-ring, after said 20 packing of the closure engages the marginal seat portion of said ring.

7. The combination with a valve-casing provided with an opening in the part between the induction and eduction ports of 25 the valve, and a valve-closure movable toward and from the opening, of a ring seated in said opening, the upper margin of which constitutes the seat, said closure comprising an annular yielding part adapted for engage-

ment with the margin of the seat-ring and a 30 nut of greater diameter than the bore of said ring for holding said yielding part in place and adapted to engage the seat-ring radially inside of said seat to constitute a final stop for said closure.

8. The combination with a valve-casing 35 provided with an opening in the part between the induction and eduction ports of the valve, and a valve-closure movable toward and from the opening, of a ring seated 40 in said opening, the upper margin of which constitutes the seat, said closure comprising an annular yielding part adapted for engagement with the margin of the seat-ring and a 45 nut for holding said yielding part in place and adapted to engage the seat-ring to constitute a final stop for said closure, said nut being made of such diameter as to prevent its falling through the seat-ring.

In testimony that I claim the foregoing as 50 my invention I affix my signature, in presence of two witnesses, this 12th day of September, A. D. 1904.

CHARLES E. HUXLEY.

Witnesses:

W. L. HALL,
D. E. MARMON.