

H. W. MASSEY.
CHECK VALVE.
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1,077,415.

Patented Nov. 4, 1913.

Fig 2

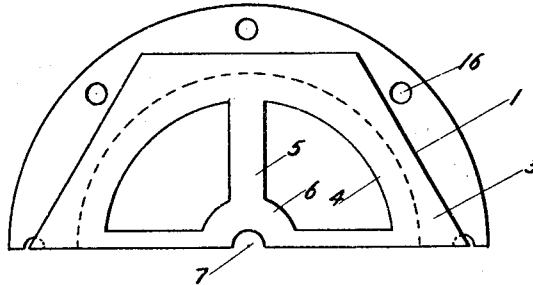


Fig 1

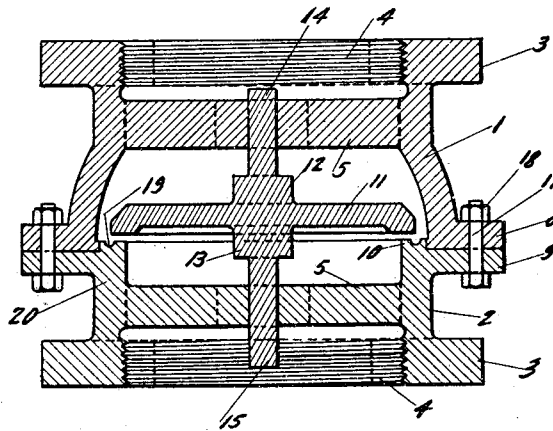
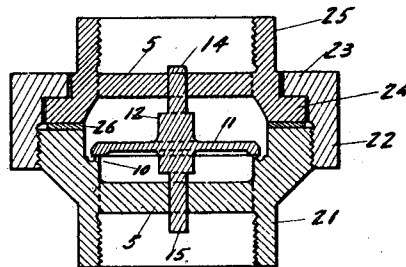


Fig 3



WITNESSES:

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CHECK-VALVE.

1,077,415.

Specification of Letters Patent.

Patented Nov. 4, 1913.

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To all whom it may concern:

Be it known that I, HARRY W. MASSEY, a citizen of the United States of America, residing at Bessemer, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Check-Valves, of which the following is a specification.

My invention relates to an improvement in check valve-fittings and has for its object to provide a check valve so arranged and designed that it will operate equally well in all positions and will not become stuck, and that has its life materially prolonged by reason of the fact that the valve seat can be continually cut down without weakening the casing or causing any tendency on the part of the valve to stick as its seat wears.

A further object of my invention is to design the valve fitting so that its casing parts can be readily and independently connected and disconnected from the pipe line, and which are so connected together as to permit the pipe line to be adjusted or tightened up by merely loosening up the connections between the sections of the valve casing without detaching same. I prefer to use a union coupling for the smaller valve fittings such as can be readily handled by the average wrench, but for larger fittings I prefer to use a circular ground seat joint with detachable bolt connections which permit the casing sections to be relatively adjusted and quickly connected in different adjusted positions.

Another important feature of my invention resides in the means utilized to prevent the valve sticking, which consists in providing the valve with a flat seat surrounded by a channel or groove so as to be overhung by the outer edge of the valve face, thus preventing the formation of a taper in the valve seat which is likely to cause the valve to stick or hang. I provide the casing with sufficient stock to enable the seat to be machined down to increase the life of the fitting, the groove or channel being maintained.

My improved valve proper comprises an integral structure formed with oppositely disposed central projections on its top and bottom faces which cooperate with spiders, carried by each casing sections, to guide and stop the valve.

A further important feature of my invention consists in providing the disk valve with

a raised flattened valve face so that in machining the valve it can be cut down without weakening the valve, the additional stock provided for this purpose greatly increasing the life of the valve and the number of times it can be machined down.

A further feature is the material strengthening of the dish-shaped disk valve by giving an increased amount of stock in the hubs from which the guide stems are turned down.

A further advantage in connection with the flanged type of two-part valve casing consists in forming the seat in a raised annular flange to give additional stock in the valve seat and to leave around it a positioning groove for the other section of the casing to maintain casing sections accurately centered without respect to the other means of connecting same.

As illustrative of the preferred embodiments of my invention, reference is made to the accompanying drawings, in which:—

Figure 1 is a vertical sectional elevation through my improved check valve fitting. Fig. 2 is a half plan view of Fig. 1, and Fig. 3 is a vertical sectional view through the smaller style of fitting in which the casing sections are joined by a union coupling.

Similar reference numerals refer to similar parts throughout the drawings.

As illustrated in Fig. 1, the valve casing comprises two sections 1 and 2, each having at its end an octagonal nut 3 surrounding a threaded opening 4 into which the pipe is adapted to be screwed. Each section is also provided with a spider 5 which is preferably cast integral with the casing section and is provided with a central hub portion 6 through which I bore guide openings 7 that are disposed in alinement. The casing section 1 is provided with a flange 8 and the section 2 with a seat 9 to receive the flange 8. The meeting surfaces 8 and 9 are annular and are machined to give a smooth fit. Section 2 is provided with an annular valve seat 10 over the outer edge of which the section 1 makes a close turning fit. The seat 10 is disposed in the casing and is adapted to receive the check valve 11, which is shown in the form of a circular disk valve provided above and below with integral projections having off-set shoulders 12 and 13 and cylindrical guide extensions 14 and 15, which latter make a close sliding fit in the openings 7, while

the shoulder 12 will engage the upper spider 5 and serve as a stop to limit the up travel of the valve.

The valve has a raised annular valve face 11^a surrounding its periphery, the raising of the valve face giving additional stock in the valve to permit the face to be machined down to a considerable extent without weakening the valve. Further, the shoulders 12 and 13 so effectively reinforce the disk valve as to prevent any uneven wearing of the face or any tendency of the face to become channeled by the flexing of the valve in action.

The flanges 8 and 9 of the casing sections are provided with a series of bolt holes 16 and the casing is adapted to be joined together by threaded bolts 17 and nuts 18. The seat 10 is provided with an annular groove 19 in its face so positioned as to be overhung by the outer edge of the flat valve face of valve 11, and it will be noted that the groove is set in from the outer edge of the seat and wall 20 of section 2 which is given ample stock to permit the seat to be turned down until it comes to a level with the spider 5 without affecting the operation of the valve, or weakening the casing. In turning down the seat the groove 19 is maintained to give the off-set flat valve seat and the manner of operation of the valve is unchanged, and in like manner the off-set valve face may be turned down to a considerable extent without weakening the valve, so that the life of the fitting is very materially increased. The length of the guide 14 is sufficient to provide for this change in position of the seat as it is turned down. The shoulder 13 may be turned down when necessary to permit the valve to properly engage its lowered seat.

In Fig. 3, I show the valve 11 disposed in a casing formed by a fitting section 21 externally threaded and in threaded engagement with a union coupling 22 which is flanged at 23 to engage a flange 24 on the casing section 25. Suitable packing 26 is interposed between the meeting faces of the sections 21 and 25, which are thus adjustably coupled by a union instead of the bolt connections shown in Fig. 1.

In practice the valve is inserted between sections 1 and 2 which are then screwed onto the threaded ends of the pipe line and are turned until their bolt holes 16 are brought into register, when the sections are joined together by the bolts 17, the casing section 1 being accurately centered by its close fit around the shoulder 10 which carries the valve seat. When it is desired to tighten up the pipe line the bolts are removed and either or both sections of the pipe line may be tightened up until the bolt holes in sections 1 and 2 again register, thus avoiding taking off the valve casing

and permitting either section of the valve casing to be unscrewed, tightened or replaced independently of the other. The same advantages of operation may be obtained from the use of the union coupling, as seen in Fig. 3.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a check valve-fitting, in combination, a sectional casing having as an integral part thereof an internally offset shoulder which has its upper face machined to form a flat valve seat and a surrounding annular groove, said shoulder comprising additional stock which can be cut away to lower the seat and groove without weakening the valve casing, a disk shaped check valve which is peripherally enlarged to form a flat valve face which overhangs said groove and has additional stock which can be cut away to lower the valve face without weakening the valve, and means to guide said valve on both sides of its face, substantially as described.

2. A check valve-fitting comprising a casing divided into sections on a transverse intermediate plane, each section having a guide for the check valve, and one section having an integral enlargement forming a valve seat which is purposely given extra size to permit it to be machined down without weakening it or the casing section, the exposed end face of said seat being machined to form a raised flat valve seat surrounded by a channel or groove, means to detachably connect the casing sections together, a check valve mounted on said casing and having guide stems which work in said guides, said valve having its periphery purposely thickened to give additional stock for its valve face which can be machined down without weakening the valve, and said valve having a flat valve face adapted to engage said raised valve seat and overhang said channel or groove.

3. A check valve-fitting comprising two casing sections, means to connect said sections, a spider in each section having central aligning openings, a disk disposed between said spiders and having a raised flat valve face and centrally disposed guide stems which work in said spider openings, and a seat for the valve carried by one of the sections and formed by an annular integral shoulder which makes a close turning fit in the other casing section to center the sections, said seat being formed of additional stock which is removable without weakening the casing and having about its inner marginal edge a flat surface forming a valve seat which is raised so that the outer edge of the face of the valve is free of engagement with the seat, when the valve is seated.

4. A check valve-fitting comprising two casing sections having machined annular flanges which engage, means to detachably

connect said flanges, a spider in each section
having central alining openings, a disk valve
disposed between said spiders and having
centrally disposed guide stems which work
5 in said spider openings, and a seat for the
valve carried by one of the sections and
formed by an annular shoulder which rises
above the machined surface of the flange on
its respective casing section and has its outer
10 side wall turned to make a close turning fit
in the other casing section to center the sec-
tions, said seat being formed of additional

stock which is removable without weakening
the casing and having a flat surface off-set
so the outer edge of the face of the valve 15
when seated is free of engagement with the
seat.

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

HARRY W. MASSEY.

Witnesses:

NOMIE WELSH,
R. D. JOHNSTON, Jr.