April 26, 1927.

1,626,549

A. N. MILLER

STANDING VALVE

Filed May 17. 1926

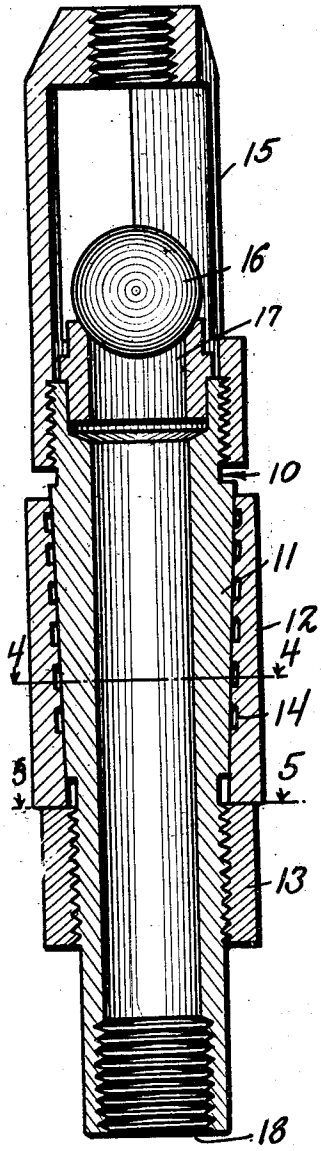


Fig. 1.

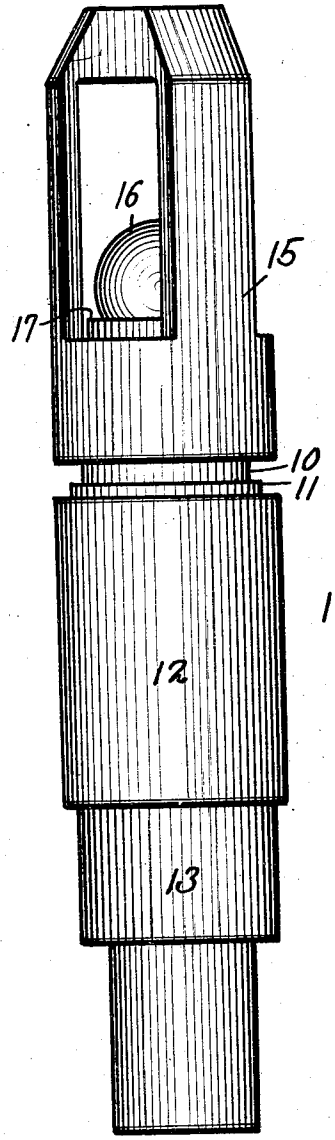


Fig. 2.

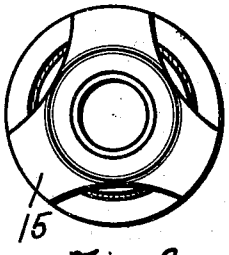


Fig. 3.

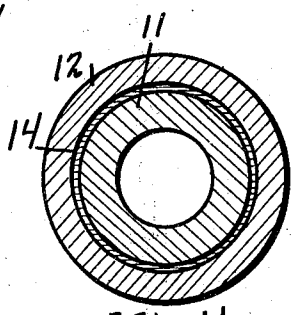


Fig. 4.

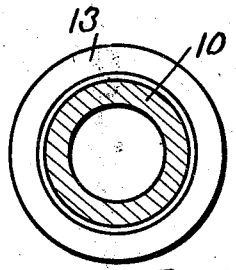


Fig. 5.

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UNITED STATES PATENT OFFICE.

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STANDING VALVE.

Application filed May 17, 1926. Serial No. 109,763.

This invention relates to certain new and useful improvements in standing valves for fluid pumps, and has more particular reference to an improved valve of this kind particularly serviceable for use in connection with the working barrels of oil well pumps and the like.

The standing valves of oil pumps, now in common use, embody tubular bodies or inlet members having valve seats upon their upper ends as well as having check valve cages attached to their upper ends within which the check valve members, engageable with said seats, are movable and retained. These standing valves are inserted in the bottoms of the working barrels and in order to secure a proper and fluid tight fit of each standing valve in the barrel, the tubular body of the valve is provided with a fixed external packing of leather or the like normally of a size somewhat greater than that of the opening in which the valve is to be fitted. This old form of standing valve is forced into place with a consequent mutilation of the external packing, and it is an extremely hard matter to obtain a proper joint between the valve and the barrel, or to prevent ultimate dislodgment of the standing valve from the barrel. This common construction also is open to the objection that, after extensive use, the packing greatly deteriorates so that the joint between the valve and the barrel is not effective and the accidental dislodgment of the standing valve from the barrel made more likely.

It is accordingly the primary object of the present invention to provide improved means for quickly and effectively securing a standing valve in the lower end of a working barrel of an oil well pump or the like, so as to overcome the above mentioned objections.

A more specific object of the invention is to provide a standing valve construction which may be readily properly positioned in the lower end of the working barrel and then adjusted to secure the proper joint between the valve and the barrel so that the valve is effectively secured in place against accidental dislodgment.

A further object is to provide for mounting of a standing valve in the working barrel of an oil well pump or the like through the use of an expansible metallic packing member which will not readily deteriorate in use.

Still another object is to provide a standing valve characterized as noted above and embracing extreme simplicity and durability of construction as well as efficiency in operation.

Other objects will become apparent as the nature of the invention is better understood, and the same consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawing and claimed.

In the drawing, wherein like reference characters indicate corresponding parts throughout the several views,

Figure 1 is a substantially central longitudinal sectional view of a standing valve constructed in accordance with the present invention;

Figure 2 is an elevational view thereof;

Figure 3 is a top plan view of the same;

Figure 4 is a horizontal section taken substantially upon line 4—4 of Figure 1; and

Figure 5 is a section taken upon line 5—5 of Figure 1.

Referring more in detail to the drawing, the embodiment of the invention illustrated includes a tubular open-ended body 10 formed with a portion 11 that is externally of frusto-conical or tapered form, and snugly fitted on this tapered portion of the body 10 is a continuous metallic packing ring or sleeve 12 of cylindrical external form and having a tapered bore slightly smaller than but otherwise corresponding to the taper of the portion 11, whereby, when the sleeve 12 is initially manually fitted onto the portion 11, an end portion of said sleeve 12 will project beyond the adjacent smaller end of the portion 11 of the body 10 as shown clearly in Figure 1. The packing ring or sleeve 12 is formed of comparatively soft metal, while the body 10 is formed of comparatively hard metal such as iron or steel, and it will thus be seen that when the sleeve is forced longitudinally of the body 10 toward the larger end of the tapered portion 11, such sleeve will be uniformly radially expanded into effective engagement with the wall of the opening in the lower end of the working barrel. The packing sleeve 12 may be constructed of lead or lead composition as well as any other suitable relatively soft metallic material, and its original external

diameter is such as to permit positioning of the same in the barrel opening without a great deal of effort although presenting only a slight clearance between the barrel opening and the packing sleeve so that only a very slight expansion of the packing sleeve is required for securing the standing valve effectively in place with a very effective fluid-tight joint presented. By securing the standing valve in place in this manner, accidental dislodgment of the same is rendered entirely unlikely, and as the metallic packing sleeve will not readily deteriorate after continued use, the standing valve will be effectively maintained in place for a long continued period of time.

As shown, the portion 11 tapers smaller in a downward direction, and the body 10 is formed with an externally threaded cylindrical lower portion directly beneath the tapered portion 11 upon which is adjustably threaded an adjusting collar 13 arranged to bear against the adjacent lower end of the packing sleeve 12 so that when said collar is adjusted in an upward direction, the packing sleeve 12 will be correspondingly adjusted for causing its expansion. In order to reduce to a great extent the friction between the contacting surfaces of the sleeve 12 and the tapered body portion 11, said sleeve 12 may be provided with a series of circumferentially extending internal annular grooves 14. By providing these grooves the packing sleeve 12 is somewhat weakened so as to facilitate its expansion as well as its longitudinal movement while being expanded. It is thus apparent that the present standing valve may be freely manually placed in proper position, and then quickly and easily secured in place in an effective manner so as to provide an efficient fluid-tight joint.

As is usual in this art, the body 10 has a valve cage 15 of conventional form detachably engaged with the upper end thereof, and loosely retained in this cage is a ball check valve member 16 arranged to normally seat under the influence of gravity upon a seat member 17 fitted to the upper end of the body 10 as shown. The seat member 17 is preferably of the renewable type, although it might be integrally or permanently formed on the body 10 if desired without departing from the spirit and scope of the present invention.

The lower end of the body 10 may be internally threaded as at 18 for connection with an anchor, strainer or the like as is well known in the art.

While the collar 13 is shown of external cylindrical form so as to be adapted to be actuated by the use of a pipe wrench or the like, it is obvious that the same may be made of polygonal external form for actuation by other forms of wrenches in the nature of a nut.

From the foregoing description it will be seen that I have provided a simple, durable and effective means for securing the standing valve in a pump barrel so as to overcome the many objections of common types of standing valves provided with a fixed external packing of leather or the like.

Minor changes may be made without departing from the spirit and scope of the invention as claimed.

What I claim as new is:—

1. A standing valve for fluid pumps comprising a tubular open ended body having a check valve member for controlling the passage of fluid therethrough and provided with a portion of external tapered form, and a metallic packing ring having a tapered bore and fitted on the tapered portion of the body whereby longitudinal movement of the packing ring relative to said tapered portion of the body will cause expansion of said packing ring into engagement with the surrounding wall of a working barrel opening, said packing ring comprising an endless sleeve of relatively soft metallic material having a series of circumferentially extending annular internal grooves for reducing friction between the packing ring and the tapered body portion and weakening the packing ring to facilitate its expansion.

2. A standing valve for fluid pumps comprising a tubular open ended body having a check valve member for controlling the passage of fluid therethrough and provided with a portion of external tapered form, and a metallic packing ring having a tapered bore and fitted on the tapered portion of the body whereby longitudinal movement of the packing ring relative to said tapered portion of the body will cause expansion of said packing ring into engagement with the surrounding wall of a working barrel opening, said packing ring comprising an endless sleeve of relatively soft metallic material having the inner face cut away to reduce friction between the packing ring and the tapered body portion and to materially weaken the packing ring to facilitate its expansion.

In testimony whereof I affix my signature.

ARTHUR N. MILLER.