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RECIPROCATING PLUNGER MECHANISM

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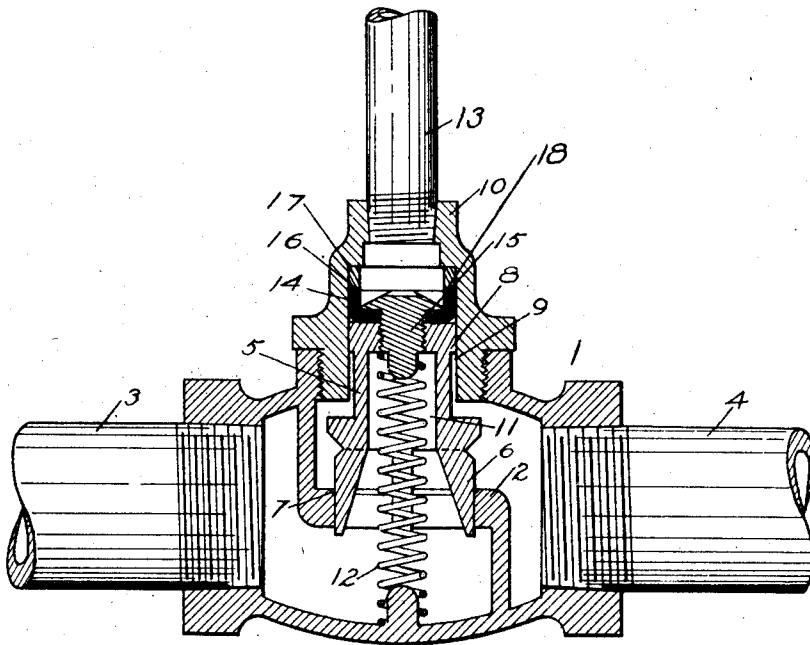


FIG. 1.

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RECIPROCATING-PLUNGER MECHANISM.

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This invention is designed to improve cup plungers. In many positions plungers are subjected intermittently to pressure and as the pressure is released from the cups the edges of the cups recede from the walls of the cylinder permitting the fluid under pressure to flow in between the walls of the cup and the walls of the cylinder, thus detracting from the efficiency of the cup. Some spreaders have been used operating on the walls of the cup but these are effective only where they exert considerable pressure, the critical point as to the sealing of the cup, namely the edge being unaffected by such spreaders. The present invention is designed to correct this difficulty and to provide a cup making a perfect seal preferably with little frictional resistance on the walls. Features and details of the invention will appear from the specification and claims.

The invention is illustrated in the accompanying drawings as follows:—

Fig. 1 shows a sectional view through an unloader valve having a controlling plunger provided with a cup.

In the construction shown in Fig. 1, 1 marks the body of the unloader valve, 2 the diaphragm, 3 and 4 pipes leading to the valve, 5 the unloader valve, 6 guide extensions on the valve, 7 a seat in the diaphragm on which the valve operates, 8 a plunger extending above the valve, and 9 a cylinder in which the plunger operates, the cylinder being arranged in a bonnet 10 of the valve.

The plunger and valve have the opening 11 in which a spring 12 is arranged, the spring tending to open the valve and force the plunger upwardly in the cylinder. The fluid is delivered to the cylinder through a pipe 13, this pipe being ordinarily connected with a pilot valve (not shown) designed to control the unloader valve by admitting and releasing fluid to and from the cylinder.

A cup 14 is secured to the top of the plunger 8 by means of screws 15. This cup has a

bevelled edge 16. A stop ring 17 is arranged in the upper end of the cylinder and has a bevelled lower edge 18. The ring 17 forms a stop against which the plunger is forced by the spring and the wedging engagement of the bevelled edges spreads the cup so that the cup is retained in sealing contact with the wall to the extreme edge of the cup. When pressure is delivered to the cylinder none of the fluid flows in between the cup and the wall and consequently the entire cup operates as a seal and is held in sealing engagement with the wall by the fluid pressure, the inner surfaces of the side walls of the cup being exposed to the fluid pressure. As the plunger returns the edge of the cup operating on the stop is locked in its spread relation as the pressure is relieved from the cylinder.

What I claim as new is:—

1. In a reciprocating plunger mechanism, the combination of a cylinder; a plunger in the cylinder comprising a flexible cup sealing the plunger with the walls of the cylinder, the inner surfaces of the side walls of the cup being exposed to pressure; means yieldingly moving the plunger in one direction; and a stop against which the cup is forced, said stop and edge having engaging surfaces wedging the wall of the cup against the wall of the cylinder.

2. In a reciprocating plunger mechanism, the combination of a cylinder; a plunger in the cylinder comprising a flexible cup sealing the plunger with the walls of the cylinder, the surfaces of the side walls of the cup being exposed to pressure; means yieldingly moving the plunger in one direction; and a stop against which the cup is forced, said stop and edge having bevelled engaging surfaces wedging the wall of the cup against the wall of the cylinder.

In testimony whereof I have hereunto set my hand.

RUDOLPH CONRADER.