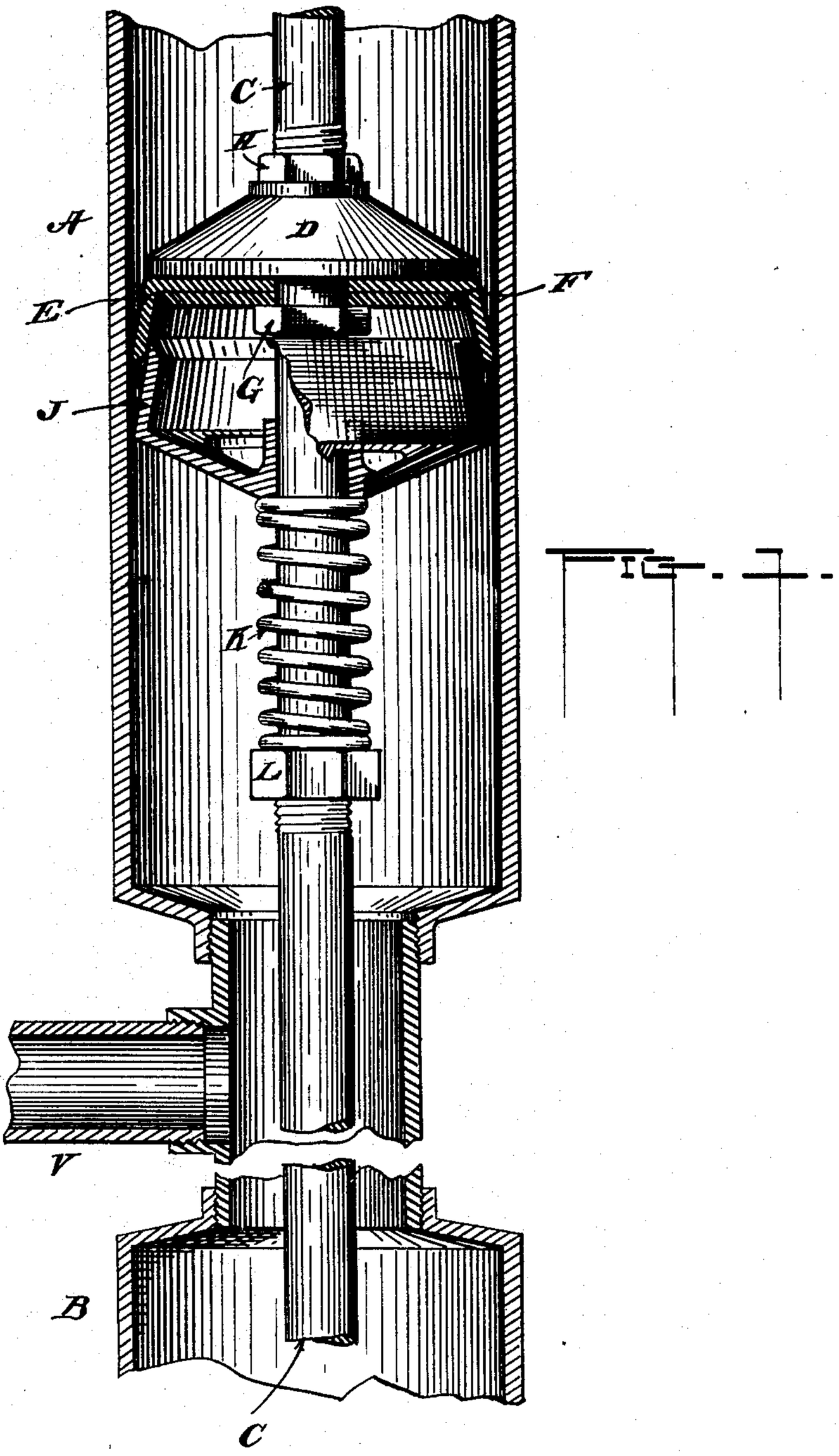
S. GAUTSCHE.

EXPANDING DEVICE FOR PUMP PISTONS.

APPLICATION FILED JAN. 17, 1906.

919,845. **Patented Apr. 27, 1909.**

2 SHEETS—SHEET 1.



Witnesses:
Mae Davis
E. J. Attwood

Inventor:
Samuel Gautsche,
By L. M. Thurlow,
Atty.

S. GAUTSCHE.

EXPANDING DEVICE FOR PUMP PISTONS.

APPLICATION FILED JAN. 17, 1906.

919,845. **Patented Apr. 27, 1909.**

2 SHEETS—SHEET 2.

FIG. 2.

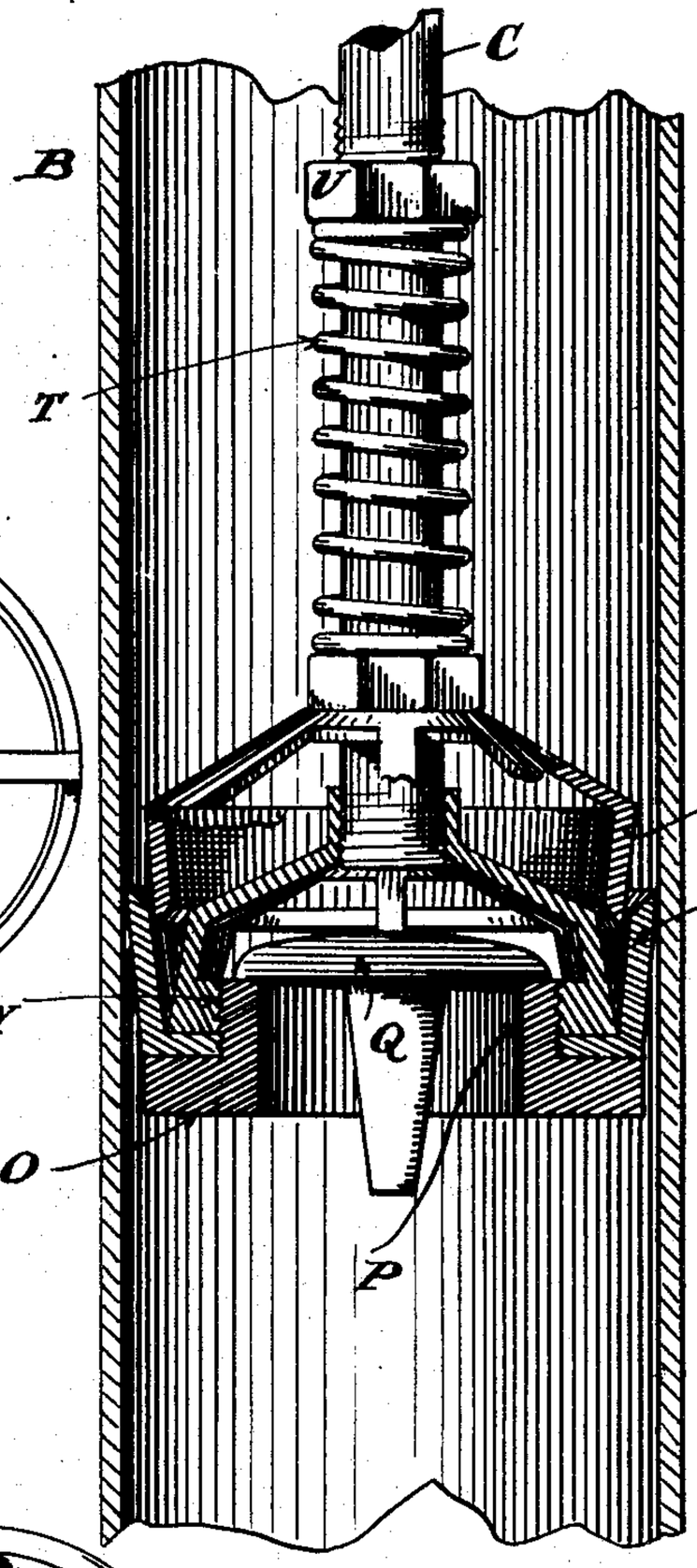


FIG. 3.

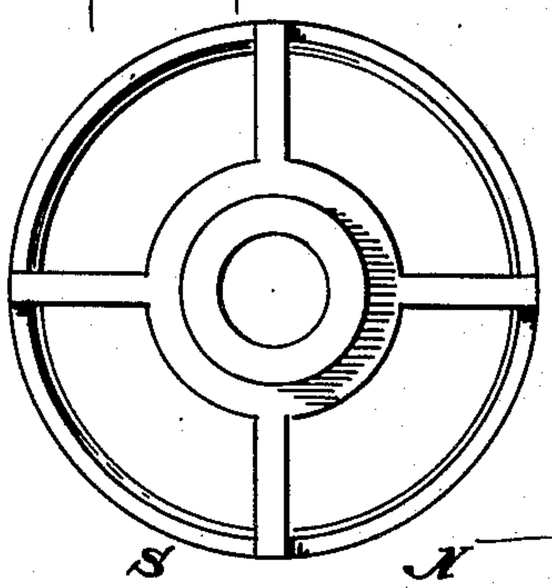


FIG. 4.

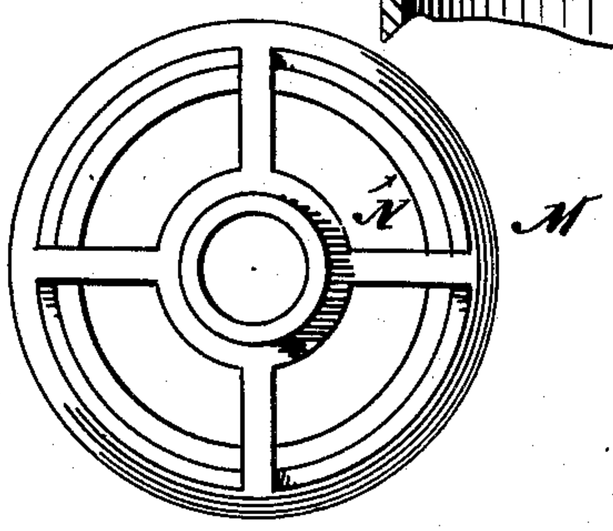
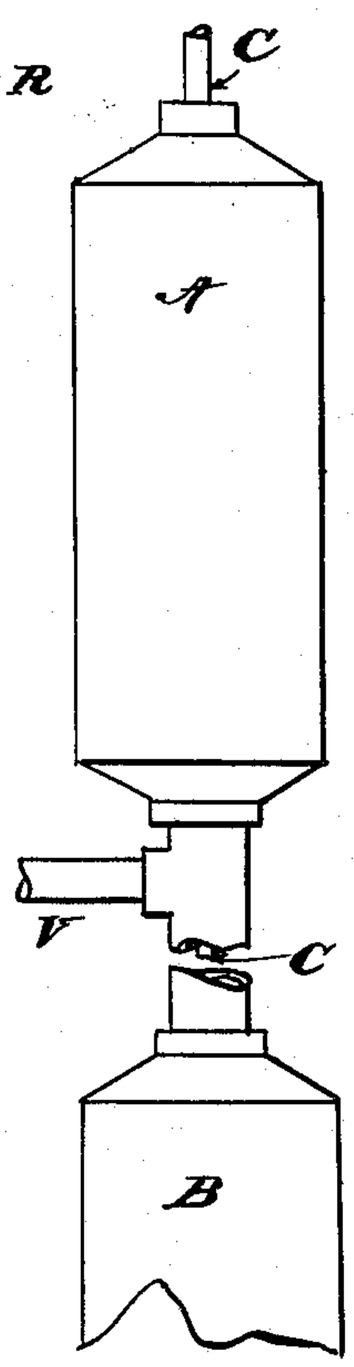


FIG. 5.



Witnesses:
Mae Davis
E. J. Thurlow

Inventor:
Samuel Gautsche
By L. M. Thurlow,
Atty.

UNITED STATES PATENT OFFICE.

SAMUEL GAUTSCHE, OF METAMORA, ILLINOIS.

EXPANDING DEVICE FOR PUMP-PISTONS.

No. 919,845. Specification of Letters Patent. Patented April 27, 1909.

Application filed January 17, 1906. Serial No. 296,555.

To all whom it may concern:

Be it known that I, SAMUEL GAUTSCHE, citizen of the United States, residing at Metamora, in the county of Woodford and State of Illinois, have invented certain new and useful Improvements in Expanding Devices for Pump-Pistons, and do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention pertains to improvements in pump pistons, relating more particularly to means for adjusting the packing or leather carried by the piston.

The invention further relates to means for automatically spreading the pump leather as it wears so as to make and maintain a water tight packing.

In the appended drawings forming part of this application, Figure 1 represents a sectional elevation of a cylinder showing part of my improved mechanism. Fig. 2 is a sectional elevation of another part of the invention. Fig. 3 is a top view of a leather spreading member. Fig. 4 is a top view of a piston member shown in Fig. 2. Fig. 5 is an elevation of the two cylinders shown in Figs. 1 and 2.

My device is applicable to all kinds of pumps. In single acting pumps either one of the forms shown in the first two figures can be employed, and for force pumps both forms are used in conjunction.

A indicates an upper cylinder, and B indicates a lower one. Extending vertically through both cylinders is a piston-rod C, which near its upper end, Fig. 1, carries an adjustable washer D having beneath it an inverted cup shaped leather packing E. Beneath and within said packing E is a washer F held in place against the packing by a nut G, there also being a nut H above the washer D by means of which the packing can be firmly clamped and held between both washers as will be understood.

Carried slidably on the rod C beneath the packing E is a cupped member J whose greatest diameter is nearly that of the inside of the cylinder as shown being tapered toward its top to enter the packing as clearly shown. This said cupped member is forced into and held snugly within the packing by means of a spiral spring K surrounding the said rod to which the desired tension is imparted by means of a nut L. It will be noted that the spring by having a continual pressure upward against the member will cause the latter to keep an outward or spreading pressure against the leather thereby maintaining a water tight joint between the leather and its cylinder.

The piston rod C extends downward into the lower cylinder and its extremity carries an open tapered member M having a threaded bore N, Figs. 2 and 4, which receives a valve-seat member O by means of an upwardly extending exteriorly threaded portion P, there being the usual flap-valve member Q seated upon said portion P as shown. Clamped between the two members M and O is a cupped leather R similar to E above described but reversed in position. Entering said cupped leather is a spreader S corresponding to J already described said member S being slidable on the rod and held with a downward pressure into the leather cup by means of a spring T to which the desired tension is applied by the use of a nut U on the rod C. In this portion of the mechanism it will be seen that the operation of the spreading parts is identical with that already explained for the piston in the cylinder A.

As shown in Fig. 5 the cylinders A and B are used in conjunction with the pistons shown in Figs. 1 and 2 when the apparatus is to be used for pumping water under pressure. In operation, as the piston in the lower cylinder descends the water raises the flap-valve Q and passes upward into the upper part of the cylinder B, each upward stroke raising the water by means of the packing R and the continued action of the piston raises the water into the cylinder A which is now filled beneath the piston within the latter cylinder. A downward stroke of the piston-rod now puts the water between the two pistons under pressure by reason of the simultaneous entrance of water from below through the lower piston. An outlet between the pistons at V permits the water to be forced to any distance. The pump thus constructed and operated may be termed a "deep well" pump for the reason that the pressure is put upon the water in the vicinity of the bottom of the well without having to raise the water by suction. By locating it in the well the water may be forced to any distance whereas by suction its action would be limited by the well known physical law. As hereinbefore stated either one of the positions may be used to raise the

water by suction, if desired, although as a matter of fact the upper piston would have to be inverted and provided with a flap-valve similar to the lower one described. It is to be seen that the water in the pumping operation will raise above the lower piston but cannot pass downward again while the water can raise up to the upper one but cannot pass beyond it but must be forced from beneath it to the exit by reason of the inverted leather and the spreading action due to the member F and the spring tension.

I am aware that cupped jacking leathers have been used heretofore in pumps so that I do not claim anything on this feature alone. I am also aware that equivalents of said members have been employed in other arts with which means have been combined for spreading them into contact with the cylinder wall in which they travel to allow for the continual reduction in diameter due to wear. I am not aware, however, of the construction and arrangement of parts such as I employ for automatically spreading the leathers nor the peculiar combination of double piston each of which has the automatic spring pressure combined therewith.

I claim:—

1. The combination with a pump barrel and a plunger rod therein, of a plunger body, materially smaller than the interior of the barrel, fixed to said rod, a pliable packing disk clamped to said body and provided with a conical flange diverging therefrom to meet the barrel at some distance beyond the plane of the clamping devices, and a spring-pressed conical member sliding upon the rod at some distance from said devices and normally pressing the marginal portion only of said flange against the barrel wall.

2. The combination with a pump barrel and a plunger rod therein bearing a rigid plunger body materially smaller than the interior of the barrel, of a pliable disk of like size clamped to said disk and having a free marginal flange extending obliquely to the barrel, a rigid cone sliding on said rod, at some distance from the plane of the clamping devices, and fitting within the free marginal portion of said flange, and a spring urging the cone toward the smaller portion of the flange and pressing its free margin against the barrel wall.

3. The combination with a pump barrel having a lateral outlet, of a plunger rod arranged for reciprocating in the barrel, two widely separated, oppositely turned plungers each materially smaller than its barrel secured to the rod upon opposite sides of said outlet, and each carrying an annular cup-like packing ring of pliable material, having its free flange diverging to meet the barrel at some distance from the plane of the devices which hold it, two oppositely turned conical cup-expanding members slidably mounted upon the rod between the plungers, and adjustable rod-encircling springs yieldingly urging the cup-expanding members into the packing rings, respectively.

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

SAMUEL GAUTSCHE.

Witnesses:
E. J. ABERSOL,
L. W. THURLOW.