No. 675,101. Patented May 28, 1901.

L. H. NASH.

WATER METER.

(No Model.) Application filed Feb. 25, 1895. 3 Sheets—Sheet 1.

Fig. 1.

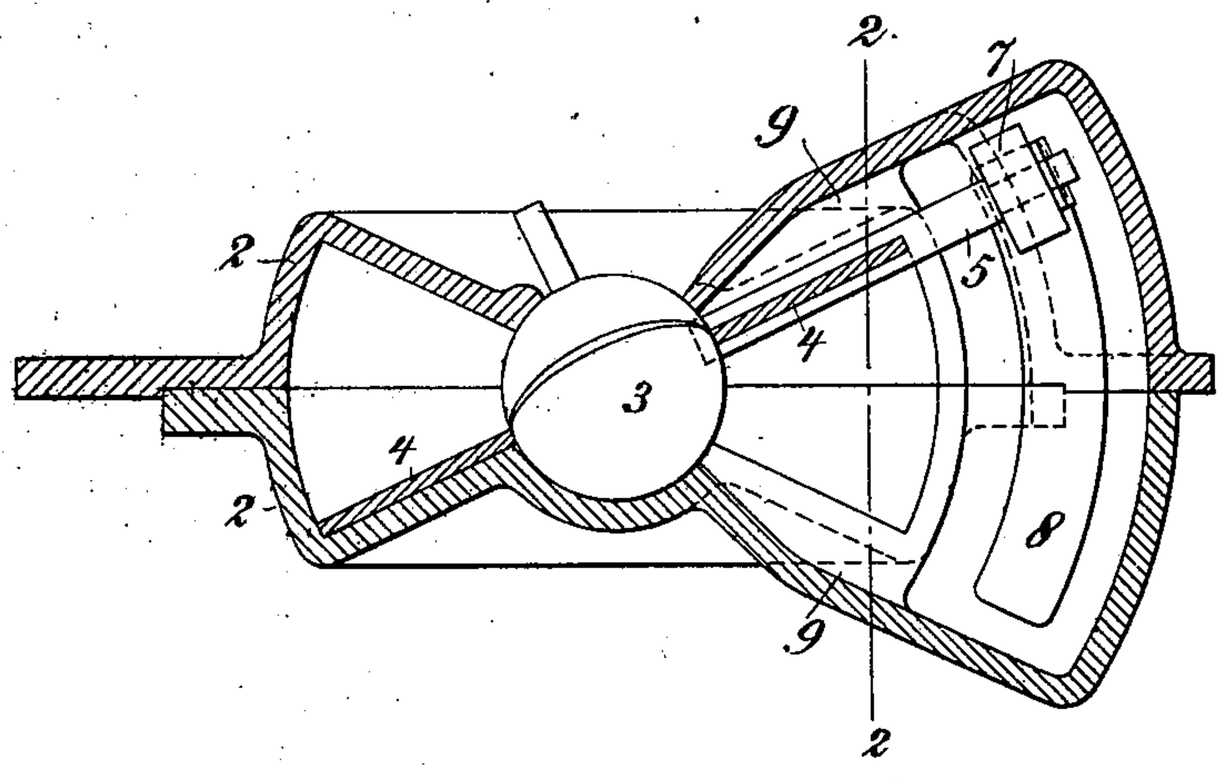

Fig. 2.

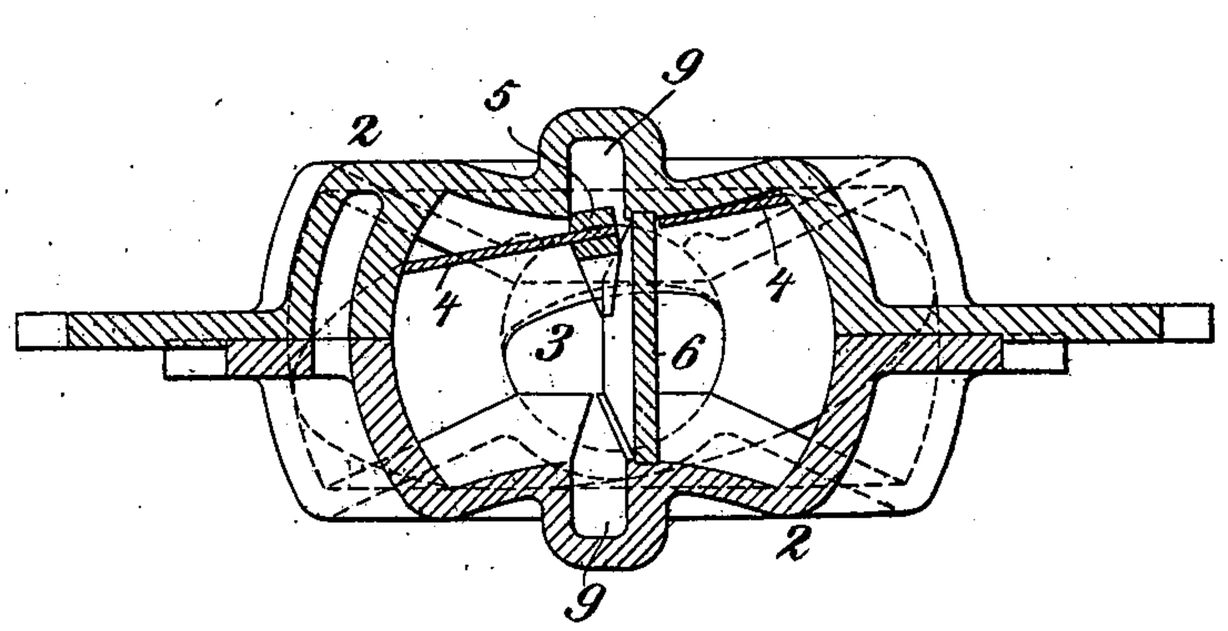

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Fig. 3.

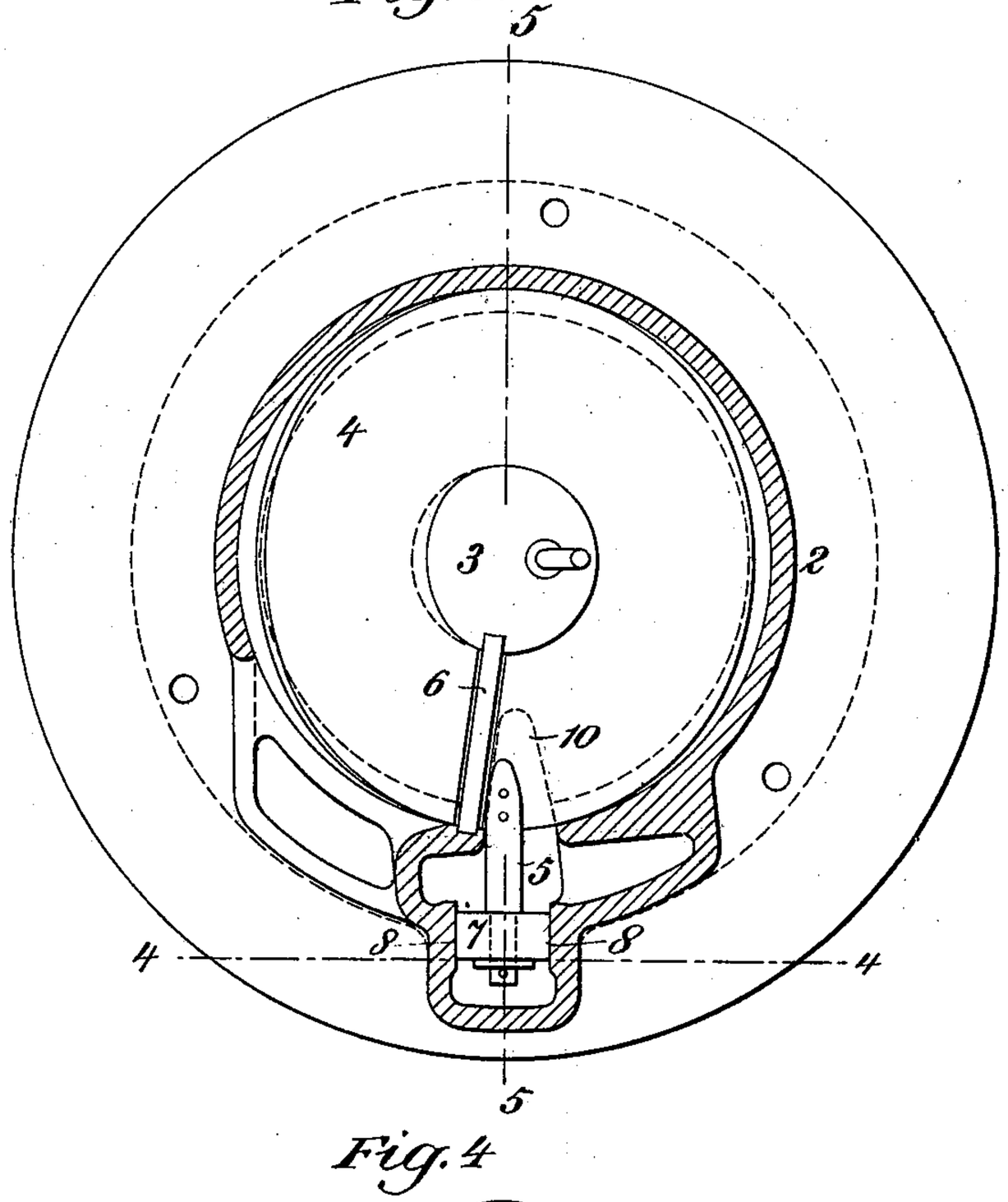

Fig. 4

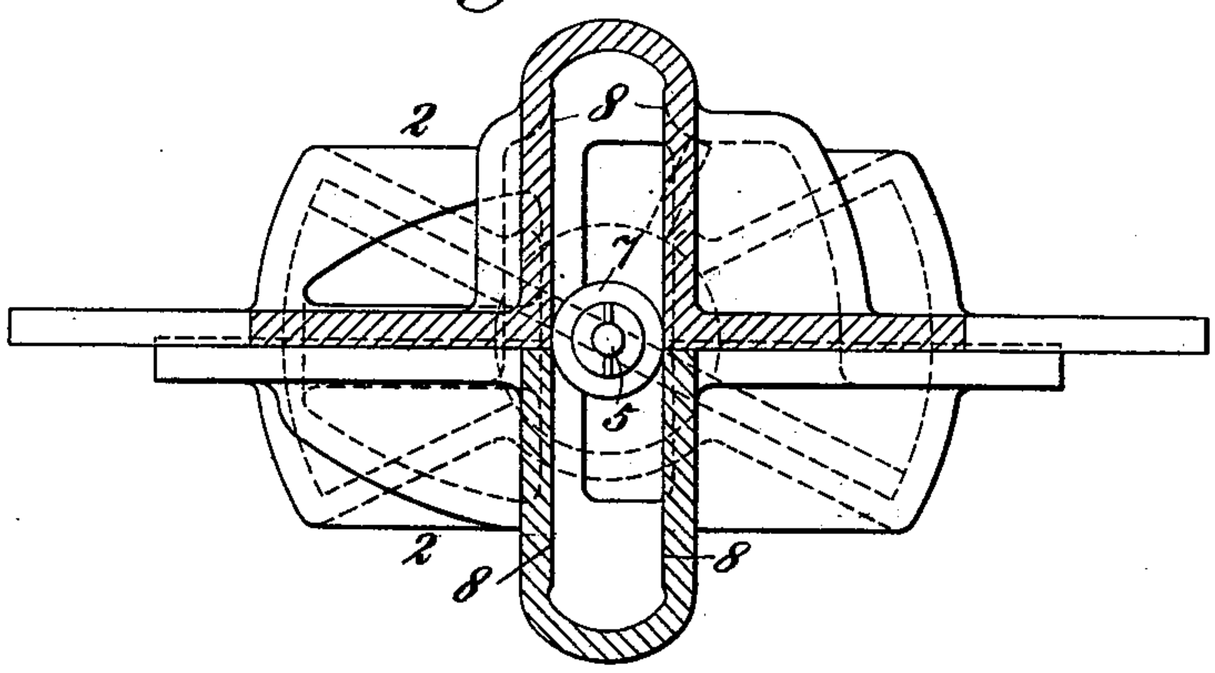

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Fig. 5.

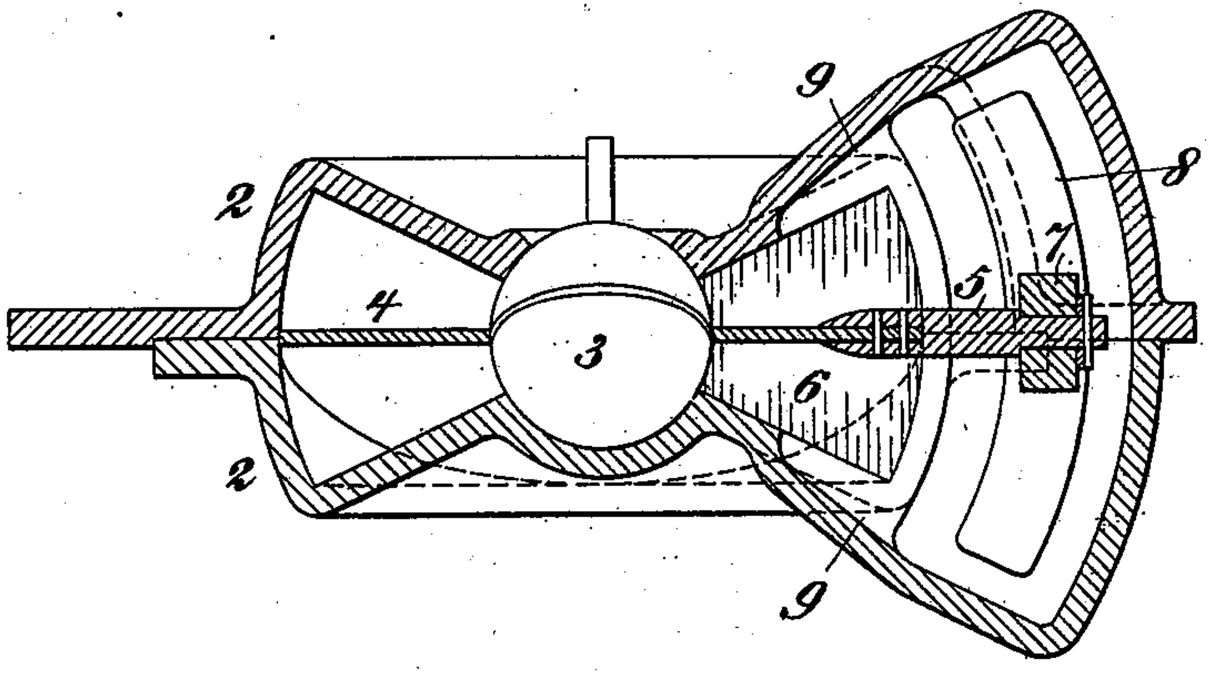
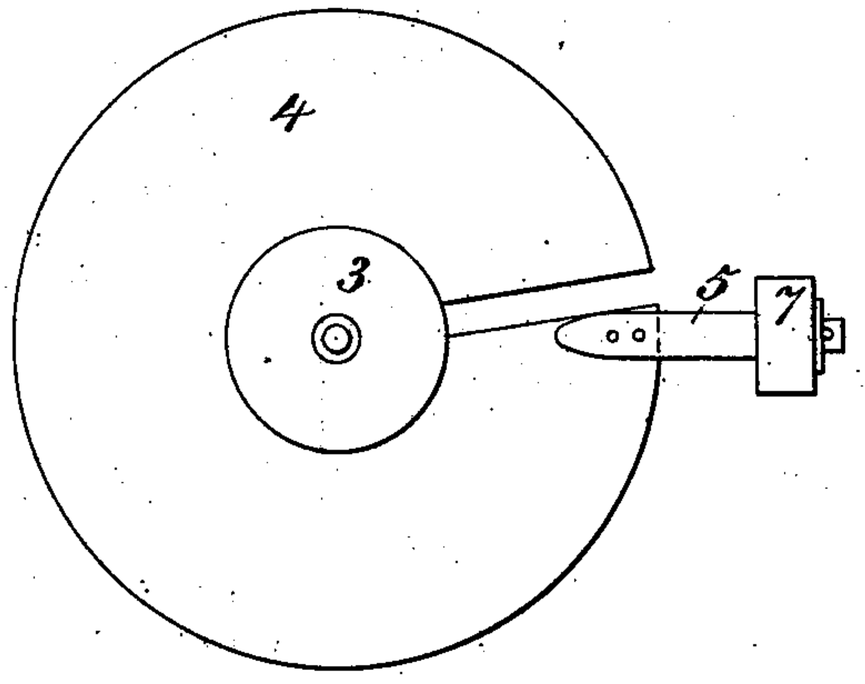


Fig. 6.



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UNITED STATES PATENT OFFICE.

LEWIS HALLOCK NASH, OF SOUTH NORWALK, CONNECTICUT, ASSIGNOR TO NATIONAL METER COMPANY, OF NEW YORK, N. Y.

WATER-METER.

SPECIFICATION forming part of Letters Patent No. 675,101, dated May 28, 1901.

Application filed February 25, 1895. Serial No. 539,655. (No model.)

To all whom it may concern:

Be it known that I, LEWIS HALLOCK NASH, a citizen of the United States, and a resident of South Norwalk, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Water-Meters, of which the following is a specification.

My invention relates to water-meters of the nutating type; and it consists of certain novel parts and combinations of parts particularly pointed out in the claims concluding this specification.

Referring to the accompanying drawings, Figure 1 is a vertical section through a water-meter. Fig. 2 is a section at right angles thereto on the line 2 2, Fig. 1. Fig. 3 is a horizontal section through a meter. Fig. 4 is a vertical section through the same on the line 4 4, Fig. 3. Fig. 5 is a horizontal section through the same on the line 5 5, Fig. 3; and Fig. 6 is a plan view of the piston of Fig. 3.

Similar numerals of reference indicate the same or corresponding parts in all the figures.

In the accompanying drawings I have shown two structures involving some or all of the features of my present invention, and I will now describe the structures shown, although it will be understood that various other modifications and changes may be made without departing from the spirit of my invention and without exceeding the scope of the concluding claims.

Referring to Figs. 1 and 2, 2 2 indicate the inclosing case of a nutating-piston meter, the piston being in the form of a disk, although obviously it might be in the form of a cone if the case were suitably modified in shape. 3 is the ball-bearing of the piston, and 4 4 indicate the disk thereof. This piston is provided with a radial extension 5 in the region of the abutment 6, Fig. 2, extending outside of the measuring-chamber proper and carrying an anti-friction-roller 7 at or near its extremity, which operates in connection with one or more bearing-surfaces 8. The extension 5 may be variously attached to and supported by a piston or made integral therewith. In this case I have shown it attached by a rod extending to and within the ball-bearing, forming a rib on one and preferably on both surfaces of the piston at or near the place where said piston straddles the abutment. When such a rib is formed on the piston, I may and preferably do utilize it, as clearly shown in Fig. 2, to perform a joint-forming function to prevent water leaking through the meter without being measured at the instant when the cone or disk is rolling past the abutment in contact with one or the other head. At this instant if there be a port in the piston or head-plate on either side of the abutment there is more or less direct communication between the inlet and outlet ports, depending upon the width of said port. In this case I have shown ports 9 in the head-plate, but no ports in the piston. These are outlet-ports. Before the disk of the piston makes contact with the head-plate on the side of these ports there would be free communication between the inlet and outlet ports were it not for the presence of these ribs 4, which at that instant make contact, as shown in Fig. 2, closing the outlet-port.

Instead of the port 9 being in the case a similar port might be made in the piston, in which case a projection from the case would perform the same function as the projection on the piston in the structure shown.

The ribs not only furnish a means of forming the desired joint-forming contact with the case to prevent leakage, but also in the form shown in Fig. 1 they add strength to the thin metal disk at the slot, where it is weakest, and may be utilized to furnish a bearing of increased width at the abutment. These functions of the ribs are independent of the other functions described and may either of them be used independently of each other or the others. The piston may be reinforced with such ribs in any part or in several parts; but it may also be formed with areas of increased thickness integral with the disk, thus furnishing the maximum strength or rigidity with the minimum weight. This feature is of especial utility in meters of large sizes.

Of course it will be understood that the port in the head-plate or in the piston might be on the inlet side or that there might be ports on both sides and that the ribs might be made independent of the support of the

antifriction-roller 7, or they or equivalent devices might be employed without the radial projection supporting the roller 7.

Referring to Figs. 3, 4, 5, and 6, the bar 5 in these figures, supporting the roller 7, does not extend to the ball-bearing. The head-plates are grooved at 10 to receive this bar, which may or may not in any substantial degree perform the functions described with reference to the same bar in Figs. 1 and 2. The roller 7 works freely between the bearing-surfaces 8, so that it may revolve, and thereby diminish friction while furnishing substantial means for preventing the rotation of the piston on its axis in either direction—a function which is usually performed by the bridge and the slit in the piston.

In all the figures I have shown the pistons as consisting of a hard-rubber ball-bearing and a metal disk of somewhat exaggerated transverse dimensions, although my invention in some of its features is not limited to a piston made of these materials.

In the foregoing specification I have incidentally referred to some of the modifications which might be adopted in the practice of my invention; but I have not endeavored to specify all the modifications which might be employed, the object of this specification being to instruct persons skilled in the art to practice my invention in the form at present preferred by me and to enable them to understand its nature, and I desire it to be distinctly understood that mention by me of a few modifications is in no way intended to exclude others not referred to, but which are within the spirit and scope of my invention.

Many of the details and combinations illustrated and above described are not essential to the several inventions, broadly considered. All this will be indicated in the concluding claims, where the omission of an element or the omission of reference to the detail features of the elements mentioned is intended to be a formal declaration of the fact that the omitted elements or features are not essential to the inventions therein severally covered.

What I claim is—

1. In a nutating-piston water-meter, the combination with a piston and a measuring-chamber, of a radial projection on said piston passing through one of the ports and a bearing-surface outside the walls of the measuring-chamber with which it makes contact.

2. In a nutating-piston water-meter, the combination of ports in the region of the abutment with a rib or ribs on the piston adapted to make joint-forming contact with the said ports.

3. In a nutating-piston water-meter, the combination with the piston of a rib or ribs thereon extending from within the ball-bearing radially and making contact with the guide-bearing.

4. In a nutating-piston water-meter, the combination, of a port in the region of the abutment and a coacting projection making joint-forming contact with said port.

5. In a nutating-piston water-meter the combination with the piston and the measuring-chamber, of a controlling device on the piston and a bearing-surface with which it makes contact, a portion of said controlling device being in a port-opening and said portion being in all positions of the piston narrower than the port areas of both the chambers above and below the piston.

LEWIS HALLOCK NASH.

Witnesses:
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M. WILSON.