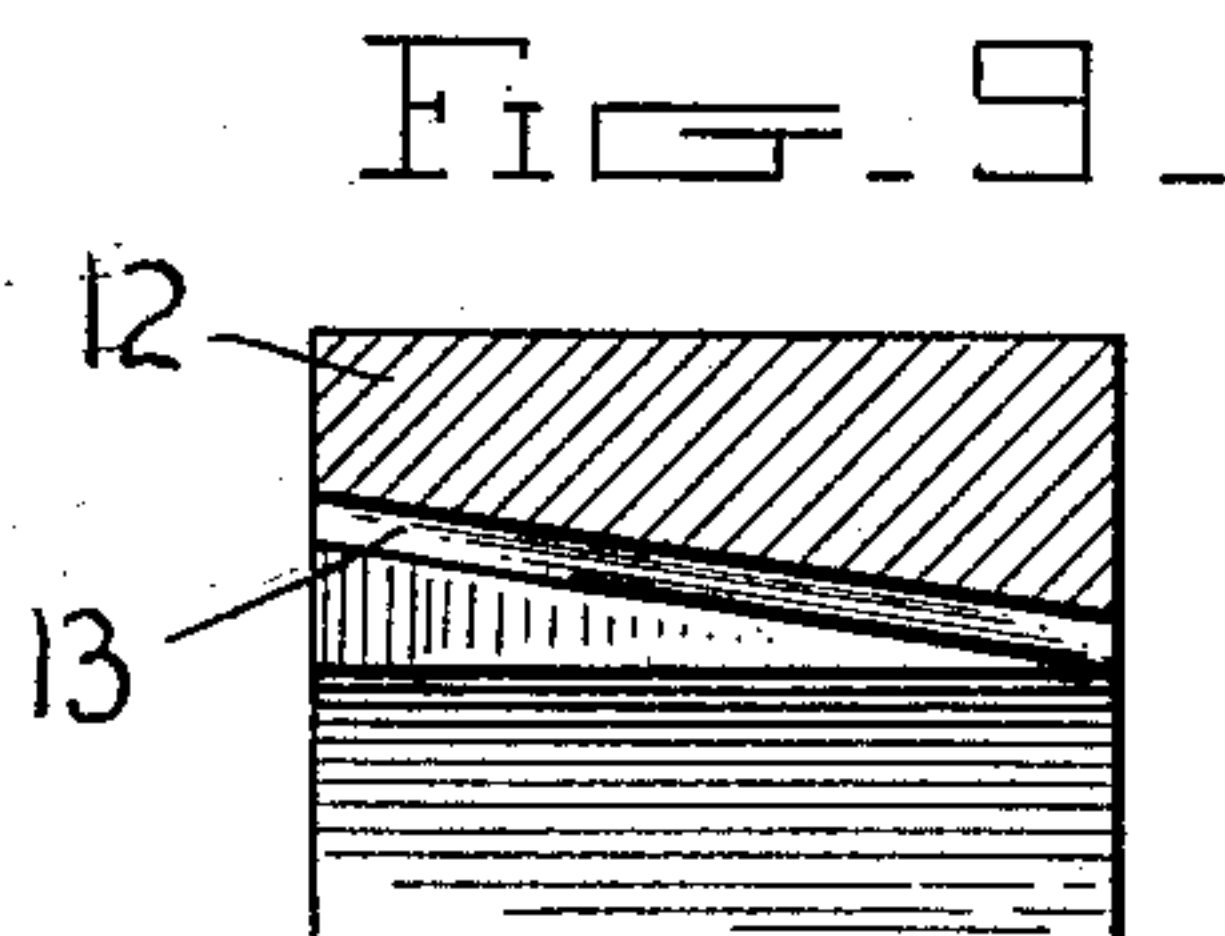
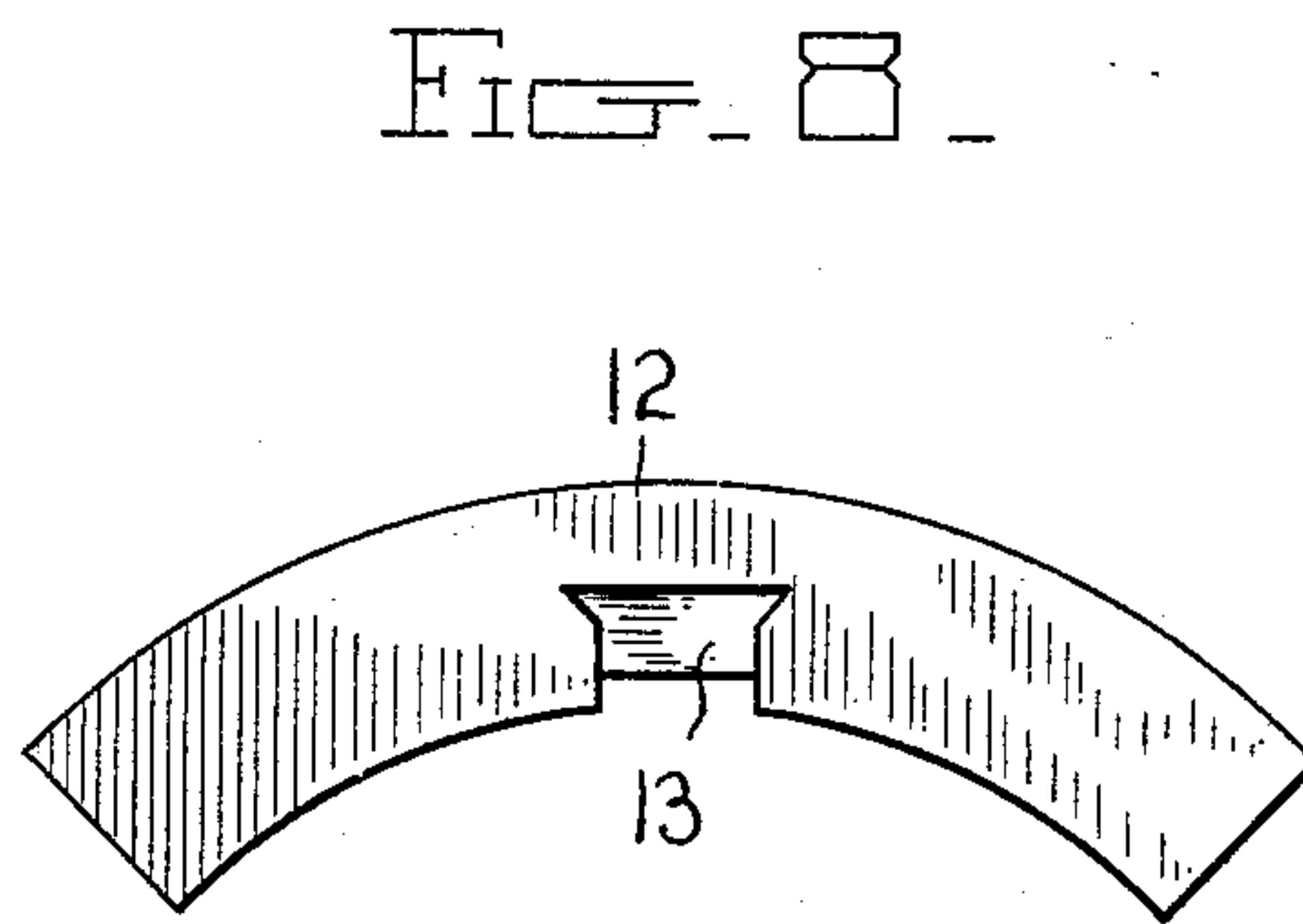
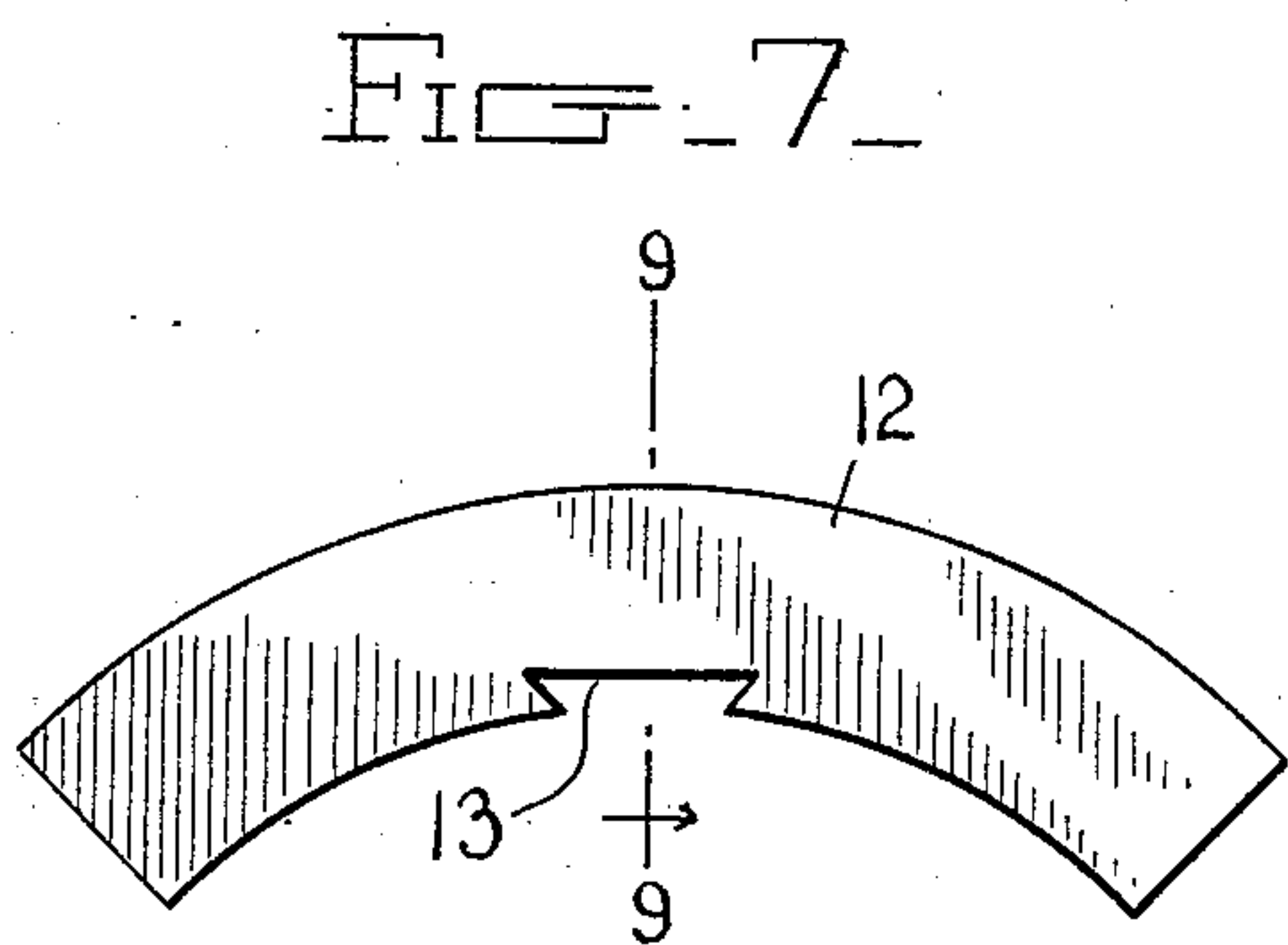
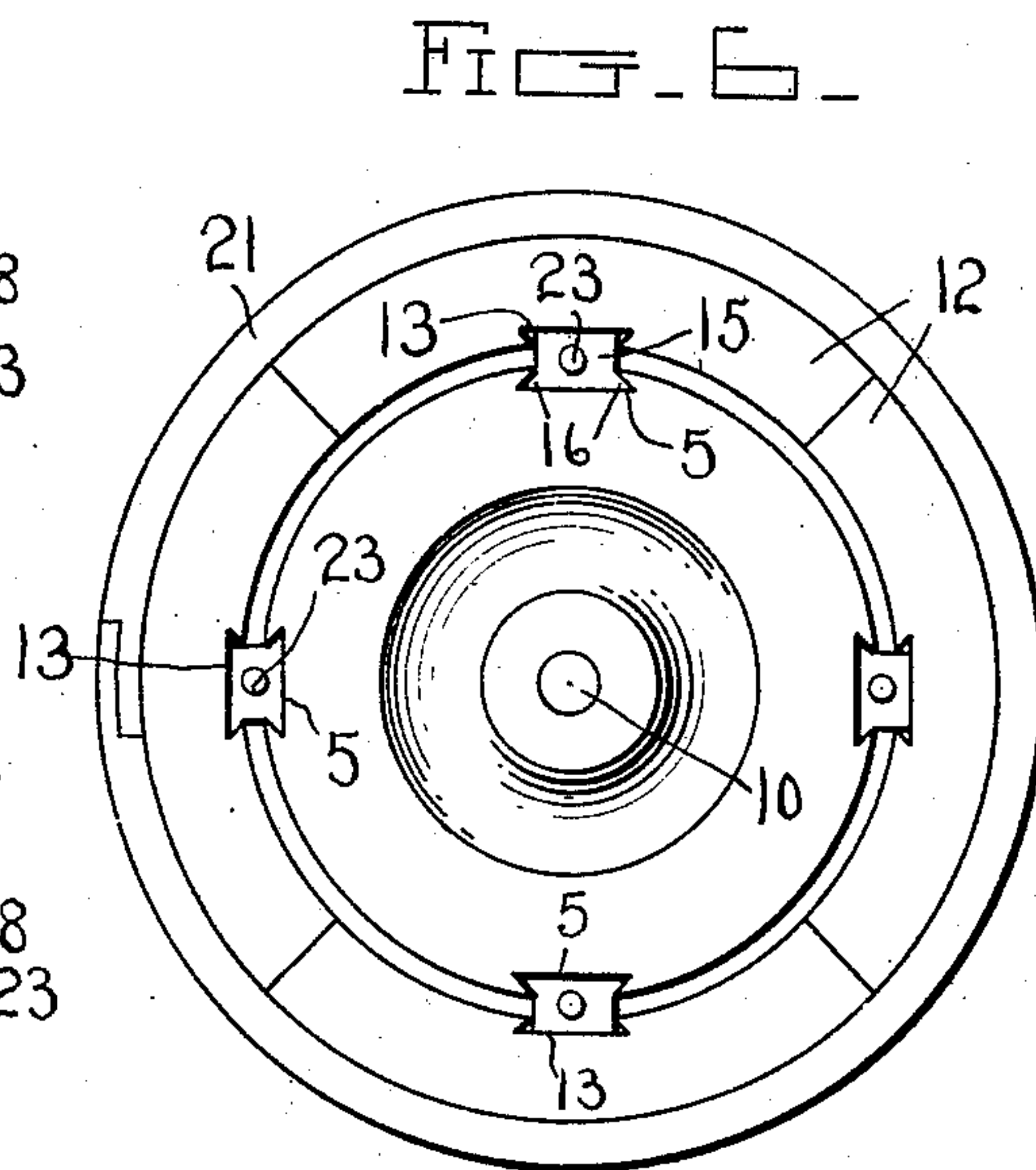
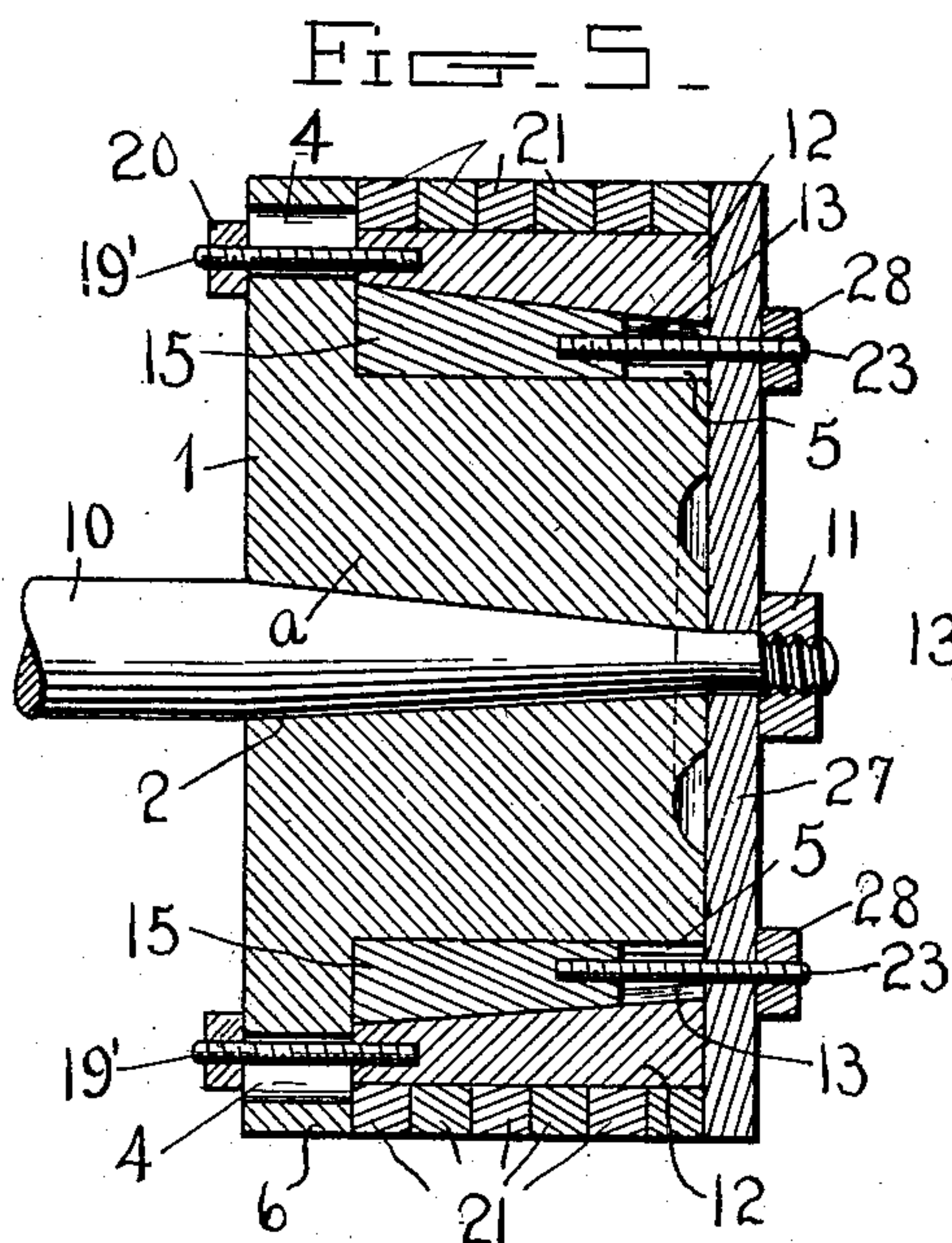


E. O. FRISK.
PISTON FOR WATER PUMPS.
APPLICATION FILED JAN. 4, 1908.

912,460.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

ERNEST O. FRISK, OF PAINESDALE, MICHIGAN.

PISTON FOR WATER-PUMPS.

No. 912,460.

Specification of Letters Patent.

Patented Feb. 16, 1909.

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To all whom it may concern:

Be it known that I, ERNEST O. FRISK, a citizen of the United States, residing at Painesdale, in the county of Houghton, State of Michigan, have invented certain new and useful Improvements in Pistons for Water-Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a new and useful improvement in pistons for water pumps.

The object of my invention is to provide a piston so arranged that the wear of the packing rings may be taken up without removing the piston from the cylinder as will be described more fully hereinafter.

In the accompanying drawings I have shown in Figure 1 a perspective view of the pump plunger complete disclosing the packing properly located thereon. Fig. 2 shows a central sectional view of the piston head. Fig. 3 shows an end view of the piston. Fig. 4 shows an enlarged detached detail of one of the wedge keys as used in my invention. Fig. 5 shows a central sectional view of a pump piston embodying my invention. Fig. 6 shows an end view of the pump piston disclosing the end plate as removed. Figs. 7 and 8 disclose two end views of one of the expanding ring sections, while, in Fig. 9 I have shown a sectional view on line 9, 9 of Fig. 7.

My present invention is more particularly adapted to be used in connection with water pumps.

In pumping water where many floating particles are usually in suspension, it is found that the packing rings of the pistons speedily wear away causing leakages and improper operation of the piston. To compensate and take up this wear without removing the piston from the cylinder is the object of my invention.

In the accompanying drawings I have shown in Fig. 1 a perspective view of a piston embodying my invention where I use a rod 10 having its end cone-shaped to fit into the cone-shaped bore 2 centrally within the piston head 1 as disclosed in Fig. 5 the end of this piston rod being cylindrical and partly threaded to receive the securing nut 11.

The piston head as used in my invention comprises the cylindrical portion *a* or head proper which is provided at one end with a projecting flange 6 which is slotted at four

points as disclosed in Fig. 3 while the cylindrical surface of the head 1 has four lengthwise disposed key ways 5, 5 terminating adjacent said flange 6 as shown.

Held upon the piston head are four equiformed expanding ring sections 12 clearly shown in Fig. 6. Each of those expanding ring sections is provided within its inner peripheral face with a lengthwise disposed wedge-shaped key way 13 as shown in Figs. 7, 8 and 9.

Each key way has two parallel shoulders and an upper expanded dove-tailed base portion as clearly illustrated in Fig. 8.

Held within each of the key ways 5 and the registering key ways 13 within the expanding ring sections, is a wedge-shaped key 15 as is shown in Fig. 4 comprising a rectangular body portion from which extend the lower flanges 16, these lower flanges being adapted to snugly work within the dove tail portions of the key ways 5. The upper portion 17 of these keys is flat and has the projecting edges 19 formed to insure a snug union within the dove-tailed enlargement of the key way within the expanding ring sections. In Fig. 5 I have shown one of these expanding ring sections in section and in this view is shown one of the retaining bolts 19', one projecting from each ring section and each of which is adapted to pass through a slot 4 within the flange 6 being secured by means of a suitable adjusting nut 20 as shown. It will be noticed that the expanding ring sections 12 do not extend up flush with the flange 6 but end a suitable distance below so as to properly receive a set of packing rings 21 of any suitable construction. The adjusting nuts 20, work against the outer face of the flange 6. Each of these wedge keys 15 is provided with a projecting threaded stem 23 passing through a perforation within the face plate 27 adapted to receive a suitable adjusting nut 28 and when first assembled the expanding sections 12 snugly rest upon the piston head 1 as disclosed in Fig. 6, the wedge keys then being in their first extreme position so that their largest end rests near the flange 6 as shown in Fig. 5.

The packing rings 21 which are carried by the ring sections 12 are of any approved construction and as they wear within the cylinder it is simply necessary to remove the cylinder cap and apply a wrench to the bolts 28. This will result in the wedge keys being carried forward so that their upper inclined

surfaces carry outward the expanding ring sections 12 which are prevented from any axial displacement by means of the face plate 27 which is secured to the piston head 5 by means of the nut 11 as shown in Figs. 1 and 5.

The face plate 27 is carried upon the cylindrical end of the piston rod 10, and it is between this plate 27 and the piston head 10 flange 6, that the packing rings 21 are held. The set nut 11 that holds the face plate 27 in position against the piston head, also securely draws the frusto-conical end of the rod 10 into its proper position. The plate 27 15 is thus rigidly held, so that any endwise displacement of the packing rings is prevented. When it is desired to lock the extending sections against radial movement, the nuts 20 are firmly screwed upon the bolts 19' and 20 this prevents the wedges 15 from being moved as the extending sections 12 are thereby held firmly against the piston head flange 6.

It is of course understood that in taking 25 up the wear of the split packing rings 21 each wedge key is advanced far enough so that the packing ring sections above the same will form a proper contact with the cylinder lining. By these means adjustment is given 30 the packing rings which are made of a material that will slightly expand so that they will accommodate themselves to the enlarged diameter which they must then occupy. Later as the rings are again worn off they can be 35 given a new adjustment until it is found that they are so far worn off that a replacing of new packing rings is made necessary.

By these means I provide a simple inex-

pensive adjustable piston which is especially adapted to be used as a pump plunger 40 or water piston though it is of course understood that the same may also be used for other purposes.

And having thus described my said invention what I claim as new is— 45

In a device of the kind described, a piston provided with a body portion, a flange formed on the forward end of said piston provided with a plurality of radial slots therethrough, a follower plate upon the opposite end of said piston, expanding sections 50 held between said flange and follower plate, said piston body and expanding sections being provided with opposed dove tail grooves, the grooves in the expanding sections being 55 deeper at the front than the rear of said sections, packing held between said follower plate and said flange exteriorly of said expanding sections, wedge-keys held in said grooves between said expanding sections 60 and the piston body, said wedge keys being of less length than the piston body, bolts attached to said wedge-keys passing through the follower plate, nuts held on said bolts to move said wedge-keys longitudinally of said 65 piston, other bolts attached to said expanding sections passing through the slots in the flange, and other nuts held on the last mentioned bolts to lock said expanding sections in position relative to said piston body. 70

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

ERNEST O. FRISK.

Witnesses:

JACOB JARVIS,
OLLIE KOSTAMO.