

Aug. 11, 1936.

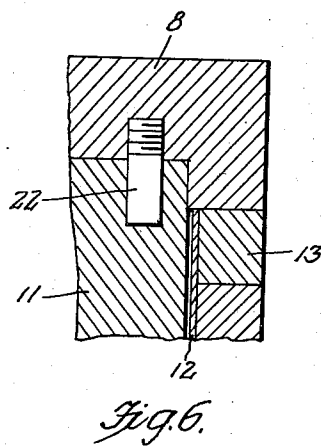
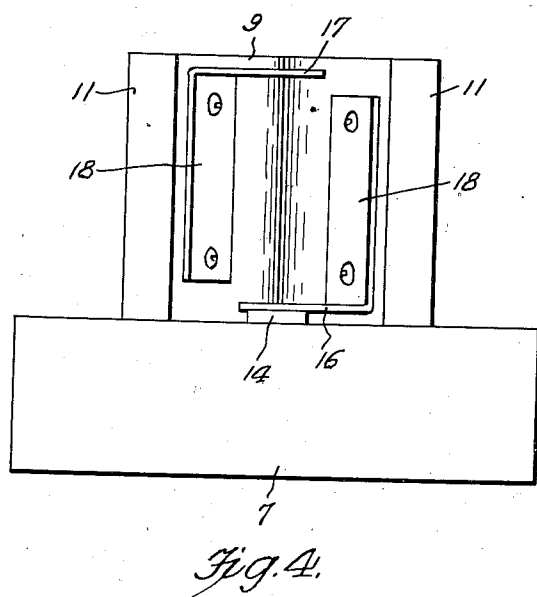
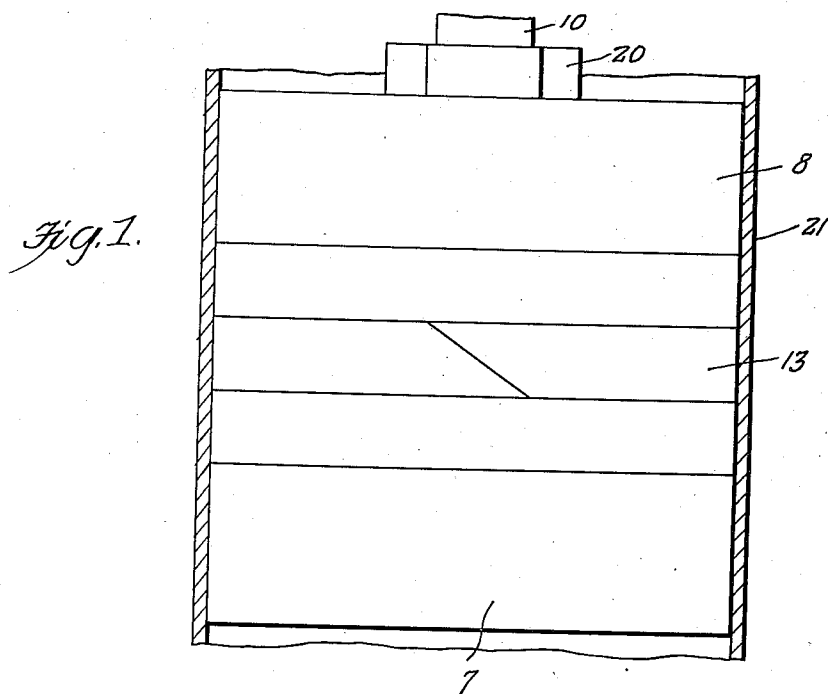
F. R. MILLER

2,050,360

PISTON HEAD CONSTRUCTION

Filed June 25, 1935

2 Sheets-Sheet 1



Inventor
Frank R. Miller,

By *Clarence A. O'Brien,*
Attorney

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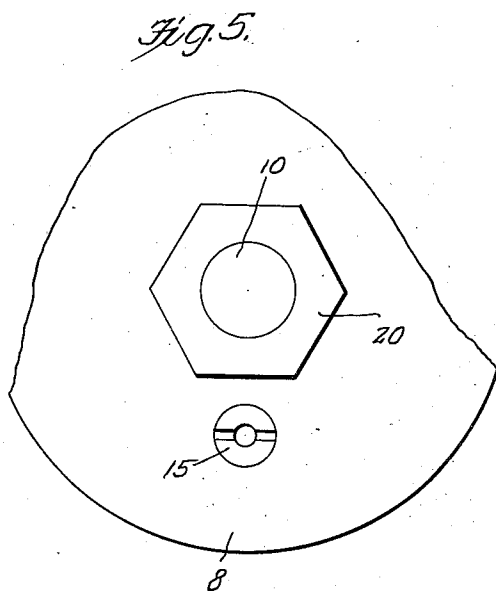
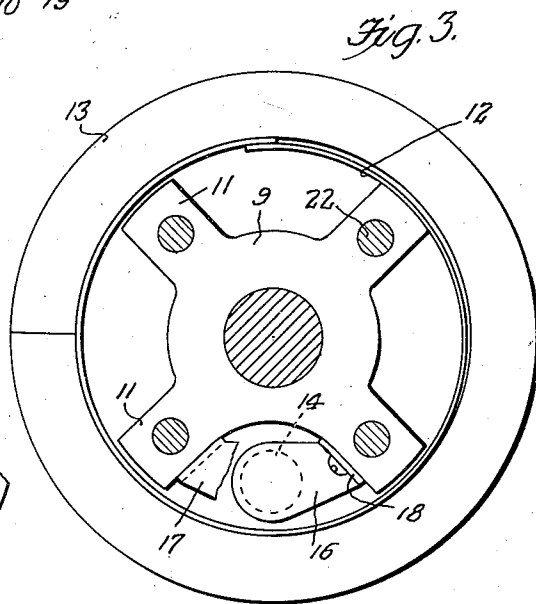
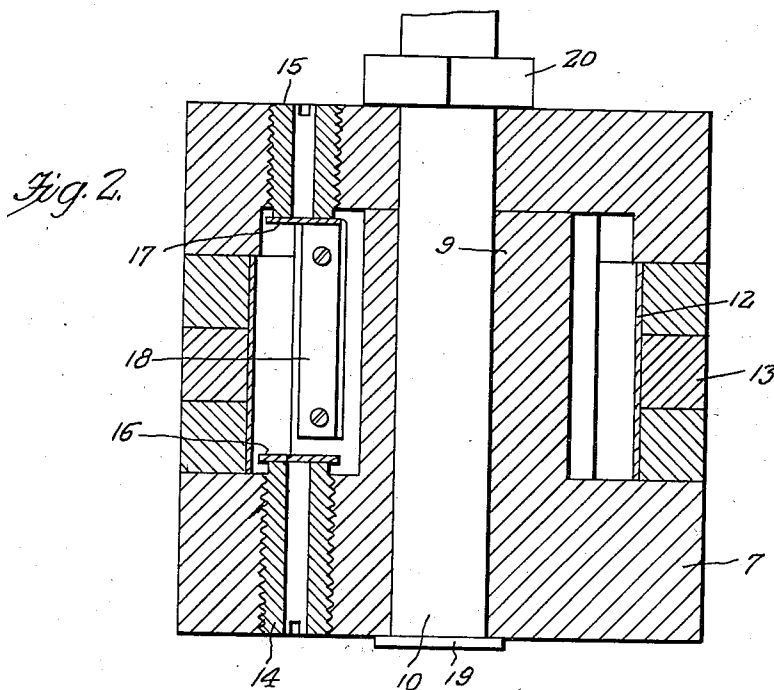
F. R. MILLER

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PISTON HEAD CONSTRUCTION

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2 Sheets-Sheet 2



Inventor

Frank R. Miller

By *Clarence A. O'Brien*
Attorney

UNITED STATES PATENT OFFICE

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PISTON HEAD CONSTRUCTION

Frank R. Miller, Cherryvale, Kans., assignor of
one-half to Archibald S. McMillan, St. Louis,
Mo.

Application June 25, 1935, Serial No. 28,363

1 Claim. (Cl. 309—31)

This invention relates to an improved piston head construction wherein the head is of a sectional type with its sections so constructed as to accommodate a radially expansible and contractible packing ring assemblage, said assemblage being expanded under the control of valved fluid pressure means.

In reducing the inventive idea to actual practice I have evolved and produced an arrangement comprising a pair of complementary sections defining the body portion proper, said sections being so fashioned and matched as to accommodate therebetween a superposed ring assemblage having an expansible and contractible liner internally associated therewith whereby to provide a fluid chamber within the piston head itself whereupon feeding fluid into the chamber maintains an outward pressure upon the liner and associated packing rings to keep the rings in constant contact with the wall of the cylinder.

Of specific importance, however, is the special adaptation and use of companion head sections wherein one section is provided with a bushing having radial flanges to limit the inward radial contraction of the piston ring assemblage, and said flanges serving further as supporting elements for coacting check valves designed to control the entrance and exit of the internal pressure producing medium.

It is my primary aim to generally improve upon piston head constructions of this class by adopting a special arrangement of parts carefully selected and mechanically coordinated to promote simplicity, durability, efficiency in operation, and to otherwise transcend in importance and operation similar known structures.

Other features and advantages will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is a view in elevation showing the improved piston head construction and illustrating the manner in which it is mounted for reciprocation in a cylinder, casing or the like.

Figure 2 is a sectional view through the sectional head disclosing the internal chambered formation and special fittings and valve elements.

Figure 3 is a horizontal section through the upper portion of the structure.

Figure 4 is a side view of the valve carrier section.

Figure 5 is a fragmentary top plan view observing the inner cap-like section.

Figure 6 is a fragmentary detail showing the

assembling of the studs on the cap section with the fins or flanges on the companion valve carrier section.

Referring now to the drawings by distinguishing reference numerals and especially to the general assembly shown in Figure 2, the outer valve carrier section is indicated by the numeral 7 and the companion inner cap-like section is denoted by the numeral 8. The section 7 is better shown in Figure 4 and from this it will be observed that it includes a disk-like body portion and a central upstanding tubular portion which may be described as a guide and assembling bushing for the adjacent end portion 10 of the piston rod. The bushing 9 extends up into firm abutting contact with the disk-like body portion of the section 8 and is provided with a series of radial flanges or wings 11. These wings are equidistant and circumferentially spaced and are either in contact with or in close proximity to the surrounding sheet metal annulus 12. This part 12 is in effect an expansible and contractible liner and has its ends overlapped as shown in Figure 3. It serves as a lining for the superposed packing ring 13, these being interposed between the marginal or peripheral portions of the sections 8 and 9 as shown in Figure 2. Thus, we have an arrangement where the sections 7 and 8 are mounted on the rods 10 and spaced apart so as to provide a space to accommodate the packing ring assembly. This comprises a ring 13 and the expansible and contractible inner wall or liner 12. This part 12 is spaced from the bushing 9 so as to define a chamber into which the expanding fluid or water (not shown) is fed.

The water is allowed to enter this chamber by way of the screw threaded centrally bored nipples or fittings 14 and 15 carried by the sections 7 and 8 respectively as shown in Figure 2. The inner ends of the bushings extend into the water chamber and serve as valve seats. They are so arranged as to accommodate the flexible flap check valves 16 and 17. These valve units are of spring metal and the shank portions 18 are attached to opposed faces of an adjacent pair of flanges 11.

It is to be observed that the free end of the piston rod 10 is properly headed as indicated at 19 to maintain the proper assembling of parts. In addition, there is a clamping nut at 20 to keep the parts together.

It will be observed that in assembling the device the part 7 is slipped onto the rod 10 against the head 19 after which the packing rings and liner are assembled. Then the cap portion or in-

ner section 8 is put in place and held there through the instrumentality of the clamping nut 20. When thus assembled we have the bushing 9 surrounding the piston rod and abutting the underside of the inner section 8 whereby to properly space these parts to accommodate the predetermined packing rings and liner assembly. The internal valves are alternately operable so that on the downward stroke of the piston head water is fed through the passage in the nipple 14 into the water chamber defined in the piston head itself. Or stated otherwise, we have a hollow piston head with alternately operable valve means therein and a centrally located packing ring assembly which is pressed out under the pressure of the water to insure firm leak-proof contact with the casing or wall of the cylinder 21 as shown in Figure 1.

In practice, I have found it expedient and practicable to provide the disk-like body portion of the part 8 with a series of guiding studs or pins 22 as shown in Figure 6. These are removably seatable in sockets formed in the adjacent ends of the complemental flanges 11. These pins 22 fitting into the socket serve to pilot and guide the parts together. They also prevent the relative rotary movement when once the parts are assembled. This insures proper valve and valve seat alignment.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after

considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Minor changes in shape, size and rearrangement of parts coming within the field of invention claimed may be resorted to in actual practice, if desired.

Having thus described the invention what is claimed as new is:

In a piston head construction of the class described, a rod, an outer section provided with a central bushing surrounding the rod, said bushing being provided with a series of radial circumferentially spaced equi-distant flanges, an inner section mounted on said rod and abutting the adjacent end of said bushing and flanges, said flanges having sockets in the upper portions thereof, studs in said inner section receivable in said sockets, a plurality of packing rings arranged in superposed relation between the marginal portions of said sections, each of said sections being provided with centrally bored screw threaded nipples, the nipples extending into the space outwardly of the bushing and between the inner peripheral portions of said packing rings, and alternately disposed successively operable resilient flap valves carried by predetermined flanges and engageable with the inner ends of said nipples whereby to permit the nipples to serve as valve seats.

FRANK R. MILLER.