

March 8, 1932.

F. D. DURHAM

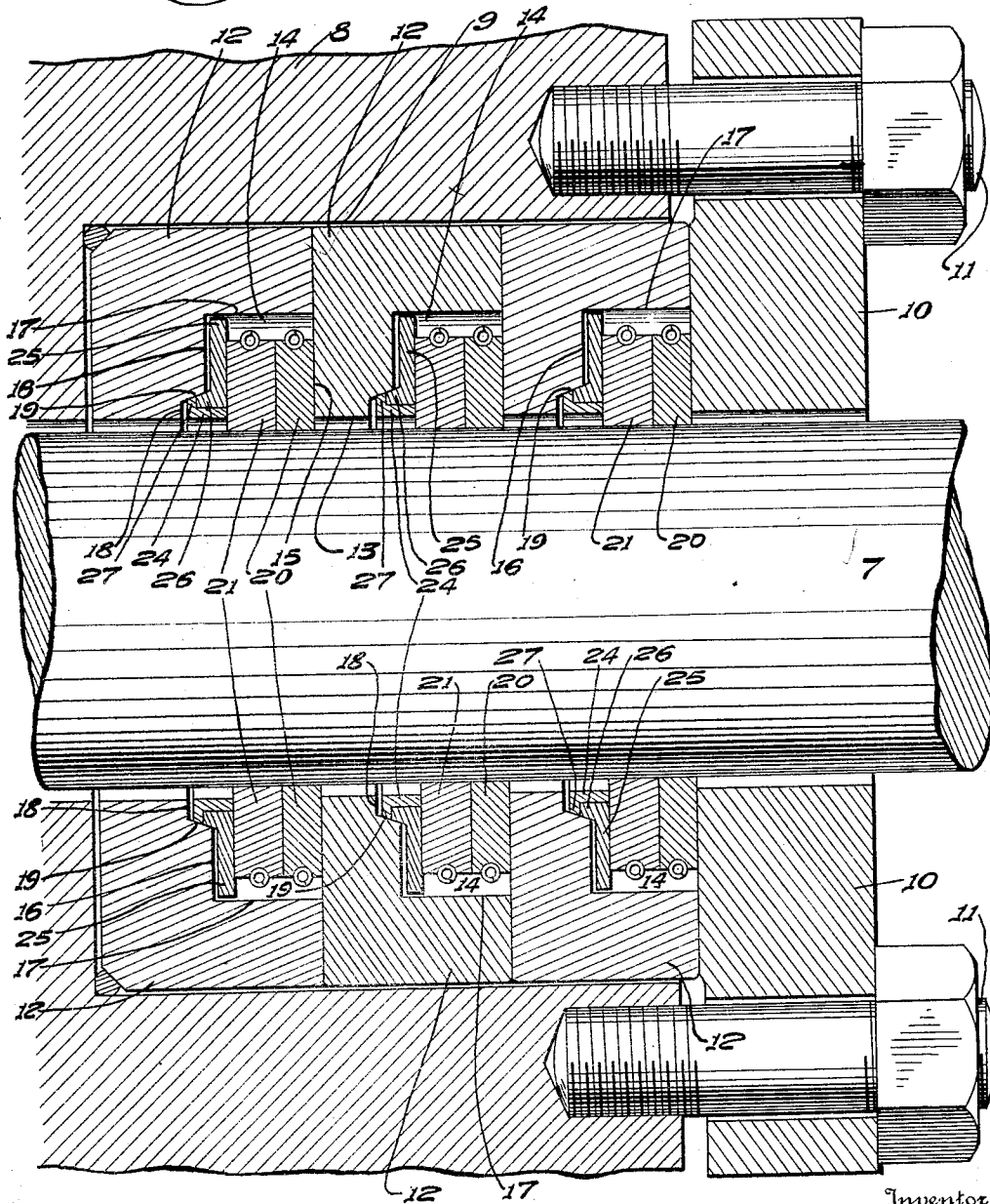
1,848,328

PISTON ROD PACKING

Filed June 26, 1929

2 Sheets-Sheet 1

Fig. 1.



Inventor

FREDERICK D. DURHAM

By

R. H. Hester

Attorney

March 8, 1932.

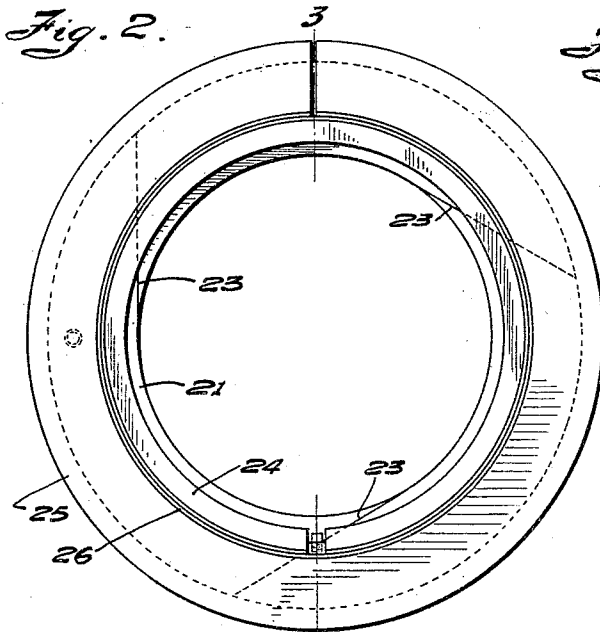
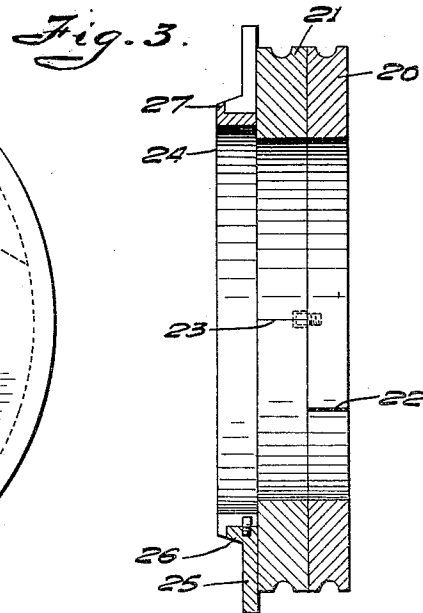
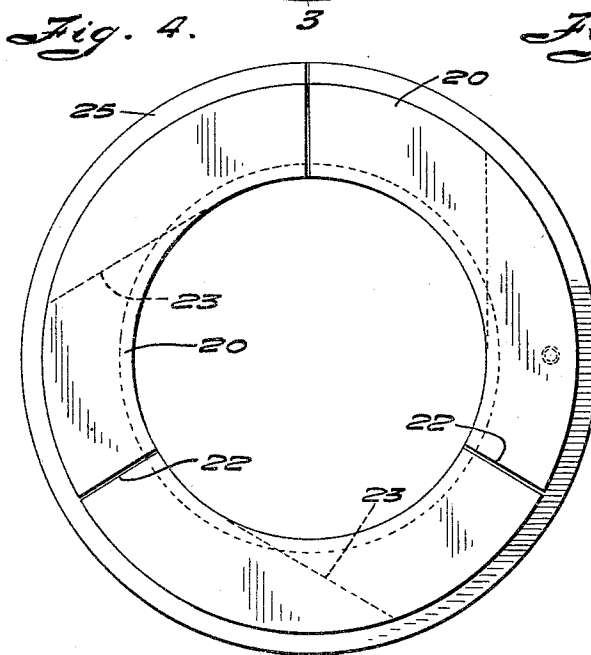
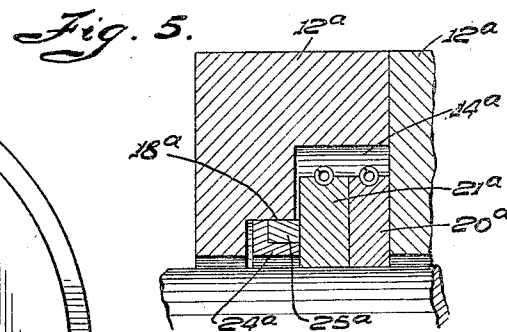
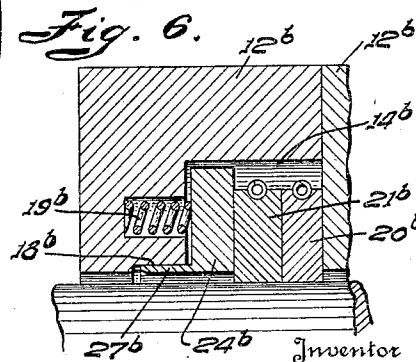
F. D. DURHAM

1,848,328

PISTON ROD PACKING

Filed June 26, 1929

2 Sheets-Sheet 2



FREDERICK D. DURHAM

334

F. D. Durham

Attorney

UNITED STATES PATENT OFFICE

FREDERICK D. DURHAM, OF LOUISVILLE, KENTUCKY

PISTON ROD PACKING

Application filed June 26, 1929. Serial No. 373,801.

In standard metallic packings for piston and like rods, there is excessive wear due to the pressure of the fluid acting on the packing rings in directions to force them against the rod that is packed and against the wall of the chamber in which they are located. As a consequence it has been found that the pressure is so excessive that it is more than the oil film will stand. Therefore scoring of the rod as well as undue wearing of the rings takes place.

The object of the present invention is to provide a novel structure that will to a marked degree overcome these tendencies and difficulties.

In the accompanying drawings:

Figure 1 is a view in elevation of one embodiment of the invention.

Figure 2 is a face view of the ring members.

Figure 3 is a vertical sectional view on the line 3—3 of Figure 2.

Figure 4 is a view of the reverse face to that shown in Figure 2.

Figures 5 and 6 are detail sectional views of modified forms of construction.

In the embodiment disclosed in Figures 1-4 inclusive, the rod to be packed is designated 7, and as usual reciprocates in a head or gland 8 provided with a socket 9 in which the packing is housed. A cap or face plate 10 covers the open end of the socket and is held in place by the usual bolts 11.

Located in the sockets 9 are cups 12 which may be termed "casing members"; these members 12 having bores 13 of slightly greater diameter than the diameter of the rod 7 that passes through said bores. Each member 12 is provided with a chamber 14 that opens through one end of the member, the open end being closed by the back of the adjacent member 12. As a consequence the chamber 14 has end walls 15 and 16 and a peripheral wall 17. The rear end wall 16 has in its inner portion a chamber extension 18 provided with a flared peripheral wall 19.

In the various chambers 14 are located packing ring members. Preferably two packing rings are employed, designated respectively 20 and 21. The packing ring 20 is of sectional formation with radial cuts 22. The

packing ring 21 is provided with diagonal cuts indicated at 23, which are staggered with relation to the cuts 22 of the ring 20, thereby providing an effective seal. By referring to Figure 1 it will be noted that the packing ring 20 bears against the chamber wall 15, while the packing ring 21 bearing against the side of the ring 20 is spaced from the other chamber wall 16. If no other provision is made, fluid travelling along the rod 7 would press against the packing ring 21 and urge it and the ring 20 firmly against the chamber wall 15. Consequently the vibration of the rod will and often does cause excessive wear on the rings. More than that, this fluid operating in the chamber 14 against the peripheries of the packing rings 20 and 21, press said rings inwardly so firmly against the rod 7 that the latter is apt to be worn and scored.

To prevent this, an expansible ring member is employed comprising an inner ring 24 and an outer ring 25. The outer ring 25 is located in the chamber 14 and occupies the space between the chamber wall 16 and the ring 21, bearing against the side of the latter. It is furthermore provided with a flange 26 entering the extension 18 of the chamber and having an outer tapered wall that bears against the flared wall 19 of said extension. Within the ring 25 is the ring 24 outwardly flanged as shown at 27, the outer edge of said flange corresponding in shape to the said flared wall 19. It will be noted by reference to Figure 1 that the internal diameter of the ring 24 is greater than the diameter of the rod 7. Consequently fluid under pressure finding its way along the rod 7, will enter said ring and expand it. This causes said ring 24 and the ring 25 to bear against the flared wall 19 of the chamber extension, sealing the chamber 14 from the intake of the fluid under pressure and at the same time urging the rings 24 and 25 toward the rings 21 and 20 and securing the necessary packing bearing but avoiding excessive pressure. The consequence is that a properly packed rod is provided, but the objectionable features of the standard packing are overcome.

In Figure 5 a slightly modified form of construction is illustrated. The casing mem-

ber is designated 12a and is chambered as shown at 14a. The two packing rings are designated 20a and 21a. The extension of the chamber is illustrated at 18a. The two sealing rings are designated 24a and 25a. In this form of structure it is to be noted that the outer wall of the extension chamber 18a is not flared, but the sealing ring 24a, is spaced from the end wall of the extension chamber so that the fluid under pressure flowing into the extension chamber 18a can operate not only against the internal face of the sealing ring 24a, but against the outer end of the same, exerting sufficient pressure to secure the sealing action against the flow of fluid into the main portion of the chamber 14a.

In Figure 6 another modification is shown. Therein the casing member is designated 12b and the chamber 14b. The packing rings are shown at 20b and 21b. The extension of the chamber is illustrated at 18b. A single sealing ring is herein employed designated 24b. It is provided with an outstanding lip or flange 27b that is located in the extension chamber 18b. In this structure the sealing ring 24b will be expanded in the manner already explained and pressure against the end of the flange 27b will of course urge the sealing ring 24b against the adjacent packing ring 21b. This pressure may be augmented by springs as 19b seated in the end wall of the chamber 14b and operating laterally against the sealing ring 24b.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description and it will be understood that various changes in the size, shape, proportion and minor details of construction may be restored to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is:

1. In combination with a rod to be packed, a casing member surrounding the rod and chambered, the chamber having side walls and an outer wall, a contractile rod packing ring member in the chamber surrounding the rod, bearing against one of the side walls and spaced from the other side wall, and an expansible sealing ring member operating to press against the latter, said sealing ring bridging the space between said other side wall and packing ring member and having an outer portion bearing against the casing member, whereby fluid leaking along the rod will accumulate against the sealing ring and force it against the packing ring, thereby sealing the chamber outside said rings against the said fluid.

2. In combination with a rod to be packed, a casing member surrounding the same and having a chamber, said chamber having a reduced extension at one end providing a

peripheral shoulder, a contractile packing ring in the chamber and surrounding the rod, and a sealing ring located in the reduced extension of the chamber and having a peripheral portion bearing against the shoulder and one end bearing against the packing ring and operating to press the same longitudinally of the rod, said sealing ring being spaced from the rod to provide a pressure chamber within it whereby fluid escaping along the rod will accumulate in the sealing ring and be prevented thereby from reaching the chamber outside the packing ring and contracting said ring.

3. In combination with a rod to be packed, a casing member surrounding the same and having a chamber, said chamber having a reduced extension at one end providing a peripheral shoulder, said shoulder being flared toward the chamber, a packing ring in the chamber and surrounding the rod, and a sealing ring located in the reduced extension of the chamber and having a peripheral portion bearing against the shoulder and one end bearing against the packing ring, said sealing ring being spaced from the rod to provide a pressure chamber within it to hold fluid under pressure that acts to expand the sealing ring against the shoulder, and said shoulder acting to shove the sealing ring against the packing ring whereby the chamber around the packing ring is sealed from fluid leaking along the rod and said packing ring is relieved of fluid pressure on its periphery.

4. In combination with a rod to be packed, a casing member surrounding the same and having a chamber, said chamber having spaced end walls and a reduced extension in the inner portion of one of said end walls, a plurality of coacting contractile packing rings in the chamber bearing against the other end wall and surrounding the rod, and an expansible substantially fluid proof sealing ring member in the extension, said sealing ring entering the chamber proper and bearing against the adjacent packing ring, the sealing ring having an internal diameter greater than the diameter of the rod forming a pressure chamber that receives fluid leaking along said rod whereby pressure thereby accumulated therein, causes the sealing ring to be expanded and pressed against the adjacent packing ring.

5. In combination with a rod to be packed, a casing member surrounding the same and having a chamber, said chamber having spaced end walls and a reduced extension in the inner portion of one of said end walls, said reduced extension having a flared outer wall, a plurality of coacting contractile packing rings in the chamber bearing against the other end wall and surrounding the rod, and an expansible sealing ring member in the extension and having a tapered portion bear-

ing against the flared wall thereof, said sealing ring entering the chamber proper and bearing against the adjacent packing ring, the sealing ring having an internal diameter
5 greater than the diameter of the rod, that receives fluid leaking along said rod whereby pressure thereby accumulated therein, causes the sealing ring to be expanded and pressed against the adjacent packing ring.

10 6. In combination with a rod to be packed, a casing member surrounding the rod and chambered, a contractile rod packing ring member in the chamber surrounding the rod, a sealing ring member alongside and
15 operating against the contractile rod packing ring and having an outer portion bearing against the casing member, whereby fluid leaking along the rod will accumulate between said sealing ring and the rod, producing a pressure within the sealing ring to
20 expand it against the casing member, sealing the portion of the chamber around the packing ring against said fluid, and causing the sealing ring to press against the contractile
25 packing ring.

In testimony whereof I affix my signature.

FREDERICK D. DURHAM.

30

35

40

45

50

55

60

65