W. A. DOBLE.

PACKING GLAND FOR HYDRAULIC MOTORS.

APPLICATION FILED APR. 14, 1913.

1,109,826. Patented Sept. 8, 1914.

Fig. 1.

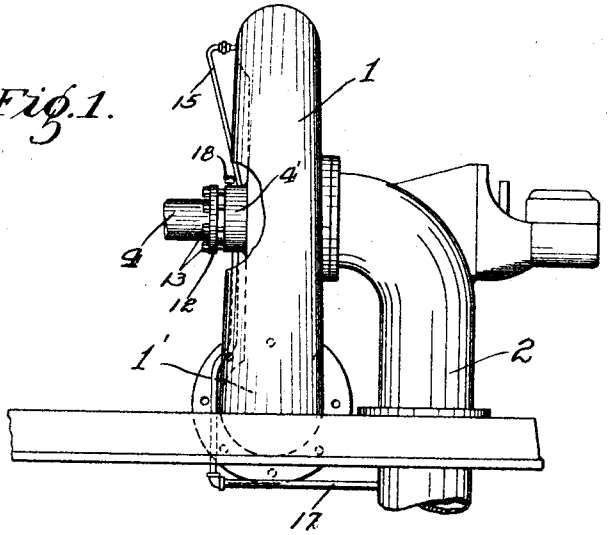
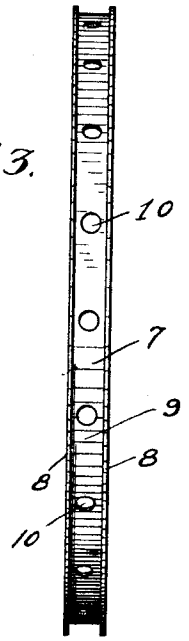


Fig. 3.



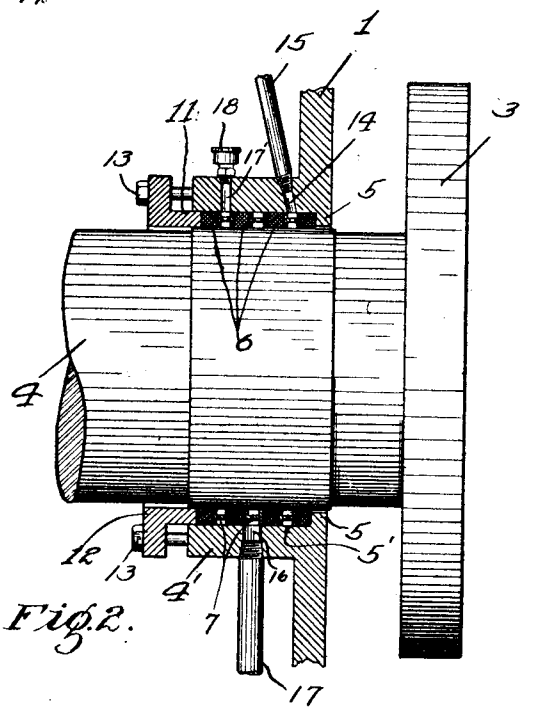


Fig. 2.

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WILLIAM A. DOBLE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE PELTON WATER WHEEL COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

PACKING-GLAND FOR HYDRAULIC MOTORS.

1,109,826. Specification of Letters Patent. Patented Sept. 8, 1914.

Application filed April 14, 1913. Serial No. 760,858.

To all whom it may concern:

Be it known that I, WILLIAM A. DOBLE, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Packing-Glands for Hydraulic Motors, of which the following is a specification.

The hereinafter described invention relates to improvements in packing glands, and particularly to a type of gland adapted for use in connection with hydraulic motors, pumps, turbines, or the like, and the invention has for its principal objects to provide a packing so constructed as to prevent the leakage of the water from the interior of the casing around the shaft; to provide a packing so constructed that the same may be readily lubricated with water from the casing; to provide means for supplying water from the casing to the packing and for conveying the same from the packing back to the casing after the packing and shaft have been lubricated; to construct a packing having an air seal therein which will prevent the drawing of air from around the shaft into the casing on the formation of a vacuum in the interior of the casing, and to construct a packing gland having but few parts, which, when the same become worn may be readily adjusted or replaced at a small expense and without removing the shaft from the casing.

With these and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the appended claims, may be resorted to without departing from the spirit or sacrificing any advantages of the invention.

To more fully comprehend the invention reference should be had to the accompanying drawings wherein is disclosed one form of my invention, and in which—

Figure 1 is a view in elevation of a hydraulic motor with my improved packing gland applied thereto. Fig. 2 is an enlarged vertical sectional view of the invention, disclosing the shaft, the packing and spacing rings, and the inlet and discharge connections from the casing to the packing flange. Fig. 3 is an enlarged view of one of the spacing rings.

Referring more particularly to the drawings, wherein like characters of reference designate corresponding parts throughout the several views, the reference numeral 1 designates a suitable hydraulic motor casing, provided with a water inlet 1′, and a water outlet 2, and in which is rotatably mounted a wheel 3, carried by a shaft 4, one end of which projects through an opening in one side of the casing. The opening is formed with an outwardly projecting annular packing flange 4′ arranged at substantially right angles to the outer face of the casing and is formed at its inner end with an annular flange 5, which extends in a plane parallel to the face of the casing, and said flanges provide an annular recess 5′ in which is mounted the alternately disposed annular packing rings 6, and spacing members 7, which surround the shaft, as in Fig. 2 of the drawings. The packing rings 6 are constructed of any suitable packing material, and the spacing members 7 are preferably constructed of brass, and are formed with parallel spaced side members 8, connected intermediate their edges by a transversely extending member 9 which provides a substantially H-shaped structure in cross section, and the member 9 is provided at spaced intervals with suitable openings 10, which permit the passage of a lubricant from the outer surface of the recess in which the packing rings and spacing members are positioned to the surface of the shaft and vice versa.

The packing rings 6 and spacing members 7 are retained in position in their recess about the shaft 4 by the inwardly extending annular flange 11 of the split collar 12, which is received within the outer end of the packing recess, and the collar 12 is maintained in position and drawn toward the end of the bearing flange 4′ by the stud bolts 13.

Communicating with the interior of the recess 5′ through a bore 14 formed in the upper surface of the bearing flange 4′, the inner end of which opens in communicative relation preferably with the innermost spacing member 7, is a pipe 15, which connects with the upper portion of the interior of the casing 1 and admits of a flow of water from the interior of the casing to the spacing

member, through the openings 10 therein from where it flows to the shaft, lubricating certain of the packing rings and passing beneath the same to one of the other spacing members 7, preferably the center one, which communicates through a bore 16 formed in the lower surface of the bearing flange 4', with a water outlet pipe 17 which leads to the outlet pipe 2; the seepage water and water admitted for lubrication being drawn from the packing rings through the pipe 17, owing to the same being connected to the outlet pipe 2 in which a vacuum is present at times.

Suitable lubricating grease is supplied through a bore 17' in the bearing flange 4' by a grease cup 18, and the inner end of said bore preferably communicates with the interior of the annular recess 5' adjacent the outer spacing member 7, the grease forming an air seal at the outer end of the packing, thus preventing the drawing in of air through the packing on the formation of a vacuum in the interior of the casing, and the grease also providing a lubricant for the two outer packing rings.

From the above construction it will be apparent that a grease lubricant forming an air seal is supplied to the outer packing rings and that a water lubricant is also supplied to the rings and shaft for lubricating the shaft and maintaining the same cool, and that the water lubricant together with any water that may seep from the interior of the casing around the shaft is withdrawn from the interior of the bearing and returned to the water outlet 2 and thus prevented from leaking from between the shaft and the flange 11 or between the flange 11 and the inner surface of the bearing flange 4'. A packing gland has also been provided which will prevent the drawing in of air through the gland to the interior of the casing, on the forming of a vacuum therein, caused by the rotation of the wheel and will prevent the forcing of the water beyond the end of the shaft on a sudden increase of pressure on the interior of the casing. It will also be apparent that any grit or foreign substance which might find its way into the packing will be drawn with the water therefrom.

Having thus described my invention what I claim as new and desire to protect by Letters Patent is:—

1. In a packing gland of the class described the combination with a packing flange, a shaft extending therethrough, a plurality of disk-shaped rings interposed between said shaft and the packing flange, a plurality of perforated disk-shaped spacing rings arranged in alternate relation with the packing rings, means for admitting grease to that spacing ring adjacent the outer end of the flange, means for delivering a cooling fluid to another of said rings between the first mentioned ring and casing, and an outlet for the waste fluid leading from the packing flange, the said grease forming an air seal at the outer end of the flange.

2. In a hydraulic motor, the combination of a substantially cylindrical casing having an inlet in the periphery thereof, an outlet pipe leading from the side thereof, a rotatable wheel within the casing, the casing having on the side opposite to said inlet conduit a laterally extending packing flange, a shaft for the wheel projecting through said packing flange, a perforated metallic spacing ring interposed between the shaft and packing flange adjacent the side of the casing, a conduit leading from the upper portion of the casing and communicating with said spacing ring through the wall of the flange, a perforated metallic spacing ring arranged to the outside of the first mentioned ring, a conduit leading from the casing inlet conduit to the lower face of said packing flange and communicating through the wall of the flange with said last mentioned spacing ring, an auxiliary perforated metallic ring arranged to the outside of the last mentioned spacing ring, a grease cup positioned on the upper surface of the flange and communicating through the wall of the flange with the auxiliary perforated spacing ring, packing rings arranged between the rings and to the outside of the end ring, and a stuffing gland engaging the end packing.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM A. DOBLE.

Witnesses:

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