G. C. HICKS, Jr.

SHAFT PACKING.

APPLICATION FILED JUNE 21, 1909.

955,332. Patented Apr. 19, 1910.

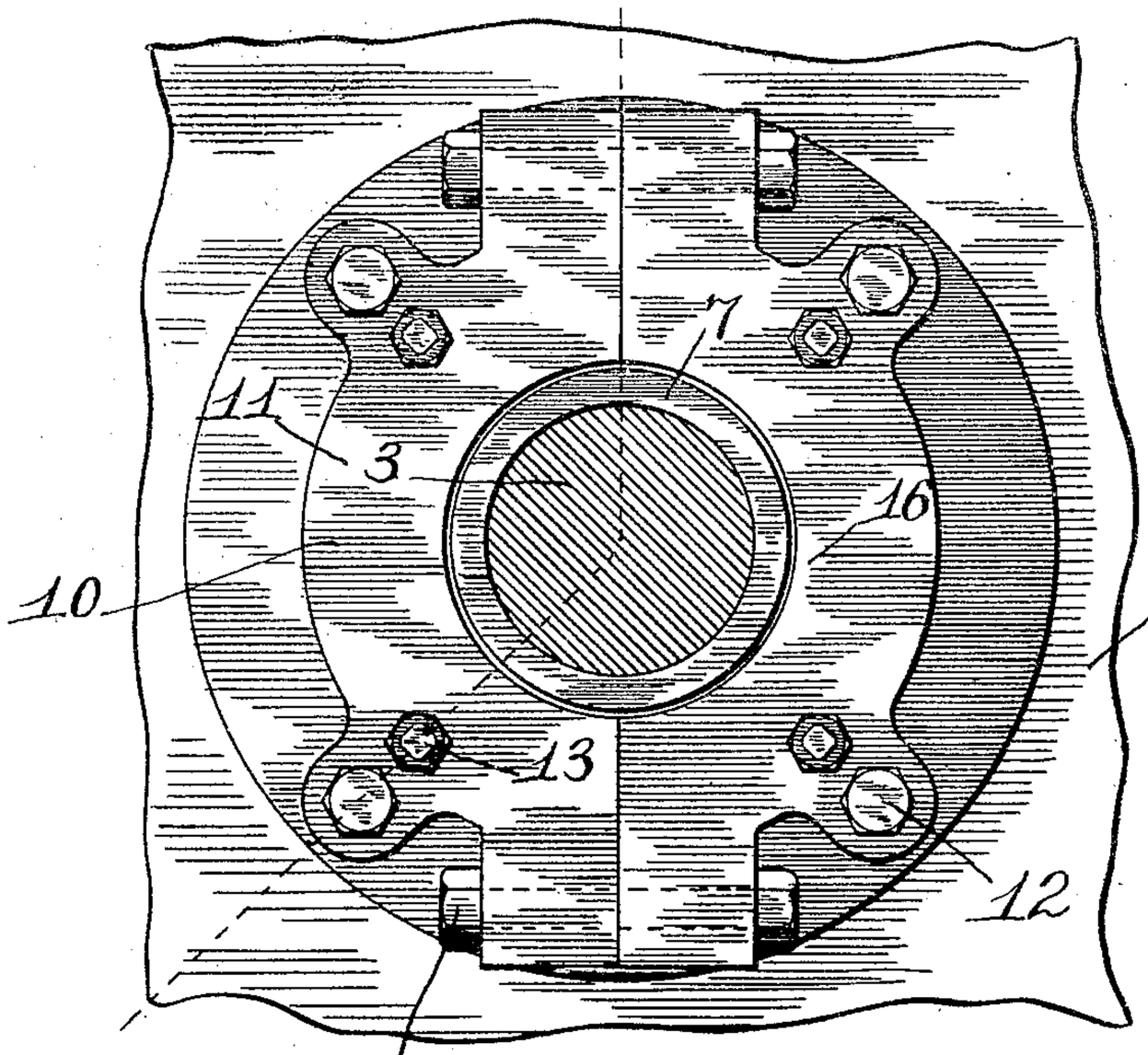


Fig 1.

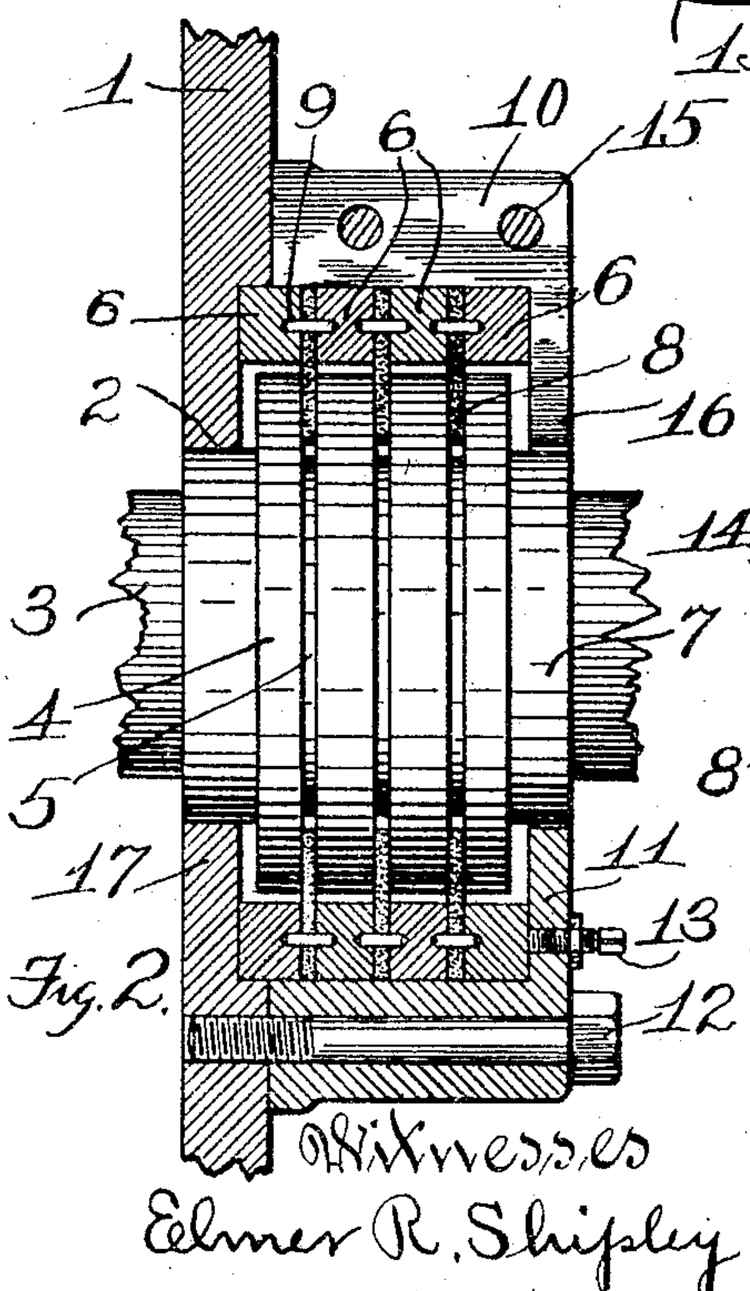
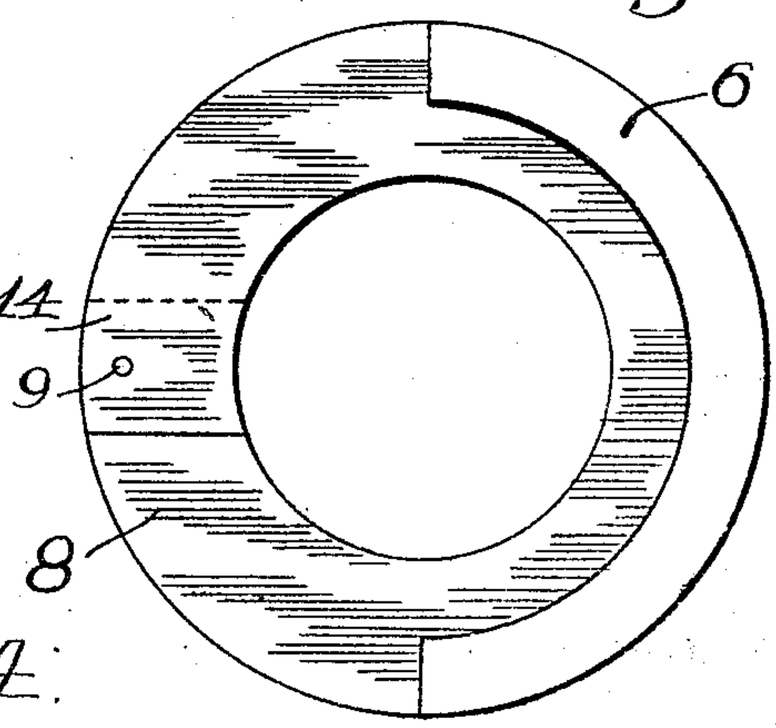


Fig. 2.

Fig. 4.

Fig 3



Witnesses

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SHAFT-PACKING.

955,332. Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed June 21, 1909. Serial No. 503,340.

To all whom it may concern:

Be it known that I, GEORGE C. HICKS, JR., a citizen of the United States, residing at Connersville, Fayette county, Indiana, have invented certain new and useful Improvements in Shaft-Packing, of which the following is a specification.

There are situations in which a rotary shaft projects through the wall of a chamber and requires to be packed to prevent inward or outward leakage. Examples are found in rotary blowers, pumps, exhausters &c. Very frequently such packing is effected by means of a stuffing-box and fibrous packing, but such packing arrangements require frequent attention as wear takes place, and proper attention to the packing generally calls for considerable space longitudinally of the shaft, and in some types of machines this space is very much restricted by the presence of gears, outer bearings, and the like.

The present invention will be readily understood from the following description taken in connection with the accompanying drawing in which:—

Figure 1 is a face elevation of a packing-box exemplifying the present invention: Fig. 2 a vertical section thereof: Fig. 3 a face elevation of one of the packing-rings and a half of one of the pressure-rings: and Fig. 4 an edge elevation of a portion of one of the packing-rings.

In the drawing:—1, indicates a chamber-wall: 2, an opening therethrough for the shaft: 3, the shaft: 4, a series of separated collars on the shaft exterior to the wall of the chamber: 5, the grooves between the collars: 6, a series of pressure-rings disposed exterior to the chamber-wall and surrounding the collars, each of these pressure-rings being divided diametrically: 7, the hubs of the collar-structure, the lot of collars being illustrated as being formed in a single general collar-structure fixed to the shaft, as by being shrunk or pressed to place: 8, a flat ring of packing material, preferably leather, clamped between each pair of pressure-rings their inner portions engaging in the grooves between the collars, these packing-rings being formed with a scarf joint to permit of their being placed and removed: 9, the dowel-pins projecting from one pressure-ring to the other and through the intermediate packing-rings, preferably at the scarfed joints of the packing-rings, and serving to prevent the rotation of the packing-rings with the shaft: 10, a casing surrounding and fitting the exterior of the pressure-rings and rigidly secured against the outer face of the chamber-wall, this casing being diametrically divided: 11, the outer wall of the casing, this wall being disposed exterior to the outermost one of the pressure-rings: 12, bolts disposed parallel with the shaft and serving to secure the casing to the chamber-wall: 13, set-screws threaded into the outer wall of the casing and impinging against the outermost pressure-ring: 14, the scarfed joint of a packing-ring: 15, bolts disposed at right angles to the axis of the shaft and serving to clamp together the two halves of the casing: 16, that portion of the outer wall of the casing nearest the shaft and coming exterior to the outermost collar: and 17, that portion of the chamber-wall coming nearest to the shaft and lying inward of the innermost collar.

The thickness of the pressure-rings is to be such as to bring the packing-rings into the planes of the grooves between the collars, and set-screws 13 are to be tightened sufficiently to bind the pressure-rings and packing-rings firmly to place against rotation. With no preponderating internal or external pressure seeking to leak past the chamber-wall the packing-rings will be free in the grooves and rub the walls thereof with only such friction as may be incident to the snugness with which the packing-rings fill the grooves sidewise. In case of preponderating pressure from the inside of the chamber the packing-rings will be forced snugly against the inner faces of the collars, and in case of preponderating pressure from the outside of the chamber the packing-rings will be forced against the outer faces of the collars and, in either case, such leakage as may occur past one packing-ring will be

throttled in passing the next packing-ring, and so on, the multiple system of packing-rings making it possible to take care of any ordinary pressures.

The formation of the collars exterior to the shaft, in lieu of forming the grooves directly in the shaft, avoids the weakening of the shaft. The forming of the collars in a single collar-structure separably secured to to the shaft permits of the assembling of the parts when the opening 2 through the chamber-wall is too small to permit the collars to pass through the opening, the separable collar-structure not being called for in case the opening 2 has a diameter sufficient to admit the collars, as would be the case if the innermost portion 17 of the chamber-wall were omitted, that portion of the chamber-wall being without office in connection with the packing but having certain office in connection with the revolvers or impellers of certain types of blowers and pumps. Similarly, the inner portion 11 of the outer wall of the casing is without office in connection with the packing other than that of neatly inclosing the collars.

Joint-bolts 15 are not essential but serve to render the casing more solid and less liable to leakage in case liquid lubricant is employed. By slacking the set-screws and by removing bolts 15 and also the bolts 12 in one-half of the casing, that half of the casing may be withdrawn in a direction at right angles to the shaft and then the pressure-rings may be withdrawn, and the joints of the packing-rings may be opened and they may be withdrawn from between the collars. The second half of the casing might, of course, be removed and, in any event, the removal and placing of the casing and packing parts may be done in a direction at right angles to the shaft and without hindrance from parts upon the shaft so near the chamber-wall as to prevent satisfactory dealings with ordinary packing-boxes.

I claim:—

1. A packing comprising, a chamber-wall, a rotary shaft passing therethrough, separated collars on the shaft exterior to the wall, divided pressure-rings encircling the collars, packing-rings clamped between the pressure-rings and engaging the grooves between the collars, means supported by the chamber-wall for forcing the pressure-rings toward each other and toward the chamber-wall, and a casing for holding the divided pressure-rings, combined substantially as set forth.

2. A packing comprising, a chamber-wall, a rotary shaft passing therethrough, separated collars on the shaft exterior to the wall, diametrically divided pressure-rings encircling the collars, openable packing-rings clamped between the pressure-rings and engaging the grooves between the collars, and means supported by the chamber-wall for forcing the pressure-rings toward each other and toward the chamber-wall, combined substantially as set forth.

3. A packing comprising, a chamber-wall, a rotary shaft passing therethrough, separated collars on the shaft exterior to the wall, pressure-rings encircling the collars, packing-rings clamped between the pressure-rings and engaging the grooves between the collars, a casing separably secured to the outer surface of the chamber-wall and inclosing the pressure-rings and packing-rings, and screws supported by the outer wall of the casing and impinging against the outermost pressure-ring of the series, combined substantially as set forth.

4. A packing comprising, a chamber-wall, a rotary shaft passing therethrough, separated collars on the shaft exterior to the wall, pressure-rings encircling the collars, packing-rings clamped between the pressure-rings and engaging the grooves between the collars, a diametrically divided casing separably secured to the outer surface of the chamber-wall and inclosing the pressure-rings and packing-rings, and screws supported by the outer wall of the casing and impinging against the outermost pressure-ring of the series, combined substantially as set forth.

5. A packing comprising, a chamber-wall, a rotary shaft passing therethrough, a collar structure separably secured to the shaft exterior to the chamber-wall, separated collars carried by the collar-structure, pressure-rings encircling the collars, packing-rings clamped between the pressure-rings and engaging the grooves between the collars, and means supported by the chamber-wall for forcing the pressure-rings toward each other and toward the chamber-wall, combined substantially as set forth.

6. A packing comprising, a chamber-wall, a rotary shaft passing therethrough, separated collars on the shaft exterior to the wall, diametrically divided pressure-rings encircling the collars, scarf-jointed packing-rings clamped between the pressure-rings and engaging the grooves between the collars, a diametrically divided casing secured to the exterior of the chamber-wall around the pressure-rings and packing-rings, set-screws carried by the outer wall of the casing and impinging against the outermost pressure-ring, and dowel-pins crossing the spaces between the pressure-rings and passing through the packing-rings, combined substantially as set forth.

7. The combination of a shaft, a plurality of separated flanges thereon, a housing, divided pressure rings within the housing and

flexible packing rings held between the pressure rings and entering the spaces between the flanges.

8. The combination of a shaft, a plurality of separated flanges thereon, a housing, divided pressure rings within the housing, flexible packing rings held between the pressure rings and entering the spaces between the flanges, and means carried by the casing for applying pressure to the pressure rings.

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Witnesses:
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