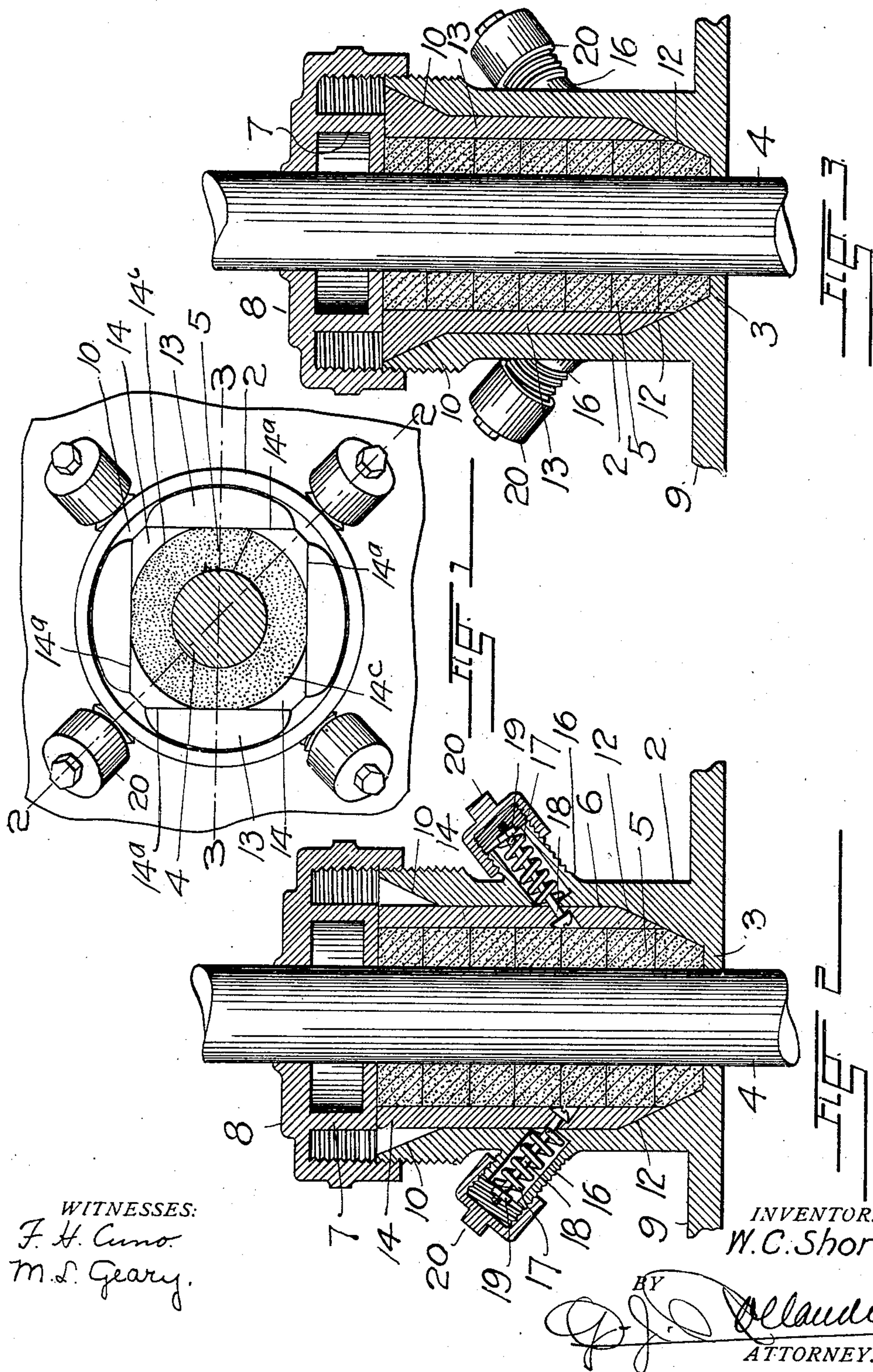


W. C. SHORT.
STUFFING BOX.
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WALTER C. SHORT, OF DENVER, COLORADO.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER C. SHORT, a citizen of the United States of America, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Stuffing-Boxes, of which the following is a specification.

This invention relates to new and useful improvements in stuffing boxes for cylinders and other devices in which it is required to provide a fluid-tight joint about a longitudinally movable or rotary part such as a rod or shaft, and its object resides in the provision of a simple though highly effective appliance by the use of which the movement of the gland ordinarily employed to compress a packing disposed within the box, is converted into a pressure uniformly exerted upon the circumferential surface of the said packing.

In the practice of my invention as will hereinafter be described, I employ a contractible element which surrounding the packing within the box, is operatively associated with its gland so that when the latter is driven inwardly for the purpose of tightening the joint about the moving part, the said element will contract uniformly against the circumferential surface of the packing. The latter is in consequence forced evenly against the entire surface of the moving part and formation of air spaces and breaks in the contact which are almost invariably caused when pressure is exerted upon one end of the packing only, is thereby completely averted.

An embodiment of the invention is illustrated in the accompanying drawings in the various views of which like parts are similarly designated and in which—

Figure 1, represents a plan view of the improved stuffing box after the gland has been removed and Figs. 2 and 3 longitudinal sections taken, respectively along the lines 2—2 and 3—3 Fig. 1, with the gland in its operative position.

Referring to the drawings by numerical reference characters, let 2 designate the internally cylindrical stuffing box whose bottom 3 has a central opening for the passage of the longitudinally movable or rotary rod 4. The packing 5 is, as usual, composed of a plurality of coils which closely surround the member 4 and are separated from the inner surface of the box to provide an an-

nular space for the reception of the contractible element 6, the construction of which will hereinafter be described.

The gland 7 forms part of an internally threaded cap 8 which is disposed in operative engagement with an external screw thread on the outer portion of the box, and it will be understood that the latter may either form part of the cylinder-cover 9 or analogous piece, or that it may be constructed to be detachably secured thereto.

The interior, cylindrical surface of the box is formed at its extreme portions with oblique faces 10 and 12 slanting circumferentially outwardly from the said surface in parallel relation to each other.

The contractible element above referred to, which in the operation of the invention, serves to compress the packing 5 by engagement with its circumferential surface, is composed of four identical members 13 which are longitudinally disposed at quadrant points within the annular space between the packing and the wall of the box 2.

The outer surface of each of the members 13 is transversely arcuate to correspond with the inner surface of the box, and is beveled at its extremities in correspondence with the oblique faces 10 and 12 of the said inner surface with which they are in contact. The opposite, inner sides of the four members are flat and extend in parallel relation to the axis of the box and at right angles to each other to engage the circumferential surface of the packing.

When the four members 13 are in their normal outermost position, with their outer ends substantially in a transverse plane with the edge of the box 2, their adjacent longitudinal edges are spaced from each other to allow the said members to approach the axis of the box, when by pressure exerted upon their outer ends by the gland 7, they are moved inwardly along the inclined faces 10 and 12.

The corners of the rectangle formed by the flat, inner faces of the four members 13 are occupied by fillets 14 whose rectangularly extending sides 14^a engage the respective surfaces of the adjacent members 13 while their diagonal sides 14^c are concave in approximate conformity with the circumferential surface of the packing with which they are in engagement.

The four fillets 14 are provided with obliquely outwardly extending pins 18 which

slidably project through corresponding openings in the wall of the box, into hollow bosses 16 which spring divergently outwardly from the circumferential surface of the box.

Coiled springs 17 which surround the pins 18 within the respective bosses, engage the bottom surfaces of the latter and nuts 19 screwed upon the threaded extremities of the pins, and caps 20 screwed upon the outer ends of the boxes provide a dirt and dust proof closure for the same.

When the assembled parts are in their normal position as shown in the drawings, the outer ends of the members 13 and the fillets 14 are substantially in a plane with the outer edge of the box 2 and engaged by the gland 7 of the screw-cap 8. The packing 5 which surrounds the rod 4, is engaged simultaneously by the members 13 and the fillets 14, while the beveled extremities of the former are contiguous with the respective oblique faces 10 and 12 of the box. When the cap is screwed further upon the box it will cause the members 13 as well as the fillets 14 to move longitudinally, and through the instrumentality of the contacting inclined faces, simultaneously inwardly toward the axis of the box. The packing being circumferentially engaged by the moving parts, is in consequence pressed evenly against the entire surface of the portion of the rod extending through the box. This operation may be repeated until the packing is worn so as to be no longer serviceable or until the longitudinal edges of the members 13 are in contact.

When the cap is unscrewed either to reduce friction between the moving part and the packing or to renew the latter, the springs will automatically cause an expansive movement of the fillets 14 and the members 13 which conjunctively compose the contractible element.

Having thus described my invention what I claim is:—

1. A stuffing-box comprising in combination with a suitable container, a compressible, cylindrical packing spaced from the interior surface thereof, a radially contractible element interposed between the said packing and the said surface, and an adjustable gland operatively engaging the said element.

2. A stuffing box comprising in combination with a suitable container, a compressible, cylindrical packing therein, a radially contractible element engaging the circumferential surface of said packing and a means adapted to actuate the said element.

3. A stuffing box comprising a suitable container whose interior, cylindrical surface is formed with a circumferentially extending oblique face, a packing spaced from the said surface a contractible element within

the said space and composed of a plurality of members each having a beveled portion conforming with the said face, and means to impart a longitudinal movement simultaneously to the said members, whereby they are forced inwardly along the said face and against the circumferential surface of the said packing.

4. A stuffing box comprising a suitable container whose interior, cylindrical surface is formed with a circumferentially extending oblique face, a packing spaced from the said surface a contractible element within the said space and composed of a plurality of members each having a beveled portion conforming with the said face, and a gland movably mounted on the said container in engagement with the ends of the said members whereby, when the said gland is actuated, the said members are impelled to move along the said face and toward the circumferential surface of the said packing.

5. A stuffing box comprising a suitable container whose interior, cylindrical surface is formed with a circumferentially extending oblique face, a packing spaced from the said surface, a contractible element within the said space and composed of a plurality of members each having a beveled portion conforming with the said face, and elastic elements constructed and arranged to resiliently maintain said members in their normal position, and means to impart a longitudinal movement simultaneously to the said members, whereby they are forced inwardly along the said face and against the circumferential surface of the said packing.

6. A stuffing box comprising a suitable container whose interior cylindrical surface is formed with a circumferentially extending oblique face, a packing spaced from the said surface, a contractible element within the space between the said surface and the said packing and composed of a plurality of normally separated equidistant members each having a beveled portion conforming with the said face, and fillets interposed between each two adjacent members in engagement with their inner surfaces, and means to impart a longitudinal movement simultaneously to the said members and the said fillets whereby they are forced inwardly along the said face and toward the circumferential surface of the said packing.

7. A stuffing box comprising a suitable container whose interior, cylindrical surface is formed with a circumferentially extending oblique face, a packing spaced from the said surface, a contractible element within the space between the said surface and the said packing and composed of a plurality of normally separated equidistant members each having a beveled portion conforming with the said face, and fillets interposed between each two adjacent members in en-

gagement with their inner surfaces, elastic means to resiliently maintain the various parts comprised in the said element, in their normal position, and a gland movably mounted on the said container in engagement with the ends of the said members and fillets whereby, when the said gland is actuated, they are impelled to move longitudinally and simultaneously inwardly along the said face and toward the circumferential surface of the said packing.

8. A stuffing box comprising a suitable container whose interior cylindrical surface is formed with a circumferentially extending oblique face, a packing spaced from the said surface, a contractible element within the space between the said surface and the said packing and composed of a plurality of normally separated equidistant members each having a beveled portion conforming with the said face, and fillets interposed between each two adjacent members in engagement with their inner surfaces, springs associated with the said fillets to resiliently maintain them in their normal position and a gland movably mounted on the said container in engagement with the ends of the said members and fillets whereby, when the said gland is actuated, they are impelled to move longitudinally and simultaneously inwardly along the said face and toward the circumferential surface of the said packing.

9. A stuffing box comprising a suitable container whose interior cylindrical surface is formed with a circumferentially extending oblique face, a packing spaced from the said surface, a contractible element within the space between the said surface and the said packing and composed of a plurality of normally separated, equidistant members each having a beveled portion conforming with the said face, and fillets interposed between each two adjacent members in engagement with their inner surfaces, rods connected with the said fillets and extending outwardly through openings in the said container, springs respectively surrounding the rods, in engagement with the said container and with nuts on the said rods, to maintain

the fillets resiliently in their normal position, and a gland movably mounted on the said container in engagement with the ends of the said members and fillets whereby, when the said gland is actuated, they are impelled to move longitudinally and simultaneously inwardly along the said face and toward the circumferential surface of the said packing.

10. A stuffing box comprising in combination with a suitable container, a packing spaced from the interior surface thereof, a plurality of members, longitudinally movably disposed within the said space and a gland movable on the said container, in engagement with the ends of the said members, the said container and the said members having coöperative means whereby their longitudinal movement is converted into a simultaneous inward movement toward the circumferential surface of the said packing.

11. A stuffing box comprising in combination with a suitable container, a packing spaced from the interior surface thereof, a plurality of members, longitudinally movably disposed within the said space, a gland movable on the said container, in engagement with the ends of the said members, and means to resiliently maintain the said members in their normal position, the said container and the said members having coöperative means whereby their longitudinal movement is converted into a simultaneous inward movement toward the circumferential surface of the said packing.

12. In a stuffing box, a suitable container, a cylindrical packing therein, an element comprising a plurality of longitudinally divided members engaging the circumferential surface thereof, and means to move the said members simultaneously radially toward the center of the said packing.

In testimony whereof I have affixed my signature in presence of two witnesses.

WALTER C. SHORT.

Witnesses:

G. J. ROLLANDET,
M. L. GEARY.