

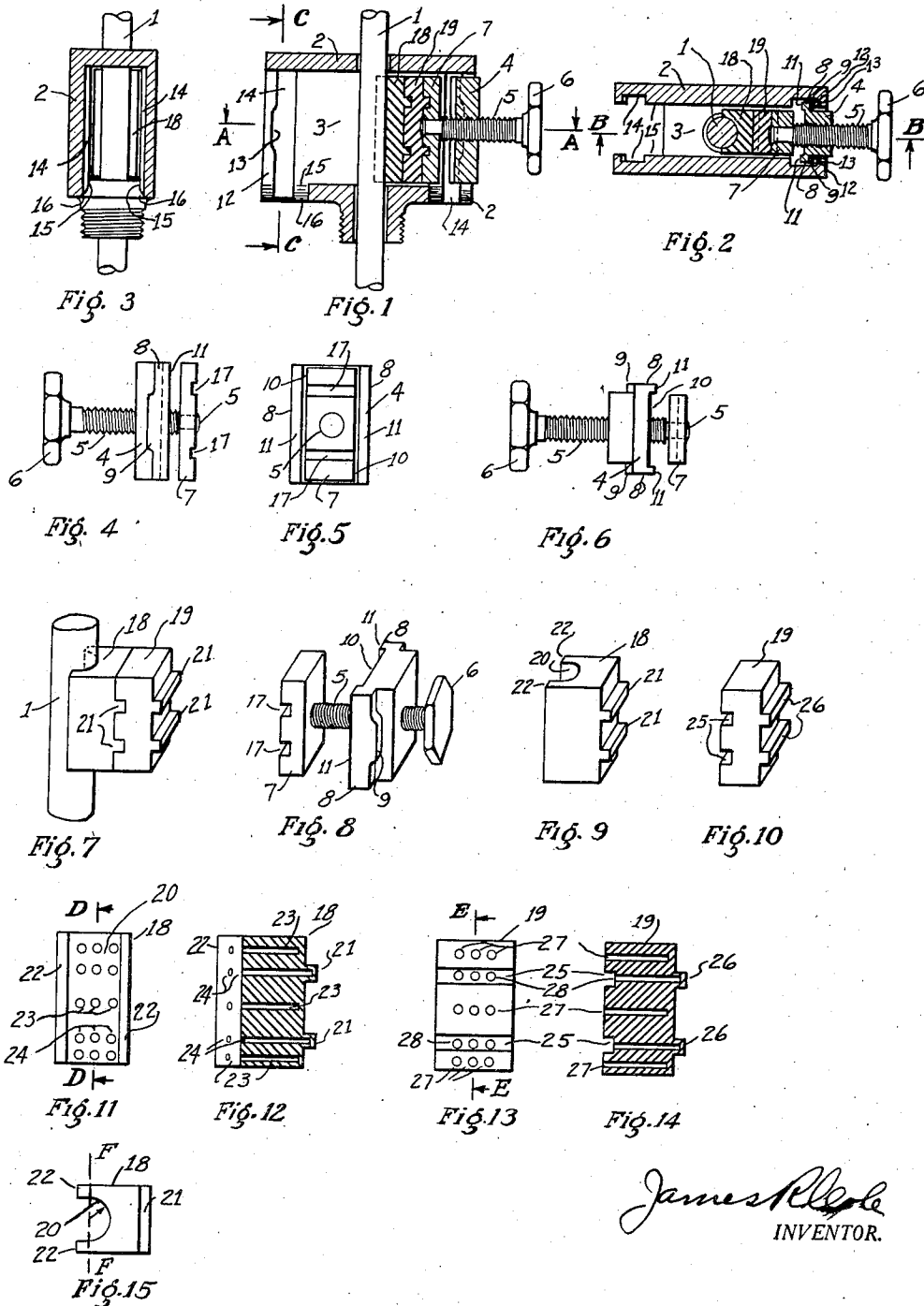
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J. R. COLE

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STUFFING BOX AND PACKING THEREFOR

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James R. Cole
INVENTOR.

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STUFFING BOX AND PACKING THEREFOR

James R. Cole, Tulsa, Okla., assignor to A. Trottnow, Tulsa, Okla., in trust

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My invention relates to stuffing boxes and packing therefor, of the general type in which the packing is compressed against the rod or shaft which is to be packed off in the box in a direction perpendicular to the rod, as in the devices disclosed in Letters Patent of the United States Nos. 1,815,036, 1,858,882, 1,877,268, granted to me under dates of July 21, 1931, May 17, 1932, and September 13, 1932, respectively, and has for its objects: to provide in a removable breech block stuffing box structure, means of guiding the breech block and follower into place in the box and positioning it therein; to provide an inexpensive, simple and efficient packing for boxes of this type, including a starter packing element and a follower packing element, and interlocking means for the two and for the follower packing elements with each other; to provide packing elements adapted to fit and be used with various sizes of polished rods; and to provide overlapping oil reservoirs in the packing elements to at all times provide lubrication against the polished rod.

With the above and other objects in view which will appear as the description proceeds, my invention consists of the novel features hereinafter set forth in detail, illustrated in the accompanying drawing and more particularly pointed out in the appended claims.

Referring to the drawing in which like numerals designate similar parts throughout the several views:

Fig. 1 is a view of said box in vertical longitudinal cross section, with packing in one side thereof, on line B—B of Fig. 2.

Fig. 2 is a view of the same in horizontal longitudinal cross section on line A—A of Fig. 1.

Fig. 3 is a view of the same in vertical transverse cross section on line C—C of Fig. 1.

Fig. 4 is a view in side elevation of the removable breech block, compression screw and compression follower.

Fig. 5 is a view of the same in front elevation showing the face of the follower and breech block.

Fig. 6 is a top plan view of the same.

Fig. 7 is a view in perspective of the polished rod or wire line or shaft against which it is desired to pack off, and a starter packing element contacting said rod and an interlocking follower packing element in place behind and interlocking with said starter packing element.

Fig. 8 is a view in perspective of the packing compressing means appearing in Figs. 4, 5 and

6, and faced as if to engage the packing shown in Fig. 7.

Fig. 9 is a view in perspective of the starter packing element.

Fig. 10 is a view in perspective of the interlocking follower packing element.

Fig. 11 is a view in front elevation of the starter packing element showing holes in said element arranged as hereinafter described.

Fig. 12 is a view of the same in cross section on line D—D of Fig. 11.

Fig. 13 is a view in front elevation of the interlocking follower packing element showing similarly placed holes in said element.

Fig. 14 is a view of the same in cross section on line E—E of Fig. 13.

Fig. 15 is a top plan view of the starter packing element, showing the lips of the same protruding beyond the plane indicated by dotted line F—F passed thru the axis of the semi-circular polished rod groove in said element and at right angles to the longitudinal axis of the packing element in its relation to the polishing rod and box.

In the drawings, 1 represents the polished rod, or other reciprocating or rotatable element against which the packing is designed to pack off, 2 the body portion of the stuffing box, and 3 the packing chamber thru which the polished rod is run.

The box has a removable breech block 4 thru which is threaded a compression screw 5 having a handle 6 thereon wherewith to turn the screw, and a packing follower 7 located on the end of the screw and pivotally connected thereto.

The breech block 4 has longitudinally extending offset portions or slides 8 on either side thereof and a rearwardly extending projection 9 on said slides 8, and said block also has a longitudinally extending groove 10 in its front face, which groove is adapted to receive the packing follower 7 and hold it in relation to said block, said groove being formed by ribs 11 on said block. The slides 8 may not be slides but may be merely offset portions of the block to form projections 9 thereon, and the groove 10 and the ribs 11 need not be such but may consist in any projections to hold the packing follower 7 in alignment with block 4 when the same is being inserted into the box, or the alignment may be maintained by a projection on the follower 7 to be held in a recess in the breech block.

The ends of the box are breeched or open to permit packing to be inserted into the packing chamber 3 of the box. At the ends of the box are inwardly extending flanges or offset portions

12 having an inner recess 13 into which projection 9 on the breech block 4 may fit when the breech block is in place on the box. The box also has grooves or tracks 14 into which the slides 8 on block 4 may slidably fit, with the grooves or tracks 14 sufficiently wide to accommodate slides 8 together with their rearwardly extending projection 9 as the breech block is being slid into place on the box. The bottom wall of the packing chamber 3 is cut short of the end of the box to permit the insertion of the packing follower 7 when it and the breech block are being slipped into operating position in the box, and the side walls of the packing chamber extend beyond the bottom wall as indicated at numeral 15 to form a guide for the packing follower 7 into the packing chamber 3 as the follower is being advanced after the breech block 4 is in position in the box. The lower protrusion of this extended wall 15 is beveled as indicated at 16 to facilitate the entrance of the follower and block into place in the box. The packing follower 7 has grooves 17 therein to receive the ridges on the rear face of the packing elements, as will later appear, and said follower may be made in form to accommodate any packing structure of the interlocking form of packing.

The packing elements disclosed are, a starter packing element 18 and an interlocking follower packing element 19. Element 18 has a polished rod groove 20 in its front face, and ribs 21 on its rear face which is a flat surface lying parallel to the axis of the polished rod groove and transverse of the longitudinal axis of the packing element when in place in the box. The lips 22 of the polished rod groove protrude beyond the cross diameter of the polished rod groove as shown in Fig. 15 wherein the dotted line F—F represents this cross diameter, for the purpose of permitting packing elements for one size of polished rod, such as an inch and one-fourth rod to be used for another size of polished rod. It has been found in practice that a polished rod groove for an inch and one-eighth polished rod and having a lip protrusion of one-sixteenth of an inch, is not only suitable for the last named size of rod but also for the inch and one-quarter size of rod. As molds for the packing elements are expensive, this feature permits one mold to serve the purpose of two molds, as otherwise a mold for both sizes of polished rods would have to be made. Moreover it eliminates the necessity for the maker, distributor and user to carry a stock of both sizes of packing, which is particularly advantageous in oil field practice.

The starter packing elements shown in Figs. 11 and 12 of the drawings have holes for lubricating between polished rod and packing. The holes are arranged in series with some of the holes, such as holes 23, ending short of the rear face of the packing element and other of the holes, such as holes 24, extending beyond and into the offset portion formed by the ribs 21. The effect of this is to provide an overlapping of oil holes with those of the follower packing element so as to at all times provide lubrication as will later be explained.

The follower packing element 19 is provided with cross grooves 25 in its front face and corresponding cross ridges 26 on its rear face. The grooves and ridges in this element coincide with the ridges 21 on the starter element 18 to the effect that element 19 may be placed behind element 18 in the stuffing box, and ridges 21 be held in grooves 25, thus interlocking the two elements

against the tendency of the polished rod to pull out of the box the remaining part of the element with which it is in contact after it has worn the element in two and is also in engagement with the follower element. Also additional follower elements such as element 19 may be inserted into the box behind the previously inserted follower elements and the follower elements will likewise interlock to effect the same result. The polished rod of course cuts its own groove into the follower packing elements as the same wear in use.

Oil holes may also be provided in the follower packing elements to overlap with holes in adjoining elements, as shown in Figs. 13 and 14 wherein holes 27 run from the front face of the element to just short of the rear face, and the holes 28 run from the front face to beyond the rear face of the element and continue into the offset portion formed by ribs 26. Thus at no time will the packing surface in contact with the polished rod be without holes for lubrication. It may be added that the holes may be recesses in any other form desired, and may be used to render the packing element more resilient against the rod and to increase its wiping effect thereon.

In operation with the box in place about the polished rod and the breech blocks removed from the box, a starter packing element is placed in the packing chamber of the box on either side of the polished rod. A follower packing element may, if desired and the box has the capacity, be placed behind each of the starter packing elements, but this is not necessary. The compressing means for compressing the packing, including the assembly of breech block, compression screw and packing follower, all illustrated in Figs. 4, 5, 6 and 8 of the drawings, is then arranged to be slipped into place, which is done by screwing back the follower 7 until it is held in recess 10 in breech block 4, the ribs 11 on the breech block serving to hold the follower in alignment with the breech block and to prevent it from turning cross wise of the block, in which position of course the assembly could not be placed in the box. The breech block and follower are then slipped into the box from the underside, with slides 8 of block 4 running on track 14 in the box and the follower 7 sliding between the side walls 15 of the packing chamber where said side walls extend beyond the packing chamber as shown at 15. The beveled face 16 of this extending portion of said side walls facilitates placing the assembly in the box. The block and follower are then slid into position at a point where the rearwardly extending projection 9 on breech block 4 are opposite recesses 13 in the box, whereupon the breech block is pulled backward and the projections 9 caused to enter and engage said recesses 13, and the screw 5 is then turned to advance the follower 7 into the packing chamber and to press against the packing in the box sufficiently to cause the packing to pack off the polished rod in the box. After the packing so placed in the box is worn to the extent that additional packing is needed, the screw 5 is run back until the follower 7 enters groove 10 of the breech block 4, upon which the breech block is advanced sufficiently to clear the projections 9 from the recesses 13, whereupon the compressing assembly of breech block, screw and follower drops or is moved clear of the breech of the box and additional follower packing elements may then be inserted into the packing chamber of the box thru the breech, upon which the breech block is

again placed in the box and the follower advanced to compress the packing.

Having thus fully disclosed my invention, what I claim and desire to secure by Letters Patent is:

5 1. In a stuffing box having a packing chamber the axis of which is radially disposed with reference to the hereinafter mentioned aligned openings and having aligned openings therein for the
10 insertion of a moving member therethru against which it is desired to pack off and with said box also having a breech in the end of said packing
15 chamber thru which packing may be inserted into said chamber, a removable breech block for said breech, means thereon for compressing packing
20 in said chamber including a packing followed pivotally mounted on the end of a compression screw threadably passed thru said breech block and a screw as aforesaid, means for slidably and simultaneously inserting said breech block together
25 with said packing follower thereon into said breech, one of which means is a track in said box for said breech block and disposed transversely of the axis of said packing chamber and another of which means is an extension of the walls of the
30 packing chamber in said box beyond the packing chamber proper and adjoining said track, interlocking means between said breech block and said packing follower for holding them against rotation with relation to each other on said screw,
35 and an offset means between said breech block and said box for locking said breech block in place in said box against slippage along the aforementioned track.

2. In an interlocking follower packing element
35 for use in a stuffing box wherein a plurality of packing elements are used on opposite sides of a shaft passed through said stuffing box, front and rear plane faced surfaces corresponding with
40 each other to the effect that one of such packing elements may follow behind another of such packing elements into a stuffing box and in turn engage the aforementioned shaft without any intervening space existing between the two packing
45 elements such as would leave the perimeter of the packing chamber of said stuffing box exposed

to the passage of fluid between the two aforesaid packing elements, a projection on one of said surfaces and a corresponding recess in the other of said surfaces, and with said projection and recess located on said packing element intermediate of those surfaces of said packing element which are radially disposed of the axis of the aforementioned shaft when said packing element is in position in said stuffing box, and with said projection extending to both sides of said packing element sufficiently to cause a part of said projection to pass on either side of said shaft when said packing element is in contact with said shaft and is about to be cut in two thereby.

3. In an interlocking follower packing element as claimed in claim 2; and wherein said projection is a ridge and said recess is a groove positioned on said packing element in a direction transverse of the axis of said shaft when said packing element is in place in said stuffing box.

4. A packing for a stuffing box wherein a plurality of packing elements, compressible in a direction transversely of a shaft passed thru said box, are used; including an initial packing element for initial use in said box in coaction with an interlocking follower packing element positioned behind said initial packing element, and with said initial packing element having a polished rod groove in its front surface and having a plane faced rear surface and a projection on said rear surface positioned thereon in manner to be received into a corresponding recess in said interlocking follower packing element, and an interlocking follower packing element having its front surface correspondingly contoured to the rear surface of said initial packing element, including therein a recess to receive said projection on said initial packing element; and with said projection on said initial packing element extending to both sides of said packing element sufficiently to cause a part thereof to pass on either side of said shaft when said packing element is in contact with said shaft and is about to be cut in two thereby.

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