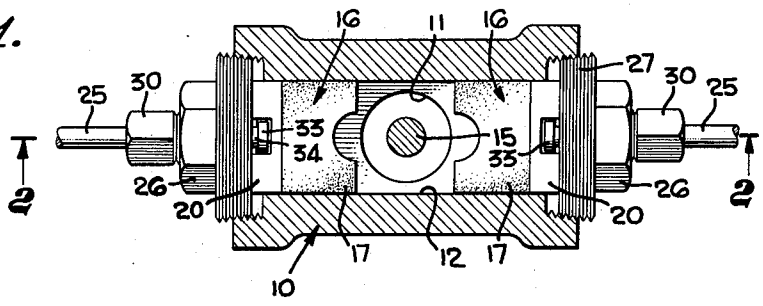
Aug. 28, 1956 J. P. RATIGAN 2,760,749

COMPOSITE BLOCK FOR SHUT-OFF MECHANISM

Filed Jan. 11, 1951

FIG. 1.



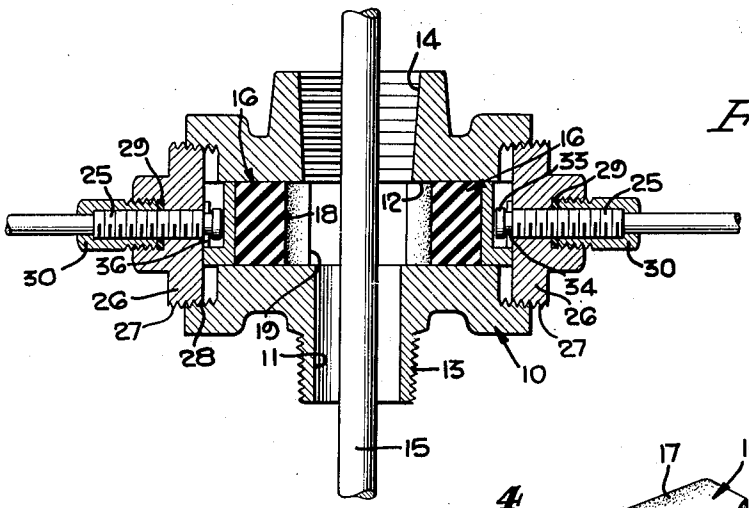
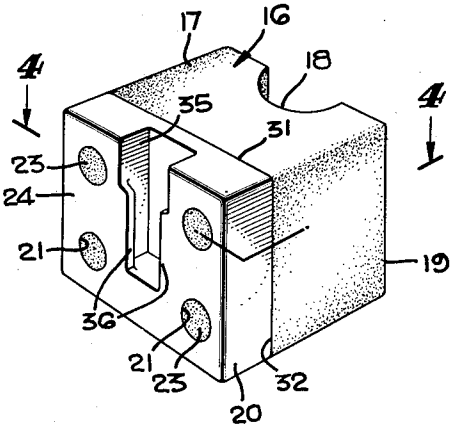


FIG. 2.

FIG. 3.



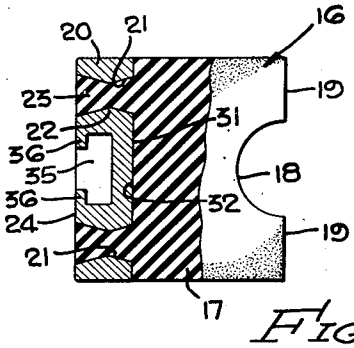


FIG. 4.

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COMPOSITE BLOCK FOR SHUT-OFF MECHANISM

James P. Ratigan, Los Angeles, Calif., assignor to J. P. Ratigan, Inc., Los Angeles, Calif., a corporation of California

Application January 11, 1951, Serial No. 205,539

1 Claim. (Cl. 251—2)

This invention relates to improvements over the shut-off mechanism disclosed in my copending application, Serial No. 672,352, filed May 27, 1946, now abandoned of which the present application is a continuation-in-part. The present invention concerns an improved form of sealing block for effecting a shut-off in the casing head of an oil well.

In the operation of oil wells it is the common practice to employ a pump located near the bottom of the well bore, the moving part of the pump being actuated by a string of sucker rods extending from the ground surface. The uppermost of these rods, called the polish rod, extends through the tubing and stuffing box, which permits the reciprocation of the polish rod relative to the tubing but prevents escape of oil around the polish rod.

It is frequently desirable to shut off the gas and oil pressure below the stuffing box, as for example, when it is desired to renew the packing in the stuffing box, and for that purpose a shut-off mechanism is either associated with the stuffing box or is provided as a separate element disposed immediately below the stuffing box with valve members adapted to close about the polish rod to seal the space between the tubing and the polish rod and prevent the escape of gas and oil, even through the stuffing box may be removed or opened for repair.

It is an object of this invention to provide an improved form of sealing block for a shut-off mechanism which may be employed in combination with a stuffing box connected to the flow tubing of oil wells.

Another object is to provide a sealing block of this type which employs a resilient sealing material attached and bonded in a novel fashion to a metal backing element.

Other objects and advantages will appear hereinafter.

In the drawings:

Figure 1 is a sectional plan view showing a shut-off mechanism employing my improved form of sealing blocks.

Figure 2 is a sectional elevation taken substantially on the line 2—2 of Figure 1.

Figure 3 is a perspective view showing a preferred embodiment of my invention.

Figure 4 is a plan view having a portion taken substantially on the line 4—4 of Figure 3.

Referring to the drawings, the shut-off mechanism includes a body **10** having a central vertical opening **11** and a transverse passageway **12** intersecting the opening. The transverse passageway **12** is preferably rectangular in cross-section. The lower portion of the body may be provided with threads **13** for connection to a well head. The upper portion of the body **10** may be threaded internally as shown at **14** for connection to a stuffing box. The polish rod **15** extends axially through the vertical opening **11**. Means are provided for sealing off around the polish rod **15**, and as shown in the drawings this means includes a pair of sealing blocks **16** mounted for sliding movement in the transverse passageway **12**. These blocks are preferably identical, and as clearly shown in Figure 3 each comprises a rectangular block element **17** shaped to fit the rectangular cross-section of the passageway **12**. A semi-circular groove **18** is provided in the forward face **19** of the block element **17** for sealing contact with the polish rod **15**. The groove **18** may be omitted if desired, particularly when the device is to be used for sealing off about a wire line of relatively small lateral dimensions. The element **17** is preferably formed of yieldable rubber-like resilient material. A metallic plate **20** having the same rectangular shape as the element **17** is secured to the rear face of the element **17**.

In accordance with my invention, the rectangular plate **20** is provided with a plurality of apertures **21** extending therethrough. Preferably the cross-sectional area of the apertures is not uniform throughout the length thereof, but on the contrary each aperture is necked in near the midpoint **22** of its length so that the outer ends of the apertures are of larger size than the necked down midportion. The resilient block element **17** is molded on the plate **20** so that integral projections **23** of resilient material fill the apertures **21** from end to end. These projections **23** preferably terminate in a plane coincident with the end surface **24** on the metallic plate **20**. The molding process also establishes a bond between the face **31** of the metallic plate and the face **32** of the resilient block **17**.

Means are provided for moving the sealing block **16** from the inoperative position shown in Figures 1 and 2 to an operative sealing position in which the semi-circular grooves **18** engage and encompass the polish rod **15**. As shown in the drawings, this means includes jack screws **25** threaded into end caps **26**. The end caps **26** are connected to the body **10** by means of tapered threads **27**, which form a seal. A packing ring **29** may be mounted in the end caps **26** encircling the jack screws **25**, and a gland **30** is threaded into each end cap for compressing the packing **29**.

The jack screws **25** are each provided with a head **33** at the inner end and a groove **34** adjacent the head. The head **33** on each jack screw is received within a slot **35** provided in the face **24** of the metallic plate **20**. The slot extends vertically to the upper end of the collar but terminates short of the lower end thereof. Parallel flanges **36** of relatively narrow width engage within the groove **34** on the jack screw **25**. These flanges **36** extend to the bottom of the slot **35**, but terminate short of the upper end of the slot. From this description it will be understood that when the jack screws **25** are turned in one direction the sealing blocks **16** are caused to move inward toward the polish rod **15**, and when the jack screws are turned in the other direction the sealing blocks **16** are retracted away from the polish rod **15**.

The resilient block elements **17** fit within the transverse passageway **12** rather closely, and after being compressed about the polish rod **15** to form a seal it may take considerable force to retract them into operative position. Accordingly, a rigid connection of high strength between the yieldable block element **17** and the metallic plate **20** is necessary. The projections **23** within the tapered apertures **21** in the plate **20** provide the necessary strength.

To assemble the block **16** into position within the transverse passageway **12**, the end caps **26** are first removed by unthreading them from the body **10**. The blocks **16** are then inserted into the ends of the passageway **12**. The jack screws are advanced within the end caps **26** and the heads **33** placed in position within the slots **35** before the end caps **26** are re-engaged with the body **10**. The end caps **26** may be screwed into the threads on the body without danger of disconnecting the

heads **33** from the slots **35** because the flanges **36** enter the grooves **34**.

While in the foregoing I have illustrated and described the shut-off mechanism as applied around the polish rod, it will be apparent that if the polish rod or sucker rods are not present or have been removed, a further tightening of the jack screws **25** will squeeze the resilient elements **17** together against each other to completely seal off the vertical opening in the body **10**. This seal can be effected whether the resilient blocks **16** are grooved at **18** or whether the groove **18** is omitted.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details herein set forth, but my invention is of the full scope of the appended claim.

I claim:

In a shut-off mechanism for use on a well head, the combination comprising: a body member having walls defining a fluid passage extending therethrough, the body member also having walls forming a transverse bore of noncircular internal cross-section intersecting said fluid passage, a pair of noncircular rubber blocks mounted in said transverse bore on opposite sides of said fluid passage, each rubber block being shaped complementary to said bore and completely filling the bore, each rubber block having side faces slidably contacting the walls of the bore, each rubber block having a front face provided with a groove so that the confronting front faces of the rubber blocks are adapted to fit around a rod extending through the fluid passage, each rubber block having a rear face, a noncircular metallic plate fixed to the rear face of each block and completely filling the bore, the plate having edges flush with the side faces of its respective rubber block, a rotatable screw element threadedly engaging a threaded bore in a member fixed relative to said body, said screw element being connected with each metallic plate within the body member for sliding the rubber blocks toward each other along the transverse bore across said fluid passage into front face abutting relation, the rubber blocks being sufficiently deformable so that, in the absence of the rod, the rubber blocks may be advanced by the screw elements to deform the abutting front faces and bring the surfaces of the grooves into complete mutual sealing contact.

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