June 7, 1932. F. J. SCHWEITZER 1,861,614

CASING CONTROL GATE

Filed Oct. 14, 1930

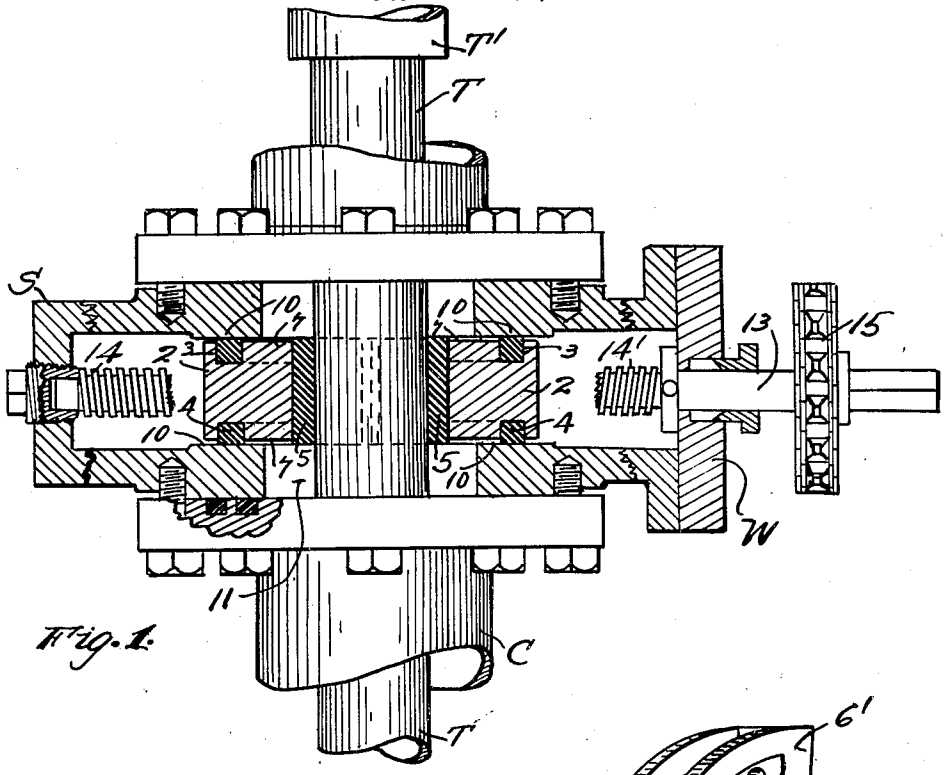


Fig. 1.

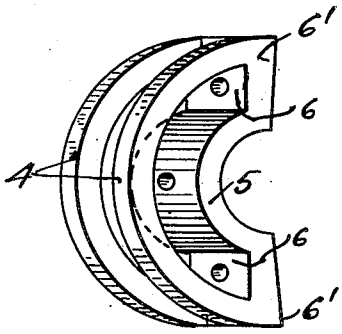


Fig. 3.

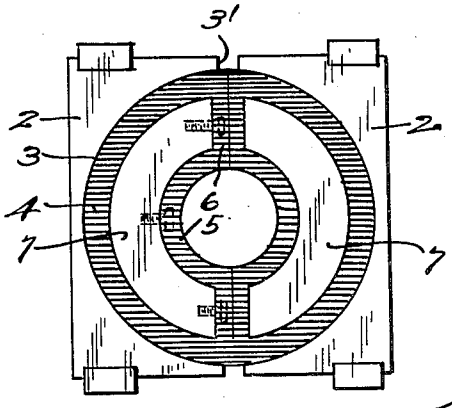


Fig. 2.

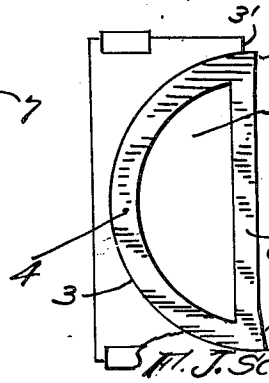


Fig. 4.

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UNITED STATES PATENT OFFICE

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CASING CONTROL GATE

Application filed October 14, 1930. Serial No. 488,572.

This invention relates to well casing control gates of the type established by W. D. Shaffer and disclosed in his application Ser. No. 351,522, filed April 1, 1929, and of which this is modification of the rubber packer element.

This packer element is fitted in a ram or gate member of which a pair is adapted to be operated in a shell so as to close onto an interposed object, or close face to face if no object is interposed.

A very important feature of this type of gate is that the rubber packer element is of such form and so mounted in the ram member that the rubber is expressed up and down from the channels in the top and bottom faces of the ram when this is set in hard and compresses the face of the packer against the object.

In the aforesaid application the gate member has top and bottom laps of rubber laterally from a face body and in each lap is sunk a washer segment.

The present improvement resides in the formation of semicircular grooves in the top and bottom of the ram member and of corresponding parallel half-rings laterally from the packer face body so that top and bottom bearing lands integral with the ram body are presented to bear on oppose guide faces of the enclosing shell.

The invention consists in certain advancements in this art as set forth in the ensuing disclosure and having, with the above, additional objects and advantages, and whose construction, combination and details of means, and the manner of operation will be made manifest in the description of the herewith illustrative embodiment; it being understood that modifications, variations and adaptations may be resorted to within the scope, principle and spirit of the invention as it is more directly claimed hereinafter.

Figure 1 is a sectional elevation of the control gate in a string of casing.

Figure 2 is a plan of the closed rams.

Figure 3 is a perspective of a rubber gasket element.

Figure 4 is a plan of a gasket for shut off of casing; without a center object.

The apparatus includes a closure device consisting of a pair of cooperative, opposed ram members hereinafter called "gates" which are of different types according to use in casing with, or in absence of, a center line of pipe.

One type of gate 2 is adaptable to close on an inner pipe or tube T, while another form $2^{\times}$ is for use when it is desired to completely close off the casing when no tube is in place; this being called a "blind gate."

In Figure 1 a pair of tube embracing gates 2 is shown assembled in a generally flat shell, and closed by an integral rear end wall and having an end wall W removable for insertion and removal of all interior parts.

A gate 2 consists of a generally rectangular block whose top and bottom faces have semicircular grooves or channels 3 arcing back from diametrical faces 3′, and filled with deformable, semicircular rings 4 of which a pair projects unidirectional and laterally from the reverse face of a main packing body 6 constituting a diametrical packer of the gate 2. If the packer is to seat on a cylindrical object, as a tube T, in the casing C the obverse face of the body has an arch 5 complementary to the object, but if the gates are to shut off a clear casing then the obverse face of each body 6 is flat so as to meet diametrically.

The half rings 4 are in parallelism as shown in Figure 3 and are snapped into place about the segmental bearing areas 7 surrounded by the channels 3.

In order to insure a backward flow of the rubber rings when the gates are closed, the faces 6 are made full or over size at the corner 6′ with the result that the ring rubber is extruded somewhat from its channels in the gate and forced out with much pressure against adjacent guide and bearing faces 10 in the shell. The thickness of the gates is such that these slide on and between faces 10 and when the gates are closed a tubing collar T′ may be lowered to hang on the solid bearing lands 7 of the gates.

The outer diameter of the lands 7 is greater than the casing bore hole 11 in the shell S so that when the gates are fully closed they do not run in past the shell hole and

therefore, the gates cannot become interlocked against opening. The minor diameter of the packer rings 4 is also greater than the shell bore and therefore when the gates are closed face to face or closed on the tubing C, a complete circle of packing rubber is established to set against the shell faces 10.

The gates are operated by means of coordinated screws 14—14′ of shafts 13 intergeared by transmission 15.

What is claimed is:

1. In a casing shut-off control, a rubber packing body including a diametrical portion with an obverse face to set against an opposed part and from which portion integrally extend lateral, parallel half-ring laps in spaced relation and adapted to be snapped into corresponding ring grooves in a complementary ram element, the said laps extending uni-directionally from the reverse face of said portion.

2. In a casing shut-off control, a rubber packing body including a diametrical portion with an obverse face to set against an opposed part and from the reverse face of which extend parallel, half-ring laps in spaced relation and adapted to be snapped into corresponding ring grooves in a complementary ram element; the said portion having an arc part to set against a corresponding object and radial webs connecting the extremities of the arc to the said caps.

3. In a casing shut-off control, a rubber packing element including a diametrical body portion to set against an opposed part and from one face of which extend, unidirectional, symmetrical lateral loops to snap into respective grooves provided therefore in a gate member against which said portion is adapted to bear when said member is interposed between the loops.

4. In a casing shut-off control, a gate member having a transverse, packer supporting face and flat, top and bottom members which have packer loop grooves commencing and ending in said face and forming intermediate bearing lands, and a packing rubber including a main facing body lapped against said face and having top and bottom loops extending laterally from the obverse face of said body and countersunk in said grooves and surrounding said lands.

5. In a casing shut-off control, a gate member having a transverse, packer supporting face and parallel, opposite sides which have packer loop grooves commencing and ending in said face and forming intermediate bearing lands, and a packing rubber including a main facing body lapped against said face and having loops extending laterally and countersunk in said grooves; said body being fulled at its corners so that its reaction under closing resistance causes extrusion of the loops from the grooves.

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