Sept. 3, 1940. B. J. FESTERVAN ET AL 2,213,580

STOP FOR OIL WELL CASING AND TUBING

Filed Oct. 25, 1938 2 Sheets-Sheet 1

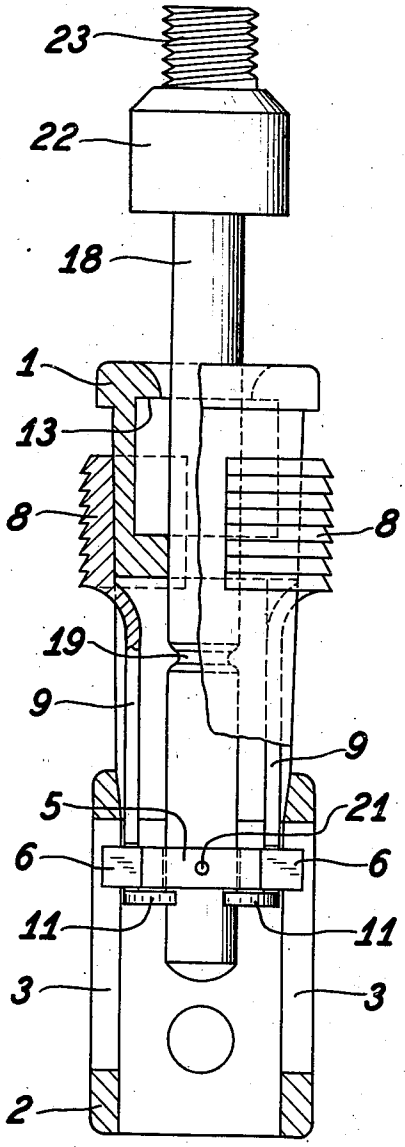


FIG_2_

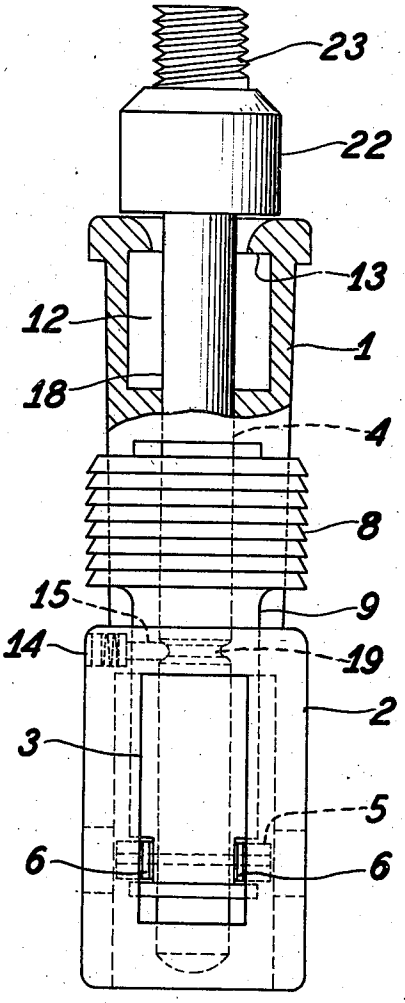


FIG_1_

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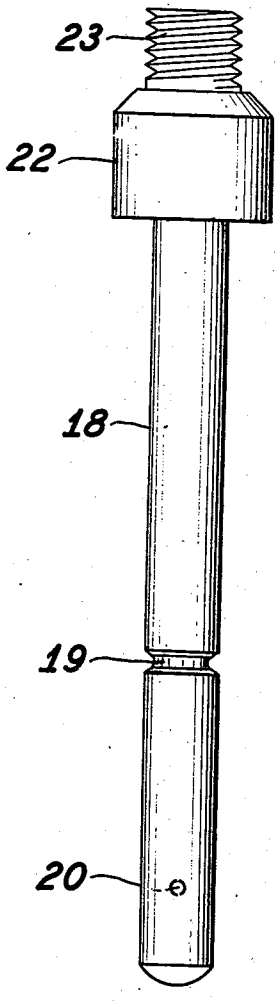


FIG_3_

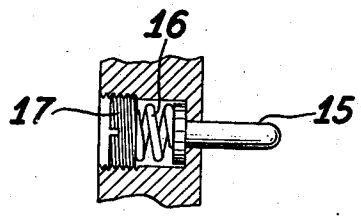


FIG_4_

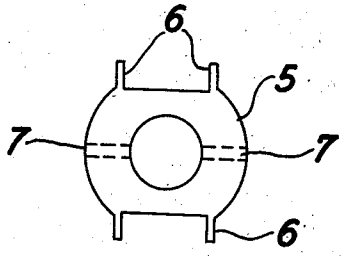


FIG_5_

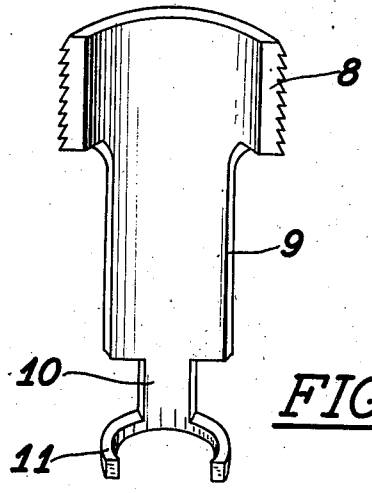


FIG_6_

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UNITED STATES PATENT OFFICE

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STOP FOR OIL WELL CASING AND TUBING

Benjamin J. Festervan and Nathan F. Henderson,
Monroe City, Tex.

Application October 25, 1938, Serial No. 236,862

6 Claims. (Cl. 166—13)

The present invention is directed to a stop adapted to be inserted in tubing or in casing for any desired purpose in oil wells. More particularly it is directed to a stop especially suited for use in conjunction with the paraffin drill described in co-pending application, Serial No. 235,795.

The principal object of the present invention is the provision of a stop of the character described having a main body portion on which are slidingly mounted slips having serrated edges which upon separation or spreading apart are adapted to engage the walls of the tube or casing in which the stop is to be set and hold the stop in position against downward shocks.

An additional object of the present invention is the provision of a stop of the character described which is adapted to be set in place by an upward jar rather than by a downward jar.

A further object of the present invention is the provision of a stop of the character described which is so constructed as to set more firmly in place by any impact it receives from above.

Another object of the present invention is the provision of a stop of the character described having an inside fishing recess.

An additional object of the present invention is the provision of a stop of the character described in which the setting mechanism is contained on the inside and is provided with a shear pin which can be sheared by a jar.

Further objects and advantages of the present invention will be apparent from the following detailed description of the accompanying drawings in which—

Figure 1 is a side view of the whole assembly as it is lowered into the tubing;

Figure 2 is a side view, partly in section, of the assembly, turned 90° from the position shown in Figure 1, with the parts shown in the position they assume when the setting operation is about completed;

Figure 3 is a side view of the setting tool;

Figure 4 is a detail of the spring lock for holding the parts in the position shown in Figure 1;

Figure 5 is a detail of the ring member provided for holding the slip springs, the setting tool and the shear pin; and

Figure 6 is a detail of the spring arm of one of the slips.

Referring to the drawings in detail, numeral 1 designates a mandrel having integrally formed at its small end an open cylinder 2, provided with diametrically opposed longitudinal slots 3. The interior of the cylinder communicates with a longitudinal bore 4 in the mandrel. Slidingly carried by the inside of the cylinder is a ring member 5 provided with ears 6 which ride along the edges of slot 3, and provided with diametrically opposed holes 7 adapted to receive a shear pin as hereinafter described. The serrated slips 8 are carried against the sides of the mandrel by spring arms 9, each slip being provided with a spring arm. Each spring arm 9 is arranged to cover a slot 3 and is provided at its lower end with an indented portion 10 adapted to fit between the ears 6 and with an arcuate element 11 adapted to abut against the lower edges of the ears 6. The arcuate element is of sufficient length to extend beyond both sides of slot 3 and is carried inside the cylinder whereby the spring arms are held in place between ears 6 and are caused to movel with ring member 5'.

The mandrel has at its outer end a cavity 12 provided with shoulder 13 the purpose of which is to engage a fishing tool. At the outer end of the cylinder 2 is a radial hole 14 carrying a bolt 15 which is normally spring pressed inwardly by a spring 16 the compression of which is adjusted by a nut 17. Thus the bolt 15 is normally forced into passage 4 at the point where the latter enters cylinder 2.

A barrel 18 of a diameter such as to pass through opening 4 in the mandrel is arranged in said opening. This barrel is of a length such as to extend from the end of the mandrel to the bottom of cylinder 2. Intermediate its ends barrel 18 is provided with a circumferential groove 19 adapted to receive bolt 15. The barrel passes through the opening in ring member 5 and is provided with a diametrical bore 20 adapted to align with bores 7 in ring member 5 and receive a shear pin 21. At its outer end barrel 18 is provided with a collar 22 adapted to abut against the end of the mandrel and is exterially threaded at 23 so as to receive the end of the tubing.

With the parts shown in the position shown in Figure 1 the assembly is lowered into the well at the end of a wire line or a string of tubing which includes conventional jars. When the point is reached at which it is desired to set the stop, the tubing is given an upward jerk thereby imparting an upward jar to the barrel 18. This disengages bolt 15 from groove 19 and permits the mandrel and cylinder to slide downwardly along the barrel whereby the slips move upwardly along the mandrel and are pressed outwardly until they engage the casing. When this occurs the momentum of the mandrel is such as to cause the slips to bite into the walls of the casing and hold

the assembly securely. Then the tubing is given a downward jar which shears off pins 21 releasing barrel 18 from ring member 5. The tubing is then withdrawn taking the barrel with it and leaving the stop in place. When it is desired to remove the stop a suitable fishing tool is lowered into the interior of the mandrel, said tool being provided with shoulders to engage shoulder 13. When this engagement is made an upward jerk will release the slips from the casing and permit the assembly to be withdrawn.

It will be understood that the above described device is relied upon only as an illustration of the present invention and not as a definition of the scope of said invention. Various changes in arrangement, and size and shape of parts will be apparent to those skilled in the art and are contemplated within the scope of the appended claims in which it is intended to claim the present invention as broadly as the prior art permits.

We claim:

1. A stop adapted to be set at any selected point in a casing comprising a mandrel, slips mounted for sliding movement on said mandrel, arms carried by said slips, a barrel arranged within said mandrel, means, releasable by a jar longitudinally applied to said barrel, for securing said barrel to said arms, and means, releasable by an upward jar on said barrel, for normally holding said barrel in a fixed relation to said mandrel.

2. A stop adapted to be set at any selected point in a casing comprising a mandrel having a central axial passage, a cylinder fixed to one end of said mandrel having its interior coaxial with and communicating with the passage in said mandrel, a ring mounted in said cylinder for movement longitudinally thereof, spring arms carried by said ring, slips carried by said arms and mounted for sliding movement on said mandrel, a barrel arranged in the passage in said mandrel and extending into said cylinder, a shear pin connecting said ring to said barrel, and means releasable by an upward jerk on said barrel for normally holding said barrel in a fixed relation to said mandrel.

3. A stop adapted to be set at any selected point in a casing comprising a body portion including a mandrel having its small end terminating in a cylinder the interior of which is coaxial with and communicates with said bore, said cylinder being of larger diameter than the small ends of said mandrel and having its upper end projecting laterally of said small end, diametrically opposed longitudinal cut out portions beginning at the top end of said cylinder and extending to a point adjacent the bottom thereof, a ring member mounted in said cylinder, spaced ears on said ring member adapted to project outwardly through said cut out portions and slide along the longitudinal edges thereof, spring arms arranged to travel in said cut out portion, notches in one end of each of said spring arms to receive said ears, a slip carried by the other end of each spring arm and adapted to slide on said mandrel, a barrel adapted to be arranged within the bore of said mandrel and extend into said cylinder, a shear pin connecting one end of said barrel with said ring, a threaded nipple on the other end of said barrel, a circumferential groove on said barrel intermediate its ends and a bolt carried by said body normally spring pressed inwardly to engage said groove and hold said barrel in a fixed relation to said mandrel.

4. A stop adapted to be set at any selected point in a casing comprising a mandrel, slips mounted for sliding movement on said mandrel, arms carried by said slips, a barrel arranged within said mandrel, and means, releasable by a jar longitudinally applied to said barrel, for securing said barrel to said arms.

5. A stop adapted to be set at any selected point in a casing comprising a mandrel having a central axial passage, a cylinder fixed to one end of said mandrel having its interior coaxial with and communicating with the passage in said mandrel, a ring mounted in said cylinder for movement longitudinally thereof, spring arms carried by said ring, and slips carried by said arms and mounted for sliding movement on said mandrel.

6. A stop adapted to be set at any selected point in a casing comprising a body portion including a mandrel having its small end terminating in a cylinder, the interior of which is coaxial with and communicates with said bore, said cylinder being of larger diameter than the small end of said mandrel and having its upper end projecting laterally of said small end, diametrically opposed longitudinal cut-out portions beginning at the top end of said cylinder and extending to a point adjacent the bottom thereof, a ring member mounted in said cylinder, spaced ears on said ring member adapted to project outwardly through said cut-out portions and slide along the longitudinal edges thereof, spring arms arranged to travel in said cut-out portion, notches in one end of each of said spring arms to receive said ears, and a slip carried by the other end of each spring arm and adapted to slide on said mandrel.

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