Sept. 1, 1936. M. CHRISTENSEN 2,052,696

RELEASEABLE CHOKE

Filed April 8, 1935 3 Sheets-Sheet 1

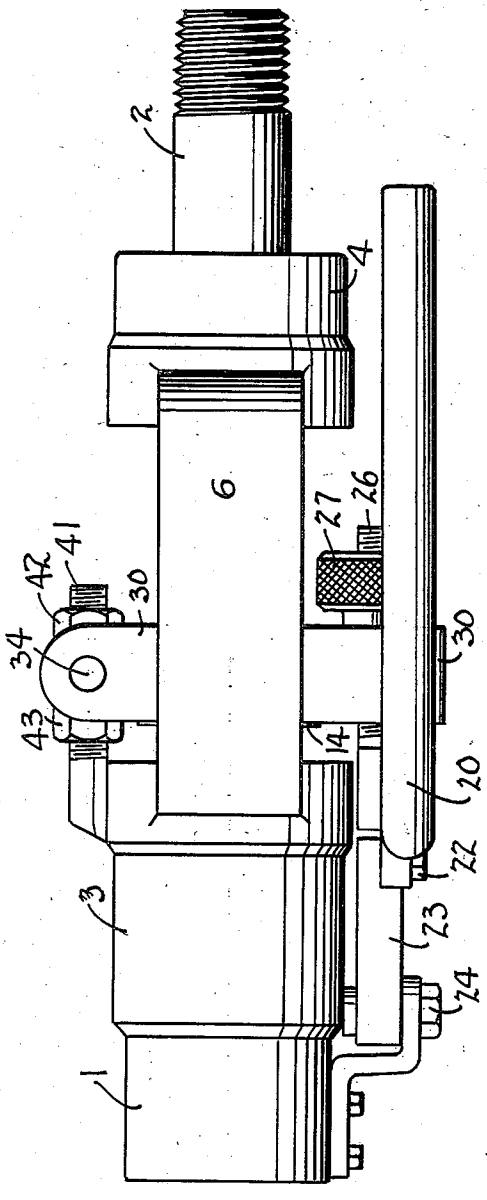


Fig. 1.

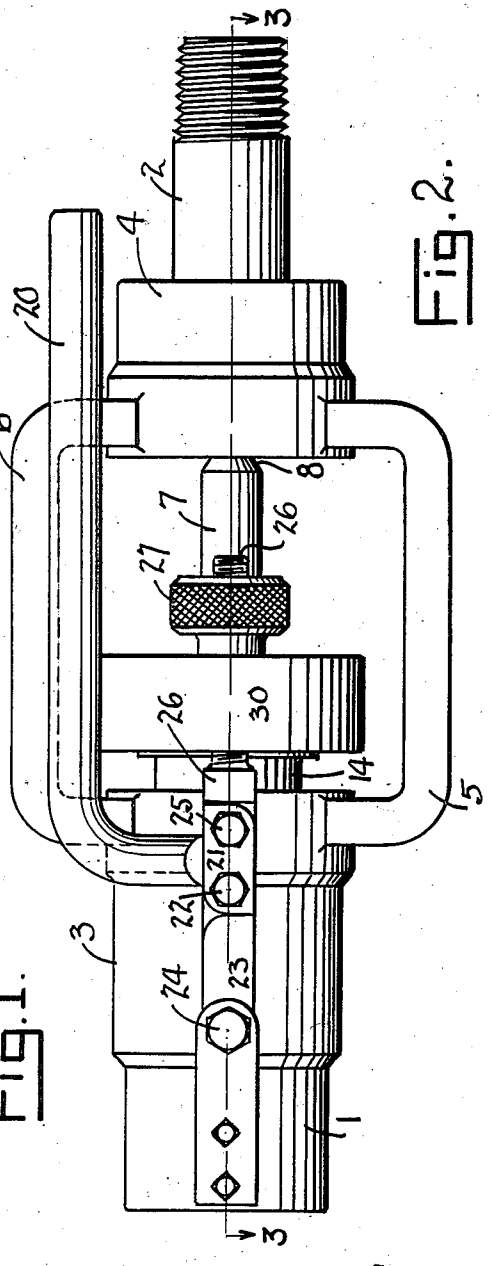


Fig. 2.

Inventor
M. CHRISTENSEN.
Jesse R. Stone
Lester B. Clark

By

Attorneys.

Sept. 1, 1936. M. CHRISTENSEN 2,052,696

RELEASEABLE CHOKE

Filed April 8, 1935 3 Sheets-Sheet 2

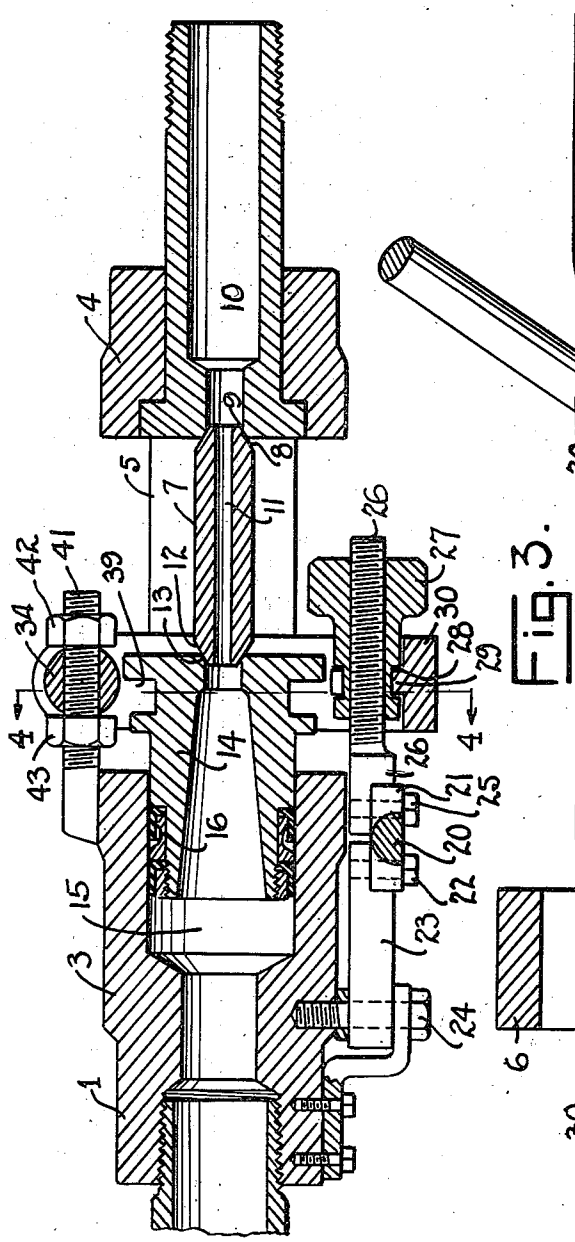


Fig. 3.

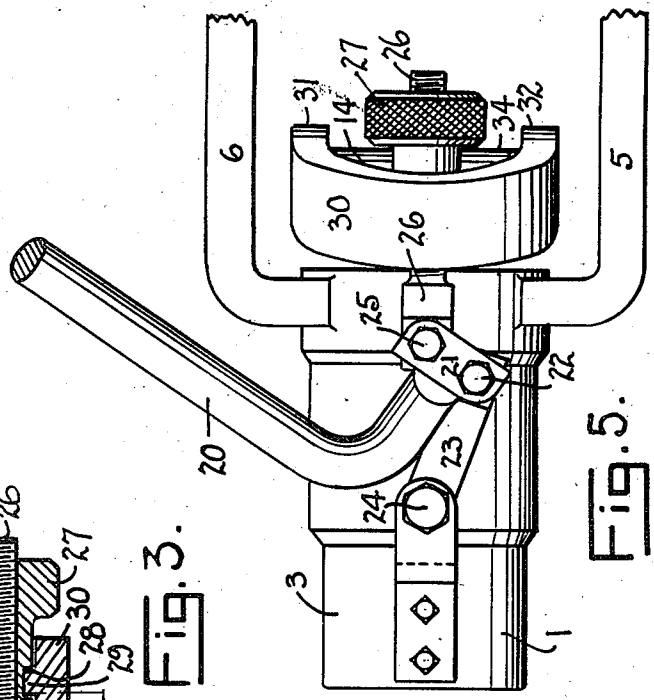


Fig. 5.

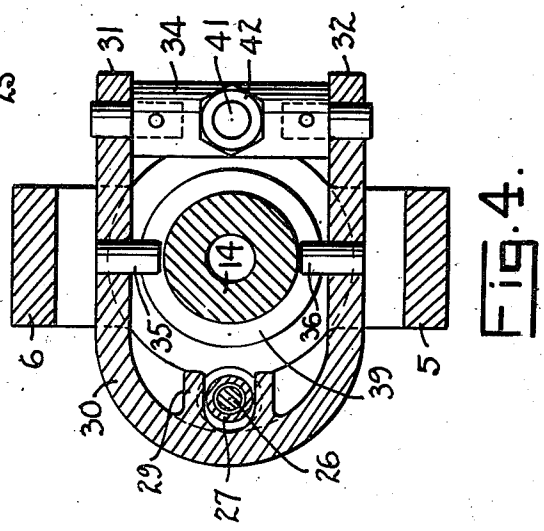


Fig. 4.

Inventor
M. CHRISTENSEN.
Jesse R. Stone
& Lester B. Clark

By

Attorneys.

Sept. 1, 1936. M. CHRISTENSEN 2,052,696

RELEASEABLE CHOKE

Filed April 8, 1935 3 Sheets-Sheet 3

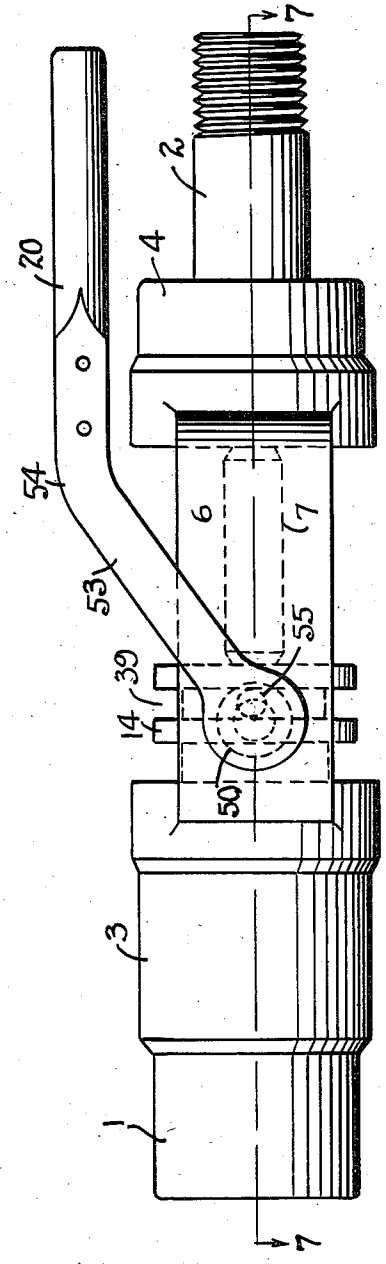


Fig. 6.

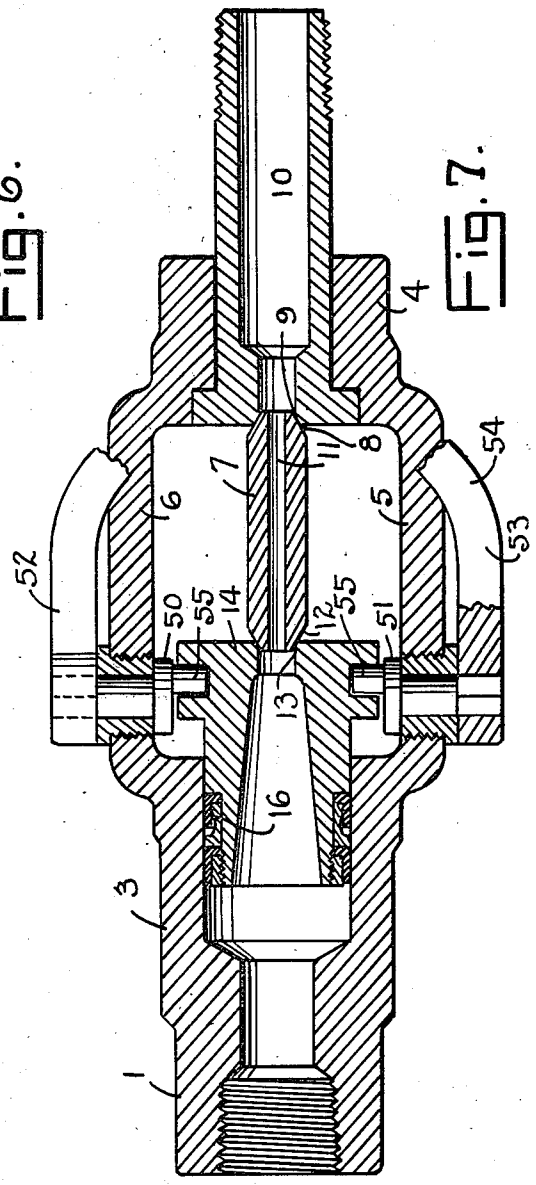


Fig. 7.

Inventor

M. CHRISTENSEN.

Jesse R. Stone

Lester B. Clark

By

Attorneys.

Patented Sept. 1, 1936 2,052,696

UNITED STATES PATENT OFFICE

2,052,696

RELEASABLE CHOKE

Marinus Christensen, Victoria, Tex., assignor of one-fourth to W. G. Huber, Victoria County, Tex.

Application April 8, 1935, Serial No. 15,216

8 Claims. (Cl. 138—44)

The invention relates to an improvement in flow chokes and particularly of the type used in connection with the control and measuring of the flow from oil and gas wells or in other fluid conducting lines where it is desired to restrict the flow of fluid.

It is the usual practice in devices of this sort to provide a restricted area through which the fluid is compelled to pass in order to govern the volume which will pass a given point in a predetermined period of time.

In connection with oil and gas wells where the fluid contains abrasives such as sand and other materials it is obvious that the choke member becomes worn and must be replaced at frequent intervals if an accurate gauge of the flow of fluid is to be had.

With the advent of proration of the flow of fluid from the various wells chokes of this general type came into prominence and it has been found from actual practice that these chokes must be replaced quite frequently so that the present invention has been devised with the object in view of providing a choke which may be very quickly replaced.

Another object of the invention is to provide a device which may be incorporated in the flow line in such a manner that a new choke member may be inserted in the line with a minimum of effort.

Another object of the invention is to provide a clamping device for the choke member in a flow choke assembly.

Another object of the invention is to provide a choke member which may be clamped in position with a suitable lever mechanism.

Still another object of the invention is to provide a choke assembly wherein choke members of different lengths and sizes may be inserted and removed from the device.

Still another object of the invention is to provide a flow choke wherein a slidable clamping member is provided to receive the choke and hold it in operative position.

Other and further objects of the invention will be readily apparent when the following description is considered in connection with the accompanying drawings wherein:

Fig. 1 is a top plan view looking down on a choke assembly embodying the invention.

Fig. 2 is a side elevation of the choke assembly seen in Fig. 1.

Fig. 3 is a section taken on the line 3—3 of Fig. 2 looking in the direction of the arrows, and illustrating the arrangement of the parts.

Fig. 4 is a section taken on the line 4—4 of Fig. 1 and showing the adjustment features of the device.

Fig. 5 shows the lever mechanism being operated in order to replace the choke member.

Fig. 6 is an elevation of a modified form of the invention wherein the adjustable features have been eliminated to some extent.

Fig. 7 is a section taken on the line 7—7 of Fig. 6 and looking in the direction of the arrows.

It will be understood that the fluid is conducted from the well through a tubing or string of pipe and brought to the surface where it is discharged into the flow line to be conveyed to the storage or pipe line as the case may be. In order to restrict and engage the flow of the well, it is usual to position a flow bean or choke in the flow line extending from the well. Fig. 1 shows a body 1 which may be connected to the flow line extending to the well and this body serves as a support for a nipple 2 which will be connected to the other end of the flow line as it discharges to the storage or the pipe line.

The body 1 is made up of the housing 3 and the support ring 4 which are coupled together by the upper and lower brackets 5 and 6 respectively. These brackets serve to rigidly space the housing 3 and the support 4. The space between the housing 3 and the support 4 is to be occupied by the choke member 7, which is arranged to seat at 8 on the shoulder 9 of the nipple 2 and form a seal therewith to discharge into the passage 10 of the nipple. The restricted passage 11 is formed in the choke member 7. The opposite end of the choke member 7 is also tapered at 12 to seat on the shoulder 13 formed on the bushing 14. The bushing 14 is slidably mounted in a chamber 15 in the housing 3. It will be noted that the bushing 14 carries the packing 16 so that a seal is formed with the chamber 15 to prevent leakage.

In order to replace the choke member 7 the bushing 14 is slidable in the chamber 15 so that it may be retracted and the worn choke member removed and then moved to the position shown in Fig. 3 when a new choke member has been inserted.

It seems obvious that the choke member 7 will have to be clamped tightly in position in order to prevent leakage on the seats 8 and 13. To accomplish this a leverage mechanism has been attached to the housing 3 and contemplates a lever 20 which carries a bar 21 at one end thereof. This bar 21 is pivoted at 22 to the link 23 which is in turn pivoted to the housing 3 at 24. The

opposite end of the bar 21 is pivoted at 25 to the push-rod 26 in such a manner that rocking movement of the handle 20 tends to force the push-rod 26 to the right as viewed in Fig. 5.

The push-rod 26 has threaded thereon an adjusting nut or thumb screw 27 which is provided with an annular groove 28 which receives a tongue 29 which is formed on the yoke 30.

The yoke 30 has its ends 31 and 32 connected to or pivoted on the shaft 34 so that there may be a rocking movement of the yoke 30 upon tilting of the lever 20.

The yoke 30 carries the pins 35 and 36 which are engaged in a groove 39 in the head of the bushing 14 so that the bushing 14 is caused to move by the rocking movement of the yoke 30 when the handle 20 is operated. When the handle is raised to the position shown in Fig. 5 the bushing 14 will be moved to the left as viewed in Fig. 3 to release the choke member 7, whereas when the lever is moved to the position shown in Fig. 2 the bar 21 will be moved into substantial alignment with its pivot pins in alignment with the pivot 24, with the push-rod 26 moved to the right as far as possible. This, of course, moves the bushing 14 to the right and securely clamps the choke member 7 in position. By proper adjustment of the thumb screw 27 the bushing may be arranged to securely clamp the choke member. Various lengths and sizes of choke members can thus be accommodated by merely adjusting the thumb screw 27.

Additional adjustment may be obtained by adjusting the shaft 34 on its supporting bolts 41 by adjustment of the nuts 42 and 43, the bolt 41 being fixed to the housing 3. For slidable adjustment the thumb screw 27 is used, but where there is a material difference in the length or size of the choke the nuts 42 and 43 may be adjusted.

In operation when a new choke member is to be inserted it is merely necessary to raise the lever or handle 20 from the Fig. 2 to the Fig. 3 position so that the clamping action on the choke will be released. The new choke member may then be held in position and the handle 20 returned to its horizontal position to securely clamp the choke. If it is found that the choke is not securely clamped either the thumb screw or the adjusting nuts may be manipulated until a seal is obtained at both ends of the choke.

Figs. 6 and 7 show a modified form of the invention whose operation is the same as in the previous figures except that the yoke 30 has been replaced by the eccentric studs 50 and 51, one of which is positioned in each of the brackets 5 and 6. These studs have fixed thereon the ends 52 and 53 of the choke 54 which is fixed to the end of the handle 20. When the handle 20 is rocked, of course, the stud bolts 50 and 51 will also rock. Each of these studs carries an eccentric projection 55 which extends into the groove 39 in the head of the bushing 14. The eccentric movement of these projections 55 tends to move the bushing toward and away from the choke member 7 the same as in the previous form of the invention. The eccentricity and positioning of the projections 55 can be so arranged that the handle 20 will lock the choke member 7 in position when the handle assumes the position of Fig. 6.

Broadly the invention contemplates a quickly replaceable choke member which can be clamped and locked in position with very little effort. While two forms of the invention have been shown and described, it is contemplated that other modifications may be employed within the scope of the appended claims.

What is claimed is:

1. A flow choke of the character described comprising a body, a bracket thereon, a support on said bracket, a bushing slidable longitudinally in said body, means to manipulate the sliding of said bushing, a choke member adapted to be clamped in operative position between said support and said bushing, and packing means to seal between said bushing and body.

2. A flow choke of the character described comprising a body, a bracket thereon, a support on said bracket, a slidable bushing in said body, means to manipulate the sliding of said bushing, and a choke member adapted to be clamped in operative position between said support and said bushing, said means being adjustable to clamp said choke in sealing position.

3. A choke assembly comprising a choke member, a fixed support to receive one end of said choke in sealing position, a slidable bushing to receive the other end of said choke, a housing for said bushing, and a quick release means operable to allow sliding of said bushing to engage or release said choke member.

4. A choke assembly comprising a choke member, a fixed support to receive one end of said choke in sealing position, a slidable bushing to receive the other end of said choke, a housing for said bushing, and means operable to slide said bushing to engage or release said choke member, said means acting to wedge said bushing against said choke member whereby the bushing may be locked in choke engaging position.

5. A choke assembly comprising a choke member, a fixed support to receive one end of said choke in sealing position, a slidable bushing to receive the other end of said choke, a housing for said bushing, and means operable to slide said bushing to engage or release said choke member, said means comprising a bar and link connection to be moved to off or on center position.

6. In a flow choke assembly, a rigid choke member, tapered ends thereon, seats for said ends to form a seal therewith, and means to move one of said seats to release or engage said member including a member operable to slide such seat longitudinally so that said choke may be quickly replaced.

7. A flow choke comprising a body, said body including a housing, a support and brackets spacing between said housing and said support, a chamber in said housing, a bushing therein, packing on said bushing to seal against said housing, a head on said bushing, a yoke pivoted to said housing, a lever mechanism connected to said yoke, a connection between said yoke and said bushing head, said lever mechanism being operable to move said yoke and bushing, a rigid choke member, seats on said body and said support therefor.

8. A quickly replaceable flow choke comprising a body, a flow choke, and means to releasably seal said choke to said body, said means comprising a bushing mounted to telescope into said body to release said choke, and a member operable to wedge said bushing against said choke by sliding said bushing longitudinally of said body.

MARINUS CHRISTENSEN.