Sept. 4, 1951 J. J. SMITH 2,566,502

CORPORATION STOP AND METHOD OF INSTALLING

Filed April 13, 1945

FIG. 1

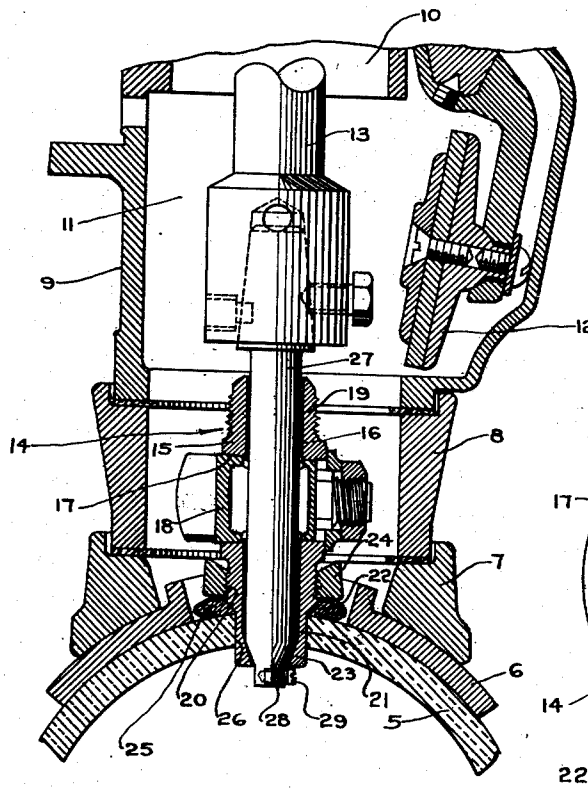



FIG. 2

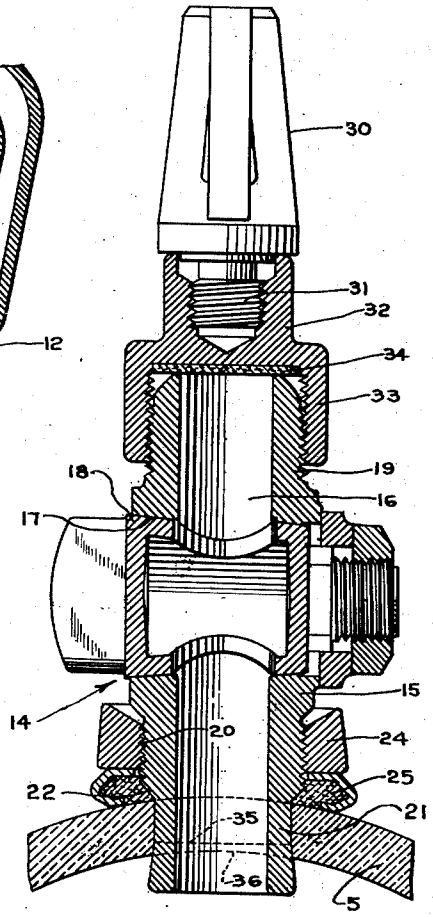
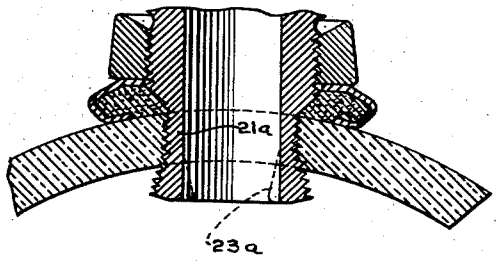



FIG. 3




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## CORPORATION STOP AND METHOD OF INSTALLING

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3 Claims. (Cl. 137—73)

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This invention relates to corporation stops and method of installing the same, a principal object being to provide for effectively locking a stop in position in a lateral opening in a main, particularly in a main which contains a fluid under pressure and which is made of plastic material. An embodiment of the invention is illustrated in the accompanying drawing in which:

Figure 1 is a section taken transversely of a main and axially of the lower portion of a boring machine and of a stop in accordance with the invention, the stop being in process of installation,

Figure 2 shows on enlarged scale the stop of Figure 1 fixed in place and equipped with a closure cap, and

Figure 3 is a fragmental section of a modified form of stop.

Referring first to Figure 1, reference numeral 5 designates a main which contains a fluid under pressure and which is here considered to be made of any suitable plastic material such as "Transite," although in some aspects of the invention, the substance of which the main is made is immaterial and may be the usual iron or steel. Sealed to the top of the main through a pad 6 is a saddle 7 which through a sealed spacer 8 supports the barrel 9 of a drilling machine. The interior of the barrel is separable into upper and lower compartments 10 and 11 by means of a flop valve 12. The top of the barrel is equipped with a removable cap, not shown, which rotatably and reciprocably supports a boring bar 13 which latter is engageable by the usual feed mechanism. A drilling machine of this type is shown, for example, in the patent to Mueller et al., No. 2,221,979 of August 4, 1942.

The stop generally designated at 14, comprises an elongated body 15 provided with a straight flow passage 16 which is intersected by a conical valve seat 17 with which is engaged a rotary valve plug 18. One end of the body is provided with co-axial threads 19 whereby the valve is adapted to be coupled to a service line.

At its other end the body 15 is provided with co-axial threads 20 immediately adjacent the valve seat and outwardly of the threaded portion is a reduced externally cylindrical neck portion 21, an annular shoulder 22 existing between the two portions. At its extremity the neck portion is provided with an internal annular constriction or rib 23 here shown as having a downwardly tapering conical face. Reference numeral 24 designates a follower nut engaged with the threads 20 and cooperative with a compressible resilient

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gasket 25 which frictionally engages the threaded portion so as to be held thereby against dropping when the stop is suspended with the neck portion down.

After a lateral cylindrical opening 26 has been drilled in the main, the boring bar is dismounted and the drill is replaced by an expanding tool 27 which is in the form of a round rod of a size slightly smaller than the passage 16 so that when the plug is in the open position shown, the stop can be strung on the tool. The latter is coned at its lower end substantially complementarily to the face of the constriction 23 and terminates in an extension 28 which will pass freely through the constriction. A screw 29 is threaded radially into the extension and underlies the constriction 23 so as to retain the stop on the suspended tool against gravity. The projection of the screw is less than a radius of the tool so that the screw does not extend beyond the circle of the latter.

With tool 27 applied to the boring bar and the stop carried by the tool, the boring bar is lowered to insert the neck 21 into the opening 26 as shown in Figure 1. When the boring bar is now forced downwardly, the tool will pass through the constriction 23 so that the lower part of the neck portion 21 will be circumferentially expanded as shown in Figure 2. The gasket 25 was preferably so positioned by nut 24 as to be somewhat compressed by the downward force prior to the positive limitation of the inserting movement by the abutment of shoulder 22 with the upper margin of opening 21.

When the stop has thus been locked in the main opening, the boring bar is lifted in order to withdraw tool 27, this being possible since the constriction 23 has disappeared so that the screw 29 can freely pass it.

Tool 27 is now replaced by a tool 30 having a threaded head 31 engaged in a threaded axial bore in the top of a closure cap 32 which at its other end has an axial socket portion 33 threaded for engagement with the stop threads 19. With the tool 30 applied to the boring bar and carrying the cap 52, the boring bar is manipulated to apply the cap and thereby seal the upper end of the stop through a gasket 34. The tool 30 is then threaded out of the cap and the drilling machine is removed. Plug 18 is thus made accessible for manipulation and can be closed so that the closure cap 32 is removable in order to make the threads 19 available for connection with the service line. Nut 24 is screwed down to suitably compress the gasket 25 and a permanent and leak proof connection with the main is thus complet-

ed. The illustrated nut and gasket are those disclosed in the patent to J. W. Simpson, No. 2,265,703, of December 9, 1941.

When the main is made of plastic material and is thus deformable, a full circumferential locking joint is securable between the neck and the main opening. In Figure 2, it will be seen that the abutment means constituted by the shoulder **22** and/or the gasket and nut **24** limited the insertion of the neck **21** so that as the result of the expanding action, the neck was flared downwardly from a line **35** which is substantially above the lower edge, as at **36**, of the main opening, thus circumferentially deforming the lower portion of the opening. Thus, not only is a most effective interlock provided but, also, a well sealed joint is made.

The new stop is made of the usual material, for example, brass, and the neck **21** is adequately strong while still being deformable by the expanding tool without the use of excessive pressure.

An advantage of the described system is that the threading of the main opening is made unnecessary and this is a feature of great practical importance since a material such as Transite will rather quickly dull a tap. However, if desired, the main opening can be threaded in the usual manner and the neck portion **21***a* of the stop, Figure 3, can be complementarily threaded. In this case the stop will be threaded into place using a turning tool, such as is shown, for example, in the patent to Mueller et al., No. 2,247,427, July 1, 1941. The turning tool will then be replaced by the expanding tool as at **27**, screw **29** being omitted. The boring bar is then lowered to insert the tool in the stop passage, with the plug open, and to expand the neck portion to the form shown in Figure 3. Reference numeral **23***a* designates the original form of the internal constriction at the extremity of the neck portion.

Other variations in the form and arrangements of parts and their manner of use are contemplated under the claims which follow.

I claim:

1. A corporation stop comprising an elongated body having a longitudinal flow passage, a valve seat intersecting said passage, a ported, rotatable valve plug in said seat, one end of said body being adapted for engagement by a closure or for connection to a service line and the other end having a threaded portion adjacent said seat for engagement by a packing follower nut and having a reduced neck portion outwardly of said threaded portion adapted to be inserted through a lateral opening in a main, there being a shoulder between said threaded portion and neck portion adapted to limit such insertion, and an annular internal constriction at the extremity of said neck portion engageable by an expanding tool inserted through said passage and plug when the plug is in open position to expand the extremity of said neck portion into locking engagement with the inside edge of a main opening in which said neck portion is inserted.

2. The method of equipping a pressure main with a corporation stop; said stop having a straight flow passage, a seat intersecting said passage, a valve plug in said seat, one end of said stop being adapted for connection to a service line and the other end including a neck portion insertable in a lateral opening in the main and having an extremity expandible to provide a locking shoulder; said main having applied thereto a drilling machine of the type including a barrel, a valve member dividing the interior of the barrel into upper and lower chambers, a removable cap, and a boring bar rotatably and reciprocably supported by said cap; said method comprising the steps, subsequent to the drilling of an opening in the main, of equipping the boring bar with an expanding tool on which the stop is strung through the flow passage and releasably retained with the plug in open position, lowering the boring bar to insert said neck portion in the opening, manipulating the boring bar to cause said tool to expand the extremity of said neck portion into locking engagement with the inside edge of the opening, manipulating the boring bar to withdraw said tool from the stop, replacing said tool with a closure cap applying tool releasably carrying a closure cap engageable with the outer end of the stop, manipulating the boring bar to apply said closure cap and then to release the applying tool, removing the boring machine, closing the plug, and removing said closure cap so that the outer end of the stop is available for connection to a service line.

3. In combination, a main having a lateral opening and a corporation stop comprising an elongated body having a longitudinal flow passage, a valve seat intersecting said passage, and a ported, rotatable valve plug in said seat, one end of said body being adapted for engagement by a closure or for connection to a service line and the other end having a neck portion inserted through said lateral opening in said main, the outer surface of the extremity of said neck portion extending into the interior of the main having a diameter greater than the diameter of the neck portion located in said lateral opening, said stop being provided with a shoulder between said neck portion and said valve seat in abutting relationship with the outer margin of said opening, a threaded portion adjacent said shoulder, a nut on said threaded portion, and a packing compressed between said nut and the exterior of the main around said opening.

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