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H. W. FLETCHER

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FLOW CHOKE

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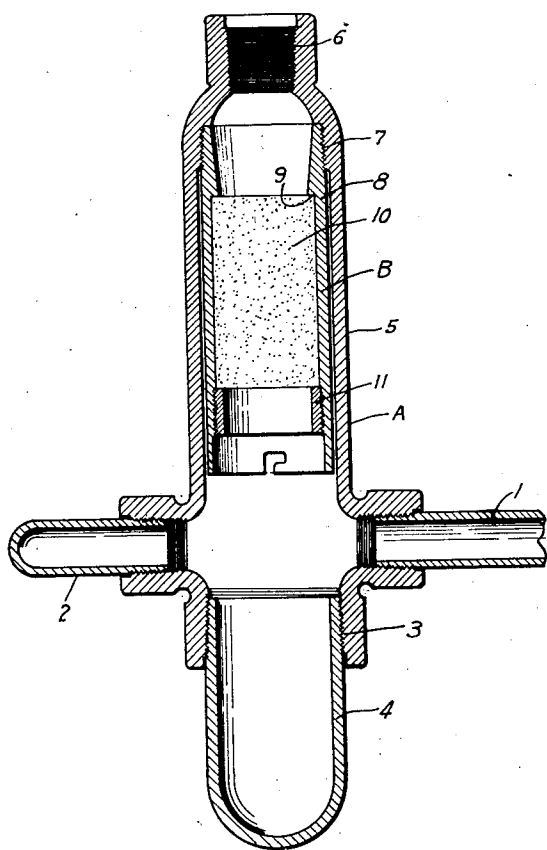


Fig. 1.

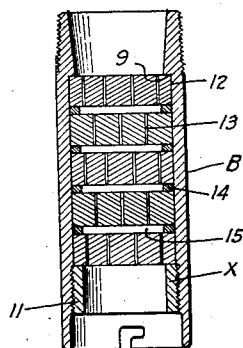


Fig. 2.

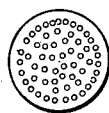


Fig. 3.

Harold W. Fletcher
INVENTOR

BY *Jesse R. Stone*
ATTORNEY

UNITED STATES PATENT OFFICE

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FLOW CHOKE

Harold W. Fletcher, Houston, Tex., assignor to
Hughes Tool Company, Houston, Tex., a corporation of Texas

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3 Claims. (Cl. 137-75)

My invention relates to flow choking devices for regulating the rate of flow of fluids under pressure. It has particular application to means for regulating fluids carrying a certain amount of abrasive material therein tending to wear the regulating device.

My device is designed particularly for use on flowing wells producing oil, gas and the like. The fluid from such a well may be under considerable gas pressure which tends to cause the fluid to be discharged from the well with violence which, if unchecked, will be wasteful of the gas, wearing on the well equipment and may lead to sanding up of the well. It is desirable to preserve a uniform ratio of oil and gas and to conserve the production from the well.

It is therefore, customary to control the flow by choking down the exit from the well into the flow line. Choke valves, flow beans, and the like are placed in the line, with orifices therein of the proper size to allow the passage of the desired amount of fluid. Because of the sand and other abrasive materials in the fluid, and the high velocity of the fluid, the choke means wears rapidly and must be replaced at frequent intervals.

It is an object of my invention to provide a flow bean which will check the flow of the fluid and which may be regulated to allow the passage of various amounts as desired.

I also desire to provide a construction of flow device which will not wear rapidly and which, when worn, may be quickly replaced.

I desire to pass the fluid through a plurality of small passages where I may keep the velocity of flow near or below the critical value for the size of the passages and thereby reduce or eliminate cutting.

In the drawing herewith, Fig. 1 is a vertical section through a portion of a flow line having my invention employed thereon.

Fig. 2 is a central longitudinal section through a flow check device removed from the line and disclosing a somewhat different embodiment of the invention.

Fig. 3 is a top plan view of one of the preformed discs employed in the Fig. 2 embodiment of the invention.

In Fig. 1 I have shown a pipe 1 which may be understood as being part of a flow line for fluid under pressure and carrying abrasive material therein. In this flow line is connected a special fitting A in which is placed my flow retarding device B.

The fitting A is a cross or four way fitting, the opening opposite the flow pipe 1 being shown as

closed by a bull plug 2. The lower opening 3 is of larger diameter and is closed by the bull plug 4. Opposite the opening 3, the branch 5 is elongated to provide a housing for the member B.

The housing has a threaded recess 7 to receive the flow bean and beyond this recess the branch is reduced in diameter and threaded at 6 to connect with the flow line from the well.

The flow choke B includes a tubular housing 8 threaded at 7 to engage with the fitting. This end on its inner periphery, is tapered inwardly to provide a shoulder at 9 forming a stop shoulder for a cylindrical porous member 10 through which the fluid must pass. Said member may be of any desired porous material adapted to resist wear such as carborundum or the like. Said material is held in position in the housing by a ring nut 11.

The lower extremity of the housing 8 has a bayonet slot therein to receive a setting tool by which it may be inserted through the opening 3 and screwed within the slot 7.

It is to be understood that this unit B may be of the desired length to limit the flow in the desired amount. The amount of porosity or size of the interstices in the body of the material and the length thereof may, of course, be varied.

In Fig. 2, I depend for a choke device, upon discs 12 fitting closely within the body 8, and spaced apart by rings or washers 14. Each disc has reduced openings or ducts 13 therein through which the fluid must pass. These ducts are staggered in one disc relative to the ducts in the disc next adjacent and it is to be noted that the fluid passing through each disc is received within a narrow space or chamber 15, where its progress is slowed down before it enters the ducts of the next disc. In this way, the speed of flow can be regulated with accuracy so that the proper rate of flow will be obtained. The bull plug 4 may serve to catch sand strained from the fluid by the choke.

By forcing the fluid to pass through small ducts, pores or interstices in the choking units which I employ, the velocity of flow is greatly reduced and the cutting action of the fluid is so lowered so that my flow beans will last materially longer than those now most commonly used.

What I claim as new is:

1. A fitting for flow lines having a plurality of branches, a flow line connected with one of said branches, a threaded seat in the outer end of another of said branches, a holder secured in said seat, and porous material in said holder to limit the rate of flow of fluid therethrough and means

below said porous material to catch sand settling by gravity from said fluid.

2. A fitting for flow lines having a plurality of branches, a flow line connected with one of said branches, a threaded seat in the outer end of another of said branches, a holder secured in said seat, and positioned within said fitting porous material in said holder to limit the rate of flow of fluid therethrough and means in another of said branches acting to catch sand settled out from said fluid.

3. A cross shaped fitting for flow lines having four ports including an inlet port, a closure for the port opposite said inlet port, an upper branch on said fitting having an interior threaded seat, a holder screwed within said seat, a core of porous material in said holder to retard the flow of fluid therethrough, and a bull plug closing the lower branch of said fitting adapted to receive sand settling from the said fluid.

HAROLD W. FLETCHER.

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