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CHOKE FITTING

Filed June 24, 1944

Fig. 1

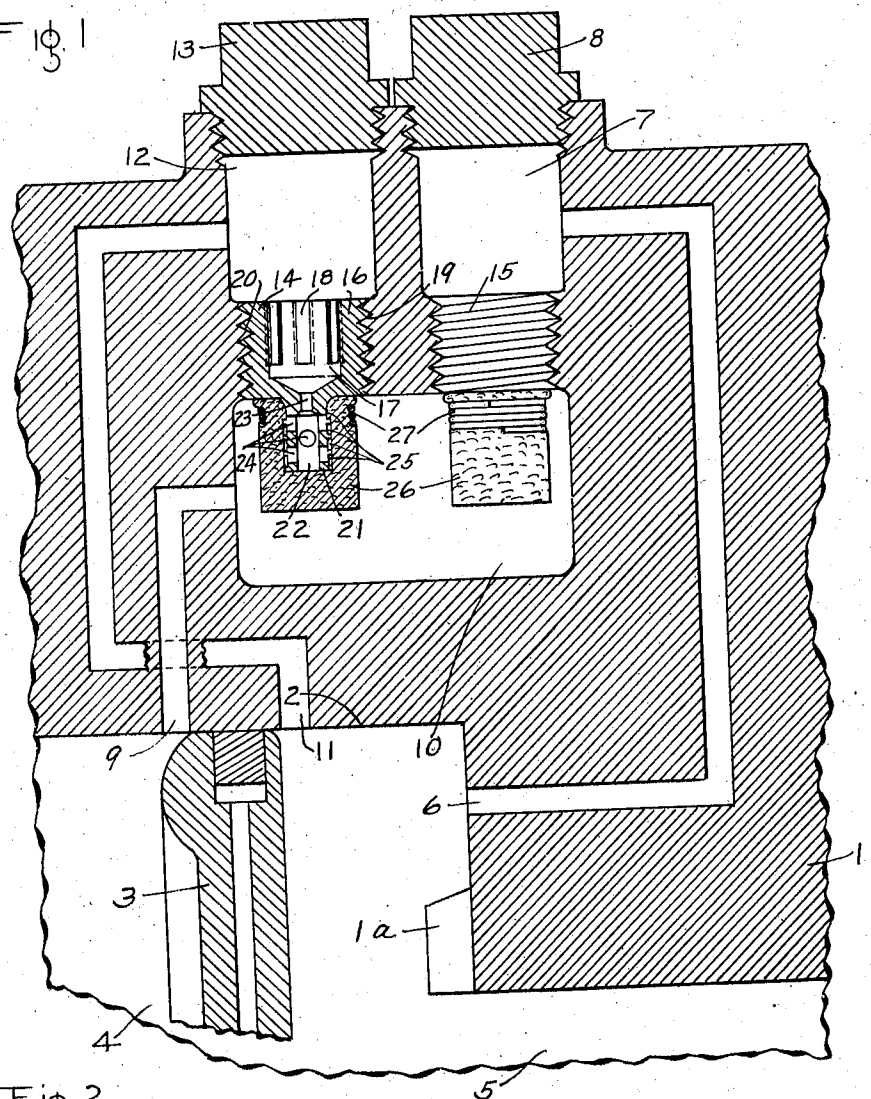
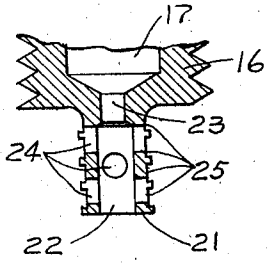


Fig. 2



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CHOKE FITTING

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4 Claims. (Cl. 138—41)

This invention relates to a choke fitting of the type to be used in a fluid conducting passage of a fluid pressure control apparatus.

An object of this invention is to provide an improved choke plug or fitting arranged for use in a fluid conducting passage and having intimately associated therewith novel fluid straining or cleaning means which operates to remove foreign matter from the fluid flowing through the passage immediately before the fluid reaches the choked port in the plug.

A further object of the invention is to provide an improved choke plug of the above type in which a fibrous fluid straining means is employed that has a large surface area exposed to fluid to be cleaned in order to prevent clogging of the fluid straining means and resultant restriction of the flow of fluid therethrough to the choked portion in the plug by collected foreign matter separated from the fluid.

Another object is to provide an improved choke plug of the type described in the preceding paragraph having means whereby the fibrous fluid cleansing material is so supported that it will be maintained spaced away from the choke port a sufficient distance that it will not restrict the flow of fluid through the port in the choke plug.

A further object is to provide a choke plug having a simple but very effective means for mounting and removably securing the straining element thereto.

Other objects of the invention and features of novelty will be apparent from the following description taken in connection with the accompanying drawing, in which Fig. 1 is an enlarged fragmentary diagrammatic view, partly in section, of an improved brake controlling valve device embodying the invention and Fig. 2 is a still further enlarged fragmentary sectional view of a portion of the choke fitting.

Referring to the drawing, there is illustrated therein a fragment of the service portion of a brake controlling valve device of the type shown and described in U. S. Patent No. 2,031,213, issued February 18, 1936, to C. C. Farmer. The service portion comprises a body 1 having a bore 2 therein in which is mounted a piston 3 having at one face a chamber 4 which is constantly connected to brake pipe, not shown, by means of a communication having an air strainer, not shown, interposed therein. Piston 3 has at its other face a valve chamber 5 which is constantly connected by way of a passage 6 with a chamber 7 formed in the body 1 and closed at the top by a screw plug 8.

The piston 3 in its full release and charging position in the bore 2 opens communication from the chamber 4 to a port and passage 9 which communicates with a conductor chamber 10 in the body 1 through which fluid under pressure is supplied from the brake pipe to the valve chamber 5 in a manner to be described more fully later. In its retarded recharged position the piston clears a passage 11 so that chamber 4 connects with said passage 11 which is open at its other end to a chamber 12 formed in the body 1 and closed at the top by a screw plug 13 in a manner identical with that of chamber 7. Located between the chamber 10 and the chamber 12, and between chamber 10 and chamber 7, are identical choke plugs 14 and 15, respectively, which have screw-threaded connection with the body or casing 1 and which are provided for the purpose of controlling the flow of fluid under pressure from the brake pipe to valve chamber 5, the left-hand plug 14 being shown in section for purposes of illustrating the details of construction of the fitting as a whole.

It will be observed that with the piston 3 in full release and charging position as shown, both passage 6 and passage 11 are connected to chamber 5 and therefore fluid under pressure will flow from chamber 4 to chamber 10 by way of port and passage 9, and thence to chamber 5 by way of choke plug 14, chamber 12 and port and passage 11, and also by way of choke plug 15, chamber 7 and passage 6. With the piston 3 in retarded recharged position, i. e., in its extreme right-hand position, in which the rear face of the piston engages a stop lug 1a carried by the body 1, port and passage 11 will be connected to chamber 4 as is port and passage 9 and consequently there will be no flow of fluid under pressure through choke plug 14. Since passage 6 is still connected to chamber 5, choke plug 15 will control the flow of fluid under pressure from brake pipe to chamber 5. As both choke plugs are of the same flow area, the flow capacity is only half that when both choke plugs are used.

As shown in the illustration in section of choke plug 14, the choke plug comprises a body 16 which may be formed of any suitable material such as brass. Formed in the top portion of the body 16 as viewed in the drawing is an annular recess 17 having in its wall a plurality of splines 18 for engagement by a spline wrench. An exterior peripheral surface of this portion of the body 16 is provided with tapered threads 19 for engaging corresponding threads 20 formed in the wall between the chamber 10 and the chamber 12. The lower end of the body terminates in an annular stud portion 21.

The stud portion 21 is provided with a bore 22 which is coaxial with the body 16 and is open to the recess 17 by way of an axial restricted port or passage 23. This bore 22 is also open by way of a plurality of transverse apertures or perforations 24 to a plurality of annular grooves 25 provided in the periphery of the stud portion 21, the apertures and grooves being so arranged

in relation to each other that each is connected to more than one of the other. As shown in detail in Fig. 2 this is accomplished by having the perforations pass through the partitions which define the grooves 25 and by making the perforations of greater diameter than the width of such partitions.

Associated with the body 16 is a fluid straining element 26 which may be formed of any suitable material, but preferably of a compacted fibrous material such as a felt, in the form of a cup-shaped body having an outside diameter slightly smaller than that of the threaded portion of the body 16 and an inside diameter slightly larger than that of the stud portion 21. This felt body may be placed over the stud portion 21 so as to snugly engage the bottom surface of the threaded portion and completely overlay or enshroud the stud portion of the body 16. For maintaining the straining element 26 securely mounted on the stud portion 21 there is provided a resilient retaining element 27 wound in the form of a helix which has been expanded and passed over the straining element so as to be positioned a short distance from its upper end as viewed in the drawing. When released, the constricting pressure of the retaining element 27 squeezes the straining element into groove 25 at the base or upper end of the stud portion and will hold it in such position.

It should be understood that the straining element does not engage the surfaces of any of the grooves 25 except that of the uppermost groove just described. It should be noted that by reason of the retaining element being spaced away from the surfaces of the grooves there are provided annular unoccupied channels between the straining element and the apertures or perforations 24 in the stud portion, thereby obtaining the maximum filtering surface and reducing the possibility of the clogging of apertures 24. Also, since each channel is connected to more than one aperture and each aperture is connected to more than one channel, should one connection between channel and aperture by chance become clogged, the clogged connection will be by-passed by routes through other connections thus insuring the free flow of fluid through the fitting.

In the service for which this invention is intended, the flow of fluid to the passage in which the strainer is mounted is normally in one direction only, and therefore, as shown in the drawing the strainer is arranged so that when fluid flows through the port and passage 9 to the chamber 10, it will then flow through the air straining element 26 before reaching the restricted passage 23 which is to be protected. If the fluid supplied to the chamber 10 contains any foreign matter, it will be removed by the straining element 26 before reaching the restricted passage 23 in the choke plug 14 where it might partially or completely close the passage, thereby interfering with the intended operation of the valve device. Thus the flow of fluid to the choke plugs is through the straining element 26 into the body 16 of the choke plug, and therefore, there will be no tendency of dislodgment of this element by this flow of fluid, the tendency of such flow being to seat the element more firmly on the stud portion 21.

It will here be noted that substantially the entire outer surface of the straining element 26 is exposed to the chamber 10 and consequently to the fluid supplied thereto, thus providing a relative large dirt collecting surface which, due to its area is not liable to become clogged over a short period of time.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A fluid conducting element comprising a body portion and an axially disposed stud portion carried by said body portion, an axially disposed fluid conducting passage in said body and stud portions, said stud portion having a plurality of grooves formed on the exterior thereof, a partition between said grooves, a radially disposed passage extending through said partition and communicating with said axially disposed passage, said radially disposed passage being of greater diameter than the width of said partition to establish communication between said grooves, and a filter element encircling said stud portion, said partition supporting said element out of engagement with the bottoms of said grooves and thereby providing an unoccupied fluid conducting space between said grooves and said radially disposed passage.

2. A choke fitting for a fluid conductor, comprising a body portion having a bore of small flow area therethrough, a stud portion carried by said body portion and having a bore therein in communication with the first mentioned bore and of greater flow area than the first mentioned bore, a plurality of grooves formed on the exterior of said stud portion, a partition between said grooves, and a passage extending through said partition from the exterior of said stud to the second mentioned bore, said passage being of greater diameter than the width of said partition, and a filter element enshrouding said stud portion, said partition maintaining said filter element spaced from the bottoms of said grooves.

3. A choke fitting for use in a fluid conductor for controlling the rate of flow of fluid through the conductor and cleaning the fluid flowing through the conductor, said choke fitting comprising a body portion having therein a flow restricting passage and comprising a perforated stud portion through which fluid flows to said passage, a fluid straining element mounted on and covering said stud portion through which straining element fluid flows to said passage, and a resilient constricting member for removably maintaining the straining element on said stud portion, said stud portion having at its base an annular groove into which a portion of said straining element is squeezed by said retaining member.

4. A choke fitting to be interposed in a fluid conductor through which fluid under pressure normally flows in one direction only, said fitting comprising a body portion arranged at its periphery for mounting engagement with the wall of said conductor and having a passage of small flow area therethrough for restricting the flow of fluid through said conductor, a stud portion provided with a plurality of perforations which are connected to said passage, a cup-shaped fluid straining element mounted on said stud portion so as to cover said perforations, a retaining member mounted on said straining element and exerting a force radially inward thereon, said stud portion having at its base an annular groove into which a portion of said straining element is squeezed by said retaining member.

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