

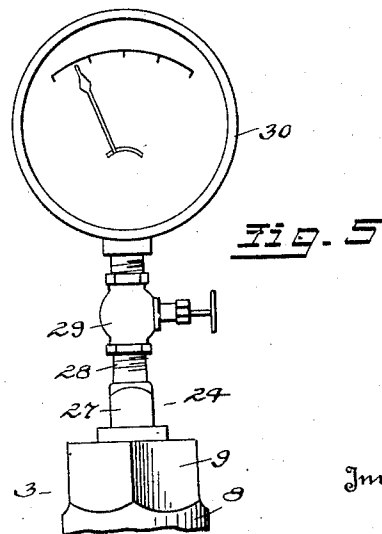
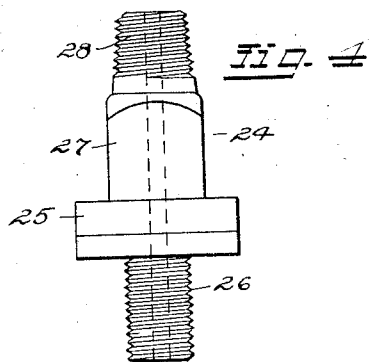
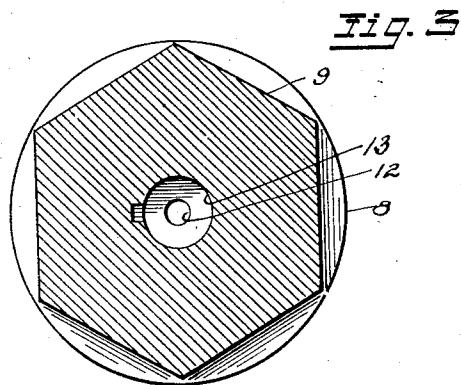
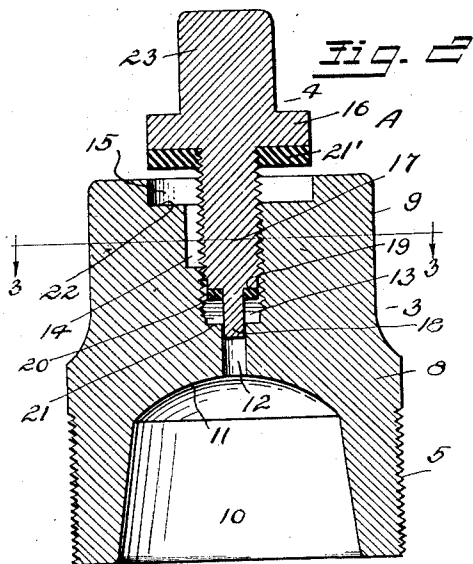
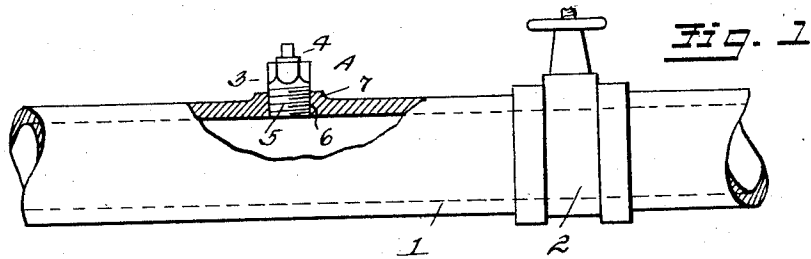
Nov. 6, 1928.

1,690,183

W. D. STOUGHTON

TEST PLUG

Filed Dec. 30, 1926



Inventor

W. D. Stoughton

By

W. D. McDowell

Attorney

UNITED STATES PATENT OFFICE.

WILLIAM D. STOUGHTON, OF NEWARK, OHIO.

TEST PLUG.

Application filed December 30, 1926. Serial No. 158,023.

This invention relates to improvements in test plugs especially adapted for use in connection with high pressure fluid conduit, and has for an object to provide a plug which may be readily inserted into or removed from a conduit while the latter is carrying a fluid under pressure so as to permit of the testing of the fluid in order, for example, to ascertain the pressure of the fluid or for the purpose of making other tests relative to its character and condition. The invention is particularly applicable when used in oil or gas well systems to permit of the application of recording instruments to said systems for data obtaining purposes.

In accordance with the present invention there is provided a test plug consisting of two interfitting sections, the primary section of which being formed for direct insertion into a conduit containing a fluid, either liquid or gas, under relatively high pressures, and is provided with a longitudinally extending axial bore, in which is threadedly positioned the removable secondary section of the plug, provision being made in the construction of the plug to allow for the escape of the fluid, immediately adjacent the plug, during the process of removing said secondary section in order that before the latter has been completely removed the fluid pressure thereon will have been sufficiently reduced so as to permit of the convenient and complete removal of the secondary section without inconvenience or injury to the operator.

Another object of the invention resides in forming the inner end of the secondary section of the plug to present a reduced area to the internal fluid pressure, to the end of securing convenience in rotating the secondary part of the plug when effecting its removal from the threaded part of the main portion of the plug.

Further objects of the invention reside in a plug of the character set forth of extremely simple and sturdy construction, and wherein an improved gasket construction is provided between the meeting faces or shoulders of the primary and secondary sections of the plug which serve to prevent seepage or undue escape of the fluid through the joints of the plug.

With these and other objects in view, as will appear as the description proceeds, the invention consists in the novel features of construction, combinations of elements and

arrangements of parts hereinafter to be fully described and pointed out in the appended claims.

In the accompanying drawing:

Figure 1 is a side elevation of the improved testing plug comprising the present invention and illustrating its position in an associated conduit or fluid line,

Figure 2 is an enlarged vertical sectional view taken through the plug, the secondary section of the plug being shown slightly separated from the primary section,

Figure 3 is a transverse horizontal sectional view taken through the plug on the line 3-3 of Figure 2,

Figure 4 is a side elevation of the secondary section of the plug, and

Figure 5 is a view in elevation showing the plug when connected with recording apparatus.

Referring more particularly to the drawings there is disclosed at 1 a pipe line or conduit construction suitably designed for transferring fluids from point to point while such fluids are under superatmospheric pressures. The conduit may be provided at suitable intervals with one or more valves 2, by means of which the flow of the fluid through the conduit may be regulated and restricted if desired to relatively localized portions of the conduit.

The improved testing plug A, comprising the present invention, is formed to include a main or primary section 3 and a removable secondary section 4. The primary section comprises preferably a strongly constructed steel body having its lower end exteriorly threaded as at 5, in order that the primary section may be received within a threaded socket 6 provided in a collar 7 forming a part of the conduit 1. Exteriorly, above the threads 5, the section 3 includes a plain circular portion 8, and above this portion the section 3 terminates in a slightly reduced multisided portion 9, which permits of the application of a wrench or other tool so as to facilitate the insertion or removal of the section 3 from the threaded socket 6.

The section 3 is formed to include an axial bore of varying proportions or diameter. The lower portion of this bore or passage is shaped to comprise a relatively enlarged chamber 10, which is in open communication with the interior of the conduit and terminates upwardly in a substantially convex wall

11. Extending axially through the section 3 above the wall 11 is a reduced port 12, which establishes communication between the chamber 10 and a diametrically larger threaded bore 13. The side of the bore 13 is provided with a vertically extending vent slot 14. This slot and the upper end of the bore 13 terminate in a larger gasket receiving pocket 15, formed in the top of the section 3.

10 The secondary section 4 of the plug includes an enlarged circular body 16 corresponding in diameter to that of the pocket 15, and projecting downwardly and integrally from the body 16 is a threaded shank 17, which is threadedly received in the bore 13 of the primary section and, therefore, corresponds in diameter to the same. The extreme inner or lower end of the shank 17 terminates in a diametrically reduced stem 18, which fits snugly within the port 12. Surrounding the stem 18 and engaging with the shoulder 19 formed at the point of juncture of the shank 17 and the stem 18 is a gasket 20 which is adapted to engage with the annular seat 21 provided at the bottom of the bore 13.

20 Also, surrounding the shank 17 immediately below the body 16 is a second gasket 21', which is adapted to be received within the pocket 15 and to engage tightly with the seat 22 constituting the bottom of said pocket when the plug sections are operatively assembled. Above the body 16 the secondary section of the plug is formed to include a polygonal head 23, formed to admit of the application of a wrench or other tool to the secondary part of the plug so as to operatively bind or remove the same into and from engagement with the main section of the plug.

30 It will be seen that when the secondary section of the plug has been applied to the primary section so as to close the axial bore of the latter, the gaskets 20 and 21' will be firmly seated in engagement with their respective seats 21 and 22. When the parts of the plug are thus assembled it will be seen that there is provided by the spaced gasket a double seal which serves effectively to prevent escape of the confined fluid. Again, due to the provision of the reduced stem 18 and the relatively restricted proportions of the port 12 there is exposed to the internal fluid pressure but a very small area of the secondary plug, or an area corresponding to the diameter of the stem 18. This relieves the gasket 20 of surface bearing pressure and secures facility in initiating the unscrewing movement of the secondary section. When it is desired to secure a reading of the fluid pressures within the conduit, where the plug is used, it is necessary first to unscrew the secondary section 4. When this operation has been carried on to an extent which has permitted the secondary section to be elevated to a point where the gasket 20 is slightly above the bottom of the slot 14, it will be seen that the internal pres-

ures within the conduit permit the confined fluid to escape through the port 12, the bore 13 and the slot 14 to the atmosphere, the valve 2, of course, being closed to limit the escaping fluid to a localized portion of the conduit. This operation enables the confined fluids to escape before the secondary sections have been completely removed from the primary sections so that the secondary sections may be removed without difficulty and more particularly without injury to the operator.

Following the removal of the secondary section of the plug there is inserted in the bore 13 a threaded fixture 24, which is formed to include a body 25, a downwardly extending threaded shank 26 and an upwardly extending portion 27 which terminate in a threaded end 28. A valve body 29 is connected with the end 28 and also removably carries a recording instrument 30 which in this instance may be in the nature of a pressure gauge. Following the connection of the gauge, the valves 2 are opened so as to obtain a reading of the pressures, after which the valves are again closed, the fixture 24 removed from the primary section of the plug, with the safety and convenience provided by the slot 14, and the secondary section is then restored to its original feeding position in connection with the primary section 3. The valves 2 may then be opened and normal operation resumed. The present invention thus provides a plug structure of simple, durable and economical form which may be used conveniently and safely in fluid pressure systems and one wherein mechanical complications are reduced to a minimum when the functions of the structure are taken into consideration.

What is claimed is:

1. A plug structure of the character set forth comprising separable primary and secondary sections, said primary section being formed to include an axially disposed bore threaded for at least a part of its length and having its inner end terminated in a reduced port, and the upper end terminating in an enlarged pocket formed in the top of said primary section, there being a vent passage extending between a point intermediate of the length of said bore and said pocket, said secondary section comprising an enlarged head adapted to be received within said pocket and terminating in an inwardly extending threaded shank arranged to be removably positioned within said bore, the inner end of said shank terminating in a reduced stem arranged to occupy said port when the sections of the plug are assembled, a gasket surrounding said stem sealing the joint between said port and said bore, and a gasket surrounding the shank and located below the head of the secondary section for sealing the upper part of said bore and said vent.

2. A plug structure of the character set forth comprising separable primary and sec-

ondary sections, said primary section being
formed to include an axially disposed bore
threaded for at least a part of its length and
having its inner end terminating in a reduced
5 port, said primary section being further
formed with an upper and a lower seat located
at each end of said bore, there being a
vent passage between a point intermediate of
the length of said bore and terminating in the
10 upper seat, said secondary section comprising
an enlarged head terminating in an inwardly

extending threaded shank arranged to be removably positioned within said bore, a gasket
attached to the lower end of said shank and
sealing the joint between said port and said 15
bore, and a gasket surrounding the upper end
of said shank and located below the head of
the secondary section for sealing the upper
part of said bore and vent.

In testimony whereof I affix my signature.

WILLIAM D. STOUGHTON.