H. J. McGILVRAY.

DEVICE FOR REMOVING ACCUMULATED LIQUID FROM GAS MAINS.

APPLICATION FILED OCT. 14, 1915.

1,191,013.

Patented July 11, 1916.

2 SHEETS—SHEET 1.

Fig. 1

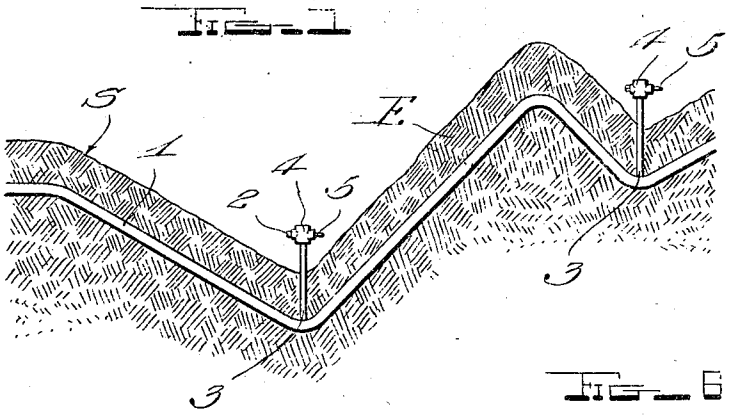


Fig. 2

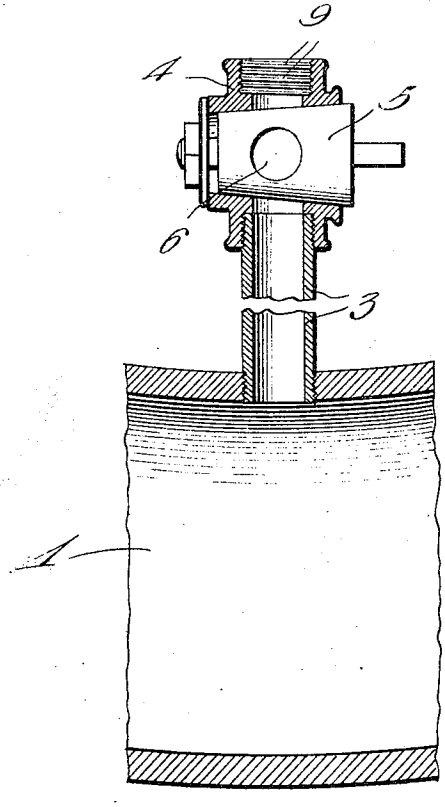


Fig. 6

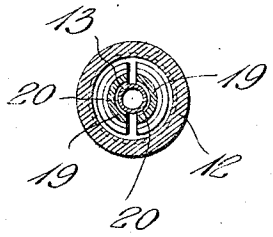
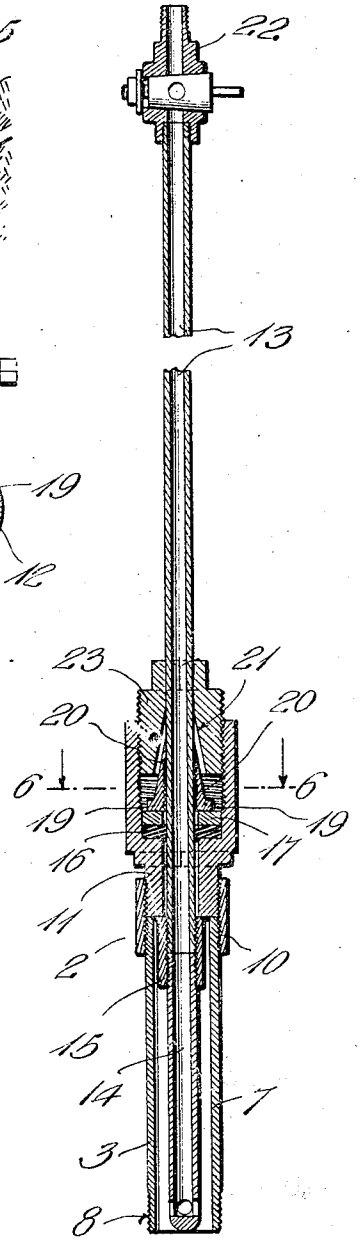


Fig. 3



Witnesses

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2 SHEETS—SHEET 2.

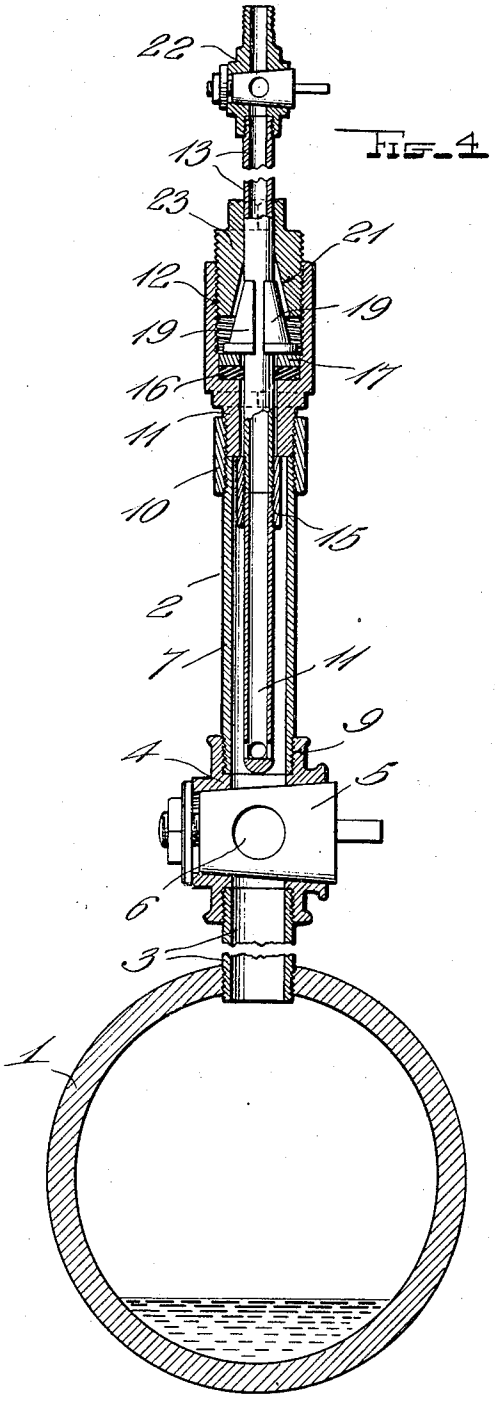


Fig. 4

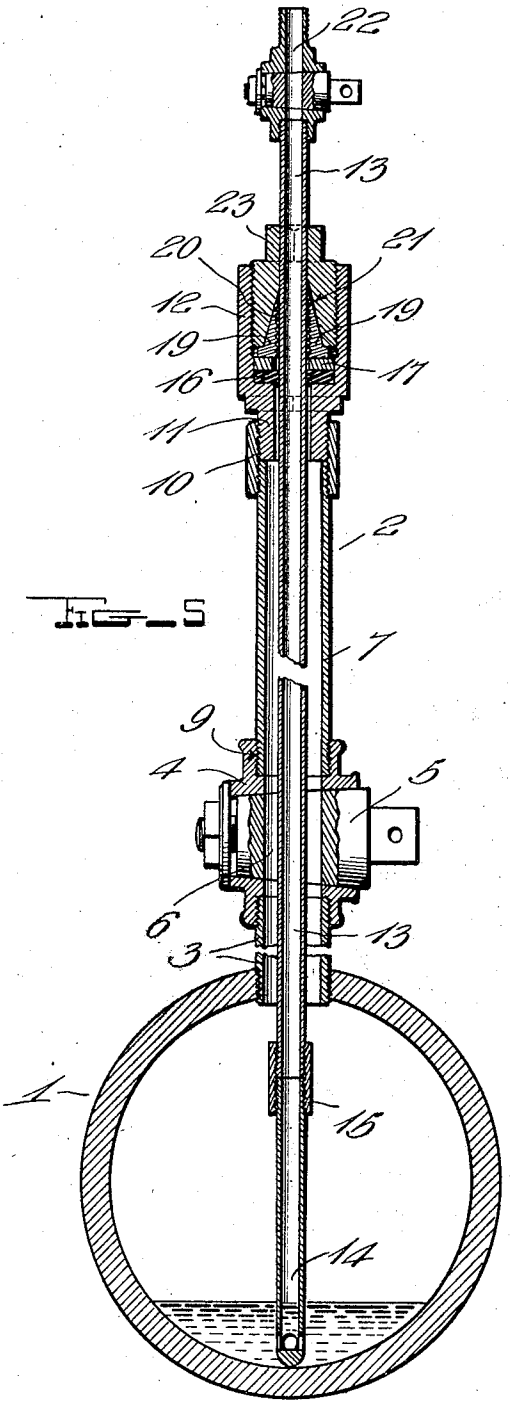


Fig. 5

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UNITED STATES PATENT OFFICE.

HARRY JAMES McGILVRAY, OF WESTON, WEST VIRGINIA, ASSIGNOR OF ONE-HALF TO HUNTER M. BENNETT, OF WESTON, WEST VIRGINIA.

DEVICE FOR REMOVING ACCUMULATED LIQUID FROM GAS-MAINS.

1,191,013. Specification of Letters Patent. **Patented July 11, 1916.**

Application filed October 14, 1915. Serial No. 55,870.

To all whom it may concern:

Be it known that I, HARRY JAMES McGILVRAY, a citizen of the United States, residing at Weston, in the county of Lewis and State of West Virginia, have invented certain new and useful Improvements in Devices for Removing Accumulated Liquid from Gas-Mains and the like; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved device for removing accumulated liquid from gas mains and the like without allowing escape of gas therefrom or loss of such liquid.

It is well known that liquid accumulates at low points in gas mains, particularly in the mains used for the transportation of natural gas in which the pressure is so great as to liquefy some of the constituents of such gas as well as to aid in the condensation of the moisture therein, into liquid form. The liquid, under such circumstances, is practically pure gasolene and is therefore valuable. From time to time it is necessary to remove all accumulated liquid from the mains. Heretofore, this has been accomplished by equipping the low points of the pipe lines with blow-off cocks and by allowing the gas pressure in such lines to blow out the liquid therein when such cocks are opened. Although this method allows the liquid to be removed, it necessitates wasting of such liquid as well as the loss of an appreciable amount of gas.

It is therefore the object of my invention to provide a novel device for removing the accumulated liquid from the lines without loss of either gas or liquid. This end is attained in the manner hereinafter fully described, by the use of an apparatus such as that shown in the accompanying drawings which constitute a part of the application, and in which:—

Figure 1 is a diagram of a pipe line or gas main equipped in accordance with the present invention; Fig. 2 is an enlarged section through the member of the apparatus carried permanently by the gas main; Fig. 3 is a similar view of the portable member of the apparatus; Fig. 4 is a sectional view showing the portable and fixed members coupled together; Fig. 5 is a similar view with all parts positioned for discharging the accumulated fluid from the main, and Fig. 6 is a detail transverse section taken on the plane of the line 6—6 of Fig. 3.

In describing the invention, I shall refer to the drawings above briefly described, by similar reference characters placed on corresponding parts throughout the several views. To this end, the numeral 1 indicates broadly a gas main usually laid below the surface S of the earth E, for conducting gas from one point to another point remote therefrom. Necessarily, since the main must travel over hills and through valleys and the like, a number of low points exist in the length of such main, it being at such points that liquid separated from the gas will accumulate. To remove such liquid from time to time, the devices or apparatuses 2 are used, the latter being positioned at suitable places throughout the length of the main.

Each device 2 includes a tubular passage member 3 in the form of a pipe which is inserted downwardly through the earth and tapped permanently into the main 1, the upper end of said passage member being constituted by a valve casing 4. Normally, communication between the upper and lower ends of the aforesaid passage member is obstructed by the provision of a valve plug or the like 5, but when desired, such plug may be so rotated as to dispose its port 6 vertically, whereby communication may be had between the inner and outer ends of the aforesaid member.

Insertible into the upper end 4 of the valve casing 3, is an additional tubular passage member 7 in the form of a pipe having external screw threads 8 on its lower end for inter-engagement with similar threads 9 formed on the upper end of said valve casing. The upper end of the pipe 7 is connected by a coupling or the like 10 to a neck 11 which depends from a socket member 12, said neck being provided with a central bore opening into the pipe 7 as clearly shown in Figs. 3, 4, and 5. It is to be observed, however, that the bore in the neck is of less size than that of the pipe.

Inserted slidably through the socket member 12 and pipe 7, is a liquid discharge tube 13 having at its lower end a perforated extension 14 connected thereto by a coupling sleeve 15, which, under normal circum-

stances, abuts the inner end of the neck 10. Disposed in the socket 12 and surrounding the tube 13 in fluid tight contact therewith, is a packing ring 16 against whose upper side a washer 17 rests, while bearing on the outer side of said washer, and having an axial bore receiving the tube 13, is a split cone 19, the wall of whose bore is preferably serrated at 20. The split cone 19 is received in a conical socket 21 formed in the lower end of a screw plug 23 which closes the upper end of the socket member 12.

In addition to the parts above described, the tube 13 is preferably equipped with a cut-off valve or cock 22 at its upper end, from which a pipe or the like (not shown) may lead to a suitable portable container.

The parts 7 to 23 inclusive are adapted to be carried by the line walker whose duty it is to remove the accumulated liquid from the low points of the main without the waste of either liquid or gas. In so doing, he will thread the pipe 7 into the upper end of the valve casing 3 by the use of an appropriate wrench or the like, will then open the valve 5, whereupon the tube 13 may be inserted into the main through the aforesaid member and the port 6 of the valve. During this operation, the valve 22 is closed.

After the tube has been inserted into the main, the plug 23 is threaded inwardly by the use of a wrench or other appropriate tool, thus contracting the split cone 21 around said tube to prevent the high pressure within the main from forcing the same outwardly. At the same time, the packing ring 16 is compressed into binding frictional contact with the tube to prevent the possible escape of gas at this point. Finally, the valve 22 is opened and the pressure within the main will force the accumulated liquid therefrom into the container above mentioned, through the tube 13, with the result that all of such liquid may be saved, this being particularly advantageous if the liquid in question be in the form of gasolene.

When the liquid has been removed, the plug 23 is loosened, whereupon the tube 13 may be moved outwardly until its coupling 15 abuts the neck 11, such coupling thus also serving the function of preventing the pressure in the main from blowing the tube from its retaining means. The plug 5 is now closed, and the pipe 7 is again detached from the valve casing 3, whereupon the portable parts of the device may be moved to the next low point, at which point the cycle of operation above described will be repeated. This manner of operation takes place successively throughout the length of the main, as will be readily understood without requiring a more extended explanation, it being evident, however, that neither gas nor liquid need be wasted, and that I have therefore fulfilled a long felt need in the art to which my invention relates.

The process herein described is not claimed in the present application, but forms the subject matter of my copending application which has now matured into Patent #1181910, May 2nd, 1916.

I claim:

1. An apparatus for removing accumulated liquid from pressure-carrying gas mains and the like, comprising a passage member to be carried by the main, a portion of which is permanently attached thereto, a valve normally closing said member, a liquid discharge tube insertible into the main through the passage member when the valve thereof is opened, and means for establishing fluid tight engagement between the passage member and tube before the valve is opened and for maintaining such engagement after said valve is opened.

2. An apparatus for discharging accumulated liquid from pressure-carrying gas mains and the like, including a passage member and a fluid discharge tube insertible into the main through said member, a packing ring carried by the passage member and surrounding the tube, and a combined ring compressing and tube gripping device for simultaneously forcing the packing ring into snug contact with the tube and for holding said tube against being moved outwardly by the pressure within the main.

3. An apparatus for removing accumulated liquid from pressure-carrying gas mains and the like, including a passage member having at one end a socket and a liquid discharge tube insertible into the main through said socket and passage member, a packing ring in the socket and surrounding the tube, an expansible and contractible tube gripping member surrounding said tube and disposed within the socket, and means for simultaneously contracting said gripping member around the tube and for forcing it against the packing ring to compress the latter around said tube.

4. An apparatus for removing accumulated liquid from pressure-carrying gas mains and the like, comprising a tubular passage member to be carried permanently by the main, a valve for normally closing said member, a portable tubular passage member, coacting coupling means on the two members, a socket carried by one end of the portable member, a discharge tube inserted slidably through said socket and through said portable member, a packing ring in the socket snugly surrounding the tube, a split cone in said socket having its base presented toward the packing ring and having an axial bore receiving the tube, and a plug movable inwardly and outwardly in the open end of the socket and having in its inner end an additional socket receiving said

split cone, whereby to contract the same around the tube and to simultaneously compress the packing ring, when said plug is moved inwardly.

5. An apparatus for removing accumulated liquid from pressure-carrying gas mains and the like, comprising a tubular passage member to be carried permanently by the main, a valve for normally closing said member, a portable tubular passage member, coacting coupling means on the two members, a socket having a depending neck received in the outer end of the portable member, a discharge tube inserted slidably through said socket into said portable member, said tube being formed in two sections disposed end to end below the socket, a coupling sleeve connecting said sections and adapted to bear against the neck of the socket to prevent excessive outward sliding of the discharge tube, a packing ring in the socket snugly surrounding the tube, a split cone in said socket having its base presented toward the packing ring and having an axial bore receiving the tube, and a plug movable inwardly and outwardly in the open end of the socket and having in its inner end an additional socket receiving said split cone, whereby to contract the latter around the tube and to simultaneously compress the packing ring, when said plug is moved inwardly.

6. The combination with a gas main having low points in which liquid is prone to accumulate; of permanent passage members carried by the main at such low points, valves for normally closing said permanent passage members, a single portable passage member, means for coupling the portable passage member to any one of the permanent passage members, a liquid discharge tube carried slidably within the portable member and insertible into the main through any one of the permanent members when the valve thereof is opened, and packing means carried by said portable member and snugly surrounding the tube.

7. The combination with a pressure-carrying gas main having low points in which liquid is prone to accumulate, of a plurality of permanent passage members carried by the main and disposed one at each of said points, valves for normally closing said passage members, a portable liquid discharge tube insertible into the main through any one of the passage members when the valve thereof is opened, and means for establishing a fluid tight engagement between the passage member and tube before the valve is opened, and for maintaining such engagement after opening said valve.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HARRY JAMES McGILVRAY.

Witnesses:
W. J. SMITH,
THOMAS I. CUMMINGS.