Dec. 25, 1928. 1,696,757

W. B. FORD

SUSPENDING AND CONTROLLING HEADER FOR METERS

Filed Feb. 12, 1927

Fig. 1

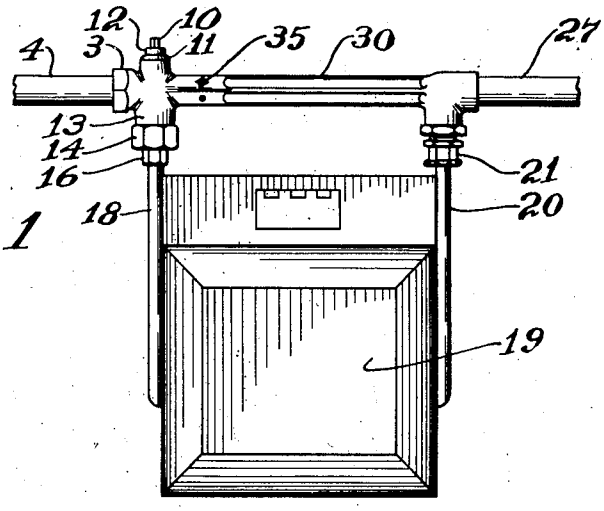


Fig. 2

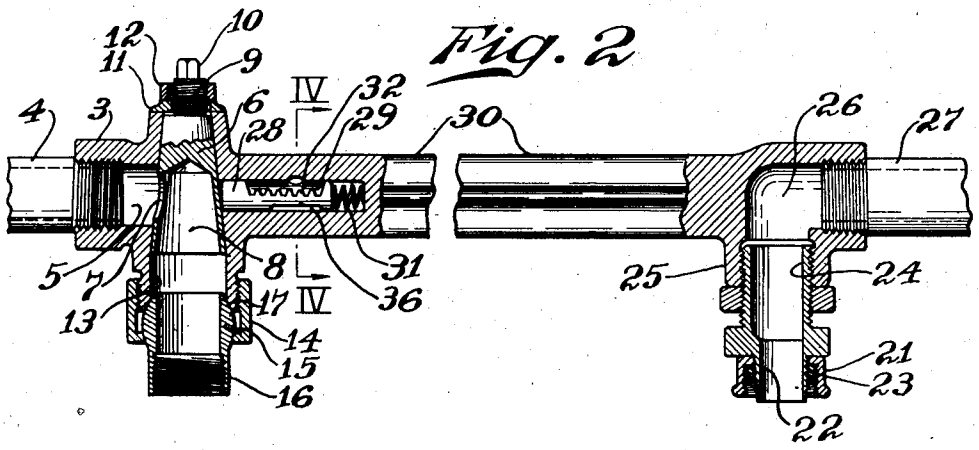


Fig. 3

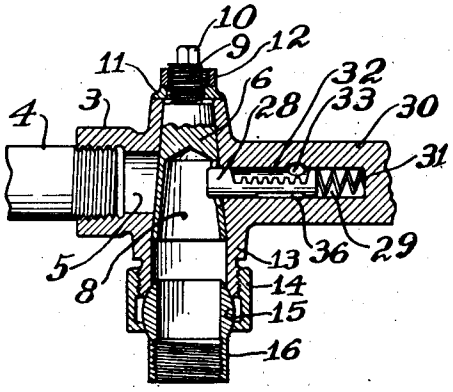
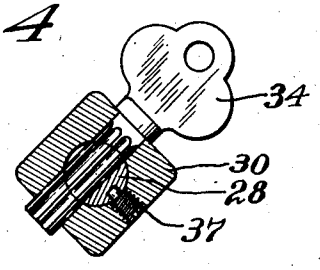


Fig. 4



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UNITED STATES PATENT OFFICE.

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SUSPENDING AND CONTROLLING HEADER FOR METERS.

Application filed February 12, 1927. Serial No. 167,842.

This invention relates to a suspending and controlling header for meters, and particularly for gas meters, the object being to provide a non-throttling connection for the gas supply and discharge which will be substantially equal to the flow capacity of the tube screws on the meter.

My invention contemplates more particularly the improvement of the type of suspending and controlling header which forms the subject matter of Letters Patent No. 1,267,651, issued to me on May 28th, 1918, wherein is shown an integral rigid header carrying at one end the intake connection for the gas supply main and a connection to the intake side of the meter and carrying at its other end an adjustable connection to the outlet side of the meter and a connection to the service pipes.

My present invention is concerned with the following changes and improvements in my said patented construction, namely:—

1st: I have found it desirable to adapt the truncated turning plug or inlet valve to be adjusted from above its seat and to disassociate it entirely from the coupling to the intake side of the meter.

2nd: I have found it desirable to design this intake coupling so as to provide definitely a ball joint connection bearing only against the valve shell and its union nut freely adjustable angularly throughout the necessary range for adaptability to the tube screws on the inlet of different meters.

3rd: I avoid the use of a throttling discharge coupling between the meter and header by the provision of a nipple externally threaded at both ends with its end towards the meter having a full flow bore eccentric to the bore of the other end, and providing a meter coupling nut which is adjustably connected to the nipple by a ring nut which provides for vertical adjustment in the connection while the eccentric nipple provides lateral adjustment. The full flow is obtained because the coupling nut can be slipped upwardly to position on the nipple and ring nut then passed upwardly through the coupling nut and screwed onto the nipple completing the assemblage. Were the ring that the coupling nut engages cast on the connection, the other threaded end of the coupling would have to permit the nut to pass and thus would be restricted and cause a throttling of the gas flow.

4th: In order to avoid the necessity of removing the meter when it is desired to disconnect a service, my invention contemplates providing the header connection with means capable of being sealed to lock the turning plug in closed position, the lock means being preferably automatic in its functioning. It is a distinctive feature of this lock that it is mounted in the arm and adapted to engage in the inlet port of the turning plug, this arrangement avoiding changes in the valve shell, and enabling the plunger seat to be drilled through the gas inlet opening of the shell.

My invention further comprises the novel details of construction and arrangements of parts, which are, in their preferred embodiment only, illustrated in the accompanying drawings which form a part of this specification, and in which:—

Fig. 1 is a front view of my meter connection installed.

Fig. 2 is an enlarged detail view partly in cross-section of the header.

Fig. 3 is a cross-sectional view of the gas inlet connection showing the plug locked in closed position.

Fig. 4 is a cross-sectional view taken on the line IV—IV of Fig. 2.

Similar reference numerals refer to similar parts throughout the drawings.

In the embodiment of my invention illustrated, which obviously may be variously modified in accordance with the type and character of meter to be served, I show the header as comprising a valve shell having a gas inlet connection 3 tapped to receive the gas supply pipe 4 and having a port 5 which will deliver the gas to the conical bore of the valve shell. Within this bore, which tapers upwardly, I mount a truncated conical turning plug 6 provided in its main body portion with a roundway full flow inlet port 7 and downwardly flaring outlet passage 8. The port 7 is adapted to register with the shell port 5. The upper end of the plug is left solid and is turned off to provide a reduced threaded shank 9 flattened along one vertical side thereof and at its upper end further reduced and made polygonal to form a tool grip 10. A spring washer 11, shaped to interlock with the flattened threaded shank 9 so as not to be rotatable thereon, is adapted to rest on the upper end of the valve shell and to be engaged by a ring nut 12, which screws on the shank 9 and leaves the tool grip exposed

for the convenient manipulation of the valve.

It will be observed that the lower end of the turning plug 6 terminates a substantial distance from the lower end of the shell where same forms the connection 13 for the coupling to the intake tube screw of the meter. This connection 13 is externally threaded and adapted to receive a union nut 14 which provides the lower ball seat for a ball 15 formed about the upper end of the coupling nipple 16. The connection 13 is cylindrical, that is to say, it has a straight bore which at its lower end is formed with an upper ball valve seat 17 for the ball 15 and the union nut will provide ample clearance for free angular play of the nipple on its ball seat to accommodate it to variations in position of meter intake tube screws. The non-tapering bore 13 is important in that it reduces the size of the valve body, and lowers its cost, it being cheaper to drill the bore 13 and then turn the taper seat 7 than to taper the whole bore and unnecessarily flare the base of the connection. The union serves to hold the ball tightly against its seat in the valve shell, leaving the plug free of contact with the ball coupling and held to its working position entirely by the action of the ring nut on its upper end. The nipple 16 has a gas port therethrough and is internally threaded for connection to the tube screw on the inlet pipe 18 for a gas meter 19, which has its outlet pipe 20 threaded to receive a union nut 21. This nut has a central top opening through which the lower threaded shank 22 of a double nipple is passed and receives a nut 23 for connecting the nipple to the union. The upper end 24 of the nipple is eccentric relative to its lower end 22 and this upper end is externally threaded and adapted to screw into a connection 25 formed at the discharge end of the header and adapted to deliver gas to an outlet port 26, normally connected to the house service pipe 27. By turning the nipple, the eccentric relation of its threaded ends will take care of the necessary horizontal adjustments for connecting the header to the meter tube screws, and vertical adjustments can be cared for by adjusting nut 23 and permitting union 21 to be raised or lowered.

In order that the plug, when it is set by the meter operator to disconnect the service, cannot be tampered with, I provide a lock means preferably in the form of a plunger 28 arranged with its axis in line with the port 5 in the connection 3 and I seat it in a bore 29 disposed longitudinally in the connecting arm 30 of the header. A spring 31 at the inner end of this bore presses the plunger outwardly against the plug and it will be observed that it is disposed in line with the plug port 7 so that when the plug is turned to full closed position, the plunger will project through the port and thus lock the plug not only in its closed position so that it cannot be turned, but also will lock it in the shell so that it cannot be removed therefrom notwithstanding that the header connection is detached from the meter. The plunger is reduced at an intermediate point and provided with rack teeth 32 which are disposed so as to project into line with a key-hole 33 formed in the connecting arm 30 and adapted to permit a key 34 to be inserted to retract the plunger and unlock the valve plug when desired. Ordinarily it is contemplated that this key-hole and the plunger will be suitably protected so that access cannot be had to unlock the plunger without this fact being indicated, and as illustrative of such a means I show, in Fig. 1 a sealing medium 35 applied to the hole so that it must be broken to give access to the plunger. The plunger carries a slot 36 in which a set screw 37 engages to limit its travel and hold its teeth in key-engaging position.

Having assembled the parts in the manner described, I adjust the ring nuts and set the plug in working position in the valve shell. The apparatus is now ready to be connected to the meter and this is done by first connecting the header to the pipes 4 and 27. Then by rocking the ball joint nipple 16 it can be coupled to the meter intake tube screw and by adjusting the outlet connection by raising or lowering the union 21 and by turning the eccentric nipple to shift the connection until co-axial with the meter outlet tube screw, this can then be connected and the device is in operating position free of all strain on the meter tube screws. If occasion arises to disconnect the service, the operator merely applies his tool to the tool grip 10 at the top of the turning plug and turns it until the plunger snaps into the valve port 7, thereupon the gas is cut off and it cannot be reinstated without tampering with the seal 35 for the key-hole.

Though I have described with great particularity the details of the embodiment of the invention herein shown, it is not to be construed that I am limited thereto, as changes in arrangement and substitution of equivalents may be made by those skilled in the art without departing from the invention as defined in the appended claims.

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

1. A header of the character described, comprising gas inlet and outlet connections and an arm joining said connections, there being a valve seat in the gas inlet connection, a turnable plug in said seat having exposed means to operate it, said plug having a gas flow passage therein for registration

with the gas inlet when in open position, a lock plunger mounted in the arm and adapted to interlock with the passage in the plug when the plug is in closed position, substantially as described.

2. A header of the character described, comprising an arm having gas inlet and outlet connections at its ends, there being a valve seat in the gas inlet connection, a turnable taper plug in said seat having exposed means to operate it, a spring-pressed lock plunger mounted in the arm in alignment with the inlet connections and adapted to interlock automatically with the valve when in closed position, substantially as described.

3. In a gas header of the character described, an arm having at its ends respectively inlet and outlet connections adapted to be coupled to the corresponding meter tube screws, a valve shell communicating with the inlet connection, an inlet control valve plug mounted in the shell and having externally accessible means to operate it, a lock plunger mounted in the arm and having rack teeth registering with a key-hole opening, said plunger being adapted to interlock with the valve in its closed position and to hold it against rotation or removal from its seat in said shell.

4. In a meter header, an inlet valve shell having an inlet port at the side and a discharge outlet normal to the inlet port and communicating with the meter, a valve plug rotatable in said shell and having a port adapted to register with the inlet port and to communicate with the outlet, and a lock having a plunger bearing against the plug and adapted to engage in said plug inlet port to lock the plug in closed position and hold it against removal from the shell.

5. A header according to claim 4, in which the shell is provided with a bore in alignment with its inlet port, and the plunger is located within the bore.

6. A header for gas meters, comprising an arm integral at one end with a gas outlet and at the other end with a valve shell having a gas inlet connection at the side and a gas outlet connection below, means to couple said latter connection to the intake side of the meter, a plug having a bore opening below to the meter with a side port adapted to register with the gas inlet connection, there being a plunger seat formed in said arm in line with the gas inlet connection, a plunger mounted in said seat in position to engage in and substantially fill the plug's side port when the plug is moved to closed position, there being a key-hole in said arm leading to said plunger seat, and key engaging means on the plunger projecting in line with said key-hole, said key-hole being adapted to be sealed to prevent tampering with the plunger.

7. A gas header, comprising an inlet connection to the gas meter and a meter outlet connection having a threaded bottom opening, a nipple threaded at both ends, one end of the nipple being adapted to screw in said opening, a union loosely surrounding the other end of the nipple, and a nut within said union engaging said latter nipple end and adapted to permit adjustment of the union vertically, one end of the nipple having a bore eccentric to the bore at the other end, whereby the turning of the nipple provides horizontal adjustment for the coupling.

8. A meter header comprising an arm carrying inlet and outlet connections to the meter and to the service mains, one of the connections having a transverse bore and said arm having a recess therein in alignment with the bore, a control valve in said connection having a port registering with the bore when the valve is open and registering with the recess when the valve is closed, and locking means disposed within the recess and including a member positioned to engage the port when the valve is closed.

9. A meter header comprising an arm carrying inlet and outlet connections to the meter and to the service mains, one of the connections having a transverse bore and said arm having a recess therein in alignment with the bore, a control valve in said connection having a port registering with the bore when the valve is open and registering with the recess when the valve is closed, a reciprocable plunger mounted within the recess and positioned to engage the port when the valve is closed.

10. A meter header comprising an arm carrying inlet and outlet connections to the meter and to the service mains, one of the connections having a transverse bore and said arm having a recess therein in alignment with the bore, a control valve in said connection having a port registering with the bore when the valve is open and registering with the recess when the valve is closed, a spring pressed reciprocable plunger mounted within the recess and positioned to automatically engage the port when the valve is closed, there being a key hole in the arm leading to the recess, and key engaging means carried by the plunger.

In testimony whereof I affix my signature.

WILLIAM B. FORD.