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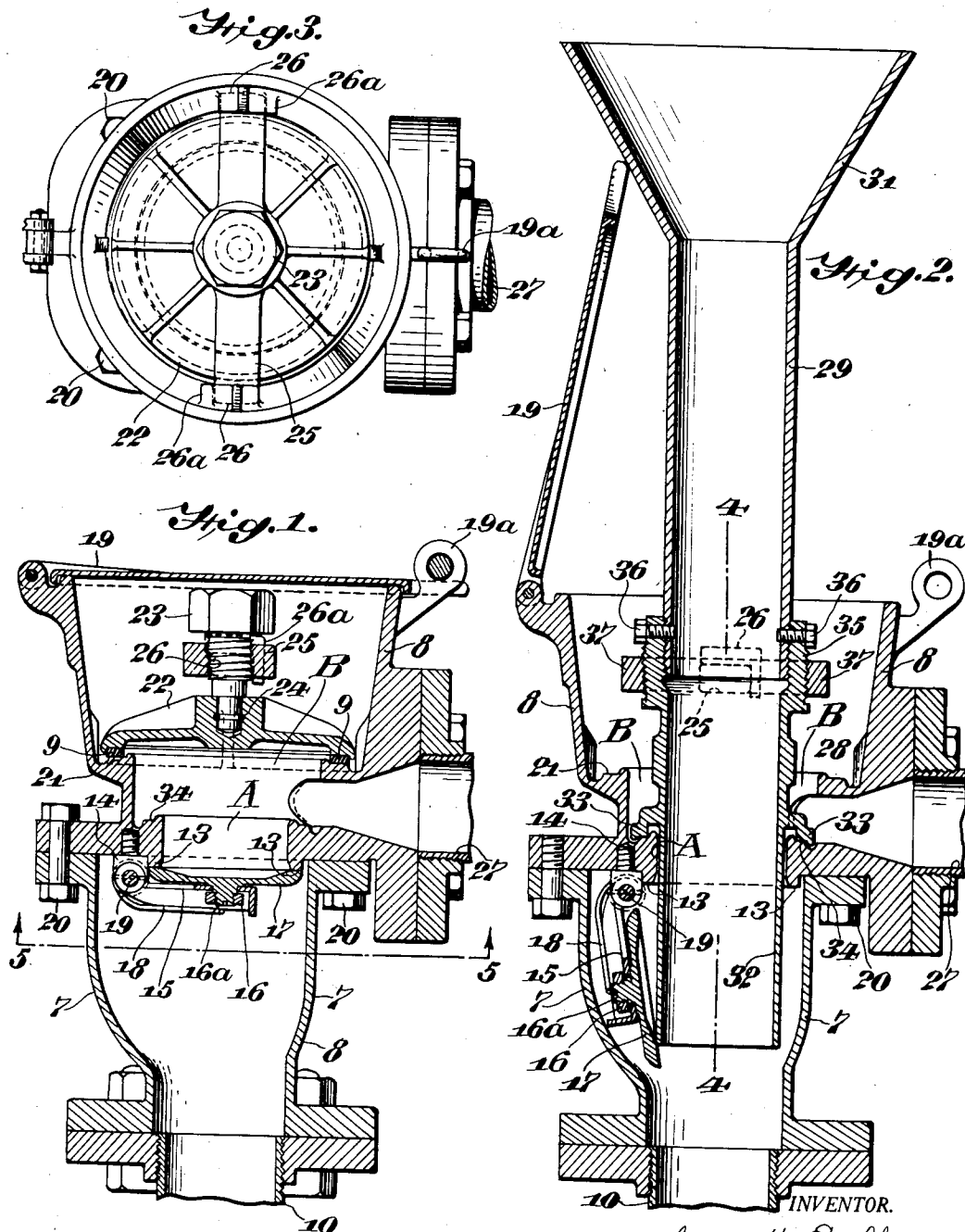
C. H. EHLERS

1,614,780

FILLING UNIT

Filed May 28, 1923

2 Sheets-Sheet 1



BY

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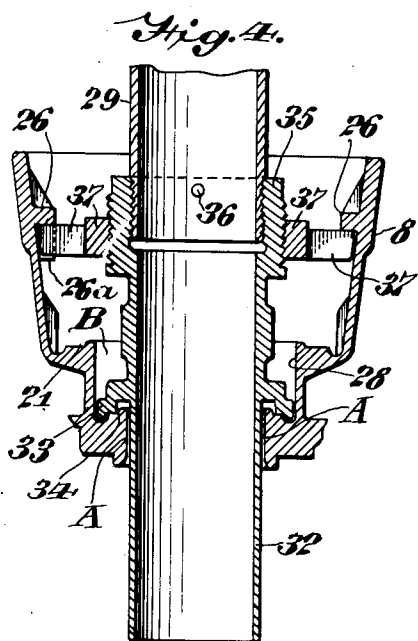
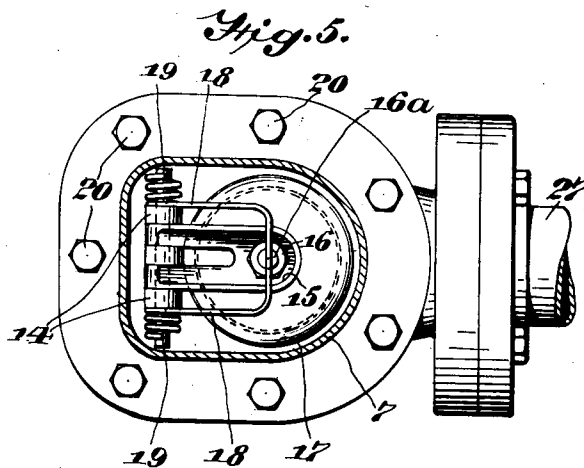
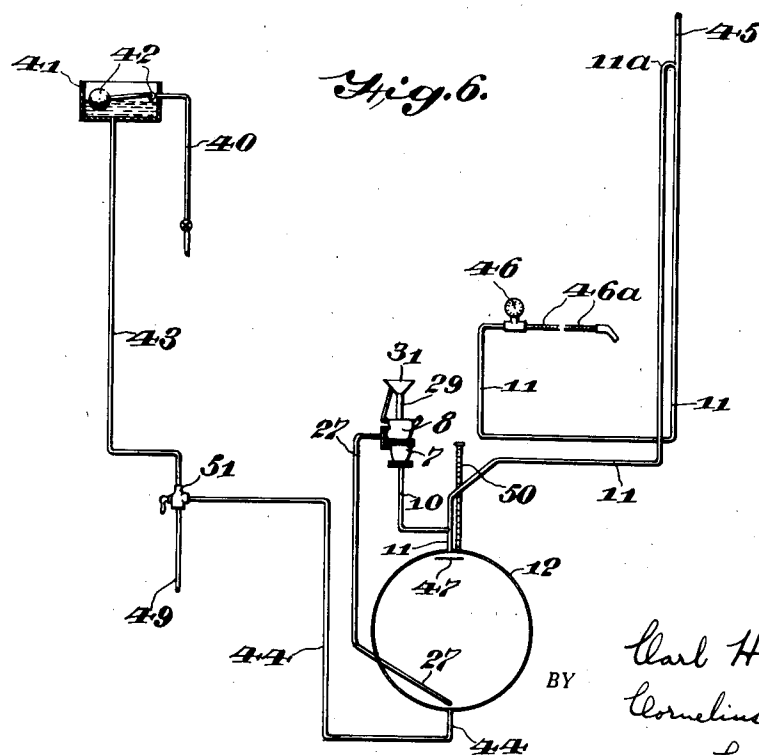
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

CARL H. EHLERS, OF PENFIELD, PENNSYLVANIA, ASSIGNOR TO THE ATLANTIC REFINING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

FILLING UNIT.

Application filed May 28, 1923. Serial No. 641,878.

My invention relates to an improved form of a filling and overflow unit particularly adapted for filling storage tanks or containers with liquid, and especially adapted for hydraulic oil delivery systems.

One object of my invention is to provide an improved combined filling and overflow device whereby the operator may readily determine when to stop supplying fluid to the container, and thereby avoid overflow and waste.

Another object of my invention is to provide a check valve to prevent back flow of the fluid out of the filling unit after the filling operation has been completed and the filling pipe removed.

Another object of my invention is to provide an improved filler pipe for introducing the fluid into the body of the filling and overflow unit.

Another object of my invention is to provide means for opening the check valve when ready to introduce liquid into the storage tank or container.

My invention resides in apparatus of the character herein described and claimed.

One of the various forms my invention may take is shown in the accompanying drawings wherein:

Fig. 1 is a vertical sectional view of the filling and overflow unit with the filler pipe removed and the equipment closed for service.

Fig. 2 is a vertical sectional view of the filling and overflow unit with the filler pipe in place.

Fig. 3 is a plan view of the filling and overflow unit with the lid thereof removed.

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

Fig. 5 is a sectional view on the line 5-5 of Fig. 1.

Fig. 6 is a diagram showing one environment in which my invention may be used for dispensing liquid by hydraulic control.

Referring more particularly to Figs. 1 and 3, the apparatus comprises a lower casing 7, and an upper casing 8. The lower casing 7 is connected to a pipe 10 connected to a pipe 11 and a storage tank 12, Fig. 6. The upper casing 8 is secured to the lower casing 7 by bolts 20 extending through the

flanges on the casing sections 7 and 8. Casing 8 is provided with an annular valve seat 13, and supports lugs 14 through which extends pin 19 which carries an arm 15. A nut 16 engages a threaded extension 16^a of the check valve disc 17 to hold the valve disc 17 to the arm 15. The valve disc 17 is normally held in closed position as shown in Figs. 1 and 5 by spring 18 supported by the pin 19, to prevent upward flow through port A.

The upper casing 8 is provided with a hinged lid 19 that protects the parts on the interior of the casing from injury and excludes dirt therefrom. The lid is slotted to fit over an eye lug 19^a and may be locked thereto by a padlock, not shown.

An annular seat 21 is provided within the casing 8 at the port B for the sealing cover or cap 22. A bolt 23 is rotatably attached to the cover or the cap 22 by means of a pin 24 engaging in a circumferential recess in the bolt 23.

A cross arm 25 has screw threaded engagement with the bolt 23 and loose connection with the lugs 26 formed upon the interior wall of casing 8. By engaging cross arm 25 under lugs 26 and turning bolt 23 in a clockwise direction the bar 25 will be forced upwardly against the under side of the lugs 26, thus causing a downward thrust upon the cover or cap 22, forcing gasket 9 against the annular seat 21, thereby tightly sealing port B. Stop members 26^a prevent rotative movement of the bar 25 from beneath the lugs 26 while the bolt 23 is being turned clockwise.

A pipe 27, Figs. 1 and 6, connects casing 8 with tank 12 for the purpose hereinafter explained.

Referring now more particularly to Figs. 2 and 4 there is provided a filling pipe 29, which may have a funnel 31, and having a lower section or nozzle 32. When the cover or cap 22 has been removed, nozzle 32 may be inserted to the position shown in Fig. 2, forcing the valve disc 17 open, and causing the annular seat of the flange 33 of the nozzle 32 to engage on annular seat 34 formed within the casing 8. The section 32 of the filling pipe is provided at its upper end with a collar 35 into which the upper

section of the filling pipe 29 is threaded, and securely held therein by means of cap screws 36.

A yoke 37 has screw threaded engagement with the exterior of collar 35, and is adapted to engage the underside of lugs 26, as shown in Fig. 4. On turning the filling pipe 29 in a clockwise direction, yoke 37 will force the annular seat of the flange 33 of the nozzle 32 into tight engagement with the annular seat 34 of casing 8 to prevent passage of fluid from casing 7, past nozzle 32, into casing 8.

When the parts are assembled, as shown in Fig. 2, liquid may be introduced into the tank 12 through pipes 10 and 11. Upon withdrawal of the filling pipe 29, the valve disc 17 will be closed by the spring 18 to prevent backflow of fluid from the tank 12, as when pressure is applied thereto.

In Fig. 6, my device is shown employed in an oil or gasoline dispensing system. Parts other than those above described may be of conventional form and include a water supply pipe 40, and a tank 41, and a float valve 42 for controlling admission of water from the pipe 40 as the water level falls due to delivery of water to pipes 43 and 44, leading to the tank 12. The pipe 11 is provided with a return bend to which a siphon breaker 45 is connected, and pipe 11 terminates at a meter 46, through which oil or gasoline from the container 12 may be withdrawn through hose and nozzle 46^a. A baffle plate 47 is mounted adjacent to the lower end of pipe 11, to diffuse the oil as it enters the tank 12 and prevent it from being impelled through the body of water in the tank. A gage pipe 50 may be employed for determining the amount of oil in the tank.

After the tank 12 has been filled with oil, the three-way valve 51 is turned to admit water from the tank 41, thus placing the oil in the tank 12 under pressure and causing it to flow through the pipe 11 when oil is drawn through the meter 46. The water will not rise in the pipe 11 sufficiently high to pass the bend 11^a, because such bend is higher than the tank 41, and consequently no water can be drawn through the meter 46. When it is desired to re-fill the tank 12 with oil, the three-way valve 51 is turned to shut off the flow of water through pipe 43 and to establish communication between the pipe 44 and a drain or waste pipe 49. The water in the system will then flow off through the pipe 49, until it reaches the level of the three-way valve. The cap 22 is removed and the filling pipe 29 introduced and secured as above explained. As oil flows through the pipes 29, 10 and 11, the water in the tank 12 will be forced off through the pipes 44 and 49 through displacement thereof by the oil, until the tank becomes filled

and the oil rises in the pipe 27 and enters the over-flow chamber 28 of the casing 8. By the appearance of oil in the casing 8 the operator is informed that the system is fully charged with oil. He then removes the filling pipe 29 and replaces the parts in the positions shown in Fig. 1, the check valve automatically closing as pipe 29 is withdrawn.

The location of the check valve 17 within the filling unit structure is of advantage in that air collecting in the pipe 10, as in horizontal portions thereof, will escape outwardly through the pipe 10 immediately the valve 17 is opened upon insertion of the filler pipe, and there will remain in the pipe 10 no air otherwise forming an air pocket interfering with the filling operation.

Various changes in detail and general arrangement may be made without departing from the spirit of the invention as defined in the accompanying claims.

What I claim is:

1. The combination with a tank, of a filling unit therefor comprising a casing, seats spaced from each other therein, a check valve biased to position against one of said seats, a removable closure member engaging the other of said seats, a connection from said casing from the under side of said valve to said tank, and a connection from said tank to the space between said seats.

2. The combination with a tank, of a filling unit therefor comprising a casing having a port therein, a check valve normally closing said port, a connection from said casing from the under side of said valve to said tank, a return connection from said tank to said casing above said check valve, a filler pipe adapted to hold said valve open, and means carried on said pipe for engaging said casing to prevent flow past said pipe from said return connection.

3. Filling apparatus comprising a casing, a normally closed valve therein, a filler pipe adapted to move said valve to open position, and a return flow connection to said casing above said valve.

4. Filling apparatus comprising a casing having a port, a check valve normally closing said port, a filler pipe adapted to be introduced through said port and to move said valve to open position, and a return flow connection to said casing above said valve.

5. Filling apparatus comprising a casing having ports spaced from each other, a check valve normally closing one of said ports, a removable member closing another of said ports, and a return flow connection to said casing between said ports.

6. Filling apparatus comprising a casing having ports spaced from each other, a check valve normally closing one of said ports, a removable member closing another of said

ports, a return flow connection to said casing between said ports, and a filler pipe adapted for introduction through said ports and to move said valve to open position.

5 7. Filling apparatus comprising a casing having a port, a supply connection extending from said casing beneath said port, a return flow connection to said casing beneath said port, a member for closing said port, and means coacting with said member and
10 said casing for holding said member in port-closing position.

8. Filling apparatus comprising a casing having a port, a check valve in said casing
15 on the discharge side of said port, a filler pipe extending freely through said port and displacing said valve, means on said filler pipe co-acting therewith for closing said port, and a return flow connection communi-
20 cating with said casing above said port.

9. Filling apparatus comprising a casing having a port, a check valve in said casing on the discharge side of said port, a filler
25 pipe extending freely through said port and displacing said valve, means on said filler pipe co-acting therewith for closing said port, means co-acting with said filler pipe and said casing for holding said filler pipe and said port-closing means in position, and
30 a return flow connection communicating with said casing above said port.

10. A filling unit for a tank, comprising a casing communicating with the tank, a seat in said casing, a check valve in said casing,
35 a filling pipe adapted to be inserted into said casing and hold said valve open, means secure on the exterior of said pipe for engaging said seat to prevent leakage of fluid past said seat to the outer side of said seat.
40

11. A filling unit for a tank, comprising a casing communicating with said tank, a valve in said casing for controlling communication between said tank and casing, and
45 a by-pass connection between said tank and a point in said casing at the outer side of said valve.

12. A filling unit comprising a casing through which fluid may be introduced into a receptacle, lugs on said casing, a filling
50 pipe, a member carried by said pipe and engaging said lugs, and means for adjusting said member longitudinally of said pipe.

13. A filling unit comprising a casing through which fluid may be introduced into a receptacle, lugs on said casing, a filling
55 pipe, and a member having screw threaded engagement with said pipe for adjustment longitudinally thereof and engaging with said lugs.

14. The combination with a tank, of a filling unit therefor comprising a casing, through which fluid may be introduced into
60 said tank, a check valve in said casing for preventing a flow of fluid from said tank, an over-flow chamber in said casing disposed

on the outer side of said valve, a by-pass connection between said tank and said chamber, and means for sealing said chamber against flow of liquid therethrough.

15. The combination with a tank, of a filling unit therefor, comprising a casing, seats spaced longitudinally of said casing, a check valve positioned against the innermost seat and mounted for inward opening movement, a by-pass connection between said tank and
75 a point in said casing between said two seats, and a removable closure member engaging said other seat to prevent flow of fluid there-through.

16. The combination with a tank, of a filling unit therefore comprising a casing, seats in said casing and spaced axially thereof, a by-pass connection between said tank and a point in said casing intermediate said seats, a filling pipe for insertion into said casing, means for preventing flow of fluid between
85 said pipe and the innermost seat, and means for preventing flow of fluid past the outermost seat when said filling pipe has been removed.

17. The combination with a tank, of a filling unit therefor comprising a casing, two seats in said casing and spaced axially thereof, a by-pass connection between said tank and a point in said casing intermediate said
95 seats, a filling pipe for insertion into said casing, a check valve in said casing in position to be opened by the insertion of said filling pipe, and means for preventing flow of fluid past the outermost seat when said
100 pipe is removed.

18. The combination with a tank, of a filling unit therefor comprising a casing through which fluid may be introduced into
105 said tank, a by-pass connection between said tank and a point intermediate the ends of said casing, means for normally sealing said casing against the exit of fluid which flows thereto through said by-pass, and means for preventing flow of fluid rearwardly through
110 the main communicating passage between said casing and said tank.

19. The combination with a tank, of a filling unit therefor comprising a casing through which fluid may be introduced into
115 said tank, a by-pass connection between said tank and a point intermediate the ends of said casing, means for normally sealing said casing against the exit of fluid which flows thereto through said by-pass, and a valve in
120 said casing disposed between the entrance from the casing to the tank and the entrance of the by-pass into said casing.

20. A filling unit comprising a casing having a bottom section, a top section detachably secured to the bottom section, a valve normally closing communication between
125 said sections, and opening inwardly into said bottom section, a by-pass connection between a point in advance of said valve and
130

said top section, and means for preventing flow of fluid from said by-pass outwardly through said top section.

21. A filling unit comprising a casing having a bottom section, a top section detachably secured to the bottom section, a check valve secured to the under-side of the top section and opening inwardly into the bottom section, a seat in said top section, a filling pipe adapted to engage said seat and prevent flow of fluid between said seat and said pipe, a second seat disposed above said first named seat, a by-pass connection between said tank and a point intermediate said seats; and means for preventing passage of fluid through said second named seat when said filling pipe has been removed.

22. A filling unit comprising a casing, a seat in said casing, a filling pipe having a seating surface adapted to engage said seat, a lug on the inner wall of said casing, and means carried by said filling pipe to engage said lug and hold said pipe against said seat.

23. A filling unit comprising a casing, a seat in said casing, a filling pipe having a seating surface adapted to engage said seat, a lug on the inner wall of said casing, and means carried by and adjustable axially of said filling pipe for engaging said lug and holding said pipe against said seat.

24. A filling unit comprising a casing, a seat in said casing, a filling pipe having a seating surface adapted to engage said seat, a pair of oppositely disposed lugs on the interior of said casing, a bar carried by said filling pipe and adapted to engage said lugs, and means for changing the position of said bar axially of said pipe to force said pipe firmly against said seat.

25. A filling unit comprising a casing, a seat in said casing, a filling pipe having a seating surface adapted to engage said seat, a pair of oppositely disposed lugs disposed on the interior of said casing, and a bar disposed radially of said casing and having screw-threaded engagement therewith, the ends of said bar adapted to engage the under-sides of said lugs, whereby said pipe may be forced into tight engagement with said seat upon rotation of said pipe.

26. A filling unit comprising a casing, a seat in said casing, a filling pipe having a seating surface adapted to engage said seat, a pair of oppositely disposed lugs disposed on the interior of said casing, a bar disposed radially of said pipe and having screw-threaded engagement therewith, the ends of said bar adapted to engage with the under-sides of said lugs, whereby said pipe may be forced into tight engagement with said seat upon rotation of said pipe in one direction, and means for preventing movement of said bar past said lugs in one direction.

27. The combination with a tank, of a

filling unit therefor comprising a casing, two seats in said casing spaced axially thereof, a by-pass connection between said tank and a point intermediate said seats, a filling pipe adapted to be inserted into said casing to a point adjacent to the innermost seat, means for preventing flow of fluid between the outer wall of said pipe and said inner seat when said pipe is in position, and members for closing the passages through said seats when said pipe is removed.

28. The combination with a tank, of a filling unit therefor comprising a casing having a conduit communicating with said tank, an over-flow chamber in said casing having communication with said conduit and the atmosphere, a by-pass connecting said tank and said over-flow chamber, means for introducing fluid into said conduit, means for sealing said over-flow chamber against communication with said conduit during a filling operation, and means for sealing said chamber against communication with the atmosphere upon the completion of a filling operation.

29. A filling unit comprising a casing having a bottom section, a top section detachably secured to the bottom section, a check valve secured to the under-side of said top section and opening inwardly into said bottom section, and a by-pass connection between a point in advance of said valve and the interior of said top section.

30. A filling unit comprising a casing, a valve in said casing, an over-flow chamber in said casing above said valve, a by-pass connection between a point above said valve and said over-flow chamber, and means for sealing said by-pass connection against communication through said valve during a filling operation.

31. The combination with a tank, of a filling unit therefor comprising a casing through which fluid may be introduced into said tank, a sealing device for preventing back flow through said casing when fluid is being introduced into said tank, and a by-pass connection around said sealing device.

32. A filling unit comprising a casing serving as a conduit through which fluid may be introduced into a container, a filling pipe adapted to be inserted into said casing, means for preventing a backward flow of fluid along the outer wall of said pipe, and a by-pass connection around said means.

33. A filling unit comprising a casing serving as a conduit through which fluid may be introduced into a container, means for supplying fluid to said casing at a point intermediate its ends, means for preventing back flow past said point, and a by-pass connection around said last named means.

34. Filling apparatus comprising a conduit, a check valve for preventing back flow through said conduit, a filling pipe for in-

roducing fluid into said conduit, means operable to positively hold said valve open when fluid is being supplied from said filling pipe, and a return connection to a point 10
5 above said valve.

pipe by relative rotation of said pipe and member for exerting on said pipe a longitudinal thrust for holding said first named member against a support.

In testimony whereof I have hereunto affixed my signature this 25 day of May 1923.

35. The combination with a filling pipe having an external port-closing member, of a member adjustable longitudinally of said

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