

April 5, 1960

E. HAYDIN

2,931,379

FROST FREE WELL PIPE CONNECTION AND CASING ADAPTER

Filed Nov. 14, 1955

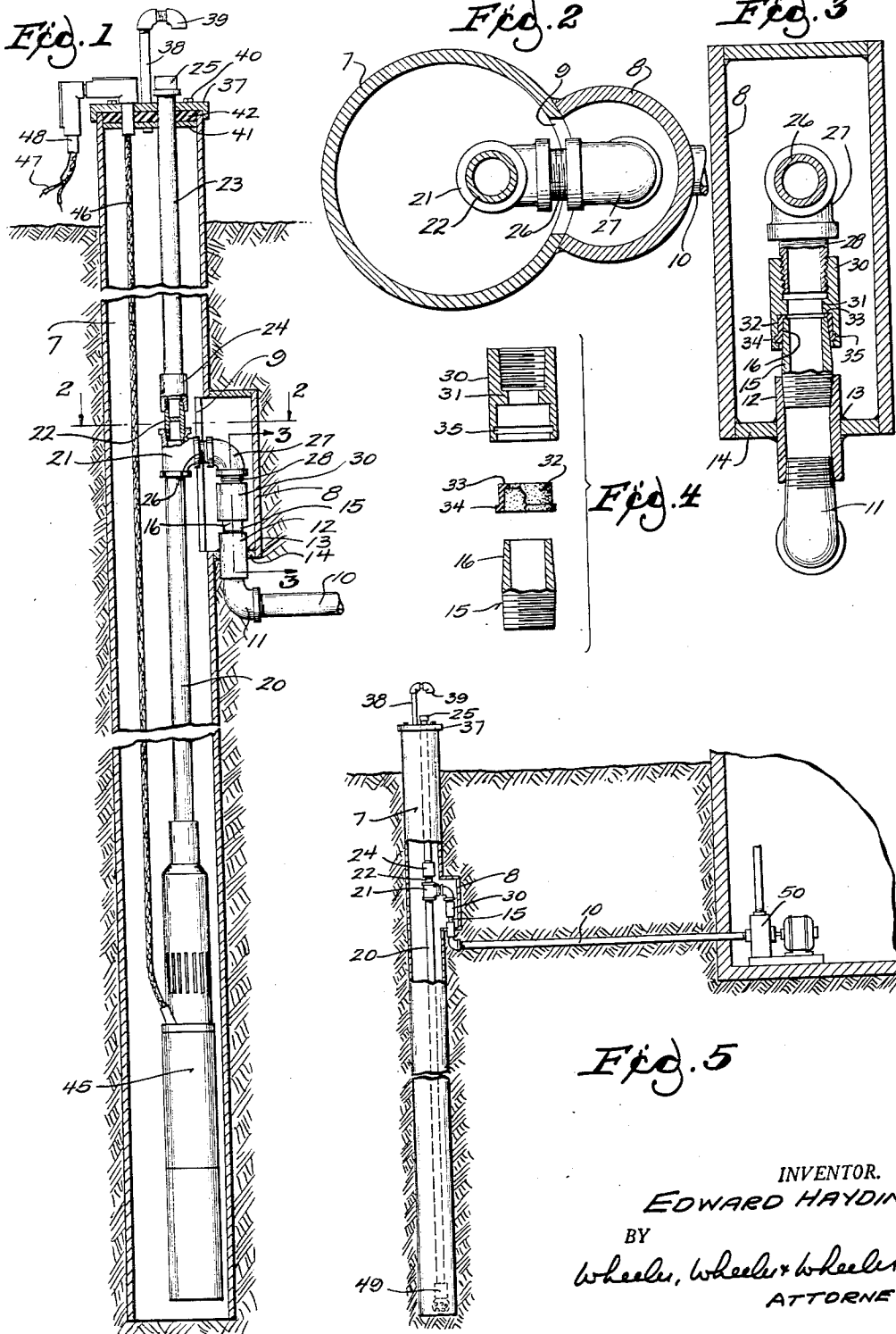


Fig. 5

INVENTOR.
EDWARD HAYDIN
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

1

2,931,379

FROST FREE WELL PIPE CONNECTION AND CASING ADAPTER

Edward Haydin, Germantown, Wis.

Application November 14, 1955, Serial No. 546,449

6 Claims. (Cl. 137—236)

This invention relates to a frost free well pipe connection and casing adapter. The present application is a continuation in part of my application Ser. No. 388,596, filed October 27, 1953, which is now abandoned.

In order that water delivery from the well may be made below frost level, the well casing is provided with an adapter housing opening from the side of the casing and hermetically sealed thereto by welding or the like. Within this housing is the upwardly tapering terminal of the service pipe, the pipe also being hermetically sealed to the adapter housing by welding or the like.

The top of the casing is sealed at or slightly above ground level. A vent pipe may extend through the seal. Also extended through the seal is a length of piping connected to, but sealed off from, the water supply pipe through which water is delivered to the service pipe. The water supply pipe has a lateral extension into the adapter housing and a downwardly extending fitting which fits over the tapered terminal of the service pipe and an intervening complementary bushing preferably attached to the downwardly opening fitting.

The entire supply pipe and its lateral and downwardly turned connection to said fitting can be manipulated within the well casing and can be moved bodily in a lateral direction within the casing in such a manner as to engage the fitting over the terminal of the service pipe. When so engaged, the weight of the supply pipe with its foot valve or pump, maintains a seal sufficiently tight between the fitting and the service pipe terminal so that water can be made to flow through the service pipe either by suction or pressure without leakage at this connection. Yet, by reason of the special seal provided, the entire organization can be lifted out of the well for servicing at any time and restored to provide a connection as tight as the original connection.

It will be understood that if a submersible pump is used within the well casing, electrical connections thereto will extend downwardly through the casing from the seal at the top thereof, but if pumping is done with a shallow well pump at the delivery end of the service pipe, no electrical connections within the well casing will be required.

In the drawings:

Fig. 1 is a view partially in side elevation and partially in section showing a well casing and adapter housing and service pipe outlet in accordance with the present invention.

Fig. 2 is a view taken in cross section on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged detail view taken in cross section on the line 3—3 of Fig. 1.

Fig. 4 is a view showing largely in section and partially in side elevation the separate components of the fitting and packing and service pipe terminal.

Fig. 5 is a diagrammatic view on a reduced scale showing an installation identical with that of Fig. 1 except that it involves a suction pump rather than a submersible pump.

The well casing 7 is of conventional design except that

2

it has welded thereto an adapter housing 8 into which the casing opens laterally at 9. The welding provides a hermetic seal so that the casing 7 remains completely closed below ground level.

The service pipe 10 to the housing or other point of use of water from the well is connected by a street elbow 11 to a coupling 12 which is welded at 13 into the bottom wall 14 of the adapter housing 8. Screwed into the coupling 12 within the housing 8 is a service pipe terminal fitting 15 which has its outer surface slightly tapered at 16 toward the end of the fitting. The tapered extremity of this terminal fitting projects in an upward direction in the lower part of adapter housing 8.

The water supply pipe 20 coming from the source of water in the well casing 7 is provided near its upper end with a conventional T 21. A plugged nipple 22 prevents the water from rising any higher. However, an extension pipe 23 connected with nipple 22 by coupling 24 extends to the top of the casing 7 and is desirably carried slidably through the casing closure hereinafter to be described, and is there closed by cap 25 as a convenient means of limiting relative sliding movement.

The water supplied through pipe 20 passes from the T 21 through the nipple 26 and elbow 27 and nipple 28 to a terminal fitting 30 internally flanged at 31 to provide a seat for an annular packing 32 of natural or synthetic rubber. The packing is provided with an internal annular flange at 33 abutting the seat provided by flange 31 of fitting 30. It has an outwardly projecting annular flange 34 at its lower end for which the fitting 30 is provided with an undercut groove at 35.

The extension pipe 23 and its cap 25 may be used as a handle to manipulate the entire assembly of the supply pipe 20 and the delivery fitting 30 during the lowering of the supply pipe 20 into the well casing 7 or the removal of the assembly therefrom. The casing is sufficiently large to permit the assembly to be completed at the surface of the ground and passed downwardly into the casing. When the assembly is lowered to such a depth that the elbow 27 and fitting 30 are at the level of the opening 9 into the adapter housing 8, the entire assembly may be moved laterally of the casing to cause the fitting 30 to enter housing 8. When the fitting is directly above the tapered terminal member 17 of the service pipe 10, the assembly is lowered to engage the packing annulus 32 with the tapered end 16 of the terminal member 15. The weight of the supply pipe and the parts assembled thereto is thereupon imposed upon the fitting 15 and supported from the adapter housing 8 and the well casing. The annular packing 32 is compressed under this weight and maintains a tight seal between the fitting 30 and the terminal member 15 to complete a hermetically sealed connection between the supply pipe and the service pipe.

In accordance with approved practice, the upper end of the well casing 7 is desirably closed by a cap 37 through which the extension pipe 23 projects. Usually there is a vent port through this cap communicating with a vent pipe 38 having a downwardly turned open end at 39. The bolts 40 extending through the cap 37 are threaded into a disc 41 within the casing. By tightening these bolts, expanding pressure is asserted upon a packing disc 42 of natural or synthetic rubber, whereby the cap is secured to the upper end of casing 7.

If a submersible pump 45 is used to deliver water upwardly under pressure through the supply pipe 20, such pump is supplied with current through a waterproof electric cable 46 connected through the closure cap 37 with a current supply cable 47 in any acceptable type of external conduit 48.

If the well is a shallow well, the supply pipe 20 will ordinarily be provided with a foot valve 49 and the water will be raised by a suction pump 50 connected with

3

the delivery end of the service pipe 10 as shown in Fig. 5. The seal provided by the cup-shaped packing member 32 is effective regardless of whether it is subject to sub-atmospheric or super-atmospheric pressure by the use of the type of pump shown in Fig. 1 or the type of pump shown in Fig. 5.

If it becomes necessary to service the pump of Fig. 1 or the foot valve of Fig. 5, the clamping pressure upon the packing disc 42 is released and the electrical connections through the closure, if any, are disconnected. This leaves the closure free of the casing and the extension pipe 23 and its cap 25 can thereupon be used to lift the entire supply line assembly to free the fitting 30 from the service line terminal 15. As soon as this connection has been freed by the upward movement of the supply line assembly, the supply line assembly can be swung laterally to cause the elbow 27 to emerge through opening 9 from the adapter housing 8, whereupon the assembly can be lifted from the casing and serviced. The procedure is extremely simple and converse movements will re-establish the operative sealed connection of the supply pipe assembly to the service line.

I claim:

1. In a well comprising a casing having a laterally communicating adapter housing and a water supply pipe unitarily provided with a lateral delivery connection and a downwardly opening fitting, said housing having a water receiving terminal fitting and a service pipe leading therefrom outwardly of said housing, the improvement which comprises forming one of said fittings with a tapering end and the other of said fittings with a socket into which said end is axially receivable, one of said fittings being provided with an annular packing having end and side wall portions clamped between said fittings when said fittings are assembled, the side wall portion of the packing being subject to endwise deformation as the tapered fitting seats in its socket and which deformation is limited by the clamping of the end portions of said packing.

2. The device of claim 1 in which said packing is disposed in the socketed fitting, said socketed fitting having a seat abutted by one of the end wall portions of the packing.

4

3. The device of claim 1 in which the packing is disposed within the socket of the socketed fitting, the socketed fitting being provided with an undercut groove and packing retaining means engaged in the groove for holding the packing in the socket.

4. The device of claim 3 in which the retaining means comprises a flange integral with the packing and projecting peripherally therefrom.

5. In a device of the character described, the combination with a first fitting having an upwardly tapering external surface and a second fitting having a socket in which the tapered surface of the first fitting is axially receivable, said socket terminating in an annular shoulder, the respective fittings having passages communicating with each other through said annular shoulder, of a cup-shaped gasket provided at one end with an inwardly projecting flange seated against said shoulder, the tapered surface of the first mentioned fitting seating within a side wall portion of said gasket and the end of the fitting first mentioned seating against the flange aforesaid, the tendency of the side wall portion of the gasket to deform endwise on relative movement of the tapered fitting toward seated position with respect to its socket being counteracted by engagement of the gasket flange between the end of the fitting and the socket shoulder.

6. The device of claim 5 in which the second mentioned fitting is provided with an undercut groove remote from its said shoulder, the said gasket having an outwardly projecting flange seated in said groove for confining the gasket releasably within the second mentioned fitting in a position to receive the tapered end of the fitting first mentioned.

References Cited in the file of this patent

UNITED STATES PATENTS

1,083,350	Davis	Jan. 6, 1914
1,947,593	Hamilton	Feb. 20, 1934
1,985,325	Nathan	Dec. 25, 1934
2,219,289	Bennett	Oct. 29, 1940
2,707,030	Ortman	Apr. 26, 1955