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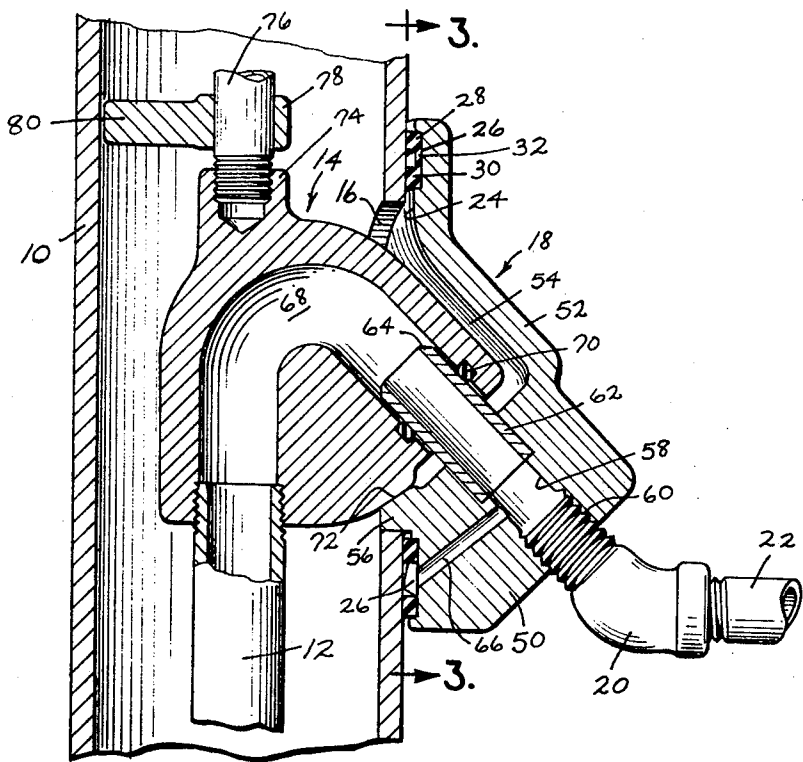
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Primary Examiner—Dave W. Arola
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[54] **PITLESS WELL ADAPTER**
10 Claims, 3 Drawing Figs.

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166/85, 285/199
[51] Int. Cl. F16I 17/02
[50] Field of Search..... 166/85, 87,
88, 89; 285/106, 197, 111, 198, 199

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ABSTRACT: A pitless well adapter having an outer adapter part anchored to a well casing around an opening and having a discharge passage therethrough, and an inner adapter part within the well casing supported by and interconnected with said outer part and having a passage in communication with the discharge passage of said outer part. A pair of spaced gasket rings interposed between said outer part and said well casing around said casing opening define an endless spaced passage which communicates with a passage branching from the discharge passage in said outlet part.



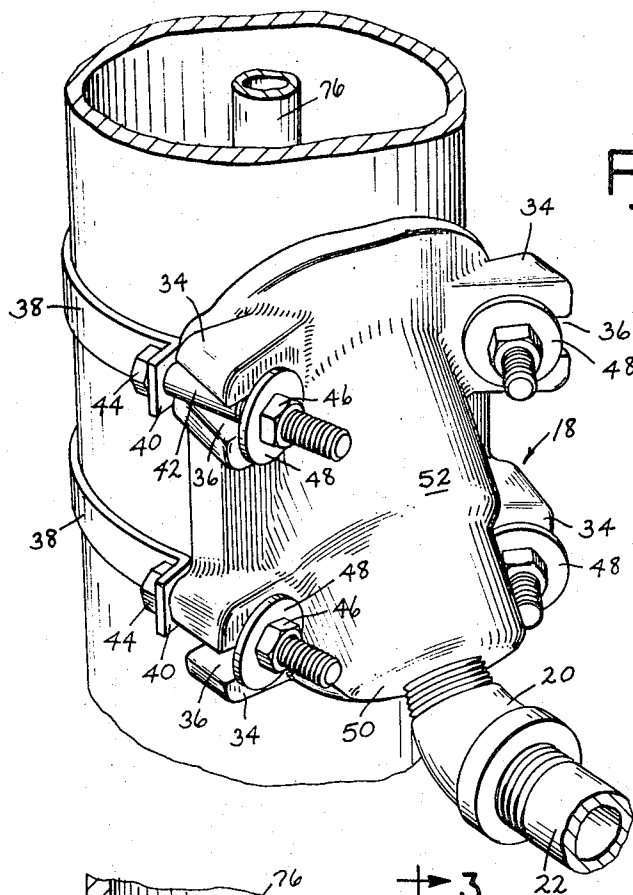


Fig. 1

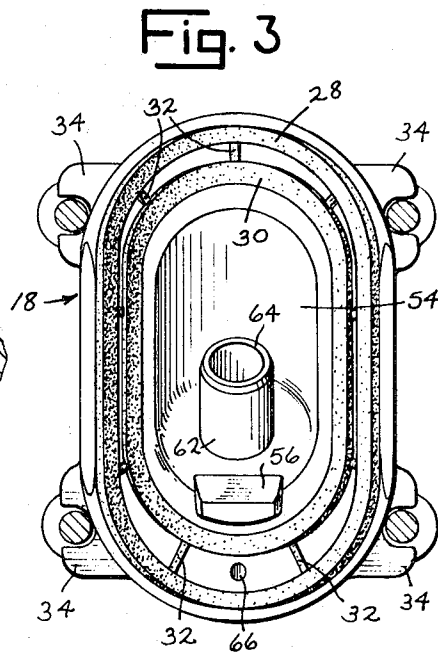


Fig. 3

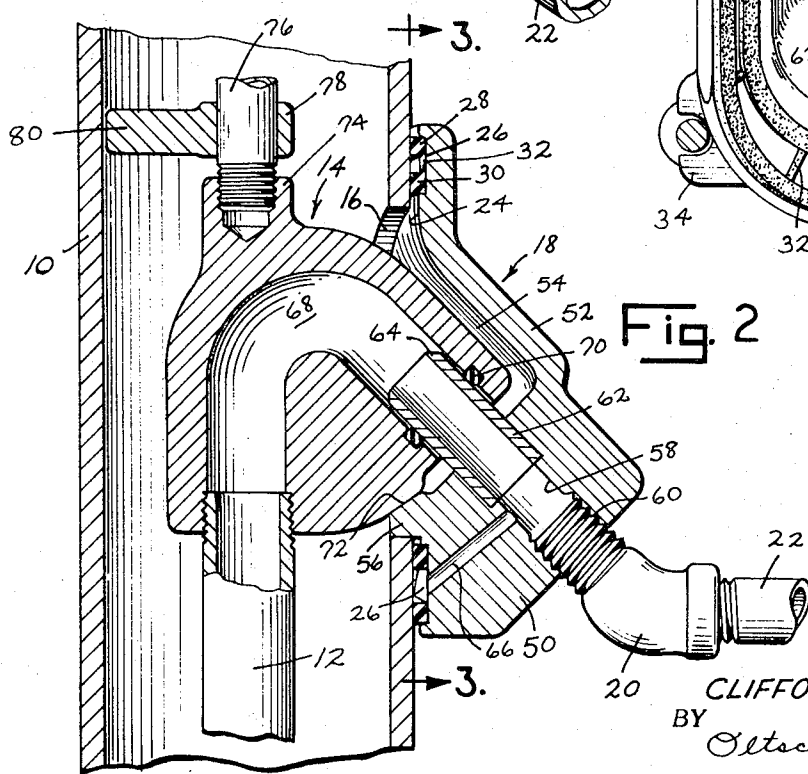


Fig. 2

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PITLESS WELL ADAPTER

This invention relates to improvements in pitless well adapters for water wells by means of which a discharge line in a well casing may be connected to a delivery pipe through an opening in the well casing located below ground level.

Various types of pitless well adapters have been provided heretofore. Many of these prior adapters have been subject of leakage of ground water or surface water into the well casing at the casing opening in the event of improper installation or gasket failure, and, hence, constitute a hazard to health due to the possibility of contamination of the well. Pitless well adapters of this type have no means by which an undesired leaking condition and danger of contamination can be detected, so that testing of the purity of the water is the sole means to determine the existence of a hazardous condition.

Other pitless well adapters have been developed which are of the so called fail-safe type, in that any leakage which occurs at the point of connection of the adapter to the well casing occurs under the pressure of the water system so that leakage occurs outwardly. Such systems avoid the hazard to health. Examples of such prior fail-safe adapters are found in my prior U.S. Pat. No. 2,968,256, dated Jan. 17, 1961; 3,306,358, dated Feb. 28, 1967; and 3,403,730, dated Oct. 1, 1968. The devices of each of these patents are highly effective, but each has certain characteristics which require accuracy and care in installation, expensive machining or parts, or welding on the job, or to other requirements which are not always easily satisfied.

It is a primary object of this invention to provide a pitless well adapter which is of the fail-safe type and consists of a few simple parts which can be formed of metal castings which require minimum machining.

A further object is to provide a device of this character which can be installed conveniently and easily, which does not require any welding in the field, and in which the parts interfit with assured accuracy and cooperative sealed relation.

A further object is to provide a device of this character having a novel dual gasket arrangement between an outer adapter part and a well casing around an underground opening in the well casing, in which the gaskets are spaced apart and provide a passage which communicates with and is open to the well discharge stream to be subject to the pressure of water in the well system, so that pressure between the gaskets is greater than the pressure of ground water which may be present and which otherwise would tend to enter the well casing if any failure of a gasket occurred.

Other objects will be apparent from the following specification. In the drawing:

FIG. 1 is a perspective view of the adapter applied to a well casing.

FIG. 2 is an axial sectional view of the adapter installed in the well casing.

FIG. 3 is an inner face view of one part of the adapter.

In this adapter, an outer adapter part is secured to a well casing around the discharge opening therein, and is sealed to the well casing by inner and outer gaskets around the opening, which spaced gaskets communicate through a passage with the water passage in the adapter. An inner adapter part carrying a drop pipe connected with a pump bears upon and is supported by the outer adapter part and has a sealed telescoping fit therewith.

In the construction selected for illustration herein, and which embodies one form of the invention, the numeral 10 designates a well casing which extends to or above ground level at its upper end and is sealed at its upper end by a cap (not shown). The well casing extends to a suitable depth below the water table of the earth or into an aquifer and may include a well screen (not shown) at its lower end through which water may enter. A suitable pump (not shown), such as a submersible pump, has at least part thereof in the well casing and has connection with a drop pipe 12 which is carried by and depends from an inner adapter part 14 which is positioned at the level of a discharge opening 16 in the well casing located below ground level, and particularly below the frost

line. An outer adapter part 18 is connected to the inner adapter through the well casing around the discharge opening 16. A water delivery line is connected to the outer adapter part and may include a fitting or elbow 20 and a discharge pipe 22.

The outer adapter part 18 preferably constitutes a metal casting having a concave inner marginal face 24 whose configuration is substantially complementary to the curvature of the outer surface of the well casing 10. Marginal face 24 is provided with an endless groove 26 whose inner dimension is larger than the dimension of the discharge opening 16 of the well casing. The marginal groove 26 receives a gasket unit which bears against the outer face of the well casing around the discharge opening 16. The gasket comprises an outer gasket ring 28 fitting in the outer part of the groove 26, and an inner gasket ring 30 fitting in the inner part of the groove 26 and spaced from the outer gasket ring 28. In the preferred form, the rings 28 and 30 constitute parts of a single integral gasket unit and are connected at spaced points by ribs or spacers 32 which are thin compared to the thickness of the rings 28 and 30, as best seen at FIG. 2.

The outer adapter part 18 is preferably provided with two spaced anchor projections 34 at each side thereof, with the upper projections at opposite sides at the same elevation, and with the lower projections at opposite sides at the same elevation. The projections 34 preferably have grooves 36. The outer adapter part 18 is preferably anchored to the well casing 10 by U-shaped members which may constitute straps 38 formed of metal and preferably having out-turned ends 40 provided with apertures to receive the shanks 42 of elongated screws having enlarged heads 44 which bear against the strap ends 40. The shank 42 of each screw passes through a groove 36 of an anchor 34 and has a nut 46 threaded thereon and bearing against the outer face of an anchor projection or against a washer 48, so that tightening of the nuts 46 on the bolts connected to opposite ends of each strap 38 will urge the outer adapter part toward the outer face of the well casing 10 so as to compress the gasket rings 28 and 30 and to provide an effective seal against leakage between the outer adapter part and the well casing.

The outer adapter part 18 is outwardly offset set at the center of the convex side thereof and preferably includes a thick lower projecting wall portion 50 which is inclined relative to the axis of the well casing when the adapter is mounted in place, and a part cylindrical wall 52 whose axis is substantially perpendicular to wall 50 and is inclined relative to the axis of the well casing in an upward inward direction when the adapter is mounted on the well casing. The walls 50 and 52, together with the marginal portion of the outer adapter part, define a recess 54 which is located adjacent to and communicates with the discharge opening 16 of the well casing. A lip 56 projects inwardly of the concave inner marginal casting face 24 and from the wall 50 to bear upon the lower part of the opening 16 of the well casing and orients or locates the outer adapter part properly relative to the well casing and its discharge opening 16.

The wall 50 has a bore 58 extending therethrough, preferably coaxial with the recess 54. The outer or lower end of bore 58 is screw-threaded at 60 to mount a fitting or elbow 20 to which delivery pipe 22 is connected. The upper or inner end of the bore 58 is preferably enlarged to seat with a press fit, or, if desired, a screw-threaded fit, the end of a tube 62 which projects inwardly from the wall 50 substantially coaxially of the recess 54 and which preferably has a beveled free end 64. A bore 66 is formed in wall 50 to communicate at one end with the groove 26 intermediate the gaskets 28 and 30, and to communicate at its other end with the bore 58, preferably between the tube 62 and the fitting 20.

The inner adapter part 14 has an inverted V-shaped bore 68 therein which may be cast therein and at one end of which the drop pipe 12 has screw-threaded connection. The opposite end portion of the bore 68 is of a diameter slightly larger than the outer diameter of the tube 62 so as to fit snugly and

slidably thereon. An inner circumferential groove in the inner adapter part receives a gasket ring, such as an O-ring 70, which provides a sealed connection between the tube 62 and the bore of the inner adapter part 14. The inner adapter part includes a shoulder or supporting surface 72 which bears upon the upper surface of the lip 56 of the outer adapter part when the parts are operatively assembled and positioned as illustrated in FIG. 2. The upper end of the inner adapter part 14 is preferably provided with an internally screw-threaded socket 74 in which may be screw-threaded a pipe or rod 76 of a length to extend to the upper end of the well casing so that it may be gripped and manipulated for the purpose of lowering the pump, the drop pipe and the inner adapter in the well casing to and from cooperative interfit with the outer adapter part, as shown in FIG. 2. A ring or collar 78 preferably encircles the lower part of the pipe 76 and carries a projecting finger 80 adapted to bear against the well casing at a point substantially aligned with the tube 62 so as to resist any tendency of the inner adapter to be displaced from the operative assembled position in FIG. 2 incident to the liquid pressure of the system.

I claim:

1. In a pitless well adapter carried by a well casing at an opening spaced below the upper end of the casing, an outer adapter part having a marginal portion and a chamber-defining outwardly offset portion, means anchoring said adapter part to said well casing with said offset portion registering with said casing opening and said marginal portion confronting the well casing around said casing opening, said offset portion having a liquid delivery passage, a pair of spaced endless gaskets interposed between the marginal portion of said adapter part and said well casing around said casing opening to define an endless channel, said endless channel facing said well casing, said gaskets being compressed between said adapter part and said well casing to form a seal around said casing opening, said outer part having a passage therein communicating with said endless channel and said liquid delivery passage.

2. The construction defined in claim 1, and spacer means separating said gaskets.

3. The construction defined in claim 1, wherein said gaskets are interconnected by spaced integral ribs of thickness less than the thickness of the gaskets in compression so as not to

block said endless channel.

4. 4. The construction defined in claim 1, wherein said offset portion has a lower wall projecting outwardly from the lower marginal portion of said adapter part, said liquid delivery passage extending through said lower wall and said communicating passage being formed in said lower wall.

5. In combination, a well casing having an opening spaced below its upper end; and outer adapter part; means anchoring said outer adapter part to said casing to span said casing opening; a pair of spaced endless gasket rings compressed between said outer adapter part and said casing around said casing opening to define an endless channel; said endless channel facing said well casing; said outer adapter part having a liquid passage; a passage connecting said endless channel to said liquid passage; an inner adapter part within said casing and having a liquid passage; a drop pipe carried by said inner adapter part and connected to the liquid passage of said inner adapter part; and a tubular member carried by one adapter part in communication with the liquid passage of said one adapter part and means providing a seal between said tubular member and the liquid passage of the other adapter part; said pair of spaced endless gasket rings, tubular member and seal means forming the sole sealing contact between said inner adapter part, outer adapter part, casing and tubular member.

6. The combination defined in claim 5, wherein said gasket rings are interconnected by relatively thin flexible spacer means having a thickness less than the thickness of said gasket rings in compression so as not to block said endless channel.

7. The combination defined in claim 6, wherein said spacer means are integral with said gasket rings.

8. The combination defined in claim 5, wherein said outer adapter part has a projection extending into said casing opening for supporting engagement with said well casing; and said inner adapter part engages and is supported by said outer adapter part.

9. The combination defined in claim 5, wherein said outer adapter part has a circumferential groove receiving said sealing means.

10. The combination defined in claim 5, and an elongated member projecting above said inner adapter part and a member carried by said elongated member and engaging the inner surface of said casing in substantially aligned relation to the liquid passage of said outer adapter part.

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