

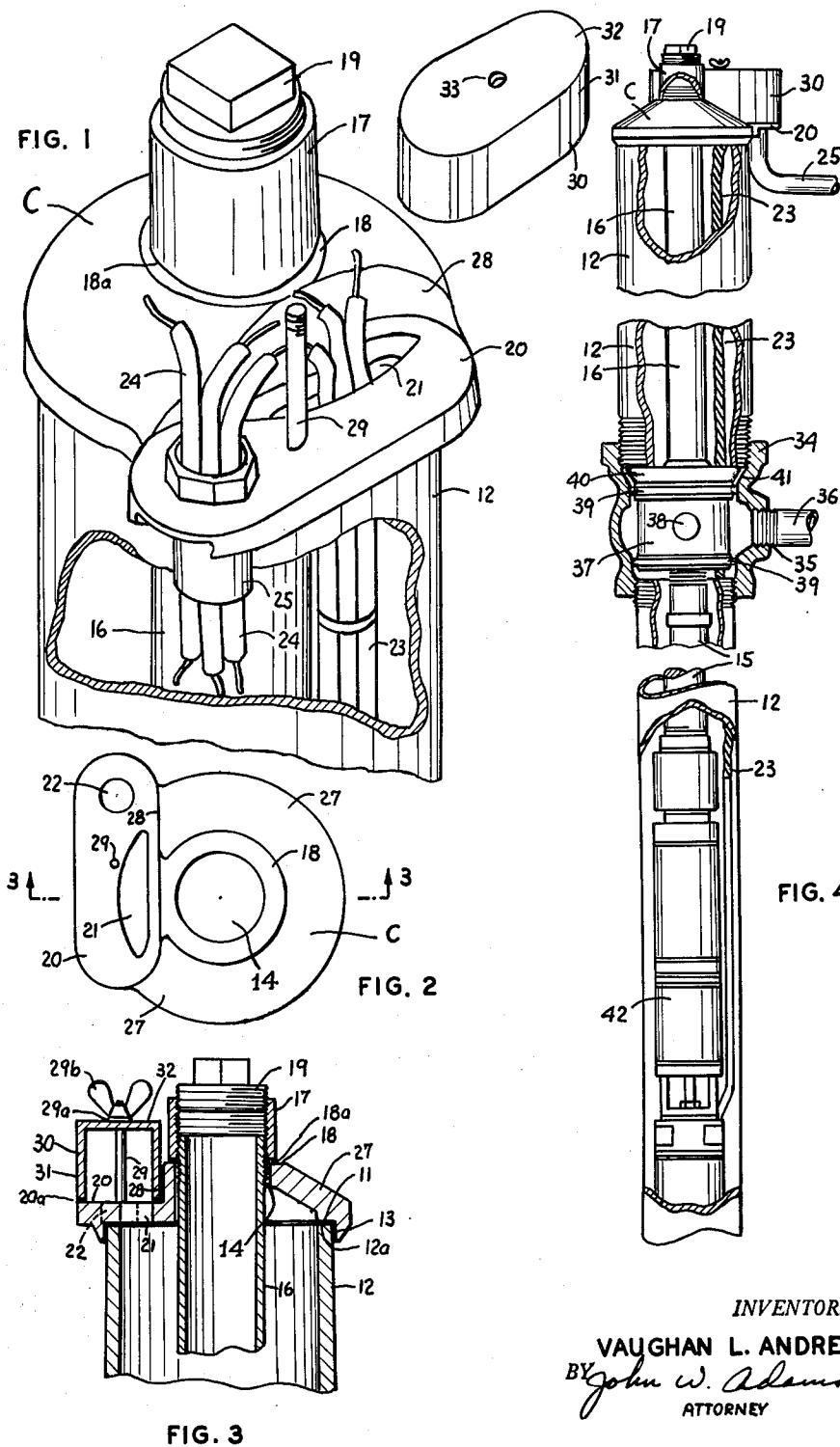
Nov. 27, 1962

V. L. ANDREW

3,065,792

WELL CONSTRUCTION AND METHOD OF ASSEMBLING THE SAME

Filed Jan. 28, 1959



INVENTOR.

VAUGHAN L. ANDREW

BY *John W. Adams*
ATTORNEY

1

3,065,792

WELL CONSTRUCTION AND METHOD OF ASSEMBLING THE SAME

Vaughan L. Andrew, Superior, Wis., assignor to Duplex Manufacturing Company, Superior, Wis., a corporation of Wisconsin

Filed Jan. 28, 1959, Ser. No. 789,654

2 Claims. (Cl. 166—46)

This invention relates to a pitless well water supply system particularly for use with submersible type pumps, and more specifically to a cap for closing the upper end of a well casing in such a well system and for housing electrical wires extending down into the casing for controlling a submersible type pump mounted at the lower end of a water delivery pipe enclosed within the casing.

It is an object of this invention to provide a well cap adapted to be supported upon the upper end of a well casing for sealingly closing the same and having a connector platform section partly overlying the casing and partly extending beyond the same and having an opening through the platform outside of the casing for receiving a conduit carrying electrical service wires and an opening through the platform overlying the interior of the casing to permit the pump service wires controlling the pump to extend therethrough from within the well casing, and including a readily removable housing removably attached to the platform to provide a protective enclosure for the service wires.

It is another object to provide such a device in which the protective housing for the electrical wires may be readily removed to completely expose the wires to facilitate unobstructed access to the same.

It is another object to provide such a well cap having an opening therein for accommodating a hanger pipe therethrough with said hanger pipe extending upwardly through said opening and provided with a hanger pipe supporting coupling adjustably mounted thereon in abutting relation to the upper surface of the well cap, the weight of the pipe assembly positively holding the well cap in sealingly closing position upon the upper end of the well casing.

It is a further object to provide means upon the pipe assembly for temporarily supporting the same in generally operative position within the well casing to facilitate installation and removal of the well cap, and to provide a method of transferring the weight of the pipe assembly from said temporary supporting means to the upper surface of the well cap.

These and other objects and advantages of this invention will more fully appear from the following descriptions made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views, in which:

FIG. 1 is a perspective view of a well cap assembly embodying my invention showing the protective housing removed and shown separately in perspective on a slightly smaller scale and showing a well casing partly broken away;

FIG. 2 is a top plan view of the well cap, shown on a smaller scale than in FIG. 1;

FIG. 3 is a fragmentary central vertical sectional view partly in elevation of the well cap taken along the line 3—3 in FIG. 2 and showing the protective housing and the hanger pipe assembly with the hanger pipe supporting coupling mounted thereon; and,

FIG. 4 is a fragmentary central vertical sectional view partly in elevation of a well having an underground water distributor system adapted for use with the present invention.

In the form of the invention shown in the accompany-

2

ing drawings I provide a well cap member, designated by the letter C, having a flat annular surface 11 at the lower portion thereof for engaging the upper end of the well casing 12 and provided with a sealing gasket 12a as best shown in FIG. 3. The outer portion of the cap member C extends beyond the circumferential upper end of the well casing 12 and forms an annular flange 13 protruding downwardly from the outer edge of the flat annular surface 11 and overhanging the junction of the well cap C and the well casing 12 to prevent lateral displacement of the cap member. A hanger pipe opening 14 is provided through the cap member overlying the water delivery pipe disposed within the well casing and generally in alignment therewith. A flat connector platform 20 is, in the form shown, integrally formed with the well cap member and is spaced above and overlying a portion of the junction of the cap member C and the well casing 12. The platform 20 extends laterally outwardly beyond the peripheral edge of the cap C. An access opening 21 is provided through the portion of the connector platform overlying the interior of the well casing and service wire receiving opening 22 is provided through the portion of the connector platform 20 extending laterally beyond the upper end of the well casing. The wall 27 of the cap member C protrudes upwardly from the flat annular surface 11 and converges upon the hanger pipe opening 14. The upper surface of the tapering wall of the cap member C is flattened at the portion thereof surrounding the hanger pipe opening 14 to form a flat annular surface 18. The cap member wall 27 is recessed downwardly at the portion thereof adjacent to the connector platform 20 to form a vertical housing flange wall 28 defining the inner marginal edge of the platform 20 at the lower portion thereof. A vertically disposed threaded bolt 29 is fixed to the connector platform 20 and extends upwardly from the generally central portion of said connector platform. A protective housing 30 is provided having depending side walls 31 and a flat top panel 32 generally similar in configuration to the connector platform 20. In attached position, the lower end of the housing 30 is supported upon the connector platform 20, with a sealing gasket 20a effecting a seal between the housing and the platform. In such attached position the housing flange 28 abuts the housing wall 31 and maintains registration of the housing 30 on the connector platform 20. An attachment opening 33 is provided through the top panel 32 of the protective housing at a generally central portion thereof, and in attached position the bolt 29 extends upwardly through the opening 33 and attachment of the housing to the connector platform is effected by placing a sealing grommet 29a over the protruding portion of the bolt 29 and tightly screwing a nut 29b downwardly on the bolt 29.

A hanger pipe 16 of a size adapted to pass readily through the hanger opening 14 is positioned within said opening 14 with the upper portion thereof extending through the upper surface of the cap member C and is threadably connected to the lower portion of a supporting coupling 17 of an outside diameter larger than the hanger opening 14. The lower end of said coupling abuts a circular sealing gasket 18a positioned upon the flat annular surface 18 surrounding the hanger opening. The upper end of the coupling 17 is closed by a screw plug 19. The weight of the delivery pipe assembly which is attached to the lower end of the hanger pipe 16 positively seals the lower end of the supporting coupling 17 against the upper end of the cap member C surrounding the hanger opening 14, and also effects a positive seal between the lower flat annular surface 11 and the upper end of the well casing 12.

Pump service wires 23 controlling the pump 42, which is mounted on the delivery pipe 15 within the casing 12

at the lower end of the well, pass out from the upper end of the casing through the access opening 21 in the connector platform 20. Wires 24 from the electrical source are extended to the well location within a protective enclosure such as the conduit 25. The end portion of the conduit 25 is extended upwardly through the conduit receiving opening 22 and maintained in position therein by a pair of nuts threadably connected to said conduit respectively above and below the platform 20. A seal between the conduit and the platform is effected by an annular gasket encircling the conduit and positioned between the nut disposed below the platform and the under surface of the platform 20. The power supplying wires 24 extend beyond the end of the conduit 25 and terminate above the surface of the connector platform 20. Removal of the protective housing completely exposes the electrical wires and provides unobstructed access to the same for making, breaking and servicing connections therein. The access opening 21 also permits inspection of the interior of the well casing and servicing of the well without breaking the seal between the well cap C and the well casing 12.

FIG. 4 shows an underground water discharge assembly adapted for use with the present invention. A distributor T 34 interconnects the upper and lower sections of the well casing 12. The distributor T 34 has a lateral opening 35 therein which affords communication with a water discharge pipe 36. A hollow water distributor 37 having a closed upper end is positioned within the distributor T. A water delivery pipe 15 is dependently connected to the lower end of the water distributor 37. Water pumped from the underground water source through the delivery pipe 15 is distributed into the distributor T through distributor openings 38 in the water distributor 37, positioned in generally lateral alignment with the discharge opening 35 in the T 34.

A water-tight seal is maintained within the distributor T 34 as by a pair of spaced apart O-rings 39 seated in grooves positioned respectively above and below the distributor openings 38 and the discharge opening 35 in the distributor T 34 and sealingly engaging the inside wall of the distributor T 34.

The upper end of the water distributor 37 is attached to the lower end of the hanger pipe 16, and a sealed conduit (not shown) passes vertically through said distributor 37 to accommodate the electric service wires passing from the pump 42 mounted below said distributor to the connector platform 20. Temporary support for the pipe assembly is provided by a suitable abutment such as the annular flange 40 formed on the upper end of the distributor 37 and spaced above the upper seal thereof. The outside diameter of the flange is greater than the inside diameter of the distributor T 34. The lower surface of the flange 40 abuts the upper surface of a cooperating annular supporting shoulder 41 formed at the upper interior portion of the distributor T 34 and supports the weight of the delivery pipe or drop pipe assembly slightly below operative position thereon. At this time the weight of said assembly is not supported at the upper end of the well casing 12 by the well cap member C or otherwise.

Method of Assembly

The well pipe assembly, including the water delivery pipe 15 with the pump 42 mounted at the lower end thereof and having the pump service wires 23 connected thereto, the water distributor 37 connected to the upper end of the water delivery pipe and the hanger pipe 16 attached to the upper end of the distributor 37, is lowered into the well casing until the flange 40 rests upon the supporting shoulder 41 and supports the weight of the well pipe assembly thereon. With the drop pipe assembly temporarily supported upon the supporting shoulder 41, the cap member C is positioned upon the upper end of the well casing with the casing gasket 12a between

the upper end of the casing and the annular sealing surface 11 of the cap member C. The hanger pipe 16 being of the necessary predetermined length, protrudes upwardly through the opening 14 in the cap member and the cap member is positioned so that the pump service wires 23 extend through the access opening 21 in the connector platform 20.

Transfer of the weight of the well pipe assembly from the supporting shoulder 41 to the well cap member C is effected by positioning the gasket 18a upon the flat surface 18 of the cap member C surrounding the opening 14, screwing the supporting coupling 17 downwardly on the upper end of the hanger pipe 16 into abutment with the upper surface of the well cap, and thereafter continuing to rotate the coupling 17 on the hanger pipe 16 whereby the upper end of the hanger pipe is drawn upwardly through said cap C and into said coupling and the well pipe assembly, including the distributor 37, is elevated into operative position within the casing and the abutment flange 40 is lifted from contact with the abutment shoulder 41 and maintained in said elevated position as shown in FIG. 4. The upper end of the coupling 17 is closed by the screw plug 19. The weight of the entire well pipe assembly is now permanently supported by the cap member C and positively seals the same against the top of the well casing 12.

What is claimed is:

1. The method of assembling component elements of a well unit consisting in lowering a well pipe assembly including a delivery pipe, a pump, a distributor, and a hanger pipe, all connected together, into a well casing, temporarily supporting said pipe assembly within the casing in a position slightly below the final operative position thereof, providing a multiple element permanent support for the pipe assembly on the upper end of the well casing, threadably projecting a coupling member onto the upper end of the hanger pipe to thereby engage the permanent support, and thereafter actuating said coupling to raise and support said pipe assembly in the final operative position.

2. In a well water supply system of the type including a well casing having the upper end thereof disposed above the surface of the ground, a removable well pipe assembly within said casing and having a water delivery pipe assembly extending downwardly to the lower portion of said casing in communication with an underground water source, a distributor T interposed in said casing below the frost line of the ground, a laterally extending water supply pipe connected to said T, said T dividing said casing into upper and lower sections and including at least one internally extending abutment shoulder, a hollow water distributor element connected in sealed relation to the upper end of said delivery pipe assembly and receiving water from said pipe and having opening means through the side wall thereof to permit said water to flow outwardly therefrom into the laterally extending water supply pipe, said distributor including enlarged abutment means for engaging the abutment means of said distributor T to provide temporary support for the depending delivery pipe assembly, spaced apart sealing means at the upper and lower portions of said hollow distributor element respectively disposed above and below the connection between said laterally extending supply pipe and said T to prevent flow of water into said casing above and below said element, a well cap member attached to engage the top of the upper well casing section in sealed relation thereto, an elongated supporting member connected to the upper end of said hollow distributor element and extending through said cap member, elevating means connected to the upper end of said supporting member above said cap member engaging the top of said cap member for raising the entire well pipe assembly from the abutting means in said T to provide the sole supporting means for said assembly and to positively

5

seat said cap in sealed relation against the top of the well casing.

References Cited in the file of this patent

UNITED STATES PATENTS

2,283,117 Arutunoff ----- May 12, 1942
 2,689,611 Martinson ----- Sept. 21, 1954

5

2,707,030
 2,771,955
 2,793,699
 2,841,223
 2,877,849
 2,880,262
 2,917,113

6

Ortman ----- Apr. 26, 1955
 Carter ----- Nov. 27, 1956
 Tubbs ----- May 28, 1957
 Maass et al. ----- July 1, 1958
 Morrison et al. ----- Mar. 17, 1959
 Bell et al. ----- Mar. 31, 1959
 Ortman ----- Dec. 15, 1959