Sept. 21, 1954 M. B. MARTINSON 2,689,611

MEANS FOR EXTRACTING THE LIQUID FROM A CASED WELL BELOW THE TOP END OF THE CASING

Filed June 19, 1953

2 Sheets-Sheet 1

FIG. 1.

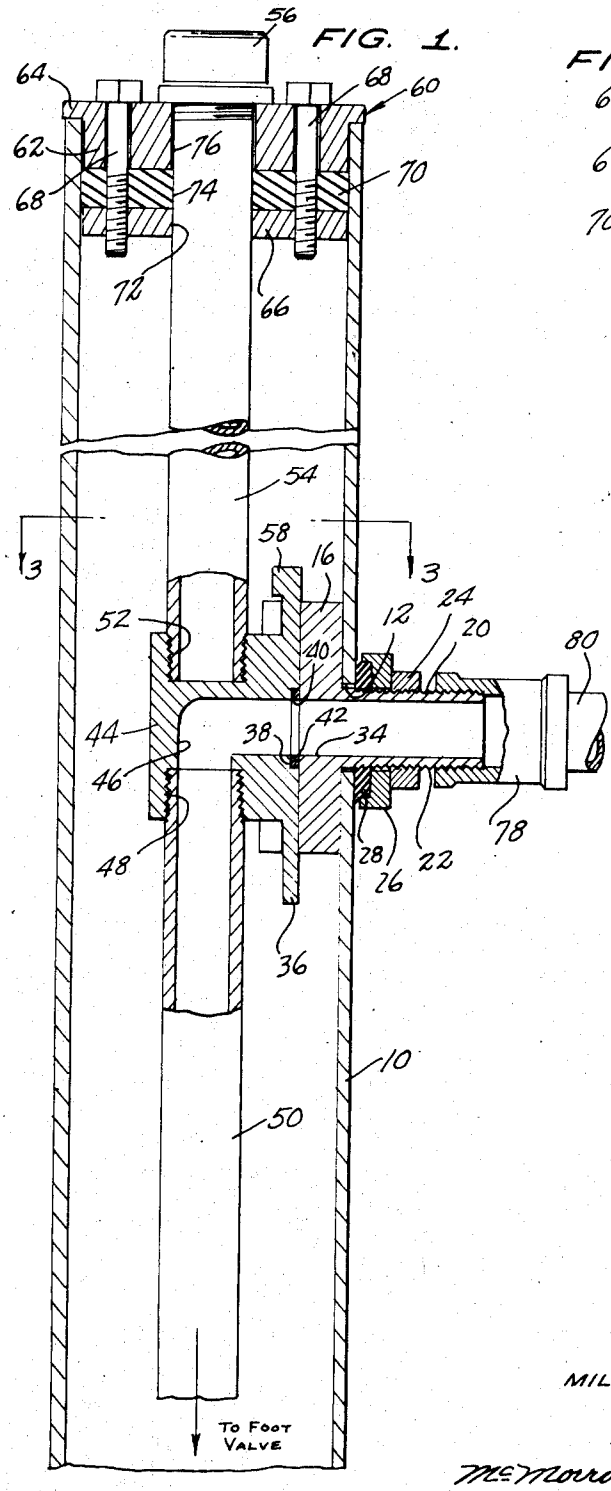


FIG. 2.

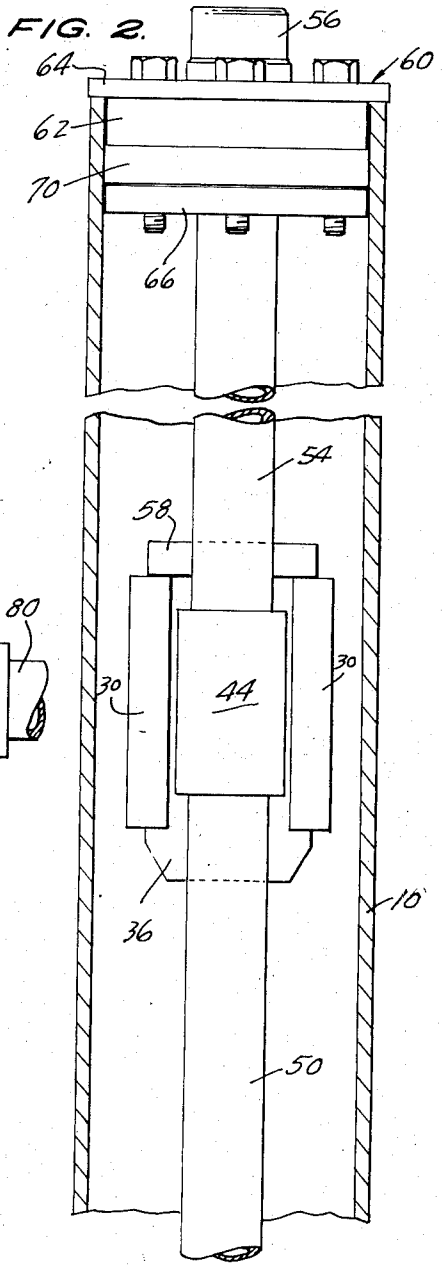


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FIG. 3.

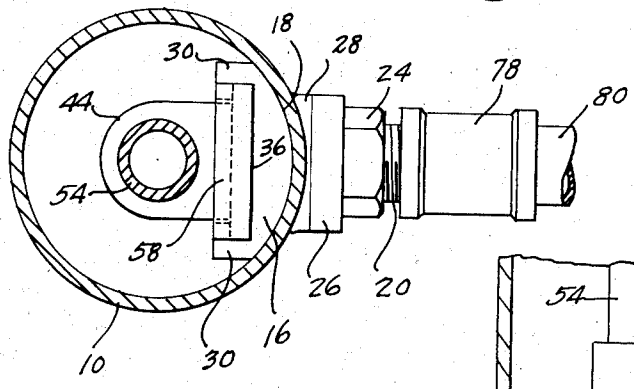



FIG. 4.

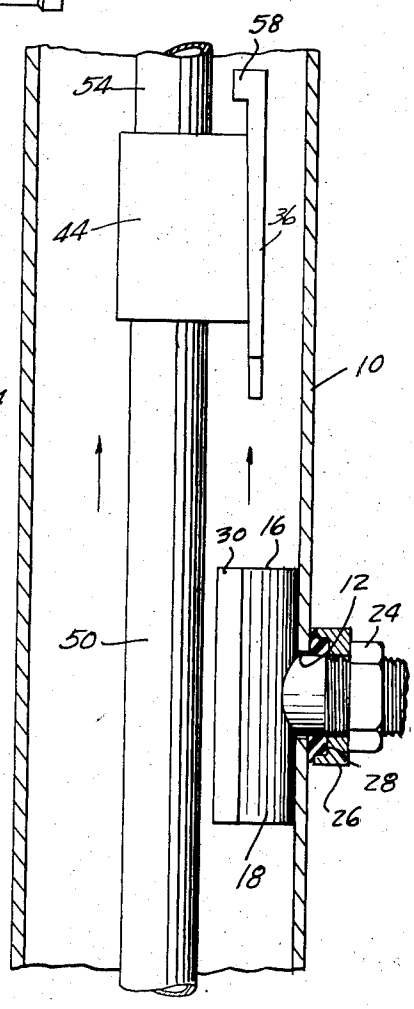



FIG 5.

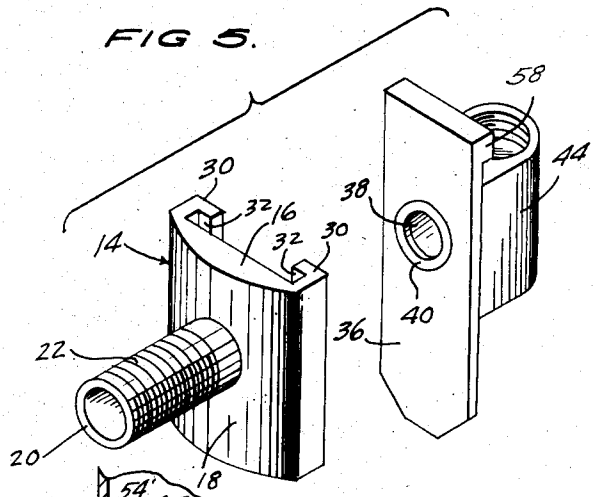
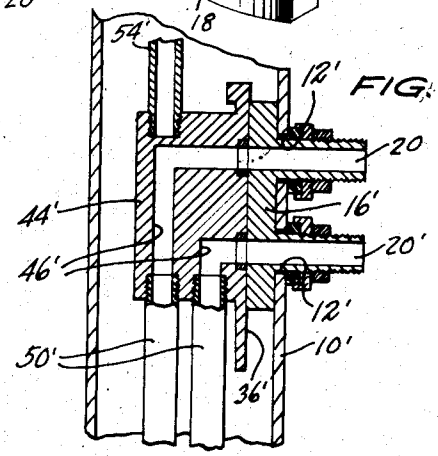



FIG. 6.

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# UNITED STATES PATENT OFFICE

2,689,611

## MEANS FOR EXTRACTING THE LIQUID FROM A CASED WELL BELOW THE TOP END OF THE CASING

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5 Claims. (Cl. 166—88)

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This invention relates to means for extracting water from a cased water well below the top end of the casing.

In the conversion of a conventional hand pumped water well of the type which is cased, into a mechanically pumped well, it becomes necessary in most instances to carry the water pumped from the well laterally therefrom below the normal frost line of the area in which the well is located. In the past it has been common procedure to sink a pit in surrounding relation to the well casing with the lower end of the pit disposed below the frost line of the area in which the well is located, and then to sever the portion of the well casing which extends above the frost line from the well casing which extends down into the well, and then insert the well pipe carrying a conventional foot valve into the open upper end of the well casing and coupling the well pipe to an elbow which extends laterally from the well casing below the frost line to the pumping equipment. Unless great care is exercised in providing adequate drainage for the pit, danger of contaminating the well water with surface water exists and consequently in many areas, the use of such pits has been rendered illegal.

The primary object of this invention is to avoid the necessity of sinking a pit in surrounding relation with the well casing and thereby to eliminate the dangers attendant upon the employment of such a pit.

Another object is to prevent the ingress of contaminating substances into the well casing through the top thereof or around the laterally extending outlet through which the well water is delivered to the pump.

A further object is to facilitate rapid access to the well pipe and foot valve for servicing, while at the same time protecting the well from contamination.

The above and other objects may be attained by employing this invention which embodies among its features a separable coupling comprising a body having a transversely convex outer face which is adapted to engage the inner side of a well casing, flanges carried by the body and extending outwardly therefrom adjacent opposite side edges thereof to define guideways on the side of the body remote from the convex face, a tubular nipple carried by the body and extending outwardly from the convex face thereof and through the well casing, said body having an opening extending therethrough in registration with the nipple, a plate adapted to be removably entered into the guideways, said plate having an opening extending therethrough intermediate the ends thereof for registration with

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the opening in the body, a socket member carried by the plate and extending outwardly therefrom intermediate the ends thereof, said socket member having an L-shaped passage extending therethrough, one leg of said L-shaped passage communicating with the opening in the plate, a well pipe carried by the socket member and extending downwardly therefrom in communication with the L-shaped passage and in substantial axial alignment with the well casing, a handle member carried by the socket member and extending upwardly through the upper end of the well casing, and a plug removably fitted in the upper end of the well casing through which the handle extends so that upon removal of the plug, the handle may be lifted to extract the plate from the flanges of the body and the well pipe from the well casing for service and repair.

In the drawings:

Figure 1 is a fragmentary longitudinal sectional view through the upper end of a well casing showing this invention applied thereto;

Figure 2 is a view similar to Figure 1, taken at right angles thereto;

Figure 3 is a horizontal sectional view taken substantially on the line 3—3 of Figure 1;

Figure 4 is a view similar to Figure 1, showing the well pipe being extracted from the well casing;

Figure 5 is an exploded perspective view of the coupling unit; and

Figure 6 is a view similar to Figure 1 of a modified form of the invention.

Referring to the drawings in detail, a well casing 10 extends into the ground and the lower end is disposed adjacent the water reservoir at the foot of the well. In normal hand pump operation, a well pipe extends axially through the casing from the water standing adjacent the foot of the well through the upper end of the well casing 10 upon which is normally supported a hand pump which is connected to the well pipe for lifting water from the reservoir of water beneath the ground to the surface. The hand pump usually stands some two to three feet above the level of the ground and consequently is subject to freezing in those areas of the country where the temperatures fall below the usual freezing temperatures. In these areas, there are what are commonly referred to as a frost line above which the ground is frozen and below which freezing of the ground rarely occurs. Consequently, when it becomes desirable to employ a mechanically actuated pump for lifting water from the well, the pump is normally located in a building where it is protected from freezing and consequently it is desirable that the pipe leading from the well to the pump be disposed

below the frost line, so that water standing therein will not freeze.

In installing such a power-actuated system, a trench is dug in the ground to a depth slightly below the normal frost line, to the well casing 10 and the well casing is perforated as at 12 at a selected distance below its upper end so that it communicates with the trench. Through the upper end thereof is lowered a coupling unit designated generally 14 which comprises a body 16 having a convex side 18 which corresponds to the curvature of the inner side of the well casing 10. Carried by the convex side of the body 16 and extending outwardly therefrom substantially midway between opposite ends and opposite sides thereof is a tubular nipple 20 having external screw threads 22. This nipple is projected through the opening 12 in the casing 10, as illustrated in Figures 1 and 4, and threadedly engaging the nipple 20 is a nut 24 which engages a compression washer 26, by means of which a gasket 28 is compressed against the casing 10 on the outer side thereof to effect a seal between the nipple and the casing. Carried by the body 16 and extending outwardly from the side thereof remote from the convex side 18 are flanges 30 defining channels or guideways 32, the purpose of which will hereinafter appear. The body is provided with an opening 34 which extends therethrough in registration with the nipple 20, as will be readily understood upon reference to the drawings.

Removably entering the guideways 32 is a plate 36 having formed intermediate its ends an opening 38 which, when the plate is in place in the guideways 32, aligns with the opening 34 in the body 16. Formed in the face of the plate 36 adjacent the body 16 is an annular recess 40 which lies concentric about the opening 34 and receives a gasket 42 by means of which a water-tight junction is effected between the body 16 and the plate 36 around the openings 34 and 38. Carried by the plate 36 and extending outwardly therefrom on the side thereof remote from the recess 40 is a socket member 44 having an L-shaped passage 46 extending therethrough, one leg of which aligns with the opening 34, while the other leg opens downwardly through the lower end of the socket member 44 and is internally screw threaded as at 48 to receive the upper end of the well pipe 50 which extends downwardly in substantial axial alignment with the casing 10 and into the water adjacent the foot of the well. The well pipe may or may not be equipped with a conventional foot valve though in most cases such equipment will be found desirable.

Opening through the upper end of the socket member 44 is an internally screw-threaded recess 52 into which is threaded a length of pipe which serves as a handle 54. This handle 54 extends upwardly beyond the upper end of the well casing 10 and is fitted with any suitable finish element 56. Carried by the plate 36 and extending outwardly therefrom adjacent the upper end thereof is a stop flange 58 which, as illustrated, is adapted to engage the upper ends of the flanges 30 to limit downward movement of plate 36 in the guideways 32 and the openings 34 and 38 are in alignment.

Closing the upper end of the well casing 10 is a plug designated generally 60 which comprises a body 62 which is adapted to fit into the well casing 10, and carried by the body 62 is an outstanding annular flange 64 which, as illustrated, engages the upper end of the well casing 10 to



support the body 62 adjacent the upper end of the well casing. A compression plate 66 is supported by suitable screws 68 on the plug 60 and disposed between the compression plate 66 and body 62 of the plug is a compressible gasket 70 which is adapted to be compressed by turning the screws 68 and advancing the plate 66 toward the body 62. The plate 66, gasket 70 and body 62 are provided with axially aligned openings 72, 74 and 76 respectively, through which the handle 54 projects, and when the screws 68 are tightened to advance the compression plate 66 toward the body 62, the gasket 70 will expand laterally into frictional contact with the inner side of the well casing 10 and the outer side of the handle member 54 to thus effect a seal at the upper end of the well casing that will exclude contamination from the well.

When it becomes necessary to service the well pipe 50 or foot valve connected thereto, the screws 68 are turned to move the compression plate 66 away from the body 62 and thereby release the pressure on the gasket 70 so as to enable the plug to be lifted upwardly and thereby move the handle 54 upwardly to extract the plate 36 from its position in the guideways 32 defined by the flanges 30. Simultaneously, with such lifting effort, the well pipe 50 will be moved upwardly in the well casing for its subsequent extraction from the upper end thereof. Thus access may be had to the well pipe and any mechanism carried thereby for service. When the well pipe has been serviced, it is returned to the well casing 10 through the upper end thereof and the plate 36 is guided into the guideways 32 and the unit lowered until the flange 58 engages the upper ends of the flanges 30, at which time the openings 34 and 38 are in alignment. Thus, the well pipe 50 will be brought into communication with the nipple 20 and through the medium of a conventional coupling 78 and pipe length 80, the well pipe may be connected to the pumping mechanism (not shown).

In the modified form of the invention, illustrated in Figure 6, a well casing 10' is provided with vertically spaced lateral openings 12' for the reception of nipples 20' carried by a body 16' which corresponds substantially to the construction of the body 16, and slidably supported on the body 16' is a plate 36' carrying a socket member 44' having spaced L-shaped openings 46' extending therethrough, the horizontal legs of which align with the nipples 20', as will be readily understood upon reference to Figure 6. The socket member 44' carries the conventional handle 54' and carried by the socket member 44 in communication with the passages 46' are well pipes 50', one of which may serve as a jet pipe when a jet pumping system is employed.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

What is claimed is:

1. A separable coupling comprising a body having a transversely convex outer face, flanges carried by the body and extending outwardly therefrom adjacent opposite side edges thereof to define guideways on the side of the body remote from the convex face, a tubular nipple carried by the body and extending outwardly from the convex face of the body intermediate the ends

thereof, said body having an opening extending therethrough in registration with the nipple, a plate adapted to be removably entered into the guideways, said plate having an opening extending therethrough intermediate the ends thereof for registration with the opening in the body, means carried by the plate and engaging the body for establishing a fluid-tight junction between the plate and the body a socket member carried by the plate and extending outwardly therefrom intermediate the ends thereof, said socket member having an L-shaped passage extending therethrough, and one leg of said L-shaped passage communicating with the opening in the plate.

2. A separable coupling comprising a body having a transversely convex outer face, flanges carried by the body and extending outwardly therefrom adjacent opposite side edges thereof to define guideways on the side of the body remote from the convex face, a tubular nipple carried by the body and extending outwardly from the convex face of the body intermediate the ends thereof, said body having an opening extending therethrough in registration with the nipple, a plate adapted to be removably entered into the guideways, said plate having an opening extending therethrough intermediate the ends thereof for registration with the opening in the body, means carried by the plate and engaging the body for establishing a fluid-tight junction between the plate and the body a socket member carried by the plate and extending outwardly therefrom intermediate the ends thereof, said socket member having an L-shaped passage extending therethrough, and one leg of said L-shaped passage communicating with the opening in the plate, and a stop carried by the plate and extending outwardly therefrom adjacent one end thereof for engaging the flanges on the body and arresting movement of the plate when the opening therein registers with the opening in the body.

3. In a well having a well casing, means for discharging well fluid from the well casing below the top thereof, said means comprising a tubular nipple extending through the well casing below the top thereof, a body carried by the nipple and engaging the inner surface of the well casing, said body having an opening extending therethrough in registration with the nipple, flanges carried by the body and defining spaced guideways which lie parallel to the longitudinal axis of the well casing, a plate removably entered into the guideways and engaging the body, said plate having an opening extending therethrough for registration with the opening in the body, a socket member carried by the plate and extending outwardly from the side thereof remote from the body, said socket member having an L-shaped passage extending therethrough one leg of which registers with the opening in the plate while the other leg opens downwardly through the bottom of the socket member in substantial alignment with the axis of the well casing, a seal carried by the plate and engaging the body for establishing a fluid-tight junction between the body and the plate a well pipe carried by the socket member and extending downwardly therefrom within the well casing, a plug closing the upper end of the well casing, and a handle member carried by the socket member and extending upwardly therefrom and through the plug.

4. In a well having a well casing, means for discharging well fluid from the well casing below the top thereof, said means comprising a tubular nipple extending through the well casing below the top thereof, a body carried by the nipple and engaging the inner surface of the well casing, said body having an opening extending therethrough in registration with the nipple, flanges carried by the body and defining spaced guideways which lie parallel to the longitudinal axis of the well casing, a plate removably entered into the guideways and engaging the body, said plate having an opening extending therethrough for registration with the opening in the body, a socket member carried by the plate and extending outwardly from the side thereof remote from the body, said socket member having an L-shaped passage extending therethrough one leg of which registers with the opening in the plate while the other leg opens downwardly through the bottom of the socket member in substantial alignment with the axis of the well casing, a seal carried by the plate on the side thereof adjacent the body for engaging said body and effecting a fluid-tight junction therewith a well pipe carried by the socket member and extending downwardly therefrom within the well casing, a plug closing the upper end of the well casing, a handle member carried by the socket member and extending upwardly therefrom and through the plug, a collar threadedly engaged with the nipple, and a gasket disposed on the nipple between the collar and the well casing for sealingly engaging the well casing and preventing the entrance of contaminating substances thereinto around the nipple.

5. In a well having a well casing, means for discharging well fluid from the well casing below the top thereof, said means comprising a tubular nipple extending through the well casing below the top thereof, a body carried by the nipple and engaging the inner surface of the well casing, said body having an opening extending therethrough in registration with the nipple, flanges carried by the body and defining spaced guideways which lie parallel to the longitudinal axis of the well casing, a plate removably entered into the guideways and engaging the body, said plate having an opening extending therethrough for registration with the opening in the body, a socket member carried by the plate and extending outwardly from the side thereof remote from the body, said socket member having an L-shaped passage extending therethrough one leg of which registers with the opening in the plate while the other leg opens downwardly through the bottom of the socket member in substantial alignment with the axis of the well casing, a well pipe carried by the socket member and extending downwardly therefrom within the well casing, a plug closing the upper end of the well casing, a handle member carried by the socket member and extending upwardly therefrom and through the plug, the plate having an annular recess therein which opens through the side thereof remote from the socket member in surrounding relation to the opening in the plate, and a gasket seated in said recess for contacting the body and establishing a liquid tight seal between the body and the plate.



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