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PITLESS WELL ADAPTER ASSEMBLY

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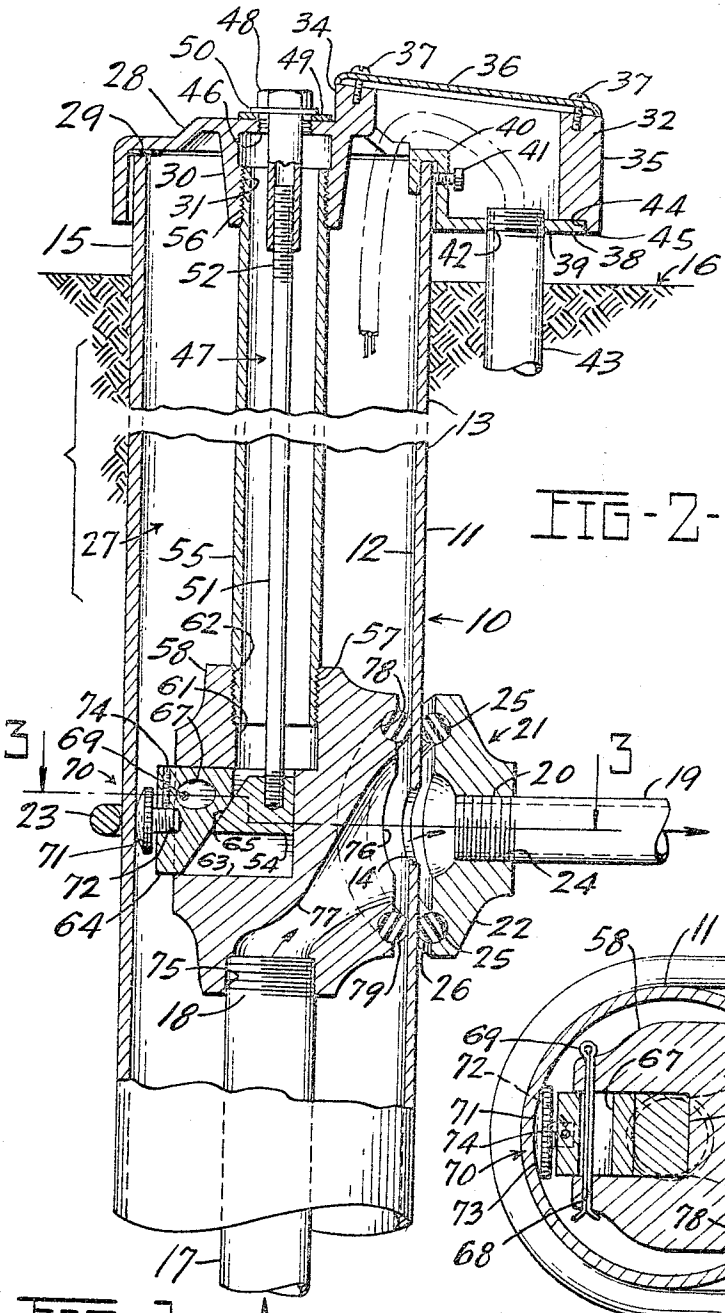


FIG-1-

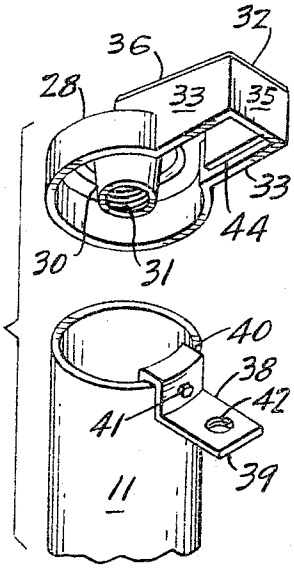


FIG-2-

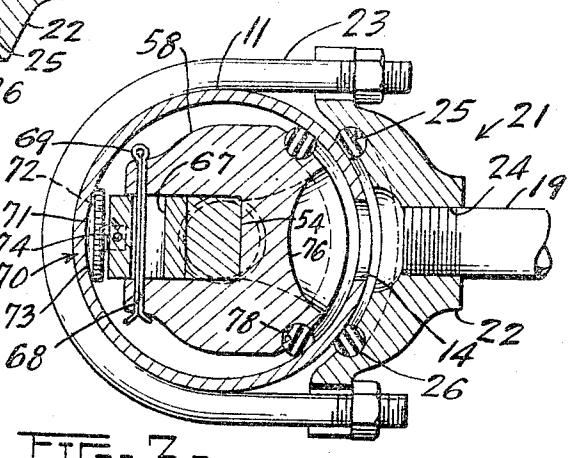


FIG-3-

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PITLESS WELL ADAPTER ASSEMBLY

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This invention relates to an apparatus for use in well supply systems, and, more particularly, to an improved well adapter assembly for connecting a pump discharge conduit to a liquid supply line and for aligning such an assembly in a predetermined position within a well casing.

The increased use of submersible motors in well supply water systems and the elimination of "pit" type well installations has created a need for an improved pitless well adapter assembly.

In a well system the discharge line from a deep well pump must be connected to the liquid supply line which leads to the point of use, for example, in a water system to a home or business establishment.

In the northern part of our country the water supply line to the home or business is buried approximately four feet below the final ground elevation to protect the water line from freezing. If the pump discharge line is extended to the top of the casing and then back down along the outside of the casing, a freezing problem is inherently created. Therefore, the common practice has been to make the connection from the pump discharge line to the water supply line within the casing or to cut off the casing below the ground elevation and make the connection at that point.

Because the pump and motor sometimes have to be removed to perform maintenance upon the pump or motor, it is not desirable to use a fixed or permanent fitting to connect the pump discharge line to the water supply line. Because the connection in the casing is located several feet below the elevation of the ground and because a well casing is often of a relatively small diameter, it is extremely difficult to work within the casing to either couple or uncouple the connection. When a connection is made within a casing, the danger is always present that the installer or maintenance man will drop the pump, motor, and connecting piping down into the well.

When a pitless adapter assembly is used to make the above connection, it is very important that a "tight" connection is made to prevent ground water or other contaminants from infiltrating, for example, a water supply, and thereby creating a health hazard.

The pitless well adapter assemblies which have been designed and used in the past were often undesirable because the adjusting mechanism used to insure a tight connection or seal was located below the top of the casing. An installer or a maintenance man had to reach downwardly into the casing with a wrench or some other tool to adjust the mechanism. This is very difficult to do, particularly in small diameter casings, and also produces the setting for an accidental dropping of the tool down in the casing and consequent damaging of the pump or motor. If a tool becomes wedged in the casing it can prevent removal of the pump. To remove such a wedged tool is both a difficult and expensive operation.

In the prior art adapter assemblies, it was difficult to realign the adapter assembly with a horizontal discharge opening in the casing once the pump, motor, and connecting piping had been removed from the well casing. Because the pump, conduit and appurtenant piping often weigh several hundred pounds, easy realignment of the adapter assembly when it is reinserted into the casing is an important factor. The well adapter assembly must be properly realigned in the casing to insure that the discharge side of the well adapter assembly registers with

the horizontal discharge opening in the casing. If proper realignment does not occur, at best a restriction in the flow of water results, and, if the misalignment is severe, a proper seal will not result, permitting contaminants to find their way into the water supply.

It is the primary object of the invention to provide a well adapter assembly which insures a tight and positive connection between a pump discharge line within the well casing and a liquid supply line outside of the well casing after the adapter assembly is in its operable position within the well casing.

It is another object of the instant invention to provide an improved pitless well adapter assembly which includes means for vertically aligning the adapter assembly with a pre-existing horizontal discharge opening in a well casing.

It is another object of the invention to provide a well adapter assembly which at all times supports the well system apparatus, thereby precluding accidental dropping of the pump, motor, and appurtenant piping down the well.

It is another object of the invention to provide a well adapter having novel alignment means which insures positive circumferential alignment of the well adapter assembly within the well casing when the adapter assembly has been removed and is replaced.

It is a further object of the invention to provide a well adapter assembly which can be adjusted without removing the cap member.

It is still another object of the invention to provide a well adapter assembly which includes adjusting means whereby the adapter assembly is adaptable to accommodate either an undersized or an oversized well casing.

Other objects of this invention will become apparent from the following specification and drawings in which:

FIG. 1 is a fragmentary, vertical sectional view showing one embodiment of a pitless well adapter assembly, according to the instant invention, positioned within a well casing;

FIG. 2 is a fragmentary, exploded, perspective view of a well casing and novel alignment means constructed according to the instant invention; and

FIG. 3 is a horizontal cross sectional view taken along the line 3—3 of FIG. 1.

Briefly, the invention relates to a pitless well adapter assembly for use in a well system which includes a vertical well casing having an interior surface, an exterior surface, and a horizontal discharge opening. The adapter assembly includes a cap mountable on the upper end of the casing. Alignment means are provided to facilitate the proper placing of the cap in a predetermined circumferential position on the casing. A support rod depends from the cap and a coupler body is secured to the support rod. A vertical draw rod assembly is supported by the cap and has a lowermost end secured to a vertical expanding block. A horizontal expanding block is supported by guide means located on the coupler body. The vertical expanding block engages the horizontal expanding block and is effective upon vertical movement of the vertical expanding block to move the horizontal expanding block laterally in the guide means for engaging relationship with the interior wall of the casing. The coupler body also has a conduit engaging bore in its lower portion and a discharge port positionable adjacent the horizontal discharge opening in the casing, with the coupler body defining a fluid passageway between the bore and the port. Adjusting means are provided in combination with the coupler body to compensate for undersized or oversized well casings.

Referring to FIG. 1, a well supply system is generally indicated at **10**. The system **10** includes a vertical well

casing 11 having an interior surface 12 and an exterior surface 13. The well casing 11 has a horizontal discharge opening 14 in its periphery and the upper portion 15 of the well casing 11 extends upwardly to an elevation higher than the surrounding ground elevation generally indicated at 16.

A submersible pump and motor (not shown) are located in the lower part of the well casing 11 and a liquid discharge conduit 17, having an upper threaded end 18, is connected to the discharge fitting on the pump. The discharge conduit 17 serves a dual function in that it both supports the pump and motor and also serves as a conduit for the liquid being pumped. An outlet liquid supply conduit 19, having a threaded end connection 20, carries the liquid, for example, water, to its point of ultimate use.

A clamp, generally indicated at 21, is secured to the exterior surface 13 of the casing 11 and comprises a saddle 22 and a U-bolt 23. The saddle 22 has a threaded bore 24 which engages the threaded end 20 of the conduit 19 and holds the conduit 19 in fluid communication with the horizontal discharge opening 14 in the casing 11. A notch 25 is provided on the interior surface of the saddle 22 and receives an O-ring 26 which, when in operable position, is compressed against the exterior surface 13 of the well casing 11. The O-ring 26 surrounds the horizontal discharge opening 14 and provides a tight seal to prevent ground water or other contaminants from entering the water supply and also to prevent the well water from escaping into the ground.

A pitless well adapter assembly according to the invention is generally indicated at 27. The assembly 27 includes a cap 28 which is supported by the upper portion 15 of the casing 11. A circular gasket 29 is disposed between the cap 28 and the top surface of the casing 11 to provide a sealed connection. The cap 28 has a boss 30, which defines a concentric threaded bore 31, depending from its lower surface.

Referring to FIGS. 1 and 2, the cap 28 has a downwardly extending flange on its circumference and has an integral junction box 32 extending outwardly from one portion of its periphery. The junction box 32 includes sidewalls 33 and end walls 34 and 35. A removably mounted inspection plate 36 is secured by bolts 37 on the top surfaces of the sidewalls 33 and the end walls 34 and 35.

An L-shaped aligner bracket 38 having an outwardly projecting first leg 39 and a J-shaped leg 40 is mounted on the top surface of the well casing 11. The J-shaped portion of the leg 40 receives the casing 11 and is held in a predetermined circumferential position by a set screw 41. The horizontal leg 39 of the aligner bracket 38 defines a threaded circular bore 42 which engages a complementary threaded portion of an electrical conduit 43. Electrical wires, indicated by the dashed lines in FIG 1, extend through the electrical conduit 43; through the interior of the junction box 32; and downwardly into the well casing 11. The electrical wires supply electrical power to the submersible motor (not shown).

The bottom surfaces of the sidewalls 33 and the end wall 35 define an aligner recess 44. When the cap 28 is properly positioned on the casing 11, the horizontal leg 39 of the aligner bracket 38 is seated in the aligner recess 44 and a flanged portion 45 of the sidewalls 33 and end wall 35 prevents horizontal rotation of the cap 28 when the horizontal leg 39 is properly seated.

The above described aligning means is a very important part of the well adapter assembly 27. When the casing 11 is initially inserted in the ground, a mark is placed directly over and in vertical alignment with the horizontal discharge opening 14 in the casing 11. The aligner bracket 38 is then placed on the top surface of the well casing 11 directly over the mark. The set screw 41 is tightened and the horizontal leg 39 of the aligner bracket 38 extends outwardly in direct vertical alignment with the horizontal discharge opening 14. The pump, motor, and appurtenant piping is inserted in the casing 11 and the cap 28 is then rotated until the horizontal leg 39 is properly seated in the aligner recess 44. When the submersible motor (not shown) is removed for maintenance purposes, the aligner bracket 38 remains in its predetermined circumferential position on the upper surface of the well casing 11 thereby insuring that upon reassembly the well adapter assembly will be replaced in correct circumferential alignment with the horizontal discharge opening 14.

A circular threaded bore 46 is located in the upper portion of the cap 28. When the well adapter assembly 27, the pump, motor, and appurtenant piping are placed into or removed from the casing 11, an eyebolt (not shown) is inserted in the threaded bore 46 to facilitate lifting of the apparatus.

A vertical draw rod assembly is indicated at 47 and is supported by the cap 28. The draw rod assembly 47 includes an internally threaded draw bolt 48 which extends through the threaded bore 46. A sealing gasket 49 is disposed between a flange 50 on the draw bolt 48 and the upper surface of the cap 28. A draw rod 51 having threaded ends 52 and 53 extends downwardly from the cap 28. The upper end 52 of the draw rod 51 is threaded into the draw bolt 48 and the lowermost end 53 is secured to a vertical expanding block 54. Preferably, the space above the upper end 52 of the draw rod 51 in the draw bolt 48 is filled with a lubricant to insure easy rotation of the draw bolt 48 relative to the draw rod 51 at all times.

A support tube 55, having an upper threaded end 56 and a lower threaded end 57, depends from and is supported by the cap 28. The upper end 56 is inserted into the threaded bore 31 of the boss 30. A coupler body 58 is secured to the lower end 57 of the support tube 55. The support tube 55 is of such length that it serves as means for vertically positioning the coupler body 58 in vertical registering relationship with the horizontal discharge opening 14 when the coupler body 58 is inserted in the casing 11.

In the preferred embodiment shown in the drawings, the draw rod 51 is positioned inside the support tube 55; however, the support tube 55 can be a solid rod with the draw rod 51 positioned adjacent such a solid rod.

In the preferred embodiment, shown in FIG. 1, the coupler body 58 defines a generally L-shaped channel 61 having a first leg 62 vertically aligned with the draw rod assembly 47 and a second leg 63 extending laterally through the coupler body 58. The first leg 62 serves as a guide to direct the path of movement of the vertical expanding block 54.

A horizontal expanding block 64 is supported by and is laterally movable within the second leg 63 of the channel 61. The second leg 63 is a guide means for the horizontal expanding block 64.

However, other types of guide means can be provided. For example, a horizontal track (not shown) can be laterally positioned on the upper surface of the coupler body 58. In this embodiment the track serves as guide means for the lateral movement of the horizontal expanding block 64 which is positioned thereon.

The vertical expanding block 54 engages the horizontal expanding block 64 and is effective upon upward vertical movement of the vertical expanding block 54 to move the horizontal expanding block 64 laterally in the second leg 63 of the channel 61 for engaging relationship with the interior surface 12 of the well casing 11. The second leg 63 of the channel 61 is vertically positioned in the coupler body 58 so that the area of contact between the horizontal expanding block 64 and the interior surface 12 of the casing 11 is in direct horizontal alignment with the horizontal axis of the horizontal discharge opening 14. This arrangement insures a uniform and positive seal around the discharge opening 14 when the coupler body 58 is in its operating position.

In the preferred embodiment, the vertical expanding block **54** has an upwardly and inwardly tapering face **65** which engages a complementary or matching face **66** of the horizontal expanding block **64**. However, the instant invention is not limited to the preferred embodiment shown in FIG. 1. For example, the engaging faces of the vertical expanding block **54** and the horizontal expanding block **64** may have tapers which are opposite to the ones shown in FIG. 1. In this embodiment the horizontal expanding block **64** would be moved laterally by a downward vertical movement of the vertical expanding block **54**. While the vertical expanding block **54** preferably has a tapering face, the engaging face of the horizontal expanding block **64** does not have to be tapered but can have a vertical engaging face.

Referring to FIGS. 1 and 3 the horizontal expanding block **64** has a bore **67** which extends completely through the horizontal expanding block **64**. The bore **67** preferably is oval shaped. The coupler body **58** defines smaller diameter bores **68** which are coaxially aligned with the bore **67** in the horizontal expanding block **64**. The bores **68** are of much smaller diameter than the bore **67** and receive a holding pin **69** which extends through the bores **68** and the bore **67** to pin the horizontal expanding block **64** to the coupler body **58**. Because the bore **67** has a greater diameter than the bores **68**, the horizontal expanding block **64** is free to move laterally in the second leg **63** of the channel **61**. The holding pin **69** serves as holding means, thereby securing the horizontal expanding block **64** to the coupler body **58** to prevent accidental dropping of the horizontal expanding block **64** into the well.

In the preferred embodiment, adjusting means, generally indicated at **70**, are provided to compensate for well casings having either an undersized or an oversized diameter. The adjusting means **70** includes a size adjuster bolt **71** which is inserted in a threaded horizontal bore **72** defined by the coupler body **58**. In the preferred embodiment, a convex contacting surface **73** of the adjuster bolt **71** is knurled and has an oval cross section which is shaped to approximate the contour of the interior surface **12** of the well casing **11** to insure closely engaging contact with the interior surface **12** of the well casing **11** when the horizontal expanding block **64** is moved into engaging relationship (see FIG. 3). The oval shape of the surface **73** prevents rotation of the adjuster bolt **71** during insertion of the assembly **27** into the casing **11**. In the embodiment shown in FIG. 1, a set screw **74** is provided to positively secure the adjuster bolt **71** in a predetermined position.

The coupler body **58** has a threaded conduit engaging bore **75** in its lower portion which receives the upper threaded end **18** of the pump discharge conduit **17**. A discharge port **76** is defined by the coupler body **58** and is positionable adjacent the horizontal discharge opening **14** of the casing **11**. Preferably the discharge port **76** has an oval cross section to improve the flow characteristics of the fluid as it passes through the port. A fluid passageway **77** is defined by the coupler body **58** and extends between the bore **75** and the discharge port **76**. When the coupler body **58** is in its operable position fluid communication is established between the pump discharge conduit **17** and the water supply conduit **19** with the fluid passing from the discharge conduit **17**; through the fluid passageway **77**; through the horizontal discharge opening **14** and into the water supply conduit **19**. This path of flow is indicated by the arrows in FIG. 1.

The coupler body **58** includes a notch **78** which is spaced from and surrounds the discharge port **76**. The notch **78** receives an elastomeric O-ring **79**. When the well adapter assembly **27** is in its operable position, the O-ring **79** is compressed against the interior surface **12** of the casing **11** thereby sealing the system from the accidental entry of contaminants.

In a typical installation of a well system, and more particularly in the installation of the well adapter assembly **27**, the well casing **11** is first inserted into the ground in a conventional manner. During installation the draw bolt **48** of the draw rod assembly **47** is removed from its position on the cap **28** and an eyebolt (not shown) is inserted into the threaded bore **46** to facilitate the use of a crane or some other type of construction equipment during installation.

The aligner bracket **38** is then positioned on the upper surface of the casing **11** as was previously described and the well assembly composed of the pump and submersible motor, the discharge conduit **17**, and the well adapter assembly **27** is then inserted into the well casing **11**. The seating of the horizontal leg **39** of the aligner bracket **38** into the aligner recess **44** insures proper circumferential alignment of the discharge port **76** with respect to the horizontal discharge opening **14**. After the cap **28** is in position on the top surface of the casing **11**, the eyebolt is removed. The gasket **49** is then positioned concentrically with the bore **46** and the draw rod bolt **48** is inserted through the bore **46** and engaged with the threaded end **52** of the draw rod **51**.

At this point in the installation the vertical expanding block **54** is at a vertical position lower than shown in FIG. 1 and the horizontal expanding block **64** is inwardly or to the right of the position shown in FIG. 1. The draw bolt **48** is rotated in a clockwise direction moving the vertical expanding block **54** upwardly into engaging relationship with the horizontal expanding block **64**. The upward movement of the vertical expanding block **54** moves the horizontal expanding block **64** laterally in the second leg **63** of the channel **61** for engaging relationship with the interior surface **12** of the well casing **11**.

After the contacting surface **73** of the adjuster bolt **71** is engaged with the casing **11** continuing upward movement of the vertical expanding block **54** and the respective lateral movement of the horizontal expanding block **64** moves the coupler body **58** into sealing engagement with the interior surface **12** of the casing **11** by compressing the O-ring **79** which surrounds the horizontal discharge opening **14**.

The clamp **21** is placed in its proper position surrounding the exterior surface **13** of the casing **11** in a conventional manner. The O-ring **26** is compressed in a position totally surrounding the horizontal discharge opening **14**, thereby sealing all connections from the accidental entry of contaminants.

When it becomes necessary to remove the pump or motor from the well casing **11**, the draw bolt **48** is rotated in a counterclockwise direction. It should be noted that the upper portion of the draw bolt **48** is at all times located above the cap **28**. This is an important feature of the well adapter assembly **27**.

As the draw bolt **48** is rotated, the vertical expanding block **54** moves downwardly out of engaging relationship with the horizontal expanding block **64**, thus relieving the lateral force acting upon the horizontal expanding block **64**. The horizontal expanding block **64** is then free to move inwardly out of its engaging relationship with the casing **11**. The pump, motor, well adapter assembly **27**, and appurtenant piping may then be removed from the well casing **11**. At no time is it necessary for a maintenance man or an installer to reach downwardly into the well casing to adjust the well adapter assembly **27**. Therefore, accidental dropping of tools into the well casing **11** is effectively prevented.

Another feature of the instant invention is that the coupler body **58** is at all times secured to the support tube **55** which in turn is supported by the cap **28**. This prevents the accidental dropping of the entire apparatus into the well.

While the present invention has been disclosed with a specific arrangement and disposition of the parts, it should be expressly understood that numerous modifications and

changes may be made without departing from the scope of the appended claims.

What is claimed is:

1. A pitless well adapter assembly for use in a well system including a vertical well casing having an interior surface, an exterior surface and a horizontal discharge opening, said adapter assembly comprising, in combination, a cap mountable on the upper end of such casing, support means depending from said cap, a coupler body secured to said support means, horizontal guide means on said coupler body, a vertical draw rod assembly having an uppermost end supported by said cap and a lowermost end secured to a vertical expanding block, a horizonal expanding block supported by said guide means, said vertical expanding block engaging said horizontal expanding block, and being effective upon vertical movement of said vertical expanding block to move said horizontal expanding block laterally in said guide means for engaging relationship with the interior wall of such casing, said coupler body having a conduit engaging bore in its lower portion and a discharge port positionable adjacent the horizontal discharge opening in such casing and defining a fluid passageway between such bore and such port.

2. In a well system having a vertical well casing, such casing having an interior surface, an exterior surface and a horizontal discharge opening, a pitless well adapter assembly comprising, in combination, a cap supported by the upper end of such casing, support means depending from said cap, a coupler body secured to the lowermost end of said support means, horizontal guide means on said coupler body, a vertical draw rod assembly having an uppermost end extending above and supported by said cap and a lowermost end secured to a vertical expanding block, a horizontal expanding block supported by said guide means, said vertical expanding block engaging said horizontal expanding block and being effective upon vertical movement of said vertical expanding block to move said horizontal expanding block laterally in said guide means for engaging relationship with the interior wall of such casing, said coupler body having a conduit engaging bore in its lower portion and a discharge port positionable adjacent the horizontal discharge opening in such casing and defining a fluid passageway between such bore and such port.

3. A pitless well adapter assembly for use in a well system including a vertical well casing having an interior surface, an exterior surface and a horizontal discharge opening, said adapter assembly comprising, in combination, a cap mountable on the upper end of such casing, a support conduit depending from said cap, a coupler body secured to said support conduit, a vertical draw rod assembly having an uppermost end supported by said cap and a lowermost end, a vertical expanding block secured to the lowermost end of said draw rod, said coupler body defining a channel, a first leg of the channel being vertically aligned with said draw rod assembly and a second leg of the channel extending laterally through said coupler body, said coupler body having in its lower portion a conduit engaging bore and a discharge port positionable adjacent the horizontal discharge opening in such casing and defining a fluid passageway between such bore and such port, said vertical expanding block positioned within the first leg of such channel and having a vertically tapering face, a horizontal expanding block positioned within the second leg of the channel and having a first end adjacent said tapering face and a second end adjacent to and engageable with the interior surface of such well casing, and being effective upon vertical movement of said vertical expanding block to move said horizontal expanding block laterally for engaging relationship with the interior wall of such casing.

4. A pitless well adapter assembly according to claim 3, wherein said vertical expanding block has an upwardly and inwardly tapering face and said horizontal expanding block has a complementary face adjacent said tapering face.

5. A pitless well adapter assembly according to claim 3, said second end of said horizontal expanding block defining a horizontal bore, said coupler body defining a threaded opening, said threaded opening being perpendicular to and in communication with said horizontal bore, an adjuster member movably mounted in said horizontal bore and having a contacting surface for engaging relationship with the interior surface of such casing, and a threaded holding pin positioned in said threaded opening and being effective for movement into engaging relationship with said adjuster member for releasably securing said adjuster member in a predetermined horizontal position.

6. A pitless well adapter assembly for use in a well system including a vertical well casing having an interior surface, an exterior surface and a horizontal discharge opening, said adapter assembly comprising, in combination, a cap mountable on the upper end of such casing, said cap having a box portion extending outwardly from its periphery and defining an aligner recess along its bottom surface, support means depending from said cap, a coupler body secured to said support means, said coupler body having a conduit engaging bore in its lower portion and a discharge port positionable adjacent the horizontal discharge opening in such casing and defining a fluid passageway between such bore and such port, means effective to move said coupler body into sealing relationship with the interior wall of such casing whereby such discharge port is in fluid communication with the horizontal discharge opening in such casing, and an aligner bracket mountable on the upper surface of such casing having a horizontal leg extending outwardly and positionable in predetermined vertical alignment with such horizontal discharge opening, whereby when said leg is seated in such aligner recess, such discharge port is circumferentially aligned with the horizontal discharge opening.

7. In a well system having a vertical well casing having an interior surface, an exterior surface and a horizontal discharge opening, a well adapter assembly comprising, in combination, a cap supported by the upper end of such casing, said cap having a box portion extending outwardly from its periphery and defining an aligner recess along its bottom surface, support means depending from said cap, a coupler body secured to said support means, said coupler body having a conduit engaging bore in its lower portion and a discharge port adjacent the horizontal discharge opening in such casing and defining a fluid passageway between such bore and such port, means releasably holding said coupler body in sealing relationship with the interior wall of such casing whereby such discharge port is in fluid communication with the horizontal discharge opening in such casing, and an aligner bracket mounted on the upper surface of such casing having a horizontal leg extending outwardly in vertical alignment with such horizontal discharge opening, said leg being seated in such aligner recess and such discharge port being circumferentially aligned with such horizontal discharge opening.

8. A pitless well adapter assembly for use in a well system including a vertical well casing having an interior surface, an exterior surface and a horizontal discharge opening, said adapter assembly comprising, in combination, a cap mountable on the upper end of such casing, aligning means mountable on the upper portion of such casing for engagement with an aligner portion of said cap in a predetermined circumferential position on such casing, a support conduit depending from said cap, a coupler body secured to said support conduit, a vertical draw rod assembly having an uppermost end extending above and supported by said cap and a lowermost end, said draw rod assembly extending through said support conduit, a vertical expanding block secured to the lowermost end of said draw rod, said coupler body de-

fining a channel, a first leg of the channel being vertically aligned with said draw rod assembly and a second leg of the channel extending laterally through said coupler body, said coupler body having in its lower portion a conduit engaging bore and a discharge port positionable adjacent the horizontal discharge opening in such casing and defining a fluid passageway between such bore and such port, said vertical expanding block positioned within the first leg of such channel and having a vertically tapering face, a horizontal expanding block positioned within the second leg of the channel and having a matching surface adjacent said tapering face and an end adjacent to and engageable with the interior surface of such well casing, and being effective upon vertical movement of said vertical expanding block to move said horizontal expanding block laterally for engaging relationship with the interior wall of such casing.

9. A pitless well adapter assembly according to claim **8**, said end of said horizontal expanding block defining a horizontal bore, said coupler body defining a threaded opening perpendicular to and in communication with said horizontal bore, and an adjuster member rotatably mounted in said horizontal bore and having a convex oval contacting surface for engaging relationship with

the interior surface of such casing in direct horizontal alignment with the horizontal axis of the horizontal discharge opening.

10. A pitless well adapter assembly according to claim **8** wherein such discharge port has an oval vertical cross section, said coupler body defining a notch spaced from and surrounding such discharge port, an elastomeric O-ring seated in such notch for engaging relationship with the portion of the inner surface of such casing surrounding the horizontal discharge opening, and holding means in combination with said horizontal expanding block and said coupler body effective to prevent removal of said horizontal expanding block from said coupler body.

References Cited by the Examiner

UNITED STATES PATENTS

2,903,067	9/1959	Hall	166—85
2,949,961	8/1960	Anderson	166—85
3,136,362	6/1964	Baker	166—85

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