Oct. 25, 1960 G. W. EARL 2,957,524

WELL SEAL

Filed July 15, 1957 2 Sheets-Sheet 1

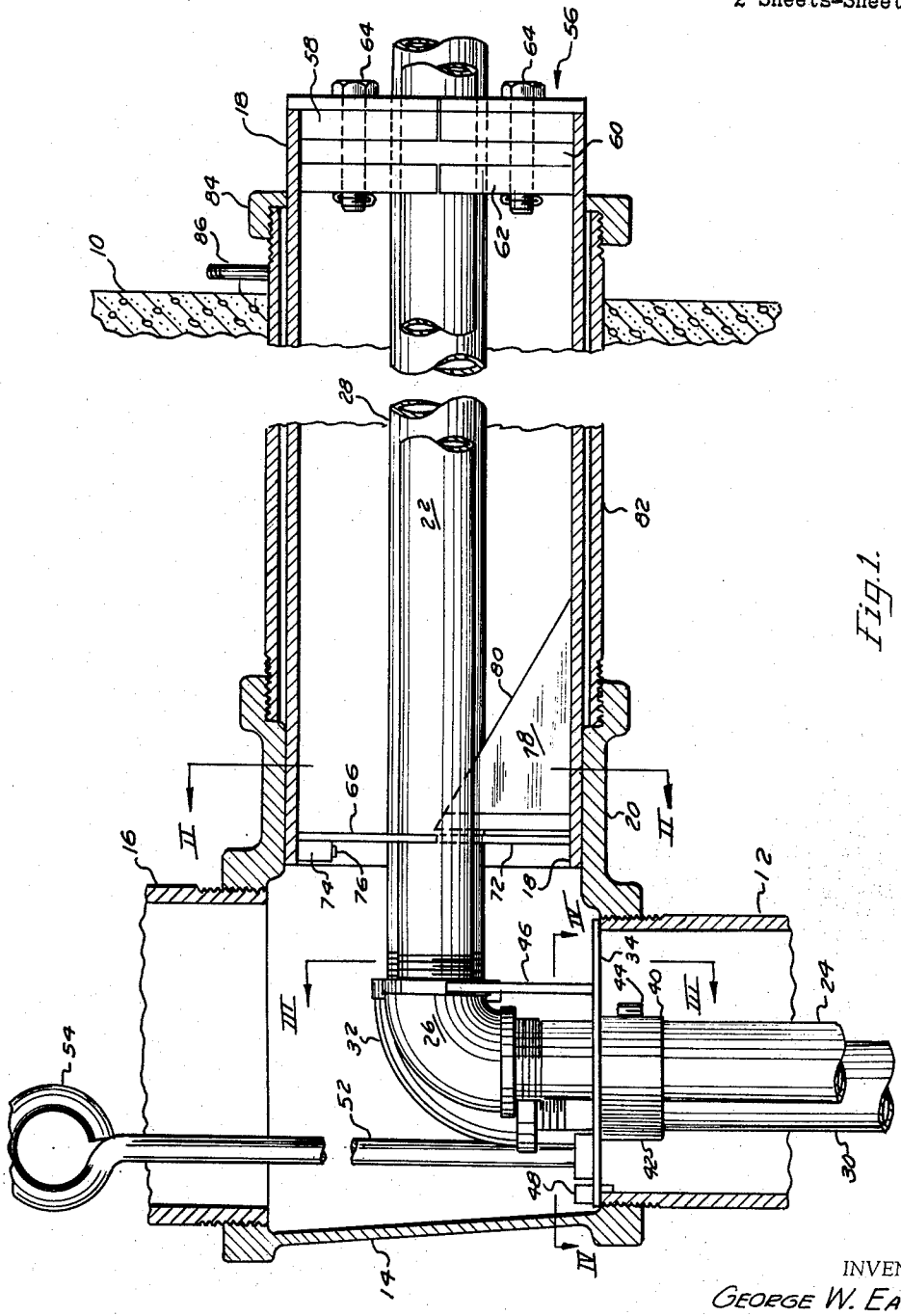

Fig. 1.

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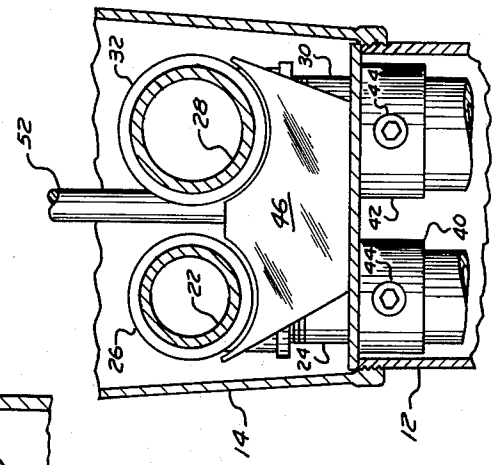

Fig. 3.

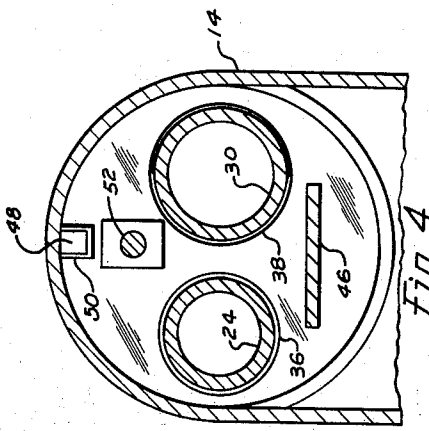

Fig. 4.

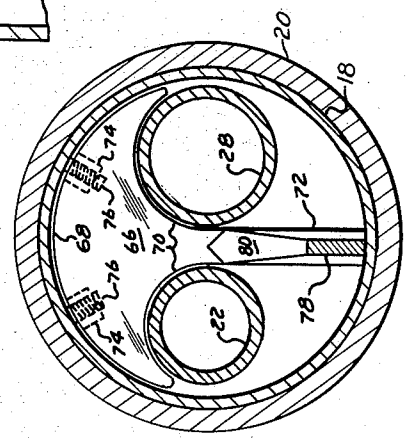

Fig. 2.

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2,957,524

WELL SEAL

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4 Claims. (Cl. 166—75)

The invention relates to a well sealing device and particularly pertains to structure for use with a well utilizing a lateral casing.

Wells from which water used for human consumption is drawn must be tightly sealed to prevent contamination from surface debris, insects, rodents and other causes to conform to health standard codes. Normally a water well may be sealed by the use of a cap over the top of the casing through which the necessary piping passes. However, in installations where it is desired to place the pump some distance from the well, as would be the case where the pump is within the basement of a dwelling and the well located outside, a lateral casing must be used which increases the chances for contamination and makes effective sealing more difficult.

It is thus an object of the invention to produce a lateral well casing assembly which will effectively seal the well and may be economically and simply manufactured.

Another object of the invention is to provide a lateral well seal which will be contamination proof and will automatically indicate leakage or failure of the lateral casing.

A further object of the invention is to design a well assembly which may be easily serviced without digging up the well and may be easily assembled and aligned from a remote position.

These and other objects of the invention will become apparent when viewed with regard to the following description and drawing wherein:

Fig. 1 is an elevational internal view of the assembled well components with the well casing, access pipe, T, lateral casing, jacket and jacket fitting and wall shown in section.

Fig. 2 is a cross section view taken along the line II—II of Fig. 1,

Fig. 3 is a cross section view taken along the line III—III of Fig. 1, and

Fig. 4 is a cross section taken along line IV—IV of Fig. 1.

The assembled well sealing device embodying the concepts of the invention is illustrated in Fig. 1 showing a typical installation wherein the foundation or wall of a building is represented at **10** and the well casing **12** is located outside the building or housing.

A **T 14** is threadedly affixed to the top of casing **12** and the access pipe or conduit **16** threads onto **T 14** concentric to the casing. It will be understood that the casing **12** and pipe **16** extend in a vertical direction. A lateral casing **18** is press fitted or welded within the lateral connection **20** of the **T 14** and extends horizontally through the wall **10**.

The disclosed embodiment shows the two pipe system employed with a jet type pump. However, the invention is not limited to any particular pumping arrangement, the jet pump system being employed for illustrative purposes only. The pipes **22**, **24** and elbow **26** constitute the jet piping and the pipes **28**, **30** and elbow **32** comprise

the intake duct work, the pipes **22** and **28** being connected directly or indirectly to the pump, not shown.

The vertical piping **24** and **30** are supported in the casing **12** by the circular plate **34** which rests upon the upper edge of the casing. The plate **34** is provided with a pair of holes **36** and **38**, Fig. 4, through which the pipes **24** and **30**, respectively, extend. Annular collars **40** and **42** are welded or otherwise affixed to the underside of plate **34** concentric to the holes **36** and **38** and are provided with set screws **44** which may be tightened down on the pipes **24** and **30** forming a connection between the pipes and plate **34**. Further support is achieved by means of the cradle **46** which is attached to the top of plate **34**, resting thereupon, and engages the underside of couplings **26** and **32**, note Fig. 3. Arcuate recesses are formed in cradle **46** for this purpose.

To insure the proper positioning of the plate **34** within the **T 14** facilitating assembly with the lateral components, a rectangular key **48** is formed on the **T 14** and a cooperating slot **50** is cut in the plate **34** as is shown in Fig. 4. Thus, before the plate **34** will seat properly on the casing **12** the key **48** and slot **50** must be aligned. Removal of the plate **34** and piping **24—30** is accomplished by the pull rod **52** affixed at one end to the plate **34** and provided at the other end with an eye **54** which may be engaged by a "fishing" tool.

The open end of the lateral casing **18** is sealed by a conventional sealing assembly **56** which consists of an outer plate **58**, an expandable resilient layer **60** and an inner plate **62**. Elements **58**, **60** and **62** are formed with holes permitting the pipes **22** and **28** to pass therethrough and a plurality of bolts **64** threaded into plate **62** and backed by the outer plate **58** produce the sealing action. Thus, when the seal **56** is in the position as shown in Fig. 1, tightening of the bolts **64** will draw plate **62** toward plate **58** compressing and expanding layer **60**. As layer **60** expands the material, such as soft rubber, of layer **60** will engage the inside of casing **18** and the pipes **22** and **28** holding assembly **56** in position and sealing the interior of casing **18** against water, insects, rodents, dirt and other undesirable matter which may contaminate the well.

Since the well casing **12**, **T 14** and lateral casing **18** are usually located under the ground and the casing **18** may be of considerable length, means are provided to align the pipes **22** and **28** with the threaded openings in couplings **26** and **32** to facilitate assembly. As will be observed in Figs. 1 and 2, a guide **66** is positioned within in casing **18** adjacent the **T 14**. Guide **66** may be formed of flat stock and is provided with a large arcuate periphery **68** which is slightly smaller than the internal diameter of casing **18** and a pair of smaller arcuate surfaces **70** corresponding to the diameter of pipes **22** and **28**. A radial extension **72** of guide **66** projects between the pipes **22** and **28** forming a separator. A pair of blocks **74** are welded to the guide **66** adjacent periphery **68** and are radially bored and threaded to receive set screws **76** which may be rotated to engage the upper inner surface of the lateral casing **18**. Thus, as screws **76** are tightened, the extension **72** will engage the opposite lower inner surface of casing **18** thereby wedging the guide **66** in place.

An important feature of the guide **66** lies in the function of the lift foot **78** which is attached to the extension **72** and projects parallel to casing **18** toward the seal assembly **56**. As shown in Fig. 1, the foot **78** is wedge shaped, one side being parallel to and fastened on the extension **72**, the base rests upon the bottom of the lateral casing **18** and the upper edge **80** rises to a point approximately even with the center of casing **18**.

The purpose of foot **78** and guide **66** is to line up the pipes **22** and **28** with the elbows **26** and **32**, respectively,

when the piping is to be assembled. Normally, if the lateral casing **18** were longer than about six feet inserting the end of pipe **22** or **28** into the proper coupling and obtaining the proper thread alignment would be very difficult. However, with the construction of the invention, the lateral piping need only be axially inserted in the open end and pushed through casing **18** until the pipe is on the proper side of the foot **78**, e.g., as seen in Fig. 2, the pipe **28** would approach guide **66** on the right of foot **78**. When the end of the pipe **22** or **28** engages the foot **78** the pipe will begin to ride up the edge **80** as the pipe is pushed toward the elbow. This lifting action is due to the fact that the end of the pipe is now supported on the edge **80** and the curved wall of casing **18**, which also tends to lift the pipe. The height of foot **78** is such that upon the end of the pipe **22** or **28** reaching the proper height to align with the threads of the elbow the pipe may be inserted through the guide **66** and engage with the elbow. By applying a pipe wrench to the pipe **22** and **28** outside the casing **18** the piping may be threaded and tightened into the elbow. The surface **70** will prevent the pipes **22** or **28** from tilting too far upward and aid in the alignment of the pipe.

As a safety feature to automatically indicate failure or a break in the lateral casing **18**, a pressure jacket system may be used. As shown in Fig. 1, the jacket **82** consists of a cylindrical pipe or conduit which extends from the connection **20** to a point inside the wall **10**. A threaded bore within connection **20** permits the jacket **82** to concentrically encompass casing **18**, slightly spaced therefrom, and at the outer end the jacket **82** is sealed by fitting **84**. An inlet **86** permits communication with the space between jacket **84** and casing **18**. Thus, by connecting the inlet **86** to the top of the water pressure tank, not shown, any break or fault in casing **18** would permit the air and water within the water pressure tank to escape, resulting in improper water pressure characteristics which would require immediate servicing. Should the seal between casing **18** and connection **20** loosen or condensation within casing **18** cause rust to corrode through the casing such a break is immediately evident from a loss in water pressure and will require immediate attention.

The operation is as follows: Assuming the well structure to be assembled as shown in Fig. 1, should it be desired to service the well, for instance replace the jet venturi or well point, the service man would first loosen the bolts **64** on the sealing assembly **56** releasing the compression on layer **60** and breaking the seal on the pipes **22**, **28** and casing **18**. The pipes **22** and **28** may now be unscrewed from the elbows **26** and **32**, respectively, without damaging the sealing assembly **56** and withdrawn from casing **18**. To remove the pipes **24** and **30** from well casing **12** the cover (not shown) on the access pipe **16** must be removed and a fishing tool or such inserted into casing **16** and engaged with eye **54**. The plate **34** may now be lifted from the T **14** and as the pipes **24** and **30** are supported by collars **40** and **42** and cradle **46** the pipes **24** and **30** will also be pulled from the casing **12**.

When reassembling the piping the plate **34** and pipes **24** and **30** are merely lowered into casing **16** and T **14** until the plate rests upon the casing **12**. To obtain proper seating of plate **34** the slot **50** must be positioned so as to fit over the key **48** and as the elbows **26** and **32** are held in position by the arcuate recesses of cradle **46** the alignment of the threaded bore of the elbows with the guide **66** and lateral casing **18** is insured. The cover of access pipe **16** may now be replaced. Coupling of the pipes **22** and **28** with the proper elbow is accomplished by inserting the pipe **28**, for instance, into casing **18**, as the end of the pipe approaches the lift foot **78** the pipe **28** may be rotated clockwise, Fig. 2, which will move the pipe to the right side of foot **78**, continued axial movement of the pipe will move the pipe up foot edge **78**, through guide **66** and alignment with elbow **32** is completed. The pipe **28** is then rotated to complete the threaded connection with the elbow. Pipe **22** is inserted in a similar manner, except would be rotated counter-clockwise during the approach of foot **78**. The seal assembly **56** is then placed over pipes **22** and **28** and inserted into casing **18**. The tightening of bolts **64** compresses layer **60** sealing the end of casing **18** and completing the reassembly.

It will, thus, be observed that the invention produces a well assembly using a lateral casing which is of relatively simple design yet permits the well to be serviced without digging up the casings, the guides and means for aligning the pipes permit easy reassembly from points remote from the elbows and the well is completely sealed against contamination by foreign matter being introduced into the lateral or well casings. Jacket **82** protects the casing **18** from direct contact with the soil and by connecting the inlet **86** to the water pressure tank any break in the wall of casing **18** will be quickly apparent.

It is to be understood that the invention is not limited to the illustrated embodiments and other designs may be apparent without departing from the spirit and scope of the invention.

I claim:

1. A well assembly including in combination, a well casing, a multi-port casing fitting affixed to the upper end of said well casing, a lateral casing opening into and affixed to said fitting, means supporting piping within said well casing, said means being positioned within said fitting, conventional pipe fittings connected to said piping within said casing fitting engaging and positioned thereon by said support means, piping within said lateral casing connected to said pipe fittings, guide means within said lateral casing adjacent said casing fitting aligning the lateral casing piping with said pipe fittings and sealing means interposed between said lateral casing and said piping therein preventing foreign matter from entering said lateral casing.

2. In a well assembly, in combination, a well casing, a casing fitting affixed to the top of said well casing, a lateral casing communicating with said fitting, first piping within said well casing, a support plate removably mounted in said casing fitting, key and slot means positioning said plate in said casing fitting, annular collars affixed to said plate, said piping projecting through said collars, locking means carried by said collars engaging said piping, elbows threaded upon the upper end of said piping adjacent said support plate, a cradle affixed to said plate supporting said elbows in predetermined relation to said plate, a guide plate mounted in said lateral casing adjacent said casing fitting, said guide plate formed with an extension engaging the lower inner surface of said lateral casing, a tapered lifter foot affixed to said extension projecting into said lateral casing, second piping within said lateral casing threadedly connected to said elbows and a radially expandable seal adapted to enclose the open end of said second casing.

3. In a well assembly as in claim 2, wherein said lateral casing is enclosed in a cylindrical pressurized jacket radially spaced from said lateral casing.

4. In a well assembly, in combination, a vertical well casing, a lateral casing, a casing fitting establishing communication between said well and lateral casings, first piping within said well casing, a support plate removably supported within said casing fitting, said first piping extending through said support plate, conventional pipe fittings having threaded openings affixed to said first piping above said support plate, a cradle mounted on said support plate supporting and positioning said pipe fittings and first piping with respect to said casing fitting, second piping within said lateral casing threadedly connected to openings within said pipe fittings, a guide plate within said lateral casing adjacent said casing fitting, an inclined

guide foot mounted on said guide plate and associated with said guide plate and lateral casing whereby upon insertion of said second piping through said lateral casing said guide foot and plate aligns each of said second piping with a respective opening of said pipe fittings and sealing means interposed between said lateral casing and said second piping.

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