Sept. 5, 1961 H. W. MAASS 2,998,847

PITLESS WELL ADAPTOR LOCKING PROPS

Filed Feb. 8, 1960

Fig. 3.

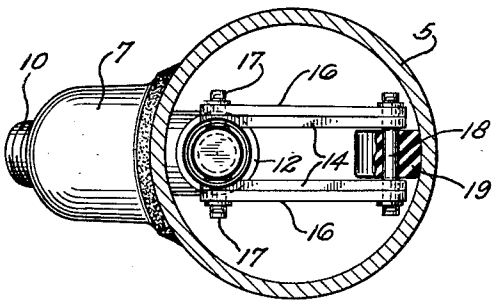
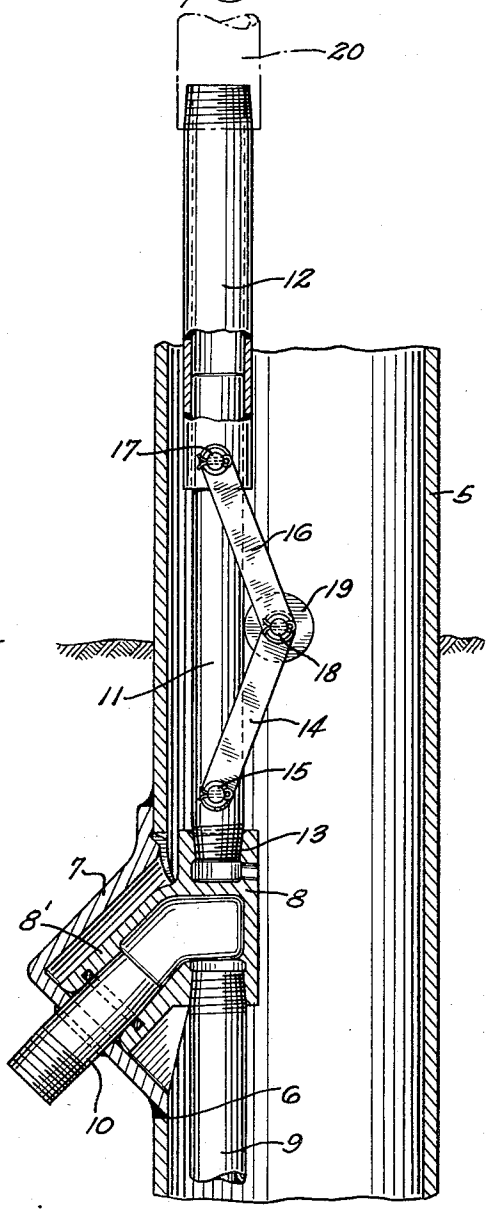


Fig. 2.



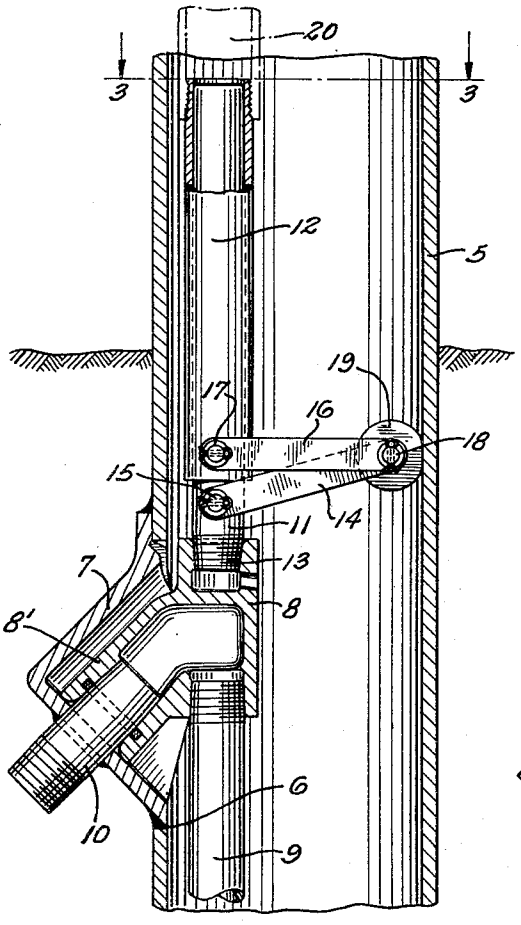


Fig. 1.

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PITLESS WELL ADAPTOR LOCKING PROPS

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This invention relates to improvements in pitless well adaptor locking props.

In the prior Herbert W. Maass et al. Patent No. 2,841,233, there is disclosed a pitless well adaptor for submersible pump wells in which the pump and its appurtenances can be conveniently and quickly removed for repairs and inspection.

The aforesaid prior construction includes a sanitary fitting within the well casing which connects both with a vertically extending water flow pipe and an outwardly directed water supply pipe. The portions of the assemblage within the well casing may be withdrawn from the well casing vertically by a drop pipe temporarily applied to the upper end of the fitting. It is highly desirable that the fitting be maintained in proper position within the well casing so that the connection portions thereof will align at all times with the water flow pipe and with the connections for the outgoing water supply pipe, and this is particularly important in respect to pressures reacting within the fitting and connecting pipes which might undesirably cause the fitting to deflect laterally.

With the above in mind, therefore, it is a primary object of the present invention to provide for a pitless well adaptor, a locking prop permanently associated with an end portion of the well adaptor fitting and susceptible of manipulation within the well casing to releasably wedgingly engage an inner wall portion of the well casing so as to brace the well adaptor and its appurtenances against any undesired lateral deflection.

A further object of the invention is to provide a pitless well adaptor, a locking wedge which, through a simple rectilinear reciprocation, may be adjusted into its locked wedging position to serve as a stabilizing prop for the well adaptor fitting and its appurtenances, or which may be reciprocated to an unlocked position wherein the well adaptor may be withdrawn vertically from the well casing for inspection and repairs.

A further object of the invention is to provide, in a pitless well adaptor, an articulated locking prop permanently carried by a portion of the adaptor fitting and to which a drop pipe may be temporarily secured when it is desired to unlock and disengage the prop from the inner wall of the well casing and to withdraw the adaptor from the well casing.

A further object of the invention is to provide a pitless well adaptor locking prop which is very easy to manually manipulate, which is unobtrusively carried by the pitless well adaptor within the well casing, which is inexpensive to manufacture and install, which is strong and durable, and which is well adapted for the purposes described.

With the above and other objects in view the invention consists of the improved pitless well adaptor locking prop, and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

FIG. 1 is a vertical sectional view through the upper portion of a well installation of the pitless and submersible pump type embodying the improved adaptor and the locking prop therefor, the latter being shown in its locked position;

FIG. 2 is a vertical sectional view similar to FIG. 1 only showing the locking prop shifted to its unlocked position which will permit the upward withdrawal of the well adaptor and its appurtenances, including a pump, from the well casing; and

FIG. 3 is a transverse sectional view taken on the line 3—3 of FIG. 1.

Referring now more particularly to the drawing it will appear that a well casing, of circular form in cross section, is indicated generally by the numeral 5 and the same protrudes above the ground level a required distance. As is shown in prior Patent No. 2,841,223, the upper end of the casing 5 may have applied thereto a removable sealing cap or closure. The well casing 5, below the frost level, has an opening 6 formed on a side wall portion thereof over which there is welded the lip or ledge portion of a box 7 which may take the form of the box illustrated in my copending application Serial No. 7,392 or of that illustrated in said prior Patent No. 2,841,223. Within the well casing 5 adjacent the opening over which the box 7 is applied there is a metallic chambered fitting 8 to which is secured the upper end portion of a flow pipe 9 which extends downwardly into the lower portion of the well casing to have water forced upwardly therein when the well pump (not shown) is in operation. Obviously, pumped water will pass from the upper end of the flow pipe 9 into the cavity of the fitting 8 and then into the downwardly outwardly offset portion 8' of the fitting which is housed within the well adaptor box 7 and which carries an outwardly projecting nipple 10 which connects with a water supply pipe (not shown) which leads to a point where the water is to be utilized.

The improved locking prop for the adaptor includes a vertical pipe section 11 and a complementary pipe section or sleeve 12 which is telescopically mounted on the upper end portion of the pipe section 11.

A well adaptor fitting 8 of the type illustrated is customarily provided with an internally threaded socket 13 into which the lower end portion of a drop pipe may be threaded when the installation is being made or when the parts are to be removed from the well casing for repairs and inspection. In the present invention, however, the lower end portion of the pipe section 11 of the locking prop is externally threaded and is permanently screwed into the socket 13 of the fitting 8. Adjacent the lower threaded end portion of the pipe section 11 the outer end portions of a pair of lever arms 14 are pivotally secured to opposite sides of said pipe section by a transverse pivot bolt 15. Similarly the outer end portions of a pair of complementary lever arms 16 are secured to opposite external lower wall portions of the sleeve 12 by pivot studs 17 which are vertically aligned with the pivot bolt 15. The opposite ends of both pairs of lever arms 14 and 16 are pivotally mounted on an axle 18 on which there is mounted fast, between said ends of the lever arms, a locking and wedging roller 19. The latter is preferably formed of a hard rubber or composition.

In the use of the improved well adaptor locking prop the adaptor elements and connections are mounted within the well casing 5 in the manner described in said prior Patent No. 2,841,223. It should be understood that the pipe section 11 of the locking prop is attached to the threaded socket portion 13 of the adaptor fitting 8. To lower the assemblage into the well casing 5 and to manipulate the locking prop a vertical drop pipe 20 may be secured onto the threaded upper end portion of the sleeve 12. In FIG. 2 the locking prop is in its released condition but by moving the sleeve 12 downwardly on the pipe section 12 through the drop pipe 20 or otherwise, the pairs of lever arms 14 and 16 will be caused to jackknife from the open or spread position of FIG. 2 to the closed position of FIG. 1. In moving toward the latter position the roller 19 will come into contact with an inner wall portion of the well casing 5. A sufficient downward pressure applied to the sleeve 12 will cause the

roller 19 to project laterally and to tightly impinge against the inner surface of the wall casing 5, as in FIG. 1. The parts will remain in this position as long as the sleeve 12 is not reciprocated upwardly because the jack-knifed position of the lever arms 14—16 is slightly over center.

When the drop pipe 20 which is temporarily applied is detached, the well is ready for use and the locking prop, which includes the elements 11, 12, 14, 16 and 19 will hold and brace the pipe sections 11 and 12, the fitting 8, and the attached water flow pipe 9 against any lateral deflection or misalignment notwithstanding pressures built up in the fluid system. The locking prop is especially useful in adaptors used in shallow well high pressure installations.

It is obvious that when the installation is to be withdrawn vertically upwardly through the well casing for repairs or inspection, it is merely necessary to reapply the drop pipe 20 to the upper end of the sleeve 12. Then, by pulling upwardly on the drop pipe the sleeve 12 will be caused to telescope upwardly outwardly on the pipe section 12 which will cause the pairs of levers 14—16 to jack-knife to open position removing the roller 19 from its wedging contact with the inner wall of the well casing, as in FIG. 2. All of the parts connected to the adaptor fitting 8 may be withdrawn vertically upwardly through the well casing because the fitting will disengage the inner end of the nipple 10 with which it has a force fit.

The improved locking prop for a pitless well adaptor is associated with the adaptor elements within the well casing in a very simple manner and does not in any way interfere with the normal functioning of the well adaptor nor its appurtenances. A simple reciprocatable movement applied to the sleeve portion of the locking prop is effective to cause locking or unlocking movements of the prop. When the prop is in its locked position it efficiently stabilizes the elements of the well adaptor and is otherwise well adapted for the purposes described.

What is claimed as the invention is:

1. In combination, a well casing, a fluid pipe fitting removably anchored within said well casing, an upright member within the well casing fixed at one end to said fitting, a member telescopically engaging said upright member and extending axially of the casing, an arm pivotally carried at its inner end by said upright member, a second arm pivotally carried at its inner end by said telescoping member, said arms projecting laterally of said upright and telescoping members within the well casing and at an angle to its axis, a pivot member directly pivotally connecting the outer ends of said arms to permit opening and closing movements of said arms upon relative telescopic movement of said upright and telescoping members, and a wedging member mounted on said pivot member adjacent the outer ends of said arms, the arms being of a length to releasably engage the wedging member with an inner wall portion of the well casing when said arms are jack-knifed toward closed position.

2. In combination, a well casing, a fluid pipe fitting removably anchored within said well casing, first and second telescopically associated members within the well casing and extending axially thereof, one of said telescopically associated members being carried by said fitting, a pair of lever arms, a pivot member directly pivotally connecting the lever arms at their outer ends and carrying an engagement element, the inner end of one arm being pivotally connected to the first telescopic member and the inner end of the other arm being pivotally connected to the second telescopic member, said arms projecting laterally of the axis of said well casing and being of a length to jack-knife upon relative telescopic movement of said telescopic members to a position wherein said engagement element is releasably wedged against an inner wall portion of the well casing to stabilize said fitting.

3. In combination, a vertical well casing, a chambered fitting releasably anchored within said well casing, a vertical fluid pipe connected to the lower portion of said fitting, first and second telescopically associated members within the well casing and extending axially thereof, one of which is rigidly carried by the upper portion of said fitting, a pair of lever arms, means directly pivotally connecting said lever arms at their outer ends and carrying a wedging element, the inner end of one arm being pivotally connected to the first telescopic member and the inner end of the other arm being pivotally connected to the second telescopic member, said arms projecting laterally of the axis of said well casing and being of a length to jack-knife upon relative telescopic movement of said telescopic members to releasably project said wedging element into wedging engagement with an inner wall portion of the well casing to stabilize said fitting.

4. In combination, a vertical well casing, a chambered fitting releasably anchored within said well casing and carrying a depending vertically disposed pipe, first and second telescopically associated members within the well casing extending axially thereof over said fitting with one of said members being affixed at its lower end to said fitting, a pair of lever arms, a stud pivotally connecting the outer ends of said lever arms, a roller carried by said stud, the inner end of one arm being pivotally connected to the first telescopic member and the inner end of the other arm being pivotally connected to the second telescopic member, said arms projecting laterally of the axis of said well casing and being of a length to jack-knife toward closed position upon relative telescopic movement of said telescopic members in one direction and releasably wedge said roller against an inner wall portion of the well casing to stabilize said fitting, and to jack-knife toward open position upon a reverse telescopic movement of said telescopic members to withdraw the roller from its contact with the well casing.

5. In combination, a vertical well casing, a chambered, well adaptor fitting removably anchored within said well casing and having a threaded upper end portion, a vertical fluid pipe connected to the lower portion of said fitting, first and second telescopically associated members within the well casing and extending longitudinally thereof, the first of said members having its lower end in threaded engagement with the threaded upper end portion of said fitting and the second of said members extending above said first member, a pair of lever arms, a stud pivotally directly connecting said lever arms together at their outer ends and carrying a wedging member, the inner end of one arm being pivotally connected to the first telescopic member and the inner end of the other arm being pivotally connected to the second telescopic member, said arms projecting laterally of the axis of said well casing and being of a length to jack-knife upon relative telescopic movement of said telescopic members to a position wherein said wedging member engages an inner wall portion of the well casing to stabilize said fitting.

6. In combination, a vertical well casing, a chambered, well adaptor fitting anchored within said well casing and having a threaded upper end portion, a vertical fluid pipe connected to the lower portion of said fitting, first and second telescopically associated members positioned longitudinally within the well casing, the first of said members having its lower end in threaded engagement with the threaded upper end portion of said fitting and the second of said members extending above said first member, and having its upper end formed to rigidly detachably receive an end portion of an elongated tool for the manual reciprocation of one telescopic member relative to the other, a pair of lever arms, a stud directly pivotally connecting the outer ends of said lever arms and carrying a wedging member, the inner end of one arm being pivotally connected to the first telescopic member and the inner end of the other arm being piv-

otally connected to the second telescopic member, said arms projecting laterally of the axis of said well casing and being adapted to jack-knife upon relative telescopic movement of said telescopic members to releasably project said wedging member into engagement with an inner wall portion of the well casing to stabilize said fitting.

7. In combination, a vertical well casing, a chambered fitting anchored within said well casing and carrying a depending vertically disposed pipe, first and second telescopically associated members positioned longitudinally within the well casing over said fitting with one of said members being affixed at its lower end to said fitting, a first pair of lever arms having their inner ends pivotally connected to opposite sides of the first telescopic member, a second pair of lever arms having their inner ends pivotally connected to opposite sides of the second telescopic member, an axle pivotally connecting the outer ends of all of said lever arms, and a roller carried by said axle, said pairs of arms projecting laterally of the axis of said well casing and the pivotal connections for said arms being arranged so that a relative telescopic movement of said telescopic members in one direction will effect an over center relationship to wedgingly engage said roller with an inner side wall portion of the well casing and maintain it in said position while a reverse telescopic movement of said members will disengage said roller from said wall portion of the well casing.

8. In combination, a vertical well casing, a chambered

well adaptor fitting fixed within said well casing, an upright member within the well casing fixed at one end to said fitting and extending thereabove, a member telescopically engaging said upright member, an arm pivotally carried at its inner end by said upright member, a second arm pivotally carried at its inner end by said telescoping member, said arms projecting laterally of said upright and telescoping members within the well casing, a stud directly pivotally connecting the outer ends of said arms to permit opening and closing movements of said arms upon relative telescopic movement of said upright and telescoping members, the pivotal connections for said arms being in off center relationship when said arms are in closed position, and a wedging member mounted on said stud adjacent the outer ends of said arms to releasably engage an inner wall portion of the well casing to serve as a stabilizing prop for said fitting when said arms are jack-knifed toward closed position, the arms and wedging member being maintained in said position by the off-center relationship of the pivotal connections.

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