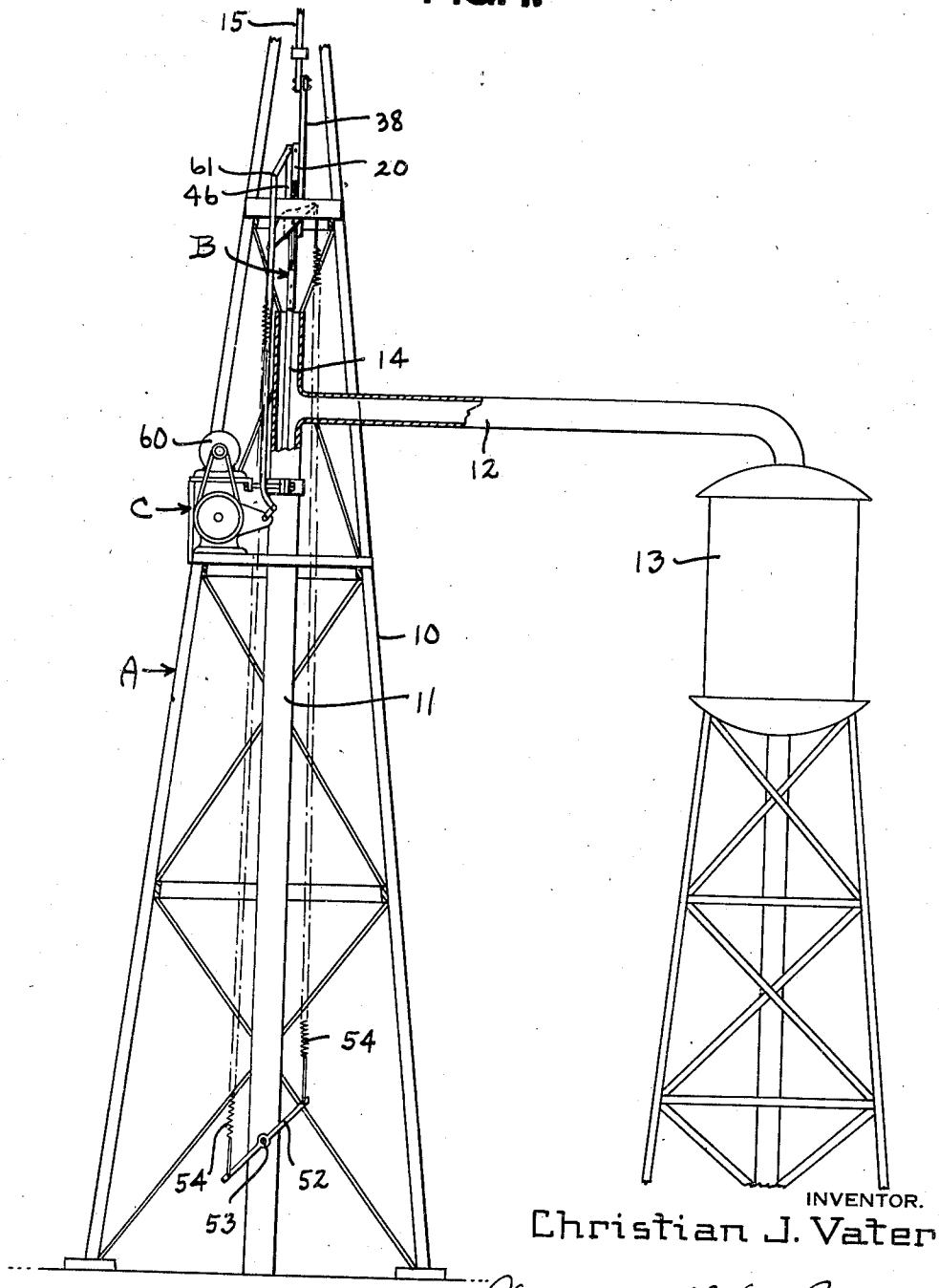
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WINDMILL COUPLER

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FIG. 1.



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FIG. 2.

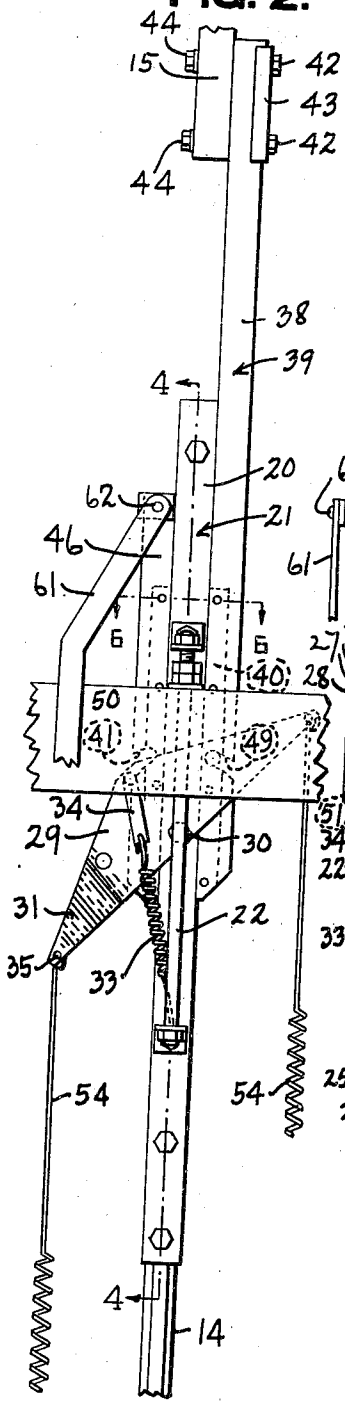


FIG. 3.

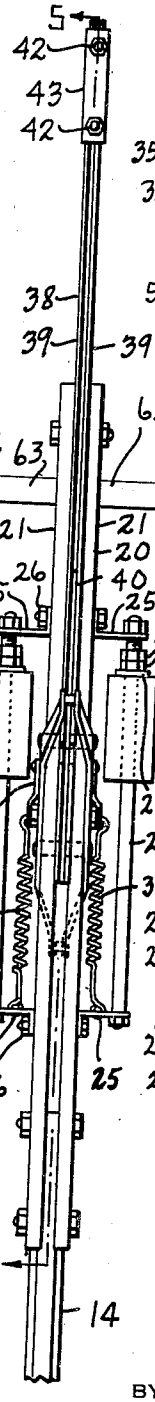


FIG. 6.

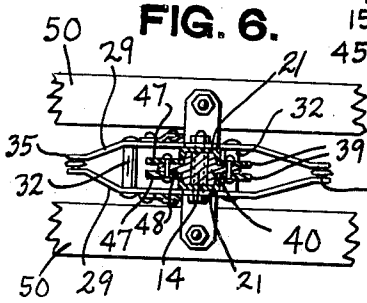


FIG. 5.

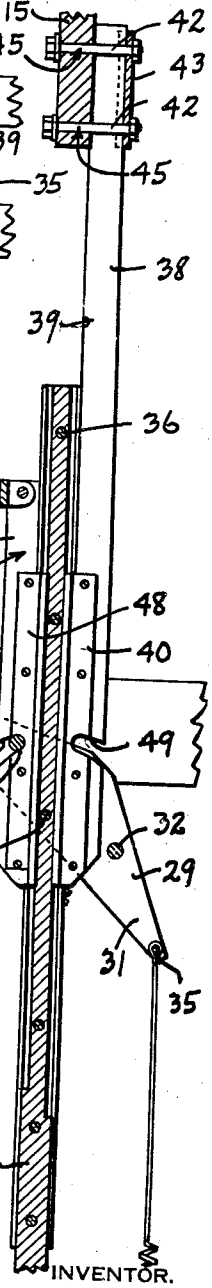


FIG. 4.

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WINDMILL COUPLER

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Application July 5, 1938, Serial No. 217,514

6 Claims. (Cl. 103—207)

This invention relates to selective couplers for windmills and the like, and more particularly to a coupler adapted to connect or disconnect a pump and either one of two means for operating the pump.

As an example, when wind fails to rotate a windwheel of a windmill, it is expedient to operate the pump by employing some auxiliary means, such as an electric motor or other prime mover, but utilizing the same pump rod. This may be accomplished by disconnecting the operative connection between the wind-wheel and the pump rod and operatively connecting the pump rod and the operative connection with the motor, until such a time as the wind will be strong enough to again rotate the wind-wheel, whereupon the operative connection between the motor and pump rod may be disconnected and the pump rod and operative connection with the wind-wheel reconnected.

An important object of this invention is to provide such a selective coupler which will operate to connect and disconnect quickly and positively.

Another important object is to provide a coupler of this kind which will operate so as not to damage the foot valve and other mechanism connected with the pump rod, when the changeover is being made.

Still another important object is to provide a selective coupler which will not be automatically disconnected with the auxiliary means to operate the pump, upon intermittent movement of the wind-wheel and pitman associated therewith.

Another object is to provide a snap-action coupler member mounted directly upon the free end of the pump rod, with members slidably carried by this coupler member for operative connection with the wind-wheel and auxiliary pump-operating means.

Among the other objects of the invention is to provide a coupler for mounting high up in the windmill, but which will not be apt to become damaged nor rendered inoperative by sand, moisture, snow or ice.

Other objects of the invention will be apparent during the course of the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawings:

Figure 1 is an elevation of a conventional windmill with the novel coupler associated therewith.

Figure 2 is an end elevation of the novel coupler, operatively connecting the wind-wheel and pump rod.

Figure 3 is a side elevation of the same.

Figure 4 is a vertical section substantially along the lines 4—4 of Figure 2.

Figure 5 is a vertical section showing the coupler, operatively connecting the pump rod and an auxiliary means for operating the same.

Figure 6 is a horizontal section, substantially upon the lines 6—6 of Figure 2.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views; the letter A may designate the windmill, the letter B, the novel coupler and the letter C an auxiliary means for operating the windmill.

The windmill A is of conventional construction, since the novel coupler B may be associated with any standard windmill, and includes a tower 10, sustaining a well tubing 11, extending into the well and projecting upwardly to communicate with a suitable delivery pipe 12, emptying into a tank or container 13 which is usually high above ground in order to provide some pressure to the pumped fluid, when employed. Extending through this well tubing is a suitable pump rod or sucker rod 14, which protrudes from the upper end of the tubing 11, and has any suitable mechanism such as a conventional foot valve (not shown) at or adjacent its lower end, cooperating in pumping the fluid. Ordinarily, the upper end of the pump rod 14 is operatively connected to the wind-wheel (not shown) by means of a pitman or reciprocating rod 15, by means well known in the art.

As for the novel coupler B, the same includes a main coupler body member 20 preferably comprising a pair of spaced apart portions 21 of channel-iron with the edges of the paralleling sections of one channel iron facing the edges of the paralleling sections of the other.

Carried outwardly by each portion 21 is a guide 22, paralleling a part of the portion 21, as shown particularly in Figures 3 and 4, being spaced from the portion 21 and preferably made up of a rod 23 having screw threads at both ends, and encircled, except at the screw-threaded end, by a sleeve 24. The guide 22 may be supported by suitable brackets 25, secured to the body portion 21 and held in place by nut and bolt assemblies 26. Abutment means at the upper ends of the guide 22 may be provided, just below the upper bracket 25, and comprise lock nuts 27 and a washer 28 for a purpose later detailed.

Pivotally carried by, preferably, each portion 27 is a rocker arm 29, suitably pivoted as at 30, intermediate its ends 31. In the example shown, a pair of rocker arms 29 is provided with two rigid portions 32, which may be cylindrical, bridging the two arms 29 and spaced from the pivot 30 and ends 31.

A suitable means may be provided for assisting in the swinging of the rocker arms 29 and for carrying them past dead centers. In the example shown, this means comprises, for each rocker arm 29, a retraction coil spring 33, suitably secured

at one end to the body portion 21 below the rocker arm 29 and suitably secured at its other end to one end of a link 34, the other end of the link 34 being pivoted as at 35 to the rocker arm directly above the pivot 30.

Preferably adjacent the ends 31 of the rocker arms 29 is suitable means for attaching pull members thereto, the latter to be later described. In the example shown, pins 35 bridge the rocker arms 29 and are secured thereto, thus providing such means.

Means for mounting the coupler body member 20 upon the upper or free end of the pump or sucker rod 14 are provided and may comprise bolts 36 and nuts 37, with the shanks of the bolts 36 extending through the coupler body member 20 and the pump or sucker rod 14, as shown particularly in Figure 4, and in this figure it will be seen that the cross sectional area of the rod 14 has been reduced so that there are a pair of spaces between it and the paralleling portions of each channel iron 21.

Means associated with the novel coupler B and comprising a portion thereof, for operatively coupling the pitman 15 and the pump or sucker rod 14 of the windmill A, comprises a connector body member 38. This member may comprise a pair of spaced apart, flat portions 39 secured together, as by a substantially T-shaped spacer 40, and slidable longitudinally along one face of the main coupler body member 20, disposed as shown particularly in Figures 2 and 5, and with the arms of the T-shaped spacer 40 within the spaces between the channel iron portions 21 and sucker rod 14, as shown particularly in Figure 6. Thus, the connector body member 38 cannot drop away nor separate from the main coupler body member 20 but may slide longitudinally thereof.

Preferably adjacent the lower end of the connector body member 38 is a recess or slot 41 extending inwardly from the outer edges of the flat portions 39 and spacer 40 and forming the arc of a circle, as shown in full lines in Figure 5. This slot 41, of course, is of a size to accommodate one of the rigid cylindrical portions 32 of the rocker arm assembly.

The upper end of the connector body member 38 is provided with means to secure it to the lower or free end of the pitman 15, in a manner similar to the means provided to secure the pitman and pump rod together. This means is shown to comprise a pair of bolts 42 with their shanks extending between (but not through) the spaced-apart flat portions 39 and through a short section of channel iron 43 extending longitudinally of the edges of the flat portions 39 and terminating in suitable nuts 44. The shanks of the bolts 42 also extend thru suitable perforations 45 in the pitman 15, as in Figure 5. By this means, the channel iron 43 may be slid longitudinally of the flat portions 39 so as to adjust the relative positions of the pitman 15 and connector body member 38.

It is now apparent that when the pitman 15 is secured to the connector body member 38, if one of the rigid cylindrical portions 32 of the rocker arm assembly is within the slot 41, there is an operative connection between the windwheel and pump rod 14, which may be broken by rocking the arms 29 so that the cylindrical portion 32 will leave the slot 41, this break being a snap-action, due to the spring 33.

Means associated with the novel coupler B and comprising a portion thereof, operatively coupling the auxiliary means C for operating the pump or sucker rod 14 of the windmill A, comprises a second connector body member 46. This member 46 may comprise a pair of spaced-apart, flat portions 47, secured together, as are the portions 39, by a substantially T-shaped spacer 48, and slidable longitudinally along a face of the main coupler body member 20, opposite the face over which slides the connector body member 38. This member 46 is disposed as shown particularly in Figures 2 and 5, with the arms of the T-shaped spacer 48 within the channel iron portions 21 and contacting the sucker rod 14, as shown particularly in Figure 6. Thus, the connector body member 46 cannot separate from the main coupler body member 20, but may readily slide longitudinally thereof. Preferably adjacent the lower end of the connector body member 46 is a recess or slot 49, substantially like the slot 41, extending inwardly from the outer edges of the flat portions 47, and is so shaped and disposed as to accommodate the other of the rigid cylindrical portions 32 of the rocker arm assembly.

It is now apparent that when the pitman 15 is being disconnected from the connector body member 38, upon shifting of the rocker arms 29, as has been described, one of the rigid cylindrical portions 32 of the rocker arm assembly will ride along the outer faces of the flat portions 47, as the pitman (to be described) of the means C reciprocates, and the portion 32 will enter the slot 49 of the second connector body member 46 and the changeover from windwheel to auxiliary pump rod operating means has been accomplished. This changeover is a quick, snaplike action due to the novel construction employed.

At the upper end of the connector body member 46 may be disposed means to secure it to a suitable portion of the prime mover C, which means and suitable portion will be later described.

An important part of the novel coupler B are a pair of spaced-apart, horizontally-disposed supports 50 extending transversely of the windmill tower 10 and secured thereto in any approved way. Each of these supports 50 is provided with a vertically-disposed perforation 51 slidably accommodating one of the guides 22, for vertical reciprocating of the latter upon movement of the coupler B. These supports 50 are so disposed that when the pump rod 14 has descended, the lowermost lock nuts 27 will be preferably, about $\frac{1}{16}$ of an inch from the upper surface of the supports 50 and so the pump rod cannot drop during the changeover from one pump rod operating means to the other, and therefore will not damage the foot valve and associated parts.

As a means for shifting the rocker arms 29, from a location adjacent the ground, a double armed throw 52 shown in Figure 1, may be pivoted adjacent its ends, as at 53 to the well tubing 11 or the like. Extending from each arm of the throw 52 may be a pull member or connection, such as a coiled wire 54, one connected at its upper end to one pin 35 of the rocker arms 29 and the other connected at its upper end to the other pin 35. Movement of the throw 52 as is now apparent, will shift or rock the rocker arms 29, so that the changeover may be made from the ground, even though the coupler B may be high up in the tower 10.

The auxiliary means C for operating the windmill A, may be any prime mover, such as a con-

ventional electric motor **60** operatively connected, as by suitable pitmans **61**, to the second connector body member **45**. This motor **60** may be elevated, as shown in Figure 1, with the pitmans **61** extending upwardly and pivoted at their free ends, as at **62** to arms **63** extending outwardly from and secured to the second connector body member **45**. Of course, without invention, any other prime mover may be employed as C and it need not be elevated as shown in Figure 1, although the elevated position contributes to safety and decreases the length of the pitman **61**.

From the foregoing, it is apparent that a quick, positive changeover may be made, but that intermittent rotation of the wind-wheel will not break the connection with the means C when the pump rod is operatively connected with the means C.

Various changes may be made to the form of invention therein shown and described, without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In a coupler for selectively operatively connecting a wind-wheel with and disconnecting said wind-wheel from a pump rod, a reciprocating member having a recess, means operatively connecting said reciprocating member with said wind-wheel for reciprocation of said member, a second reciprocating member, slidably connected with said first reciprocating member and slideable longitudinally thereof, means mounting said second member upon said pump rod, and means carried by and rigid with respect to said second member including a rigid portion for coupling said members together against said sliding movement, when said rigid portion enters said recess.

2. In a coupler for selectively operatively connecting a wind-wheel with and disconnecting said wind-wheel from a pump rod, a reciprocating member having a recess, means operatively connecting said reciprocating member with said wind-wheel for reciprocation of said member, a second reciprocating member, slidably connected with said first reciprocating member and slidable longitudinally thereof, means mounting said second member upon said pump rod, and means carried by said second member, including a rocker arm and a rigid portion carried by and rigid with respect to said rocker arm for coupling said members together against said sliding movement, when said rocker arm is rocked so as to cause said rigid portion to enter said recess.

3. In a multiple coupler for windmills for selectively coupling either one of two pump rod operating means with the windmill pump rod, a main body member, means rigidly securing said main body member to said pump rod, two connector body members, separate means slidably connecting said connector body members to said main body member for independent vertical sliding movement thereof, means connecting one of said connector body members with one of said pump rod operating means, means connecting the other of said connector body members with the other of said pump rod operating means, and means selectively coupling either one of said connector body members with said main body member against relative sliding movement, including a rocker arm pivotally carried by said main body member provided with rigid portions, said rigid portions being also rigid with respect to said rocker arm, engaging either one of said connector body members upon pivoting of said rocker arms.

4. In a multiple coupler for windmills for selectively coupling either one of two pump rod operating means with the windmill pump rod, a main body member, means rigidly securing said main body member to said pump rod, two connector body members, separate means slidably connecting said connector body members to said main body member for independent vertical sliding movement thereof, means connecting one of said connector body members with one of said pump rod operating means, means connecting the other of said connector body members with the other of said pump rod operating means, means selectively coupling either one of said connector body members with said main body member against relative sliding movement, including a rocker arm pivotally carried by said main body member provided with rigid portions engaging either one of said connector body members upon pivoting of said rocker arm, and means directly associated with said main body member for limiting descent of said pump rod during pivotal movement of said rocker arm.

5. In a multiple coupler for windmills for selectively coupling either one of two pump rod operating means with the windmill pump rod, a main body member, means rigidly securing said main body member to said pump rod, two connector body members, separate means slidably connecting said connector body members to said main body member for independent vertical sliding movement thereof, means connecting one of said connector body members with one of said pump rod operating means, means connecting the other of said connector body members with the other of said pump rod operating means, means selectively coupling either one of said connector body members with said main body member against relative sliding movement, including a rocker arm pivotally carried by said main body member provided with rigid portions engaging either one of said connector body members upon pivoting of said rocker arm, and means directly associated with said main body member for limiting descent of said pump rod during pivotal movement of said rocker arm, including a support having a perforation, a guide slidable in said perforation, a bracket carried by said main body member and carrying said guide and a stop carried by said guide.

6. In a dual coupler for windmills for selectively coupling either one of two pump rod operating means with the windmill pump rod, a vertically-disposed main body member having a plurality of faces, with a pair of rocker arms pivoted to opposite faces and carrying a pair of rigid portions bridging said arms, means rigidly securing said member to said pump rod, two connector body members, separate means slidably connecting said connector body members to said main body member for independent vertical sliding movement, each along a separate face of said main body member, each of said connector body members having a recess adapted to accommodate said rigid portions, means connecting one of said connector body members with one of said pump rod operating means, means connecting the other of said connector body members with the other of said pump rod operating means, and means to rock said rocker arms so that one of said rigid portions will enter one recess in one connector body member when the other of said rigid portions emerges from said other of said recesses.

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