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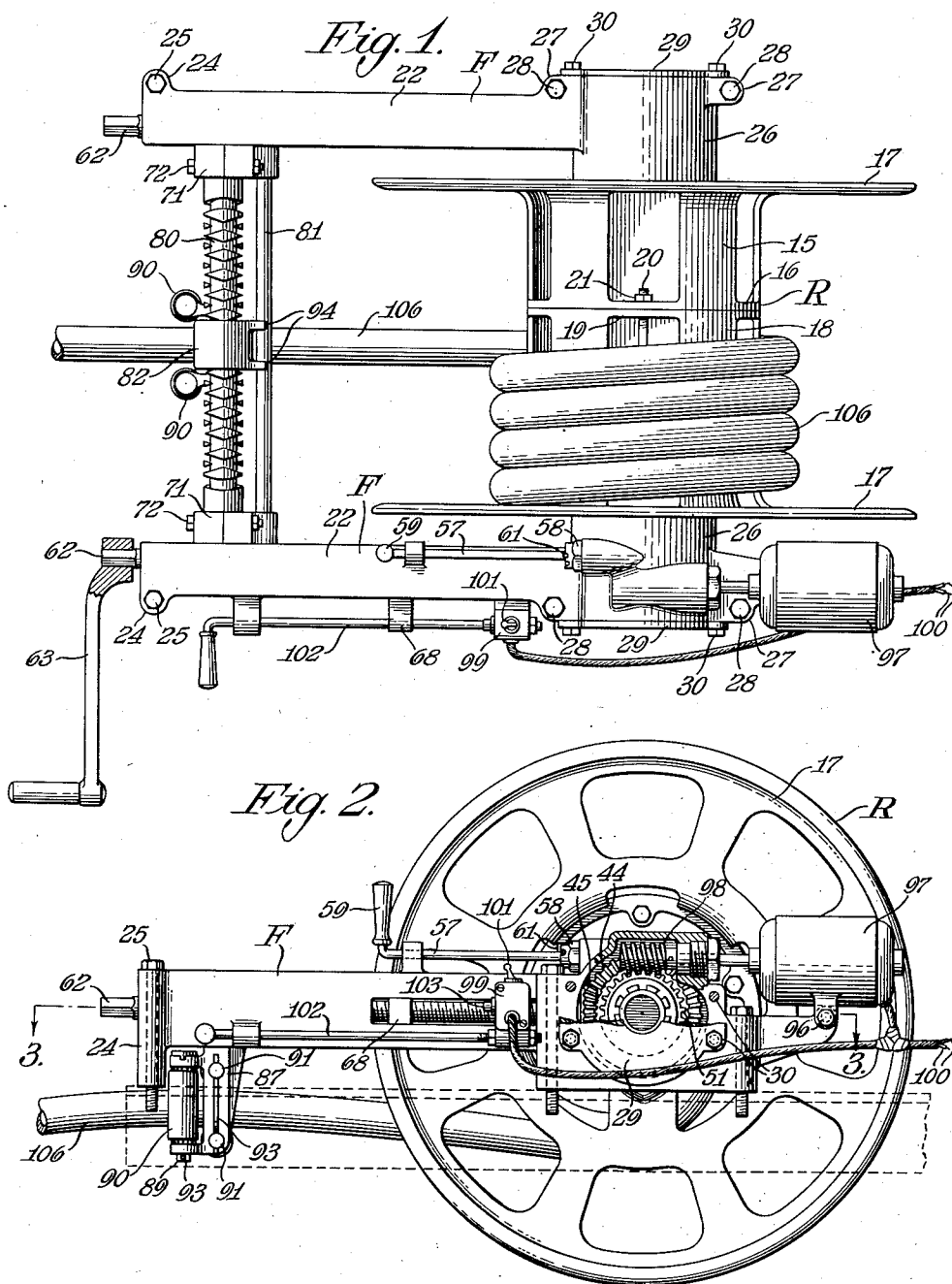
R. J. GEAR

2,301,208

HOSE REEL APPARATUS

Filed May 12, 1941

3 Sheets-Sheet 1



Nov. 10, 1942.

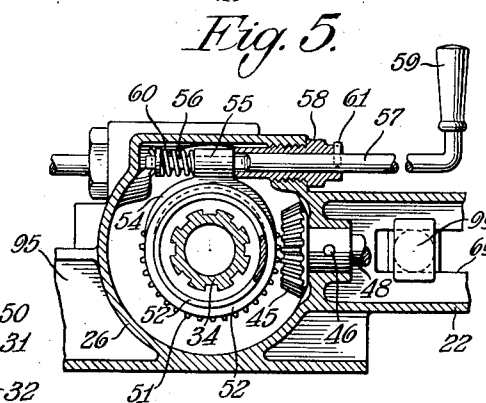
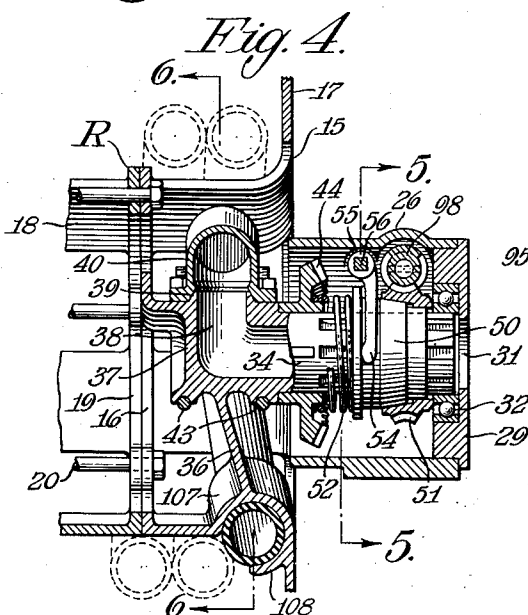
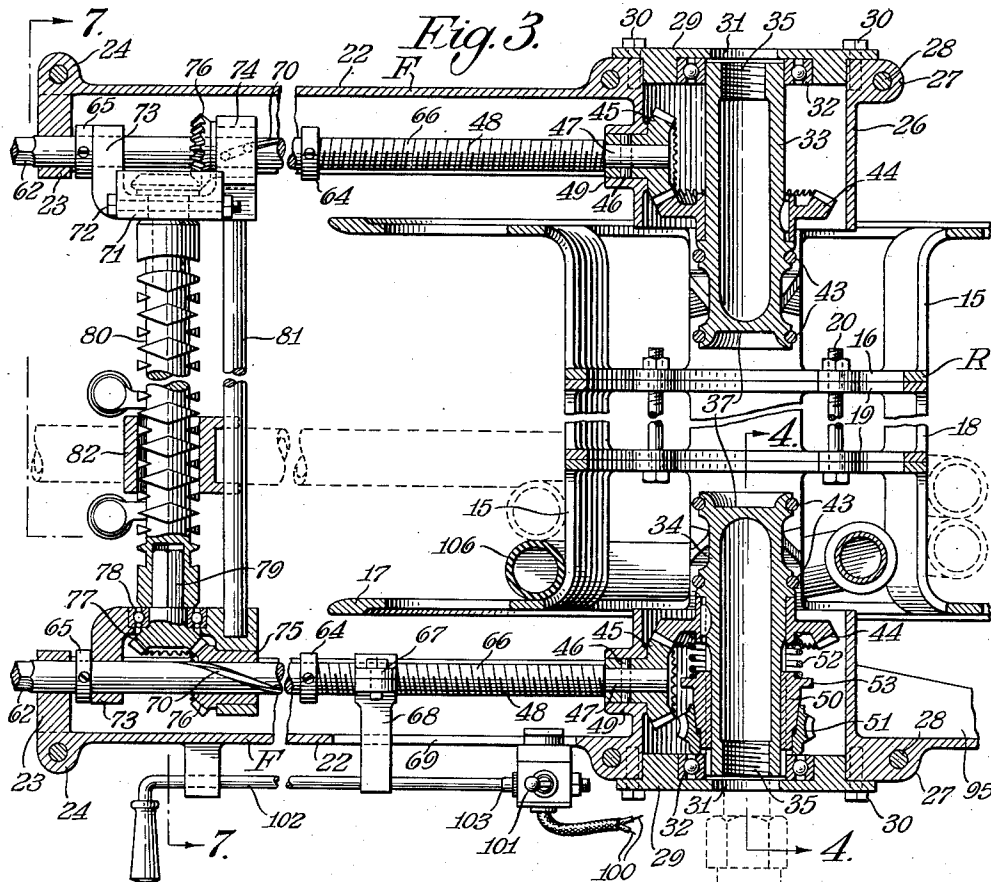
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HOSE REEL APPARATUS

Filed May 12, 1941

3 Sheets-Sheet 2



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HOSE REEL APPARATUS

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Fig. 6.

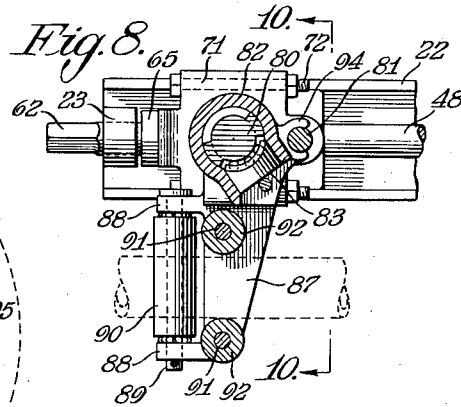
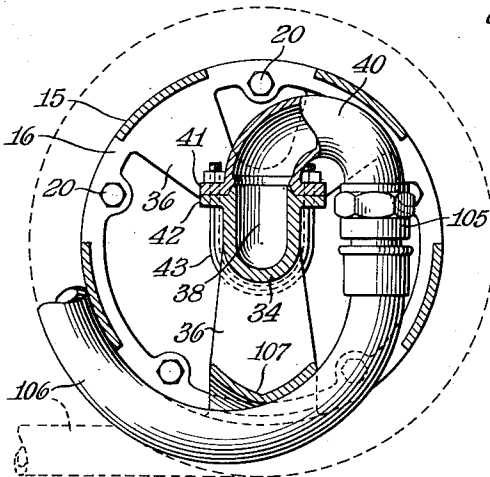


Fig. 9.

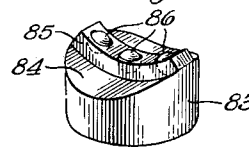


Fig. 7.

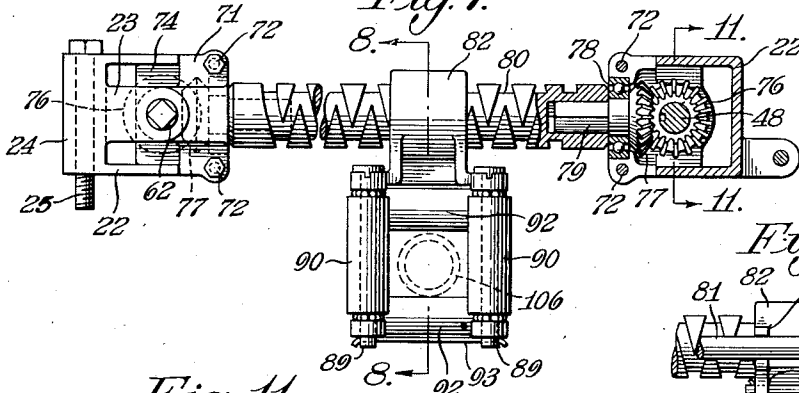


Fig. 11.

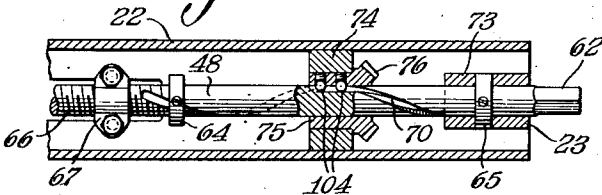
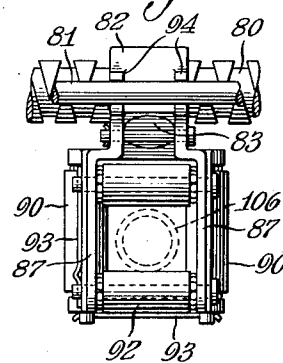


Fig. 10.



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2,301,208

HOSE REEL APPARATUS

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Application May 12, 1941, Serial No. 393,100

4 Claims. (Cl. 242—86)

The present invention relates to improvements in hose reel apparatus and has particular reference to hose reel construction which is particularly adaptable for use on tank vehicles employed in the delivery of fuel oil, gasoline and the like.

An object of the invention is to provide a hose reel apparatus of generally improved design.

Another object of the invention is the provision of a hose reel apparatus which is constructed to enable manual or motor operation.

A further object of the invention is the provision of a hose reel apparatus designed so that the size thereof may be varied to accommodate hose of varying length.

Still another object of the invention is the provision of a hose reel apparatus which may be quickly and easily assembled or disassembled.

A still further object of the invention is the provision of a hose reel apparatus of the aforesaid character which may be mounted for operation in various positions.

Still another object of the invention is the provision of a hose reel apparatus of the above character which is durable in construction and efficient and reliable in operation.

Other objects and advantages of the invention will become apparent as the description progresses.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate corresponding parts throughout:

Figure 1 is a top plan view of the assembled apparatus,

Figure 2 is a side elevational view of the same partly broken away to illustrate interior construction,

Figure 3 is a longitudinal section taken on line 3—3 of Figure 2,

Figure 4 is a fragmentary transverse section taken approximately on line 4—4 of Figure 3,

Figure 5 is a fragmentary detail section taken on line 5—5 of Figure 4,

Figure 6 is a transverse section taken on line 6—6 of Figure 4,

Figure 7 is a transverse section taken on line 7—7 of Figure 3,

Figure 8 is a fragmentary section taken on line 8—8 of Figure 7,

Figure 9 is a detailed perspective view of a bearing member,

Figure 10 is a fragmentary elevational view as viewed from line 10—10 of Figure 8, and

Figure 11 is a fragmentary longitudinal section taken on line 11—11 of Figure 7.

Referring in detail to the drawings, wherein for the purpose of illustration is shown a preferred example of the invention, R generally designates a substantially cylindrical reel composed of complementary end sections 15 each of which embodies a plurality of spaced longitudinally directed ribs formed at the inner end with an inwardly directed flange 16. At the outer end of each section 15 is formed a perforated disk 17. When assembled in reel forming arrangement the end reel sections 15 are attached to an intermediate reel section 18 provided with flanges 19 complementary to the flanges 16. These sections are firmly connected in assembly by rods 20 extended through registering openings in the flanges and releasably secured by nuts 21 threaded on the ends of the rods.

Designed for horizontal mounting at each side of the reel and to project substantially forward thereof are a pair of complementary side frame sections F, each of which embodies a longitudinal channel-shaped bar 22 formed at the forward end with an apertured bearing lug 23 and, exteriorly of the lug, with a vertically extending boss 24 provided with a through bore to accommodate therein a fastening stud 25. At the rear end of each frame section F is formed a cylindrical hub 26 provided with a pair of vertical bosses 27 having through bores designed to accommodate fastening studs 28. In the outer end of each of these hub members is fitted a circular plate 29 fastened to the hub by studs 30 and having a central opening 31. The inner portion of the plate 29 is shaped to form an annular recess in the form of a counterbore relative to the opening 31 to carry therein a ball bearing 32.

As shown to advantage at Figures 1 and 3, the pair of complementary hubs 26 is assembled in transverse alignment and house concentrically therein a pair of aligned tubular shaft sections 33 and 34. Each of these sections is formed with an interiorly threaded opening 35 at the outer end, journaled in the bearing 32, these members extending axially through the hubs and into the end reel sections 15. The inner portions of these sections are integrally secured to the end reel sections by substantially radial webs 36 firmly uniting the shaft sections with the reel. The inner end portion of the sections 33 and 34 is shaped to form an end wall 37 and an angular passage 38 forming an L-shaped passage in conjunction with the main bore, the said angular passage extending radially of the reel and opening at the side of the tubular section, which is formed with a tapered outwardly protruding boss 39 thereat.

Upon the outlet boss of one or both of the tubular members 33 and 34 is fastened an open end of an arcuate U-fitting 40 mounted so that the opposite open end is offset transversely. The end of the fitting 40 attached to the shaft section is formed at opposed sides with flanges 41 adapted to be seated on corresponding flanges 42 at opposed sides of the radial outlet 38. These complementary flanges are provided with registering openings adapted to receive therethrough the threaded end portions of U-shaped fastener rods 43 adapted to be fitted in grooves on the tubular section for tightly mounting the fitting 40 thereon. On each of the tubular sections 33 and 34 is keyed or otherwise fastened a bevel gear 44 mounted to mesh with a bevel pinion 45 secured, by a pin 46, on the rear reduced end 47 of a shaft 48. A hub on the pinion 45 is rotatably mounted within a bearing sleeve 49 formed at the forward wall portion of each hub section 26.

On the tubular member 34 is slidably fitted an annular clutch sleeve 50 formed with inwardly directed keys slidable in grooves provided longitudinally on the exterior of the shaft 34. The exterior of the clutch element 50 is tapered toward the outer end for detachable engagement with the inner tapered portion of an annular worm gear 51. A coil spring 52 sleeved about the inner portion of the section 34 and bearing against a flange 53 on the clutch functions to yieldingly force the clutch outward for frictionally engaging the worm gear 51 with the shaft section. The clutch may be selectively adjusted through the medium of a shifting yoke 54 mounted to span the upper inner portion of the clutch element in coacting relation with the flange 53 thereon. This clutch actuating yoke is formed with a transversely arranged sleeve 55 having a non-circular through bore designed to slidably engage the inner non-circular portion 56 of an operating rod 57 slidable and rotatable in a bearing sleeve 58 and formed at its outer end with a right angular operating handle lever 59. On the inner end of the rod extension 56 is sleeved a coiled compression spring 60 bearing against a washer on the rod so as to yieldingly urge the same to an inward position. On the outer portion of the rod 57 is secured a pin 61 having a radially projecting part engageable with notches on the outer end portion of the bearing sleeve 58 for setting the clutch in desired position.

Each of the shafts 48 is mounted so that the forward end portion is journaled in the bearing lug 23 and is formed with an outwardly projecting extension 62 of non-circular cross section adapted for engagement with a hand crank 63. On the intermediate and forward portions these shafts carry collars 64 and 65 secured in fixed position thereon. Between the collar 64 and the bearing 49 the shaft is externally screw threaded as indicated at 66 and engages a threaded clamp 67 having an arm 68 projecting laterally from the shaft through a slot 69 in each frame section for a purpose which will hereinafter appear. The forward portion of each of these shafts is formed with a spiral groove 70 extending from the collar 64 to a point short of the forward end.

On each of these shafts is slidably mounted a U-shaped bearing bracket 71 preferably composed of divided sections secured in assembly by bolts 72 and having one arm 73 shaped to form a bearing sleeve slidably and rotatably fitted upon the shaft. The opposite rear arm of the bracket is formed with an enlarged sleeve 74 having rotatably fitted therein the cylindrical hub por-

tion 75 of a bevel gear 76, rotatable and slidable upon the shaft 48. The gear 76 of each bracket is disposed to mesh with a bevel gear 77 having a stub shaft journaled in a bearing 78 in the transverse bearing aperture in the body of the bracket, this stub shaft having a square reduced extension 79 slidably fitted into a correspondingly shaped socket at the end of a rotary exteriorly threaded shaft 80. As shown to advantage at Figures 1, 3 and 7, the transverse rotary shaft 80 is externally screw threaded to form both right and left hand threads. Parallel with and rearwardly of the shaft 80 is mounted a guide rod 81 removably fitted in sockets in the complementary end brackets 71.

On the shaft 80 is mounted a sleeve 82 having a smooth interior bore and shaped to removably carry a fitting 83 embodying a disk-shaped body having formed on a concave inner face 84 thereof an arcuate bearing ridge 85. In depressions in this ridge are seated a plurality of, in the present example three, ball guides 86 partially projecting from the ridge to effect connection with the external threads of the shaft 80. The sleeve 82 is formed with depending parallel arms 87, at the top and bottom portions of which are formed forwardly projecting apertured bearing ears 88. In vertically opposed pairs of ears 88 are secured the vertical shafts 89 of a pair of rollers 90. Between the top and bottom portions of the arms 87 are mounted transversely arranged roller shafts 91 adapted to support thereon tubular rollers 92. These roller shafts are detachably held in position by a plurality of resilient locking strips 93. As shown to advantage at Figure 7 this construction provides a rectangular-shaped guide opening having horizontal and vertical marginal rollers providing an efficient hose support. Projecting rearwardly from the sleeve 82, at each end thereof, is a yoke 94 designed to slidably engage the rod 81 to prevent annular displacement of the sleeve and the roller guide structure suspended therefrom.

On a rearwardly projecting bracket 95 of one of the side frame sections F is mounted, by a pivot connection 96, an electric drive motor 97 having a worm 98 secured on the forwardly projecting end portion of its drive shaft, said worm being mounted to mesh with and drive the worm gear 51. In a position in advance of the reel connection with this frame section is mounted a switch box 99 having connected thereto the conductors 100 in circuit with the motor 97 and a battery or other source of electrical current. This switch device is provided, at the top, with a manually operable toggle lever 101 and at its under side with any suitable known switch actuating means operable by an L-shaped operating lever 102. At the front side the switch device is provided with a yieldingly projected switch control button 103 mounted so that it is in circuit closing position when extended and operable by the arm 68 to a retracted circuit opening position.

To the hub portion 75 of each of the drive gears 76 is connected a pair of ball followers 104 projecting inwardly thereof to engage the spiral groove 70 of each shaft 48 for longitudinal movement of the roller guide assembly.

To the outer end of the fitting 40 is securely connected by a suitable union 105, the inner end of a hose 106 trained from its inward position in the reel through a guide channel 107 formed on one of the reel ribs, at an inclination to the rib, and having an exterior lip 108 designed to firmly

grip the hose. This guide structure is shaped so that the inner portion of the hose is directed onto the reel in a gradual spiral, as shown to advantage at Figure 6, and to prevent abrupt curvature or bending thereof.

When the apparatus is mounted on a tank truck or the like the complementary side frame sections F are fastened on suitable base elements by the studs 25 and 28. Assuming that the reel apparatus is to be employed in the arrangement shown at Figures 1 and 2, and the hose is in fully wound position on the reel, suitable extension of the hose may be effected by pulling the same through the suspended guide device or by operation of the mechanism through the medium of the crank 63, depending on the size of the apparatus. To rewind the hose the operator closes the circuit through the motor by turning the operating lever 102 or by movement of the toggle lever 101 of the switch to energize the motor. At such time the clutch lever 57 is positioned so that the spring 52 forces the clutch sleeve 50 into connecting engagement with the worm gear 51 so that the motor drives the reel shaft sections and the reel in a counter-clockwise direction as viewed from Figure 2. Through rotation of the reel shafts the bevel gears 44 and 45 function to rotate the side shafts 48, in opposite directions, which initially act to slide the transverse guide assembly rearwardly of the frame through coaction of the follower elements 104 of the hubs 75 with the spiral grooves 70. When the slidable shaft supporting structure is brought to a position against the collars 64 the shafts 48 rotate the gears 76 and, through the medium of the complementary gears 77, actuate the externally threaded shaft 80. This shaft causes the depending guide structure to slide back and forth in a transversely reciprocating movement in timed relation with the revolution of the reel so as to automatically guide the hose in proper winding convolutions on the reel R. During such winding operation one of the shafts 48 causes rearward sliding movement of the arm 68 which, upon completion of the winding operation, contacts and depresses the switch button 103 to automatically open the circuit and stop the operative movement of the actuating mechanism. Reverse movement of the actuating mechanism effects forward adjustment of the guide structure and similar transverse movement of the guide device.

In as much as the apparatus is particularly adapted for use upon oil carrying tank vehicles and such vehicles usually carry manifold valves and meter equipment below the apparatus it is advantageous to provide for inward and outward sliding movement of the guide carrying transverse shaft 80. Thus, when the hose is extended the guide shaft is moved radially from the reel in order that the depending outer loop portion of the hose is held clear of the valve and meter equipment therebelow and, during winding of the hose, the guide support shaft is held outwardly until the winding operation is nearly completed when it is released and is moved radially inward with reference to the axis of the reel while the operator engages and supports the hose end connection fitting to prevent undue vibration thereof. This retraction of the transverse side supporting shaft enables support of the hose so that the fitting on the outer end is held in a position within the compass of the frame so as to obviate objectional extension or projection of the hose fitting.

It is to be noted that the winding operation, as well as the unwinding of the hose, may be effected manually by crank rotation of either of the longitudinally extending shafts 48 if so desired or if a motor is not provided. Furthermore, it will be readily apparent that the device may be transposed or turned in reverse upside down position to effect an overwinding operation of the hose in contradistinction to the underwinding shown in the drawings and that parts may be interchanged to widen the apparatus for accommodating varying lengths of hose. Such enlargement would require the replacement of the center reel section 18, the guide actuating shaft 80 and the guide rod 81 by elements of increased length, if the modification is to be made with a view to accommodating a hose of greater length.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In hose reel apparatus of the character described, a pair of longitudinal side frame sections having transversely aligned hubs at their rear ends, a reel having a plurality of transversely divided detachably connected sections mounted between the frame sections, a pair of tubular shaft sections attached to the reel and projecting axially therefrom, a longitudinally extending shaft journaled in each frame section, drive gearing connecting the said longitudinal shafts with the tubular shaft sections, a pair of complementary brackets mounted to slide axially on the said longitudinal shafts, a guide support shaft journaled transversely on the said brackets, a roller carrying guide device mounted on the transverse support shaft and movable axially thereon in reverse directions during rotation of the shaft, gear mechanism for rotating the transverse support shaft through the medium of the longitudinal shafts, and means for driving the shafts and gearing connections for simultaneously rotating the guide support shaft with the reel shaft sections.

2. In hose reel apparatus of the character described, a pair of longitudinal side frame sections having transversely aligned hubs at their rear ends, a reel having a plurality of transversely divided detachably connected sections mounted between the frame sections, a pair of tubular shaft sections attached to the reel and projecting axially therefrom, a longitudinally extending shaft journaled in each frame section, drive gearing connecting the said longitudinal shafts with the tubular shaft sections, a pair of complementary brackets mounted to slide axially on the said longitudinal shafts, a guide support shaft journaled on the said brackets arranged transversely of the frame sections, a roller guide device mounted on the transverse support shaft adapted to slide axially thereon in reverse directions during rotation of the shaft, gear mechanism for rotating the transverse support shaft through the medium of the longitudinal shafts, an electric motor, worm gear mechanism having driving connection with the said motor, and a selectively operable clutch for releasably connecting the worm gear mechanism with one of the tubular shaft sections.

3. In hose reel apparatus comprising a pair

of complementary support frame sections, a hose winding reel rotatably journaled on the frame sections in transversely extending position, a longitudinally extending drive shaft journaled in each frame section, gearing connecting one end of each longitudinal drive shaft with an end portion of the reel, a pair of brackets mounted to slide axially on the said longitudinal shafts, a guide support shaft journaled on the said brackets and extending transversely of the frame section in a position spaced longitudinally from the axis of the reel, gear mechanism for effecting drive connection between the longitudinal shafts and the transverse shaft and a hose guide device mounted on the said transverse shaft and

movable axially thereon in reverse direction upon rotation of the shaft.

5 4. In apparatus of the character described, a support frame, a reel rotatably mounted on the said frame, a radially disposed shaft mounted at each side of the reel, a bracket mounted for limited sliding movement on each radial shaft, a transversely disposed guide carrying shaft journaled in the said brackets, mechanism for rotating the said radial shafts with the reel, and means driven by the said radial shafts operable to move the transverse shaft radially of the reel and to effect rotation of the transverse shaft during rotation of the reel.

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