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Courtright

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[45] **Nov. 19, 1974**

[54] **WINCH-DRIVEN IRRIGATION APPARATUS**

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[52] **U.S. Cl.** **239/189,** 239/191

[51] **Int. Cl.** **B05b 3/18**

[58] **Field of Search** ..... 239/188–191; 242/86.5 R, 86.64

[56] **References Cited**

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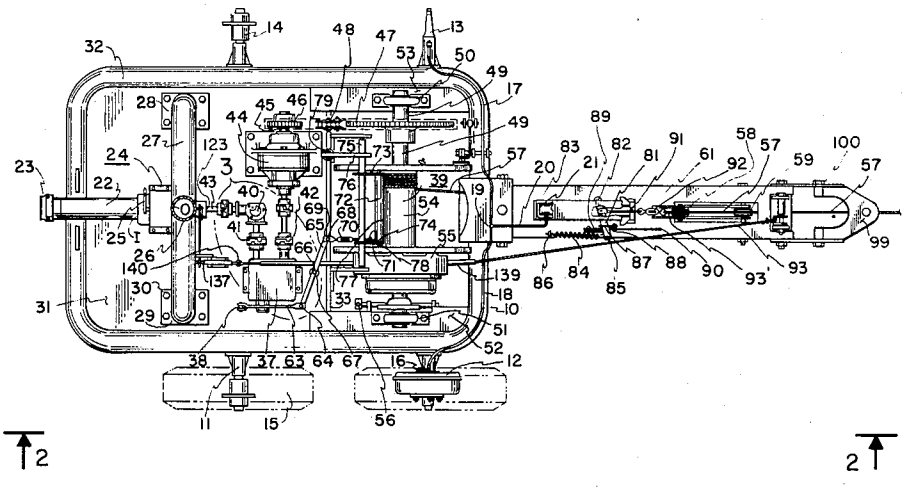
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Primary Examiner—M. Henson Wood, Jr.
Assistant Examiner—John J. Love

[57] **ABSTRACT**

Improved, winch-driven irrigation apparatus wherein the subject vehicle includes a hose coupling and converter means connected thereto for supplying revolving mechanical power and also for conducting water to a delivery system such as a revolving, irrigation sprinkler head. A water-pressure-to-revolving-output-shaft drive is effected through use of a fluid motor, preferably of the self-contained turbine type. The subject apparatus comprises a vehicle having a winch drum mechanically coupled to such output drive. Means are provided for automatically and progressively varying the drive speed for the winch such that the vehicle moves at a uniform speed regardless of the amount of cable that exists at any one time on the winch. Means are likewise provided for applying wheel brakes during times of winch cable slack and at water turn-on, and likewise, of braking the output mechanical drive of such converter at the end of a run. Clutch and speed control means are used.

10 Claims, 7 Drawing Figures



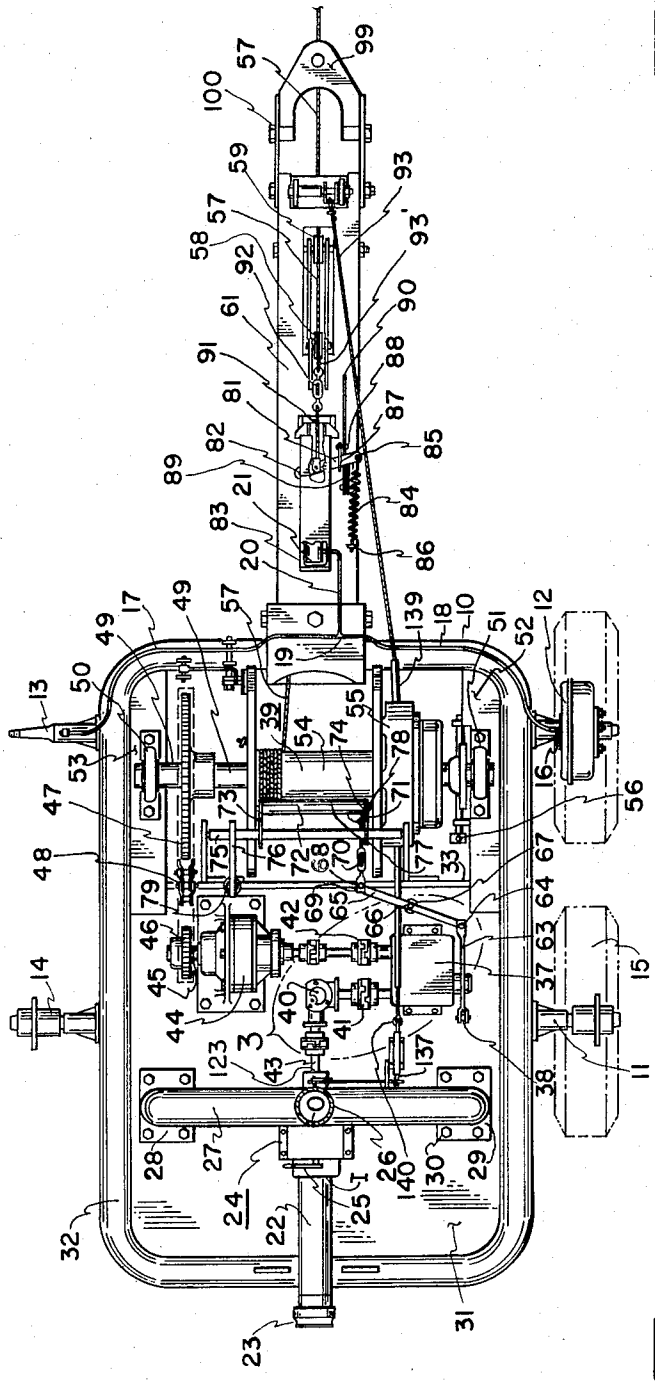


FIG. 1

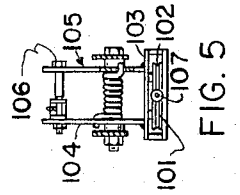


FIG. 5

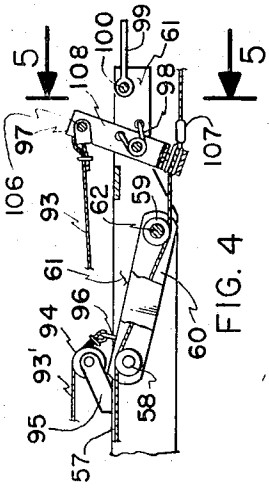


FIG. 4

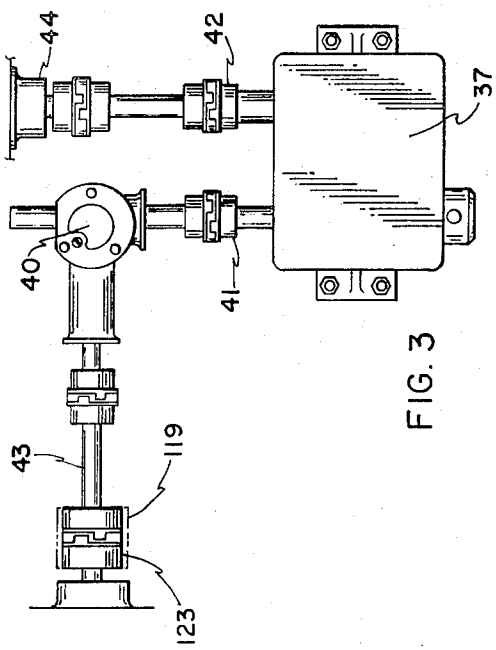


FIG. 3

FIG. 2

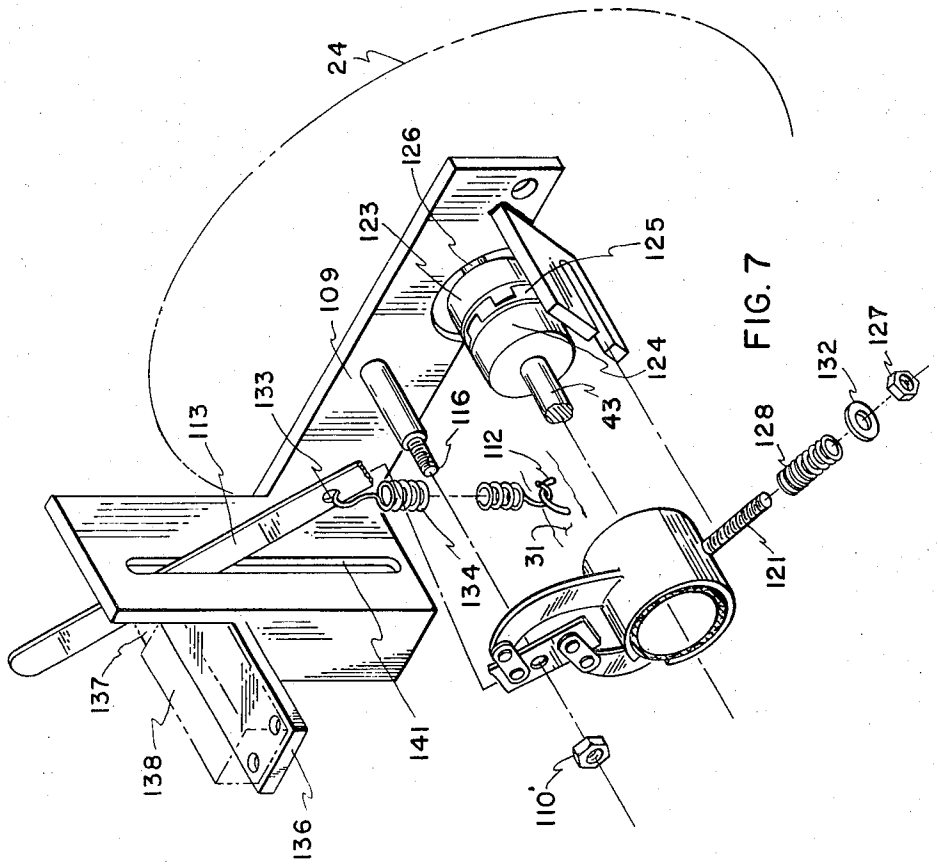

24
126
123
125
109
124
43
133
113
116
112
132
127
128
31
134
121
137
141
138
136
110'

FIG. 7

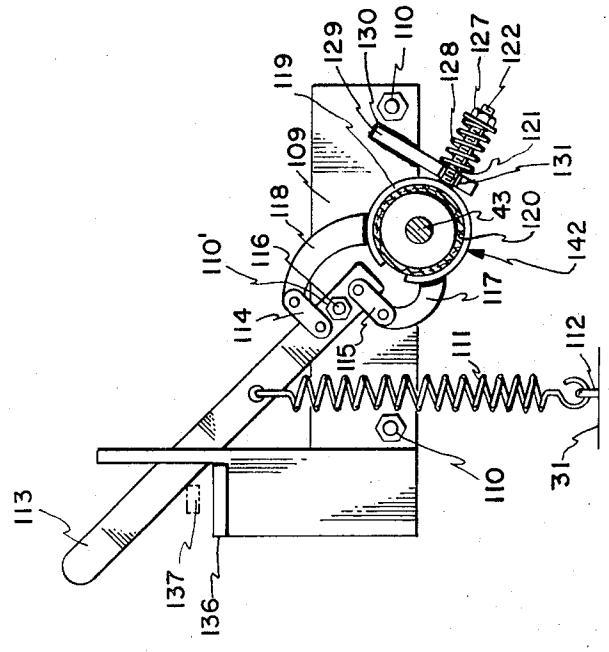

110
129
130
119
128
127
122
109
121
131
118
43
120
110'
116
142
117
114
115
111
112
110
113
31
137
136

FIG. 6

WINCH-DRIVEN IRRIGATION APPARATUS

The present invention relates to field irrigation vehicles incorporating a self-contained winch drive and, more particularly, to a new and improved irrigation apparatus incorporating a speed control and transmission between the water turbine of the unit and the winch drum which the transmission drives. Various features are utilized for automatically stopping the unit at the end of its run. Automatic adjustment of the speed of revolvement of the winch is effected to compensate for varying effective diameters of the winch as cable is wound thereon.

The application of brakes to the wheels of the unit is caused to exist whenever there is slack, i.e., lack of predetermined tension in the winch cable. This precludes "cats paw" or snarling of the cable. This feature of the invention is particularly useful at the time at which water pressure is applied since, in the absence of the application of wheel brakes, the unit under water pressure might shoot forward several feet. Hence, the brakes are designed to be automatically applied prior to and at the application of water pressure and also at any time whenever there is slack in the winch cable, this so as to keep the cable taut and to preclude snarling thereof.

The automatical mechanical braking of the output drive of the turbine or fluid motor is effective to stop the drive of the winch and hence stop the forward movement of the unit, without altering the units ability to continue its water application.

The brakes themselves are constructed to have a mechanical release, this for easy transport of the unit.

Accordingly, a principal object of the present invention is to provide new and improved, creeper-type apparatus for irrigating agricultural fields.

A further object is to provide an improved irrigation vehicle having a winch drive whereby the revolving winch, in wrapping forwardly upon a fixed cable, operates to pull the unit forwardly at a uniform speed toward the anchor-end of such cable.

An additional object is to provide agricultural irrigation apparatus with wheels and with brakes applied to the wheels prior to and at the application of water pressure to the unit.

A further object is to provide wheel braking means for a unit of the type described wherein brakes are automatically applied at any time when there exists slack in the winch cable.

An additional object is to provide compensating means for insuring uniformity of apparatus travel despite variation in effective diameter of the winch, owing to cable being progressively wound thereupon.

A further object is to provide means for automatically braking the output mechanical drive of the turbine employed, this so as to stop the mechanical drive coupled to the winch.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings in which:

FIG. 1 is a top plan of irrigation apparatus constructed in accordance with the principles of the present invention and represents a preferred embodiment thereof.

FIG. 2 is a side elevation of the structure shown in FIG. 1 and is taken along the line 2—2.

FIG. 3 is an enlarged detail taken along the arcuate line 3 in FIG. 1.

FIG. 4 is an enlarged detail and represents an elevation of the forward structure in FIG. 2, where a cable stop abutment has actuated the apparatus so as to brake the output drive of the water turbine.

FIG. 5 is a detail taken along the line 5—5 of FIG. 4.

FIG. 6 is an enlarged elevation of the braking portion of the structure relative to the output drive of the water turbine and is taken along the line 6—6 of FIG. 2.

FIG. 7 is an enlarged, exploded, perspective view of the structure of FIG. 6 illustrating the manner and structure of assembly thereof.

In FIG. 1 the frame 10 is shown to be provided with standard axle units 11–14 having the customary wheels 15 as indicated in phantom lines. Axle units 12 and 13 are each provided with hydraulically actuated braking structure 16 that is respectively supplied braking fluid via conduits 17 and 18. Conduits 17 and 18 lead to a T-connection of the leg of which is supplied conduit 20. Conduit 20 is connected to hydraulic cylinder 21 shown in FIGS. 1 and 2. Rearwardly oriented conduit 22 is provided with a hose fitting 23, suitable for receiving the clamping end of a water pressure hose to be attached thereto. Conduit 22 is connected directly to a manually variable fluid motor 24 such as the Berkeley water motor manufactured by the Berkeley Corporation of Berkeley, Calif. The same includes inlet I, outlet O, and a revolving, mechanical output drive at 123. Self-contained in fluid motor 24 is a handle 25 which actuates an integral bypass control valve. The valve is operable in the usual manner for shunting a portion of the water input past the turbine contained in the fluid motor 24. All of the output from the water turbine proceeds upwardly through upstanding conduit 26, the latter being coupled or directly connected to fluid motor 24. Inverted, U-configured bracing 27 includes flanges 28 and 29 which are bolted by bolts 30 to decking web 31. The decking web 31 may be welded or otherwise secured to the tubular framing 32 and will proceed to line 33 in FIG. 1.

Upstanding conduit 26 in connected via flanges 34 and 35 to rotating water delivery spray unit 36 which may be of conventional design and which is known in the art as a "water gun." The details and construction of the water delivery system such as at 36 is conventional and need not be described. Variable speed drive unit 37 is conventional and may comprise what is known in the art as a zero-max variable speed drive, the same incorporating a control handle 38, the actuation of which will vary the gear reduction and hence the speed of revolvement of the winch 39, the construction of which will be later described. In any event, right angle gear drive 40 and mechanical coupling units 41 and 42 are provided to connect the output shaft 43 of fluid motor 24 to transmission 44. Transmission 44 may comprise simply a large, gear reduction mechanism including output shaft 45 to which drive gear 46 is connected. Drive gear 46 may comprise a sprocket gear coupled to sprocket gear 47 by means of endless sprocket chain 48. Sprocket gear 47 is keyed to shaft

49, and the latter is journaled by bearings 50 and 51 to plates 52 and 53 of the frame 32.

Winch 39 includes a winch drum 54 that is coupled for rotation to shaft 49. This coupling may be via clutch 55 that can be provided, including actuating handle 56 for selectively engaging and disengaging the clutch unit relative to winch drum 54. Cable 57 is wrapped around the winch drum and is secured thereto at one end. Cable 57 proceeds forwardly, see FIG. 4, to a position over idler pulleys 58 and 59 which are journaled to pulley lever 16, the latter being pivoted to tongue 61 of the frame by pivot pin 62.

Connected to handle 38 is a link arm 63 which is pivoted at 64 to lever 65. Lever 65 is fulcrumed by pin 66 to an upstanding post 67. Post 67 is secured in an upstanding manner to the web 31 of the vehicle frame.

The opposite end 68 of lever 65 is connected by link 69 to turn buckle connector 70. This latter is coupled to arm pivot 71 associated with sensing roller 72. Sensing roller 72 includes a pair of arms 73 and 74 which are welded to shaft 75. To shaft 75 is welded a bell crank arm 76. Roller 72 includes a shaft 78, and the roller abuts the looped turns of cable 57. Spring 79 holds arm 76 downwardly, being anchored to web 31.

In operation, the winch drum 54, the drive for which will be later explained, includes the sensing roller 72 in the structure as shown such that as the cable 57 wraps around the winch drum and the over-all diameter of winch drum 54, having drum surface 77, becomes larger, sensing roller 72 will proceed outwardly so as to rotate shaft 75 and draw arm 76 upwardly under the force of restoring spring 79. As previously pointed out, spring 79 will be fastened to the web 31 in any usual manner. Turnbuckle unit 70, in being connected to arm 71, will force lever end 69 in a direction to the left relative to FIG. 1 so as to revolve lever 65 in a counterclockwise rotational movement. This in turn tends to pull elongate linked member 63 forwardly so as to actuate arm 38 in FIG. 2 and thereby slow down the speed of unit 37. In this way the speed forward of the unit may be made constant even though the effective diameter of the winch drum is progressively enlarged, through the wrapping of the cable 57 thereon, as the unit progresses in a direction to the right.

In returning now to the consideration of the actual drive of the winch drum, the drive is supplied by water pressure and passage of water through fluid motor 24. Again, the output torque of the internal rotor of the fluid motor may be controlled by varying the amount of fluid shunted across the rotor or turbine by virtue of the actuation of bypass valve handle 25. Of course, all of the water will proceed upwardly out of the upstanding pipe 26 to the water delivery system 36 in FIG. 2.

At the end of a run, and also at the very beginning, it will be desired for brakes to be applied to the unit. This structure will now be described.

It has been before mentioned that hydraulic conduit 20 leads to the master cylinder 21 shown in FIGS. 1 and 2. The forward end of this hydraulic master cylinder includes a rubber extension 80 having annular, accordion-like creases in the usual manner. A lever 81 is pivoted at 82 to torque 61 or, alternatively, the cover assembly 83. A spring 84 is used as a tension spring to urge rearwardly the end 85 of lever 81. Tension spring 84 is anchored at 86 to the tongue as shown in FIG. 1.

A latch 87 is pivoted at 88 to member 89, and is actuated by handle 90 for selective release of the lever. This structure may likewise be anchored to the frame in a conventional manner. At this point it is important to note that connector 91 is secured to lever 81 and, by turnbuckle adjustment means 92 is directly connected to elongate member 93'. In FIG. 2 it is seen that this elongate member proceeds over idler pulley 94, mounted by bracket 95 to tongue 61. An inverted U-configured member 96 is connected to pivoted lever member 60 and serves as an anchor for elongate member 93.

Control lever 97 is provided with a torsion spring mount 98 connecting the same to bifurcated tongue 61. A U-configured towing member 99 is pivoted at 100 to the tongue and may be used for towing purposes. A pair of sheaves 101 and 102 are journaled for revolving in a horizontal plane within box 103. Box 103 is welded to the lower extremities of levers 104 and 105. These latter may be retained together at pivot anchor 106 which anchors the cable 93 in the manner shown in FIGS. 4 and 5. The cable itself has a stop above it, 107, which, when engaged in the sheaves, as illustrated in FIG. 4, serves to rotate the composite lever unit 108 in a clockwise direction as seen in FIG. 4. This action serves to reduce the tension upon cable 57, thereby permitting member 60 to pivot upwardly relative to its left-hand edge so as to release the tension applied to cable 93. Here again, cable 93 and cable 91 are made integral by turnbuckle adjustment 92, and the entire length of this composite structure serves to release the force to the right upon lever 81, thereby allowing lever 81 to be pulled in a direction to the left under the pressure tension spring 84. This operates to compress the rubber forward extremity 80 of the hydraulic cylinder and thereby applies the brakes at front wheel axles 13 and 16. This is the manner in which the brakes are applied at the end of the run so as to stop the unit, whether the same is running on flat or sloping terrain. Also, these brakes are set upon the initial application of water measure, to keep the unit from "jumping" forwardly when water pressure is initially turned on.

A further, automatic stopping apparatus is disclosed in the drawings and incorporates bracket 109 which is mounted to the fluid motor 24 by means of stud and nut attachments 110. The spring 111 is anchored by retainer means 112 to the web 31 of the unit. A lever 113 includes links 114 and 115 pivoted thereto as indicated in FIG. 6. Lever 113 itself is pivoted by stud and nut attachment means 116, 110° to the bracket 109. Arcuate arms 117 and 118 are welded to the opposite extremities of spring steel clamping member 119. Clamping member 119 forms a portion of a brake including a fiber or other type of shoe 120 engaging the outer surface 123 of one half 124 of coupling unit 125 integral with or affixed to the output shaft 126 of fluid motor 24. Clamping member 119 includes a threaded elongate portion 121 which is threaded at 122 to receive nut 27 backing spring 128. Element 129 is welded at 130 and includes slot 131 for receiving portion 121. Washer 132 may be provided if desired.

As to lever 113, the same includes an aperture 133 receiving spring 134. The latter is retained by retainer 135 to web 31.

Mounted to horizontal flange 136 of bracket 109 is a latch 138 having a spring-loaded latch element 137. The same is shown in phantom lines in FIG. 6 and is

seen indicated to operate so as to retain the lever **113** upwardly in the position shown in FIG. **6,** in the absence of the withdrawal force being applied to latch element **137.** In FIG. **1** and **4** cable **93** is shown to proceed forwardly through conduit guide **139** and connect to the spring loaded latch **137** at engagement point **140.**

Accordingly it is seen that as soon as the stop abutment **107** pushes the lower end of unit **108** forwardly, then there will automatically be applied a force of tension to cable **93** so as to withdraw the spring loaded latch, and thus allow the lever **133** to fall within slot **141.** When this happens, there is an immediate constriction of the brake structure at **142** so as to compress the brake about the shaft or coupling structure associated with the fluid motor. Hence, the output shaft is precluded from revolvement, thereby positively stopping the revolvement of winch drum **54.**

In summary as to operation, an agricultural water supply hose will be coupled to hose fitting **23** of conduit **22** in FIG. **1.** Handle **25** will be adjusted so that a preselected amount of water may be shunted across the interior water turbine of standard fluid motor **24.** For maximum torque, of course, there will be no water shunted across the rotor, this so that all of the input water pressure may be employed to drive the rotor for supplying maximum torque. In any event, all of the water passing through the fluid motor **24** is directed upwardly to conduit **26** coupled to the water output thereof, so that such water is routed to the water delivery system at **36** in FIG. **2.**

The irrigation unit of FIG. **1** is self-propelled in a sense that a winch drum **54** is provided, with winch cable **57** being wrapped therearound and progressing forwardly in the manner indicated in FIGS. **1, 2** and **4.** The forward end of cable **57** includes stop abutment **107** that may take the form of an enlarged cylindrical tube that is crimped onto the cable. The forward end of the cable will be tied or anchored to a stake S, or some other anchoring object, such that the unit can pull itself toward the stake by virtue of the revolving winch drum **54** winding itself upon cable **57.**

At the end of the run abutment **107** contacts the pair of sheaves **101** and **102** in FIG. **5** so as to urge the sheave box **103** rearwardly in the manner as seen in FIGS. **4** and **5.**

Upon such occurrence as immediately above described, cable **93** becomes tensioned, see FIG. **4,** since coupler **97** is moved to the right. The tensioning of cable **93,** see FIG. **1,** operates to pull spring-biased latch element **138** rearwardly, causing a release of lever **113** so that the same can pivot downwardly and hence, under the pressure of spring **111,** tighten clamping member **119** of brake **142** about surface **123,** this so as to stop the rotor or output shaft of the fluid motor from turning.

The impingement of stop abutment **107** against the sheaves **101** and **102** also produces a slack in cable **107** to the rear or left in FIG. **4** of stop abutment **107** so that the pulley lever unit **60** pivots upwardly, that is in a clockwise direction relative to pivot **62.** This action in turn produces slack in cable **93',** and such action releases lever **81** so that the same can be pulled by tension spring **84** so as to apply pressure to the accordion extension of brake cylinder **21** and hence apply brakes to the front wheel axles at **12** and **13.**

It is to be noted that, without more, the speed of the unit would be increased as the cable roll wrapping about winch drum **54** progressively increases the over-all diameter of the winch drum plus cable as the unit progresses across the field. Since each successive revolvement would tend to progressively increase the amount of cable **57** being wrapped around the drum, then the over-all speed of the vehicle would increase as the unit progresses. So that uniform irrigation may be achieved, the roller **17** and associated structures are provided so as to sense the over-all diameter of the winch drum plus cable such that as the cable progressively winds upon the winch drum in succeeding turns, the roller, through lever **65** and link arms **63** in associated structure may control the setting of variable speed zero-max unit **37.** Accordingly, the increasing diameter of the winch drum can be compensated for, so that the unit may progress at a uniform velocity regardless of the amount of cable that has been wound upon the winch drum **54.**

Of course, the clutch mechanism of standard design may be controlled by lever **56.** The drive from the fluid motor is positive and proceeds through couplers **41** and **42,** L-gear drive **40,** transmission **44,** and sprocket chain **46, 47** and **48.**

It is thus seen that the instantaneous water pressure surge which occurs at the inlet of convertor **24,** as results when the water supply of the hose (not shown) is turned on, is precluded from rapidly propelling or "shooting" the machine forwardly, this by virtue of the application of brakes, via hydraulic conduit **20,** which results as a consequence of initial slack in winch cable **57.** The impeller or rotor of converter **24,** however, does operate to drive winch drum **54** which serves to tension the winch cable **57** and hence remove brake application. The vehicle thus runs forwardly at a constant speed until the end of the run, see FIG. **4,** is reached, at which point slack again reappears in winch cable **57,** so that the wheel brakes are reapplied; in addition, the tension at this point relative to cable **93** in FIG. **4** operates to withdraw the latch element such that lever **113** falls downwardly under the pressure of spring **111** so as to apply a friction brake to the output drive of the converter or turbine at **24.**

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention at its broader aspects and, therefore, the aim in the appended claims is to cover all such modifications as fall within the true spirit and scope of the present invention.

I claim:

1. Agricultural irrigation apparatus comprising a horizontal frame provided with supporting wheels; an erect, water delivery structure mounted to said frame and having a fluid input; a drive line including a speed-reduction transmission having input and output drives; a water-pressure-to-revolving-mechanical-power converter having water inlet structure constructed for coupling to an external water-carrying hose, a revolving output drive coupled to said transmission input drive, and a fluid outlet coupled to said fluid input of said water delivery structure; a winch drum journaled to said frame and having an input drive coupled to said output drive of said transmission; a winch cable having an inner end wound upon said winch drum and an

outer end constructed for extension forwardly of said frame to be anchored to the external object; a stop abutment disposed upon said cable proximate said outer end thereof; and means mounted to said frame and responsive to the contact with said means of said stop abutment, for simultaneously braking said wheels and also braking said revolving output drive of said converter.

2. Agricultural irrigation apparatus comprising a horizontal, wheel-carrying frame; an erect, water delivery structure mounted to said frame and having a fluid input; a drive line including a speed-reduction transmission having input and output drives; a water-pressure-to-revolving mechanical-power converter having water inlet structure constructed for coupling to an external water-carrying hose, a revolving output drive coupled to said transmission input drive, and a fluid outlet coupled to said fluid input of said water delivery structure; a winch drum journaled to said frame and having an input drive coupled to said output drive of said transmission; a winch cable having a inner end wound upon said winch drum and an outer end constructed for extension forwardly of said frame to be anchored to an external object; a stop abutment disposed upon said cable proximate said outer end thereof; and means mounted to said frame and responsive to the contact with said means of said stop abutment, for braking said revolving output drive of said converter, and wherein said braking means comprises: a friction brake means operatively disposed with respect to said revolving output drive of said converter, a lever, linkage intercoupling said lever with said friction brake means, spring means anchoring said lever to said frame, a latch mounted to said frame and maintaining said lever in an upward position, whereby to release said friction brake means, said latch being constructed to selectively release said lever to the action of said spring, whereby to apply said brake means, and means responsive to the contact of said stop abutment for withdrawing said latch from retentive engagement with said lever.

3. Apparatus according to claim **2** wherein said withdrawing means comprises lever means pivoted to said frame, forwardly thereof, and including cable guide means receiving said winch cable but constructed for actuation abutment by said stop abutment means, a second cable, secured to said lever means, for pulling said latch out of engagement with said lever upon the pivoting of said lever means through contact therewith by said stop abutment.

4. Agricultural irrigation apparatus comprising a horizontal, wheel-carrying frame; an erect, water delivery structure mounted to said frame and having a fluid input; a drive line including a speed-reduction transmission having input and output drives; a water-pressure-to-revolving mechanical-power converter having water inlet structure constructed for coupling to an external water-carrying hose, a revolving output drive coupled to said transmission input drive, and a fluid outlet coupled to said fluid input of said water delivery structure; a winch drum journaled to said frame and having an input drive coupled to said output drive of said transmission; a winch cable having an inner end wound upon said winch drum and an outer end constructed for extension forwardly of said frame to be anchored to an external object; a stop abutment disposed upon said cable proximate said outer end thereof; and means mounted to said frame and responsive to the contact with said means of said stop abutment, for braking said revolving output drive of said converter, and wherein said frame includes fluid-operated wheel braking means, and means responsive to the presence of slack in said winch cable for automatically applying said wheel braking means.

5. Agricultural irrigation apparatus comprising a horizontal, wheel-carrying frame; an erect, water delivery structure mounted to said frame and having a fluid input; a drive line including a speed-reduction transmission having input and output drives; a water-pressure-to-revolving mechanical-power converter having water inlet structure constructed for coupling to an external water-carrying hose, a revolving output drive coupled to said transmission input drive, and a fluid outlet coupled to said fluid input of said water delivery structure; a winch drum journaled to said frame and having an input drive coupled to said output drive of said transmission; a winch cable having an inner end wound upon said winch drum and an outer end constructed for extension forwardly of said frame to be anchored to an external object; a stop abutment disposed upon said cable proximate said outer end thereof; and means mounted to said frame and responsive to the contact with said means of said stop abutment, for braking said revolving output drive of said converter, and wherein said apparatus includes speed control means in said drive line including said transmission, and sensing means responsive to the diameter of said winch drum, including such winch cable as is wrapped thereon, for automatically adjusting said speed control means, whereby to advance said vehicle along said cable at a uniform speed, regardless of the amount of winch cable at any time disposed upon said winch drum.

6. The irrigation vehicle of claim **5** wherein sensing means comprises a roller, supporting structure journaling said roller and mounting the same to said frame, said roller being constructed for essentially radial movement relative to said winch drum in response to varying amounts of winch cable present upon said winch drum, and means coupled to said roller and responsive to the movement thereof for controlling said speed control means.

7. The irrigation vehicle of claim **6** wherein said supporting structure includes upright means fixedly mounted to said frame, bell crank means journaled to said upright means and journaling said roller, and spring means coupled to said bell crank means and to said frame for retaining said roller against said winch cable as wrapped upon said winch drum.

8. An agricultural irrigation vehicle including, in combination, a frame; wheels journaled to said frame; a watery delivery system supported by said frame and having an input; a water-pressure-to-revolving-mechanical-power converter having a fluid inlet oriented rearwardly of said frame, a fluid outlet coupled to said input, and a revolvable output drive, winch means, including a winch drum and a winch cable wrapped thereon, mechanically coupled to said output drive and constructed to pull said vehicle forwardly by wrapping said winch cable upon said winch drum, and means supported by said frame for braking selected ones of said wheels at times of water surge pressure application to said fluid inlet.

9. The vehicle of claim **8** wherein said winch cable includes an end-of-run stop abutment, said frame including means responsive to the impingement thereof

by said stop abutment for braking said revolvable output drive.

10. Agricultural irrigation apparatus comprising a horizontal, wheel-carrying frame; an erect, water delivery structure mounted to said frame and having a fluid input; a drive line including a speed-reduction transmission having input and output drives; a water-pressure-to-revolving-mechanical-power converter having water inlet structure constructed for coupling to an external water-carrying hose, a revolving output drive coupled to said transmission input drive, releasably latched, spring-pressurized braking means operatively coupled to the combination of said drive line and said transmission output drive, and a fluid outlet coupled to said fluid input of said water delivery structure; a winch drum journaled to said frame and having an input drive coupled to said output drive of said transmission; a winch cable having an inner end wound upon said winch drum and an outer end constructed for extension forwardly of said frame to be anchored to an external object; a stop abutment disposed upon said cable proximate said outer end thereof; and means mounted to said frame and responsive to the contact with said means of said stop abutment, for unlatching said braking means to thereby effect spring-pressure braking of the combination of said revolving output drive of said converter and said drive line.

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