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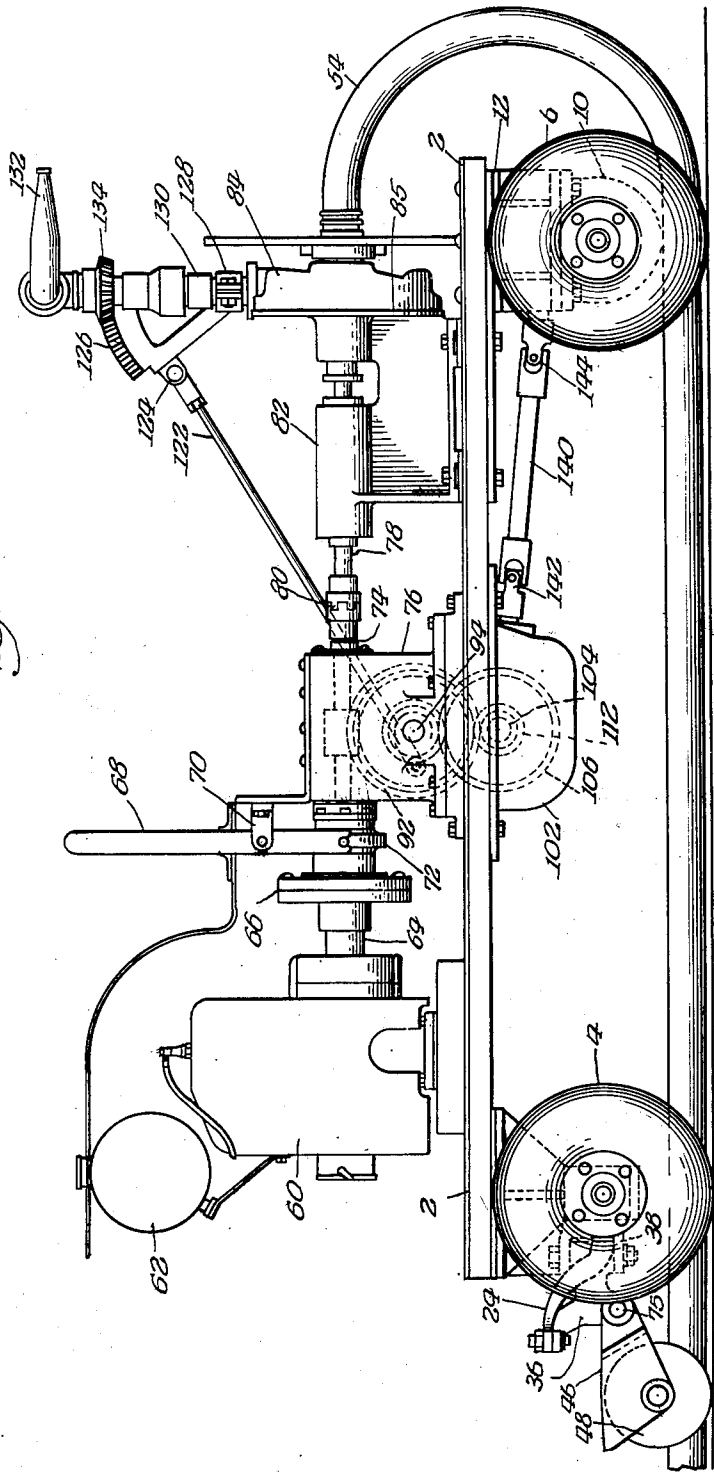
A. F. STETSON
POWER SPRINKLER

2,474,071

Filed March 22, 1946

5 Sheets-Sheet 1

Fig. 1



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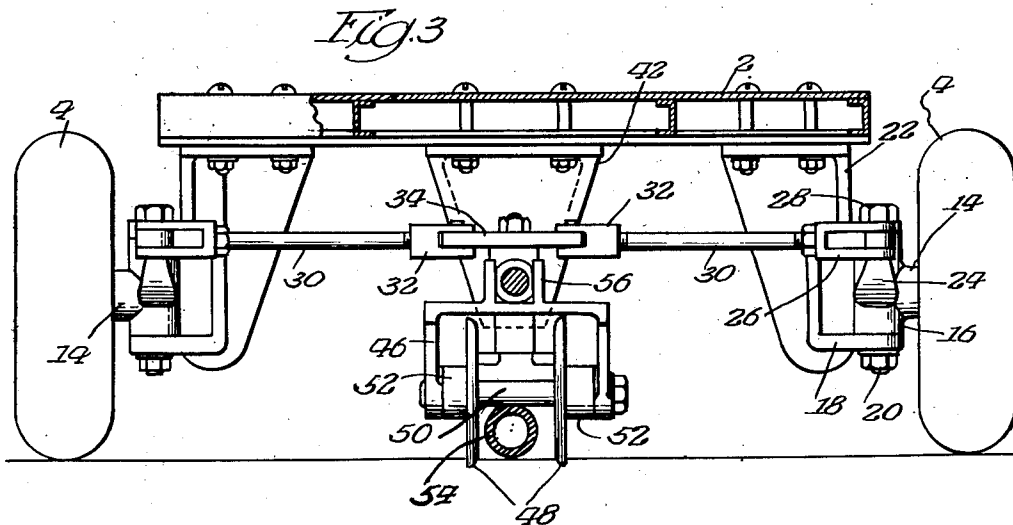
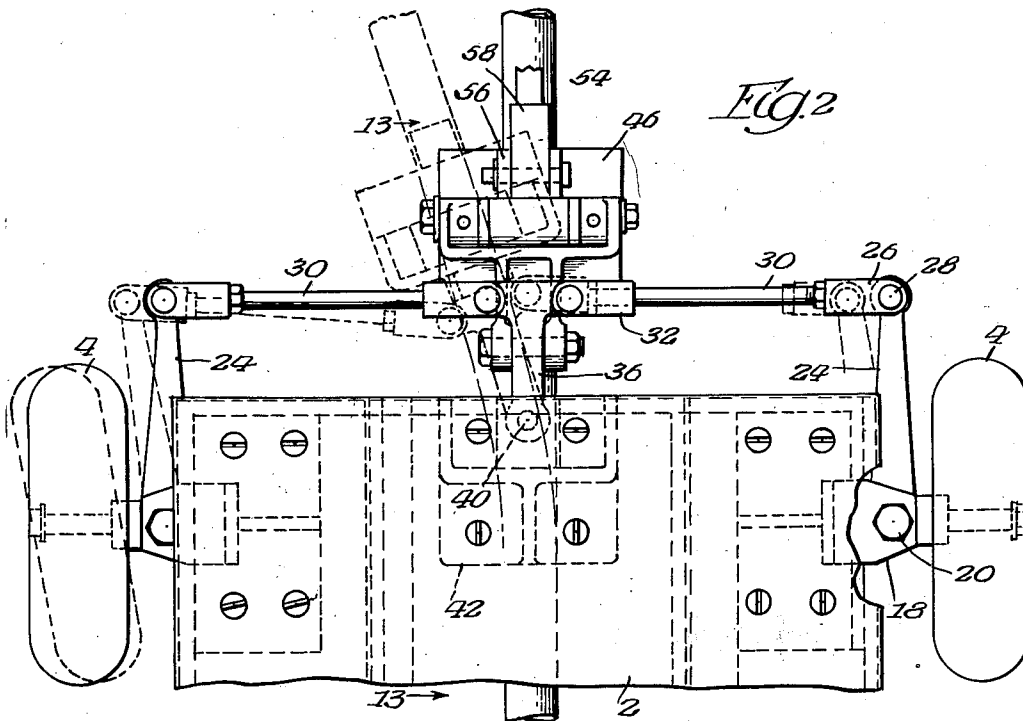
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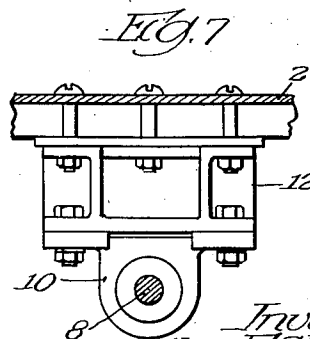
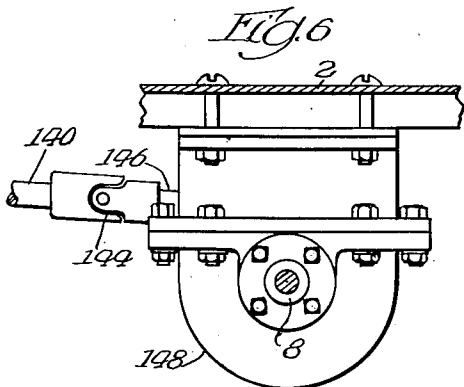
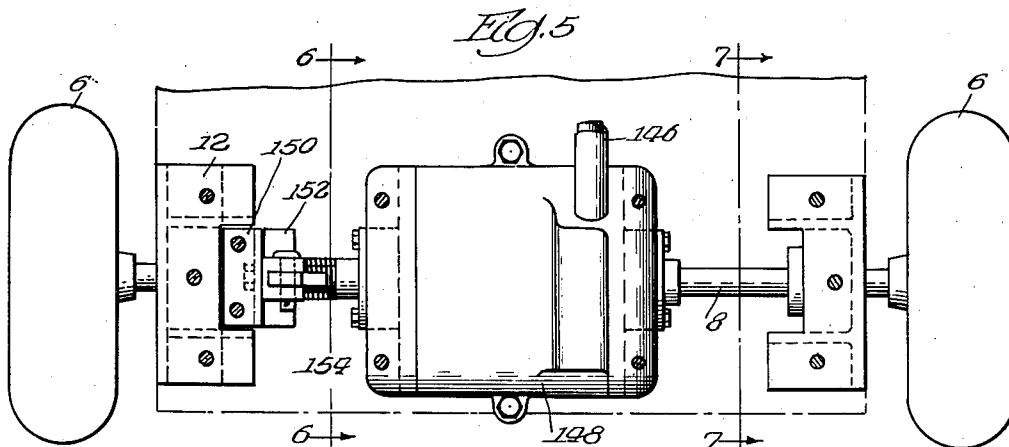
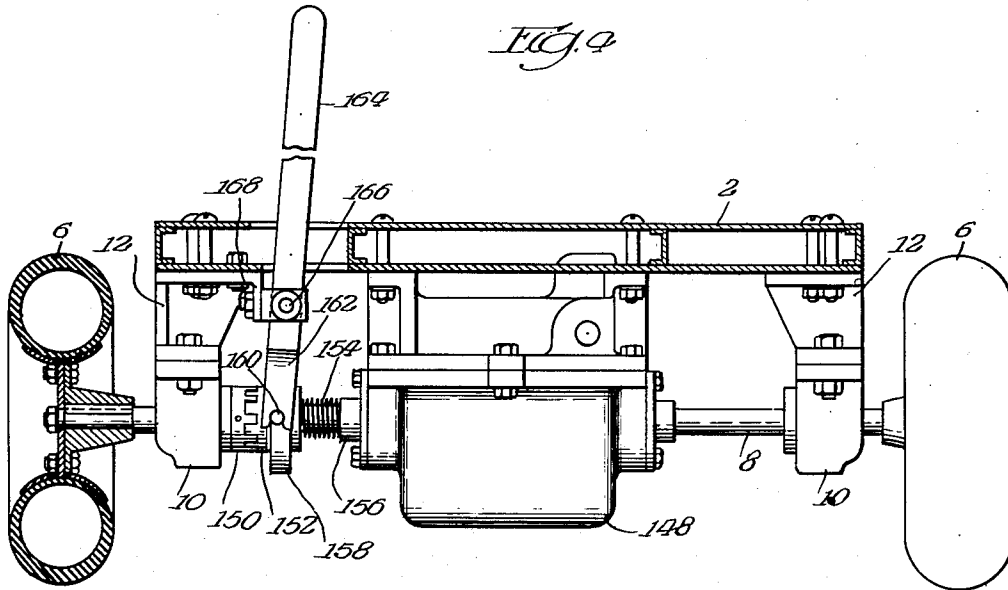
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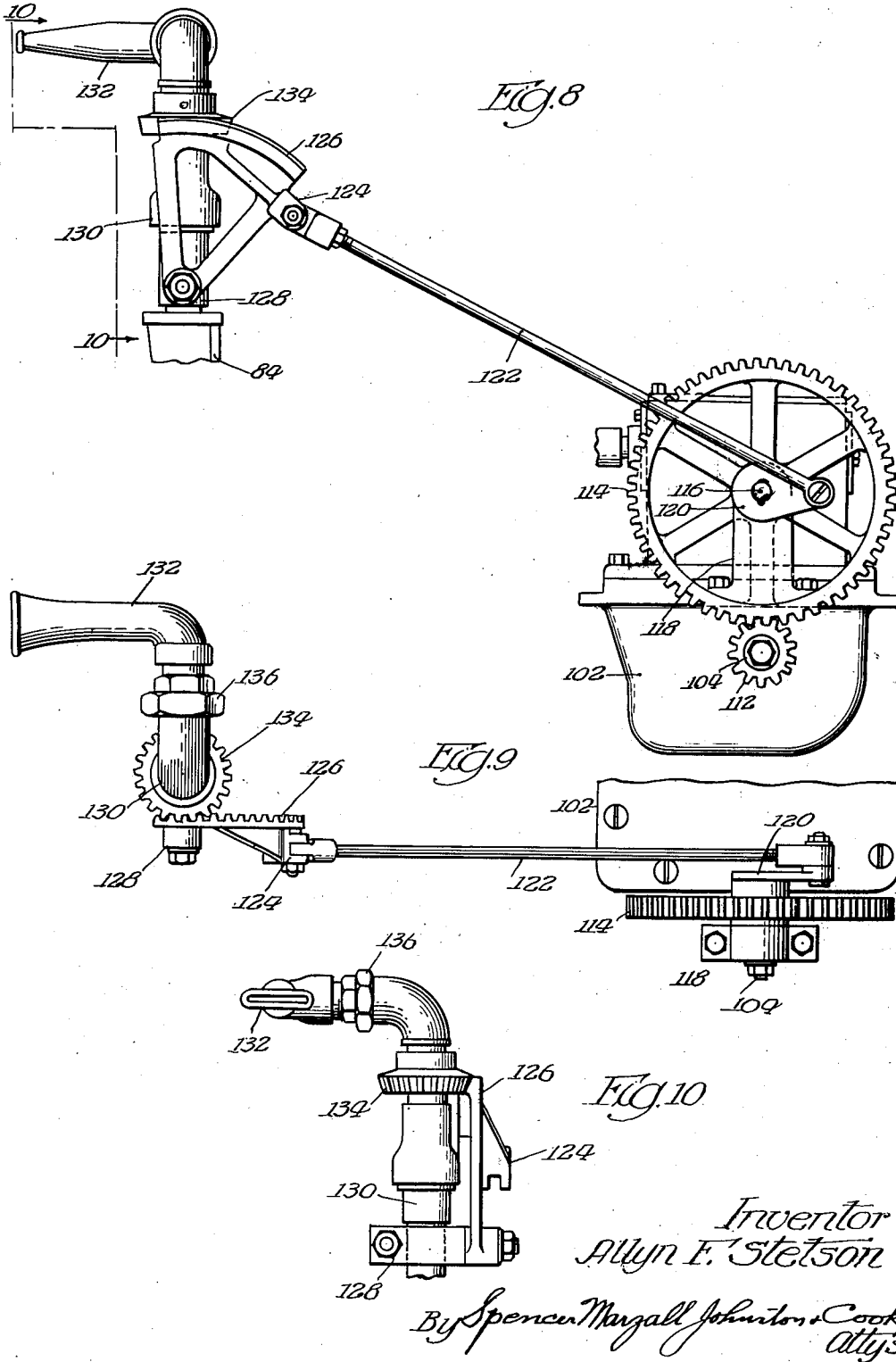
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FIG. 11

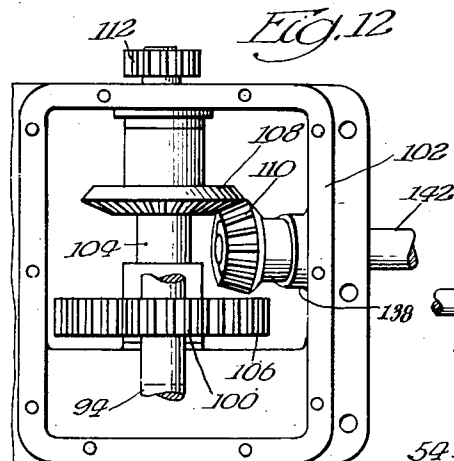
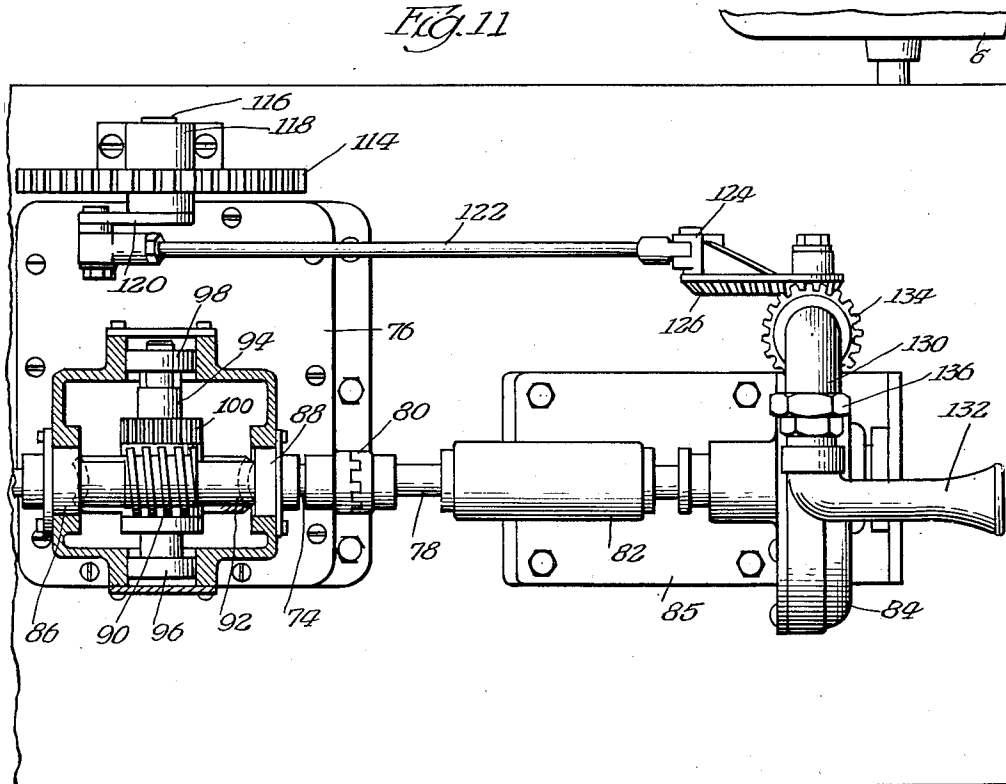
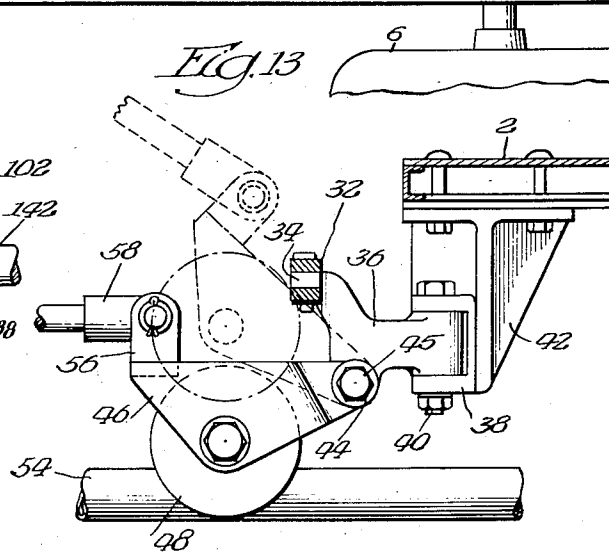


FIG. 13



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POWER SPRINKLER

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4 Claims. (Cl. 299—47)

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This invention relates in general to sprinklers adapted for use in sprinkling lawns, and particularly to a motor driven or power sprinkler which has for its primary use sprinkling the grounds of large estates or golf courses.

Heretofore, in sprinklers of this general character, it has been customary to use the power supplied by water under pressure as a means for moving or driving the entire apparatus. That is, water would be supplied to a rotating nozzle which would be caused to rotate by the force of the water and which, in turn, would operate a driving means for the apparatus. One of the main objections to this type of sprinkler has been the occasional lack of pressure in the source of water supply. If the pressure were to be decreased for any reason, the sprinkler may stall or at least function in an unsatisfactory manner.

Furthermore, while the water pressure may be sufficient to permit water to be projected from the spray nozzle, it may not always be sufficient to move the entire apparatus over the ground, and in general such mode of operation is uncertain.

In view of the foregoing, it is therefore one of the main objects of my invention to provide a sprinkler which has a positive source of power, such as an engine or motor, to drive the entire apparatus.

Another object is to provide a power sprinkler having positive means of locomotion in combination with a device for automatically guiding the apparatus in a predetermined path.

A further object is to provide a sprinkler having a positive source of power with a novel spray nozzle which is adapted to have a rotary reciprocating or oscillating movement actuated by the power supply means.

A still further object is to provide a power sprinkler having a positive source of power supply with means actuated by such power supply to deliver a fluid, such as water, under substantially constant pressure to the spray nozzle.

Still another object is to provide means in a power sprinkler whereby the positive source of power may be disconnected from the means driving the apparatus and yet permit the power supply to operate the fluid supply means as well as the means for actuating the movement of the nozzle.

Still another object is to provide a sprinkler having a positive source of power supply and which will be so synchronized with the spray means as to deliver a constant supply of water

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over a given area in accordance with the speed of movement of the machine.

A further object is to provide a source of power supply in a power sprinkler which will drive the sprinkler, and will also positively furnish water under pressure, and positively actuate the oscillating nozzle.

Other objects and advantages of the invention will become apparent from a reading of the following description in conjunction with the accompanying drawings wherein:

Fig. 1 is a side elevational view of my improved power sprinkler;

Fig. 2 is a somewhat enlarged fragmentary plane view of the forward end of the sprinkler;

Fig. 3 is a front elevation thereof without showing any of the mechanism above the supporting platform;

Fig. 4 is a rear elevation without showing any of the mechanism above the supporting platform;

Fig. 5 is a fragmentary under plan view of the rear end of the machine;

Fig. 6 is a fragmentary vertical section taken substantially along the plane of line 6—6 of Fig. 5;

Fig. 7 is a fragmentary vertical section taken substantially along the plane of line 7—7 of Fig. 5;

Fig. 8 is a side elevation of the means for imparting an oscillating movement to the spray means looking at the opposite side of the machine from that shown in Fig. 1;

Fig. 9 is a plan view of the apparatus shown in Fig. 8;

Fig. 10 is an elevation of the nozzle and its connecting parts looking in the direction of the arrows 10—10 in Fig. 8;

Fig. 11 is a horizontal view showing a portion of the apparatus in plan and showing the upper transmission gear box in section;

Fig. 12 is a plan view of the lower transmission gear box, and

Fig. 13 is an enlarged fragmentary side elevation of the steering mechanism at the front end of the machine.

In accordance with my invention I provide a carriage having a supporting platform on which is mounted a positive means for supplying power such as an engine. I also provide a spray nozzle adapted to have a rotary reciprocating movement at the rear end of the carriage which is actuated by positive means driven by the motor. As is customary in devices of this character a flexible conduit, such as a hose, is connected at one end

to a source of water supply, and at its other end to the carriage of the sprinkler. In my device, however, the sprinkler end of the hose is connected directly to a pump which is also positively actuated by driving means from the motor to supply water under substantially constant pressure to the nozzle.

The sprinkler is adapted to be located initially at some considerable distance from the source of water supply and a sufficient length of hose extends from the water supply to the sprinkler. At the forward end of the carriage I provide a steering device in the form of spaced rotatable discs, which may be adjustable, or a grooved wheel which is adapted to receive the hose between the sides thereof and to follow the hose as the carriage is driven forwardly. Any curves or turns in the hose will be followed by the guide wheel which in turn will steer the front wheels of the carriage in the desired direction.

I also provide drive means connected to the rear wheels for driving the apparatus by means of the motor. It may be desirable, however, on certain occasions, to move the entire machine by hand, either when the spray means is functioning, or when the entire machine is idle. For moving the apparatus by hand I provide a handle at the front end of the machine which is so connected to the guide wheel that when a pull is exerted thereon the guide wheel will be elevated from the ground and will clear the hose. Furthermore, I provide a clutch means to disengage the driving means from the motor so that the entire carriage can be moved manually when the motor is running.

Referring now more particularly to the drawings the carriage is made up primarily of a supporting platform 2, front wheels 4 and rear wheels 6. As will be clearly seen in Figs. 1 and 4 the rear wheels 6 are located at each end of an axle 8 which in turn is suitably mounted near its ends in bearings 10 suspended from brackets 12 which are located beneath and secured to the under side of the platform 2.

For a description of the front end of the machine and the specific form of steering apparatus reference will now be made to Figs. 1, 2 and 3 where it will be seen that the front wheels 4 are rotatably mounted on stub shafts 14. One of these shafts is located at each side of the machine and each is connected to a vertical tubular member or sleeve 16 pivotally mounted between the sides of a U-shaped bracket 18 by means of a pin or bolt 20 extending through the sleeve 16 and the sides of the bracket 18. Each bracket is then secured to a supporting bracket 22 extending downwardly from the under side of the platform 2.

A forwardly extending arm 24 is secured at its rear end to each of the sleeves 16 and at its forward end is pivotally mounted between the sides of a bracket 26 by means of a pivot pin 28.

Each bracket 26 normally extends inwardly at substantially right angles to the arm 24 and each has connected thereto a link 30 extending inwardly. The inner end of each link is secured to a bracket 32 having spaced sides at its opposite end to receive the ends of a link 34. The main body of this link is indicated by the numeral 36 and may be clearly seen in Fig. 13. The rear end thereof is formed so as to be pivotally mounted between the horizontal sides of a vertical bracket 38 by means of a vertically extending pivot pin 40. A bracket 42 extending downwardly from the under side of the platform 2 at substantially the

center thereof supports the bracket 38 and the parts connected therewith. It will be evident that the link 36 will be free to move in a horizontal plane and when thus moved will operate the links 30 to rotate the arms 24 and thus turn the wheels 4.

Again referring to Fig. 13, the lower side of the link 36 has a depending portion 44 adapted to receive a horizontal pivot pin 45 on which is pivotally mounted a bracket 46. Between the sides of this bracket a guide wheel having sides 48 is rotatably mounted on an axis 50 which is supported in bearings 52. The flexible conduit or hose for carrying the water from the source of supply to the sprinkler unit is indicated at 54 and lies within the sides 48 of the guide wheel. When the carriage is moving forwardly the guide wheel will follow the path of the hose and if the hose curves the guide wheel will be pivoted on the pivot pin 40 and will move the links 30 longitudinally through the link 36. The position of the various parts when the apparatus is turning is shown in dotted lines in Fig. 2 where it will be seen that longitudinal movement of the links 30 will cause a rotary movement of the arms 24. The rear ends of these arms being secured to the vertical sleeves 16 will cause rotation thereof and a turning movement of the wheels 4 through the axles 14.

The upper side of the bracket 46 is provided with spaced apart supporting means 56 adapted to pivotally hold a handle member 58 which enables the carriage to be moved manually. The natural upward pull on the handle 58 will automatically elevate the guide wheel 48 above the hose 54 as shown in dotted lines in Fig. 13.

The power supply means for driving the apparatus may be of any suitable character, and by way of illustration, I have shown a gasoline engine 60 mounted on the platform 2 having the usual fuel tank 62 mounted adjacent thereto. In the form of the invention shown, the engine drives the horizontal shaft 64 having a clutch 66 thereon, operated by means of the clutch lever arm 68, pivoted to a bracket 70 and which operates the clutch through the sleeve 72. The clutch, however, may be automatic if desired, and will operate in the usual and well known manner.

A driven shaft 74 passes through the upper transmission gear box 76 and is driven by the engine through the clutch 66.

The shaft 74 also drives a shaft 78 through the flexible coupling 80, the shaft 78 being mounted in an elongated bearing 82 and adapted to drive a pump 84, all of which is mounted on a bracket 85 secured to the supporting platform 2.

Referring now to Fig. 11, which is a horizontal section through the upper transmission gear box 76, it will be seen that the shaft 74 is mounted in suitable bearings 86 and 88 and has a worm 90 thereon. The rotation of the shaft 74 and worm 90 operates the worm gear 92 which is mounted on a shaft 94 which has each end thereof located in bearings 96 and 98.

Fig. 12 shows a pinion 100 also mounted on the worm gear shaft 94. The lower transmission gear box 102 has a shaft 104 located therein to which is secured a gear 106 in mesh with the pinion 100. Also mounted on the shaft 104 is a bevel gear 108 in mesh with a second bevel gear 110 for purposes of driving the entire apparatus and which will be explained more fully hereinafter.

The shaft 104 extends beyond one side of the lower transmission gear box 102 and has a pinion

112 attached thereto. Referring now particularly to Figs. 8, 9, 10 and 11 it will be noted that a short stub shaft 116 is located in a bearing block 118 mounted on the supporting platform, the shaft 116 at one end thereof being provided with an eccentric 120. The pinion 112 being in mesh with the gear 114, also mounted on the shaft 116, will drive the eccentric 120, which has pivotally secured at one side thereof, the elongated link 122. The other end of this link is pivotally secured between the arms of a bracket 124 mounted on the framework of a segmental gear 126 which, in turn, is suitably mounted for an oscillating movement on a bracket 128 secured to the upper side of the pump 84.

A conduit 130 is connected to the pump 84 for conveying a fluid under pressure upwardly through the spray nozzle 132. As illustrated, the conduit 130 has a vertical portion and a horizontal portion, the horizontal portion terminating in the spray nozzle 132. The vertical portion thereof has mounted thereon a bevel gear 134, adapted to mesh with the segmental gear 126, so that an oscillating movement thereof will also impart an oscillating movement to the spray nozzle. It will therefore be evident that when the clutch 66 is engaged the engine 60 will drive the shaft 74 which, through the worm 90, worm gear 92, pinion 100, gear 106 and pinion 112, will rotate the gear 114 and the eccentric 120, both of which are mounted on the common stub shaft 116, and will thus reciprocate the link 122 to oscillate the nozzle 132 through the medium of the segmental gear 126 and the bevel gear 134. The locking nut 136 may be mounted adjacent the nozzle for regulating the elevation thereof.

It will be further evident that rotation of the shaft 74 will also drive the shaft 78 through the flexible coupling 80 and actuate the pump 84 to thus furnish water under pressure to the nozzle 132, which water has been supplied to the pump through the hose 54, the other end of which is connected in the usual way to a source of water supply.

Returning now to the lower transmission gear box 102 as shown in Fig. 12, and referring also to Figs. 1, 4, 5, 6 and 7 the operation of the driving means for the entire carriage will now be explained. The bevel gear 110 will be rotated through its connection with bevel gear 108, as explained above. The gear 110 is suitably mounted in a bearing 138 and has a link 140 adapted to be rotated thereby through actuation of the universal joint 142. A second universal joint 144 at the rear end of the link 140 forms a connection through a short shaft 146 to suitable gears within the differential gear box 148. The details of this differential need not be described in detail since it is of the usual construction and has gears therein driven by the shaft 146 to drive the rear axle 8. I provide, however, means for connecting, or disconnecting, the rear axle with respect to the main driving means. At one end of the axle 8 I provide a clutch member in the form of square tooth gears 150 and 152. One member 152 of the clutch may be so connected as to be normally driven by the differential and the other member 150 may be connected to the axle and the wheels so that when the clutch members are in mesh the wheels will be driven, but when these members are disengaged, the one will rotate freely without having any moving action on the axle. These clutch members are normally maintained in engagement by means of a coiled spring 154 surrounding a portion of the

axle and bearing at one end against a boss 156 and at the other end against the clutch member 152. This clutch member is also provided with a collar 158 having pins 160 at each side thereof adapted to be received in recessed portions in the bifurcated end 162 of the clutch lever arm 164. This arm is pivoted at 166 to a bracket 168 mounted on the under side of the supporting platform. The arm also extends upwardly through the platform in an opening therein, which is so designed as to be able to hold the arm against pressure of the spring 154 when the clutch members are disengaged.

By providing this sprinkler carriage with such means for disengaging the driving means from the engine it will be possible to manually move the carriage, because the rear wheel will then be freely rotatable. In certain instances it may be desirable to move the carriage by hand while the spray means is in operation. It is always necessary, of course, to be able to locate the sprinkler by moving it by hand to the location where it is desired that the sprinkling operation begin.

For example, on a large estate or on a golf course, several hundred yards of hose may be connected between the source of water supply and the place where the sprinkler begins its operation. By disengaging the clutch means 150 and 152 it will be a simple matter to move the machine by hand over the ground.

It will thus be clear that the engine, by driving the shaft 74, will also drive the carriage through the worm 90, worm gear 92, pinion 100, gear 106, bevel gears 108 and 110 which, through the universal joints 142 and 144, will rotate the shaft 146 to actuate the gears in the differential box and the rear axle 8.

I have therefore been able to provide a single source of power supply for not only driving the carriage, but also to deliver the fluid under substantially constant pressure to the spray nozzle and to oscillate said nozzle. It should be noted that all of these operations must be synchronized so that a desired amount of water can be distributed over a given area evenly as the machine moves forwardly. The apparatus as shown and described herein functions to synchronize the various operations in the necessary manner.

It will be evident that other specific means can be used for carrying out the various functions above described than those illustrated without in any way departing from the spirit of the invention.

For example, it may be possible to use three wheels instead of four, as shown, with a single wheel in front, or the guide wheel itself could be used as a supporting wheel for the front end.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. A power sprinkler comprising a carriage having wheels thereon, a transmission on said carriage including upper and lower gear boxes, an internal combustion engine on said carriage, a driving connection between said engine and transmission for driving said transmission, means connecting the gears in said lower gear box with the wheels for driving the carriage, a movable spray nozzle on said carriage, means connecting said nozzle with the gears in said upper gear box for actuating said nozzle, a pump on said carriage connected to a source of water supply, conduit means connecting said pump with said nozzle, means connecting said pump with

said transmission for driving the pump to supply water to said nozzle, and clutch means for disengaging the driving connection between said transmission and said engine.

2. A power sprinkler comprising a carriage having wheels thereon, a transmission on said carriage, an internal combustion engine on said carriage, a driving connection between said engine and transmission for driving said transmission, means connecting said transmission with the wheels for driving the carriage, a movable spray nozzle on said carriage, means connecting said nozzle with said transmission for actuating the nozzle, a pump on said carriage connected to a source of water supply, conduit means connecting said pump with said nozzle, means connecting said pump with said transmission for driving the pump to supply water to said nozzle under pressure, clutch means for disengaging the driving connection between said engine and said transmission, and other clutch means for disengaging the connecting means between said transmission and said wheels.

3. A power sprinkler comprising a carriage having wheels thereon, a transmission on said carriage, an internal combustion engine on said carriage for driving said transmission, a spray nozzle on said carriage mounted for rotary reciprocation, means connecting said transmission with said nozzle for actuating the nozzle, a pump on said carriage, means for supplying water to said pump from a source of water supply, conduit means connecting said pump with said nozzle, means connecting said transmission with said pump for supplying water to said nozzle under

pressure, and means connecting said transmission with said wheels for driving the carriage.

4. A power sprinkler comprising a carriage having wheels thereon, a transmission on said carriage, an internal combustion engine on said carriage, a driving connection between said engine and said transmission for driving said transmission, a spray nozzle on said carriage mounted for rotary reciprocation, means connecting said transmission with said nozzle for actuating the nozzle, a pump on said carriage, means for supplying water to said pump from a source of water supply, conduit means connecting said pump with said nozzle, means connecting said transmission with said pump for supplying water to said nozzle under pressure, means connecting said transmission with the wheels for driving the carriage, clutch means for disengaging the driving connection between said engine and said transmission, and other clutch means for disengaging the connecting means between said transmission and said wheels.

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