

Nov. 8, 1960

W. R. SHAFFER
ROAD STRIPING MACHINE

2,959,356

Filed Jan. 27, 1959

4 Sheets-Sheet 1

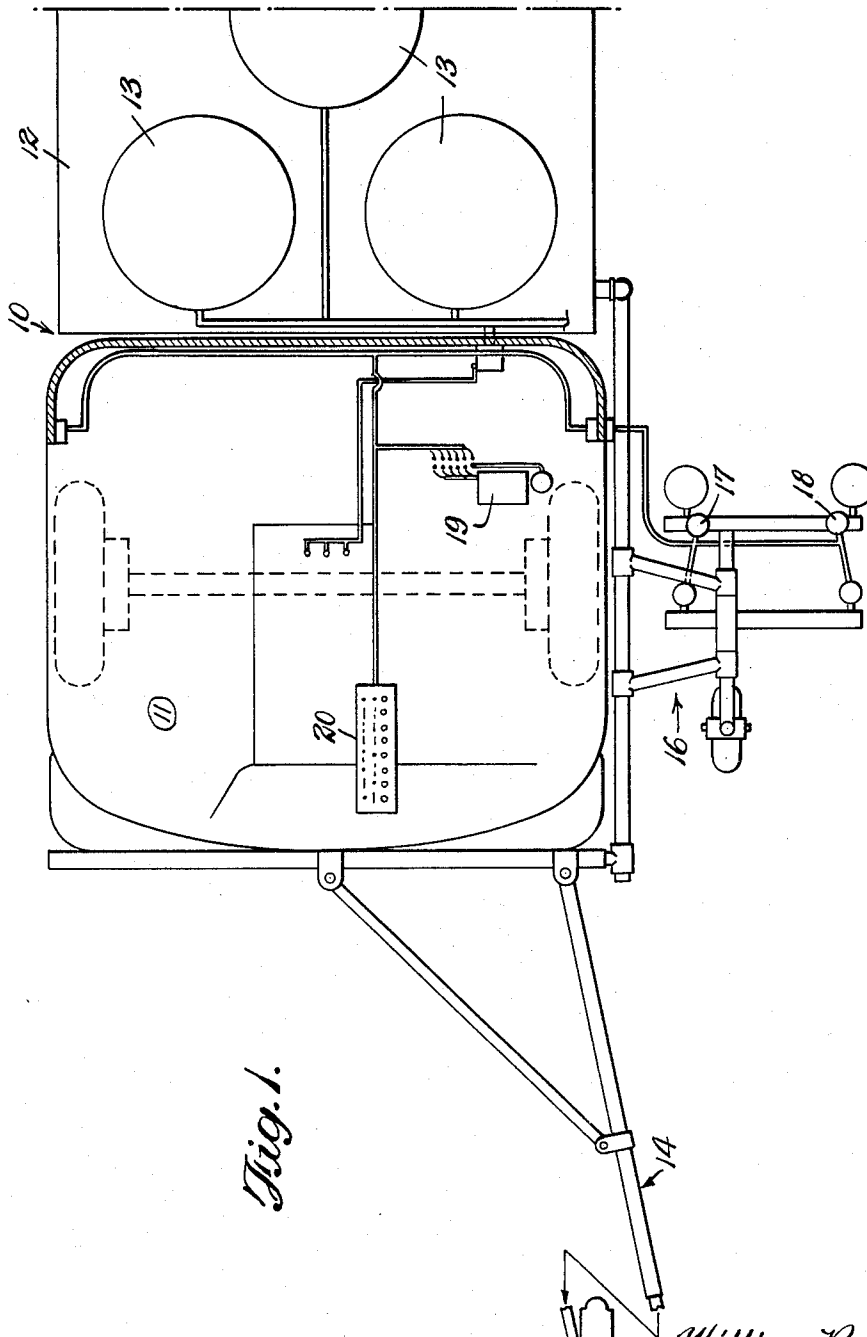


Fig. 1.

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4 Sheets-Sheet 2

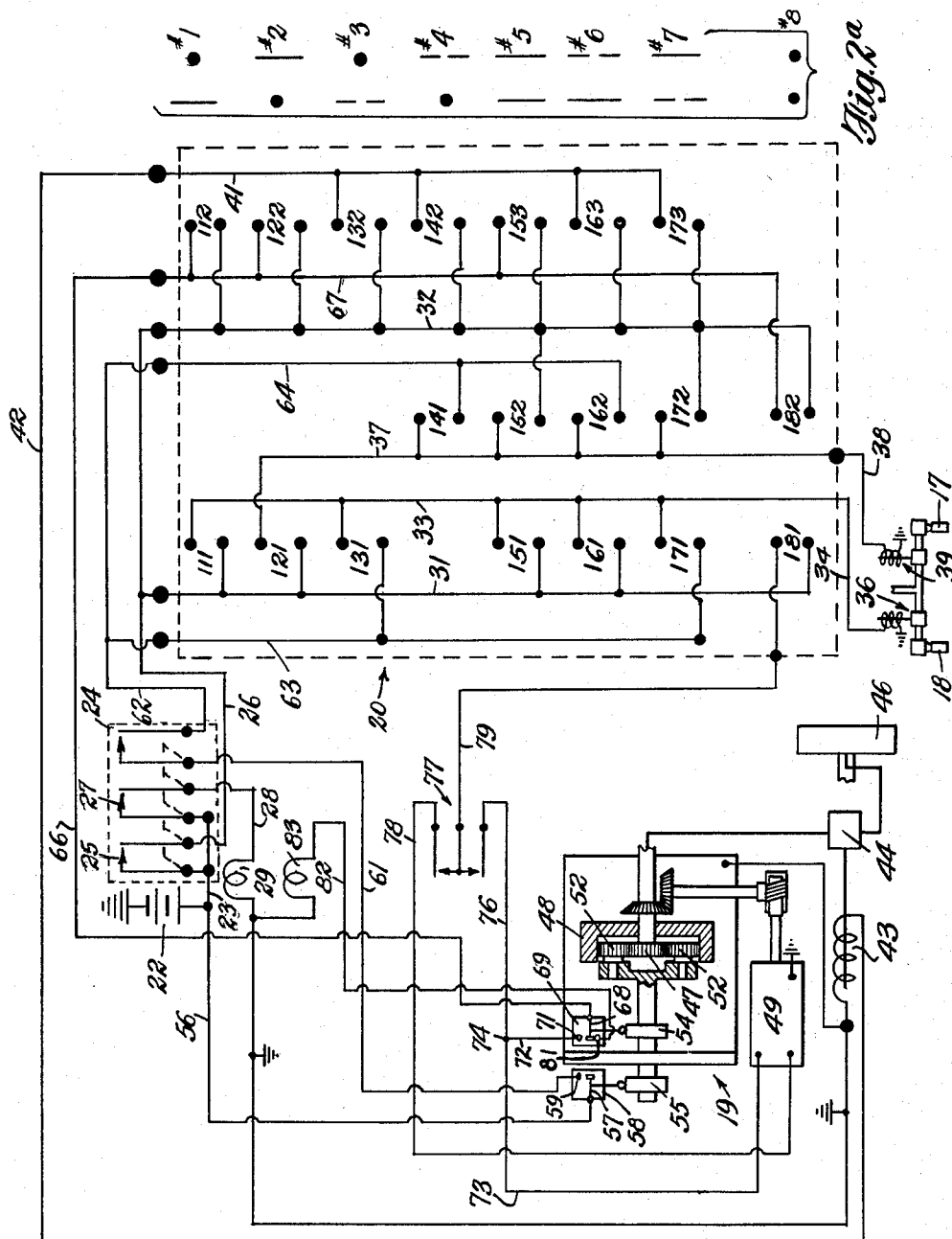


Fig. 2.

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4 Sheets-Sheet 3

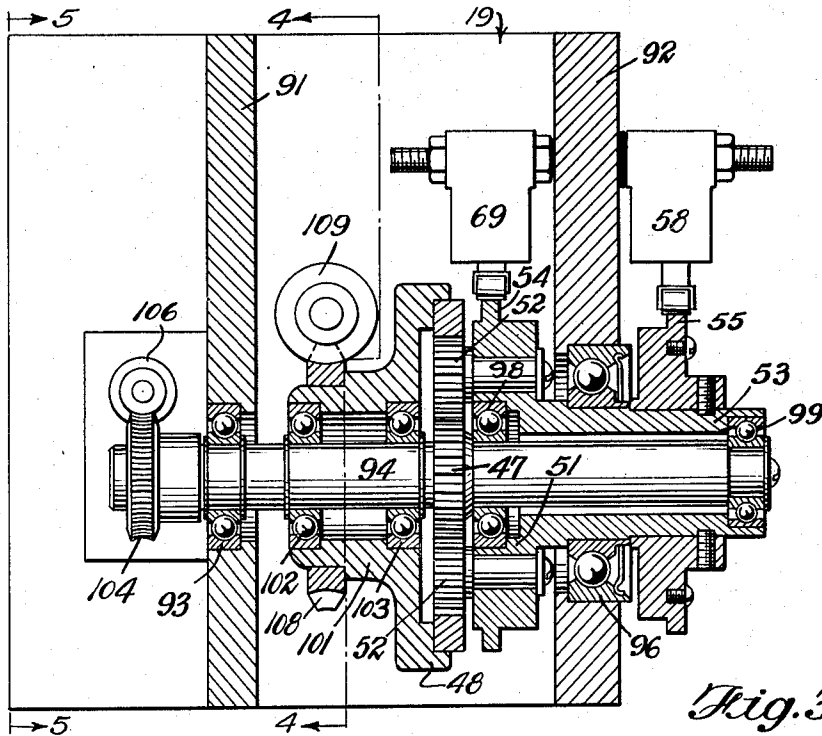


Fig. 3.

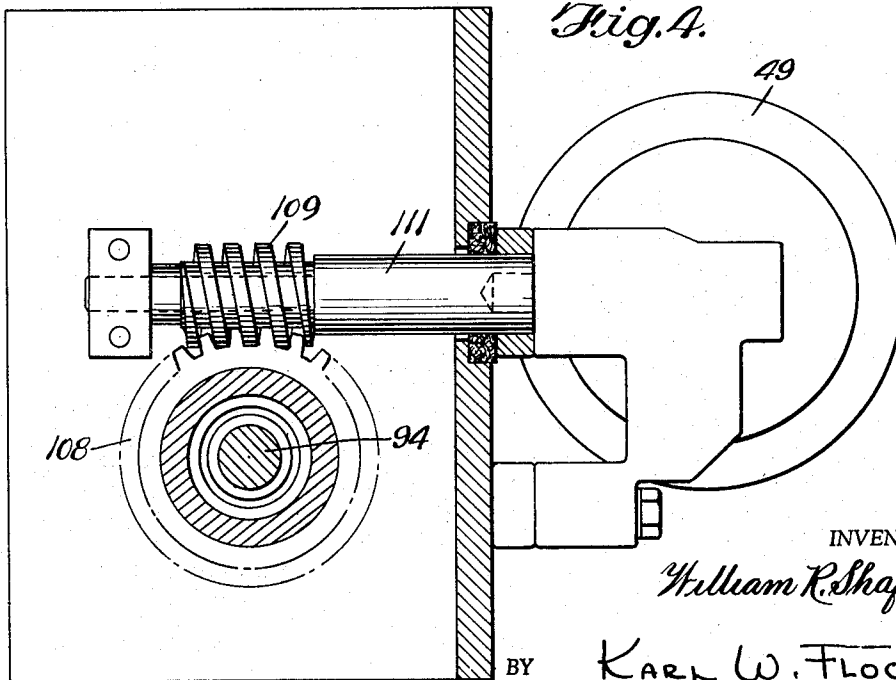


Fig. 4.

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4 Sheets-Sheet 4

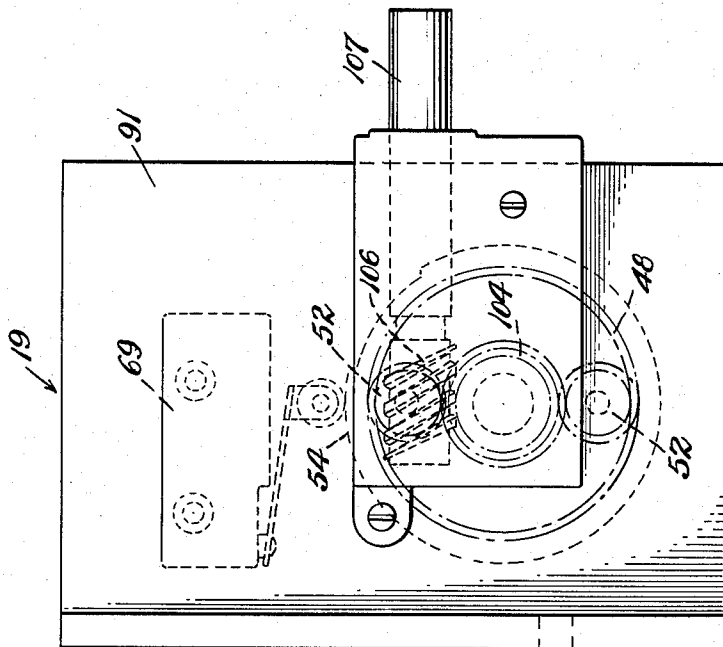


Fig. 5.

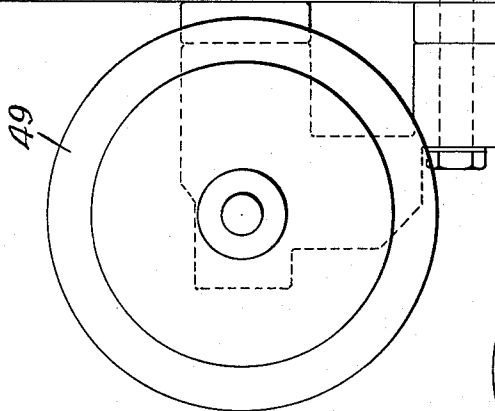


Fig. 6.

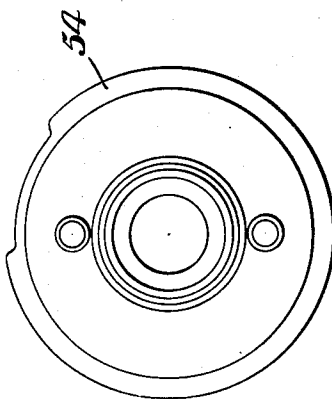
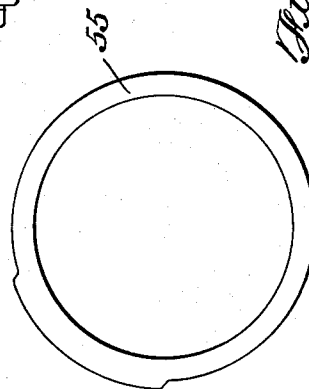


Fig. 7.



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2,959,356

ROAD STRIPING MACHINE

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Filed Jan. 27, 1959, Ser. No. 789,296

13 Claims. (Cl. 239—100)

The present invention relates to a highway line spraying apparatus, and more particularly to such an apparatus having an electrical control for the line patterns, and which has circuits to automatically return an intermittent line generating device to an initial position and to vary the length of the intermittent line.

It has long been known to be desirable to place markings or indicating lines along the center of a highway, or between the lanes of a multi-lane highway. In order to rapidly and economically apply the desired line pattern, it is necessary that equipment be provided that is capable of laying down or spraying a number of different line patterns. This equipment usually comprises a vehicle having a plurality of spray guns directed towards the roadway, together with the necessary paint supply containers, air compressors, and controls. The equipment known to the prior art, although generally comprising the noted parts, was not facile and did not provide for economical, remote control of the sprayed pattern. Thus, some of the known prior art road marking equipment relied upon complicated mechanical connections and linkages to control the spray pattern, and other known equipment resorted to electrical control of limited scope and adaptability.

It is a general object of the present invention to provide a highway line spraying apparatus in which electrical circuits are utilized in order to obtain an easily operated remote control of the spray patterns, together with certain improvements that will answer all of the needs and requirements of modern highway line spraying. These needs and requirements will become apparent as the specification proceeds.

A more specific object of the present invention is to provide a highway line spraying apparatus in which multiple spray guns are remotely controlled by easily manipulated operating devices.

Another object of the present invention is the provision of a highway line spraying apparatus which may be remotely electrically controlled to spray a wide selection of line patterns.

A still further object of the present invention is to provide a highway line spraying apparatus in which a plurality of line lengths of the intermittent lines may be sprayed.

Yet another object of the present invention is the provision of a highway line spraying apparatus wherein there is an automatic recycling of the intermittent line generating device after the completion of the spraying of an intermittent line.

A still further object of the present invention is to provide a planetary gear train having improved flexibility.

Other objects and the nature and advantages of the instant invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a schematic plan view of a vehicle having the highway line spraying apparatus of the present invention thereon.

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Fig. 2 shows the circuitry of the present invention in combination with the mechanical parts thereof.

Fig. 2A is a table showing line patterns obtainable with the instant invention.

Fig. 3 is a cross-sectional view of the intermittent line generating device used with and forming a part of the present invention.

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a cross-sectional view taken on the line 5—5 of Fig. 3.

Fig. 6 shows the intermittent line generating cam that forms a part of the device of Fig. 3.

Fig. 7 is a view of a reset cam forming a part of the device of Fig. 3.

Referring now to the drawings, wherein like reference characters are used to designate like or corresponding parts throughout the several views, there is shown in Fig. 1 a vehicle generally designated 10 having a cab area 11 and a bed 12. On the bed 12 are schematically illustrated a plurality of containers 13 that contain the paint, solvent, etc., usually found on road spraying vehicles. Extending forwardly of the vehicle 10 is a guide pointer 14 and mounted at the side of the vehicle 10 generally in line with the operator's seat in the cab area 11 is a spray gun carriage 16 that carries a right spray gun 17 and a left spray gun 18. The carriage 16 may also carry a center spray gun (not shown). The tanks 13 are connected with the spray guns 17 and 18 by conduits and valves in known fashion.

Attached to the frame of the vehicle 10 is an intermittent line generating device 19, and located in the cab area 11 where it is readily accessible to the operator of the vehicle is a multi-station pushbutton switch 20. The switch 20 may conveniently form a part of a panel having other control switches and indicating lights therein.

Referring now to Fig. 2, there may be seen therein a battery 22 that may be the battery of the vehicle 10. The battery 22 is connected to ground and also to a conductor 56 that is connected with a main switch 24 that is of the three pole single throw type. One set of contacts 25 of switch 24 connects the conductor 23 with the conductor 26 that is connected with the multi-station switch 20, and which conductor 26 forms a part of the feed circuit of the system. A second pair of contacts 27 connects the conductor 23 with a conductor 28 that is connected to ground and has an indicating light 29 therein; the light 29 is conveniently mounted on the same panel as the multi-station switch 20 and serves to show when voltage has been applied to switch 24 and is available to operate unit.

The multi-station switch 20 has eight separate operators, and each of these operators controls either two or three sets of contacts, as will be apparent hereinafter. The conductor 26 is connected with conductors 31 and 32 of the switch 20. A conductor 33 in the switch 20 is connected with a conductor 34 that has the solenoid of a solenoid operated valve 36 therein, and is connected to ground. The solenoid operated valve 36 controls the flow of fluid to the left spray gun 18, and thus the conductors 33 and 34 constitute a left spray gun operating circuit.

A right spray gun operating circuit comprises the conductor 37 in the switch 20, a conductor 38 connected between the conductor 37 and ground, the conductor 38 also including the solenoid of a solenoid operated valve 39. Valve 39 controls the flow of fluid to the right spray gun 17.

A skip cam drive actuating circuit comprises a conductor 41 in the switch 20, conductor 41 being connected with a conductor 42 that is connected to ground and has therein the solenoid 43 of a clutch 44. Clutch 44 is

normally open, and is closed so as to transmit the power when the solenoid 43 is energized. Clutch 44 serves to transmit power from a ground engaging wheel 46 to the circuit interrupter device 19. It will be understood that ground engaging wheel 46 may be either a separate wheel that is carried by the vehicle 10 or may be one of the ordinary four wheels thereof. Ground engaging wheel 46 drives the sun gear 47 of a planetary transmission through means diagrammatically indicated in Fig. 2 and more completely detailed in Fig. 3. An internal ring gear 48 surrounds the sun gear 47 in known fashion and is driven by means of a reversible electric motor 49. A planet carrier 51 having planet gears 52 journaled therein has a cam shaft 53 extending therefrom. A reset cam 54 and a skip cam 55 are secured on the cam shaft 53.

Extending from the battery 22 is a conductor 56 that is connected to the movable contact 57 of a skip cam switch 58, switch 58 having a fixed contact 59 that has connected thereto a conductor 61. Conductor 61 is connected through the main switch 24 to a conductor 62 that is in turn joined with the conductors 63 and 64 of the multi-station switch 20. The conductor 56, switch 58, conductors 61 and 62 constitute a skip cam circuit.

A reset cam circuit comprises a conductor 66 that connects a conductor 67 in the switch 20 with the movable contact 68 of a reset cam switch 69. One fixed contact 71 of switch 69 is connected with a conductor 72 that is joined to a conductor 73 at the junction 74. The conductor 73 is connected to one pole of the reversible motor 49. The junction 74 has a conductor 76 connected to it, conductor 76 forming a part of a retard circuit and being connected to one side of an advance-retard switch 77 which is of the single pole double throw type. The other side of switch 77 is connected by a conductor 78 with the other pole of the reversible motor 49, and the conductor 78 constitutes a part of an advance circuit. The movable blade of switch 77 is connected by a conductor 79 with the switch 20.

The switch 69 has a second fixed contact, designated 81, that is connected by conductor 82 to ground through the skip cam pilot light 83.

The multi-station power switch 20 has switch 111 and switch 112 that are both operated by a first key or operator and are closed upon movement of that key. The closing of switch 111 will connect conductor 31 with the conductor 33 and the closing of switch 112 will connect conductor 32 with conductor 67. In similar manner, movement of the other operators will serve to close the various switches, with the exception of switch 181 which is a normally closed switch and which will be opened upon movement of the key or operator.

Referring to Fig. 3, there may be seen therein a cross-sectional view of the circuit interrupter device 19 which has therein the main support walls 91 and 92. The wall 91 carries a bearing 93 that has a sun gear shaft 94 journaled therein, shaft 94 having the sun gear 47 thereon. The wall 92 has a bearing 96 therein and a hollow cam shaft 53 is journaled in the bearing 96. Cam shaft 53 carries bearings 98 and 99 adjacent the ends thereof, and the shaft 94 is journaled in the bearings 98 and 99 as shown. The cam shaft 53 is integral with a carrier 51 that has planet gears 52 journaled therein, the planet gears 52 meshing with the sun gear 47. The planet gears 52 also mesh with an internal ring gear 48 that is integral with a hollow collar 101 that carries bearings 102 and 103; the sun gear shaft 94 is also journaled in the bearings 102 and 103.

To drive the sun gear shaft 94, there is a gear 104 on one end thereof, and gear 104 is in mesh with a worm 106 (see also Fig. 5), the worm 106 being integral with or otherwise caused to rotate with a drive shaft 107. It is the drive shaft 107 that is driven by the ground wheel 46 (see Fig. 2) upon engagement of clutch 44.

To selectively drive or hold the internal ring gear 48, there is provided a gear 108 on the collar 101 with which

the internal ring gear 48 is integral, and a worm 109 (see Fig. 4) is in engagement with the gear 108 and is driven by the reversible electric motor 49 by means of the shaft 111.

The reset cam 54 is carried on the cam shaft 53 and is in alignment with the reset cam switch 69; the skip cam 55 is also carried on the cam shaft 53 and is in alignment with the skip cam switch 58. Conventional followers are shown extending from the switches 59 and 58 and into engagement with the cams 54 and 55, respectively. The follower of the switch 69 is shown, for example, in Fig. 5.

In Fig. 6 there may be seen the configuration of the skip cam 55 and in Fig. 7 there may be seen the configuration of the reset cam 54.

In operation, the vehicle will be understood to be in the general condition shown in Fig. 1, i.e., with the spray guns 17 and 18 in position and fluid connected with the tanks 13. The vehicle is moving along a roadway and the ground wheel 46 shown in Fig. 2 is turning. The operator will close the main switch 24, and a circuit will be completed through the conductor 28 and indicating light 29 to ground, showing unit to be ready for operation. Assuming that it is desired to spray the pattern No. 1 shown in Fig. 2A, that is a single unbroken line from the left spray gun, the operator moves the key of multi-station switch 20 so as to close the switches 111 and 112. When switch 111 is closed, a circuit will be completed from the battery 22 through the conductor 23, the switch 24, conductor 26, conductor 31, switch 111, conductor 33, and conductor 34 to ground, it being recalled that conductor 34 includes the solenoid of the solenoid operated valve 36 for the left spray gun 18. Accordingly, it will be understood that the left spray gun will become operative to spray a continuous line. Also, a circuit will be completed from the conductor 32 through the switch 112 to the conductor 67. If the reset cam 54 is in such a position that the cam follower of the reset cam switch 69 is down as shown in Fig. 2, a circuit will be completed through the contacts 68 and 71 of reset switch 69 and thence through the conductor 82 and the pilot light 83 to ground. This position of the reset cam 54 occurs when the cam shaft 53 is in a proper position so that the skip cam 55 can begin from an initial point, and this will be explained in detail hereinafter. Alternatively, if the cam shaft 53 and the cams 54 and 55 are not in a proper position for the initiation of the cycle on cam 55, then the cam follower of reset cam switch 69 will cause the movable contact 68 of switch 69 to be in engagement with the fixed contact 71 and a circuit will thus be completed through the conductor 73 to one pole of the reversible motor 49, and this will cause the motor 49 to turn. When it is desired to change to another spraying pattern, as shown in Fig. 2A, the operator for the desired switches is depressed, thus automatically opening the desired switches.

When it is desired to spray the pattern No. 2 shown in Fig. 2A, the second operator is moved to close switches 121 and 122. Closing the switch 21 will energize the right spray gun operating circuit in a similar manner as was described above in connection with switch 111, it being understood that at this time the right rather than the left spray gun is caused to operate. The switch 122 performs essentially the same office as switch 112.

A discontinuous, or intermittent line, commonly known as a "skip-line" may be sprayed from the left-hand spray gun, to obtain the pattern No. 3 shown in Fig. 2A, by movement of the third key or operator of multi-station switch 20. The closing of the switch 132 will complete a circuit from the conductor 32 through the switch 132, the conductor 42 and the solenoid 43 to ground. The energization of solenoid 43 will cause engagement of the clutch 44 and this will in turn cause the ground engaging wheel 46 to drive the drive shaft 107. Worm 106 on drive shaft 107 will rotate the gear 104 and the sun gear shaft 94, as well as the sun gear 47. Assuming that the reversible electric motor 49

is not energized, the internal ring gear 48 will be held fixed by the worm 109, and the sun gear 47 will cause the planet gears 52 to rotate the cam shaft 53. As cam shaft 53 rotates, the skip cam 55 will rotate with it to cause the follower of skip cam switch 58 to rise and fall. When it rises (or moves up as shown in Fig. 2) it will close the contacts 57 and 59 to establish a circuit from battery 22 to conductor 56, the skip cam switch 58, the conductor 61, the main switch 24, conductor 62, conductor 63, switch 131, conductor 33 and conductor 34 to ground to thus energize the solenoid of solenoid operated valve 36 for the left-hand spray gun 18. As the movement of cam shaft 53 continues, the movable contact 57 will be separated from the fixed contact 59 to thereby break the above described circuit and thus the operation of spray gun 18 will be halted. Similarly, as the cam shaft 53 is thus continuously rotated, the contacts 57 and 59 of the skip cam switch 58 will intermittently engage to give an intermittent or skip line from the left spray gun 18.

Pattern No. 4, which is a skip-line from the right-hand spray gun, is obtained through similar circuitry to pattern No. 3. In particular, a circuit is completed through switch 142 and the conductor 42 to thus energize the skip cam drive actuating circuit, and a skip cam circuit is completed, but in the case of pattern No. 4 the conductor 64 and the switch 141 are used to complete the circuit to the right spray gun operating circuit.

Should it be desired to advance or retard the skip-line of pattern No. 4, the advance-retard switch 77 is utilized. It will be recalled that switch 181 is normally closed, so that upon closing of switch 77 in either direction a circuit will be completed from battery 22, main switch 24, conductors 26 and 31, switch 181, conductor 79 and switch 77 to the motor 49. If the switch 77 is closed so as to complete a circuit through the conductor 78 the electric motor 49 will be driven in one direction to thus drive the internal ring gear 48; when this is done, the relative speeds of the sun gear shaft 94 and the cam shaft 53 will be changed so that the speed of the cam shaft 53 is relatively slower. This will cause the skip cam 55 to rotate more slowly and so the period during which the skip cam switch 58 is closed will be lengthened, and this in turn will lengthen the operating and non-operating parts of the cycle of the spray gun. Hence, the spray gun will cause longer skip-lines or intermittent lines to be sprayed when the skip advance circuit including the conductor 78 is energized.

Alternatively, if the switch 77 is moved in the other direction, so as to connect conductor 79 with conductor 76, current will flow to the other pole of the reversible motor 49, through junction 74 and conductor 73. This will cause the motor 49 to rotate in the opposite direction, to thus rotate the internal ring gear 48 in the opposite direction; this will increase the relative speeds of the cam shaft 53 and the skip cam 55 and thus the cycling of the skip cam 55, the skip cam switch 58 and the spray gun will be relatively faster. This will cause the skip-line to be made up of shorter lines.

In view of the above, it will be understood that the skip-line has a normal length of component lines and spaces, as determined for a given vehicle speed by the shape of the skip cam 55, and that this normal length of component lines may be changed by making it either longer or shorter by moving the advance-retard switch 77 from a neutral position to either of the circuit-completing positions thereof.

Assuming that a skip-line has been sprayed, for example the skip-line of pattern No. 4, and that pattern No. 5 is to be sprayed next, the operator will simply move the key for the fifth station of multi-station switch 20, and this will close switches 151, 152 and 153. As will be understood, when switches 151 and 152 are closed, circuits will be completed through the left spray

gun operating circuit and the right spray gun operating circuit. Also, a circuit will be completed from the conductor 32 through switch 153 and conductors 67 and 66. Assuming that the spraying of pattern No. 4 had been stopped at some intermediate point of the cycle thereof, the reset cam 54 will be in such a position that movable contact 68 of reset cam switch 69 will be in position against fixed contact 71. Hence, a circuit will be completed from the aforementioned conductor 66 through the contacts 68 and 71, the junction 74, conductor 73 to the reversible motor 49. Rotation of motor 49 will cause the worm 109 and gear 108 (see Fig. 3) to rotate, to rotate the internal ring gear 48 and the planet gear 52. The drive shaft 107 and sun gear shaft 94 will be stationary, and the movement of internal ring gear 48 will thus cause the cam shaft 53 to rotate. This rotation will continue until the circuit through contacts 68 and 71 of reset cam switch 69 is broken. When the circuit is thus broken, the motor 49 will stop, and a circuit will be completed through the fixed contact 81, conductor 82 and pilot light 83 to indicate that the skip cam 55 is in its initial position.

As a result of the operation that has just been described, the skip cam is automatically repositioned to its initial position, simply by the next use of the spraying equipment when a solid line (or two solid lines) is sprayed. The resetting of the skip cam to initial position comes about because the reset cam circuit including conductor 66, to which conductor 67 in switch 20 is connected, is energized whenever the solid line patterns Nos. 1, 2 or 5 are sprayed. Also, the reset cam circuit is energized whenever the eighth operator is moved, for movement of the operator will close switch 82 to also energize the reset cam circuit.

There has been provided a highway line spraying apparatus that is capable of spraying a variety of line patterns upon operation of switches that are placed within easy reach of the operator of the vehicle of the apparatus. The present invention may be seen to comprise multiple spray guns that are electrically remotely controlled, and may be controlled to give either normal, lengthened or shortened skip-lines at the will of the operator. While the apparatus described and claimed comprises two spray guns, the number of spray guns may be changed within the spirit of the invention. In addition, the spray apparatus of the present invention may be seen to comprise an intermittent line generating device that is automatically reset to an initial operating position upon movement of an "off" key or operator as well as keys or operators of a multi-station switch that are used to select continuous line patterns.

In addition, there has been provided a novel and highly flexible intermittent line generating device comprising a unique planetary gear system.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

What is claimed is:

1. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each including the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam and a reset cam thereon, a drive for said cam shaft comprising a planetary gear train having a sun gear operatively connected through a worm and a solenoid-operated clutch to a ground-engaging wheel, an internal ring gear operatively connected through a second worm to a reversible electric motor, said cam shaft being connected with a planet carrier of said planetary gear train, a skip cam

circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, a reset cam circuit including a reset cam switch operated by said reset cam and connected to said selector switch and to one side of said electric motor, said reset cam switch being a double throw switch and having one contact thereof connected to a skip cam indicating circuit, an advance-retard circuit connected to said selector switch and to opposite sides of said electric motor and including advance-retard switch means for connecting either of said sides of said electric motor to said selector switch or for interrupting said advance-retard circuit, and a skip cam drive actuating circuit connected to said selector switch and including the solenoid of said solenoid operating clutch, said selector switch including contact means for selectively connecting said left and right spray gun operating circuits to either or both of said feed circuit and said skip cam circuit, and for connecting said feed circuit to said skip cam drive actuating circuit and said reset cam circuit.

2. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each including the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam and a reset cam thereon, a drive for said cam shaft comprising a planetary gear train having a sun gear operatively connected through a worm and a solenoid-operated clutch to a ground-engaging wheel, an internal ring gear operatively connected through a second worm to a reversible electric motor, said cam shaft being connected with a planet carrier of said planetary gear train, a skip cam circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, a reset cam circuit including a reset cam switch operated by said reset cam and connected to said selector switch and to one side of said electric motor, an advance-retard circuit connected to said selector switch and to opposite sides of said electric motor and including advance-retard switch means for connecting either of said sides of said electric motor to said selector switch or for interrupting said advance-retard circuit, and a skip cam drive actuating circuit connected to said selector switch and including the solenoid of said solenoid operating clutch, said selector switch including contact means for selectively connecting said left and right spray gun operating circuits to either or both of said feed circuits and said skip cam circuit, and for connecting said feed circuit to said skip cam drive actuating circuit and said reset cam circuit.

3. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each including the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam and a reset cam thereon, a drive for said cam shaft comprising a planetary gear train having a sun gear operatively connected through a worm and a solenoid-operated clutch to a ground-engaging wheel, an internal ring gear operatively connected through a second worm to a reversible electric motor, said cam shaft being connected with a planet carrier of said planetary gear train, a skip cam circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, a reset cam circuit including a reset cam switch operated by said reset cam and connected to said selector switch and to one side of said electric motor, an advance-retard circuit connected to said selector switch and to opposite sides of said electric motor and including advance-retard switch means for connecting either of said sides of said electric motor to said

selector switch or for interrupting said advance-retard circuit, and a skip cam drive actuating circuit connected to said selector switch and including the solenoid of said solenoid operating clutch, said selector switch having switch means for connecting said feed circuit with either or both of said spray gun operating circuits and for simultaneously connecting said feed circuit with said reset cam circuit.

4. The machine of claim 3, said selector switch having switch means for connecting said skip cam circuit with either or both of said spray gun operating circuits and for simultaneously connecting said feed circuit with said skip cam drive actuating circuit.

5. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each including the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam and a reset cam thereon, a drive for said cam shaft comprising a planetary gear train having a sun gear operatively connected through a worm and a solenoid-operated clutch to a ground-engaging wheel, an internal ring gear operatively connected through a second worm to a reversible electric motor, said cam shaft being connected with a planet carrier of said planetary gear train, a skip cam circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, a reset cam circuit including a reset cam switch operated by said reset cam and connected to said selector switch and to one side of said electric motor, an advance-retard circuit connected to said selector switch and to opposite sides of said electric motor and including advance-retard switch means for connecting either of said sides of said electric motor to said selector switch or for interrupting said advance-retard circuit, and a skip cam drive actuating circuit connected to said selector switch and including the solenoid of said solenoid operating clutch, said selector switch having switch means for connecting said skip cam circuit with either or both of said spray gun operating circuits and for simultaneously connecting said feed circuit with said skip cam drive actuating circuit.

6. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each including the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam and a reset cam thereon, a drive for said cam shaft comprising a solenoid-operated clutch operatively connected to a ground-engaging wheel, and to said cam shaft, a reversible electric motor operatively connected to said cam shaft, a skip cam circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, a reset cam circuit including a reset cam switch operated by said reset cam and connected to said selector switch and to one side of said electric motor, an advance-retard circuit connected to said selector switch to opposite sides of said electric motor and including an advance-retard switch means for connecting either of said sides of said electric motor to said selector switch or for interrupting said advance-retard circuit, and a skip cam drive actuating circuit connected to said selector switch and including the solenoid of said solenoid operating clutch, said selector switch including contact means for selectively connecting said left and right spray gun operating circuits to either or both of said feed circuit and said skip cam circuit, and for connecting said feed circuit to said skip cam drive actuating circuit and said reset cam circuit.

7. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each in-

cluding the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam and a reset cam thereon, a drive for said cam shaft comprising a solenoid-operated clutch operatively connected to a ground-engaging wheel, and to said cam shaft, a reversible electric motor operatively connected to said cam shaft, a skip cam circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, a reset cam circuit including a reset cam switch operated by said reset cam and connected to said selector switch and to one side of said electric motor, an advance-retard circuit connected to said selector switch to opposite sides of said electric motor and including an advance-retard switch means for connecting either of said sides of said electric motor to said selector switch or for interrupting said advance-retard circuit, and a skip cam drive actuating circuit connected to said selector switch and including the solenoid of said solenoid operating clutch, said selector switch having switch means for connecting said feed circuit with either or both of said spray gun operating circuits and for simultaneously connecting said feed circuits with said reset cam circuit.

8. The machine of claim 7, said selector switch having switch means for connecting said skip cam circuit with either or both of said spray gun operating circuits and for simultaneously connecting said feed circuit with said skip cam drive actuating circuit.

9. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each including the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam and a reset cam thereon, a drive for said cam shaft comprising a solenoid-operated clutch operatively connected to a ground-engaging wheel, and to said cam shaft, a reversible electric motor operatively connected to said cam shaft, a skip cam circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, a reset cam circuit including a reset cam switch operated by said reset cam and connected to said selector switch and to one side of said electric motor, an advance-retard circuit connected to said selector switch to opposite sides of said electric motor and including an advance-retard switch means for connecting either of said sides of said electric motor to said selector switch or for interrupting said advance-retard circuit, and a skip cam drive actuating circuit connected to said selector switch and including the solenoid of said solenoid-operating clutch, said selector switch having switch means for connecting said skip cam circuit with either or both of said spray gun operating circuits and for simultaneously connecting said feed circuit with said skip cam drive actuating circuit.

10. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each including the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam and a reset cam thereon, a drive for said cam shaft comprising a solenoid-operated clutch operatively connected to a ground-engaging wheel, and to said cam shaft, an electric motor operatively connected to said cam shaft, a skip cam circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, a reset cam circuit including a reset cam switch operated by said reset cam and connected to said selector switch and to one side of said electric motor, and a skip cam drive actuating circuit connected to said selector switch and including the solenoid of said solenoid operating clutch, said selector switch including contact means for connecting said left and right spray gun operating circuits selectively to either or both of said feed circuit and said skip cam circuit, and for connecting said feed circuit to said skip cam drive actuating circuit and said reset cam circuit.

11. The machine of claim 10, said contact means connecting said reset cam circuit to said feed circuit simultaneously with the connection of either or both spray gun operating circuits only with said feed circuit.

12. In a road striping machine, right and left spray guns, right and left spray gun operating circuits each including the solenoid of a solenoid-operated spray gun control valve, a multi-station selector switch having said operating circuits connected therewith, a source of energy connected to said selector switch by a feed circuit, circuit interrupter means comprising a cam shaft having a skip cam thereon, means for driving said cam shaft, a skip cam circuit including a skip cam switch operated by said skip cam and connected to said source of energy and also to said selector switch, said selector switch including contact means for connecting either or both of said spray gun operating circuits to said feed circuit to spray either a single or double continuous line, means for effecting rotation of said cam shaft to reposition said skip cam to an initial position during the spraying of the said single or double continuous line, said selector switch further including contact means for connecting either of said operating circuits to said skip cam circuit.

13. The machine of claim 12, said selector switch further including contact means for connecting one of said operating circuits to said skip cam circuit and the other of said operating circuits to said feed circuit.

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