

1,239,293.

J. M. MURPHY.
STREET SWEEPING MACHINE.
APPLICATION FILED AUG. 21, 1913.

Patented Sept. 4, 1917.
5 SHEETS—SHEET 1.

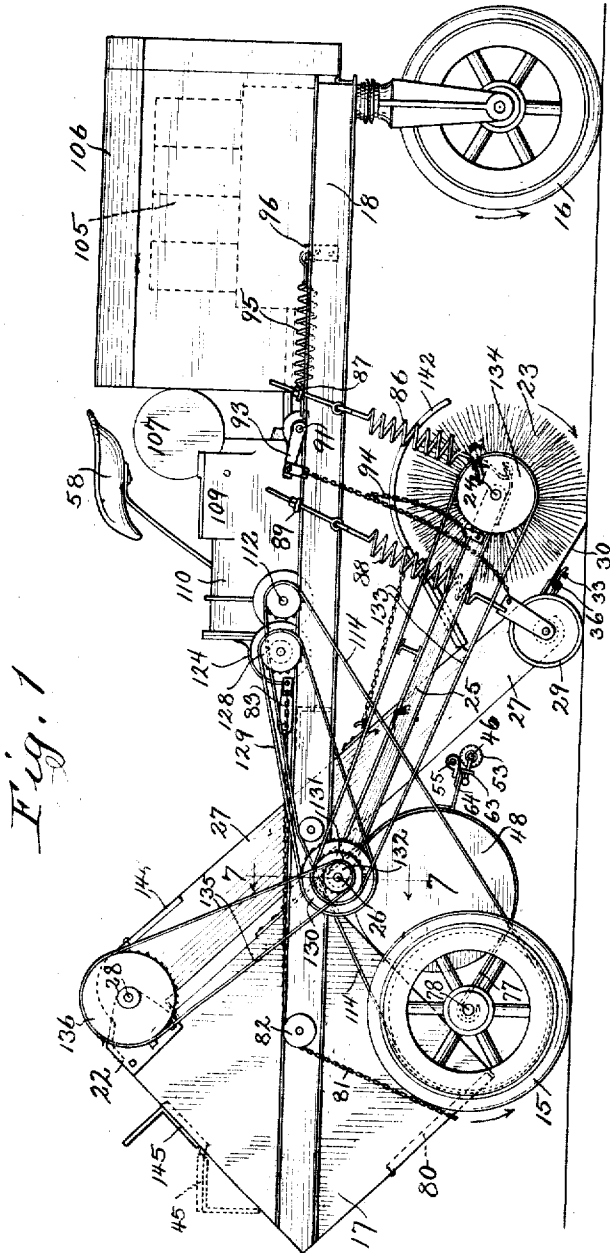


Fig. 1

Witnesses:
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M. Jacker

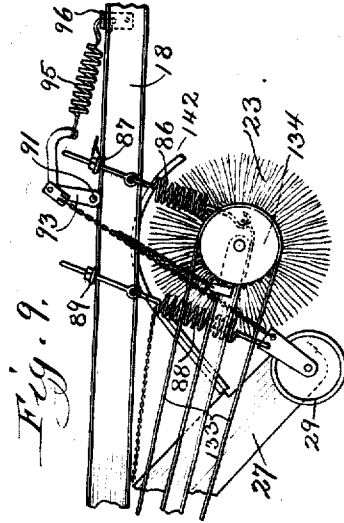


Fig. 9.



Fig. 8.

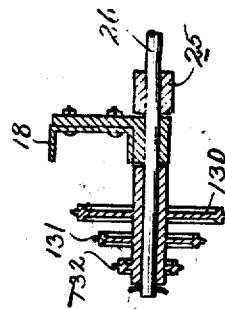


Fig. 7.

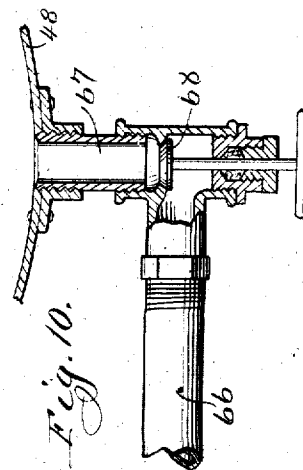
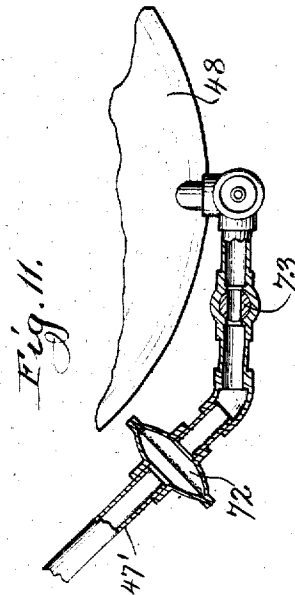
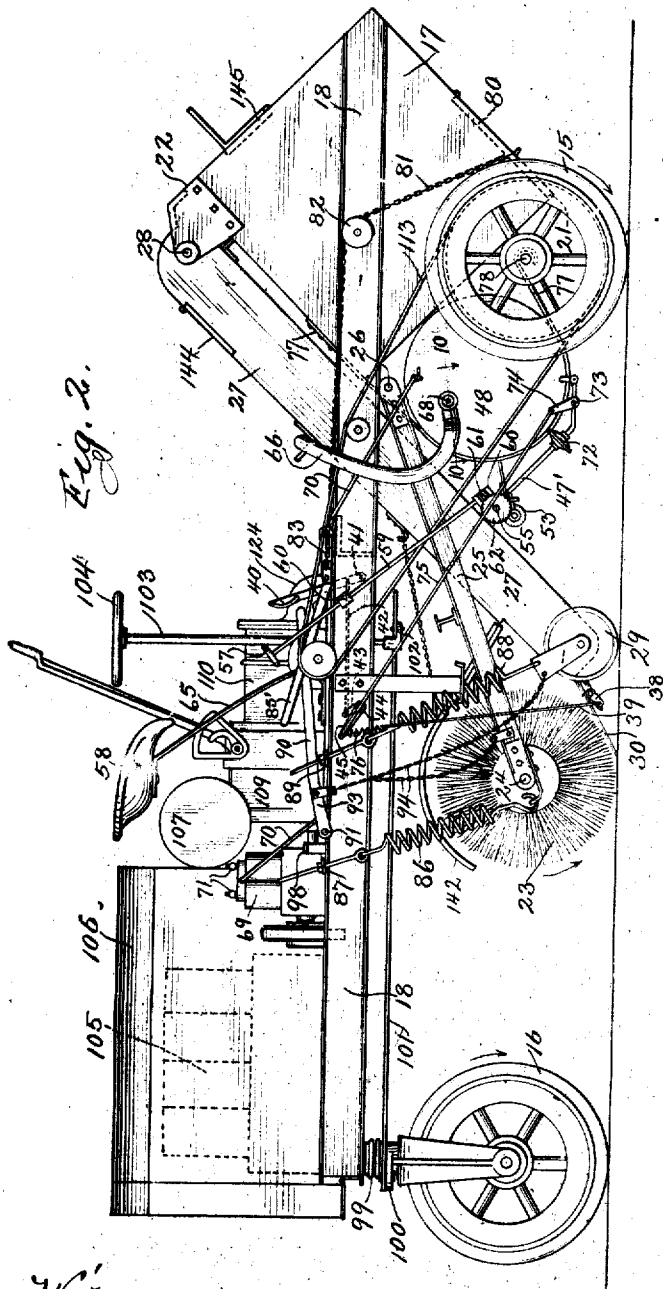
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5 SHEETS--SHEET 2.



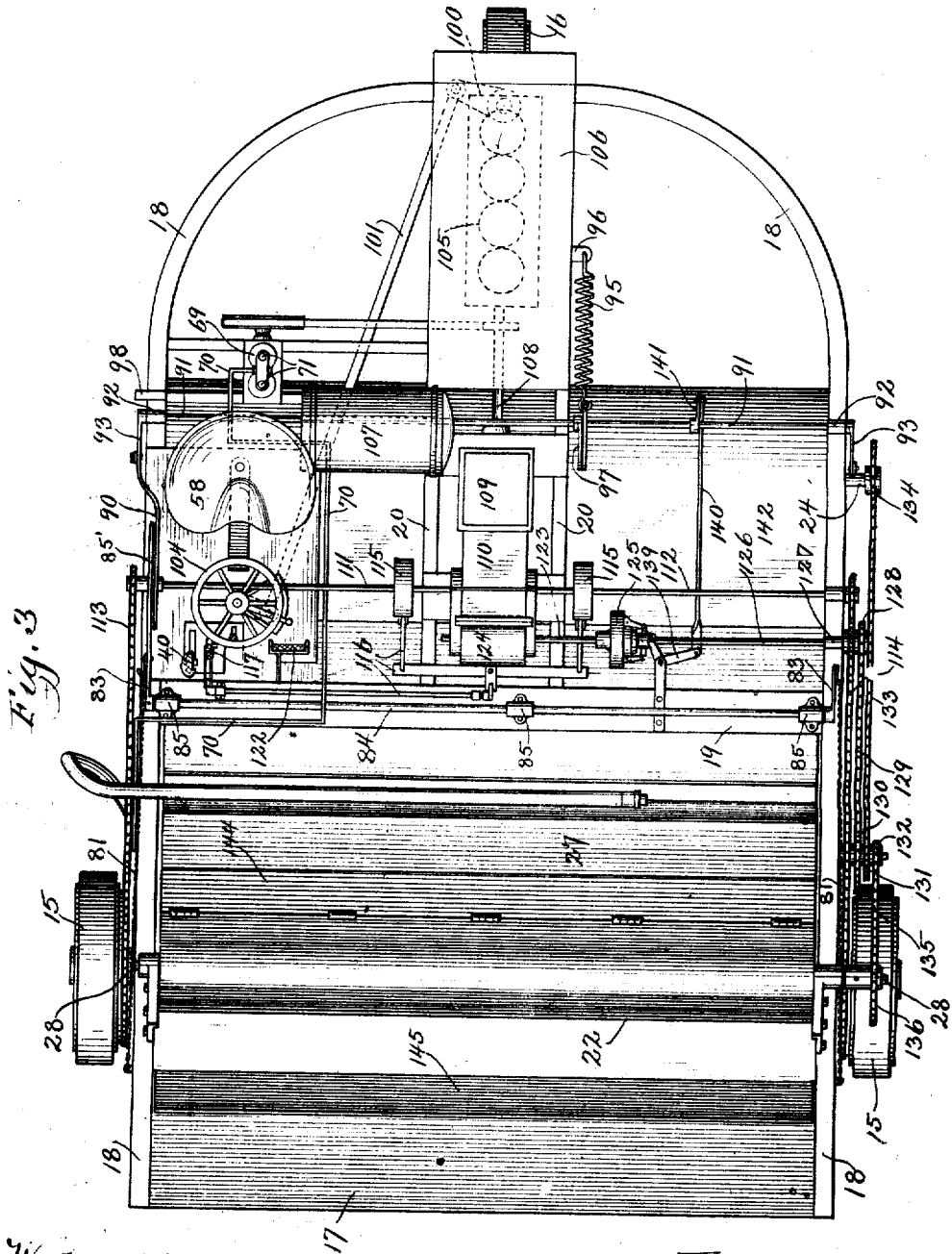
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5 SHEETS—SHEET 3.

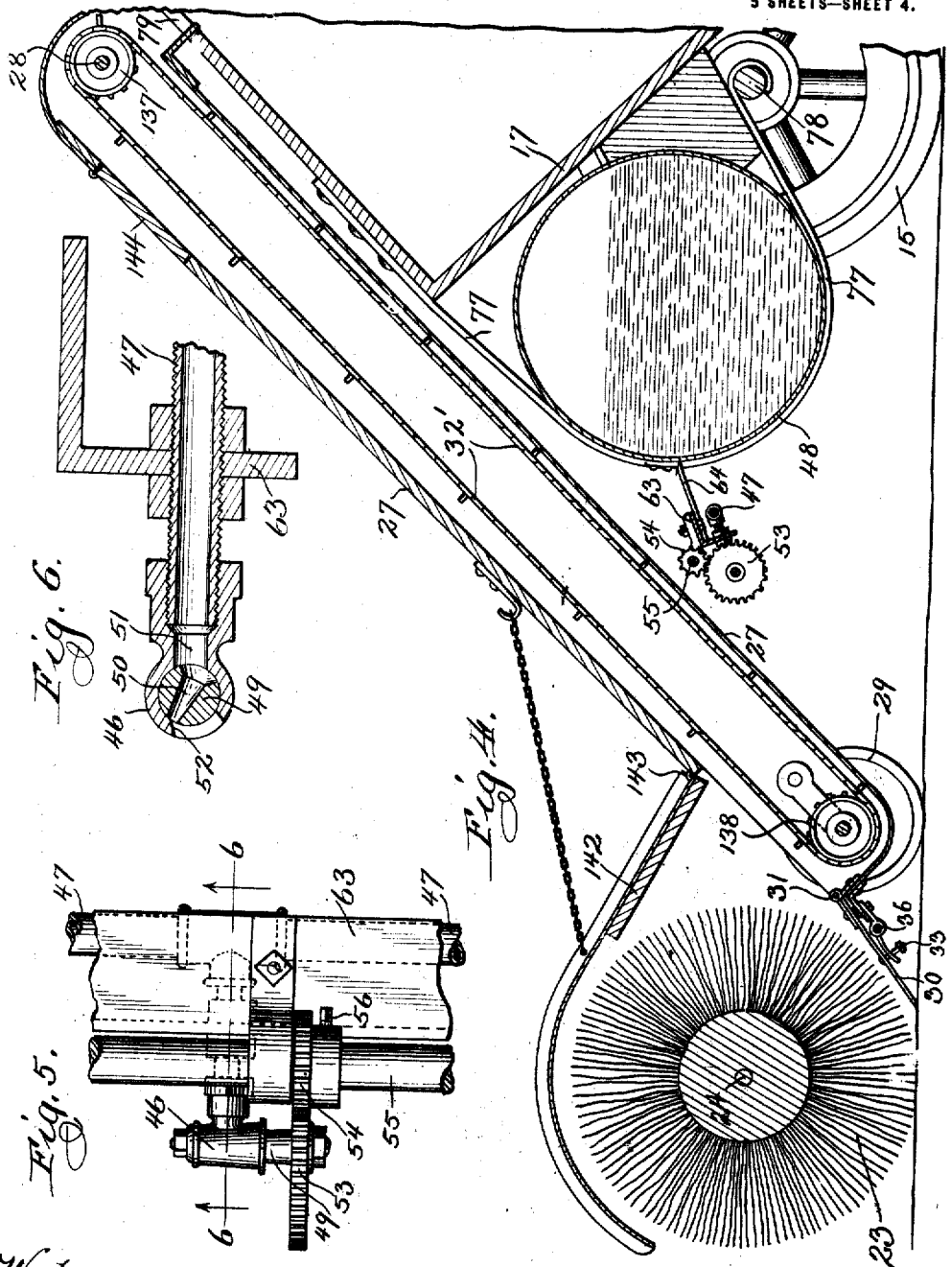


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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

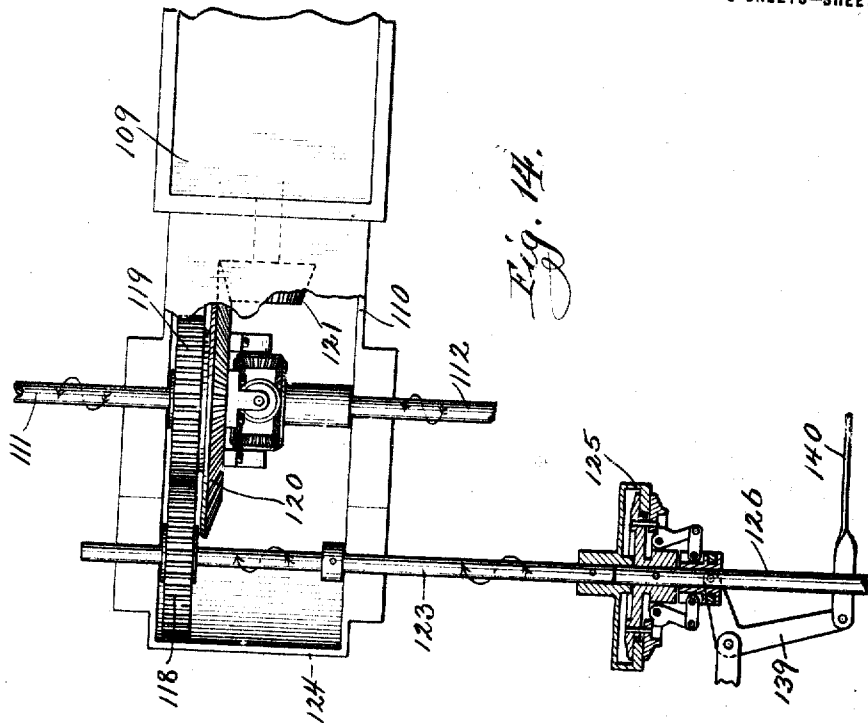


Fig. 14.

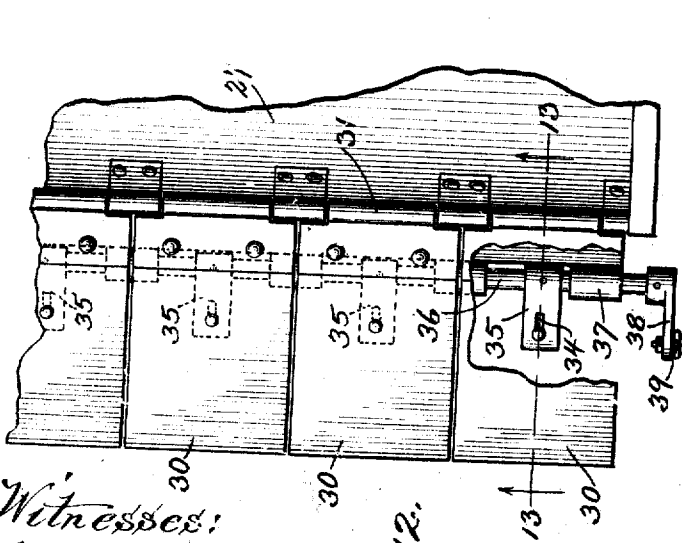


Fig. 12.

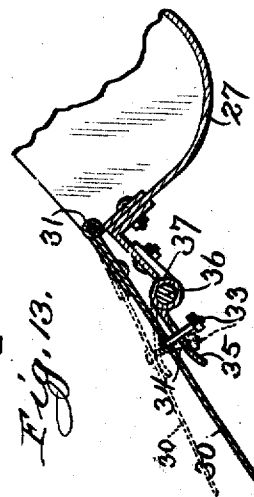


Fig. 13.

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UNITED STATES PATENT OFFICE.

JOHN M. MURPHY, OF ELGIN, ILLINOIS.

STREET-SWEEPING MACHINE

1,239,293.

Specification of Letters Patent.

Patented Sept. 4, 1917.

Application filed August 21, 1913. Serial No. 785,859.

To all whom it may concern:

Be it known that I, JOHN M. MURPHY, a citizen of the United States, residing at Elgin, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Street-Sweeping Machines, of which the following is a specification.

My invention relates to street sweeping machines designed to collect dirt from a street and carry it to a dumping place; and among the objects of my improvements are, first, to provide a truck supported on traction wheels and having a dirt receptacle shaped and arranged to improve the operation with respect to the size of load which the machine will take and practically handle; second, to provide a sweeper brush, a dirt gathering pan, and dirt elevator arranged to be adjusted relative to the road bed and designed to improve the operation with respect to the collecting and delivery of dirt into the receptacle; third, to provide improved means for spraying water upon the street immediately in advance of the brush and dirt pan in a sheet of spray; fourth, to provide a motor for propelling the truck upon the street and operating the brush and elevator; fifth, to provide means whereby the power driving the brush and elevator is automatically shut off when said brush and elevator are lifted; and sixth, to provide an improved dust pan connected with the elevator whereby the travel of the pan in front of the brush is bettered. Other objects will appear from the description to follow.

The machine is a combination of a street sweeping means and a water spraying means which are so arranged and constructed to operate in conjunction with one another as to accomplish the one result of gathering dirt from the street and depositing it into a receptacle without raising any objectionable dust.

I attain the above named objects by the mechanism illustrated in the accompanying five sheets of drawings in which:

Figure 1, (Sheet 1) is an elevation of the left side of a machine embodying my invention; Fig. 2, (Sheet 2) is an elevation of the right side of the same; Fig. 3, (Sheet 3) is a top plan view; Fig. 4 (Sheet 4) is an enlarged vertical sectional view through the elevator and associated parts; Fig. 5 (Sheet 4) is a fragmentary plan view show-

ing one of the water spraying devices; Fig. 6 (Sheet 4) is a sectional view taken on line 6—6 of Fig. 5; Fig. 7 (Sheet 1) is a vertical sectional view taken on line 7—7 of Fig. 1, showing a part of the drive gear; Fig. 8 (Sheet 1) is a detail sectional view showing a part of the brush lifting mechanism; Fig. 9 (Sheet 1) is a detail view showing the brush and dirt elevator in a raised position; Fig. 10 (Sheet 2) is an enlarged detail sectional view showing the inlet on the water tank; Fig. 11 (Sheet 2) is an enlarged detail view partly in section showing the outlet on the water tank; Fig. 12 (Sheet 5) is an enlarged detail view of the dirt pan employed in the machine; Fig. 13 (Sheet 5) is a vertical sectional view taken on line 13—13 of Fig. 12; and Fig. 14 (Sheet 5) is an enlarged detail plan view partly in section showing a part of the driving mechanism.

Similar reference characters refer to similar parts throughout the several views.

The truck is preferably mounted on two front wheels 15 and one rear steering wheel 16, and comprises a dirt receptacle 17, a peripheral U-shaped beam or channel 18, cross beam 19 and central pieces 20, all rigidly secured together by rivets and supporting the different parts of the machine. The frame of the machine being supported at three points, *i. e.*, at each wheel it is unnecessary to provide for any flexibility in the frame which greatly simplifies the construction of the frame as well as of the different mechanisms mounted thereon.

The dirt receptacle 17 is substantially square in cross section, and of a length to extend entirely across the frame between the parallel sides of the U-shaped beam or frame 18 corresponding to the upper ends of the U to the forward ends of which it is rigidly secured and acts as a stiffening brace for the frame as well as the receptacle into which the dirt from the street is delivered. The receptacle 17 is positioned at the front of the truck with one corner 21 lowermost and the diametrically opposite corner 22 uppermost so that the dirt which is delivered into the upper part of same will be deposited or settle within the same in such manner as to fill or occupy the entire interior of said receptacle. In this manner all the space within the receptacle is made available for the purpose of storing or re-

taining dirt while a full load is being collected, and the size of the receptacle is reduced to a minimum.

A rotary sweeper brush 23 is rigidly mounted on a shaft 24 which is journaled in the lower free ends of two carrying beams 25 pivoted at 26 to the beam 18 and forming a part of the truck. The position of the brush 23 is approximately midway between the front wheels 15 and the rear wheel 16, and the shaft 24 on which the brush 23 is mounted has its bearings in the carrying beams 25 sufficiently loose so that the axis of the brush 23 can tilt with respect to the plane of the supporting frame or surface of the road and thus at all times permit the brush to fall into such looseness and come into contact with the street or roadbed automatically throughout its entire length while the machine is in action.

A dirt elevator is provided immediately in advance of brush 23 for catching the dirt swept up by the brush and elevating the same to the upper part of the receptacle, and comprises a casing 27 pivotally mounted at its upper end to the receptacle at 28 so that its lower end is free to swing up and down. The lower end of the casing is provided at each side with a wheel 29, Fig. 4, to travel on the street and support the lower end of the casing at a short distance above the ground during its travel.

The lower end of the casing is provided with a sectional dirt pan, the sections 30 of which are pivoted at 31 to have their free lower ends resting by gravity upon the ground. The purpose of making the dirt pan in sections is to have it automatically adjust itself to uneven road beds as it is dragged thereon and thus prevent any dirt from being thrown beneath the pan by the brush. The pan is located immediately in front of the brush, see Fig. 4, Sheet 4, so that the dirt as swept up by the brush will pass up the incline of the pan and be caught in the lower end of the casing 27 whence it is elevated and deposited into the receptacle.

The sections 30 of the pan, being pivotally mounted at 31, may incidentally be caught by the brush and be turned up above the line of their pivotal point unless some means is provided to prevent. To positively limit the upturning of the pan sections on their pivot, I provide a bolt 33 (Figs. 12 and 13) on the lower side of each pan section 30, which extends loosely through a slot 34 in a cam plate 35 rigidly mounted on a rock shaft 36 journaled in bearings 37 on the casing 27. The relative positions of the pivot 31, rock shaft 36, bolt 33, and slot 34 are such that the upturning of the pan sections will be limited at the proper time by the bolt 33 contacting with the end of the slot 34 as indicated by dotted lines in Fig. 13. When the machine is traveling up grade and is

brought to a stand-still, the free ends of the sections 30 which drag on the ground must be lifted up off the ground slightly to avoid being bent or broken by contact with the ground because the machine will travel backward or down grade slightly by gravity and also on account of some lost motion in the driving gear, and to thus lift the free ends of the pan sections in unison, I secure a crank arm 38 rigidly to one end of the rock shaft 36, and connect the free end of said crank arm 38 to a link or rod 39 which is arranged to be operated by a pedal 40. The pedal is pivotally mounted at 41 to the frame of the machine, and connected by a rod 42 to a crank arm 43 on shaft 44 also mounted on the frame of the machine; a second crank arm 45 is mounted on shaft 44 and has its free end connected to the rod 39, so that as the pedal is pushed to the right as viewed in Fig. 2, the rod 39 and also the free ends of the pan sections will be lifted. Referring again to Figs. 12 and 13, it will be seen that as the free end of the crank arm 38 is lifted the rock shaft 36 will be partially rotated, and the free ends of all the cam plates 35 will be lifted to raise the free ends of the dirt pan sections as indicated by dotted lines in Fig. 13. The lifting or upturning of the cam plates 35 is limited by the bolts 33 on the pan sections coming against the left end of the slots 34, as viewed in Figs. 12 and 13. By placing the rock shaft 36 some distance from the pivotal point of the pan sections the operation of lifting said pan sections is made easier because the leverage is shortened.

To prevent dust from being raised and escaping from the machine a water spraying device is provided to spray water upon the street immediately in advance of the brush 23 and the dirt pan, comprising a series of spraying nozzles 46 (Figs. 5 and 2) connected by a horizontal pipe 47 and a connecting pipe 47¹ to a water tank 48 secured to the frame of the machine as clearly shown on Sheets 2 and 4 of the drawings. The water in tank 48 is kept under constant pressure so that the water will be forced out of the nozzles 46 in a sheet of spray and not in streams.

The nozzles 46 are constructed as seen in Figs. 5 and 6, with a rotatable stem 49 provided with a tapering transverse hole 50 arranged to register with the water inlet 51 communicating with the pipe 47. When the nozzles are in use the position of each stem 49 is as illustrated in Fig. 6, with the larger end of the hole 50 communicating with the inlet 51 and the smaller end of said hole 50 in a position to direct the stream of water under pressure against a flat surface 52 which will convert the stream of water into a thin flat body of spray. It will be noted that the quantity of water passing out through the nozzle 46 can be varied by slightly rotating

the stem 49 in one direction or the other as desired. Should there be any foreign matter in the water large enough to clog the smaller end of the hole 50 the stem 49 can be turned a one half revolution so that the water under pressure from the inlet 51 will pass through the hole 50 in the reverse direction and force the obstruction out through the larger end of hole 50.

- 10 Experience has proven that the quantity of water applied to the dirt upon the street must be regulated somewhat in proportion to the quantity of dirt to give the best results, and this proper amount of water must be applied in a spray.

15 The nozzles 46 of which there is a row arranged in a horizontal line across the machine just below the elevator casing 27 and at such a height from the ground that the several flat volumes of spray from the nozzles 46 will be joined and form one continuous unbroken sheet crosswise of the street and from one side of the machine to the other. These nozzles 46 are all connected to have their stems 49 operated simultaneously, and to this end each stem 49 has rigidly secured to its exposed end a gear wheel 53 which is in constant mesh with a companion gear 54 mounted on a horizontal shaft 55. Each of the gears 54 is secured in position on the shaft 55 by means of set screw 56 so that each of the stems 49 can be individually adjusted in position. When properly adjusted all the stems 49 will be in exactly the same position so that the spray from any one nozzle will be in identical plane with the sheet of spray from any other nozzle, and the stems 49 will all be turned in unison when the shaft 55 is turned. A hand wheel 57 is provided near the operator's seat 58 for turning the shaft 55, said hand wheel being secured to the upper end of a shaft 59 rotatably mounted in bearings 60 and having rigidly mounted on its lower end a gear wheel 61 in constant mesh with a gear 62 rigidly mounted on the one end of the shaft 55, the parts being so connected that all the stems 49 of the nozzles 46 will be rotated in unison in either direction when the hand wheel 57 is turned. An angle iron 63 secured to the tank 48 by suitable braces 64 is provided to support all the nozzles 46 at the bearings for shaft 55. The seat 58 is mounted on the usual curved spring 65 rigidly secured to the frame of the machine.

55 The tank 48 is filled with water through a large hose 66 (Fig. 10) connected to the inlet pipe 67 provided with the valve 68. The valve 68 is opened to admit water into the tank 48 and is closed when the tank is full. The constant pressure is maintained in the tank by means of an air pump 69, Figs. 2 and 3, which is connected by means of a small pipe 70 with the upper part of the tank. Each cylinder of the pump is

provided with a safety valve 71 to prevent any excess pressure. The outlet pipe 47' connecting the water tank 48 to the nozzles 46 is preferably provided with a strainer 72 to prevent dirt passing into the nozzles. 70 The said pipe 47' is also provided with a shut off valve 73, Figs. 2 and 11, which has its handle 74 connected by a rod 75 to the free end of the crank lever 45, so that the valve 73 is open when the pedal is turned to the left as viewed in Fig. 2, and said valve 73 is closed when the pedal is pushed to the right. The valve 73 is open when the pan sections are in their lower position and said valve 73 is closed when the pan sections are raised. A spring 76 is preferably interposed between the rod 39 and the crank arm 45 to prevent any breakage when the pedal is operated, since the crank arm 38 of the pan shaft 36 is positively stopped in its upward movement. 85

The tank is rigidly secured to the frame of the machine by means of a plurality of straps 77 passing about the tank and having one end secured to the front wheel axle 78 and the other end secured to the receptacle Fig. 4. The upper part of the receptacle is provided with an opening 79 into which the dirt from the elevator 32' is discharged. The lower side of the receptacle is provided with a hinged door 80 normally held closed by chains 81 on each side of the truck which, after passing over the idlers 82 have their ends attached to crank arms 83 rigidly mounted on the transverse shaft 84 mounted in bearings 85 secured to the cross beam 19. A hand lever 85' is secured to the shaft 84 for the purpose of manipulating said shaft for opening and closing the door 80. The door 80 is so located and arranged that it will open by force of gravity when released and all the dirt within the receptacle will fall out through the open door. 100

To lessen the weight of the brush upon the street, I connect a coiled contracting spring 86 between the free end of the beams 25 and a bracket 87 on the beam 18 on each side of the machine. Similarly, to lessen the weight of the lower end of the elevator casing upon the street, I connect a coiled contracting spring 88 between the lower end of the elevator casing and a bracket 89 on the beam 18 on each side of the machine. In this manner there is always sufficient weight on the brush to make a clean sweep, and the easy lifting of the brush entirely off the street is facilitated. Preferably only one hand lever 90 is provided for lifting both the brush and the lower end of the elevator casing up off the ground substantially in unison. The hand lever 90 is rigidly mounted on one end of a rock shaft 91 extending entirely across the machine and mounted in bearings 92 on the frame of the machine. Each end of the shaft 91 is provided with a 130

rigid crank arm 93 the free end of which is connected by means of the chains 94 with the free ends of the brush carrying beams 25 and the elevator casing. The hand lever 90 is conveniently made integral with one of the crank arms 93. The parts are so arranged and connected that the lifting of the hand lever 90 from its lower position to its upper position will rock the shaft 91, raise the crank arms 93 from the position shown in Fig. 1 to the position shown in Fig. 9, and lift both the brush and the elevator casing off the ground; the springs 86 and 88 assisting materially in the lifting. To retain the said parts in a lifted position a coiled contracting spring 95 is interposed between a suitable bracket 96 secured to the machine frame and the free end of a crank arm 97 rigidly secured to the shaft 91. The position of the free end of the crank arm 97 with relation to the pull exerted by the spring 95 is such, that practically no pull to rotate shaft 91 is exerted by the spring 95 when the brush and the elevator casing are resting on the ground and the shaft 91 is in the position shown by full lines in Fig. 8, but that said spring 95 will exert a pull to rotate said shaft 91 as soon as the brush and the elevator casing are only slightly lifted off the ground and will rotate said shaft into the position indicated by dotted lines in Fig. 8. The shaft 91 is prevented from rotating, to the right as viewed in Fig. 8, too far by a stop 98 secured to the beam 18, against which one of the crank arms 93 strikes (see Figs. 2 and 3). The hand lever 90 as well as the hand lever 85 is within easy reach of the operator seated in the seat 58.

The steering wheel 16 is mounted to swing about a vertical pivot at 99 and an arm 100 which is rigidly secured to the wheel fork has its free end connected by means of a rod 101 to the free end of the crank arm 102 rigidly secured to the lower end of a vertical shaft 103 mounted in bearings on the machine frame. A hand wheel 104 is secured to the upper end of the shaft 103 by means of which the shaft is turned in its bearings to turn the rear wheel 16 and steer the machine in its course.

A motor 105 is mounted on the rear end of the truck frame and is inclosed in a hood or housing 106. By connecting means to be described the motor operates the front wheels 15, the elevator 32', the brush 23, and the pump 69. In the drawings the motor 105 is shown to be a gasoline engine, and a gasoline tank 107 is provided to carry a supply of gasoline. The engine shaft is seen at 108, Fig. 3, the usual transmission gear located within the housing 109, and the usual differential gear is within the housing 110, out of which project in opposite directions the shafts 111 and 112, the former connected by means of chain and sprockets 113

to one front wheel 15, and the latter connected by means of chain and sprockets 114 to the other front wheel 15. Suitable brake wheels 115 are provided on each shaft 111 and 112 and are connected by the usual levers and rods 116 to the foot lever 117, by means of which the machine is stopped.

The rotation of the brush and the elevator must be the reverse of that of the front traction wheels 15 and to secure such reverse rotation I mount a gear 118, Fig. 14, to constantly mesh with another gear 119 rigid with the gear 120 of the differential gearing which is in constant mesh with the gear 121 rigidly mounted on the engine shaft 108. There is the customary clutch (not shown), between the engine shaft 108 and the engine 105 which is operated by the foot lever 122, Fig. 3.

The gear 118 is rigidly mounted on shaft 123 mounted in suitable bearings in the casing 124 rigidly secured to the casing 110. One end of the shaft 123, Figs. 14 and 3, extends out of the casing 124 a material distance where it has rigidly secured thereto one member of a clutch 125, the other member of which is mounted rigidly on the end of a concentric shaft 126, so that the operation of shaft 126 is controlled by the open or closed position of the clutch 125. The end of the shaft 126 remote from the clutch 125 is mounted in a suitable bearing 127 on beam 18 and has rigidly secured thereon a sprocket 128 connected by chain 129 to the sprocket 130 rigid with the sprockets 131 and 132 which are loosely mounted on the shaft 26 forming the fulcrum for the beams 25. The sprocket wheel 131 is connected by means of chain 133 to the sprocket wheel 134 rigidly mounted on shaft 24 carrying the brush, and the sprocket wheel 132 is connected by means of the chain 135 to the sprocket wheel 136 rigidly mounted on the shaft 28 forming the fulcrum of the upper end of the elevator casing 27. The shaft 28 extends from one side of the machine to the other and has rigidly mounted thereon the upper driving sprocket wheels 137, Fig. 4, of a belt conveyer 32'. At the lower end the belt conveyer passes around the idlers 138.

The shaft 126 rotates in an opposite direction to the shafts 111 and 112 and it is connected to positively drive or rotate the brush 23 and the elevator belt.

The operation of said shaft 126 is controlled by the clutch 125, which, if closed, will rotate shaft 126, and if open, the shaft 126 will remain idle. The operation of the clutch 125 is conveniently performed simultaneously with the lowering and raising of the brush 23 and elevator casing 27 by connecting the clutch operating lever 139, Figs. 3 and 14, by means of a rod 140 to the free end of the crank arm 141 rigidly

mounted on the rock shaft 91. The parts are so arranged and connected that the clutch 125 will be closed when the brush 23 and casing 27 are lowered to the ground, and the clutch 125 will be open when the brush 23 and the casing 27 are in a raised position. Thus by lowering the hand lever 90 the brush 23 and elevator 32 are caused to operate and by raising the said hand lever 90 the brush 10 and elevator are placed in their inoperative position.

A shield or baffle 142 is mounted on the elevator casing 27 to extend from the lower end of the upper side of said casing at 143 to a point above the rear side of the brush 23 to prevent any dirt from being thrown above the brush. Hinged doors 144 and 145 are provided on the upper sides of the elevator casing 27 and the dirt receptacle 17 20 respectively.

I will not claim herein the sprinkling device *per se*, in view of the fact that the same has been held to more properly constitute the subject matter for a divisional application.

I am aware that prior to my invention street sweeping machines have been made with a vertically swinging rotatable brush operating in conjunction with an elevator, a dirt receptacle and a sprinkling means, and I therefore do not claim such a combination broadly, but I claim:—

1. In an apparatus of the class described, a dirt pan comprising a plurality of sections each of which is pivotally connected at one end to a carrying member and arranged to have its free end gravitate upon the ground, a rock shaft under the pan sections remote from, and parallel to the axis of the pivotal connections of the sections, slotted cam plates rigidly secured to said rock shaft arranged to engage the under sides of said sections, headed bolts depending from the pan sections and extending through the slots in the cam plates whereby the raising of the pan sections is limited, and means for oscillating the rock shaft.

2. In an apparatus of the class described, a truck frame, an inclined elevator mounted on said frame having its upper end pivotally connected to the frame to have its lower end free to move up and down in an arc, a pair of inclined beams having their upper ends pivotally connected to said frame and a sweeper brush rotatably mounted on the lower ends of said beams so that the sweeper brush is free to move up and down in an arc, a rock shaft mounted on said frame provided with a crank arm at each end, flexible connections between the free ends of said crank arms and the lower free ends of said elevator and inclined beams, a third crank arm on said rock shaft, a spring connected between the free end of said third crank arm and the frame to yieldingly hold the rock shaft in a position required to hold

the free ends of the elevator and inclined beams in a raised position.

3. In a street sweeping machine, the combination with a supporting frame, of dust collecting means including a brush and a conveyer associated with said brush, said conveyer being pivotally mounted at its upper end and relatively free at its lower end which approximates the surface of the road, means for pivoting the brush relative to the frame, spring supporting means for the brush and free end of the conveyer, a common positive elevating means for the brush and conveyer, said elevating means comprising chains connected to an actuating lever and having branches running to the free end of the conveyer and to the brush, in combination with means for retaining the brush and conveyer in elevated positions comprising a spring and intermediate connections adapted to be thrown to a dead center position, substantially as described.

4. In a street sweeping machine, the combination with a frame having side members, of supporting wheels at the forward end of said frame, a receptacle supported between said frame members at approximately the center of the receptacle, the upper walls of the receptacle converging upwardly and provided with an inlet at the highest point thereof, and the lower walls converging downwardly to a point in advance of the axis of the supporting wheels and adjacent to the ground, the lower portion of the receptacle being provided with a discharge opening and closure therefor, and collecting means adapted to discharge into the inlet of the receptacle.

5. In a street sweeping machine, the combination with a frame having side members, of supporting wheels at the forward end of said frame, a receptacle supported between said frame members at approximately the center of the receptacle, the upper walls of the receptacle converging upwardly and provided with an inlet at the highest point thereof, and the lower walls converging downwardly to a point in advance of the axis of the supporting wheels and adjacent to the ground, the lower portion of the receptacle being provided with a discharge opening and closure therefor, and collecting means adapted to discharge into the inlet of the receptacle, said collecting means being pivoted at the top of the receptacle and extending downwardly approximately parallel to the adjacent upper wall of the receptacle and to a point near the ground, substantially as described.

6. In a street sweeping machine, the combination with a frame having side members, of supporting wheels at the forward end of said frame, a receptacle supported between said frame members at approximately the center of the receptacle, the upper walls of

the receptacle converging upwardly and provided with an inlet at the highest point thereof, and the lower walls converging downwardly to a point in advance of the axis of the supporting wheels and adjacent to the ground, the lower portion of the receptacle being provided with a discharge opening and closure therefor, collecting means adapted to discharge into the inlet of the receptacle, said collecting means extending downwardly approximately parallel to the adjacent upper wall of the receptacle and to a point near the ground and leaving an approximately inverted V-shaped space between the adjacent lower wall of the receptacle and the collecting means, and a water tank supported in said space and provided with spraying means, substantially as and for the purpose described.

7. In a street sweeping machine, the combination with a frame having side members, of supporting wheels at the forward end of said frame, a receptacle supported between said frame members at approximately the center of the receptacle, the upper walls of the receptacle converging upwardly and provided with an inlet at the highest point thereof, and the lower walls converging downwardly to a point in advance of the axis of the supporting wheels and adjacent to the ground, the lower portion of the receptacle being provided with a discharge opening and closure therefor, collecting means adapted to discharge into the inlet of the receptacle, said collecting means extending downwardly approximately parallel to the adjacent upper wall of the receptacle and to a point near the ground and leaving an approximately inverted V-shaped space between the adjacent lower wall of the receptacle and the collecting means, and a water tank supported in said space and provided with spraying means, said tank being secured in place by hangers engaging the same and the wheeled supporting means at one side and the receptacle at the other side.

8. In a street sweeping machine, the combination with a frame having side members, of supporting wheels at the forward end of said frame, a receptacle supported between said frame members at approximately the center of the receptacle, the upper walls of the receptacle converging upwardly and provided with an inlet at the highest point thereof, and the lower walls converging downwardly to a point in advance of the axis of the supporting wheels and adjacent to the ground, the lower portion of the receptacle being provided with a discharge opening and closure therefor, collecting means adapted to discharge into the inlet of the receptacle, said collecting means being pivoted to the top of the receptacle and extending downwardly approximately parallel

to the adjacent upper wall of the receptacle and to a point near the ground and leaving an approximately V-shaped space between the adjacent lower wall of the receptacle and the collecting means, beams pivotally mounted in said space between the receptacle and the collecting means and passing rearwardly across the collecting means, and a brush carried by the free ends of said beams operatively associated with the collecting means.

9. In a street sweeping machine, the combination with a frame having side members, of supporting wheels at the forward end of said frame, a receptacle supported between said frame members at approximately the center of the receptacle, the upper walls of the receptacle converging upwardly and provided with an inlet at the highest point thereof, and the lower ends converging downwardly to a point in advance of the axis of the supporting wheels and adjacent to the ground, the lower portion of the receptacle being provided with a discharge opening and closure therefor, collecting means adapted to discharge into the inlet of the receptacle, said collecting means being pivoted at the top of the receptacle and extending downwardly approximately parallel to the adjacent upper wall of the receptacle and to a point near the ground and leaving an approximately V-shaped space between the adjacent lower wall of the receptacle and the collecting means, a water tank supported in said space and provided with spraying means, beams pivotally mounted in said space between the receptacle and the collecting means and passing rearwardly across the collecting means, and a brush carried by the free ends of said beams operatively associated with the collecting means.

10. In a street sweeping machine, the combination with a frame having side members, of supporting wheels at the forward end of said frame, a receptacle supported between said frame members at approximately the center of the receptacle, the upper walls of the receptacle converging upwardly and provided with an inlet at the highest point thereof, and the lower walls converging downwardly to a point in advance of the axis of the supporting wheels and adjacent to the ground, the lower portion of the receptacle being provided with a discharge opening and closure therefor, collecting means adapted to discharge into the inlet of the receptacle, said collecting means extending downwardly approximately parallel to the adjacent upper wall of the receptacle and to a point near the ground and leaving an approximately inverted V-shaped space between the adjacent lower wall of the receptacle and the collecting means, a water tank supported in said space and provided with spraying means, a hose section con-

nected to the tank by which the latter may be filled, and a support mounted on the collecting means for said hose section when in inoperative position.

5 11. In a street sweeping machine the combination with a supporting frame, of a wheeled support at the forward end thereof, a receptacle mounted on said frame and depending therefrom forwardly of the axis of
10 the wheels to a position near the ground, collecting means discharging into the upper portion of the receptacle, and a closure for the discharge opening at the front of the lower portion of the receptacle, said closure
15 being pivoted at its upper end to swing outwardly and the rear lower wall of the receptacle inclining downwardly and forwardly, substantially as described.

12. In a street sweeping machine, a brush,
20 a movably mounted dirt pan operably associated with the brush, valved means for spraying the ground, and mechanism for lowering and raising the dirt pan while simultaneously opening or closing the valve
25 of the spraying means.

13. In a street sweeping machine, a brush, means for receiving the dirt from the brush, said means being mounted for movement
30 into and out of operative position, means for moistening the ground, controlling means for the moistening means, and means for adjusting both said controlling means and said dirt receiving means by manipulation of one
35 of them.

14. In a street sweeping machine, dirt collecting instrumentalities, means for raising and lowering the same with reference to the ground including an operating lever, a crank
40 operatively connected therewith, connections between the crank and the dirt collecting means effecting the raising and lowering of said last mentioned means in keeping with the position of the crank, in combination
45 with means for assisting in maintaining the dirt collecting means in raised position comprising an arm pivoted near the end of the crank and extending backwardly therebeyond, and a spring connected to the free end
50 of the arm and to a fixed part of the machine, said arm being shaped to pass through and depend in rear of the pivoted end of the crank when the dirt collecting means is lowered to operating position to render the
55 spring inactive.

15. In a street sweeping machine, dirt collecting instrumentalities, and a receptacle into the top of which the dirt collecting instrumentalities discharge, said receptacle being closed throughout, save at its inlet and
60 being of angular formation in cross section to present converging upper walls meeting at approximately the inlet of the receptacle and similar lower walls forming a hopper adapted to discharge at approximately the
65 juncture of the lower walls, one of the walls

being provided with a movable closure to normally close the discharge opening.

16. In a street sweeping machine, the combination with a supporting frame having
70 wheel supports at its opposite ends, dirt collecting instrumentalities arranged to approach the ground at a point intermediate of the wheel supports, a receptacle into which the dirt collecting instrumentalities
75 discharge, said receptacle being mounted on the frame and having a portion depending below the frame in advance of the forward wheel support and between the latter.

17. In a street sweeping machine, the combination with a wheeled supporting frame, a
80 motor thereon, collecting means including a rotary brush, driving instrumentalities between the motor and the wheels of the frame and between the motor and the rotary brush including differential mechanism for the
85 wheels, and means for maintaining a constant drive of the brush irrespective of the varying movements of the differential mechanism.

18. In a street sweeping machine, the combination with a wheeled supporting
90 frame, of collecting means including a rotary brush, a motor mounted on said frame, differential driving connections between the motor and the wheels of the frame, and constant
95 drive connections between a part of said differential mechanism and the brush whereby the movement of the latter will be uniform while permitting variations in the movement of the differential mechanism. 100

19. In a street sweeping machine, the combination with a wheeled supporting frame, of collecting means including a rotary brush,
105 a motor mounted on said frame, differential driving connections between the motor and the wheels of the frame, and constant drive connections between a part of said differential mechanism and the brush whereby the movement of the latter will be uniform
110 while permitting variations in the movement of the differential mechanism, said last connections comprising intermeshing gears and a driving shaft for the rotary brush arranged parallel to the axis of rotation of the drive wheels. 115

20. In a street sweeping machine, a pivotally mounted dirt pan, means for raising the free end thereof comprising a rock shaft
120 mounted thereunder, a slotted cam plate rigid on the rock shaft, and a headed bolt depending from the dirt pan and extending through the slot in the cam plate.

21. In a street sweeping machine, a frame, an inclined elevator having its upper end pivotally connected to the truck frame and
125 its lower end free to swing up and down, a pair of inclined beams having their upper ends pivotally connected to said truck frame, a sweeper brush rotatably mounted on the lower ends of said beams, a rock shaft 130

mounted on said frame provided with a crank arm at each end, flexible connections between the free ends of said crank arms and the lower free ends of said elevator and
 5 said inclined beams whereby the rocking of the shaft will lift the lower ends of the elevator and beams and yieldable means for locking the rock shaft in a position required to hold the free ends of the elevator
 10 and the beams in a raised position.

22. In a street sweeping machine, the combination with a suitable frame, traction wheels, rotatable broom, elevator, and motor, of driving connections between the motor, traction wheels and broom including a
 15 driven shaft operatively connected to the said traction wheels, power transmitting mechanism comprising transmission and differential gearing interposed between the motor and said shaft, and another driven shaft
 20 in mesh with the differential end of said power transmitting mechanism to be rotated by the power transmitted through the various speeds of the transmission in a direction the reverse of the rotation of the
 25 traction wheels to correspondingly rela-

tively rotate the broom while said traction wheels are being driven.

23. In a street sweeping machine, the combination with a suitable frame, traction
 30 wheels, rotatable broom, elevator, and motor, of driving connections between the motor, traction wheels and broom including a driven shaft operatively connected to the said traction wheels, power transmitting
 35 mechanism comprising transmission and differential gearing interposed between the motor and said shaft, another driven shaft in mesh with the differential end of said power transmitting mechanism to be rotated
 40 by the power transmitted through the various speeds of the transmission in a direction the reverse of the rotation of the traction wheels to correspondingly relatively rotate the broom while the traction wheels are
 45 being driven, and clutch mechanism associated with the last mentioned shaft for controlling the rotation of the broom.

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Witnesses:

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