

May 17, 1955

J. ANTOS ET AL
STREET SWEEPERS

2,708,280

Filed June 8, 1949

5 Sheets-Sheet 1

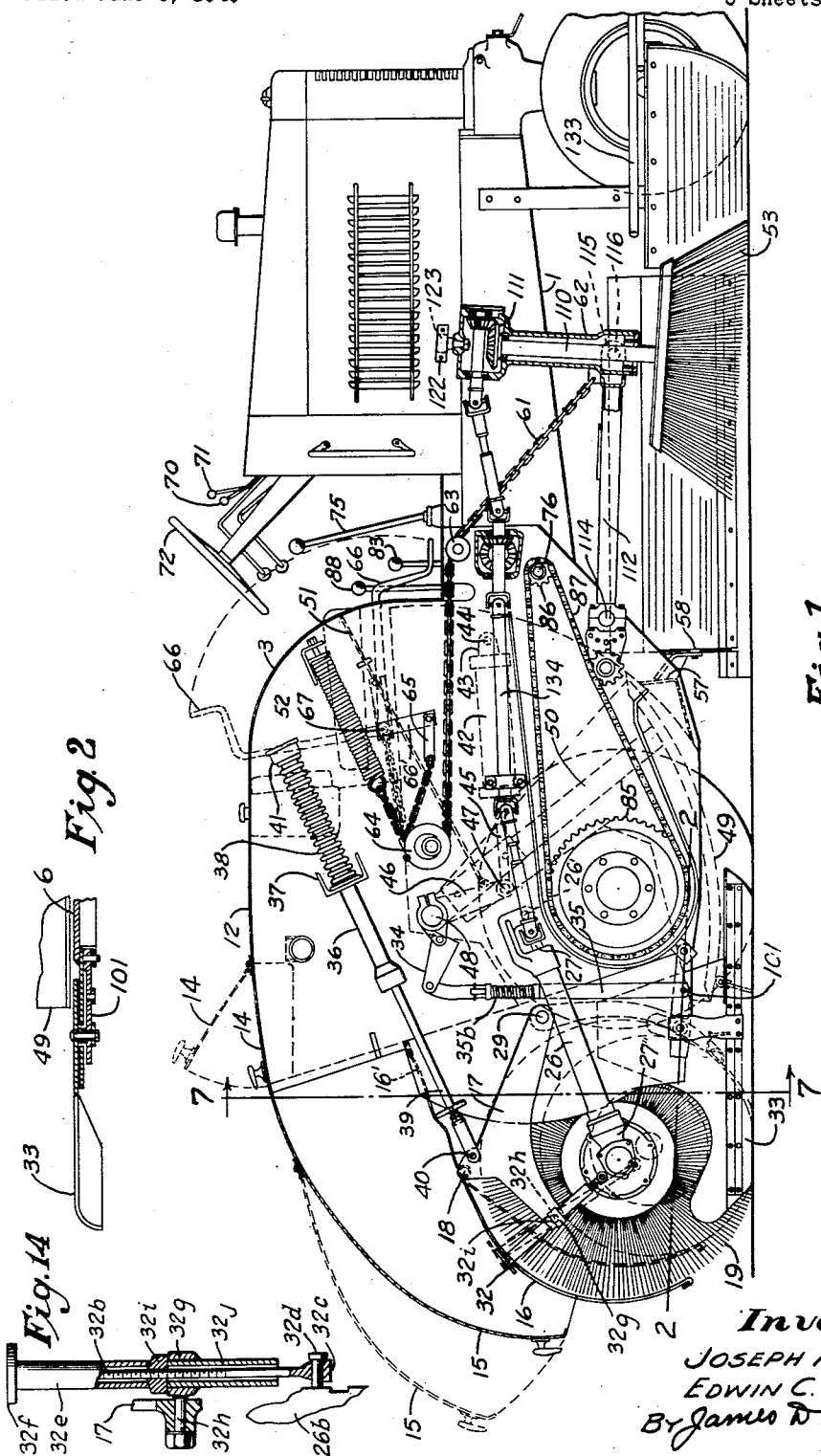


Fig. 1

Fig. 14

Fig. 2

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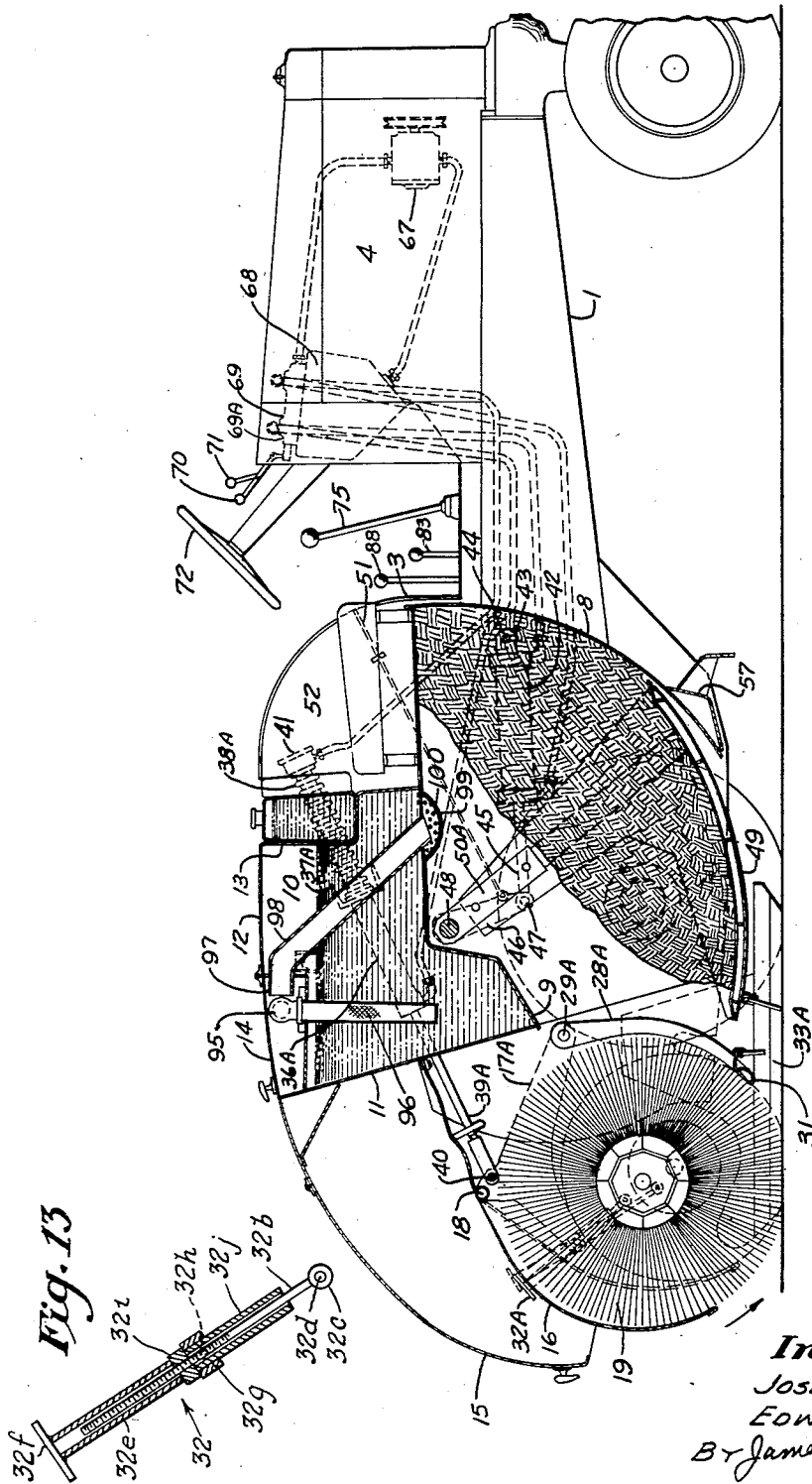


Fig. 3

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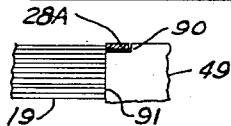
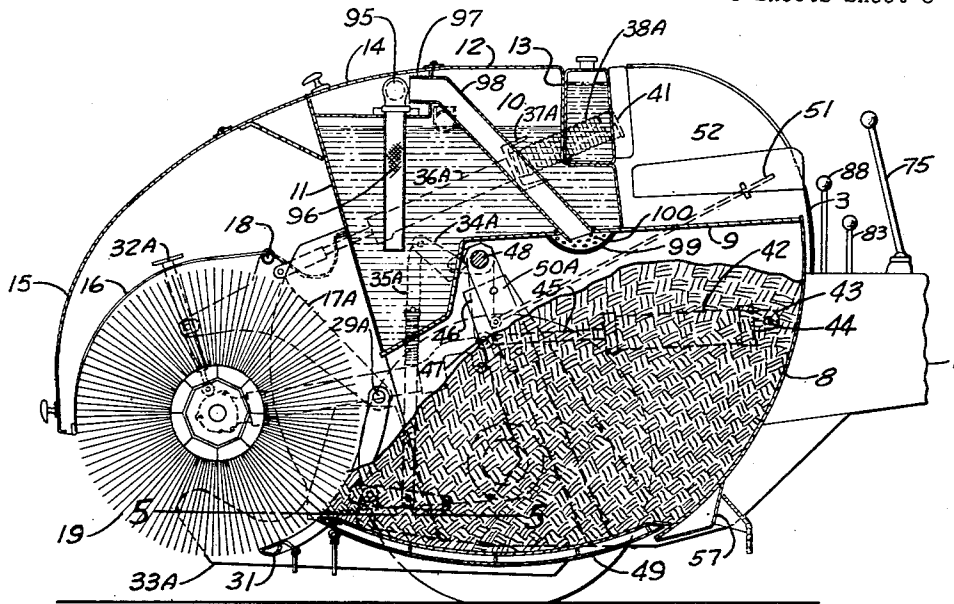


Fig. 5

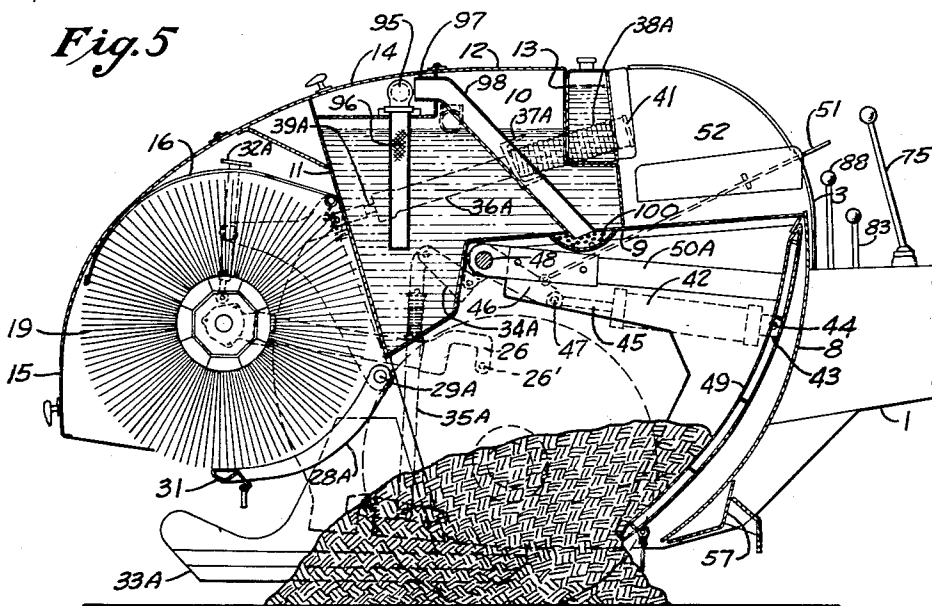


Fig. 6

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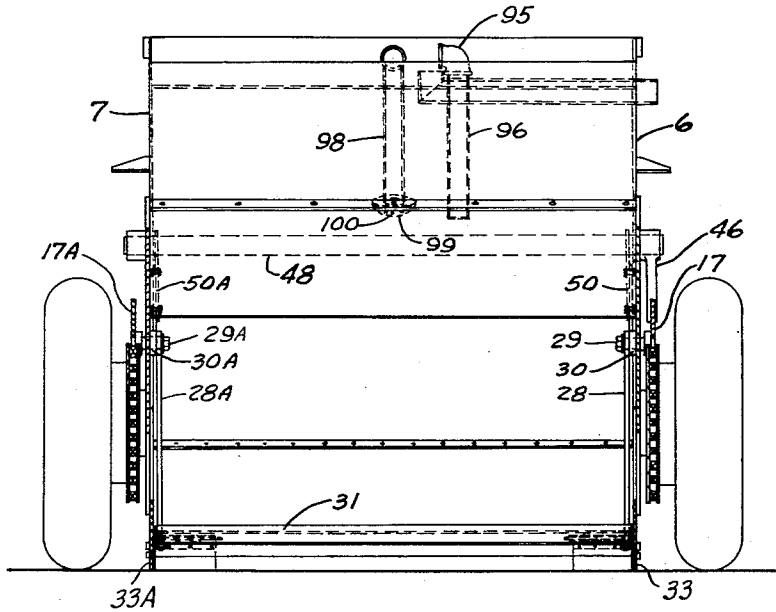


Fig. 7

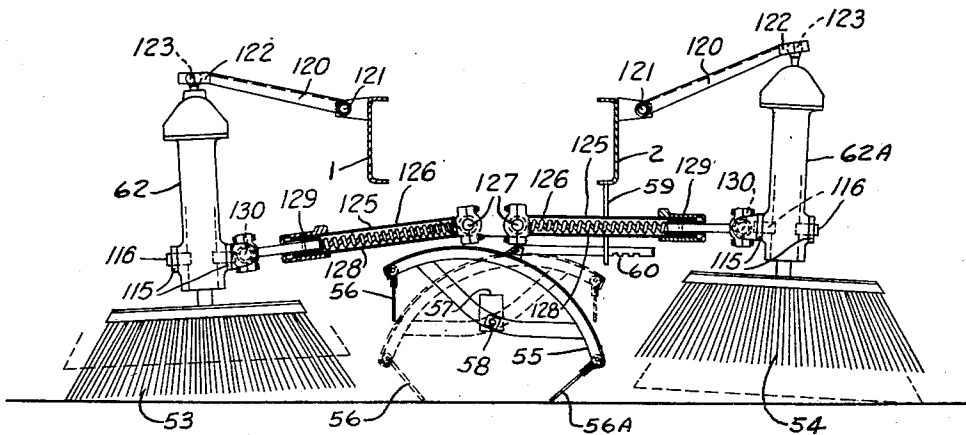


Fig. 8

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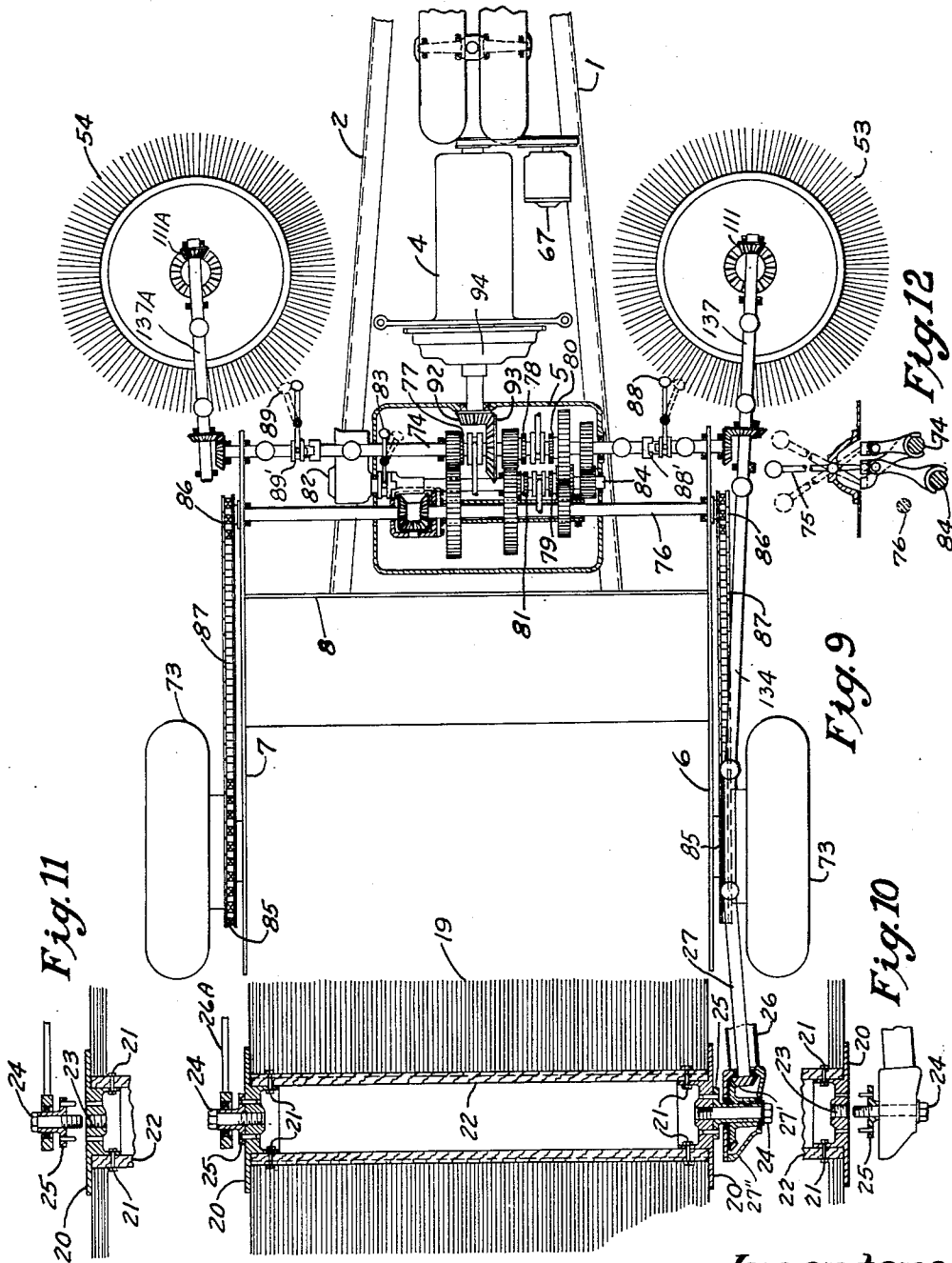
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Filed June 8, 1949

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STREET SWEEPERS

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Application June 8, 1949, Serial No. 97,843

13 Claims. (Cl. 15—83)

Our invention relates to improvements in street sweepers, and particularly of the type where the rear sweeping broom is adapted to contact deflecting means which causes the dirt picked up by the broom to be thrown into a dirt receptacle, similar to the mode of operation disclosed in Wilson and Antos Patent 2,286,245.

One of the objects of this invention is to provide improved means to permit the rear sweeping broom to oscillate up and down, whereby in the sweeping operation to remove substantially all of the dirt from an uneven roadway.

Another object of this invention is to provide improved actuating mechanism and control means for controlling the position of a movable dirt receptacle bottom and for causing the movable dirt receptacle bottom to contact the rear broom and raise this broom and the drag wings to transport position when carrying the load to a point of dumping. In this transport position, the rear broom is not rotating, but is functioning in the manner of a tail gate at the rear edge of the movable dirt receptacle bottom for holding the dirt thereon during transport.

In this regard, another object of the invention is to provide improved indicating means at the operator's station to advise the operator as to the position of the movable dirt receptacle bottom with respect to the rear broom.

Another object of this invention is to provide improved means whereby the rear broom can be removed from its supports and controls without disturbing the driving or controlling mechanism.

Another object of this invention is to provide two gutter brooms and an improved pivotally mounted semi-circular baffle plate located at the front of the rear broom between the two gutter brooms; also to provide improved control means to rotate the baffle plate to permit the side opposite to the operating gutter broom to contact the roadway, thus confining the dirt to a windrow or path in line with the rear broom.

Another object of this invention is to provide a water receptacle at the top of the sweeper, together with improved control means to control the release of the water to sprinkle the roadway and prevent dust.

Another object of this invention is to provide a pipe to extend upwardly in the water receptacle to which a hose can be connected, together with improved means at the lower end of the pipe to spray water and thereby clean sticky dirt from the rear broom and the dirt receptacle.

Further objects of this invention are to provide a construction which is simple, efficient and easy to assembly and operate, and which will have other advantages as will later more fully appear and are inherently possessed thereby.

The invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while we have shown therein a preferred embodiment it is understood that the same

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is susceptible of modification and change, without departing from the spirit of the invention.

In the drawings:

Figure 1 is a side elevation of the sweeper showing the brooms in normal working position and showing the gutter broom drive in cross-section.

Figure 2 is a cross-section of one of the drag wings, taken approximately on the plane of the line 2—2 of Figure 1;

Figure 3 is a side elevation showing a cross-section of the rear broom, dirt receptacle, movable bottom and water container, and illustrating the loading position of the rear broom and movable bottom.

Figure 4 shows a cross-section of the rear broom, deflector and movable bottom with the load in a carrying position.

Figure 5 is a fragmentary detail sectional view taken approximately on the plane of the line 5—5 of Figure 4;

Figure 6 is a cross-section similar to Figure 4 showing the positions of the rear broom, the deflector bar and the movable bottom of the dirt receptacle when dumping the load;

Figure 7 shows a rear view of the machine with the side covers removed, partly in section and partly in elevation, taken approximately on the plane of the line 7—7 of Figure 1;

Figure 8 is a partial front view of the machine showing one gutter broom in operating position, and the baffle plate in position to guide the dirt to the rear broom;

Figure 9 is a diagrammatic plan view showing the power and control means for operating the rear driving wheels, the rear broom and the gutter brooms, the rear broom being illustrated in axial section;

Figures 10 and 11 are corresponding right and left detail sectional views showing the manner of attaching and detaching the right and left ends of the rear broom;

Figure 12 is a fragmentary detail sectional view showing the arrangement for operating the clutches of the selective speed control mechanism;

Figure 13 is a fragmentary detail sectional view showing one of the two adjustable link connections which support opposite ends of the rear broom, and

Figure 14 is a view of this same link connection taken at right angles to the plane of Figure 13.

As shown in Figures 1, 3, 4, 6, and 9, the frame of the sweeper is composed of two side sills, 1, 2 riveted or welded to the end of the material carrying receptacle or hopper 3. Mounted on these side sills 1 and 2 are the power plant 4 and the selective speed transmission 5.

The material carrying receptacle or hopper 3 comprises two side plates 6 and 7, a curved end plate 8 and a top plate 9, the latter also forming the bottom of the water container 10. The walls of the water container 10 are defined by the upper portion of the material receptacle sides 6 and 7, and also by end plates 11 and 13 and a top plate 12, the latter being provided with a door 14. The rear portion of the material receptacle or hopper 3 has a hinged door 15 which permits access to a rear broom cover 16, the latter having a flexible rubber connection to the adjacent plate 11 by a rubber sheet 16'. This cover 16 for the rear broom is connected to right and left hand broom lifting plates or levers 17 and 17A by a rod 18. As will be later described, the right and left lifting levers 17 and 17A have pivotal mounting on short pivot studs or shafts 29, 29A which rotate in bearings 30 and 30A (Figure 7) secured to the inner sides of the side plates 6 and 7. The rear broom 19 has broom core hubs 20 (Figures 9—11) fastened by bolts 21 to the broom core 22. The broom core hubs 20 have holes 23 tapped for bolts 24, which connect the outwardly projecting stub axes 25 to the broom core hubs 20. The stub axes 25 of this rear

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broom have rotatable mounting in bearing hubs carried at the rear ends of right and left hand drag links 26 and 26A, the forward ends of these drag links being pivotally connected to the side plates 6 and 7, or to the frame of the machine by pivot bolts of studs 26', one of which is illustrated in Figure 1. The right hand drag link 26 is tubular and houses a drive shaft 27 which transmits a drive to the rear broom 19 through bevel gearing 27' enclosed within a gear housing 27" at the rear end of the tubular drag link 26. Referring particularly to Figures 10 and 11, it will be seen that the rear broom 19 can be easily removed without disturbing the mounting of the drag links 26 and 26A or disconnecting the drive shaft 27, by merely releasing the bolts 24 from the broom hubs 20 and springing the drag links 26 and 26A outwardly to free the broom therefrom.

This rear broom is adapted to be lifted from the sweeping position shown in Figure 1 to the transport position shown in Figure 4 and finally to the load dumping position shown in Figure 6 through the operation of the above described right and left lifting levers 17, 17A, which, as previously described, are pivotally supported by the short shafts 29, 29A rotating in bearings 30, 30A carried by the side plates 6 and 7. These lifting levers 17, 17A are secured to the outer ends of the shafts 29, 29A and are disposed on the outer sides of the side plates 6 and 7, while the inner ends of these shafts 29, 29A have deflector bar arms 28, 28A rigidly secured thereto and disposed on the inner sides of the side plates 6 and 7, whereby the lifting links 17, 17A and the deflector bar arms 28, 28A always pivot together around the axis of the shafts 29, 29A. Extending transversely between the lower ends of the deflector bar arms 28, 28A is a deflector bar 31 against which the sweeping bristles of the rear broom 19 are adapted to contact in the sweeping operation so as to cause the material swept by the rear broom to be thrown with a snapping or flipping motion into the material carrying receptacle 3 for collection on the movable bottom 49.

The raising and lowering of the rear broom 19 is controlled by double acting hydraulic cylinders 36, 36A which are operatively connected to impart swinging movement to the lifting levers 17, 17A, as will be later described. The downwardly extending arms of these lifting levers are pivotally connected with the right and left hand ends of the broom through adjustable link connections indicated generally at 32, 32A. As shown in detail in Figures 13 and 14, each of these adjustable links or rods 32, 32A comprises a threaded shank 32b, having an apertured eye 32c at its lower end which is pivoted by pivot stud 32d to the adjacent drag link 26A at the left hand side of the machine, or to the tubular drag link 26 or bevel gear housing 27' at the right hand side of the machine. Passing down over the upper end of the non-rotating threaded shank 32b in spaced relation thereto is a rotatable sleeve 32e which carries a rotating handle 32f at its upper end, and has a threaded nut 32i welded to its lower end. The internal threads of this nut screw over the threads on the upper end of the shank 32b. The bottom side of the nut 32i abuts against the top of a pivoted stop collar 32g, which is provided with a laterally projecting pivot pin 32h that has pivoted mounting in the rearwardly extending arm of the adjacent lifting lever 17 or 17A, as clearly illustrated in Figure 14. A shielding sleeve 32j extends down from the stop collar 32g in spaced relation to the shank 32b. When the rear broom is in a raised position out of contact with the pavement (Figures 4 and 6) all of the weight of the broom exerts a continuous downward tension through the threaded shank 32b at each side of the broom; and when the broom is in its lowermost position in sweeping engagement with the pavement (Figure 1) a substantial part of the weight of the broom is still exerting a downward tension on the threaded shank 32b at each side of the broom. This

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downward pull on the threaded shank is transmitted to the threaded nut 32i through the threaded connection between the shank and the nut, and hence this downward pull continuously holds the nut 32 pressed against the stop collar 32g which has the pivoted attachment at 32h to the adjacent lifting lever 17 or 17A. It will be seen that by reason of this continuous downward tension transmitted through the threaded shank 32b, rotation of the sleeve 32e and nut 32i causes the shank 32b to be moved upwardly or downwardly within the nut 32i and stop collar 32g, so as to decrease or increase the distance between the lower pivot stud 32d and the upper pivot pin 32h mounted in the lifting lever. This enables either the right side or left side of the broom 19 to be separately adjusted with respect to the deflector bar 31 (through the lifting levers 17, 17A and deflector bar arms 28, 28A) whereby to obtain the proper pressure between the broom bristles and the deflector bar, and also to effect successive adjustments between the broom and deflector bar as wear of the broom occurs. The rotating handles 32f for making these adjustments are conveniently accessible, and can be actuated while the broom 19 is revolving.

Disposed on each side of the machine just beyond the ends of the rear broom 19 are drag wings 33, 33A which are adapted to prevent outward projection of the dirt when the broom is in sweeping position (Figure 1). These drag wings are adapted to be raised and lowered through the instrumentality of substantially vertical links 35, 35A which have their upper ends pivoted to levers or rocker members 34, and which have their lower ends pivotally connected to pivoted drag arms 101 from which the drag wings are suspended. As shown in Figure 2, the drag wings 33 and 33A follow directly in line with their respective hopper side plates 6 and 7. Provision is made for lifting the drag wings out of contact with the street when the rear broom 19 is raised to transport position, as shown in Figure 4. This is accomplished by compression springs 35b carried by each of the lifting links 35, 35A and arranged to have upward thrust imparted to their lower ends by upward movement of the drag links 26, 26A when the broom 19 is raised to transport position, as shown in Figures 4 and 6.

Referring now to the double acting hydraulic cylinders 36 and 36A which operate to raise and lower the rear broom 19, these cylinders are disposed outside of each side plate 6 and 7 and are mounted for endwise sliding and vertical tilting movement in brackets 37 and 37A which are attached to the side plates. Springs 38 and 38A surround the outer ends of these hydraulic cylinders and act between the brackets 37, 37A and the cylinder heads 41 on the upper ends of the cylinders. The piston rods 39 and 39A extending out of the lower ends of these hydraulic cylinders are pivotally connected at 40 to their respective lifting levers 17, 17A. The springs 38 and 38A exert a continuous upward thrust on the hydraulic cylinders 36, 36A, the latter being free to slide in their mounting brackets 37, 37A, as above described, whereby this spring mounting permits either side of the rear broom 19 to oscillate up and down, thereby sweeping dirt or refuse out of depressed surfaces, as well as from level surfaces in the pavement. The introduction of hydraulic pressure either to the lower ends or to the upper ends of the cylinders 36, 36A enables the piston rods 39, 39A to be actuated in either direction for swinging the lifting levers 17, 17A upwardly or downwardly. As previously described, such motion of the lifting levers is operative to raise or lower the broom 19 through the one-way push connections effective between the pivoted stop collars 32g carried by the lifting levers and the adjustable nuts 32i connected through the threaded shanks 32b to the ends of the broom.

The movable load carrying bottom 49 of the dirt receptacle 3 is adapted to be actuated by a double acting hydraulic cylinder 42 (Figure 1). This cylinder 42 is mounted on the left hand side of the machine on side

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plate 7, the forward end of the cylinder being provided with a head bracket 43 which is pivotally mounted on a pin 44 projecting laterally from the side plate 7. The piston rod 45 of this cylinder is pivotally connected to a crank arm 46 by pivot pin 47, this crank arm or lever 46 being secured to the left hand end of a transverse shaft 48 which extends between and through the side plates 6 and 7, and is journaled in bearings carried by these side plates. Secured to this transverse shaft 48 just inside of each side wall 6, 7 are downwardly extending arms 50, 50A which have the curved movable bottom 49 secured to their lower ends. Thus it will be seen that by energization of the double acting hydraulic cylinder 42 in the appropriate direction, the load carrying bottom 49 can be swung between any one of three positions, namely the loading position illustrated in Figure 3, the transport position illustrated in Figure 4 and the dumping position illustrated in Figure 6. An indicating rod 51 is pivotally connected at its lower end to the actuating lever 46 and has its upper end extending to a position adjacent the operator's station 52, so that the operator can tell from the position of this indicating rod 51 the position of the movable bottom 49, so as to determine whether it is in loading, transport or dumping position.

Referring to Figures 8 and 9, we have shown the present street sweeper as provided with two gutter brooms 53 and 54 located near the forward end of the vehicle. On the center line between these two gutter brooms is located a semi-circular or arcuate baffle plate 55 having two flexible side wings 56 and 56A. The rear end of the baffle plate 55 is rotatably mounted on a bracket 57 by a pivot pin or bolt 58 (Figure 1), this bracket being secured to the front plate 8 of the dirt receptacle. This pivotal mounting permits the arcuate baffle plate 55 to be tilted downwardly toward right or left, depending upon which gutter broom 53 or 54 is contacting the roadway, as indicated by the full line and dotted line positions illustrated in Figure 8. On the under side of the frame sill 2 is welded a bracket 59, having a slotted vertical hole to permit up and down movement therein of a notched link 60 which has its inner end pivoted to the center of the top of baffle plate 55. This notched link can be raised to released position and then shifted inwardly or outwardly to engage a different notch with the bottom of the slotted hole in bracket 29, whereby to control and hold the baffle plate 55 in the proper position to prevent the dirt swept by either gutter broom 53 or 54 from being thrown out of the desired central path or windrow in line with the rear broom 19. Figure 8 illustrates in full lines the positions of the baffle plate 55, flexible side walls 56 and 56A and the notched rod 60 when the right hand gutter broom 53 is contacting the roadway during the sweeping operation, it being noted that the right hand flexible side wall 56 is raised to permit the left hand flexible side wall 56A to contact the roadway and cause the dirt from the broom 53 to be confined or directed backwardly into the line of travel of the rear broom 19. Conversely, by raising the right hand gutter broom 53 and lowering the left hand gutter broom 54 into contact with the roadway, and moving the notched rod 60 toward the center of the sweeper, the left hand flexible side wall 56 will be raised and the right hand flexible side wall 56A will be lowered into contact with the roadway, as shown in the dotted line positions, thus reversing the action with respect to the dirt thrown inwardly by the left hand gutter broom. The substantial span of the arcuate plate 55 acts as a ceiling to restrict the dust cloud thrown by the gutter broom from rising to the operator's position, the power plant, etc.

Referring now to the adjustable mounting of each gutter broom, the upwardly extending drive shaft 110 of each broom is journaled in a shaft housing 62 or 62A carrying a bevel gear set 111 in its upper end for driving

the shaft. The forward pushing or propelling force of the vehicle is transmitted to the shaft housing and gutter broom through a compression strut 112 (Figure 1) which has its rear end pivoted to the vehicle body on a horizontal pivot stud 114. The front end of the compression strut 112 is provided with a clevis 115, the spaced arms of which are shown in Figure 8, these spaced arms being pivoted to the shaft housing 62 or 62A on substantially horizontal pivot studs 116, whereby the pusher strut 112 can have vertical articulation when the gutter broom passes over uneven spots in the pavement, or when the gutter broom is lifted to transport position out of contact with the pavement. Lateral stresses acting on the gutter broom are borne by the linkage system shown in Figure 8. An upper link device 120 has its inner end pivoted to the adjacent sill beam 1 or 2 on a substantially horizontal pivot axis 121, and at its outer end this upper link device 120 is provided with a spherical socket 122 in which is pivoted a ball 123 projecting upwardly from the top of the shaft housing 62 or 62A. The lateral stress of forcing the gutter broom into the gutter and against the curb is yieldingly borne by a resilient lower compression strut 125 pivotally connected between the lower end of the shaft housing 62 or 62A and the vehicle frame. Each yieldable compression strut 125 comprises a tubular housing 126 pivoted to the vehicle frame on a horizontal pivot 127 and enclosing a compression spring 128. A spring plunger 129 slides in the outer end of the tubular housing and reacts against the compression spring. The outer end of this spring plunger is pivoted to the lower portion of the shaft housing 62 or 62A by a horizontal pivot pin 130. It will be seen that the above described mounting links for each gutter broom permit free rising and falling movement as the broom passes over uneven spots in the pavement, and also permits free upward movement when the gutter broom is lifted to transport position out of contact with the pavement.

Each gutter broom is provided with an individual lifting and lowering mechanism comprising a chain 61 which has its front end connected to the vertical shaft housing 62 and which then extends rearwardly over chain sheaves 63 and 64 and is connected through link 65 with a hand lever 66 (Figure 1). This hand lever is pivotally mounted on a pivot pin 67 and comprises a crank arm 66' extending substantially at right angles to the main length of the hand lever, the chain connecting link 65 being pivotally connected to this right angle crank lever 66'. It will be seen that when the hand lever 66 is in the lower full line position illustrated, the crank arm 66' is in its lower full line position, corresponding to a lowered position of the associated gutter broom; and when the hand lever 66 is swung upwardly to the dotted line position the crank arm 66' also swings upwardly and pulls forwardly on the chain 61 for raising the gutter broom to its raised position. When the sweeper is provided with right and left gutter brooms, each broom will be provided with a separate lifting and lowering lever 66. When performing a sweeping operation, one gutter broom is lowered and the other is raised. When the vehicle is travelling from one point of operation to another, or is carrying a load in transport, both gutter brooms 53 and 54 are raised, and the baffle plate 55 is placed in neutral position, thus raising both flexible side walls 56 and 56A of the baffle to clear the roadway.

The operations of raising and lowering the rear broom 19, deflector bar 31 and drag wings 33 and 33A, and the operation of swinging the load carrying bottom 49 between dirt receiving, load carrying and dumping positions are controlled by the operation of twin hydraulic control valves 69 and 69A (Figure 3) which are located near the steering wheel 72. The control valve 69 is operated by lever 70, and the control valve 69A is operated by lever 71. The operating arrangement between the control valves and their levers is such that movement of the lever 70 admits oil from valve 69 into the two double

acting hydraulic cylinders 36 and 36A, whereby to raise or lower the rear broom 19, depending upon the direction in which the control lever 69 is moved. As previously described, the deflector bar 31 moves up and down with the lifting and lowering of the rear broom 19. The operation of the other control lever 71 controls the swinging of the movable load carrying bottom 49 and the lifting and lowering of the drag wings 33 and 33A by the admission of oil from valve 69A into the double acting hydraulic cylinder 42, thereby swinging the movable bottom 49 to the position desired, viz. into the loading position for receiving dirt (Figure 3), or into the transport or carrying position for transporting the load (Figure 4) or into the dumping position for dumping the load (Figure 6). As previously described, the indicating rod 51 is pivotally connected to lever 46 which moves with the swinging bottom 49, whereby the position of the upper end of this rod 51 indicates to the operator the position of movable bottom 49 by the location of the end of the indicating rod in relation to the end plate 8.

The power plant 4 is operative through clutch 94 to drive the main shaft 74 through the level gear set 92, 93. The propelling speed of the vehicle is controlled by the clutch lever 75 (Figure 1), which selectively controls the engagement of the clutches 77, 78, 79, 80 and 81, as shown in Figure 12, these clutches determining the speed of the drive shaft 76, and hence the speed of the rear wheels 73 of the vehicle, there being four speeds forward obtained by using the clutches 77, 78, 79 and 80, and there being one speed in reverse obtained by using the clutch 81.

The speed of the gutter brooms 53 and 54 and the speed of the rear broom 19 are independent of the speed of the rear driving wheels 73, and the operation of these brooms is controlled by actuating levers 88 and 89 connected with right and left control clutches 88' and 89' mounted on the outer portions of shaft 74 (Figure 9). If the rear broom 19 and only the right hand gutter broom 53 are to be operated, then clutch 88' is engaged. If the left hand gutter broom 54 is also to be operated, then clutch 89' is also engaged.

As also illustrated in Figure 9, the hydraulic pump 67 which supplies hydraulic pressure to the hydraulic control cylinders is connected to the power plant 4 by any suitable belt drive or the like. As further illustrated in Figure 9, a water pump 82 is arranged to be driven from power plant 4 under control of a clutch 83 which engages with the intermediate shaft 84 of the transmission mechanism. This water pump 82 supplies water under pressure from the water tank 10 to a spray nozzle arrangement 133 (Figure 1) disposed in front of the two gutter brooms 53 and 54.

The rear drive wheels 73, 73 of the vehicle are provided with chain sprockets 85 (Figure 9), and the transmission drive shaft 76 is also provided with chain sprocket pinions 86, over which are trained sprocket chains 87 for transmitting a drive to the propelling wheels.

The rear broom 19 is driven by a line of articulated shafting 134 (Figure 1) extending back through drive shaft 27 to the bevel gear set 27' which connects with the stub axle 25 at the right hand end of the rear broom (Figure 9). The right and left hand gutter brooms 53 and 54 are driven by lines of articulated shafting 137 and 137A, which connect with the downwardly extending gutter broom shafts 110 through bevel gear sets 111 and 111A in the upper ends of the shaft housings 62 and 62A.

Referring again to the interaction between the rear broom 19, the deflector bar 31 and the movable load carrying bottom 49, it will be seen from Figure 5 that the side edges of the movable bottom 49 are notched at 90 to engage the deflector bar arms 28, 28A when the movable bottom 49 is swung into the load carrying position shown in Figure 4. In this position, the rear edge 91 of the movable bottom 49 engages the lower front

surface of the rear broom 19 to prevent the dirt in the container 3 from spilling off the rear edge 91 of the movable bottom 49, the broom not being rotated at this time. The swinging movement of the movable bottom 49 into this load carrying position carries the rear broom 19 and deflector bar 31 with it rearwardly and upwardly to the position shown in Figure 4, by the action of the notches 90 striking the deflector bar arms 28, 28A, thereby swinging these arms and the lifting levers 17, 17A and broom 19 into this load carrying position shown in Figure 4.

In Figures 1 and 3, the side drag wings 33, 33A are shown lowered into their loading positions, in which positions these side wings prevent the dirt from spilling outwardly. Figure 3 shows a typical loaded condition of the material receptacle 3 and movable bottom 49 when the material swept by the rear broom 19 has almost filled the material receptacle. Figure 4 illustrates the transport positions of the drag wings 33, 33A, the movable bottom 49, the piston rods 39, 39A and 45, and the rear broom 19, viz. the positions of these parts when the vehicle is transporting the load to a point of dumping, with the movable bottom 49 swung rearwardly into engagement with the rear broom 19 at a point above the level of the deflector bar 31, and with the rear broom 19 swung part way up. It will be noted that in this transport position, at which time the load should be held against spilling, the rear broom functions much in the manner of a tail gate for preventing the load from spilling from the movable bottom. Of course, at this time the rear broom 19 is not revolving.

Referring now to the dumping operation, shown in Figure 6, this is effected by raising the rear broom 19 to its maximum height by operation of the hydraulic cylinders 36, 36A, and swinging the load carrying bottom 49 forwardly and upwardly by operation of the hydraulic cylinder 42. Figure 6 shows the positions of the piston rods 39, 39A, their double acting cylinders 36, 36A and the compressed springs 38, 38A, in effecting such raising of the rear broom. This figure also illustrates the positions of the double acting cylinder 42, its piston rod 45 and connected lever 46, and the drag wings 33 and 33A, when the cylinder 42 effects this upward swinging of the movable bottom 49 in the operation of dumping the load.

The filling of water tank 10 is accomplished through water inlet 95, which communicates down through screen 96 with the interior of the water tank. For flushing the inside of the hopper 8 and the rear broom 19, a flushing inlet 97 is provided. This inlet is attached to a pipe 98 which passes down through the closed bottom of the water tank 10 and opens at its lower end into a dome-shaped spray outlet 99 secured to the under side of the tank and provided with a plurality of holes 100 directed to spray water horizontally and downwardly in all directions below the tank 10. This spray discharge is effective to clean sticky dirt from the dirt receptacle 3. Also, by lowering the rear broom 19 into sweeping position (Figures 1 and 3) and allowing it to revolve slowly, the spray discharge from the dome-shaped outlet 99 will strike the forward part of the broom and also the deflector bar 31, so as to clean the broom and deflector bar assembly.

While we have illustrated and described what we regard to be the preferred embodiment of our invention, nevertheless it will be understood that such is merely exemplary, and that numerous modifications and rearrangements may be made therein without departing from the essence of the invention.

We claim:

1. In a street sweeper, in combination, a self-propelled vehicle frame, an operator's station on said frame, a material receptacle having a curved front end and a curved movable bottom, a broom at the rear of said receptacle, means supporting said movable bottom on said frame for movement between a forward load receiving position

and a rearward load transporting position where the rear edge of said bottom is in contact with said broom, means at said operator's station to move said movable bottom rearwardly into such transport position with its rear edge in contact with said broom to prevent spillage of the material in said material receptacle when said receptacle is full, and two spring supported hydraulic cylinders, one attached to each side of said material receptacle and each end of said rear broom to permit each end of the rear broom to adjust itself automatically to uneven surfaces in a roadway to sweep the surface clean.

2. In a street sweeper, in combination, a frame supported by wheels for movement, a rear broom and two gutter brooms on said frame, an engine with a clutch and transmission and means to propel said wheels and to rotate said rear broom and said two gutter brooms, a material carrying receptacle having a movable bottom rotatably mounted therein supported by said receptacle, said rotatable rear broom having a material deflector with means to maintain a constant relation between said deflector and said broom rotatably mounted at the rear of said material receptacle, hydraulic means on the frame to raise and lower the said rear broom and deflector, hydraulic means on the frame operative to move said movable bottom rearwardly into contact with said rear broom when it is desired to transport a collected load of dirt to a point of dumping, an operator's station on said frame, and control means at the said operator's station to control the movements of the said rear broom, said deflector, said movable bottom and said gutter brooms.

3. In a self-propelled sweeper, in combination, a frame, a rotatable broom and deflector with means to maintain a constant relation between said deflector and said broom swingably mounted on said frame, a material receptacle with a movable bottom swingably mounted on and supported by the sides of said material receptacle, means mounted on said frame to move said movable bottom rearwardly into engagement with said broom and to thereafter cause said movable bottom and broom to move as a unit into transport position, an operator's station on said frame, and control means at the operator's station to control the movements of the said broom and deflector and the said movable bottom as one unit.

4. In a self-propelled sweeper, in combination, a frame, a rotatable broom and deflector swingably mounted at the rear of said frame, a material receptacle for receiving material swept by said broom, said material receptacle comprising a movable bottom swingably mounted on and supported by the sides of said receptacle, hydraulic means mounted on said sweeper operative to raise and lower the said broom and deflector and operative to move said movable bottom into contact with said broom to cause said broom to hold the dirt on said bottom during transport, an operator's station on said frame, and control means at the operator's station to control the movement of the said broom and deflector and the said movable bottom to dump material which has been collected in said receptacle.

5. In a street sweeper, in combination, a frame supported for movement, a material receptacle having a movable bottom swingably mounted on said material receptacle, a rotatable broom and a material deflector with means to adjust and maintain a constant relation between said material deflector and said broom swingably mounted on said material receptacle, means to rotate said broom and cause material to be delivered into said material receptacle, means mounted on said material receptacle for causing said movable bottom and broom to come into engaging relation and to move substantially synchronously into load transporting position with said broom holding the load on said bottom, an operator's station on said sweeper frame, and control means at said operator's station to control the synchronized movement of the said broom, material deflector and swinging bot-

tom so as to transport and dump the material collected in the said material receptacle.

6. In a street sweeper of the class described, the combination of a rear broom and a material receptacle receiving dirt therefrom, means for revolving said rear broom, spray means in the upper portion of said material receptacle comprising spray apertures directed to project water into said material receptacle and also directed to project water against said rear broom in the operation of cleaning the material receptacle and broom, said broom being adapted to be rotated in such cleaning operation to subject all portions thereof to the spray from said spray means, and means for supplying water to said spray means.

7. In a street sweeper of the class described, the combination of a power driven rear broom, a material receptacle adapted to receive dirt therefrom, a deflector bar against which said broom is adapted to act for projecting the dirt into said material receptacle, a perforated spray head mounted in the upper portion of said material receptacle and comprising forwardly directed spray apertures adapted to project water into the forward portion of said material receptacle and also comprising rearwardly directed spray apertures adapted to project water against the front portion of said rear broom and against said deflector bar, said rear broom being adapted to be rotated during the spraying operation to subject all portions of the broom to the cleaning action of the spray from said rearwardly directed apertures, and means for supplying water to said perforated spray head.

8. In a street sweeping vehicle of the class described, the combination of a self-propelled vehicle frame, a rotatable broom carried thereby, means for revolving said broom to cause the latter to perform a street sweeping operation, a dirt receiving hopper having a movable bottom adapted to receive the dirt swept up by said broom, said hopper bottom having a loading position in which it receives the dirt from said broom in the sweeping operation, and mechanism for moving said hopper bottom from said loading position into a transport position in contact with said broom preparatory to transporting a collected load of dirt to a point of dumping, in which transport position the rotation of said broom is interrupted and the non-rotating broom functions substantially as a tail gate to close said hopper bottom.

9. In a street sweeper of the class described, the combination of a self-propelled vehicle frame, a rotatable broom carried thereby, means for revolving said rotatable broom, a deflector bar against which the periphery of the broom impinges to project the dirt picked up by the broom, a dirt receiving hopper adapted to receive the dirt projected by said broom, linkage operatively connecting said broom with said deflector bar, lifting mechanism operative to raise and lower said broom and deflector bar, and mechanism for swinging said hopper into contact with said broom at a point above said deflector bar preparatory to transporting a collected load of dirt to a point of dumping, in which transport position said broom functions as a tail gate to close said hopper.

10. In a street sweeper of the class described, the combination of a self-propelled vehicle frame, a rotatable broom carried thereby, means for revolving said rotatable broom, a deflector bar against which the periphery of the broom impinges to project the dirt picked up by the broom, a dirt receiving hopper adapted to receive the dirt projected by said broom, linkage operatively connecting said broom with said deflector bar, lifting mechanism operative to raise and lower said broom and deflector bar comprising separate hydraulic cylinders and pistons operatively connected between each end of said broom and said vehicle frame, guide means mounting said cylinders on said vehicle frame for endwise sliding movement, and springs acting on said cylinders tending to slide them endwise in said guide means in a direction operative to sustain part of the weight of said broom,

whereby either end of the broom can rise and fall independently of the other end in sweeping uneven surfaces, and in such rising and falling movement of either end of the broom relatively to the vehicle frame the cylinder and piston connected to that end move correspondingly. 5

11. In a street sweeper of the class described, the combination of a self-propelled vehicle frame, a rotatable broom carried thereby, means for revolving said rotatable broom, a deflector bar against which the periphery of the broom impinges to project the dirt picked up by the broom, a dirt receiving hopper adapted to receive the dirt projected by said broom, linkage operatively connecting said broom with said deflector bar, lifting mechanism operative to raise and lower said broom and deflector bar comprising hydraulic cylinders and pistons operatively connected between said vehicle frame and broom, means mounting said cylinders on said vehicle frame for endwise sliding movement, springs acting on said cylinders in a direction tending to sustain part of the weight of said broom, and transport mechanism for placing said hopper and broom in transport position for carrying a collected load of dirt to a point of dumping, said latter mechanism swinging the rear edge of said hopper into contact with said broom at a point above said deflector bar and causing said broom to swing in an upward direction with said hopper, said hydraulic cylinders sliding endwise relatively to said vehicle frame when said broom thus swings upwardly with said hopper. 15

12. In a street sweeper of the class described, the combination of a self-propelled vehicle frame, a drive shaft driven from a source of power on said frame, a gutter broom assembly mounted adjacent to one side of said frame comprising an upwardly extending shaft, a gutter broom mounted on the lower end of said shaft, and bevel gearing in said gutter broom assembly operatively connecting said drive shaft with said upwardly extending shaft, vertically spaced upper and lower mounting links pivotally supporting said gutter broom assembly on said frame for substantially straight line lifting and lowering movement between a raised non-sweeping position and a lower sweeping position, said upper mounting link establishing a pivotal center above the level of said 20

drive shaft and the bevel gearing of said gutter broom assembly for accommodating inward swinging movement of the lower part of the gutter broom assembly around said pivotal center toward the vehicle frame, and compression spring means embodied in said lower mounting link and acting in a direction substantially at right angles to the line of forward travel of the gutter broom for absorbing the shock of impact in the event of the gutter broom or lower portion of the gutter broom assembly striking laterally against a curb or other obstruction. 25

13. In a street sweeping vehicle, the combination of a vehicle frame, a power plant on said frame, an operator's position on said frame, a power driven rotatable rear broom carried by said frame, two power driven gutter brooms carried at opposite sides of said frame forwardly of said rear broom for directing dirt into the path of the rear broom, a baffle plate carried beneath said frame between said gutter brooms, side wings carried by the sides of said baffle plate, and means mounting said baffle plate for tilting movement whereby in one direction of tilt one of said side wings lowers into contact with the street, and in the other direction of tilt the other side wing lowers into contact with the street, depending upon which gutter broom is in operation, said baffle plate covering a substantial part of the span between the operating gutter broom and the lowered side wing, whereby to form a covering hood over this span for restricting dust thrown up by the operating gutter broom from rising to said power plant or operator's position. 30

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