W. H. SHIRA.

STREET SWEEPING MACHINE.

APPLICATION FILED AUG. 15, 1911.

1,053,233.

Patented Feb. 18, 1913.

5 SHEETS—SHEET 1.

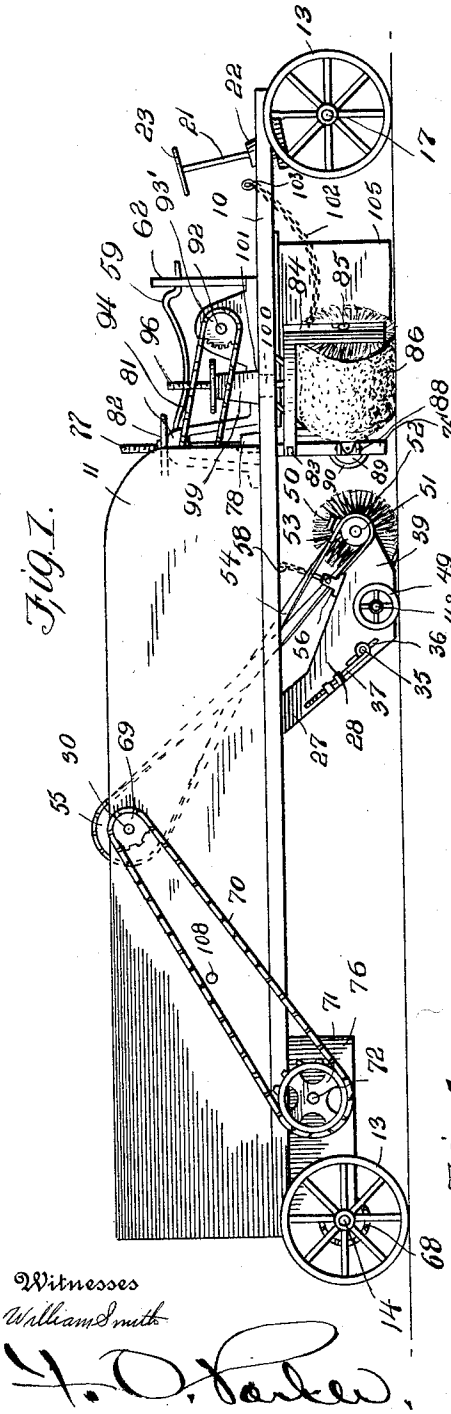

Fig. 7.

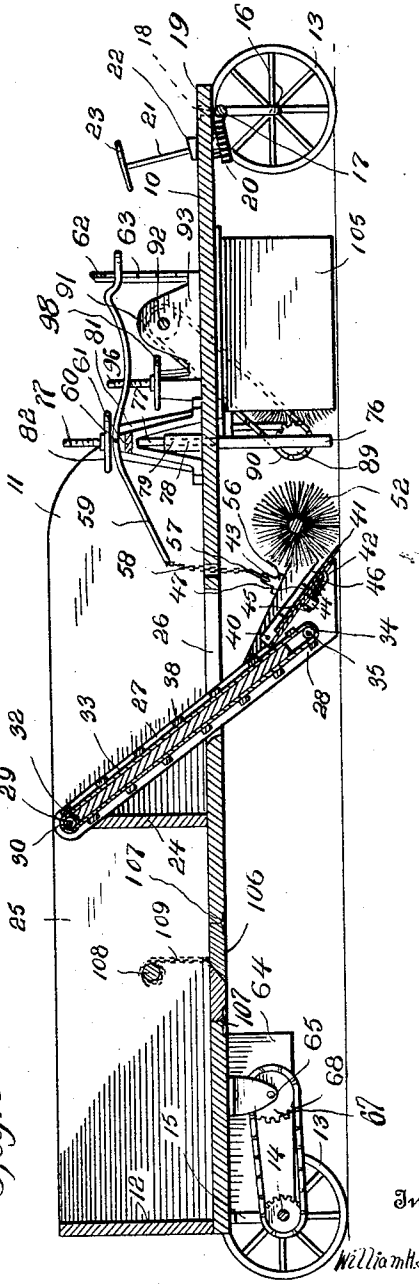

Fig. 5

Witnesses

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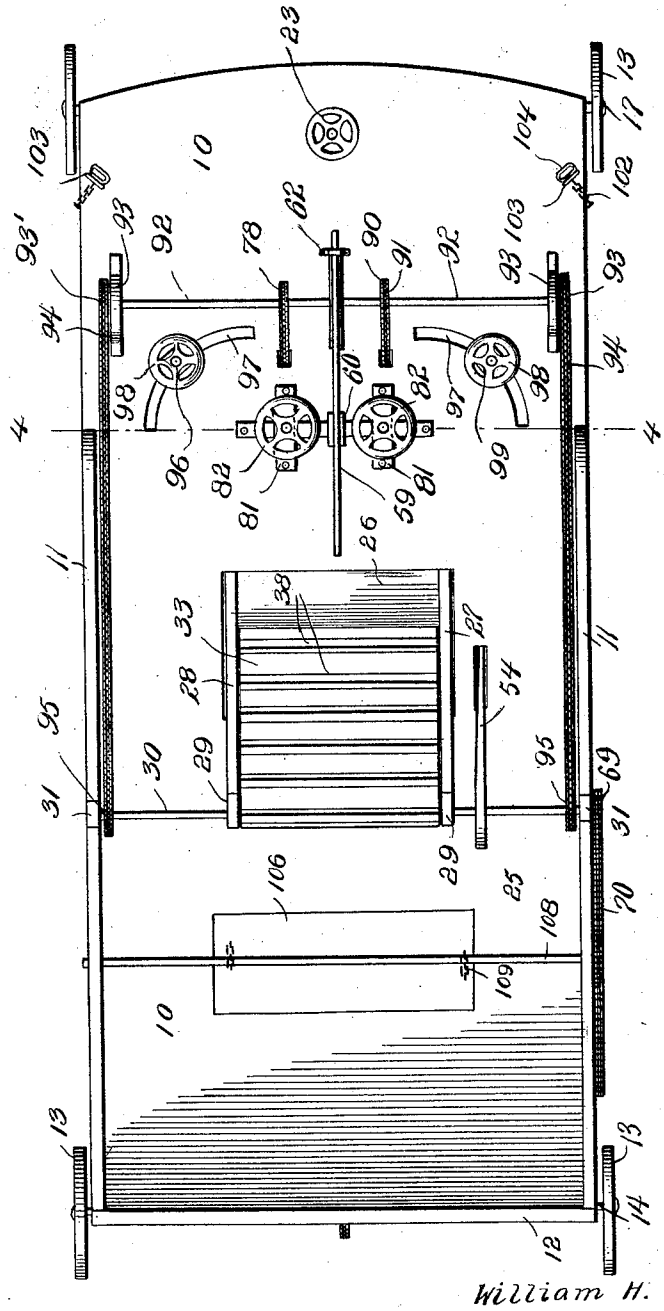

Fig. 2.

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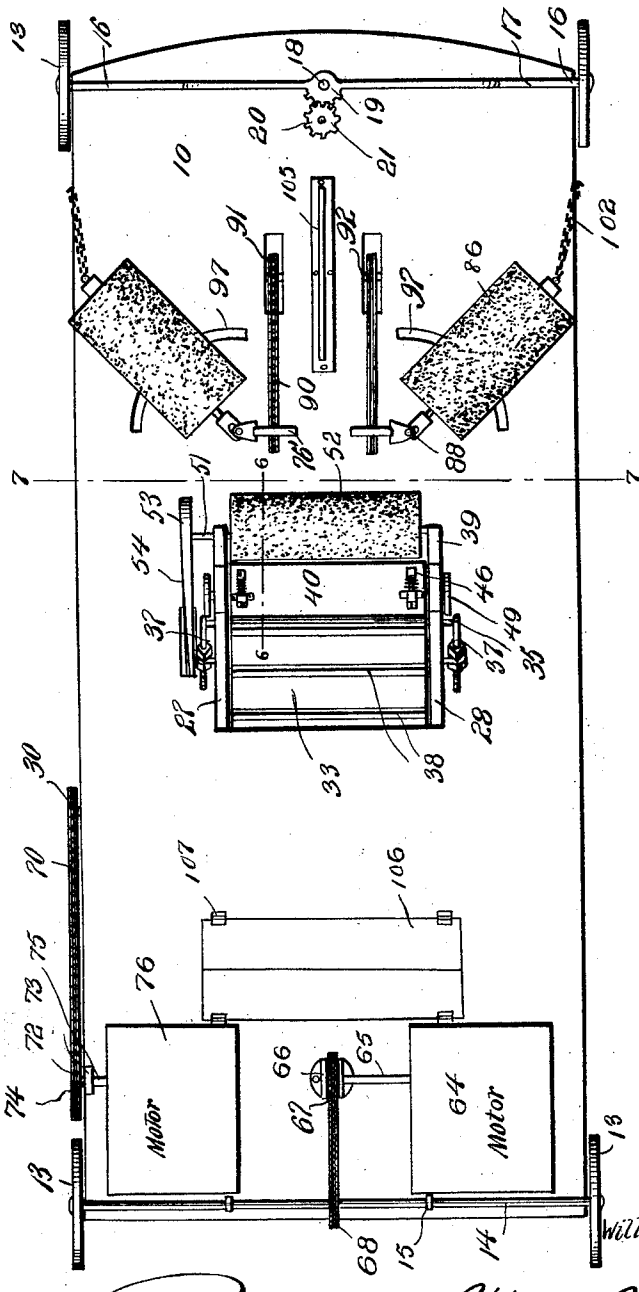

Fig. 3.

Witnesses

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5 SHEETS—SHEET 4.

Fig. 4.

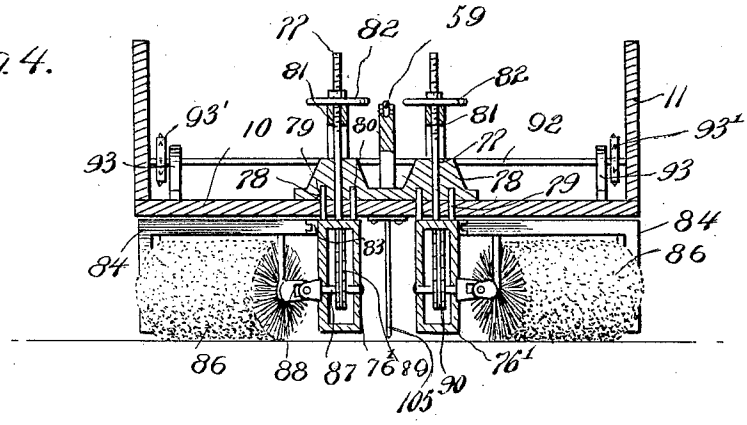


Fig. 7.

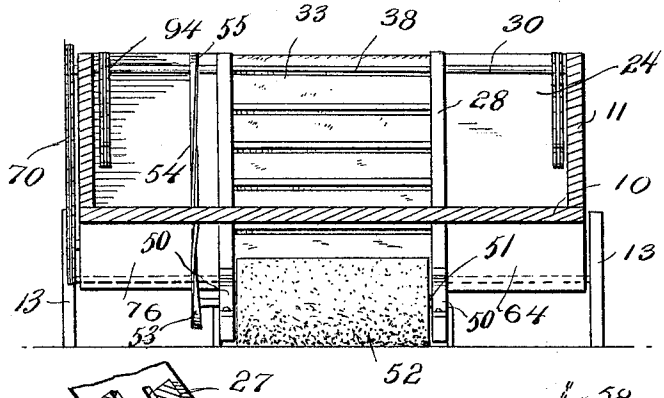
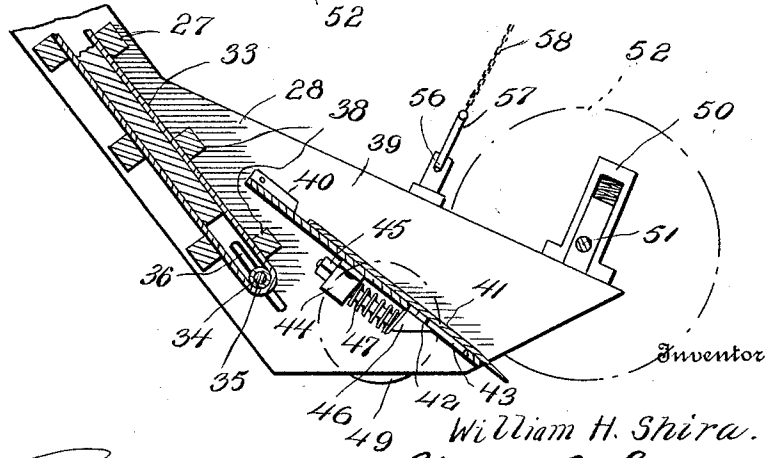


Fig. 6.



Witnesses

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5 SHEETS—SHEET 5.

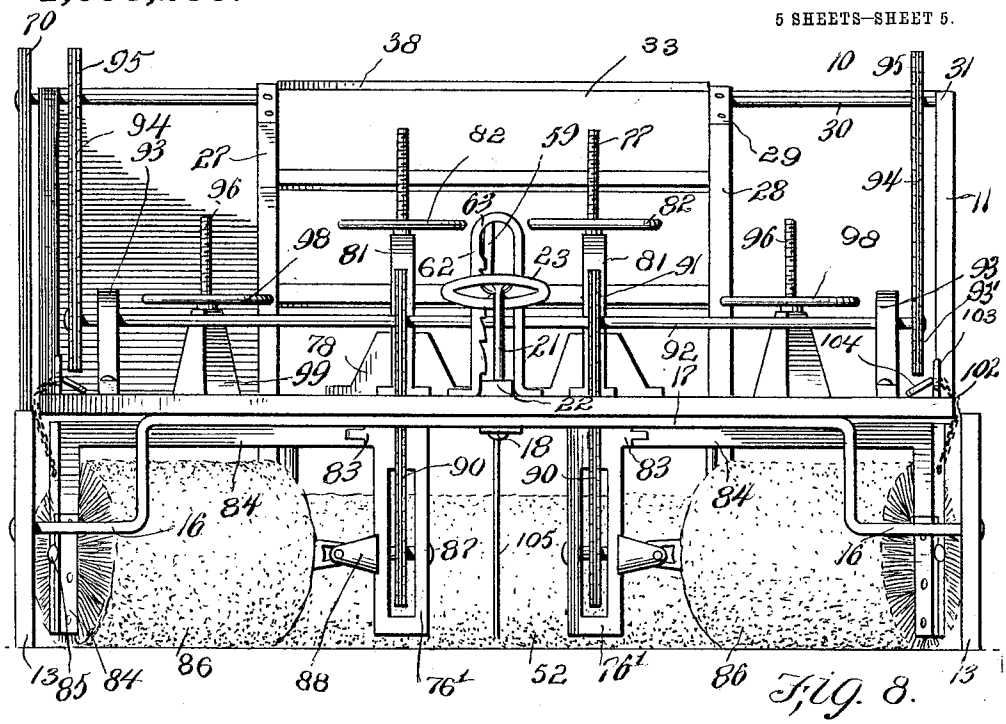

Fig. 8.

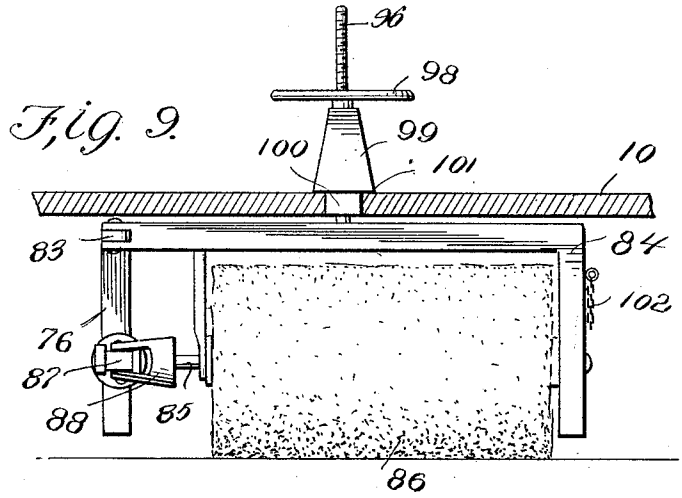

Fig. 9.

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UNITED STATES PATENT OFFICE.

WILLIAM H. SHIRA, OF TRAVERSE CITY, MICHIGAN.

STREET-SWEEPING MACHINE.

1,053,233. Specification of Letters Patent. Patented Feb. 18, 1913.

Application filed August 15, 1911. Serial No. 644,147.

To all whom it may concern:

Be it known that I, WILLIAM H. SHIRA, a citizen of the United States, residing at Traverse City, in the county of Grand Traverse and State of Michigan, have invented new and useful Improvements in Street-Sweeping Machines, of which the following is a specification.

The invention relates to street sweeping machines, and more particularly to the class of self-propelling street sweeping machines.

The primary object of the invention is the provision of a machine of this character in which the sweeping brushes are adjustably arranged, so that the dirt upon a street surface will be directed to a conveyer, whence it will be discharged into the body of the machine, and subsequently dumped therefrom, the sweeping brushes being operated through the medium of a motor, while the machine is propelled from an independent motor for advancing the same in any predetermined course.

Another object of the invention is the provision of a machine of this character in which the dirt conveyer is capable of being adjusted relative to the street surface, and its lower end has mounted therein a self adjustable scraper which prevents any possibility of the dirt escaping the conveyer, as the machine is advanced.

A further object of the invention is the provision of a machine in which the sweeping brushes may be adjusted in forwardly diverging relation to each other, and locked therein, so as to direct the dirt upon the street surface centrally relative to the line of draft of the machine.

A still further object of the invention is the provision of a machine of this character which is simple in construction, thoroughly reliable and efficient in operation, and inexpensive in manufacture.

With these and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

In the drawings, Figure 1 is a side elevation of a machine constructed in accordance with the invention. Fig. 2 is a top plan view thereof. Fig. 3 is a bottom plan view. Fig. 4 is a sectional view on the line 4—4 of Fig. 2. Fig. 5 is a vertical longitudinal sectional view through the machine. Fig. 6 is a fragmentary sectional view on the line 6—6 of Fig. 3. Fig. 7 is a sectional view on the line 7—7 of Fig. 3. Fig. 8 is a front elevation of the machine. Fig. 9 is a front elevation of the adjustable side sweeping brush and frame.

Similar reference characters indicate corresponding parts throughout the several views or the drawings.

Referring to the drawings by numerals, the machine comprises a wagon-like body 10 which is preferably of elongated shape, having side walls 11 extending only partially the length of the same, and closed at its rear by a rear wall 12, the latter and the side walls being fastened to the bottom of the body in any suitable manner. The body 10 is supported upon traction wheels 13, the rear pair of which are fixed to a rear axle 14 which is journaled in a stationary hanger or bearing 15, the latter being fixed to the under face of the bottom of the body 10 at the rear end thereof, while the front traction wheels are loosely journaled upon spindle ends 16 of a front turning axle 17, the latter being centrally pivoted to a king bolt or other coupling 18, the front axle at its center being formed with a rearwardly extending toothed sector 19, meshing with a pinion 20 formed on the lower end of a steering shaft 21 rotatably supported in a bearing 22 mounted in the bottom of the body, the said shaft rising into the body and terminating at its upper end in a hand turning wheel 23, which, when actuated by an operator, permits the steering of the machine in its course.

Mounted within the body 10 is a vertical transversely disposed partition 24, the same, together with the side and rear walls, forming at the rear end of the body a dirt receptacle or depository 25, into which is adapted to be delivered dirt which is raised from the street surface through the medium of a conveyer, presently described.

Formed in the bottom of the body 10, forwardly of the dirt depository 25, is a rectangular-shaped opening 26, through which extends a forwardly inclined conveyer, comprising a supporting frame 27, the side rails 28 of which are provided at their upper ends with bearings 29, through which is passed a rotatable shaft 30, the same being journaled in suitable bearings mounted in opposite side walls 11 of the body. Fixed to the rotary shaft 30, between the side rails 28, at the upper end thereof, is a conveyer

belt roller 32, over which is trained an endless conveyer belt or apron 33, the same being also trained over a roller 34 fixed to a counter shaft 35, the latter having its ends passed through elongated slots 36 formed in the side rails 28 of the frame, and engaged in adjustable belt tightening hangers 37, the same being suitably supported on the outer faces of the side rails 28 of the conveyer frame, the belt or apron 33 being provided with spaced transverse slats 38, as usual, which serve to hold the dirt when the conveyer apron is operated. The lower ends of the side rails 28 of the conveyer frame are formed with widened portions 39, to which is secured a supporting plate 40, the same being disposed slightly forward of the lower end of the conveyer apron 33, and is forwardly inclined to serve as a support for an adjustable scraper blade or plate 41, which is superimposed thereon and is adapted to extend close to or in contacting relation to the street surface for scraping purposes, the scraping blade 41 being provided with rearwardly directed guide stems 42, the same being passed through elongated slots 43 formed in the supporting plate 40, and are slidably engaged in guide eyes 44 fixed to and depending from the under face of the said supporting plate, the said stems 42 being threaded and carrying adjusting nuts 45 on their free ends, while formed integral with the said arms, forwardly of the eyes 44, are annular shoulders 46 forming bearings for the forward ends of coiled tension springs 47, surrounding the stems 42, the springs having their rear ends contacting with the guide eyes 44. Thus it will be seen that the scraper blade will become retracted when contacting with any irregularity in the street surface, or when meeting an obstruction, thereby preventing the bending or otherwise damaging of the same.

Projecting laterally from the widened portions 39 of the side rails of the frame are stud axles 48, on which are journaled wheels 49, which are adapted to travel upon the ground for sustaining the lower end of the conveyer frame sufficiently elevated from the street surface, during the advancement of the machine.

Mounted upon the enlarged lower end portions of the side rails of the conveyer frame are bearings 50, in which is journaled the shaft 51 of a sweeping brush 52, the latter being disposed slightly forwardly of the scraping plate or blade 41, and is adapted to contact with the ground for directing dirt onto the scraping blade or plate, during the travel of the machine, the shaft 51 being provided at one end with a belt pulley 53, over which is trained an endless belt 54, the same being crossed and also trained over a belt pulley 55 fixed to the shaft 30, so that on the rotation of the latter, the conveyer apron 33 will be driven in one direction, while the sweeping brush 52 will be driven in a reverse direction, both the apron and brush being operated in unison.

Mounted upon the lower enlarged ends 39 of the conveyer frame are uprights 56, the same being disposed rearwardly of the bearings 50, and in which are pivoted the ends of an upwardly arched yoke 57, the latter being connected centrally to one end of a chain 58, which is also connected to a lever 59 provided intermediate its ends with a fulcrum 60 journaled in a vertical bearing 61 fixed to and rising from the bottom of the body 10, the forward end of the rocking lever 59 being passed through an inverted U-shaped rack member 62 fixed to and rising from the bottom of the body 10, at a suitable point forwardly of the bearing 61, the said rack 62 being provided with the usual rack teeth 63 adapted to be engaged by the forward end of the lever 59 for locking the same in adjusted position. Thus, by means of this lever, the said conveyer frame may be raised and lowered when desired.

Mounted on the body 10 of the machine, at any suitable point, is a motor 64, the driving shaft 65 of which is journaled in a suitable bearing 66 carried by the body on the bottom thereof, and upon this shaft is fixed the usual sprocket 67, over which is trained a sprocket chain 68, the same being also trained over the sprocket 67 fixed to the rear axle 14. Thus on the starting of the motor, the machine may be advanced in any predetermined course.

Securely mounted upon one end of the shaft 30 is a sprocket wheel 69, over which is trained a sprocket chain 70, the same being trained over a sprocket wheel 71 fixed to one end of a shaft 72, the latter being journaled in bearings 73 fixed to the bottom of the body 10, the shaft 72 being driven through connections with a motor 76 mounted on the bottom of the body of the machine in any ordinary well-known manner.

Arranged below the bottom of the body 10, forwardly of the sweeping brush 52, are open frame-like hangers 76, the same being arranged in alinement with and spaced from each other, centrally of the body, and are provided with vertical adjusting stems 77 extending upwardly through the bottom of said body and the bearings 78 which are mounted upon and rise from the bottom of the body. At opposite sides of the adjustable stems 77 and rising from the open frame-like hangers 76 are vertical guide lugs 79, the latter working in guide openings 80 formed in the said bearings 78, the lugs being designed to prevent the slight turning or twisting of the hangers. Bridging the bearings 78 and fixed to the bottom of the body 10 are inverted U-shaped wheel stands 81, through which are passed the adjustable stems 77,

the latter being formed with threaded upper ends, on which are adjustably engaged turning wheels 82, whereby the said hangers may be readily and easily vertically adjusted, when desired, for raising and lowering the same.

Formed on the outer sides of the hangers 76 are laterally extending bearings 83, to which are pivotally connected substantially L-shaped arms 84, the short limbs of which extend downwardly and serve as bearings for the outer ends of the shafts 85 of sweeping brushes 86, the inner ends of the shafts 85 being connected to stud axles 87 journaled in the hangers 76 by means of universal joints 88. The stud axles 87 have fixed thereto sprocket wheels 89, over which are trained sprocket chains 90, the latter being also trained over sprocket wheels 91 fixed to a horizontal shaft 92 journaled in bearings 93 mounted upon and rising from the bottom of the body 10. The outer end of the shaft is provided with sprocket wheels 93′, over which are trained sprocket chains 94, the latter being also trained over sprocket wheels 95 fixed to the shaft 30, so that motion from the latter will be imparted to the shaft 92 and thence to the said stud axles 87, thus rotating the sweeping brushes 86 in unison. The sweeping brushes 86 are adapted to be swung laterally of the body 10, and are arranged in forwardly diverging relation to each other. Formed on the L-shaped arms 84 and rising therefrom are adjusting stems 96, the latter being movable in arcuate shaped slots 97 formed in the bottom of the body 10, and are provided with threaded upper ends, on which are adjustably connected turning wheels 98, the latter working against blocks 99 carried by the stems 96 and having reduced lower ends 100 engaged in the slots 97.

The reduced ends 100 of the blocks 99 are designed to snugly fit within the slots 97 and also provide bearing shoulders 101 which are adapted to rest upon adjacent opposed edges of the slots 97 and these reduced ends 100 are permitted to be shifted the full extent of the slots when it is desired to angularly adjust the L-shaped arms 84 supporting the sweeping brushes. When it is desired to vertically adjust the said arms 84 the turning wheels 98 are operated so that the stems 96 will be caused to slide through the blocks 99, the wheels 98 being adapted to work against the upper ends of the blocks 99 and by reason of the weight of the arms 84 the reduced ends 100 of the said blocks will be sustained engaged in the slots 97. The L-shaped arms 84 are held in angularly adjusted position in a manner presently described.

Suitably connected to the outer ends of the L-shaped arms 84 are pull chains 102, the same being trained through guide eyes 103 mounted upon the bottom of the body 10, near the front end thereof, the free ends of the chains 102 being provided with hand loops 104 which permit the pulling of the L-shaped arms toward each other, when it is desired to adjust the same in diverging relation to one another. It will be apparent that on pulling upon the chain 102 and by twisting the same about the eyes 103 the arms 84 can be held against rearward swinging movement, thereby sustaining the same in their angularly adjusted position.

Arranged centrally and longitudinally of the body 10, between the sweeping brushes 86, is a dust guard 105, the same being fixed to the under face of the bottom of said body, and depending therefrom, so as to prevent the dirt from being thrown from one brush 86 toward the other, during the sweeping of the street surface.

Formed in the bottom of the body 10 and communicating with the depository 25 is a suitable dumping opening, the same being closed by swinging door sections 106, the latter connected to the bottom of the said body by means of hinges 107, and are opened and closed by means of door controlling mechanism comprising a turning shaft 108 journaled in the side walls 11 of the body, and to which are connected the upper ends of chains 109, the lower ends of which are connected to the door sections 106, respectively, each chain being adapted to be reversely wound upon the turning shaft 108 and unwound therefrom for the closing and opening of the door sections. This turning shaft 108 is provided with a suitable transverse opening adapted to receive a handle bar (not shown), whereby it may be readily and conveniently turned, when it is desired to open and close the said door sections. The door sections, when open, will permit the dumping of the dirt from the dirt depository, as will be clearly obvious.

From the foregoing, taken in connection with the accompanying drawings, it is thought that the construction and operation of the invention will be readily understood, without requiring a more extended explanation.

What is claimed is:

1. In a street sweeping machine, a wheel supported body, a transversely disposed sweeping brush journaled beneath said body, open frame-like hangers connected to and depending from the body forwardly of said transverse brush, means for vertically adjusting the said hangers, substantially L-shaped arms pivotally connected to said hangers at the outer side thereof, means for angularly adjusting the said arms, sweeping brushes journaled in said arms, gears journaled in said hangers and having universal joint connection with the said last named sweeping brushes, and means for

driving the said gears and also for simultaneously operating the first named sweeping brush.

2. In a street sweeping machine, a wheel supported body, a transversely disposed sweeping brush journaled beneath the body, open frame-like hangers connected to and depending from the body forwardly of said transverse brush, means for vertically adjusting the said hangers, substantially L-shaped arms pivotally connected to said hangers at the outer side thereof, means for angularly adjusting the said arms, sweeping brushes journaled in said arms, gears journaled in said hangers and having universal joint connection with the said last named sweeping brushes, means for driving the said gears and also for simultaneously operating the first named sweeping brush, and means connected with the body and said arms for limiting the angular movement of the latter.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. SHIRA.

Witnesses:
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A. B. CLEMENT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."