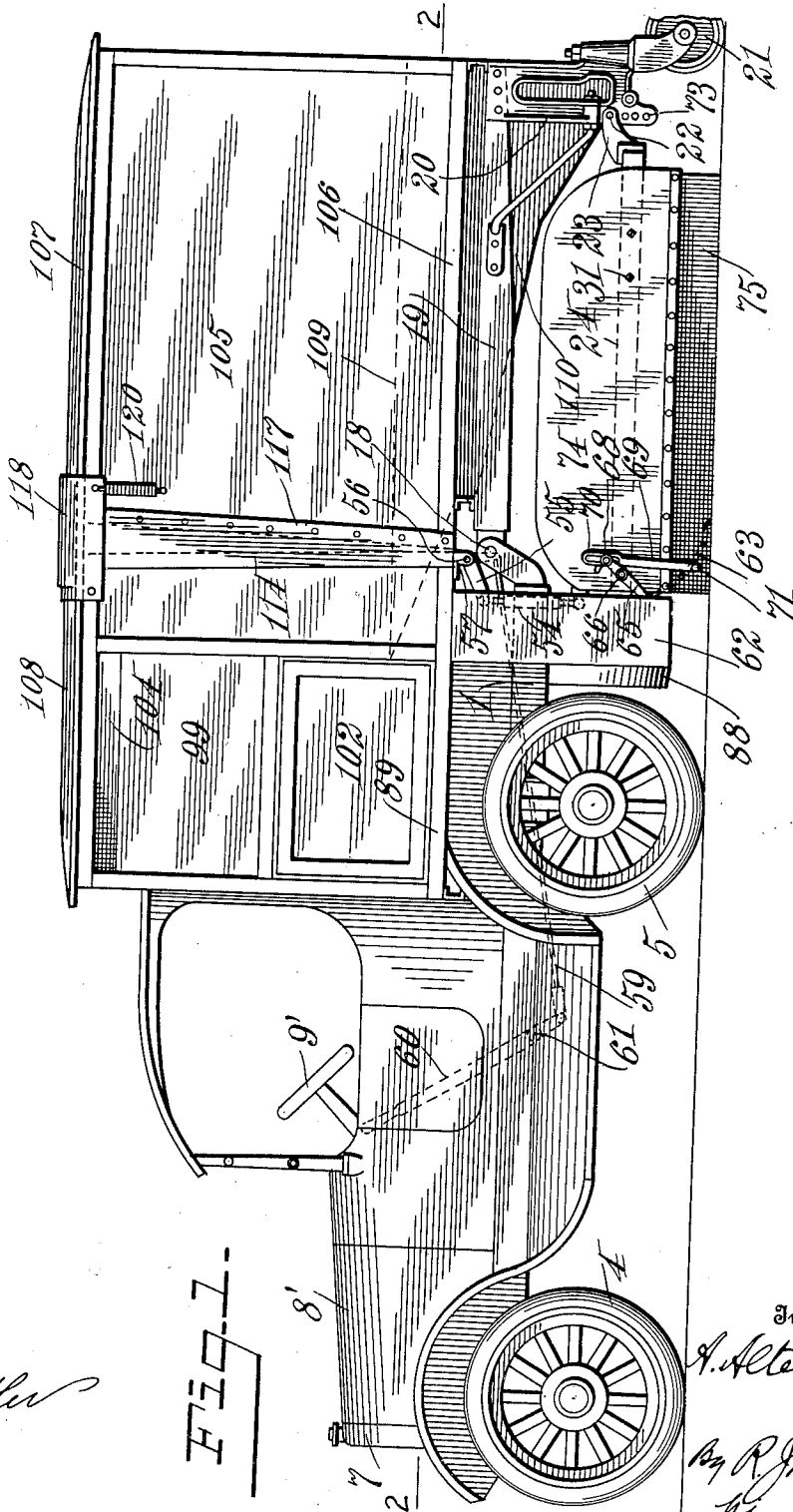


1,244,009.

A. ALTENBERG.
STREET SWEEPING MACHINE.
APPLICATION FILED MAR. 1, 1917.

Patented Oct. 23, 1917.

6 SHEETS—SHEET 1.



Witness
M. L. L. L.

FIG. 1.

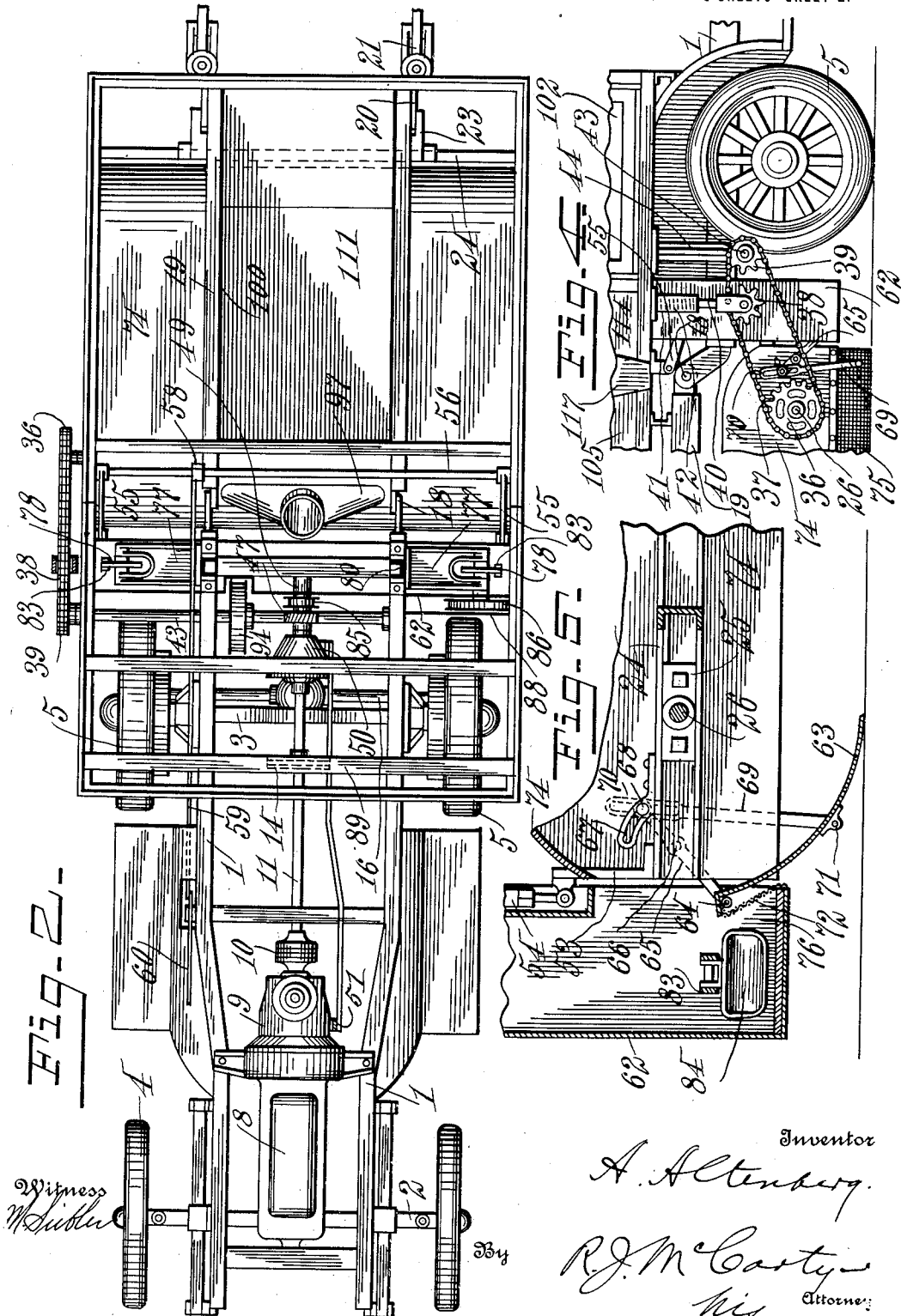
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6 SHEETS—SHEET 2.



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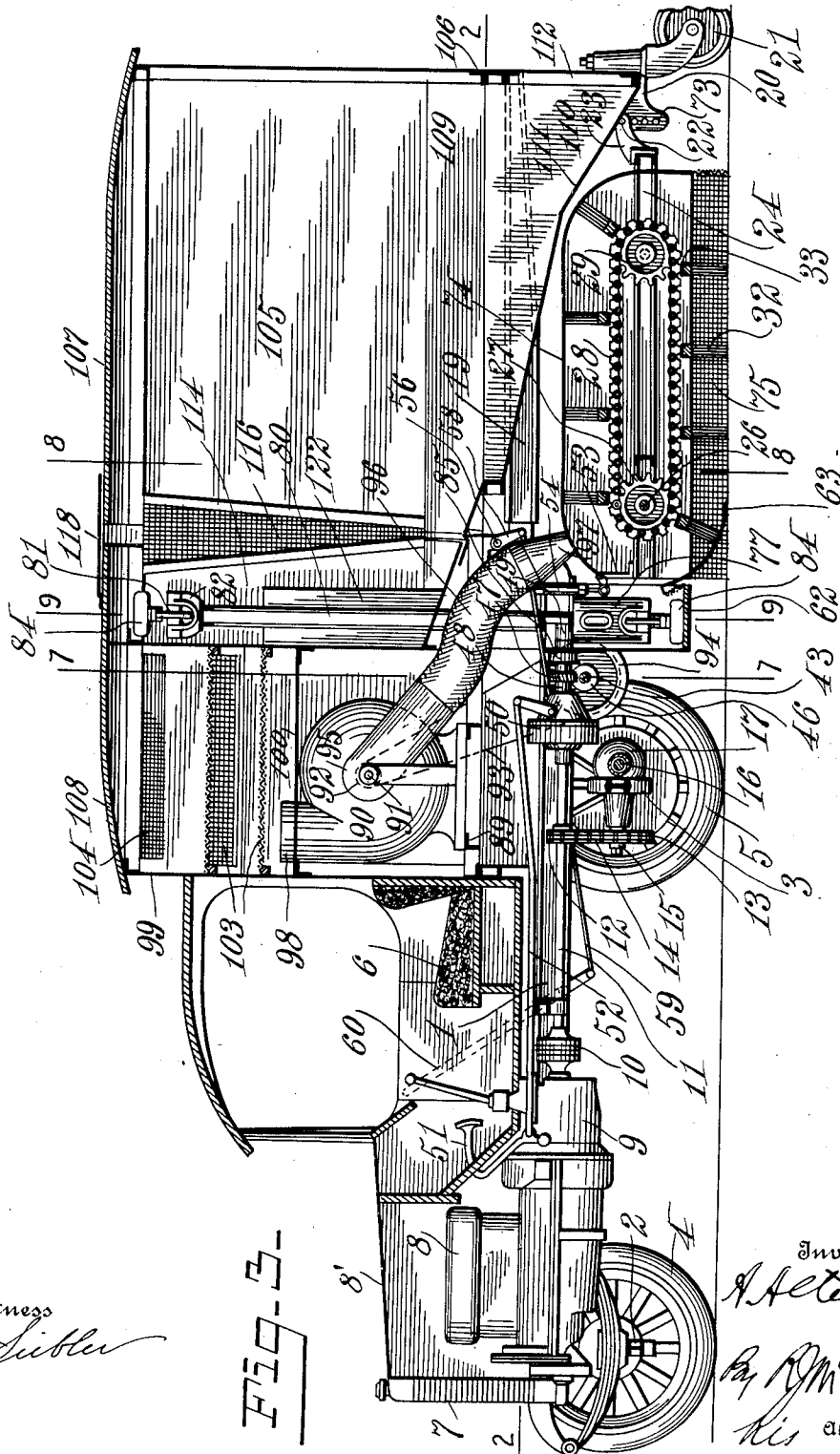
1,244,009.

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6 SHEETS—SHEET 3.

Witness
M. S. S. S.

Fig. 3—



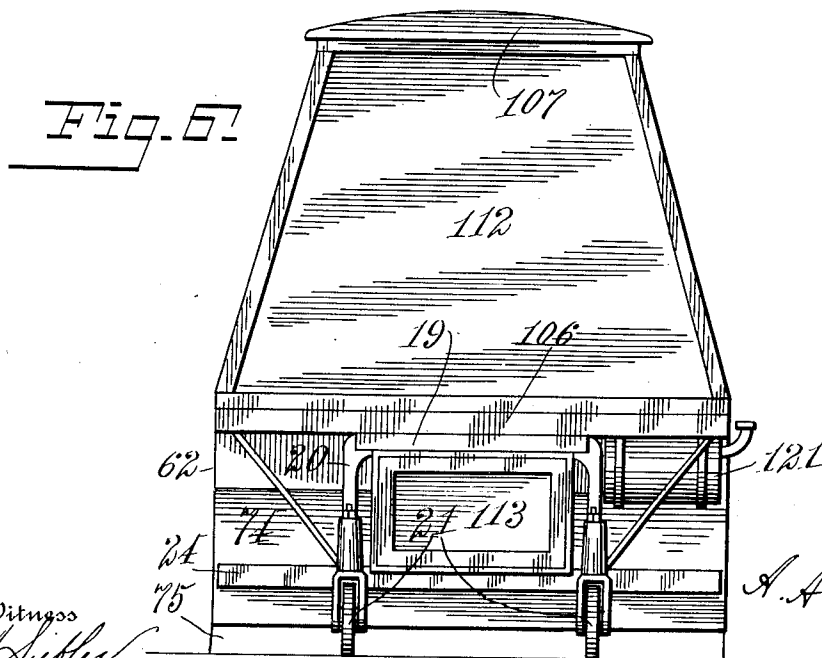
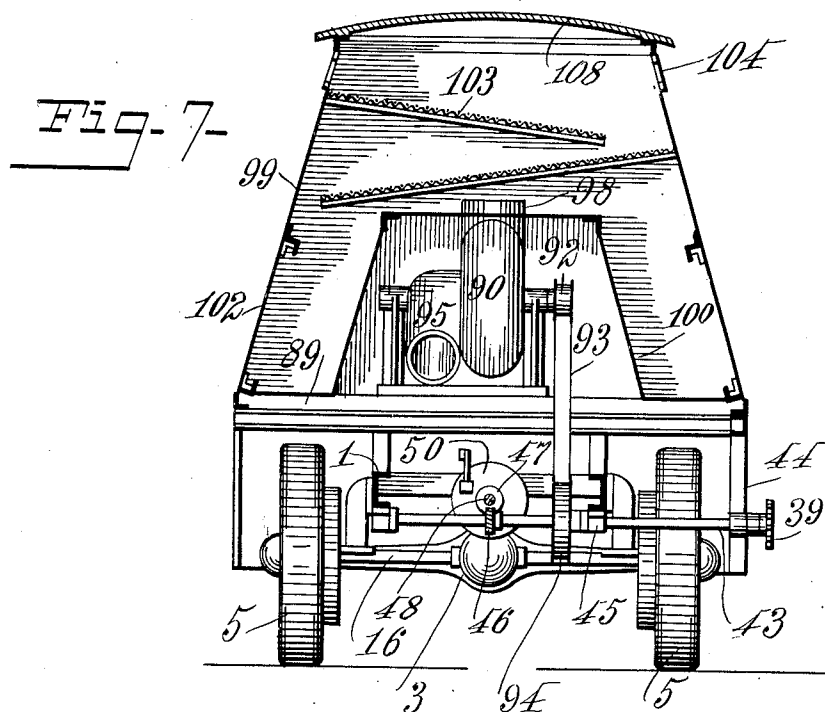
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6 SHEETS—SHEET 4.



Witness
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his Attorney

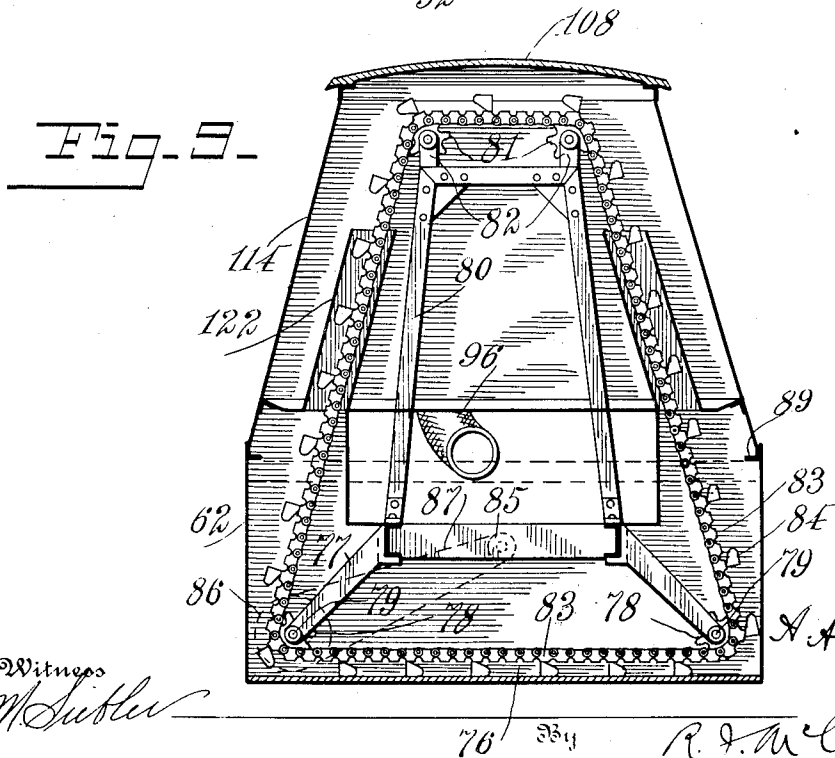
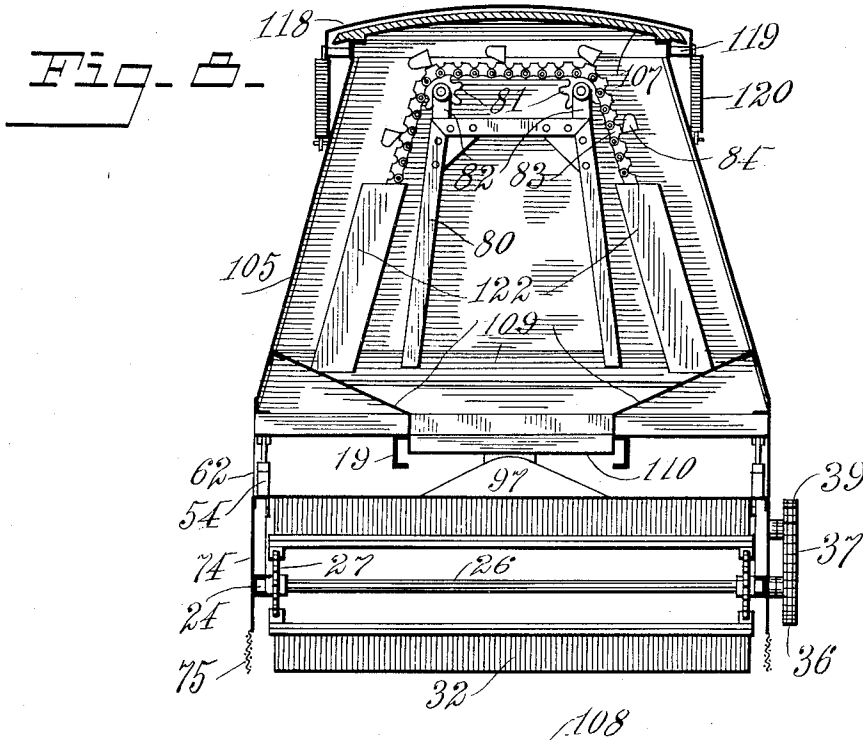
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6 SHEETS—SHEET 5.



Witnesses
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1,244,009.

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6 SHEETS—SHEET 6.

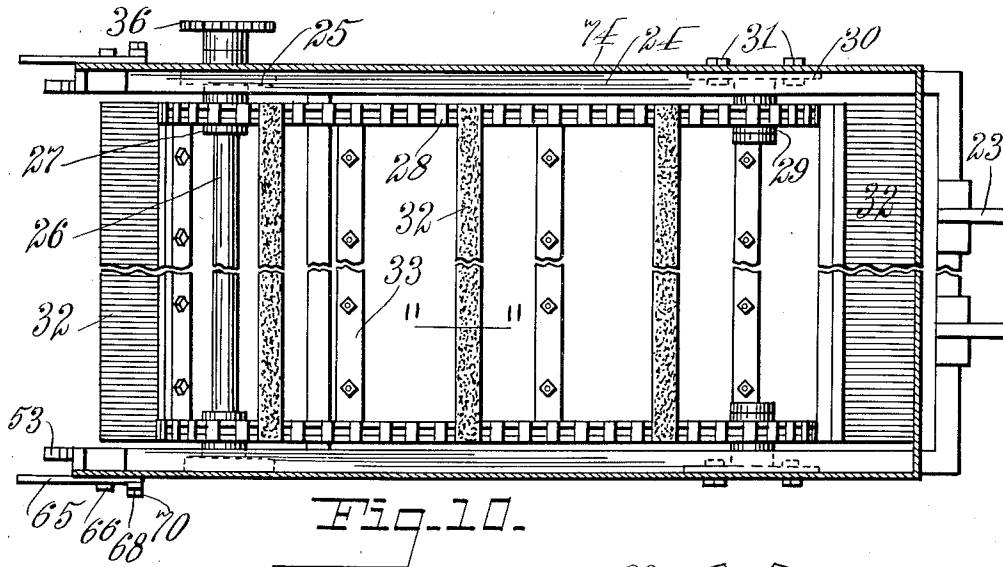


Fig. 10.

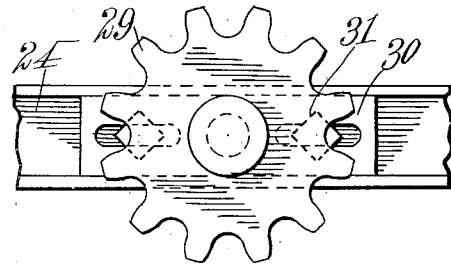


Fig. 12.

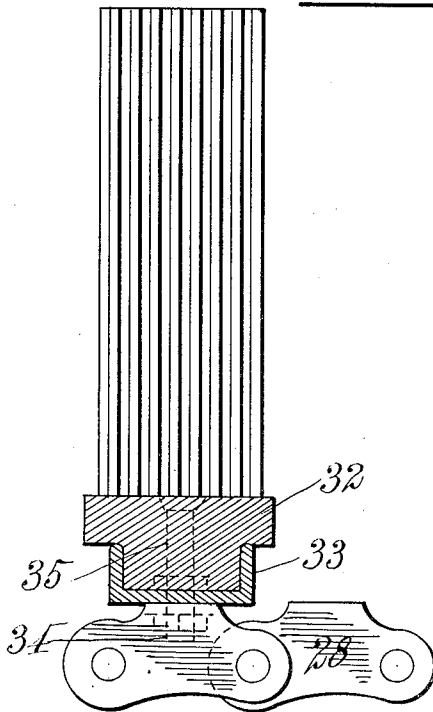


Fig. 11.

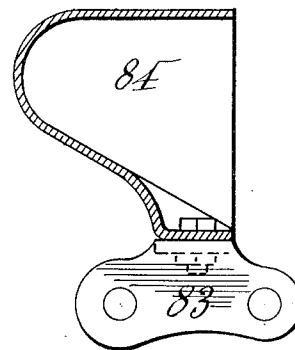


Fig. 13.

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UNITED STATES PATENT OFFICE.

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STREET-SWEEPING MACHINE.

1,244,009.

Specification of Letters Patent.

Patented Oct. 23, 1917.

Application filed March 1, 1917. Serial No. 151,662.

To all whom it may concern:

Be it known that I, ALFONS ALTENBERG, a subject of the Kingdom of Prussia, residing at Piqua, in the county of Miami and State of Ohio, have invented certain new and useful Improvements in Street-Sweeping Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in street sweeping machines. The objects of the invention are several, first to provide a self-propelled machine of this type which effectually sweeps and gathers the dirt from the street and which collects the dust and deposits it with the dirt in suitable receptacles. A further object of the invention is to provide a trailer and a sweeper frame, the former being connected with the truck frame and the sweeper frame being connected with both the truck frame and the trailer frame whereby the sweeper frame may be individually adjusted or manipulated as required without interfering with the permanent connection between the truck frame and the trailer frame. Other objects which have to do with the efficiency of the machine will appear in the description to follow and be pointed out in the annexed claims. A further object may, however, be stated to consist in the provision of variously improved details such as the mounting of the dirt pan and the dirt carriers, the dirt pan being so mounted relatively to the dirt carriers that it may be adjusted independently thereof, and a further object and purpose of the invention is to provide means whereby the sweepers may be always maintained in proper contact with the surface of the ground over which they move. These instrumentalities, to wit, the sweepers and the dirt pan are supported from the trailer frame through the sweeper frame before referred to. A further object of the invention is to provide a vacuum device or dust collector which controls the dust and discharges it at a point where it may be conveniently removed, all of which will appear in the description to follow. To the

above ends the machine is simple in construction and efficient in operation.

Referring to the accompanying drawings, Figure 1 is a side elevation of the complete machine. Fig. 2 is a sectional plan view of the lower portion of the machine, the same being approximately on the line 2—2 of Figs. 1 and 3. Fig. 3 is a longitudinal vertical section through the complete machine. Fig. 4 is a detailed elevation of the driving means for the brooms or brushes. Fig. 5 is an enlarged detailed view of the means for supporting the dust pan. Fig. 6 is a rear elevation of the machine. Fig. 7 is a section approximately on the line 7—7 of Fig. 3. Fig. 8 is a section approximately on the line 8—8 of Fig. 3. Fig. 9 is a section approximately on the line 9—9 of Fig. 3. Fig. 10 is a top plan view of the brushes and supporting frame, the casing being shown in section. Fig. 11 is a detail view of the means for supporting the brushes, the same being a section on the line 11—11 of Fig. 10. Fig. 12 is a detail view of one of the rear sprockets of the sweeping mechanism showing the method of adjusting the chains, and Fig. 13 is a detail sectional view of one of the dirt elevating buckets. Throughout the specification and drawings similar reference characters indicate corresponding parts.

The machine in its entirety consists of two main parts or divisions. The first division is represented by a tractor which consists of a conventional form of motor truck and is constructed in the present instance as follows: (See Figs. 1, 2 and 3.) The truck consists of a main frame 1 provided with a front axle 2 and a rear axle 3. The front axle 2 is provided with steering wheels 4, and the rear axle is provided with the usual tractor wheels 5. The truck is provided with the usual seat 6, radiator 7, hood 8', and steering mechanism 9'. Mounted upon the frame 1 is an engine or motor 8 which connects, through the usual transmission 9 and universal joint 10, with a driving shaft 11. The shaft 11 is provided with a sprocket 12 which is connected with a sprocket 13 by a chain 14. The sprocket 13 is mounted upon the shaft 15 which is connected with driving shafts 16 through a conventional form of differential gear 17. The driving shafts 16 propel the tractor wheels 5 in a well known manner. Through the agency

of the above means the entire machine is moved over the ground to perform its sweeping operations.

The second division of the machine consists of sweeping mechanism and part of the dirt-collecting mechanism. These mechanisms are mounted upon a sub-frame pivotally secured to the main frame and carried by suitable casters. This arrangement permits the sweeping mechanism to be always in contact with the street when moving over uneven surfaces. (See Figs. 1, 2 and 3). Pivotaly attached at 18 to the frame 1 is a rear or trailing frame 19. Depending from the rear ends of the frame 19 are brackets 20 which support swiveled caster wheels 21. The caster wheels 21 are instrumental in supporting the rear end of the trailing frame 19 and the parts carried thereby. Pivotaly attached at 22 to the brackets 20 are brackets 23 which project from a frame 24. The frame 24 is the supporting frame for the sweeping brushes which are constructed and operated as follows: (See also Fig. 10). At its forward end the frame 24 is provided with bearings 25 in which is journaled a shaft 26. The shaft 26 is provided with sprockets 27 around which extend sprocket chains 28. The sprocket chains 28 also extend around idler sprockets 29. The idler sprockets 29 are mounted upon adjustable brackets 30 mounted on the frame 24. The brackets 30 are adjusted through the agency of bolts 31 which permit each sprocket 29 to be adjusted independently of the other, thereby permitting the independent adjustment of each sprocket chain 28. Mounted upon the sprocket chain 28 are a series of brushes 32 which are instrumental in sweeping the dirt from the street. These brushes are mounted upon the chains by the following means: (See also Fig. 11). Attached to a suitable number of links of the chains 28 are channel bars 33 in which the backs of the brushes 32 are placed. The channel bars 33 extend the entire length of the brushes and are secured to the links of the chains 28 by bolts 34. The backs of the brushes 32 are secured and held within the channel bars 33 by bolts 35. By this means of mounting the brushes 32, the said brushes may be easily removed and replaced, which facilitates the repair and operation of the machine. The shaft 26 is a driving shaft, and when said shaft is rotated the brushes mounted on the lower run of the sprockets 28 will, when in engagement with the street, loosen and move forward the dirt thereon. The shaft 26 is driven by the following means: (See also Fig. 4). The shaft 26 extends on one side beyond the frame 24 and is provided with a sprocket 36 around which passes a chain 37. The chain 37 also passes over an idler sprocket 38 and a driving sprocket 39.

The object of the idler sprocket is to take up the slack of the chain 37. The sprocket 38 is resiliently mounted upon the lower end of a rod 40 which extends into a housing 41 where it is under the control of a spring 42. The driving sprocket 39 is mounted upon the outer end of a shaft 43 which is journaled in a bracket 44 and bearings 45 attached to the main frame 1. (See also Fig. 7). The shaft 43 is provided with a spiral gear 46 which meshes with a spiral gear 47 mounted upon a shaft 48 journaled in a bearing 49 and in a clutch 50. The clutch 50 connects the shaft 48 with the driving shaft 11 and said clutch is therefore instrumental in controlling the movement of the sweeping and dirt-collecting mechanism. It will be noted that the clutch 50 is located in the rear of the sprocket 12 through which the machine is driven forward. The forward movement of the machine may therefore be accomplished without affecting the operation of the sweeping and dust-collecting mechanism. The machine may therefore be moved from one location to another without operating the sweeping mechanism. The clutch 50 is actuated by a foot lever 51 connected thereto through a rod 52. As has been previously stated, the frame 24 which supports the sweeping brushes is pivoted at 22. The brushes are elevated on their pivots 22 from contact with the street surface by the following means: (See Figs. 1, 2 and 3). The forward ends of the frame 24 are provided with brackets 53 which are pivotally connected to turn buckles 54 in turn connected to cranks 55 on a rock shaft 56 journaled in bearings 57. The shaft 56 is provided with a crank 58 which is connected by means of a rod 59 with a lever 60 pivoted at 61 to the frame 1 and located adjacent to the driver's seat 6. By manipulating the lever 60 the frame 24 of the sweeping mechanism will be rocked on the pivots 22, thereby elevating the brushes from contact with the street. As the lower brushes move forward, the dirt collected by them is swept into a conveyer housing 62 through the agency of a dust pan 63. (See Figs. 3 and 5). The dust pan 63 is semi-circular in shape to conform to the circular movement of the brushes at the end of the frame. The lower edge of the dust pan 63 is in engagement with the street and the same is supported upon the frame 24 by the following means: Pivotaly attached at 64 at each side and at the upper edge of the dust pan are levers 65. The levers 65 are pivoted at 66 to the frame 24. The ends of the levers opposite the pivots 64 are adapted to be clamped to semi-circular brackets 67 through the agency of bolts 68. Also adapted to be attached to the brackets 67 through the agency of the bolts 68 are slotted bars

69, the slotted ends 70 of which receive the bolts 68 and the lower ends 71 of which are pivotally attached to the sides of the dust pan at intermediate points. The levers 65 permit the upper edge of the dust pan 63 to be moved forward and rearwardly, while the bars 69 permit the lower edge of the dust pan to be elevated and lowered, thereby permitting the said dust pan to be adjusted to a proper position to compensate for the wear of the brushes. Also in this connection, the pivots 22 of the brackets 23 are provided with a plurality of holes 73 in the bracket 20 to permit the rear end of the frame 24 to be adjusted to compensate for the wear of the brushes. The forward end of the frame 24 may be adjusted to compensate for wear of the brushes by the turn buckles 54 see Fig. 5.

The frame 24 supports a casing 74 which is instrumental in retaining the dust raised by the brushes, the dust being subsequently removed by a blower, as hereinafter described. The casing 74 does not extend to the surface of the street and the intermediate space is occupied by a skirt 75 which is essentially flexible and may be of any suitable fabric. The said skirt 75 prevents the dust from escaping from beneath the housing 74. As before stated, the dirt is swept from the street into a conveyer housing 62. The dirt accumulates in the lower portion or trough 76 of this housing, where it is collected by a conveyer constructed as follows: (See Figs. 1, 3 and 9). Also extending from the main frame 1 are brackets 77 in which are journaled sprockets 78 upon shafts 79. Extending upwardly from said main frame 1 is a frame 80 upon which are mounted sprockets 81 in frames 82. Extending around the sprockets 78 and 81 is a sprocket chain 83 upon which are mounted buckets 84. When the buckets 84 are on the lower horizontal run and are traversing the trough 76, they are collecting the dirt swept into the trough by the brooms. When the buckets reach their upper horizontal run, the dirt collected in the trough will fall out of the buckets into a sweeping receptacle hereinafter described. The bottoms of the buckets 84 are suitably inclined as shown in Fig. 13 to permit the dirt to slide out of said buckets when traveling in a horizontal direction. The sprocket chain 83 is driven from the shaft 48 through the agency of pulleys 85 and 86 and a belt 87, the pulley 85 being mounted upon the shaft 48 and the pulley 86 being mounted on one of the shafts 78. The pulleys 85 and 86 and the belt 87 are inclosed in a suitable casing 88. As the pulley 85 is in the rear of the clutch 50, the operation of the conveyer mechanism is under the control of said clutch.

The dust and floating portions of the dirt are collected by the following means: (See

Figs. 3 and 7). Mounted upon the frame 1 is a sub-frame 89 upon which a blower 90 is mounted. The blower 90 is of a well known type and is provided with a shaft 91 provided with a pulley 92. The pulley 92 is connected by means of a belt 93 with a pulley 94 upon the shaft 43. The suction inlet 95 of the blower 90 is connected by means of a flexible connection 96 with a funnel 97 extending from the housing 74 of the brushes. The suction created by the blower collects the dust in the casing 74 and delivers it through the discharge opening 98 of the blower into a housing 99 supported upon the sub-frame 89. The blower 90 is mounted within an inner housing 100 which is mounted within the housing 99. The dust in the present instance is separated from the air by a series of baffle screens 103 arranged in inclined staggered relation within the housing 99 and above the blower 90. The air passes out of the housing 99 in proximity to the doors 102 where it may be easily removed.

The dirt elevated by the conveyer buckets 84 and discharged therefrom on their upper run is received by a receptacle consisting of a housing 105. (See Figs. 1, 2, 3, 6 and 9). The housing 105 is mounted upon a sub-frame 106 which in turn is mounted upon the trailing frame 19. The housing 105 is provided with a top 107 the forward continued portion 108 of which forms the covering for the receptacle 99. The housing 105 is provided with an inclined bottom 109 which is adapted to discharge the dirt into a lower receptacle 110 having an inclined bottom 111 and located between the side members of the frame 19. The receptacle 105 has a rear wall 112, while the lower receptacle 110 has a door 113 in alinement with the wall 112 and through which the dirt may be removed from the receptacle 110. The dirt receptacle is provided with sleeves 122 which surround the conveyer chain 83 and prevent the dirt obstructing the movement of the buckets 84.

It has been stated that the housing 105 of the dirt receptacle is mounted upon the sub-frame 106. However, the extreme forward portion 114 of the housing 105 is, in reality, in the present instance, mounted upon the sub-frame 89, and is therefore carried by the main frame 1. This construction is necessary to permit the rear portion including the sweeping mechanism to move independently on the pivots 18 and casters 21 which permits the brooms or brushes to be always in contact with the surface of the street. To maintain the dirt receptacle sealed at all times, during the relative movement between two portions of the dirt receptacle, the said portions are connected on the inside of the receptacle by a flexible connection 116, formed of cloth or other suitable fabric.

The openings between the portions 105 and 114 are closed on the outside by plates 117. The top portions 107 and 108 are connected by a plate 118 pivoted at 119 and provided with springs 120 which maintains the plate against the portion 107 thereby providing for a closed joint at this point during the relative movement between the portions 107 and 108. The machine as a whole may be provided with many appurtenances peculiar to motor trucks which are not shown in the drawings, with the exception of the fuel tank 121 shown in Fig. 6.

Having described my invention, I claim:

1. In a street sweeping machine, the combination with a truck frame, of an inclosed trailer frame connected to the rear of the truck frame, swiveled wheels supporting the rearward portion of the trailer frame, a sweeper frame below said trailer frame having an adjustable connection with the trailer frame, and sweepers united by an endless connection and mounted on said sweeper frame.
2. In a street sweeping machine, the combination with a truck and the frame thereof, of a trailer frame pivotally connected to the rear of said truck frame and supported at its rear end by swiveled wheels, a sweeper frame mounted below said trailer frame and having an adjustable connection with the rear end of the trailer frame, a sweeper comprising a series of brooms flexibly connected and supported by said sweeper frame, and a connection between the forward end of the sweeper frame and the truck frame whereby the sweepers and the frame may be elevated upon the adjustable connection of said frame with the trailer frame.
3. In a street sweeping machine, a tractor, a trailing frame pivotally connected to the frame of said tractor, a sweeper frame adjustably connected at one end to said trailing frame, a series of flexibly connected brooms supported on the sweeper frame, and

a connection between the forward end of the sweeper frame and the truck frame including a lever by means of which the sweeper frame may be elevated on its adjustable connection with the trailer frame.

4. In a street sweeping machine, the combination with a truck and the frame thereof of a trailing frame pivotally connected with said truck frame, a broom supporting frame having its rearward end adjustably connected to said trailing frame, a series of flexibly connected brooms supported on said last named frame, a conveyer mounted on said truck frame and adapted to receive the dirt from said brooms, and supporting wheels for the rear end of the trailing frame.

5. In a street sweeping machine, the combination with a truck and the frame thereof of a trailing frame pivotally connected to said truck frame, a sweeper frame adjustably connected to the trailing frame at one end, a lifting connection extending from the forward end of said sweeper frame and carried by said truck frame, a series of flexibly connected brooms mounted in said sweeper frame, a dirt-receiving pan supported on said sweeper frame, and supporting wheels swivelly connected to the rear end of the trailing frame.

6. A tractor, a trailing frame pivotally connected to said tractor, wheels supporting the rearward end of said trailing frame, a sweeper frame having its rearward end adjustably connected to the trailing frame and its forward end supported by lifting connections extending from the tractor, a series of flexibly connected brooms mounted in said sweeper frame, and a dirt-receiving pan adjustably supported on said sweeper frame.

In testimony whereof I affix my signature in presence of a witness.

ALFONS ALTENBERG.

Witness:

MATTHEW SIEBLER.