Dec. 7, 1926. 1,610,119

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STREET CLEANING MACHINE

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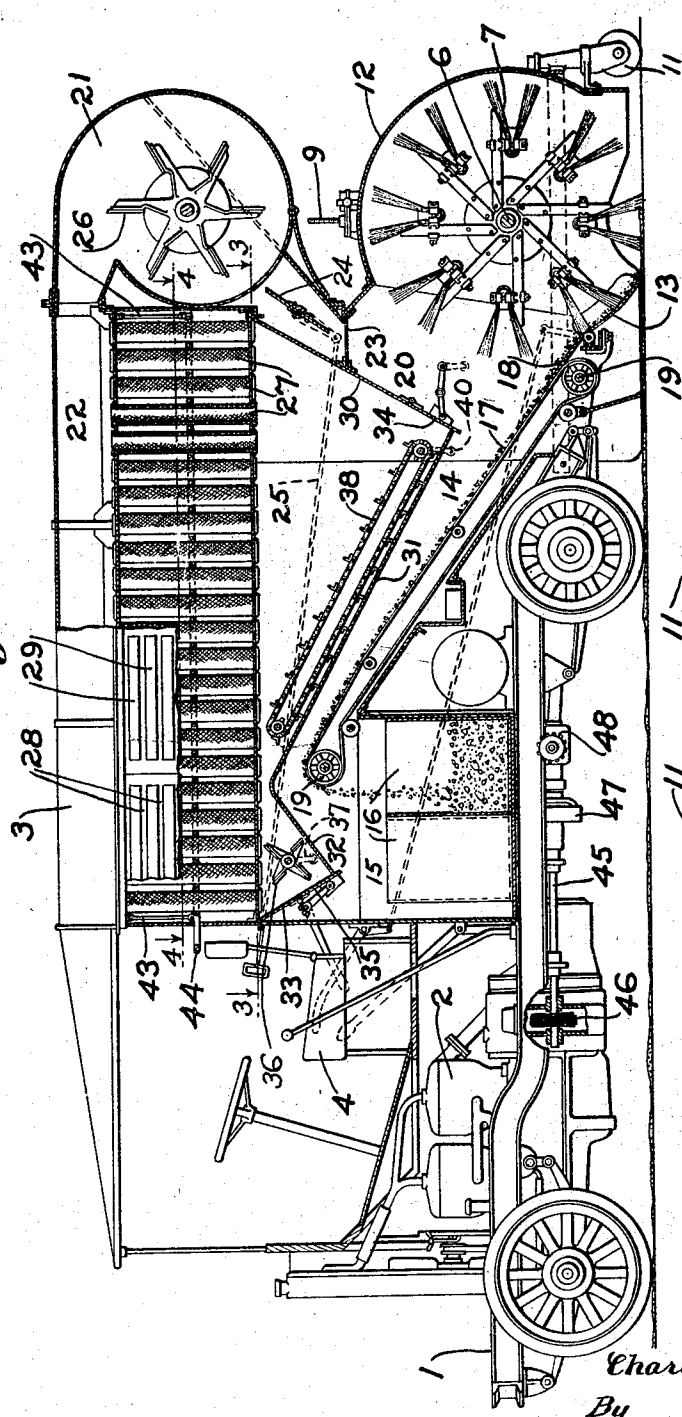


Fig. 1.

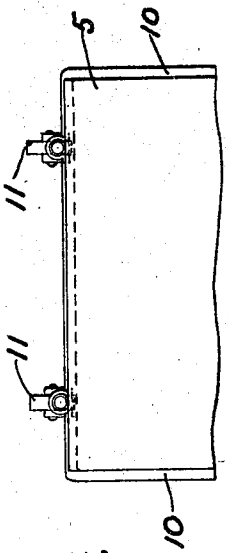


Fig. 5.

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Fig. 2.

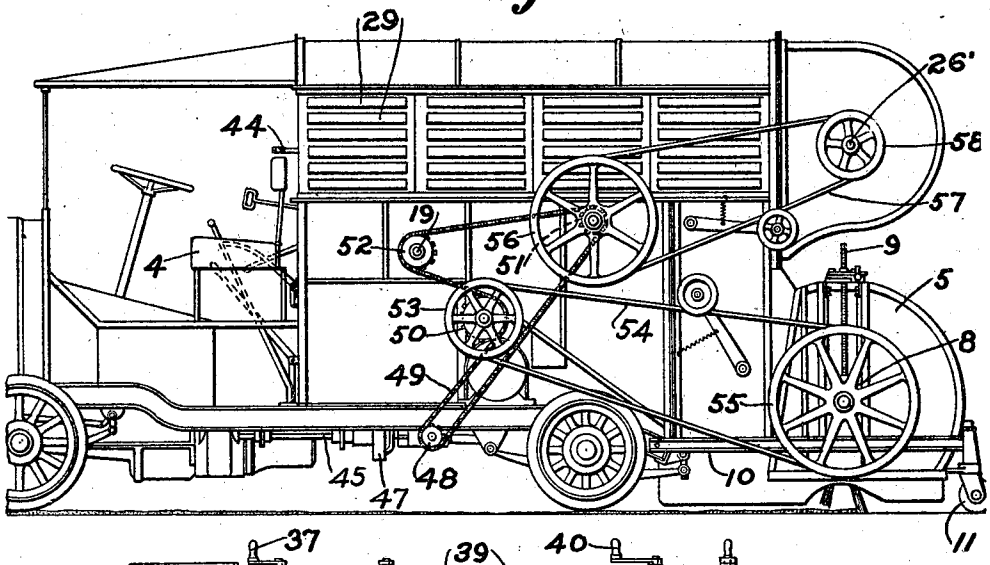
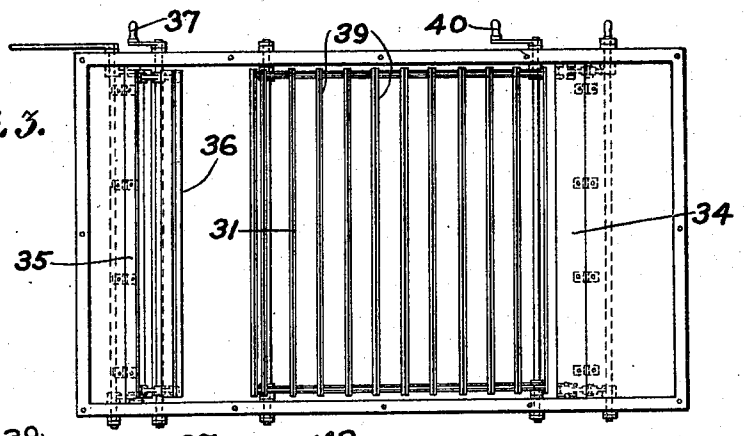


Fig. 3.



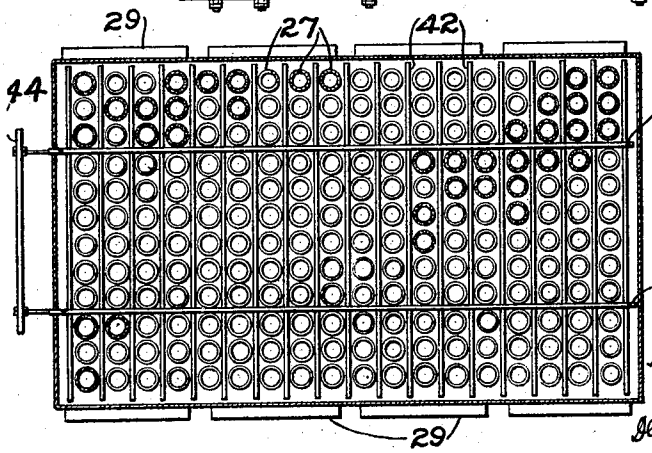


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES H. BUTLER, OF OAKLAND, CALIFORNIA.

STREET-CLEANING MACHINE.

Application filed December 15, 1924. Serial No. 755,846.

This invention relates to street cleaning machines, and more particularly to machines of the pneumatic or vacuum type which are propelled along the streets and which, as they travel therealong, sweep up the refuse, collect the dust and lighter particles of refuse from the air, discharge the cleansed air into the atmosphere, and collect both the heavy and light refuse into receptacles or hoppers. Such a machine forms the subject-matter of applicant's former Patents, Numbers 808,006, 880,124, and 909,865, and the object of this invention is to provide certain improvements in such machines.

The improved features of the machine comprising this invention are described in this specification and illustrated in the accompanying drawing, and while in such drawing I have shown certain specific embodiments of my invention, it should be understood that the drawing is not to be construed as defining or limiting the scope of the invention, the claims appended to this specification being relied upon for that purpose.

Referring to the figures of the drawing,

Fig. 1 is a side elevation, mostly in longitudinal section, showing a street cleaning machine of the type stated, embodying my invention;

Fig. 2 is a side elevation thereof on a smaller scale;

Fig. 3 is a detail view of the invention, taken approximately on line 3—3 of Fig. 1;

Fig. 4 is a detail view of the invention, taken approximately on line 4—4 of Fig. 1;

Fig. 5 is a fragmentary plan view of the rear of the machine.

Referring more specifically to the drawing by reference characters, 1 indicates the frame or chassis of a motor vehicle propelled by an engine 2. The street cleaning and refuse-receiving apparatus of the machine, as shown in Fig. 1, is mostly enclosed within the housing 3 rearwardly of the driver's seat 4.

Connected to the rear end of the frame 1, for flexible vertical movement thereon, is a housing 5 within which is rotatably mounted, on a shaft 6, a rotary broom 7. The ends of the shaft 6 are mounted in bearing blocks 8, adjustable vertically in the housing by means of screws 9. The housing is supported on a pair of rearwardly-extending arms 10 flexibly or pivotally connected to the rear of the frame 1, the rear ends of the arms preferably being connected U-shaped and supported by one or more casters 11.

The broom housing 5 has an enclosing portion 12 surrounding the broom 7, and the frame 1 or housing 3 carries a portion 13 adjacent the broom and forming a dust-pan therefor. This pan rides on the pavement forwardly of the broom and receives the refuse swept thereonto by the broom. The housing 5, together with the casters 11, supports the broom in sweeping contact with the road directly adjacent the refuse-receiving pan 13, and the mounting of the broom shaft 6 provides means for vertically adjusting the broom to the desired operating position.

A passageway 14 extends from the housing 5 upwardly and forwardly to a chamber 15, which is adapted to receive one or more refuse-receiving cans 16. An endless conveyor 17 extends from the dust-pan, or from an extended platform 18 thereof, up the passageway 14 to the chamber 15. This conveyor is carried on rollers mounted on shafts 19. It is obvious that in operation the refuse swept over the pan and onto the conveyor will be carried up the passageway 14 and into the receptacles 16.

An air trunk or passageway 20 intersects the passageway 14 and extends upwardly and rearwardly into a fan-chamber 21, and thence forwardly at 22. A coarse screen 23 is provided in this passageway for preventing papers and such light bulky material from passing into the fan-chamber. A damper 24 is also provided adjacent the screen for closing this passageway when desired, for example, when operating on wet streets where there is no dust. Such closing of the passageway prevents mud and other objectionable material from entering the fan-chamber. This damper can be operated from the driver's seat through a connecting rod 25. A rotary fan 26, mounted in the fan-chamber 21, is adapted to cause a draft of air to pass through the trunk, as indicated by the arrows.

Mounted in the housing 3, beneath and in direct communication with the chamber 22, are a series of dust-collecting tubes 27. The sides of the vehicle body are provided with air-discharge openings or slots 28 located below louvers 29. The tubes consist of thin, closely-woven cloth which will allow the air to pass outwardly through the meshes there-

of, but which will retain the finest dust within the tubes. The tubes may be mounted in any desired manner.

Located beneath the tubes 27 is a dust-receiving hopper having one steep wall 30 and a co-operating wall 31, the forward portion of the hopper comprising co-operating walls 32 and 33. Dust-removing gates 34 and 35 are respectively provided in the lower portions of the walls 30 and 33, and means, such as illustrated, can be provided for opening these gates. A rotary scraper, having scraping blades 36 and an outside operating handle 37, is provided for scraping the dust down the wall 32 toward the gate 35. The provision of the gates 34 and 35 provides a normally closed hopper which collects the dust without permitting escape thereof, the dust being removable from the hopper at intervals by opening these gates. An endless scraper 38, provided with transversely-extending scraping blades 39 and an outside operating handle 40, is provided for scraping the dust down the wall 31 toward the gate 34. As shown in Fig. 3, the spaces between the blades 39 are entirely open, and therefore in no way prevent the dust from falling onto the wall 31.

As illustrated in Fig. 4, a pair of rods 41 extend longitudinally through the tube chamber and are provided with transversely-extending bars 42 thereon, between the adjacent rows of tubes. The rods are movably supported by links 43 within the tube chamber. The forward ends of the rods extend through the front wall of the housing 1 and are provided with an operating handle 44 thereon adjacent the driver's seat. The construction is such that the driver can grasp the handle 44 and rapidly reciprocate the rods longitudinally in a manner to shake the tubes and cause the clinging dust to drop therefrom into the hopper.

As heretofore stated, the vehicle is propelled from the engine 2. The broom 7, conveyor 17 and fan 6 are also operated from the engine. A shaft 45 is driven from the engine shaft through a chain 46. This shaft is connected by a clutch 47 and suitable driving connections to a sprocket gear 48 on the left-hand side of the machine.

An endless sprocket chain 49 extends about sprocket gears 48, 50, 51, and 52. A pulley 53, connected to the sprocket 50 by a belt 54, drives a pulley 55 on the broom shaft 6. A pulley 56, connected to the sprocket 51 by a belt 57, drives a pulley 58 on the fan-shaft 26'. The sprocket 52 is secured to the upper conveyor roll shaft 19.

It is believed that the operation of the machine and the advantages of our improved features therein will be obvious without further description. Briefly, however, the operation is as follows: As the vehicle is driven along in the street cleaning operation, the several moving parts are driven in the directions indicated by the arrows. As shown in Fig. 2, the entire driving connections from the engine to these parts are located on the left-hand side of the machine, which, in this country, is ordinarily the side away from the curb. The advantage of such an arrangement of the drive is obviously to permit operating the machine close up to the curb without any possibility of the driving mechanism interfering therewith. The operation of this mechanism is controlled from the driver's seat through the clutch 47.

The refuse swept up by the broom 7 is carried to the receptacle 16 by the conveyor 17. The dust and light refuse are drawn upward through the trunk 20 and deposited within the tubes 28, as will be understood. The screen 23 prevents bulky material from entering the fan chamber, the damper 24 can be closed from the driver's seat, when the condition of the road demands, the dust clinging to the tubes can be shaken into the hopper beneath by the operator gripping the handle 44, the hopper can be cleaned by rotating the scraping handles 37 and 40, and the refuse can be removed from the hopper through the gates 34 and 35.

It should be particularly noted that the construction of the machine is such that the entire refuse picked up thereby is deposited in the receptacles 16 in the chamber 15. The heavy refuse is carried directly to this chamber by the conveyor 17. The gate 35 is over the chamber, so that when this gate is opened the light collected material in the forward end of the hopper drops directly into this chamber. The gate 34 is over the conveyor 17, so that when this gate is opened the light collected material in the rear end of the hopper drops onto the conveyor and is carried upwardly to the chamber. It will be understood that during this latter operation the damper 24 is closed to prevent the material from again entering the fan-chamber.

It should furthermore be noted that the casters 11 are located on the frame or housing 5, between the sides thereof. Such arrangement of the casters permits operating close to the curb and directly in the gutter without interference by the casters, and furthermore, the casters never collide with obstructions when turning corners, as would be the case were they located at the corners or on the outside of the frame 5.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A street cleaning machine comprising the combination of a vehicle frame having a housing thereon, a driver's seat on the frame, a rotary sweeping broom connected to the frame, an endless conveyor extending

upwardly and forwardly in a passageway formed in the housing, a receiving chamber for the material lifted by the conveyor, an air trunk intersecting the conveyor passageway, a rotary fan in the air trunk for providing a draft therethrough from the passageway, said air trunk extending upwardly and forwardly of the vehicle, settling tubes in the air trunk, a damper in the trunk between the fan and passageway, and means operative from the seat for adjusting the damper.

2. A street cleaning machine comprising the combination of a vehicle frame having a housing thereon, a rotary sweeping broom carried thereby, an endless conveyor extending upwardly and forwardly in a passageway formed in the housing and adapted to carry the swept material to a receptacle, an air trunk intersecting the passageway, settling tubes in the air trunk, means for forcing a draft of air through the trunk from the passageway toward the tubes, a hopper having an inclined bottom beneath the tubes, a gate at the lower end of the inclined bottom for removing the collected material from the hopper, and movable means in the hopper, operative from the outside thereof, for scraping the material along the said bottom toward the gate.

3. A street cleaning machine comprising the combination of a vehicle frame having a housing thereon, a refuse-receiving chamber on the frame, a rotary sweeping broom connected with the frame, an endless conveyor extending upwardly and forwardly therefrom in the passageway formed in the housing and adapted to carry the swept material to the chamber, an air trunk intersecting the passageway, settling tubes connected with the air trunk, means for forcing a draft of air through the trunk from the passageway toward the tubes, a hopper beneath the tubes, a gate in the hopper over the conveyor and openable to permit the collected material in the hopper to drop onto the conveyor, and means for opening and closing the gate.

4. A street cleaning machine comprising the combination of a vehicle frame having a housing thereon, a refuse-receiving chamber on the frame, a rotary sweeping broom connected with the frame, an endless conveyor extending upwardly and forwardly therefrom in a passageway formed in the housing and adapted to carry the swept material to the chamber, an air trunk intersecting the passageway, settling tubes connected with the air trunk, means for forcing a draft of air through the trunk from the passageway toward the tubes, a hopper beneath the tubes, two gates in the hopper, one gate being over the said chamber, and the other gate being over the conveyor, the two gates being openable to permit the collected material to drop into the chamber and onto the conveyor respectively, and means for opening and closing the gates.

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