F. R. BRUGGER.

DUST COLLECTOR MECHANISM FOR STREET SWEEPERS.

APPLICATION FILED OCT. 11, 1913.

1,137,184.

Patented Apr. 27, 1915.

4 SHEETS—SHEET 1.

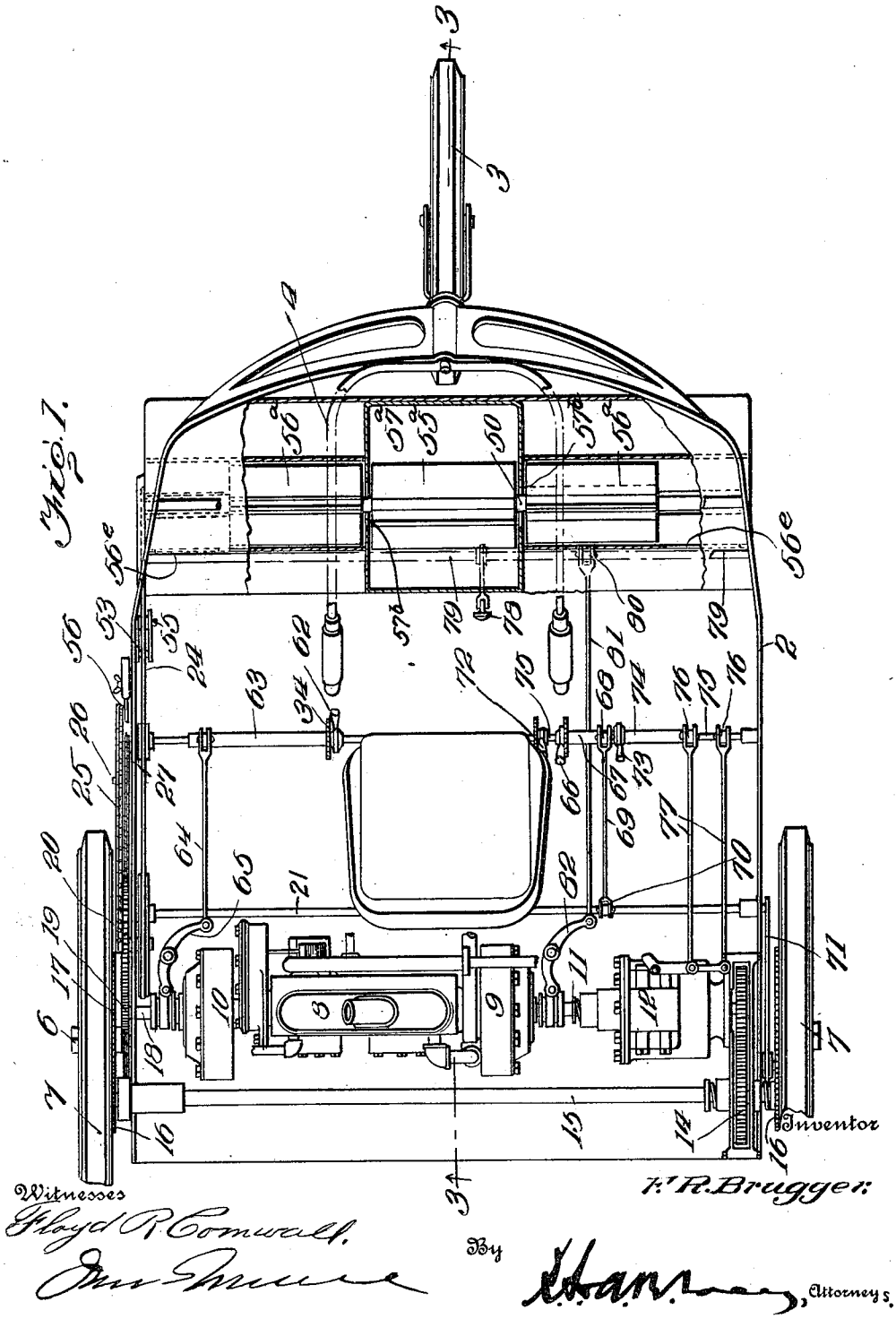


Fig. 1.

Witnesses

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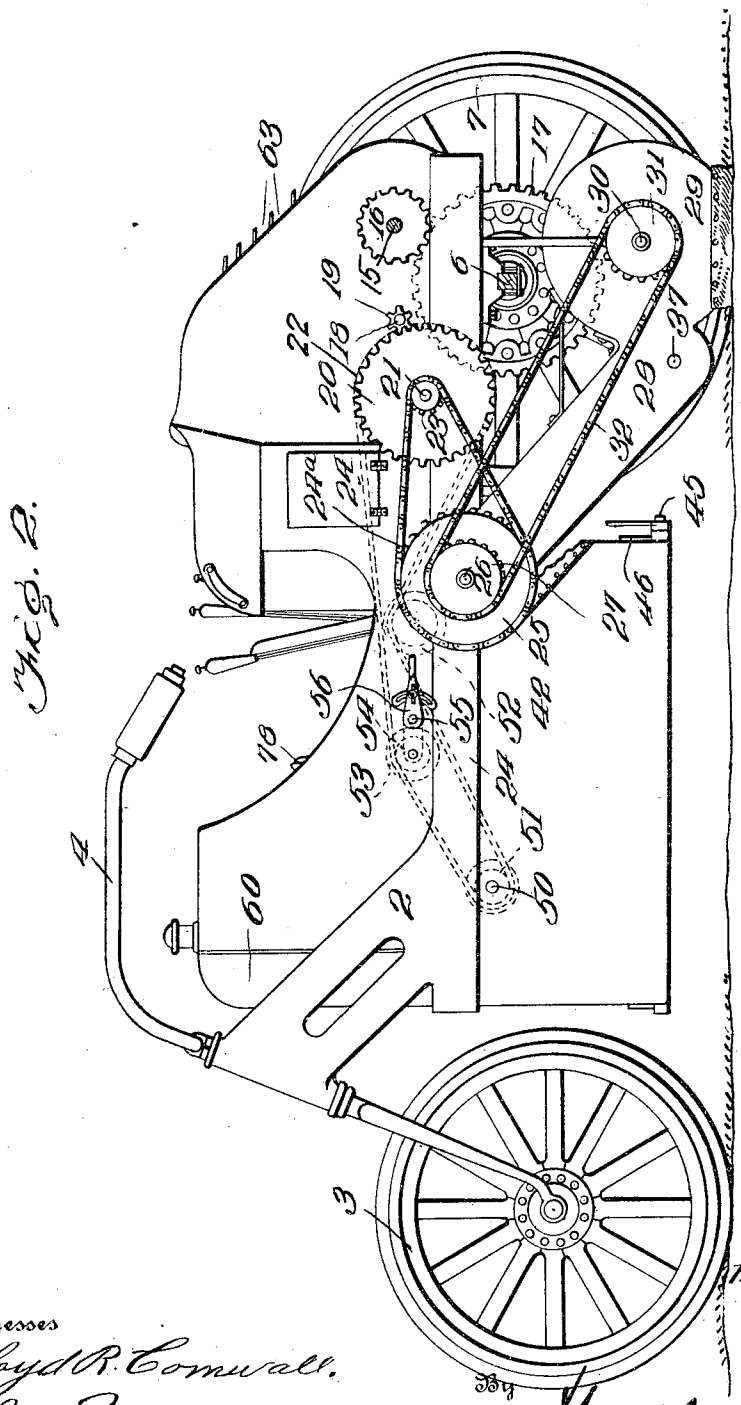
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4 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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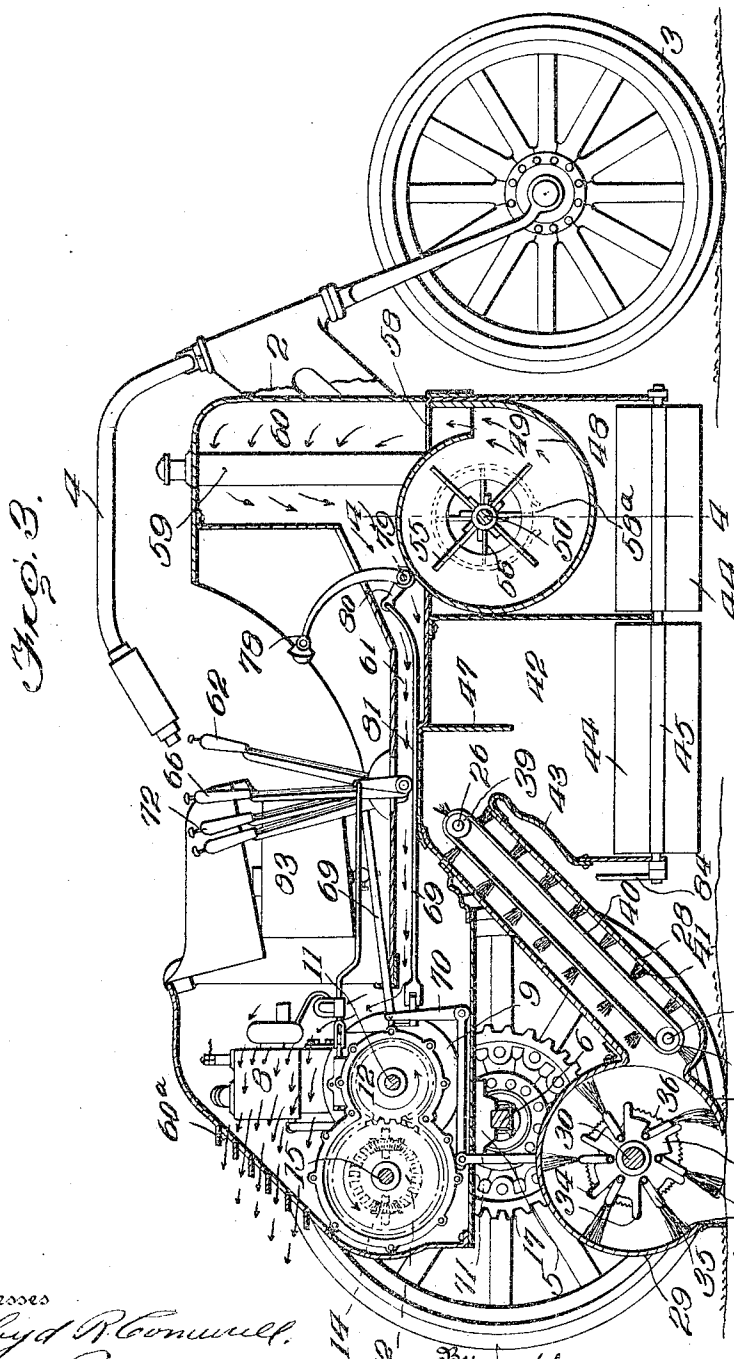
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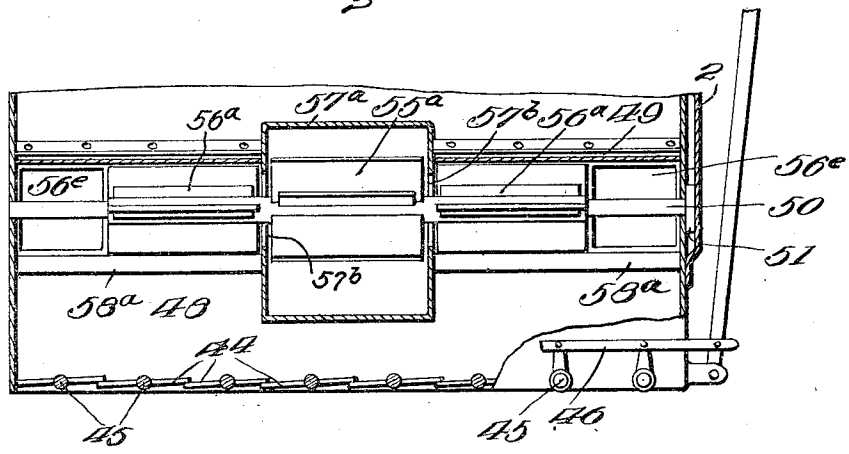
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4 SHEETS—SHEET 4.

Fig. 4.



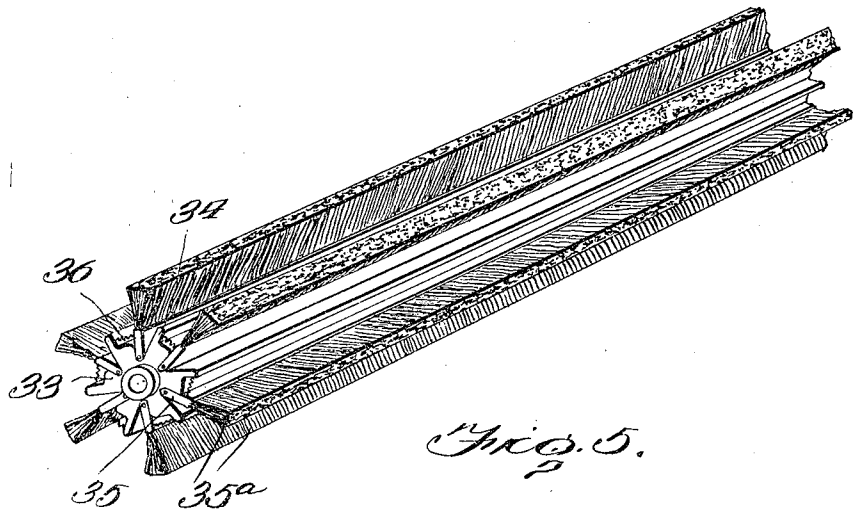


Fig. 5.

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UNITED STATES PATENT OFFICE.

FREDERICK R. BRUGGER, OF YETTER, IOWA.

DUST-COLLECTOR MECHANISM FOR STREET-SWEEPERS.

1,137,184. Specification of Letters Patent. Patented Apr. 27, 1915.

Application filed October 11, 1913. Serial No. 794,657.

To all whom it may concern:

Be it known that I, FREDERICK R. BRUGGER, citizen of the United States, residing at Yetter, in the county of Calhoun and State of Iowa, have invented certain new and useful Improvements in Dust-Collector Mechanism for Street-Sweepers, of which the following is a specification.

My invention relates to street sweeping apparatus, and particularly to that form of apparatus which is driven by its own motive power.

The invention is primarily designed to provide novel means for separating the sweepings after the same have been gathered so that the relatively heavy particles may accumulate in one chamber, the dust and like particles collect in another chamber and the air free from all dust pass off readily.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings wherein:

Figure 1 is a plan view partly in section of a street sweeper constructed in accordance with my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a longitudinal vertical section on the line 3—3 of Fig. 1. Fig. 4 is a transverse section on the line 4—4 of Fig. 3. Fig. 5 is a perspective detail view of the rotary broom.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Referring to these drawings, it will be seen that my improved street sweeper is mounted upon a frame 2 of any suitable form or construction, supported at its forward end by the front steering wheel 3 whose post extends up through the frame 2 and is rotatably mounted therein and is provided at its upper end with the handle bar 4 of any usual or ordinary form. The rear end of the frame is supported by means of a bolster 5 which in turn is mounted upon the rear axle 6. Mounted upon this rear axle are the rear driving wheels 7.

Carried upon the rear end of the frame and preferably inclosed in a suitable casing is a motor 8 of any suitable type. Preferably this is an internal combustion engine and is illustrated as a four-cylinder automobile engine. As illustrated, this engine is provided with two oppositely disposed fly wheels 9 and 10 respectively, each fly wheel being equipped with a friction clutch. The friction clutch in the fly wheel 9 is operatively connected with the transmission shaft 11 connected to suitable transmission gearing 12, the transmission shaft being connected to the engine shaft by means of the clutch in the fly wheel 9, this clutch being operated by mechanism to be hereafter stated. The transmission drives the differential 14 on the jack shaft 15, and master pinions 16 carried upon the extremity of the jack shaft mesh with master gears 17 mounted upon the rear driving wheels. The transmission illustrated is of the planetary type with two speeds forward and reverse. Any form of transmission may be used, however, and my invention does not lie in this part of the mechanism.

The friction clutch 10 transmits its power through a shaft 18 to a pinion 19 which meshes with a gear 20. This gear 20 is mounted upon a shaft 21 which carries upon it a belt wheel 22 and a sprocket wheel 23. A belt 24 transmits the power of the belt wheel 22 to the fans in the forward portion of the dust collector as will be later described and the sprocket wheel 23 by means of the sprocket chain 24ª transmits its power to a sprocket wheel 25 mounted upon a shaft 26. This shaft carries upon it a sprocket wheel 27 whereby power is applied to the rotary brush at the rear of the machine.

Pivotally mounted upon the shaft 26 is an elevator casing 28 which at its rear end terminates in a nearly cylindrical brush casing 29 shown clearly in Fig. 3. Passing longitudinally through this brush casing 29 is the broom shaft 30 carrying upon one end the sprocket wheel 31 which by means of the chain 32 is connected to the sprocket wheel 27 as heretofore described. The rotary broom is illustrated in Fig. 5. It comprises a central core having radiating members 33, the radiating members being provided on one edge with longitudinally extending radially projecting flanges 34.

Pivotally mounted between the bases of each pair of radiating members 33 are the bristle holders 35 from which extend the bristles 35ª. It will be seen that these bristle holders 35 and therefore the bristles are hingedly mounted for movement in the arc of a circle between the radiating members

33. Each bristle holder is held up against one of the radiating members 33 by means of the springs 36.

Mounted in the lower end of the conveyer casing 28 is the shaft 37 upon which is mounted a band wheel 38. Mounted upon the shaft 26 is a roller 39, and passing over this roller is the elevator apron 40. This apron preferably has brushes 41 projecting from it, these brushes acting to sweep up the dirt and dust which is thrown into the elevator casing by means of the revolving broom and carry the dust and dirt up into a collecting chamber 42. This collecting chamber 42 has a flexible wall 43 which yields to permit the casing 28 to be raised or lowered when the broom is intended to be raised or lowered. The chamber 42 has a pivoted floor composed of transverse slats 44 each mounted upon a rock shaft 45, these slats 44 extending longitudinally of the machine instead of transversely thereof. The slats 44 of the chamber 42 are connected to each other by means of links 46 as illustrated in Fig. 4 so that all of the slats 44 will be operated simultaneously either to dump the contents of the collecting chambers 42 and 48 or close the bottom of the chambers. A baffle plate 47 extends longitudinally of the chamber 42 and transversely of the length of the sweeper and depends from the top of such collecting chamber. This baffle plate is of a depth somewhat greater than the opening at the end of the elevator and so positioned that the dust and dirt cast into the collecting chamber 42 by means of the elevator will strike against the baffle plate. This will cause the heavy particles to fall downward immediately and only the lighter particles of dust will remain suspended in the air.

Disposed forward of the collecting chamber 42 is a dust collecting chamber 48 having a bottom formed by slats 44 and mounted in the upper portion of this chamber is a fan casing 49. This fan casing extends along the whole length of the chamber 48, and extending transversely through the fan casing is a fan shaft 50. This fan shaft carries upon it a band wheel 51 over which the band 24 passes. This band passes over an idler 52 and the belt or band is tightened by means of a belt tightener roller 53 mounted upon an arm 54 which in turn is mounted upon a shaft 55 from which projects a handle 56 on the outside of the machine.

Mounted upon the shaft 50 are two sets of fan blades. The fan blades 55^a are disposed at the middle of the shaft 50 and are relatively long while the fan blades 56^a are disposed on each side of the fan blades 55^a. The casing 49 is enlarged at its middle portion as at 57^a to accommodate the fan blades 55^a and is provided with an upwardly directed opening 58 through which the air expelled by the fan passes. The compartments in which the fan blades 56^a are disposed open at their ends as at 56^e into the dust collecting chamber 42 and the bottom of the compartments within which the fan blades 56^a revolve, is slotted as at 58^a to permit dust to pass down into the dust collecting chamber 48.

The radiator 59 of the engine is disposed above the casing 49 and is disposed within a compartment 60. The opening 58 discharges air into the forward portion of the compartment 60 forward of the radiator 59 and the air passes through the radiator and downward in the compartment 60 from which it is conducted by means of a duct 61 to the rear of the machine and passes into the casing which incloses the engine 8 as illustrated clearly in Fig. 3. The rear face of this casing is formed with a plurality of slots 60^a through which the air is finally discharged. It will thus be seen that the air after it has been deprived of dust does work by passing around the radiator 59, thus cooling the water used for cooling the engine, and from thence circles around the engine itself so as to cool it.

The action of the peculiar fan arrangement I have described is as follows. The air passes from the chamber 42 through the passages 56^e into the chamber inclosing the fans 56^a. Here due to the high velocity of the fan, the dust by virtue of the difference of weight through its centrifugal force is thrown to the outside of the casing and drops downward eventually passing through the slots at the bottom of the casing into the dust collecting chamber 48. The air is prevented from entering the dust collecting chamber because of the pressure in the chamber but is drawn toward the fan casing 57^a passing through the openings 57^b in the ends of this fan casing. Here due to the fact that the air escapes from the fan at a greater distance from the center than the point where it enters, a suction is induced. These fans will be so designed and proportioned as to have a high enough velocity to separate the dust from the air and the fans formed by the blades 55^a will be so designed that at a given speed, the induction of air will be sufficient to prevent any escape of dust from the machine. The air upon leaving the fans passes up through the radiator 59 as previously described, and back through the discharge duct under the footboard, and to the back of the machine and has been deprived of all dust before it passes around the engine.

When sufficient dirt has been collected in the chamber 42 and sufficient fine dust in the chamber 48, the broom containing chamber 29 is raised from the ground, and the friction clutch in fly wheel 10 is thrown out of operation, thus causing the broom, ele-

vator and fans to stop. When a dumping place is reached, the slats 44 are rotated, the dirt drops from the chambers 42 and 48 and the machine is ready to be loaded again.

The clutch 10 is controlled by means of a lever 62 operating on a sleeve 63 which has a projecting arm connected to a link 64 connected to a shifter lever 65. The rear end of the broom casing is raised by means of a hand lever 66 mounted upon a shaft 67 having a radially extending arm 68 which is connected by a link 69 to a bell crank lever 70 which is connected by means of a link 71 to the broom casing 29. The change speed gears are controlled by means of the hand levers 72 and 73, one of which is mounted upon a sleeve 74 and the other of which is mounted upon a shaft 75. The sleeve 74 and the shaft 75 are provided with outwardly projecting arms 76 connected by links 77 to any suitable means for shifting the change speed gears. The clutch 9 whereby the driving wheels are thrown into and out of operative engagement with the engine is controlled by means of a foot pedal 78 mounted upon a shaft 79 having a radially directed arm 80 connected by means of a link 81 to a shipper lever 82 operatively engaging the movable member of the clutch 9.

The fuel tank 83 is disposed under the seat. The dumping lever 84 operatively connected to the shafts 45 is shown broken off to avoid complications in the drawing but will be disposed in convenient proximity to the operator's seat. The slats 44 are disposed longitudinally so that the dirt will empty quickly and so that the slats will not act to draw the dirt over the dump as the machine is moved forward.

What I claim is:

1. In combination, juxtaposed chambers, the one adapted to receive sweepings and the other dust separated from such sweepings, and a separator arranged in the upper portion of the dust chamber and comprising a casing, and a rotary fan, said casing having a central air outlet in its upper forward portion and having its end portions opening into the sweepings chamber at a point midway between the top and bottom of the casing, and such end portions of the casing being formed in their bottoms with dust outlets discharging into the dust chamber.

2. In a street sweeper, a primary dirt collecting chamber, a secondary dust collecting chamber extending parallel to the dirt collecting chamber, a circular fan casing disposed in the upper portion of the dust collecting chamber, said casing having a relatively large middle portion, the ends of said fan casing communicating with the primarv dirt collecting chamber, a shaft passing through the casing, relatively small radiating blades disposed upon said shaft on each side of the enlarged middle portion of the casing, the relatively contracted portions of the casing being formed with openings in the bottom thereof whereby dust may pass into the dust collecting chamber, the middle portion of the shaft having relatively large fan blades thereon and having a discharge opening.

3. In combination, juxtaposed chambers, the one adapted to receive sweepings and the other the dust separated from such sweepings, a casing arranged in the upper portion of the dust chamber and having an air outlet in its upper forward portion midway of its ends, and having its end portions opening into the sweepings chamber and further provided in their bottoms with openings for discharging into the dust chamber, suction fans arranged in the end portions of the casing for drawing the dust and air therein from the sweepings chamber and separating the dust from the air, and a third fan arranged medially of the casing to draw the air to a central point from the ends of the casing and to force such air outwardly through the outlet.

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

FREDERICK R. BRUGGER. [L. S.]

Witnesses:

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INEZ M. CLARK.

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