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Patented May 15, 1900.

H. D. LAYMAN & F. W. PARPART.

STREET CLEANING MACHINE.

(No Model.)

(Application filed Mar. 6, 1899. Renewed Apr. 11, 1900.)

2 Sheets—Sheet 1.

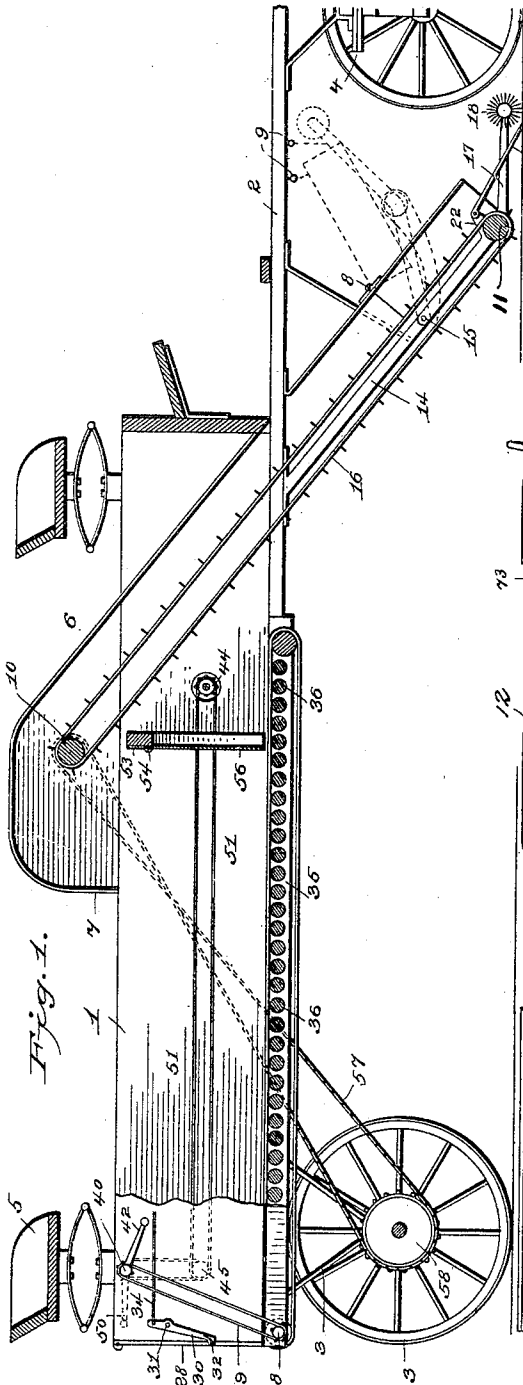


Fig. 1.

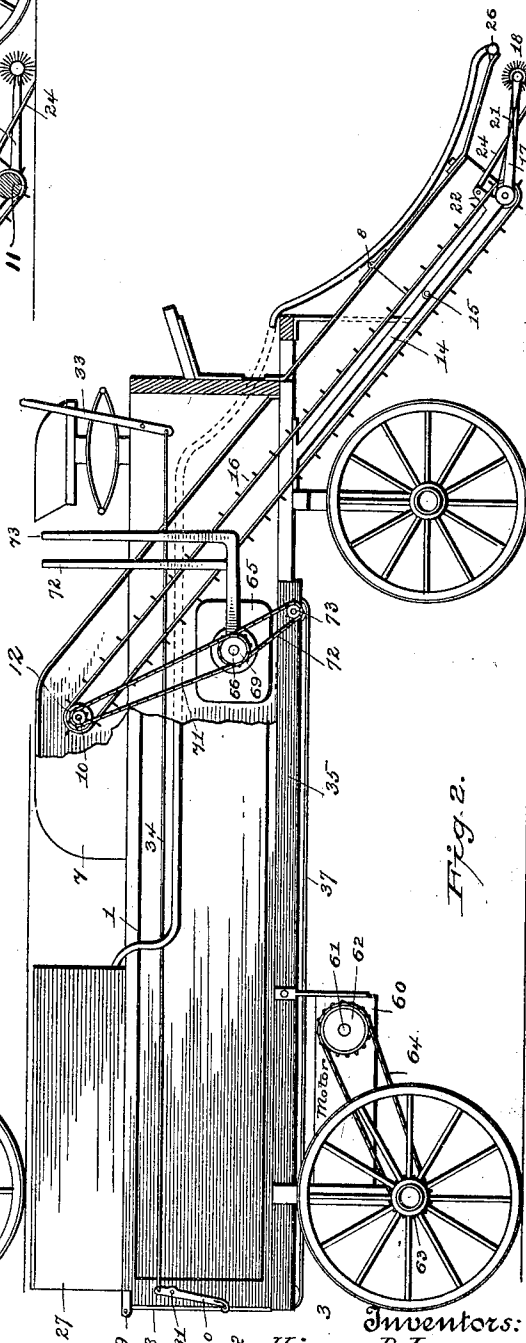


Fig. 2.

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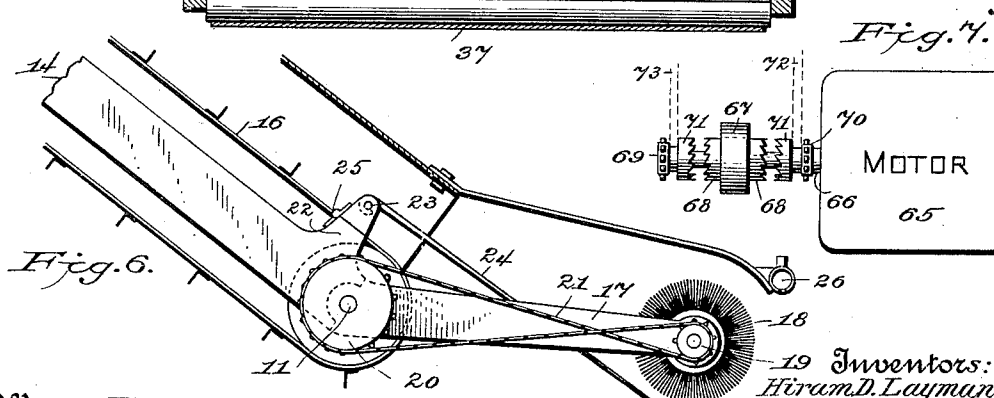
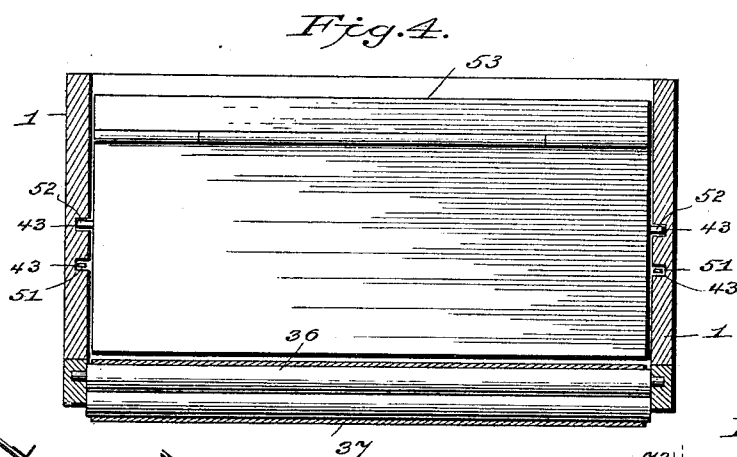
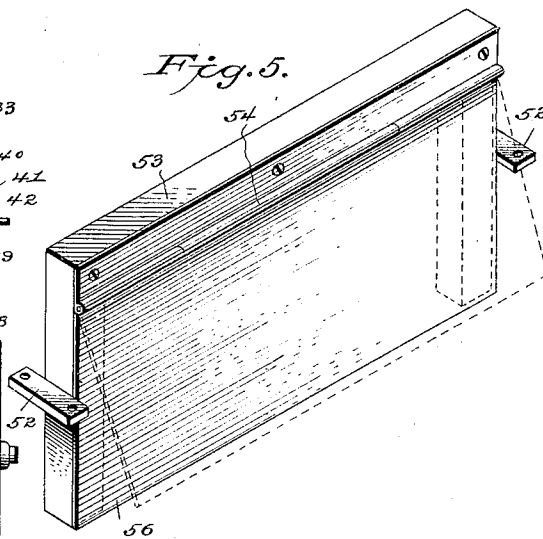
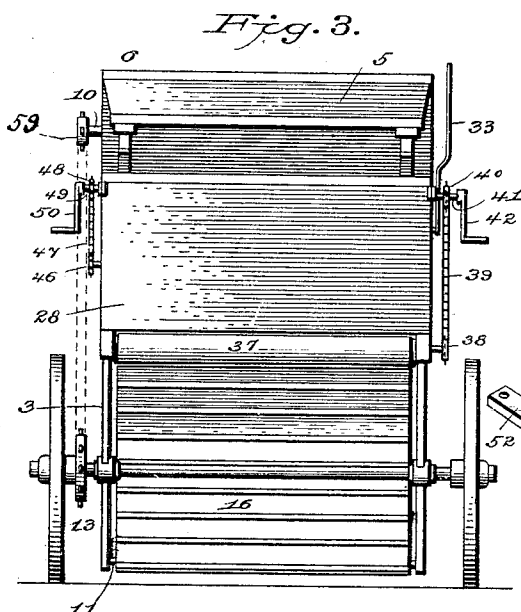
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UNITED STATES PATENT OFFICE.

HIRAM D. LAYMAN AND FLORENCE W. PARPART, OF NEW YORK, N. Y.

STREET-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 649,609, dated May 15, 1900.

Application filed March 6, 1899. Renewed April 11, 1900. Serial No. 12,478. (No model.)

To all whom it may concern:

Be it known that we, HIRAM D. LAYMAN and FLORENCE W. PARPART, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Street-Cleaning Machines; and we do hereby 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.

This invention relates to street cleaning machines; and the main objects of the invention are to produce an economically-constructed practicable machine designed to successfully meet all the various conditions of the city streets, such as accumulations of dirt, snow, or refuse of any kind; to construct the machine whereby it may be operated as an automobile or by horse-power, and in either case have the controlling devices for the various submechanisms ready at the convenience of the driver or conductor; to adapt the machine to carry on the operations of sprinkling, scraping, and sweeping continuously and successively and to elevate and deliver the refuse, dirt, or snow from the street to the rear end of the machine, which may constitute a receptacle for this purpose; to produce in said machine a new and improved dumping mechanism, and in instances where the machine is of the automobile type to provide mechanism for accomplishing the different operations of the various combinations, such being capable of either separate or conjoint action, all as will hereinafter appear, and be particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 is a longitudinal sectional view of a street-cleaning machine adapted to be operated by horse-power and embodying our invention. Fig. 2 is a side elevation, partially in section, of the same machine, but in this instance of the automobile type. Fig. 3 is a rear end elevation of the machine. Fig. 4 is a vertical transverse sectional view of the same. Fig. 5 is a detail in perspective of the follower or packer-frame. Fig. 6 is an enlarged detail in section of the lower end of the endless carrier, showing the scraper and brush-roll. Fig. 7 is a front elevation of a portion of the secondary motor,

illustrating its driving-shaft and the clutch mechanism that may be employed for throwing the endless carrier and the dumping mechanism into and out of operation.

Like numerals of reference indicate like parts throughout the drawings.

Before proceeding to give a detailed description of our invention and calling particular attention to the specific mechanism which we have adopted we deem it proper to state that such details of construction as will be hereinafter enumerated and particularized are subject to changes and modifications which experience in the practical building of the machine will in all probability dictate, and that therefore we do not wish to be understood as limiting our invention as regards its several combinations to the particular and precise construction hereinafter described, but hold that we may vary the same to any extent or degree that properly comes within the domain or knowledge of the skilled mechanic. It is also to be understood that in the automobile style suitable brake mechanisms, steering-gears, and other necessary and common accessories are to be considered as included in our invention, and which for the purpose of avoiding complexity are herein purposely omitted, inasmuch as they form no part of our present invention.

In the present instance we employ a wagon-body 1, of suitable dimensions and in the style shown in Fig. 1, wherein the machine is designed to be operated by horse-power. We prefer to supplement the same with a front extension or frame 2, the same being in advance of the endless carrier and parts supported thereby, as will hereinafter appear. The rear of the wagon is supported by the rear wheeled trucks 3, while the front of the wagon is likewise supported by the front wheeled trucks 4, upon which latter the front extension-frame 2 is surmounted.

It will be understood that suitable seats 5 for the driver and his assistant or conductor, when the latter is employed, may be located at the front and rear ends of the wagon-body.

Adjacent to its front end the bottom of the wagon is provided with an opening, and through the same is supported an inclined boot or guard 6, which terminates at its upper end in rear of the front seat for the driver

and in a discharge 7. The boot or guard may be braced in any desired manner to render it stable, and near its lower end a portion of it may be hinged, as at 8, the remainder being rigid, while the lower hinged end is capable of being swung up and temporarily secured by a hook and eye 9 or other form of connection.

In the upper and lower ends of the guard 6 are transverse shafts 10 and 11, respectively, the same receiving and accommodating pairs of suitable sprocket-wheels 12 and 13, respectively. The lower shaft is also journaled in the lower end of an inclined standard 14, which at a convenient point relative to the hinge 8 of the guard is likewise hinged, as at 15, so that the lower portion of the standard 14 is capable of being swung up with the corresponding portion of the guard. Over the sprocket-wheels 12 and 13 is arranged to run the endless carrier or belt 16, the same having its exterior surface provided with suitable flights or cleats capable of performing the usual function of elevating dirt, snow, and other refuse matter from the street-surface.

On the shaft 11, which, it will be understood, is removable, is loosely supported a pair of forwardly-projecting brush-arms 17, in the front ends of which is journaled a brush-roll 18, at one end of which, beyond the arm, is mounted a sprocket wheel or pulley 19. The shaft 11 carries a companion sprocket wheel or pulley which receives its motion from the shaft 11, upon which it is mounted and which communicates motion to the sprocket wheel or pulley 19 of the brush-roll by means of a crossed belt or sprocket-chain 21. The brush-roll, it will be understood, may be removed and its place occupied by a cutter-shaft where the machine is designed to operate upon snow that has become partly frozen. If preferred, however, such hard snow or ice may be loosened by hand to be subsequently gathered up by the machine.

At or near the lower ends and at the opposite sides of the inclined braces may be located short standards 22, in which between their upper ends on a cross-bar 23 may be loosely supported the upper end of an inclined gravity-scraper 24, the lower front end of which moves in the track of the brush-roll 18, and hence catches the refuse as the same is brushed up from the street. In order to obviate the danger of breaking the scraper and the mechanism supporting the same by reason of its front end contacting with the paving-stones or other immovable obstacles, we prefer to form the standards in two sections, hinging the same together at their rear edges, as at 25, the weight of the upper portions of the standards and the scraper-blade being sufficient to depress the latter with sufficient tension upon the street-surface. We may also and preferably do locate at the front end of the lower hinged part of the

guard 6 a transverse sprinkling-pipe 26, connecting the same by suitable hose with a water-supply tank 27, located on the top of the wagon-body.

The end-gate or tail-board 28 is preferably hinged at its upper end to the sides of the wagon-body, and therefore is capable of being swung outward at its lower end a sufficient distance to enable the load of refuse to be discharged. A lever 30, pivoted as at 31, is preferably located at one side of the wagon immediately in front of the tail-board or end-gate, the lower or free end of the lever being pivoted, as at 32, to one end of said gate. An operating-lever 33 is fulcrumed on the side of the wagon convenient to the driver, and the lower end of this lever is connected to the upper free end of the end-gate operating-lever 30 by an intermediate connecting-rod 34. It will thus be seen that by drawing backward upon the upper end of the lever 33 the driver is at any time able to dump the contents of the wagon, suitable mechanism for aiding in the dumping being hereinafter described.

At opposite sides of the wagon are supported, in this instance by means of longitudinal side-bars 35, which constitute a frame, a series of horizontally-aligning transversely-disposed rolls 36, the said frame and the series of rolls extending from a point below and slightly in advance of the upper discharge end of the carrier 16 to the rear dumping end of the machine. These rolls are surrounded by and therefore support an endless carrier or apron 37, which constitute a movable bottom for the machine. The rear shaft of the series upon which the endless carrier 37 is supported also carries a sprocket-wheel 38, and the same is connected and operated through the medium of a sprocket-belt 39, which runs over and is operated by a sprocket-wheel 40, located on a transverse winding-shaft 41, journaled in the sides and near the rear ends of the wagon-body. From this it will be observed that the end-gate having been swung outward a rotation of the shaft 41, through the crank 42, applied to the end thereof, will cause the movable bottom to operate or advance to the rear, and thus carry with it the load of refuse which it supports, discharging the same in a perfectly obvious manner.

Inasmuch as the endless carrier 16 discharges at one point only into the receptacle, (the wagon-body,) it becomes necessary to provide some means for moving the discharged refuse toward the rear end of the wagon during the operation of the machine. This contingency is provided for by employing what we term a "packer," which is simply a follower, with suitable means for operating the same, whereby the refuse is moved along, leaving space for further discharges from the carrier. We prefer in carrying out this arrangement to form in the opposite sides of the wagon endless channels 43, locating in

the front and rear ends thereof sprocket-wheels 44 and 45, respectively, one shaft of one of the latter being laterally extended and provided with a sprocket-wheel 46, which
 5 is connected by a sprocket-chain 47 to a sprocket-wheel 48, located on a winding-shaft 49, and adapted to be operated by a crank 50. Within the endless channels 43 sprocket-chains 51 are located and designed to travel,
 10 and the upper side of each chain is connected to horizontal lugs 52, formed on the sides of an inverted-U-shaped or three-sided frame 53, said lugs in reality forming a portion or section of the chains and serving as guides
 15 in the horizontal movements of the frame. In order to prevent the frame from binding or rocking, the guides are preferably made of a length to exceed the width of the frame, all as shown in Fig. 5 of the drawings. The
 20 frame itself is open, but has hinged, as at 54, near the upper edge thereof, a closing-flap 56, the same being located at the rear side of the frame. This frame, together with the operating mechanism and the flap, constitutes the
 25 packing mechanism. Of course any other construction may be employed in lieu of the frame and flap described, and other means may be found more convenient or practicable for operating or moving the frame than those
 30 herein described. The object of employing the flap is that in moving to the rear it closes against the frame, and it and the frame constitute a solid imperforate plunger designed to operate against the loose deposits of refuse
 35 and pack the same at the rear end of the wagon. Should the machine be in operation during the rearward advance of the packing device, it is obvious that deposits of refuse will fall into the receptacle or wagon in front
 40 of the packer. By employing the flap, however, it will be obvious that the same, yielding to the obstruction, will open or swing backward, thus permitting the device to be retracted to a point in advance of any de-
 45 posit, whereupon the operation may be repeated. In the style of machine shown in Fig. 1 motion to the inclined carrier and brush-roll is preferably given from the rear drive-axle through the intervention of a cross-
 50 belt 57, the same passing around a drive-sprocket 58 and over a convenient sprocket 59, located on the upper transverse shaft 10 of the carrier.

In the style of machine known as the "automobile" there are of course certain changes necessary, some of which we have thought best to herein point out. It is desired in this class of machines that the machine itself be moved and the working parts be operated by
 60 distinctly-separate motors, although, as will be understood, the same motor may be employed for the double purpose. We, however, prefer the former arrangement, where-
 65 in the driving-motor is separate and distinct from that which operates the several mechanisms, for the reason that the driving mechanism is sometimes at rest, while the remain-

ing mechanism, such as the brush-carrier or the dumping mechanism, is in operation.

In Fig. 2 of the drawings 60 designates an ordinary motor of any desired height and
 70 which we will designate as the "main" motor, the same being located, preferably, adjacent to and either partly or wholly supported by the rear axle. From the motor extends the drive-
 75 shaft 61, the same having a suitable sprocket 62, belted to a corresponding sprocket 63 on the motor-shaft of a sprocket-belt 64. The secondary motor, or that employed for driv-
 80 ing the operating mechanisms, is located, preferably, near the front of the machine, within the receptacle and below the inclined carrier 16, such motor being designated as 65. From
 85 this motor projects the operating-shaft 66, which carries a toothed collar 67, the collar being adapted to move with the shaft and having at opposite sides toothed hubs 68. A
 90 sprocket-wheel 69 is located loosely on the shaft 66 at the outside of the collar 67, and a similar sprocket-wheel 70 is located on the shaft 66 at the inner side of the aforesaid
 95 collar 67, and each of these sprocket-wheels 69 and 70 has inner toothed hubs 71. The inner sprocket-wheel is operated by a vibra-
 100 tory hand-lever 72 and a similar hand-lever 73 operates the outer sprocket 69, either or both of said sprockets being designed to be
 105 slid into engagement with the toothed hubs of the collar 67, and hence when in such an engagement to be driven by the motor-shaft
 110 66. The inner sprocket 70 is connected by means of a chain 71 with the sprocket-wheel 59 of the shaft 10 at the upper end of the inclined carrier 16, and hence operates the car-
 115 rier. The outer sprocket-wheel 69 is connected by a chain 72 with a sprocket-wheel 73, which corresponds with the sprocket-wheel 38 employed in the construction first
 120 described, but which is in the present instance transferred to the front one of those shafts which receives the rolls 36. It will thus
 125 be seen that the movable bottom may be operated by the secondary motor and wholly independent from the carrier 16 and the brush.

The operation will no doubt be understood
 115 from the foregoing description; but, briefly stated, the machine is moved along and the dirt, snow, or other refuse is deposited by the rapidly-revolving brush upon the scraper,
 120 which latter also scrapes up any of the refuse that adheres to the street-surface and over which the brush may have passed. The refuse is forced up the scraper and is delivered over
 125 the upper end of the same onto the slowly-moving inclined carrier, up which it is carried and delivered over the end of the same into the wagon-body or receptacle. At inter-
 130 vals the packer is advanced to the back of the receptacle, as heretofore described, so that the refuse is accumulated at the back. When the receptacle is full, the machine may
 135 be carried to some point and dumped, or it may be dumped in attending carts or wagons following for the purpose or at intervals upon

the ground, to be subsequently manually gathered up.

Having described our invention, what we claim is—

5 1. In a street-cleaning machine, the combination with a wagon-body forming a receptacle, of an inverted-U-shaped frame located therein and adapted for horizontal movement, a flap hinged to the rear side of the frame,
10 and means for moving said frame.

2. In a street-cleaning machine, the combination with a wagon-body constituting a receptacle and having its opposite walls provided with endless channels, sprocket-wheels
15 arranged in the ends of the channels and sprocket-chains located in the channels and connecting the wheels, of a plunger located in the receptacle and connected to one side of each chain, and means for moving the
20 chains in their channels.

3. In a street-cleaning machine, the combination with a wagon-body constituting a receptacle and having its opposite sides provided with endless channels, sprocket-wheels
25 located in the ends of the channels, and endless chains connecting the sprocket-wheels, of a transversely-disposed, inverted-U-shaped frame, guides on the sides of the frame forming links of the said chains, a flap loosely
30 hinged at its upper edge to the said frame and means for removing the chains and frame.

4. In a street-cleaning machine, the combination with a receptacle, as a wagon-body, the same being provided with endless channels, of sprocket-wheels located in the ends
35 of said channels, a head connected to the chains for connecting the sprocket-wheels and adapted to move therewith, a superimposed sprocket-wheel, a crank for the shaft
40 of the same and an endless chain connected to said sprocket-wheel and to a companion sprocket-wheel located on the shaft of one of the sprocket-wheels first mentioned.

5. In a street-cleaning machine, the combination with a receptacle, an inclined carrier, a brush and means for conveying motion from the carrier to the brush, of a sprocket-wheel on the shaft at the upper end of the carrier, a motor carried by the machine and having a motor-shaft, a toothed collar
50 mounted upon and adapted to rotate with the shaft, a sprocket-wheel having a toothed hub, a lever for operating the sprocket-wheel and a sprocket-chain connecting said wheel with the wheel of the carrier-shaft.

6. In a street-cleaning machine, the combination with an inclined carrier and means for operating the same, of short standards hinged at their rear edges to the sides of the carrier and a scraper-blade connected to the
60 standards above the hinges.

7. In a street-cleaning machine, the combination with an inclined carrier-frame and a carrier supported therein, of arms removably connected at their rear ends to the ends
65 of the lower shaft of the carrier-frame, a brush-roll journaled in the front ends of the arms and a scraper-blade located between the roll and lower front end of the carrier and supported by the frame of the latter above
70 said carrier.

8. In a street-cleaning machine, the combination with a receptacle, as a wagon-body, of an inclined carrier adapted to deliver therein, a brush mechanism at the lower end of
75 the carrier, and a motor carried by the machine and geared to operate the carrier and the brush mechanism.

In testimony whereof we affix our signatures in the presence of two witnesses.

HIRAM D. LAYMAN.
FLORENCE W. PARPART.

Witnesses:

C. F. DUVAL,
W. T. S. DUVAL.