No. 712,315. Patented Oct. 28, 1902.

D. I. LANGWORTHY.

STREET CLEANING APPARATUS.

(Application filed Sept. 6, 1901.)

(No Model.) 3 Sheets—Sheet 1.

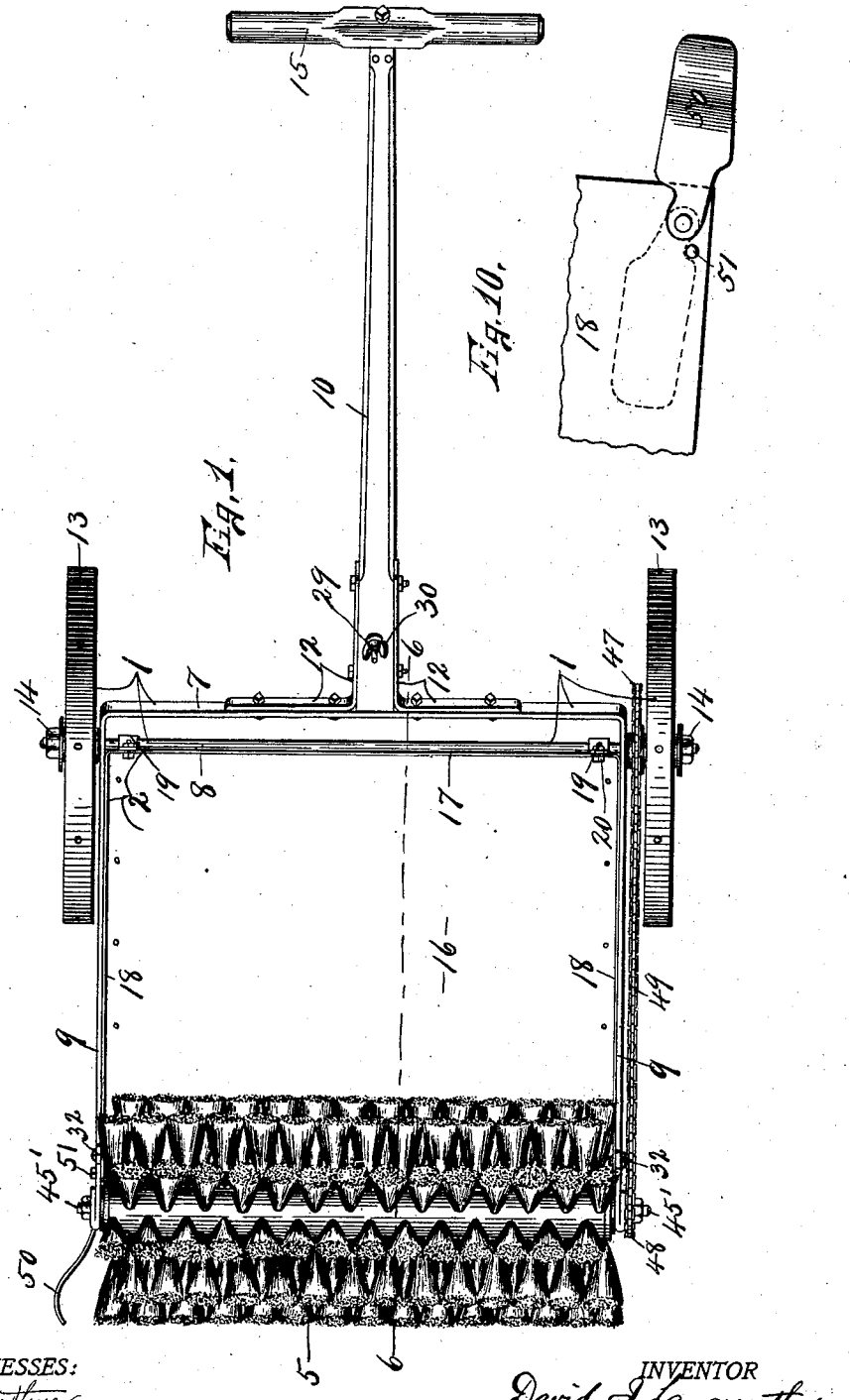

Fig. 1.

Fig. 10.

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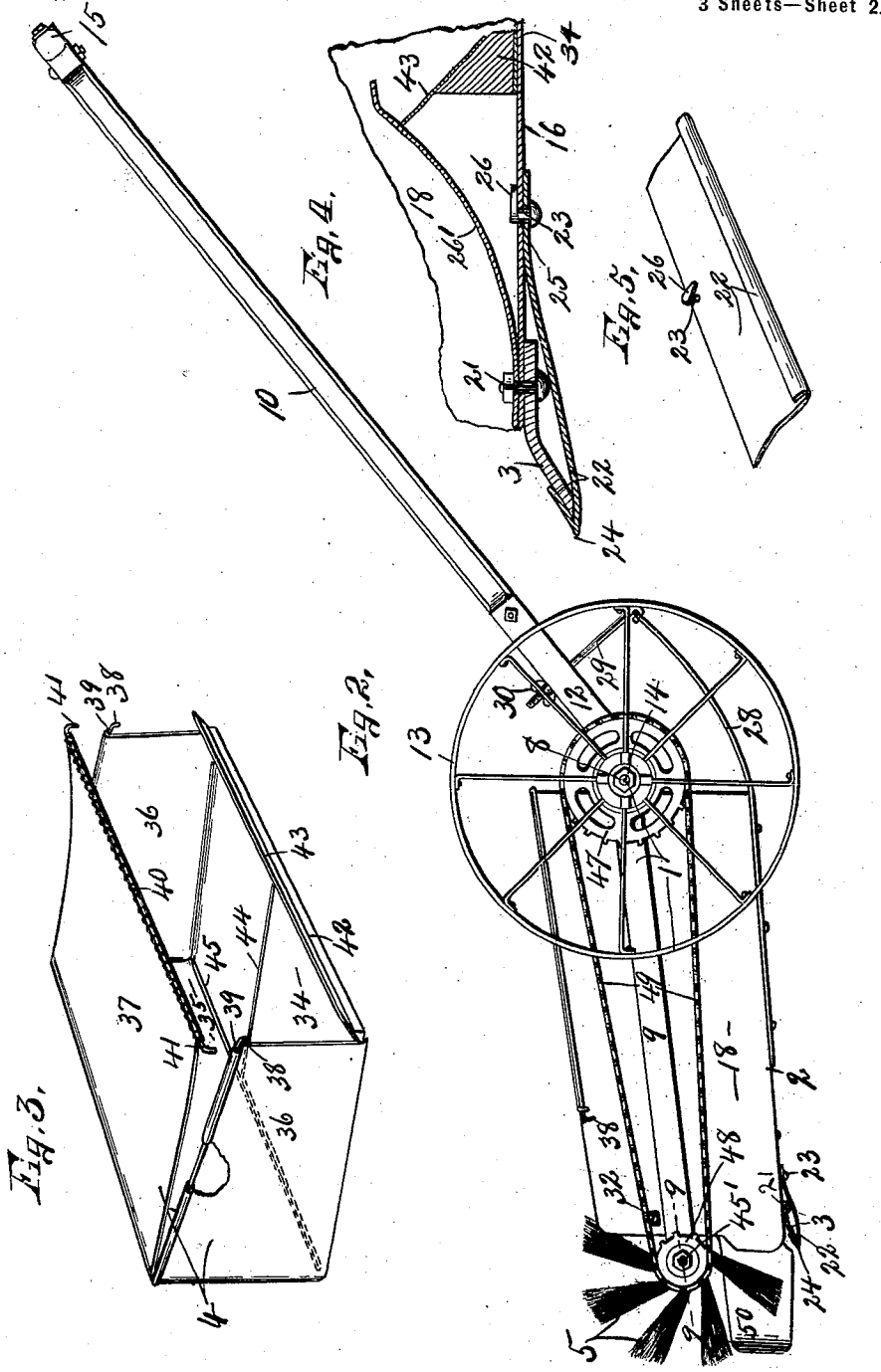

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Fig. 6

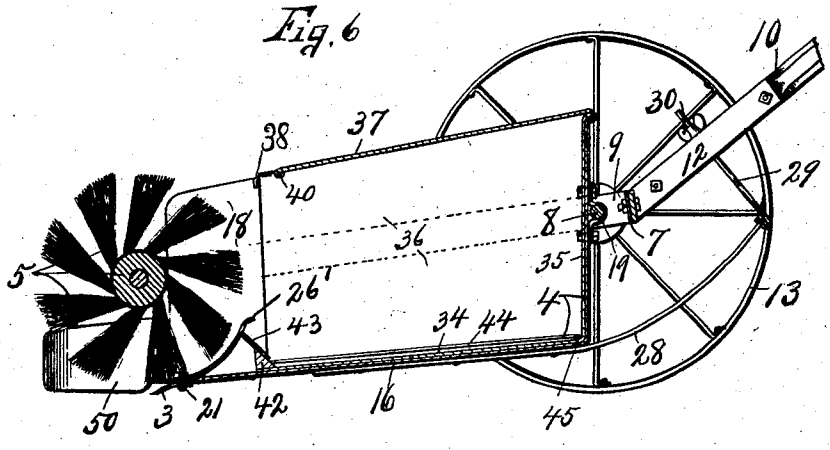


Fig. 7.

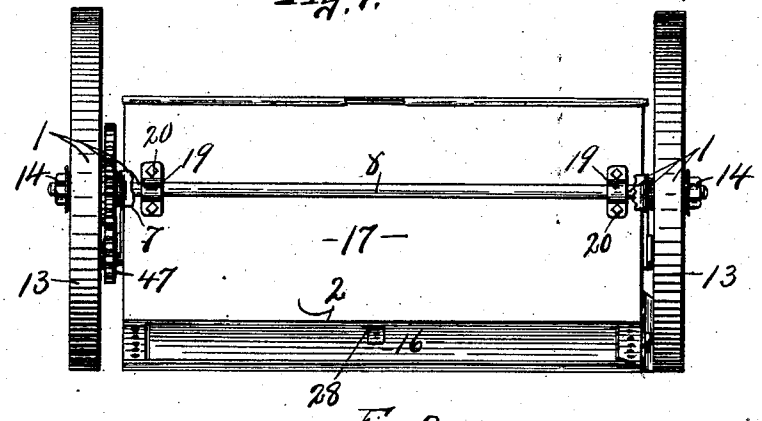


Fig. 8.

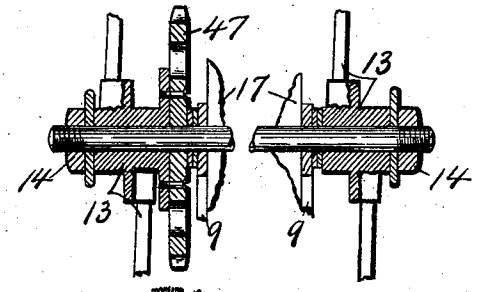
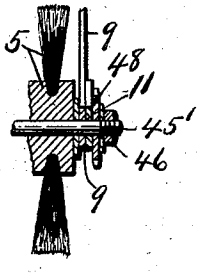


Fig. 9.



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UNITED STATES PATENT OFFICE.

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STREET-CLEANING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 712,315, dated October 28, 1902.

Application filed September 6, 1901. Serial No. 74,476. (No model.)

To all whom it may concern:

Be it known that I, DAVID I. LANGWORTHY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Street-Cleaning Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in street-cleaning apparatus, having more particular reference to a combined sweeper and scraper.

The object of this invention is to produce a simple, compact, and efficient device mounted upon a wheel-truck and adapted to be operated manually for scraping or loosening refuse from pavements and simultaneously sweeping the pavement in advance of the scraper and forcing the scrapings and sweepings into a suitable receptacle.

Another object is to provide the device with a suitable vertical scraper whereby the refuse in close proximity to the curb or other vertical projection may be diverted to the main scraper and forced into the receptacle by the sweeper.

A further object is to provide the main receptacle with an auxiliary bag or pocket for receiving the scrapings and sweepings, which bag or pocket is removable from the main receptacle for permitting the refuse to be deposited in any convenient locality.

A still further object is to so connect the main receptacle to the frame of the truck that the scraper and sweeper may be adjusted toward and away from each other, whereby the scraper and sweeper are yieldingly suspended relatively to each other and whereby the scraper may be forced into contact with the pavement with a greater or less degree of firmness or tension.

Other objects and purposes of my invention will appear in the description.

To this end the invention consists in the combination, construction, and arrangements of the parts of a street-cleaning apparatus, as hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a top plan view of my invention, the bag or pocket being removed. Fig. 2 is a side elevation of the device seen in Fig. 1. Fig. 3 is a perspective view of the removable bag or pocket for the main receptacle. Fig. 4 is an enlarged sectional view of the front portion of the main receptacle, showing particularly the scraper, deflector-plate, and guard for the scraper. Fig. 5 is an isometric view of the detached guard for the scraper. Fig. 6 is a sectional view taken on line 6 6, Fig. 1, the guard for the scraper and its clamping member being removed. Fig. 7 is a rear elevation of the device seen in Fig. 1, the rear transverse frame-bar to which the tongue or pole is secured being broken away. Fig. 8 is an enlarged sectional view through the wheel-hubs and sprocket, showing the bearings therefor and the means for securing the sprocket to one of the hubs. Fig. 9 is a sectional view taken on line 9 9, Fig. 2, showing one of the bearings for the sweeper and the sprocket connected thereto; and Fig. 10 is a detailed view of the vertical scraper and adjacent portion of the receptacle.

Similar reference characters indicate corresponding parts in all the views.

The invention consists, essentially, in a truck 1, a main receptacle 2, having a removable scraper 3, auxiliary bag or pocket 4, a sweeper 5, and means for transmitting rotary motion from one of the wheels to the sweeper. The truck 1 may be of any desired construction, but preferably consists of an open frame having transverse bars 7 and 8, forwardly-extending arms 9, and a pole or handle 10, the arms 9 being formed integral with the transverse bar 7 and having their forward ends reinforced by bending the same back upon themselves, said reinforced ends being provided with apertures 11, forming suitable bearings for the sweeper 5. The transverse bar 7 unites the rear ends of the bars 9 and is secured to the pole or handle 10 by suitable braces 12. The transverse bar 8 is preferably arranged in front of the bar 7, substantially parallel therewith, and is mounted in suitable apertures formed in the arms 9 in proximity to the bar 7, the opposite ends of the bar 8 being extended laterally beyond the bars 9 for forming bearings for the traction-wheels 13, which constitute a portion of the truck. These wheels 13 may be of any desired construction and are held in position upon the rod 8 by suitable nuts 14, engaged

with threaded ends of the rod 8. The pole 10 is provided with a suitable handpiece 15, which, together with the pole 10, permits the operator to readily and conveniently move the device along the pavement in the act of scraping and sweeping the same. The receptacle 2 may also be of any desired size, form, or construction, open at its front end and provided with bottom, rear, and side walls 16, 17, and 18. This receptacle 2 is pivotally suspended at its rear end from the rod 8, the rear wall 17 being provided with straps or boxes 19 in proximity to its opposite sides, which encircle a portion of the rod 2 and are secured to the rear wall 17 by any suitable fastening means, as bolts 20. The forward end of the bottom wall is provided with a scraper 3, which preferably consists of a bar of steel or equivalent material arranged transversely of the receptacle 2, beneath the forward end of the bottom wall 16 and secured thereto by fastening means, as bolts 21. The forward edge of the scraper 3 preferably inclines downwardly and forwardly from the front edge of the bottom wall 16, the front edge of the scraper being beveled in a substantially horizontal plane and is adapted to contact with the pavement for loosening the refuse therefrom and deflecting the same onto the upper surface of the bottom wall 16. It is apparent from the construction of scraper just described that the scraper edge is automatically sharpened and maintained in a perfect working condition by contact with the pavement.

The scraper thus far described is adapted for use on smooth pavements, such as asphalt or other unbroken surfaces; but when it is desired to use my device on brick or stone pavements or other uneven surfaces I usually employ a suitable guard 22, consisting of a plate of sheet metal detachably secured to the lower surface of the bottom wall 16 by a pivot clamping member 23 and having its forward end turned backwardly upon itself for forming a V-shaped recess which receives and closely fits upon the scraping edge of the scraper 3. By thus turning the front edge of the guard-plate 22 backwardly a rounding scraping edge 24 is formed which permits the scraper to ride freely over uneven surfaces without liability of dulling the scraper 3, said edge 24 being sufficiently sharp to take up any ordinary refuse. The clamping member 23 is pivoted to the rear edge of the plate 22 and is adapted to be passed through an elongated aperture 25 in the bottom wall 16, said clamping member 23 being provided with an eccentric arm 26, which is adapted to be passed through the aperture 25 and then turned or rotated upon its axis for detachably locking the member 22 to the wall 16. It is evident, however, that other forms of clamping means may be employed, if desired, the essential feature of this part of my invention being that the forward end is hook-shaped and adapted to interlock with the forward edge of the knife or scraper 3, while the rear end is detachably interlocked with the bottom wall 16 of the receptacle.

The scraper 3 and the guard-plate 22 extend entirely across the front edge of the receptacle 2, and it is evident that when working upon smooth pavements, such as asphalt, the guard-plate 22 may be removed and the scraper 3 employed, and by inclining the forward edge of the scraper downwardly it is evident that the scraper may be worn almost to the front edge of the bottom wall 16 before it becomes necessary to replace the same with a new one. This renewal of the scraper may be readily effected by removing the bolts or fastening means 21, whereupon the old scraper may be removed and a new one replaced with but slight expense and little loss of time.

In order to economize in the construction of the receptacle, I preferably provide the forward end of the bottom wall 16 with a deflector-plate 26′, having its forward edge provided with apertures for receiving the clamping-bolts 21, whereupon the deflector-plate is clamped in position by the same means which holds the scraper in place. The rear edge or portion of the deflector-plate 26′ inclines upwardly and rearwardly from the front edge of the bottom wall 16, preferably in a curved plane, and coöperates with the sweeper to conduct the sweepings and scrapings into the pocket 4 or directly into the receptacle when said pocket is dispensed with.

As previously stated, the receptacle 2 is yieldingly supported upon the truck of the sweeper, being suspended from the rod 8, and its forward end is free to move vertically independently of the supporting-frame, said receptacle being preferably interposed between the rod 8 and the axis of the sweeper 6.

The means for yieldingly supporting the receptacle 2 and permitting its forward end to be raised and lowered independently of the frame preferably consists of a spring-arm 28 and an adjusting-rod 29, the spring-arm 28 being secured to the bottom wall 16 substantially midway between its opposite sides, and is extended rearwardly beyond the rear wall 17 or rather beyond the axis of movement of the receptacle, and is connected to one end of the adjusting-rod 29, this connection being such that the rod 29 and spring 28 may be detached from each other when desired. The other end of rod 29 is preferably screw-threaded and is passed through an aperture in the tongue or pole-piece 10 and provided with a suitable thumb-nut 30, engaged with the pole 10, whereby the tension of the spring 28 may be varied and the forward end of the receptacle raised or lowered, as may be desired, for the purpose of increasing or diminishing the pressure of the scraper upon the surface of the pavement.

The receptacle 2 is preferably of substantially the same size as the opening in the frame 1, its side walls 18 being in proximity

to the inner faces of the bars 9, each of the side walls being provided with a suitable stop 32, which is adapted to engage the upper face of the bars 9 for limiting the downward movement of the receptacle 2 independently of said bars.

The bag or pocket 4 may also be of any desired size or form, but is usually arranged to fit closely within the receptacle 2, between its rear wall and the sweeper, and is provided with bottom, rear, and side walls 34, 35, and 36 and a top wall 37. This bag or pocket is usually formed of canvas or ducking or equivalent strong fabric, the bottom, rear, and side walls being united to each other and the top wall being hinged to the upper edge of the rear wall. The upper edges of the side walls are provided with suitable hooks 38, formed on the front ends of the stiffening-rods 39, which hold said side walls in their extended position. The front edge of the upper wall 37 is provided with a transverse bar 40, having its opposite ends extended beyond the side walls 36 and provided with hook-shaped extremities 41, which are arranged to interlock with the upper edges of the side walls 18 of the receptacle 2, said extended ends of the bottom 40 being also adapted to interlock with the shoulders or extensions 38 of the bars 39 for holding the box in its extended position. The front edge of the bottom wall 34 of this box is secured to the transverse bar 42, extending between the side walls 36 and provided with a transverse plate 43, said transverse bar 42 and plate 43 being adapted to be inserted between the rear edge of the deflector-plate 26′ and the bottom wall 16 of the receptacle 2, so that when the box is in position the rear edge of the deflector-plate 26′ extends over and beyond the plate 43, whereby the sweepings and scrapings of refuse are folded over the deflector-plate 26′ and into the box, it being evident that the front end of the bag is open to receive said sweepings. In order to further brace the bag and retain the same in its extended position, I provide longitudinal and transverse bars 44 and 45, the bar 45 being arranged at the junction of the rear and bottom walls for stiffening the bag laterally or transversely and the bar 44 being interposed between the bar 45 and the front bar 42 for stiffening the bottom wall 34 longitudinally. When the bag is placed in position, the bottom wall 34 normally rests upon the bottom wall 16 of the receptacle 2, with its front plate 43 beneath the deflector-plate 26′, while the rear wall 35 of said bag or box lies in close proximity to the upright rear wall 17, and the bars 39 and 40 being engaged with the upper edges of the side walls serve to hold the bag in its extended position vertically, with the open end of the bag alined with the sweeper.

The sweeper 5 preferably consists of a drum having a series of rows of brushes projecting therefrom, the brushes of each row being arranged tangential to a circle drawn within the radius of the drum, and the outer surfaces of the brushes incline inwardly in the direction of rotation of said brush or sweeper. This arrangement of the brushes upon the drum produces a wiping effect across the surface of the pavement toward the scraper and the receptacle for the sweepings, and thereby renders the operation of the sweeper more effective in removing fine dust or refuse from the pavement and also reduces the throw or scatter of the dust or refuse to a minimum. This sweeper is provided at its opposite ends with extensions 45′, which are journaled in the apertures in the reinforced front ends of the bars 9, said extensions being threaded for receiving suitable nuts 46, which serve to hold the sweeper and the adjacent bearings in their proper relative positions. The sweeper 5 is preferably rotated in the same direction as the traction-wheels and at a slightly-greater rate of speed, the means for rotating the sweeper preferably consisting of sprocket-wheels 47 and 48 and a chain 49, the sprocket-wheel 47 being secured to one of the wheels 13, and the sprocket 48 is secured to one of the extensions of the sweeper 5 at the outside of the adjacent frame-bar 9, and the chain 49 is connected to said sprocket-wheels in the usual manner for transmitting motion from the sprocket-wheel 47 to the sprocket-wheel 48, whereby the sweeper is rotated in the same direction as the traction-wheel 13, it being understood that the sprocket-wheel 48 is of slightly-less diameter than the sprocket 47 for increasing the speed of revolution of the sweeper over the traction-wheels.

In order to permit the operator to remove the refuse from the pavement in proximity to the curb and other vertical projections, I provide one of the side walls 18 with a vertical scraper 50, which is pivotally secured at one end to the forward end of said side wall of the receptacle 2, its other end being curved outwardly and forwardly beyond the line of travel of the wheel 13 at the same side of the receptacle 2, and it is evident that when said vertical scraper 50 is in its operative position, as seen in Fig. 1, the refuse near the curb or other vertical projection on the pavement is readily deflected into the path of the sweeper as the device is moved forwardly, whereupon the sweeper readily forces the same into the receptacle, or rather into the bag or box 4. Under ordinary conditions—in sweeping in the middle of the street, for instance—this vertical scraper is simply thrown backwardly upon its axis or pivot and is held in position by gravity against a suitable stop 51, provided therefor.

The operation of my invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that some change may be made in the detail construction and arrangement of the parts of my invention without departing from the spirit

thereof. Therefore I do not limit myself to the construction as shown and described.

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

1. In a street-cleaning apparatus, the combination with a frame having supporting-wheels, a receptacle pivotally mounted on the frame and provided with a scraper, and a spring connected to the frame at one side of its pivot and to the receptacle at the opposite side of the pivot for the purpose described.

2. In a street-cleaning apparatus, the combination with a frame, of supporting-wheels and a brush on the frame, a receptacle pivotally mounted on the frame and provided with a scraper, and adjustable means for rocking the receptacle independently of the frame, and varying the position of the scraper relatively to the brush.

3. In a street-cleaning apparatus, the combination with a frame having supporting-wheels and a rotary brush journaled thereon, the brush being actuated by one of the wheels, a receptacle pivotally mounted at one end on the frame between the axes of the wheels and brush and having its front end open, a removable horizontal scraper secured to the front end of the bottom wall of the receptacle, a deflector-plate inclining upwardly and rearwardly from said scraper into the open end of the receptacle, a vertical scraper at one end of the former scraper, means for adjusting the front end of the receptacle vertically and independently of the frame, a stop for limiting the downward movement of the receptacle and upward movement of the frame, and a removable bag or pocket supported in the receptacle and extended beneath the deflector-plate to receive the sweepings.

4. In a street-sweeping apparatus, the combination with a frame having supporting-wheels and a rotary brush journaled thereon, the brush being actuated by one of the wheels, a receptacle pivotally mounted at one end on the frame between the axes of the wheels and brush and having its front end open and provided with a removable horizontal scraper and a deflector-plate, a vertical scraper at one end of the former scraper, means for adjusting the front end of the receptacle vertically, a stop for limiting the downward movement of the receptacle and upward movement of the frame, and a removable bag or pocket supported in the receptacle to receive the sweepings.

In witness whereof I have hereunto set my hand this 29th day of August, 1901.

DAVID I. LANGWORTHY.

Witnesses:
M. M. NOTT,
HOWARD P. DENISON.