

(No Model.)

4 Sheets—Sheet 1.

D. F. GRAHAM.
STREET SWEEPER.

No. 553,029.

Patented Jan. 14, 1896.

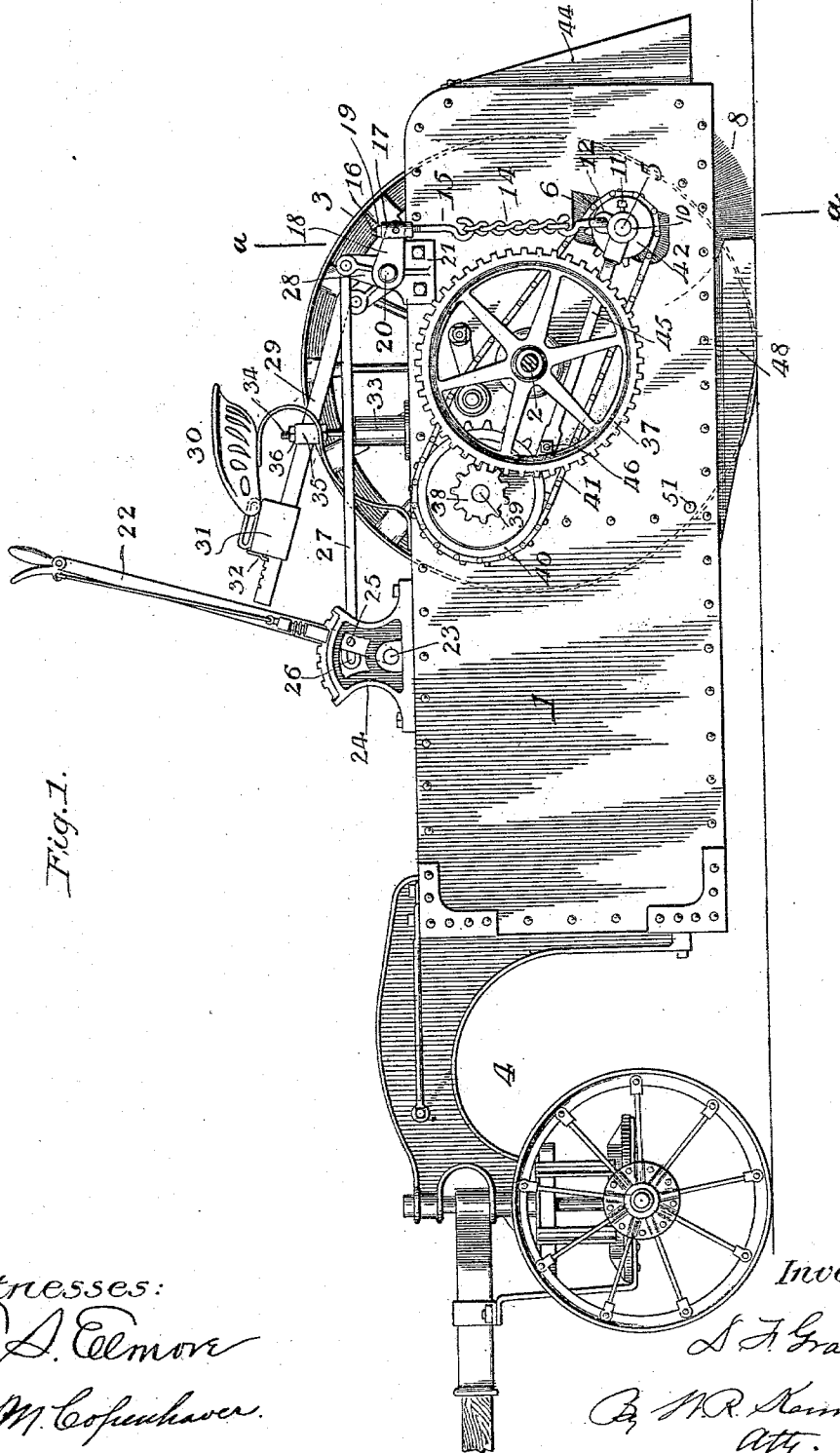


Fig. 1.

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Inventor:

S. J. Graham

By M. R. Kennedy
Att.

(No Model.)

4 Sheets—Sheet 2

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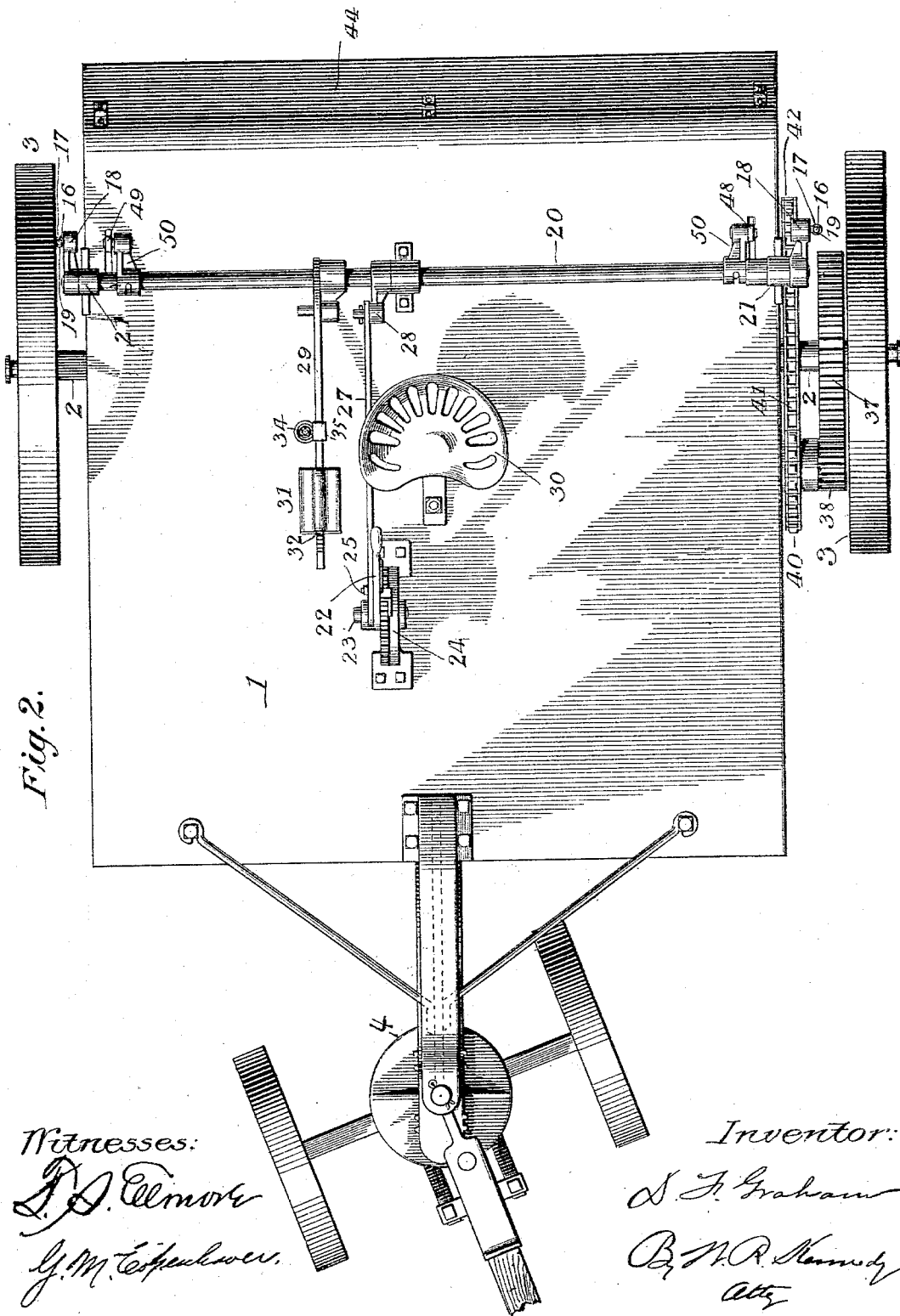


Fig. 2.

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4 Sheets—Sheet 3.

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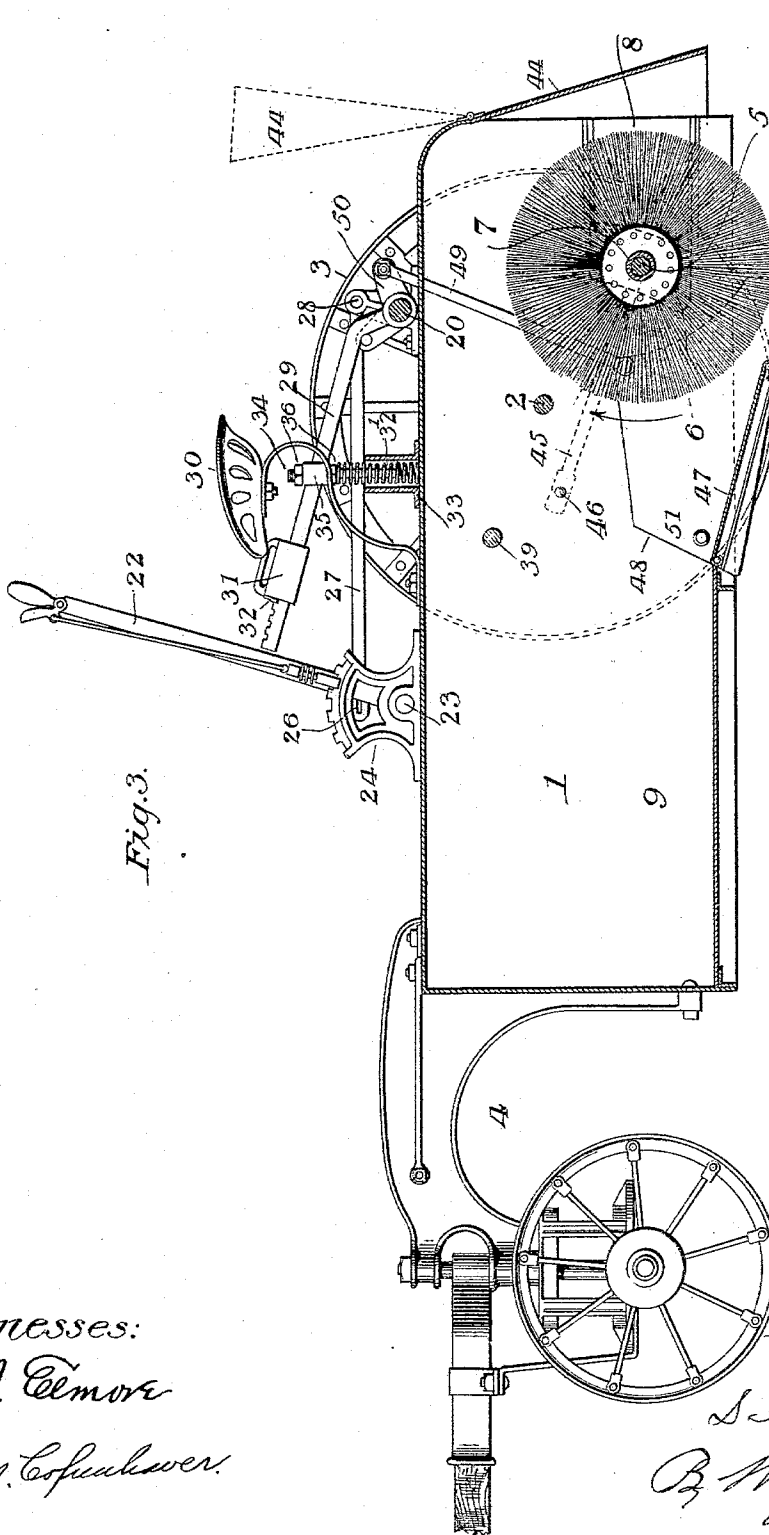


Fig. 3.

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A. S. Emore
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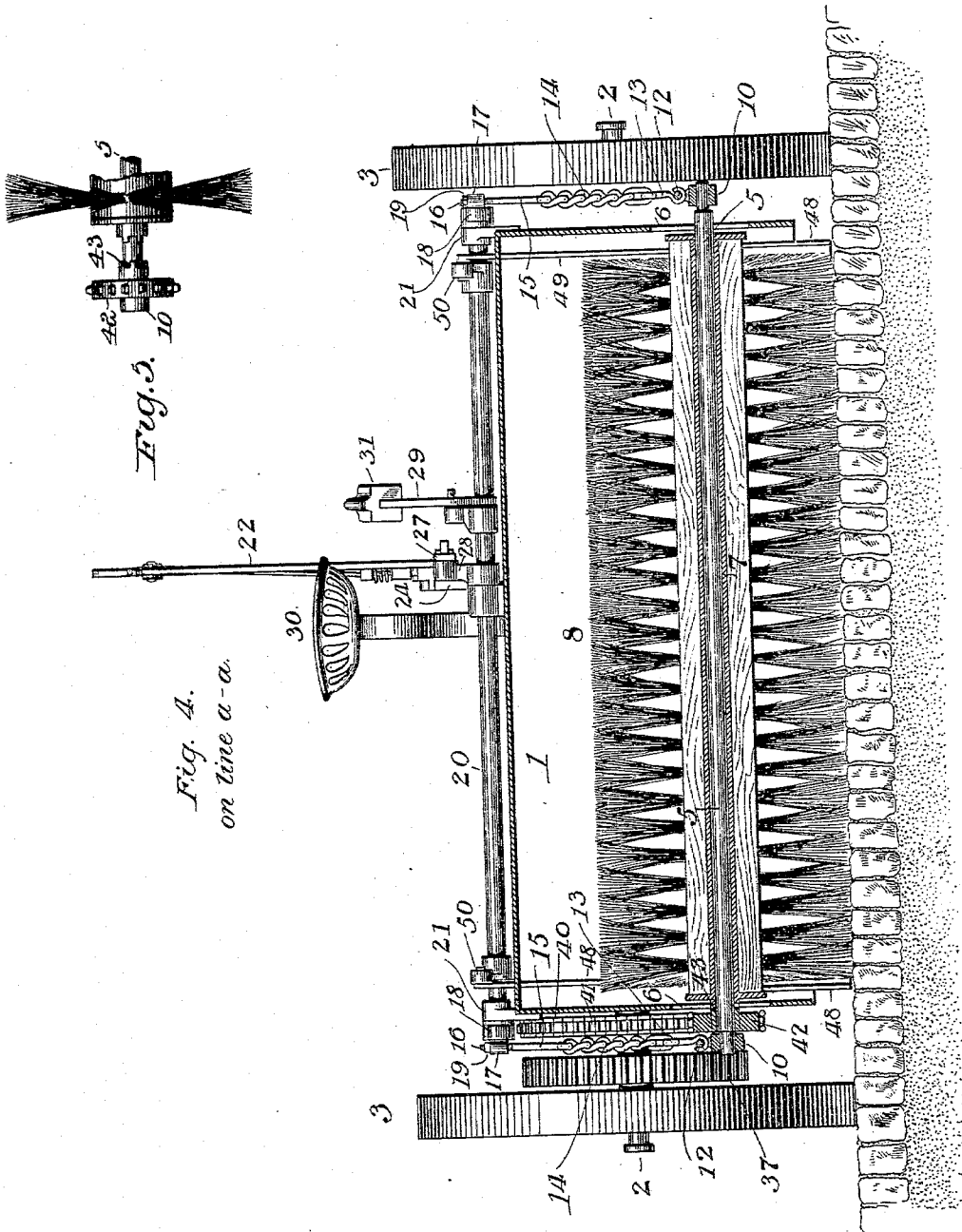
Inventor:
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Witnesses:
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UNITED STATES PATENT OFFICE.

DAVID F. GRAHAM, OF DAYTON, OHIO, ASSIGNOR TO THE INTERNATIONAL SWEEPING MACHINE COMPANY, OF WEST VIRGINIA.

STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 553,029, dated January 14, 1896.

Application filed March 22, 1895. Serial No. 542,837. (No model.)

To all whom it may concern:

Be it known that I, DAVID F. GRAHAM, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Sweeping-Machines; and I 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.

My invention has reference to that class of sweeping - machines comprising a wheeled frame or casing having mounted in its rear end a horizontal rotary brush driven from the ground-wheels, and a receptacle for the sweepings located in front of the brush; and the invention consists in an improved manner of sustaining and adjusting the brush to adapt it to operate to the best advantage, in an improved arrangement of the gearing for driving the same from the ground-wheels, and in various other details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a sweeping-machine having my invention embodied therein. Fig. 2 is a top plan view of the same. Fig. 3 is a longitudinal vertical section from front to rear on the line *bb* of Fig. 4. Fig. 4 is a vertical section through the brush and its sustaining connections on the line *aa* of Fig. 1. Fig. 5 is an elevation on an enlarged scale of one end of the brush, its sustaining-shaft, and its driving-wheel.

Referring to the drawings, 1 represents a rectangular casing sustained at its rear end by a horizontal transverse axle 2, on the ends of which ground-wheels 3 are journaled. At its front the frame is sustained by a swiveling-truck 4, provided with suitable devices for the attachment of the draft-animals.

In the rear of the axle and extending parallel thereto is located a shaft 5 having its ends extending through vertical slots 6 in the sides of the casing and sustained by suspending devices, particularly described hereinafter. The shaft is loosely encircled by a sleeve 7, terminating at its ends within the sides of the casing and having connected thereto a brush 8, circular in cross-section and of the usual

and customary construction. This brush is adapted to be driven from the ground-wheels in a manner more fully described hereinafter and in the direction indicated by the arrow in Fig. 3, its action being to throw the dirt and dust forward and upward into a receptacle 9, located in the forward portion of the casing, from which receptacle the accumulated load may be discharged at suitable intervals.

The two ends of the shaft 5 are reduced in diameter, as shown in Fig. 4, and upon these reduced ends are applied two collars 10, held by set-screws 11. Each of the collars is provided on its upper side with an eye 12, which eyes receive hooks 13 on the lower ends of two chains 14, the upper ends of which are connected to hooks 15, provided with threaded shanks 16, extending through sleeves 17, pivoted to the ends of two crank-arms 18, the said threaded shanks being held by nuts 19 screwed thereon, by which they may be adjusted vertically within the sleeves. The crank-arms 18 are fixed to the opposite ends of a horizontal transverse rocking shaft 20, which is mounted in suitable bearings 21, fixed to the top of the casing at opposite sides of the same. From this description it will be seen that the brush is suspended at its opposite ends by flexible connections from crank-arms on the rock-shaft, the result of which is that by the rocking of the shaft the brush may be lifted bodily from the ground to an inoperative position or lowered in contact therewith as desired. In order to effect these adjustments of the brush I provide a vertical lever 22, pivoted at its lower end on a horizontal axis 23 to the base of a standard 24, fixed to the upper side of the casing near the front of the same, the said lever being provided with the usual locking-dog arranged to engage a toothed segment on the upper edge of the standard. On its side near its lower end the lever is provided with a lateral stud 25, extending through an elongated slot 26, formed on the forward end of a horizontal rod 27, extending rearward, where it is pivoted to the end of a crank-arm 28, fixed to the horizontal rock-shaft 20 before referred to. From this it will be seen that by the movement of the lever back and forth the shaft will be rocked and the brush raised or low-

ered bodily as desired, the locking-dog permitting the brush to be held in different positions according to the conditions encountered in practice.

5 In order to provide for the counterbalancing of the brush so that it will readily yield to pass over obstructions and so as to relieve the attendant from the necessity of lifting its whole weight when it is to be raised to an inoperative position, I secure to the rock-shaft 10 an arm 29, which extends forward and terminates adjacent to a driver's seat 30, located about midway of the length of the casing. The forward end of the arm is provided with a sliding weight 31, adapted to be adjusted to different positions by a spring-latch 32, arranged to engage a series of notches formed in the edge of the arm. This weighted arm serves to balance the brush, and by the adjustment of the weight the brush may be caused to bear with a greater or less degree of pressure on the surface of the ground, as desired, according to the character of the surface to be swept. By providing the forward end of the rod 27 with the elongated slot, as described, the brush is permitted to yield vertically to a limited extent, irrespective of the position to which it may be adjusted by the lever 22, in which case the slotted rod will be moved backward or forward to a limited extent with respect to the lever, such movements corresponding to the length of the slot.

In order that when the brush is raised out of action by the forward movement of the lever, the weighted arm 29 will be prevented from violently striking the top of the casing and injuring the same, I provide a yielding cushion for the arm consisting of a vertical coiled spring 32' seated in a cup or socket 33 fixed to the casing, which spring has connected to its upper end a threaded rod 34 extending through a vertical sleeve 35 fixed to the side of the weighted arm. The threaded rod is confined by two nuts 36, applied thereto at the opposite ends of the sleeve. This spring in addition to cushioning the downward movement of the arm acts by its expansive force to hold the weighted arm yieldingly in the position it may occupy, and by the adjustment of the collar 35 by means of the two nuts the degree of tension and pressure exerted by the spring may be varied to meet the requirements encountered in practice.

The brush is driven from the ground-wheels in the following manner: One of the ground-wheels has fixed to it a circular rack 37, which engages a small pinion 38, fixed to the outer end of a stud 39, which has its inner end mounted in bearings on the side of the casing forward of the axle. This stud carries a sprocket-wheel 40, connected by a sprocket-chain 41 to a sprocket-wheel 42, having its hub loosely encircling the end of the brush-shaft and having its end formed with a series of lugs and recesses 43, adapted to interlock with a corresponding series of lugs and recesses on the end of the sleeve 7 of the brush. This sprocket-

wheel is held in place in engagement with the end of the sleeve by the collar 10 before alluded to, which is removably applied to the reduced end of the brush-shaft and held by its set-screw. By the construction described it will be seen that the brush may be moved bodily from the machine by detaching the suspending-chains 14 from the collars 10 and loosening the latter and removing the sprocket-wheel, after which the brush-shaft may be pushed endwise of the sleeve, and the latter, owing to the termination of its ends within the walls of the casing, may be moved rearwardly therefrom. To allow the brush to be removed in this manner the rear wall of the casing is in the form of a door 44, hinged at its upper edge to the rear edge of the top of the casing so that it may be turned upward to a vertical position, as indicated by dotted lines in Fig. 3, thereby opening the entire rear end of the casing.

In order to prevent the draft or pull of the lower side of the sprocket-chain from drawing the brush downward, as its tendency would be unless prevented, I connect to the two collars 10 on the ends of the brush-shaft the rear ends of two rods 45, which extend forwardly along the outer sides of the casing parallel or substantially so to the chain at its lower side, their forward ends being pivoted to the side of the casing, as at 46. As a result of extending these rods parallel with the lower side of the chain, or that portion which exerts the "pull," the pivotal pins of the rods will be located below the center of the sprocket-wheel 40, the result being that the draft or pull of the chain will be exerted in a line endwise of the two rods, so that the position of the brush will in no wise be affected by this pull of the chain. Were the ends of the rods pivoted adjacent to the axis of the sprocket-wheel 40 the tendency of the chain would be to pull the brush downward, which is a very objectionable feature in machines of this character, and one to be avoided.

To insure the entrance of dust and dirt into the receptacle an apron 47 is located between the brush and receptacle, and in connection with this apron two shields 48 are employed, which are located at opposite sides of the casing on its interior in front of the brush, their form being such that they slightly compress the brush-sections at the front and effectually close up the spaces between the ends of the same and the sides of the casing, thus preventing the escape of dirt to the outside. It is important that when the brush is lifted out of action to clear obstructions or for other purposes that these shields be also lifted, and for this purpose their upper edges are pivoted to the lower ends of two links 48 49, which extend upward through openings in the top of the casing, where their upper ends are jointed to two crank-arms 50, carried by the rock-shaft 20. When the rock-shaft is operated to raise the brush, as described, the shields will, by the connections set forth, be

raised with the brush, they being guided and caused to occupy their proper position with respect to the casing by means of two pins 51 fixed to the outer sides and sliding at their 5 outer ends against the inner sides of the casing.

Having thus described my invention, I claim—

1. In a sweeping machine the combination 10 of a wheeled frame a rotary brush, a rock-shaft mounted in bearings on the frame, crank arms on the said shaft, connections between the crank arms and the brush, an operating lever mounted on the frame and provided with a stud, a rod having its forward 15 end slotted to receive the stud and its rear end connected to the rock-shaft, and a forwardly extending weighted arm acting on the said shaft to counterbalance the weight of 20 the brush.

2. In a sweeping machine the combination 25 of a casing having its rear wall in the form of a door, a horizontal rotary brush situated in the casing and terminating at its ends within the same, a shaft sustaining said

brush and disconnected from the casing, suitable devices for suspending the ends of the shaft, whereby the latter and the brush are movable vertically, and means for adjusting the same vertically, whereby the brush may 30 be removed bodily rearward from the casing by first removing its sustaining shaft.

3. In a sweeping machine the combination of a wheeled casing or frame having its rear wall movable, a horizontal shaft fixed from 35 rotation, and projecting at its ends through openings in the casing, suitable sustaining bearings for said shaft, a sleeve loosely encircling the shaft and carrying the brush, said sleeve terminating within the wheels of the 40 casing, a wall loosely encircling the end of the shaft and removably interlocked with the end of the sleeve and means for rotating said wheel.

In testimony whereof I affix my signature 45 in presence of two witnesses.

DAVID F. GRAHAM.

Witnesses:

E. W. HAWKS,
JNO. J. HOOVER.