

**STREET SWEEPER.**

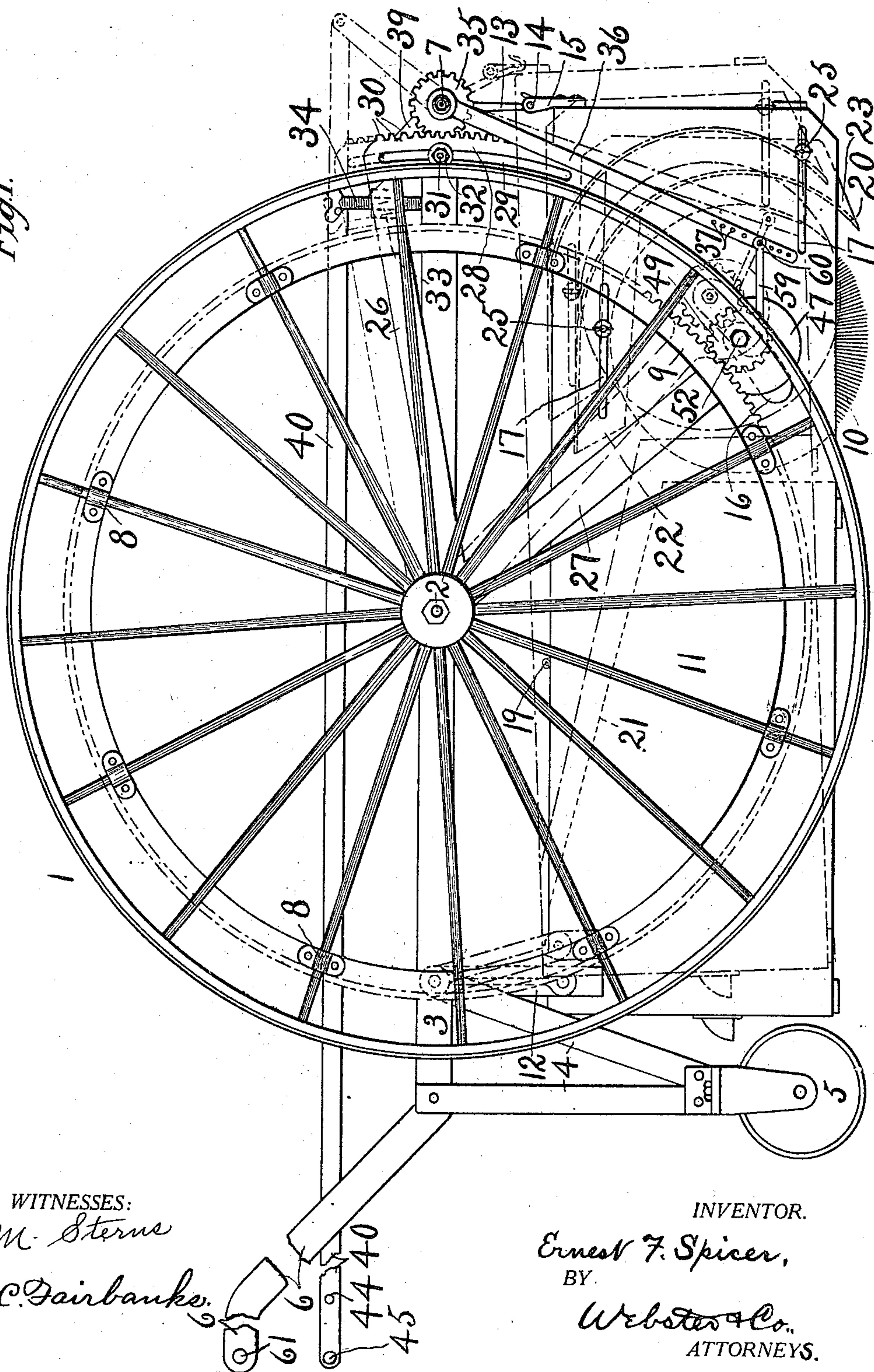
APPLICATION FILED MAR. 16, 1909.

**Patented July 26, 1910.**

4 SHEETS—SHEET 1.

965,245.

Fig. 1.



**WITNESSES:**

J. M. Sterne  
A. C. Fairbanks.

*INVENTOR.*

Ernest F. Spicer,  
BY.

Webster & Co.,  
ATTORNEYS.

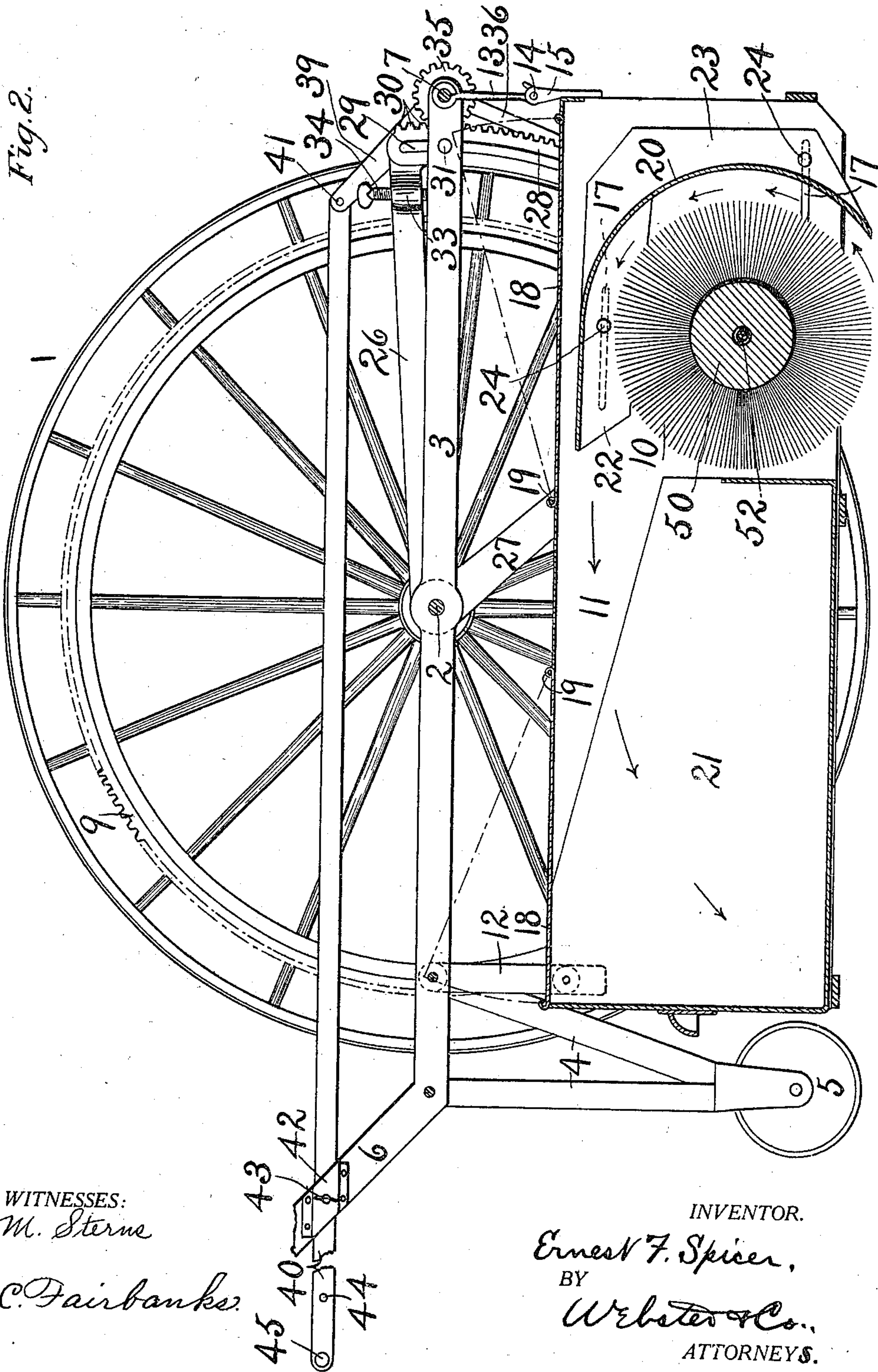


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E. F. SPICER.  
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J. M. Sterne  
A. C. Fairbanks.

INVENTOR.  
Ernest F. Spicer,  
BY  
Webster & Co.,  
ATTORNEYS.

E. F. SPICER.

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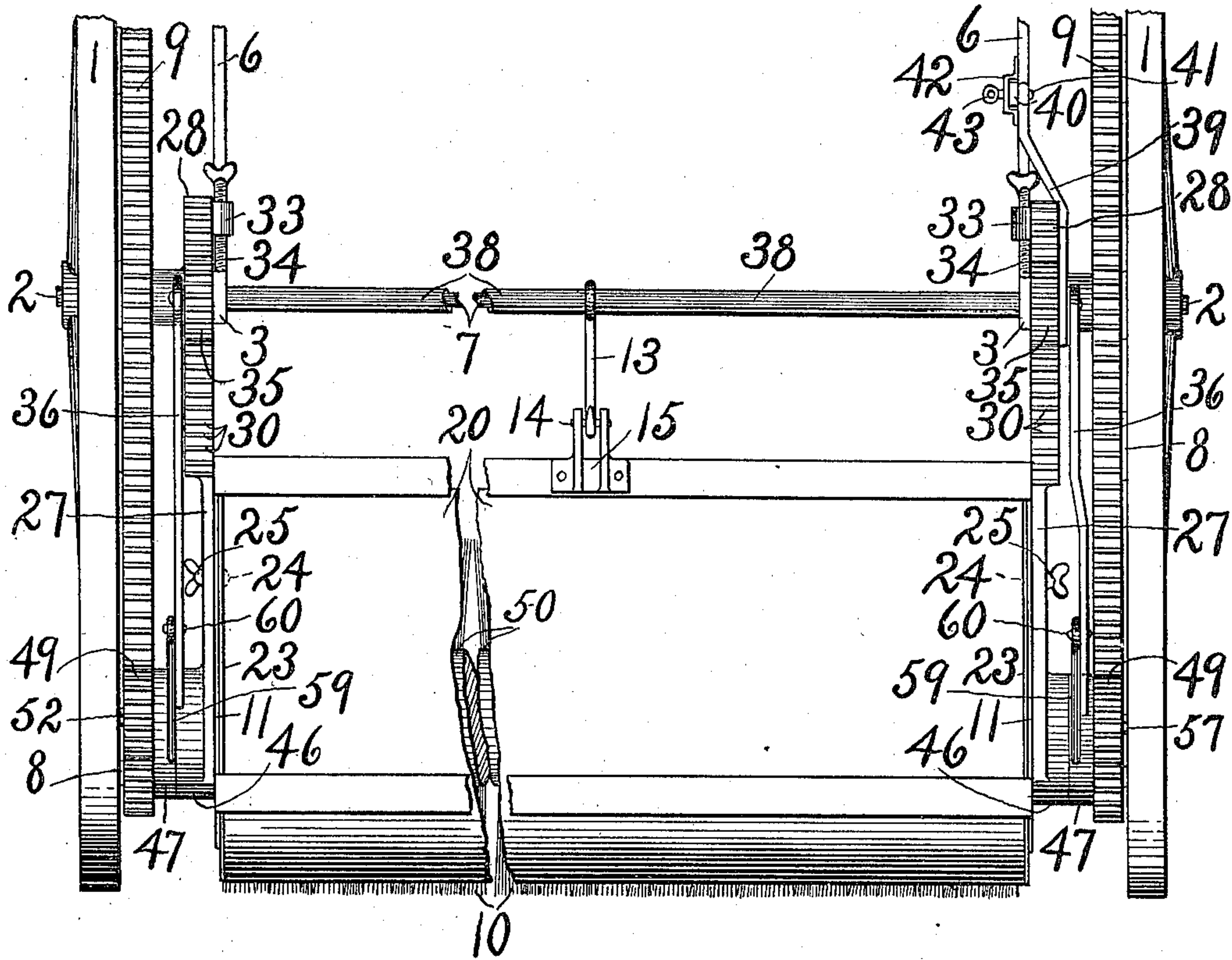


Fig. 3.

WITNESSES:

J. M. Sterne  
A. C. Fairbanks.

INVENTOR.

Ernest F. Spicer.

BY

Webster & Co.,  
ATTORNEYS.



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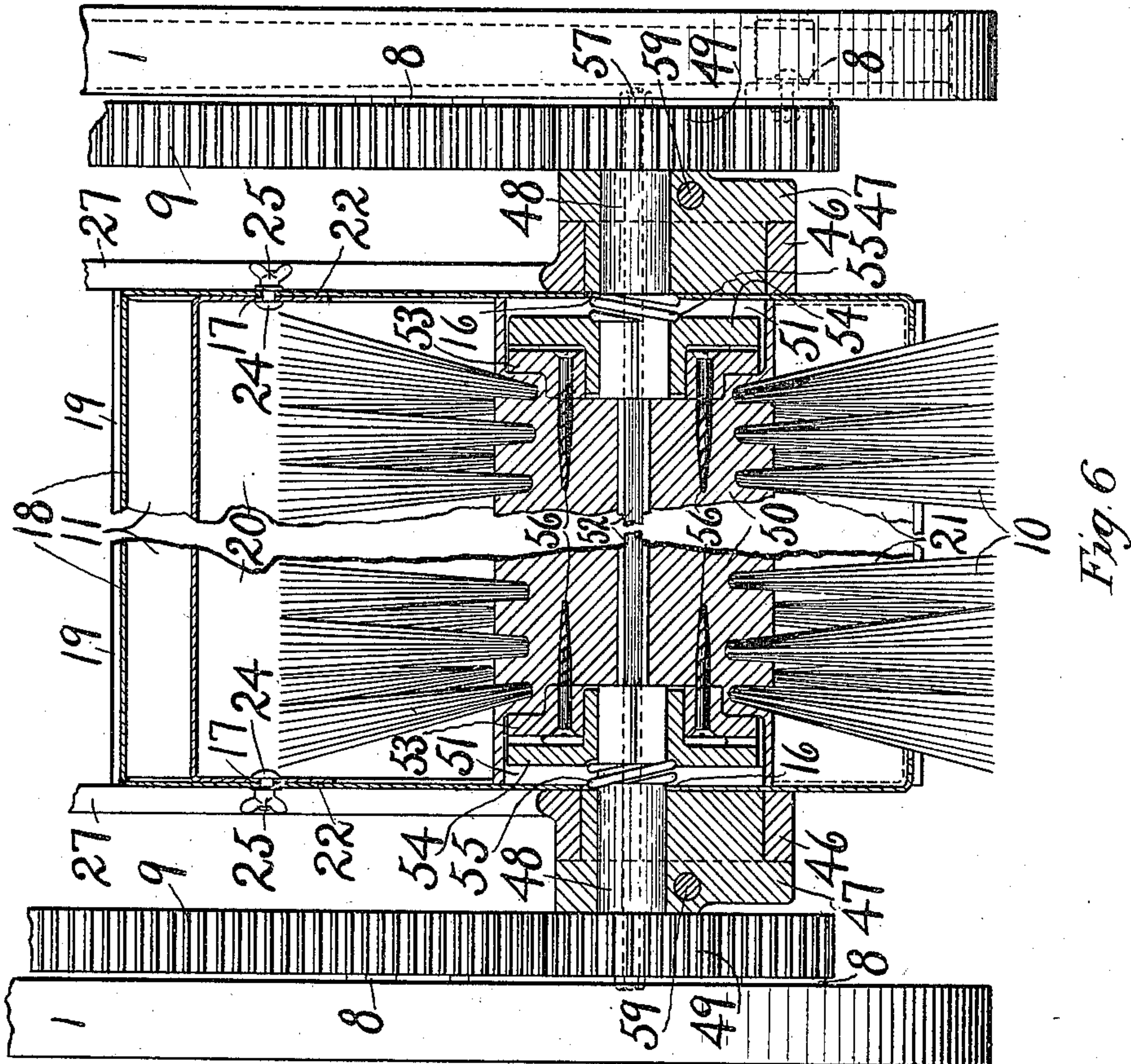


Fig. 6

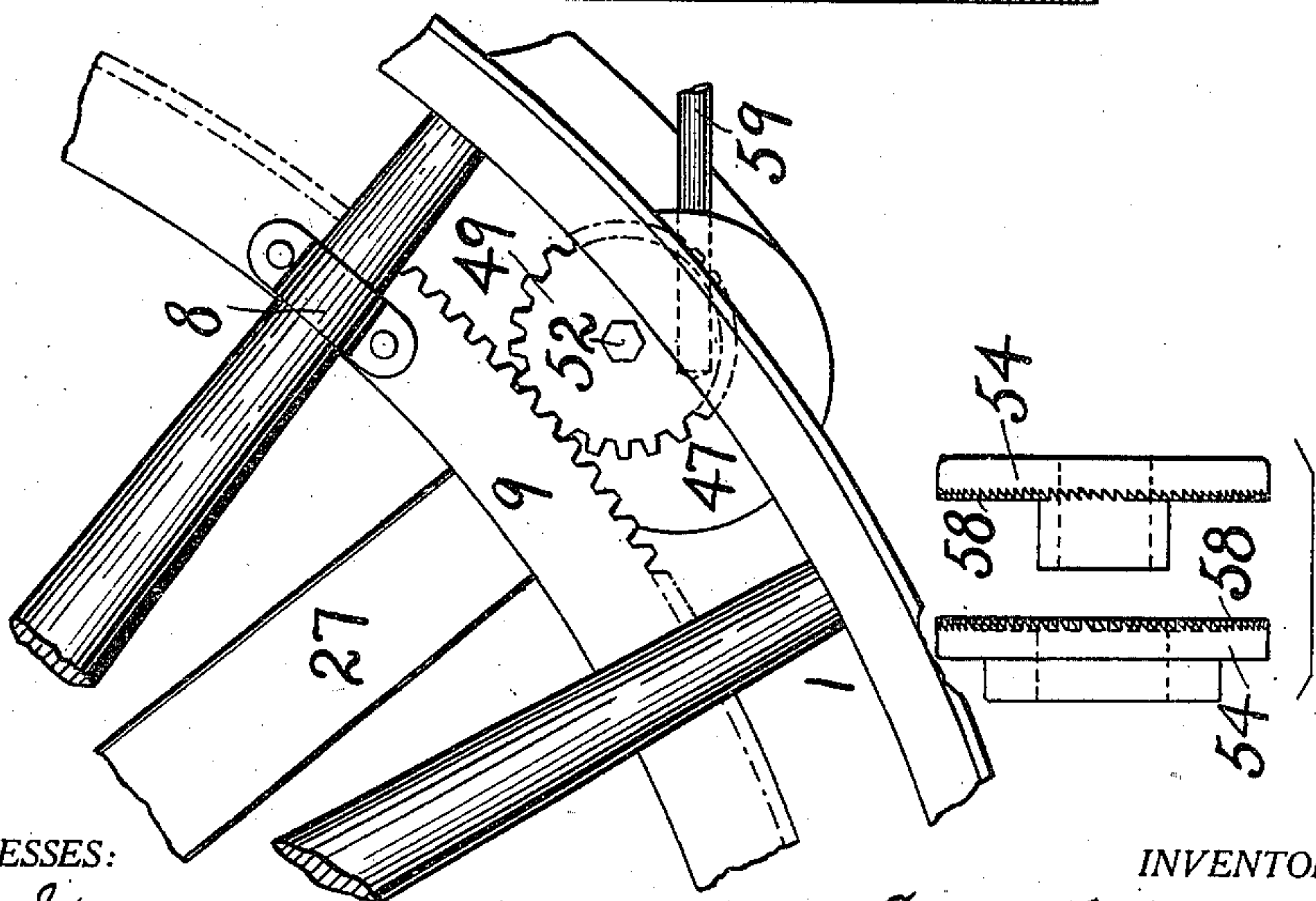


Fig. 5

WITNESSES:  
J. M. Sterne  
A. C. Fairbanks.

Fig. 4

INVENTOR.  
Ernest F. Spicer,  
BY  
Webster & Co.,  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

ERNEST F. SPICER, OF SPRINGFIELD, MASSACHUSETTS.

STREET-SWEEPER.

965,245.

Specification of Letters Patent.

Patented July 26, 1910.

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*To all whom it may concern:*

Be it known that I, ERNEST F. SPICER, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Street-Sweeper, of which the following is a specification.

My invention relates to improvements in sweepers designed for street use and to be propelled by hand, in which I employ a wheeled vehicle which is equipped with a rotary brush driven from the wheels of said vehicle and provided with certain peculiar mechanism for operating and controlling said brush, together with such auxiliary and subsidiary parts and members as may be required to make the sweeper practicable and efficient, all as hereinafter set forth.

The objects of my invention are, first, to produce a comparatively light but durable and serviceable street sweeper which can be readily pushed about by the person using the same to remove the dust and dirt in its path in a thorough manner and without filling the air with a cloud of foreign matter; second, to provide such a sweeper with easily operated means for simultaneously raising the brush and throwing it out of action on the one hand, and for lowering said brush and throwing it into action on the other hand, a single movement only on the part of the operator being required for either of these compound motions; third, to furnish the sweeper with a suitable receptacle and guide thereto for the matter swept up by the brush; fourth, to provide a brush with axial mechanism which increases the efficiency of said brush by enhancing its operation, and, fifth, to afford the necessary adjustments for the aforesaid guide and the carriers for the brush and its connections.

Other objects of greater or less importance will appear in the course of this description.

I attain these objects by the means and mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a practical embodiment of my sweeper, the supporting and throw-out mechanism for the brush being shown as retaining the brush in its active position in full lines and as retaining said brush in its inactive position by dot-and-dash lines, and portions of the handle

of the frame by means of which the sweeper is propelled and of the operating bar for said supporting and throw-out mechanism being broken out; Fig. 2, a central, vertical, longitudinal section through said sweeper, viewed from the same position as in Fig. 1, the aforesaid handle and bar being incomplete as before; Fig. 3, a front elevation of the sweeper, some of the middle portion being broken out and the upper parts of the handle, wheels and gears being broken off; Fig. 4, a fragmentary detail, enlarged, showing one of the eccentrics for the brush axle; Fig. 5, an enlarged elevation of one pair of the ratchet members used in connection with said brush, and, Fig. 6, a central, vertical, longitudinal section, enlarged, through the brush and its axle members and through the hood or casing and guide, looking toward the rear, the middle portions of the brush, casing and guide being broken out—the driving parts for the brush also appear in this view, in elevation.

Similar figures refer to similar parts throughout the several views.

As shown in the drawings, the vehicle which carries the working parts of my sweeper consists of two large wheels 1 mounted on an axle 2, a frame 3 mounted on said axle between said wheels, and two V-shaped legs 4 extending downward from said frame at the rear and equipped at their bases with the same number of rolls 5 the connections between which and said legs are of the ordinary swivel variety. The wheels 1 and the rolls 5 support the sweeper on the ground and enable it to be freely pushed about in any direction. The sides of the frame 3 at the rear extend upward and backward, as shown at 6, and are connected behind by a cross-rod 61 to form a handle with which to propel the sweeper. A shaft 7 is journaled in the frame 3 at its front end. Fastened on the inside of each wheel 1 by means of suitable clips 8 to the spokes of each wheel is a driving gear 9 for a brush 10.

A hood or casing 11 for the sweepings is suspended at the rear end from the frame 3 by hangers 12 and at the front end by a hook 13. The hook 13 is loosely mounted at the upper end on the shaft 7 in the center and engages with the lower end a horizontal pin 14 which connects the branches of a bi-



furcated bracket 15 fastened on the front of the casing 11. In this way provision is made for disconnecting the casing at the front and letting it down at this end whenever it is necessary to do so. The bottom and back end of the casing are open, and there are two segmental slots 16 and four horizontal slots 17 in the sides of said casing. The longitudinal center so to speak of each of the slots 16 is an arc of a circle struck from an adjacent point on the main axis of the vehicle. One of the slots 16 and two of the slots 17 are located in each side of the casing forward of the vertical center thereof, one of such slots 17 being below and in advance of the other. Access to the casing from above may be had through two top covers or lids 18 hinged at 19—19 to the top of said casing.

Inside of the casing 11 at the front is a shield or guide 20, and behind this guide is a suitably supported drawer 21. The guide 20 extends over the brush 10 and curves downward in front of said brush and serves to direct the sweepings from the brush over into the drawer 21, the arrows in Fig. 2 indicating the direction of rotation of the brush and the course of said sweepings into the drawer. The latter is drawn from the casing at the back end to be emptied from time to time as occasion demands. The contents of the drawer can be seen upon raising the rear lid 18.

At each end of the guide 20 are flanges 22 and 23 through which and the adjacent slot 17 bolts 24—24 pass and receive on their outer terminals thumb-nuts 25—25 by means of which said guide is held in position. Adjustment of the guide is effected by loosening the thumb-nuts 25, moving said guide nearer to or farther from the brush 10, and retightening said thumb-nuts, the slots 17 permitting this to be done. By removing the thumb-nuts 25 and the bolts 24 and opening the forward lid 18 the guide 20 can be taken from the casing 11 through the open, front end of the latter.

Supported on each side of the sweeper, against the adjacent side of the casing 11, by arms 26 and 27 which are radial to the axle 2 upon which they are directly mounted at their junctions, is a segment 28. These segments 28 are positioned at the front of the sweeper and each has a segmental slot 29 therein and is provided with teeth 30 on its front edge. The slot 29 and teeth 30 are respectively located in and on the upper portions of the segments. A bolt 31 passes through each side of the frame 3 and the adjacent slot 29 to receive a nut 32 for the purpose of guiding and steadying the corresponding segment. Passing downward through a screw-threaded lug 33, on the outside face of each arm 26, onto the upper edge of the side of the frame 3 below, is a

set-screw 34 for adjustment. These adjusting set-screws 34 regulate and limit the downward movement of the segments and so determine the working position of the brush 10 which is mounted between said segments and is in the main governed thereby in the manner presently to be explained. The hubs of the arms 26 and 27 at the junctions of such arms are situated between the hubs of the wheels 1 and the sides of the frame 3.

Tight on the shaft 7 and in mesh with the segmental teeth or gears 30 are two pinions 35, while loose on said shaft and depending therefrom are two arms 36 having a series of holes 37 in their lower terminals, said pinions and arms being outside of the frame 3. Spacer sleeves 38—38 on the shaft 7, between the back ends of the frame 3 and the hook 13, keep said hook in place and assist in stiffening the structure. It is now clear that if the shaft 7 be rotated or partially rotated the segments 28 must move up or down according to the direction of such partial rotation, owing to the presence of the meshing members 35 and 30, the downward movement of said segments necessarily being limited, however, by the set-screws 34 when they strike and come to rest on the frame 3.

Motion is imparted to the shaft 7 from the rear of the sweeper through the medium of a rocker-arm 39 tight on said shaft, and a bar 40 having its front end pivotally connected with said rocker-arm at 41 and its back end slidingly supported in a carrier 42 fastened on the inside of one of the parts 6 of the frame. A pin 43 is employed to hold the bar 40 against endwise movement and prevent accidental displacement of the connected members, such pin being adapted to pass through one or the other of two holes 44 in said bar and through alining holes in the carrier 42 and the part 6 to which said carrier is attached.

45 is a handle at the back end of the bar to facilitate operating the same. The arrangement of these parts is such that when the pin 43 is drawn out and the bar 40 is pushed forward the segments 28 are swung upward, and they can be secured in this position by replacing said pin only this time inserting it in the rear hole 44; and when next the pin is withdrawn said bar is drawn backward and said segments are lowered again, the pin then being passed through the front hole 44 as at first. Since, as already intimated, the brush 10 is supported by the segments it is moved bodily up and down with and by them.

There are bearings 46, Fig. 6, at the lower end of the segments 28 and in these bearings flanged eccentric bearings or eccentrics 47 are placed, the flanges of said eccentrics covering the outer faces of said bearings 46.



Studs 48—48, which constitute trunnions for the brush 10, are journaled in the bearings or eccentrics 47. A pinion 49, in mesh with the adjacent gear 9, is mounted on each stud 48 and tightly secured thereto. Each end of the core 50 of the brush 10 is recessed at 51 to receive two ratchet clutch members 53 and 54, the inner terminal of one of the studs 48, and a spring 55. The clutch members 53 are fastened in the inner ends of the recesses 51 by means of screws 56. A long bolt 52, having a nut 57 on one end, extends through the pinions 49, the studs 48, and the axial center of the core 50 to secure said pinions to the studs and to connect the latter with said core. The nut 57 must not be screwed up so tight as to cause the rotary parts on the bolt 52 to bind.

The clutch members 54 are slidingly mounted on the inner terminals of the studs 48, which terminals are made angular in cross-section in order that such clutch members shall rotate with the studs. These clutch members have hubs which enter central openings in the clutch members 53, and there are ratchet-teeth 58 on adjacent faces of each pair of members 53 and 54. The springs 55 encircle the studs 48 between the inner faces of the eccentrics 47 and the outer faces of the clutch members 54 and so tension the latter toward the clutch members 53.

The construction and arrangement of the clutch members 53 and 54 and of their ratchet-teeth 58 are such as to cause the brush 10, when in operative position, to revolve in the direction indicated by the arrows in Fig. 2 when the sweeper is pushed forward, and to enable said brush to be rotated in the same direction as before but more slowly as the wheels 1 rotate when said sweeper is drawn backward, also to facilitate turning the sweeper with the brush on the ground as before. As long as the sweeper is pushed forward the brush is caused to revolve with some little rapidity by means of the gears 9, the pinions 49 which mesh with said gears, the studs 48, and the clutch members 54 mounted on the angular portions of said studs to be rotated by and to rotate with the studs and pressed into engagement with the clutch members 53 fast to the core 50; but upon drawing said sweeper backward and so reversing the movement of said gears, pinions, and clutch members 54, the ratchet-teeth 58 which were before interlocked become disengaged from such condition and those on the clutch members 54 click past those on the clutch members 53, owing to the presence of the springs 55 which yield to permit this action to take place, the brush however continues to rotate although slowly in the same direction as before since it is in contact with the ground, rotating now in agreement with the wheels 1, otherwise the brush would be re-

versed with the other parts and so offer a great amount of resistance and stir up a cloud of dust. The clutch-members facilitate turning the sweeper by releasing the end of the brush that is being backed or held stationary as the case may be while said sweeper is in the act of turning or of being turned, and continuing in interlocking engagement at the opposite end of said brush that is being moved forward; without automatic disconnecting means of this or an equivalent nature in the driving mechanism it would be very difficult to propel the sweeper with the brush down excepting in a straight course forward.

To each eccentric 47 the rear end of a rod 59 is affixed and the front end of such rod is pivoted at 60 through one of the holes 37 to the associated arm 36. Since the arms 36 are loose on the shaft 7 they can be and are swung forward by the pivotally connected rods 59 at the time the segments 28 are elevated, and backward when said segments are depressed, and since said rods are rigidly attached to the eccentrics 47 the latter are partially rotated in their bearings 46 at such times as the segments are raised and lowered. The raising of the segments 28 causes the eccentrics 47, through the medium of the rods 59 and the arms 36, to turn and carry the studs 48 and all parts supported thereby forward and so to disengage the pinions 49 from the gears 9, and the lowering of said segments causes said eccentrics, through the same medium, to roll back into their former positions and bring about a reengagement between said pinions and gears. In this manner the brush 10 is thrown out of operation whenever it is elevated and so remains until depressed, and is thrown into operation whenever depressed. By in this way equipping the sweeper with means for easily and quickly disconnecting or connecting the brush from or with the driving mechanism I save unnecessary wear and tear on the brush and brush mechanism, materially lighten the labor of the person who is using the sweeper, and avoid needless agitation of dust and dirt. As previously noted the brush 10 with the exception of its lower part is located in the casing 11 behind and under the guide 20. The studs 48 project outward through the slots 16 in the sides of the casing 11.

In the present construction, the studs 48 are situated in the upper or forward ends of the slots 16, so that, when the brush is raised, the casing 11 will be swung on the hangers 12 upward and forward, into the position indicated by dot-and-dash lines in Fig. 1. This movement on the part of the casing is due to the engagement between the studs 48 and the upper or forward ends of the slots 16. The pin 14 slips upward out of the hook 13 when the casing is tilted. The casing is



restored to normal position with the lowering of the brush into active or operative position.

While the above-described means of adjustment for the casing is not a positively necessary adjunct of my invention, it adds a desirable feature, since it is thus possible to raise said casing away from the ground at such times as the sweeper is not in actual use as such, but is being wheeled over ground that is often broken or uneven and might interfere with the progress of said sweeper were the casing left down in its normal position.

The operations of the several mechanisms of this machine will be fully comprehended from the foregoing description, wherefore it only remains to refer briefly to the operation of the machine as a whole. With the brush down as shown in full lines in several of the views it will take up the dust and dirt in its path as the sweeper is pushed about in a generally forward direction, and deposit such dust and dirt, with the aid of the guide 20, in the drawer 21. To dispense with the brush as an active element, however, all that is required is to force forward the bar 40 and thus cause said brush to be simultaneously raised from the ground and disengaged from the driving mechanism. By the same action of the bar 40 the casing 11 is swung forward and upward. The brush-operating parts and the casing now stand as represented by dot-and-dash lines in Fig. 1, and the sweeper meanwhile can be moved about freely in any direction. As soon as the brush is needed again the bar 40 is drawn back with the result that the brush is lowered into working position and reengaged with the driving mechanism, and the casing is also lowered. Proper adjustment of the segments 28 relative to the limit of their downward travel, and of the guide 20 relative to the brush 10 are effected by the means and in the manner hereinbefore set forth.

It is to be noted that when the bar 40 is moved forward it not only elevates the segments 28 through the medium of the rocker-arm 39, shaft 7, pinions 35 and segmental gears 30, but also brings about the disengagement of the pinions 49 from the gears 9 through the medium of the eccentrics 47 and their connected mechanism, the rods 59 and the loose arms 36; and that when said bar is returned to its former position said segments are lowered and said pinions 49 caused to reengage said gears 9 through the same mediums as before. When the forward lid 18 is open and with the guide 20 out of the way, the brush can be removed from the casing after taking off the nut 57 and withdrawing the bolt 52.

Various changes in the shape, size, location and construction of some or all of the

parts which together make up my invention, may be made without departing from the spirit or nature of said invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a street sweeper, with a pair of wheels and their axle, a pair of segments mounted on said axle, and gears fastened to said wheels, of a brush provided with axle members journaled in said segments, pinions tight on said axle members and adapted to mesh with said gears, and means to elevate and depress said segments and simultaneously throw said pinions out of mesh with said gears or into mesh with the same accordingly as the segments are raised or lowered.

2. The combination, in a street sweeper, of a pair of wheels and their axle, a pair of segments mounted on said axle, gears fastened to said wheels, a brush provided with axle members journaled in said segments, pinions tight on said axle members and adapted to mesh with said gears, means to elevate and depress said segments and simultaneously throw said pinions out of mesh with said gears or into mesh with the same accordingly as the segments are raised or lowered, and adjustable means to limit automatically the downward movement of the segments.

3. The combination, in a street sweeper, with a pair of wheels and their axle, a suitable frame and a pair of slotted segments mounted on said axle, guide members connecting the slotted parts of the segments with said frame, and gears fastened to said wheels, of a brush provided with axle members journaled in said segments, pinions tight on said axle members and adapted to mesh with said gears, and means to elevate and depress said segments and simultaneously throw said pinions out of mesh with said gears or into mesh with the same accordingly as the segments are raised or lowered.

4. The combination, in a street sweeper, with a pair of wheels and their axle, a suitable frame and a pair of toothed segments mounted on said axle, gears fastened to said wheels, a shaft at the front end of said frame, operative means for such shaft, and pinions on said shaft in mesh with the segment teeth, of a brush provided with axle members journaled in said segments, pinions tight on said axle members and adapted to mesh with said gears, and means to throw said last-mentioned pinions out of mesh with said gears when said segments are actuated upward by said first-mentioned pinions.

5. The combination, in a street sweeper, with a suitably mounted segment provided with a bearing, and means to elevate and depress said segment, of an eccentric jour-

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naled in said bearing, a rotary brush provided with an axle member journaled in said eccentric, and means to rotate the eccentric as said segment rises and falls.

5 6. The combination, in a street sweeper, with a suitably mounted segment provided with a bearing, means to elevate and depress said segment, and a loosely swinging arm, of an eccentric journaled in said bearing, a  
10 brush provided with an axle member journaled in said eccentric, and a rod fast at one end to the eccentric and pivotally connected at the other end with said arm.

7. The combination, in a street sweeper,  
15 with the core of a rotary brush, and clutch members rigidly attached to said core, of studs connected with the core and having independent rotary motion relative thereto, driving members for said brush on such  
20 studs, eccentrics in which the latter are journaled, bearings for such eccentrics, means to rotate said eccentrics and so change the position of the axial center of said driving members for the brush, spring-pressed clutch  
25 members slidingly-mounted on said studs without independent rotation and adapted to coact with said first-mentioned clutch

members, and driving means for said driving members.

8. The combination, in a street sweeper, 30 with a suitable wheeled vehicle, a casing swung at one end from said vehicle and supported at the other end therefrom, and a revoluble brush having axial members which engage said casing, of means to carry 35 said brush forward and upward and with it said casing.

9. The combination, in a street sweeper, with a suitable wheeled vehicle, of a casing carried thereby and having slotted sides, 40 a revoluble brush in such casing, a guide in said casing for the sweepings of the brush, such guide having flanges at the sides and being substantially concentric with said brush, and screw-threaded members adapted 45 to engage the slotted portions of said casing and the guide flanges, whereby the guide can be located nearer to or farther from said brush and secured wherever left after such adjustment.

ERNEST F. SPICER.

Witnesses:

F. A. CUTTER,  
A. C. FAIRBANKS.