No. 701,381. Patented June 3, 1902.

A. P. PALMER & H. L. PHELPS.

STREET SWEEPER.

(Application filed Oct. 15, 1900.)

(No Model.) 4 Sheets—Sheet 1.

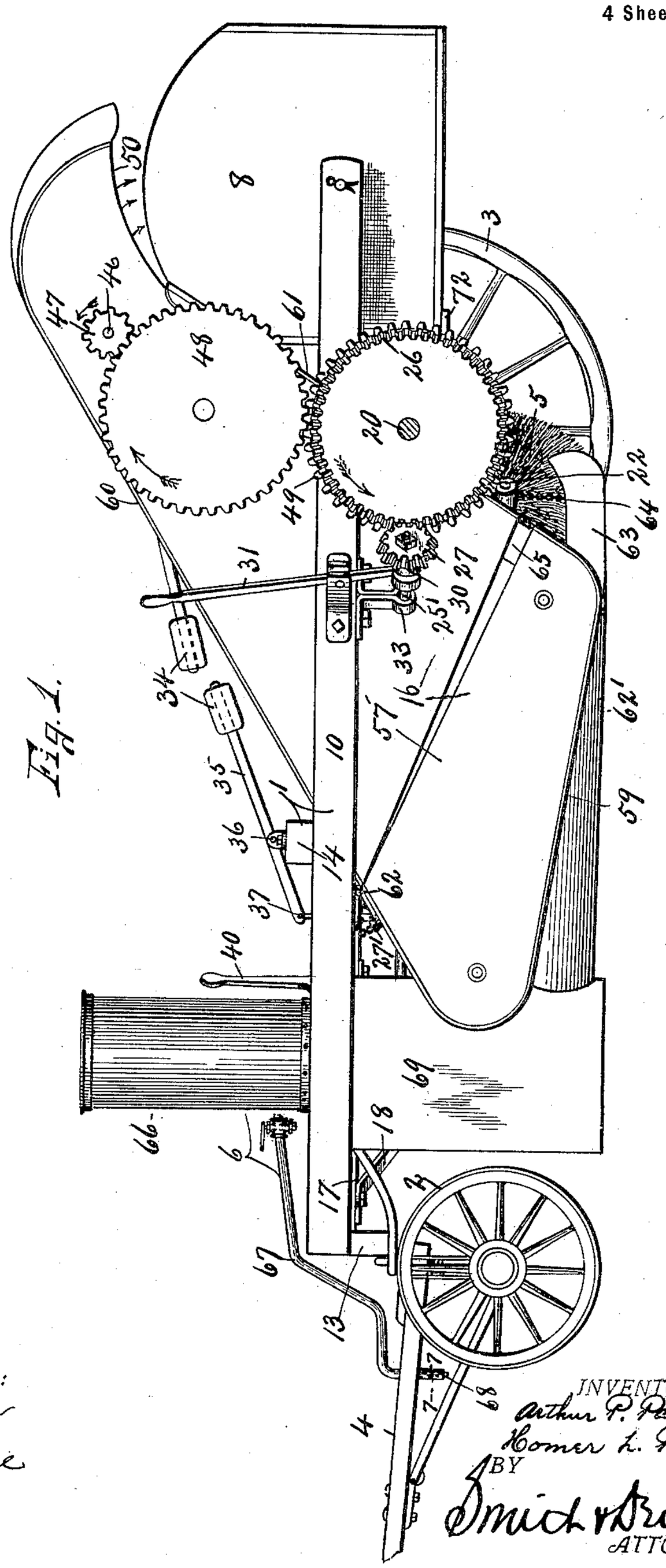

Fig. 1.

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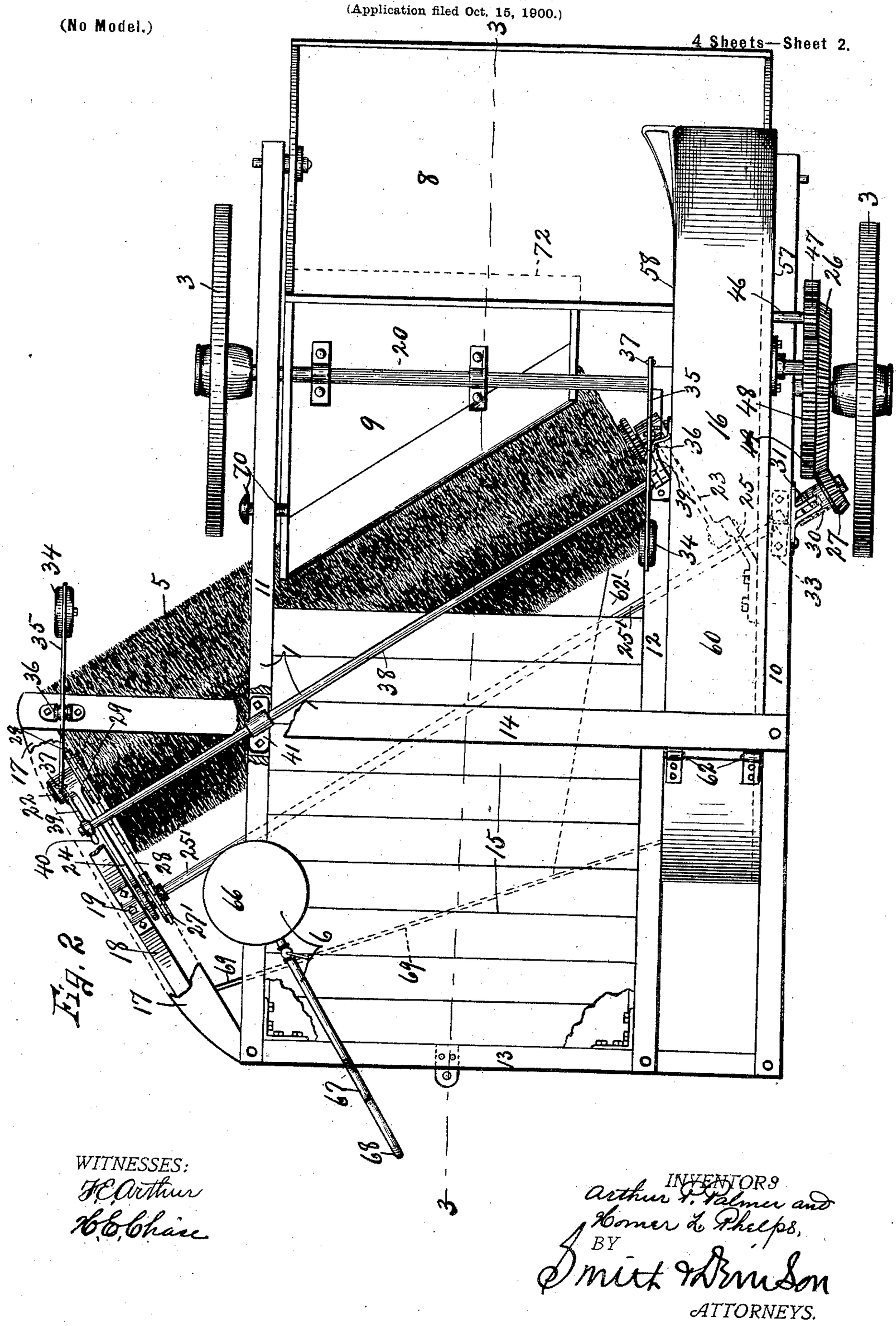

Fig. 2.

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4 Sheets—Sheet 3.

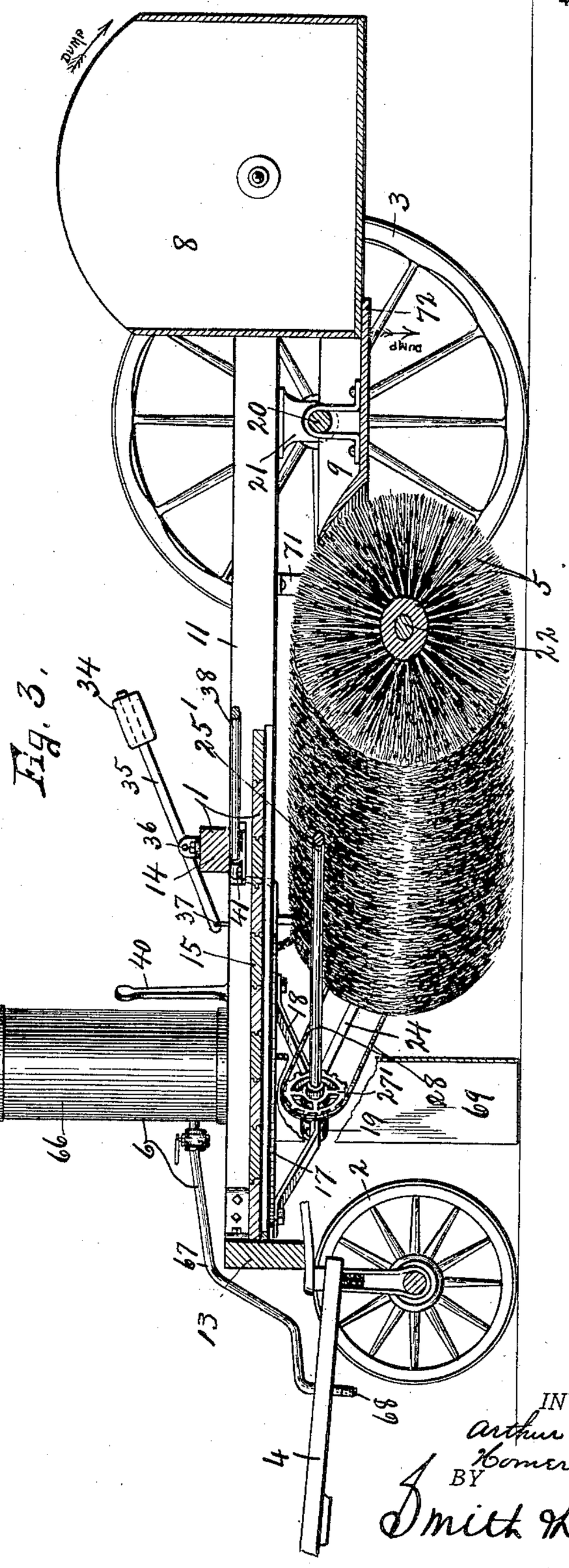

Fig. 3.

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(Application filed Oct. 15, 1900.)

(No Model.) 4 Sheets—Sheet 4.

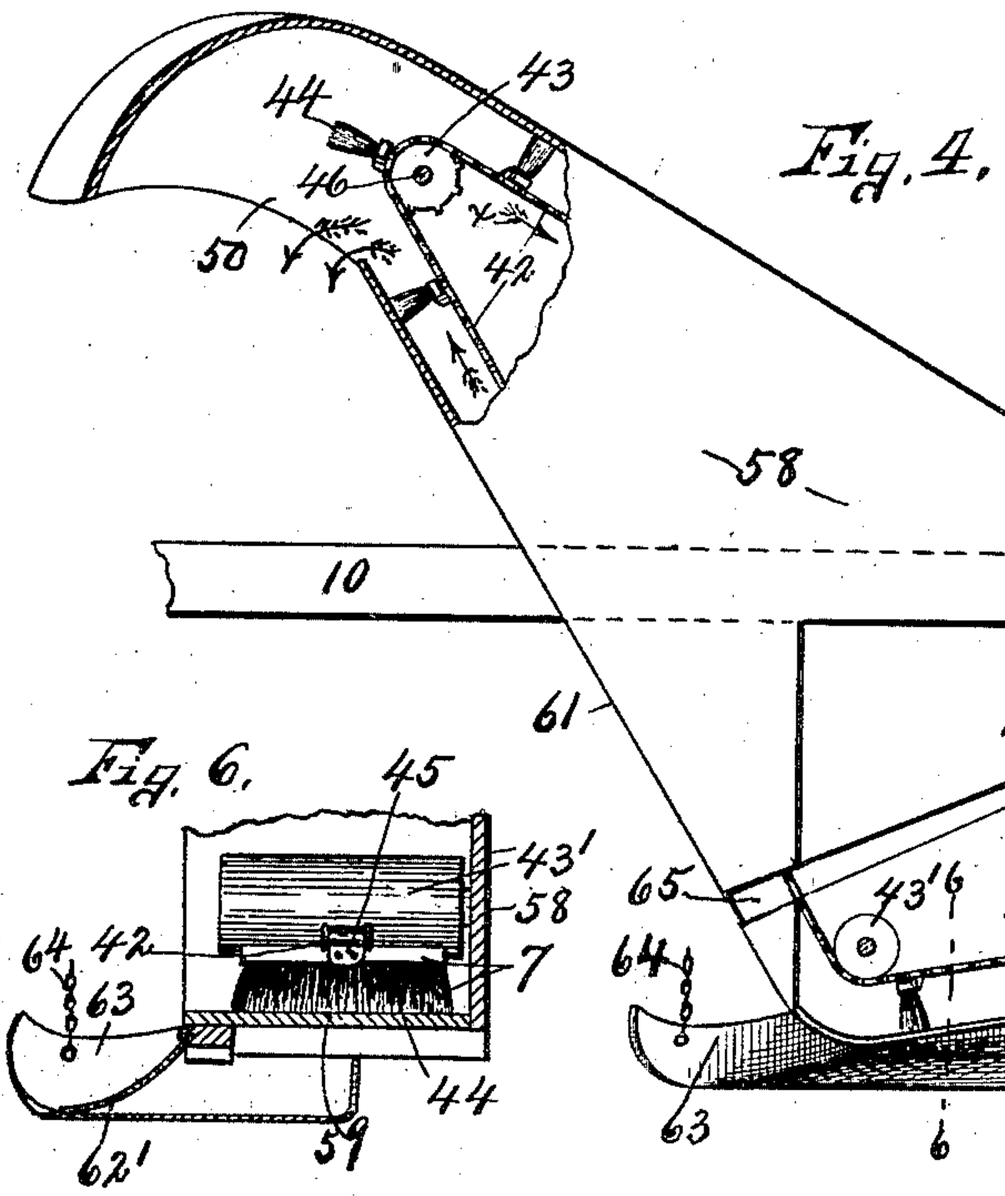

Fig. 4.

Fig. 7.

Fig. 6.

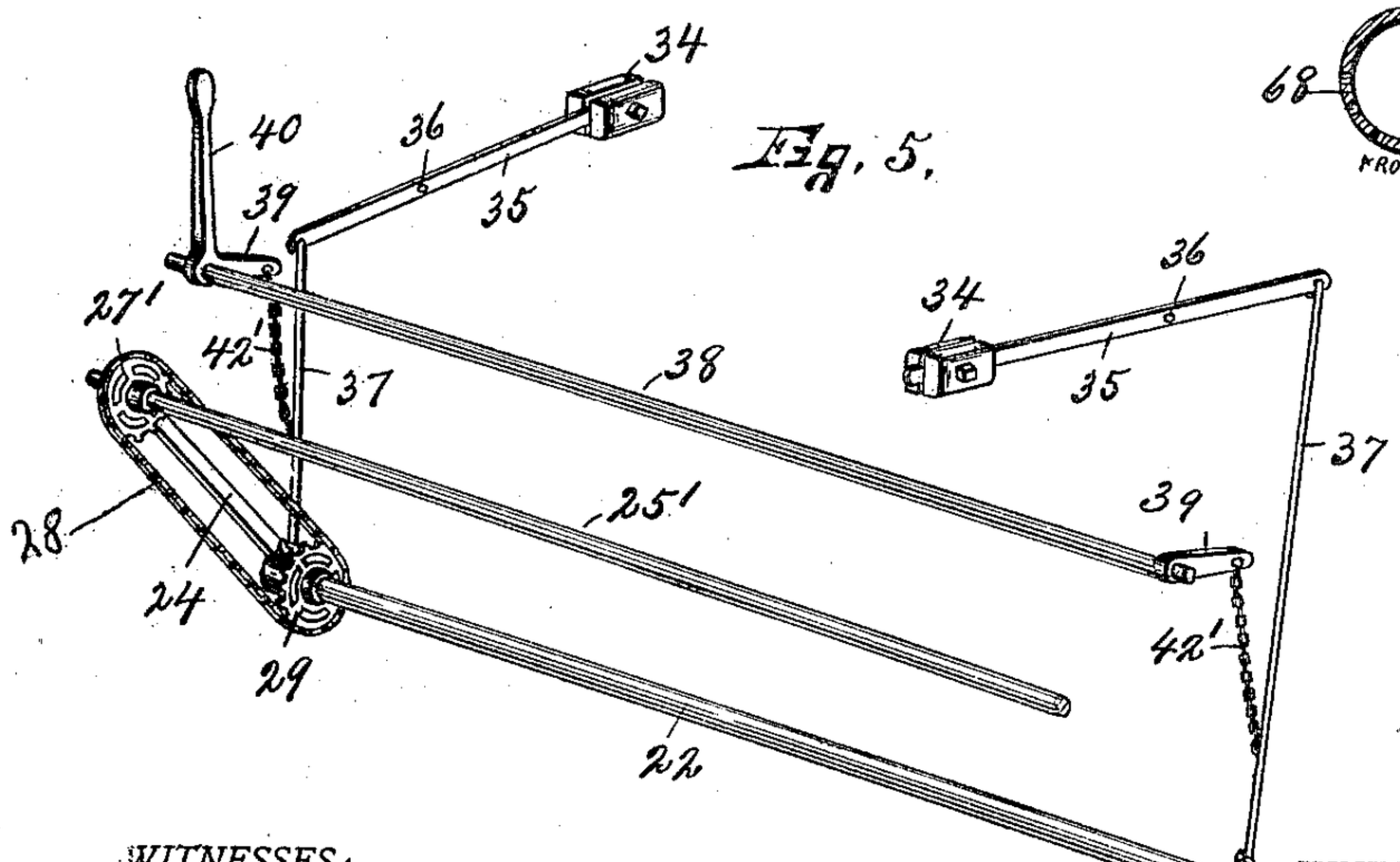

Fig. 5.

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UNITED STATES PATENT OFFICE.

ARTHUR P. PALMER, OF WAVERLY, NEW YORK, AND HOMER L. PHELPS, OF ATHENS, PENNSYLVANIA, ASSIGNORS OF ONE-THIRD TO DUANE HOWARD, OF CORTLAND, NEW YORK.

STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 701,381, dated June 3, 1902.

Application filed October 15, 1900. Serial No. 33,114. (No model.)

To all whom it may concern:

Be it known that we, ARTHUR P. PALMER, of Waverly, in the county of Tioga and State of New York, and HOMER L. PHELPS, of Athens, in the county of Bradford, in the State of Pennsylvania, have invented new and useful Improvements in Street-Sweepers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

Our invention relates to improvements in street-sweepers.

The object of this invention is to combine in a single machine the following mechanisms—viz., a rotary sweeper actuated by the traction-wheels of a suitable truck or running-gear, a sprinkler carried by the truck and discharging in advance of the sweeper, a spatter-dash or flexible curtain between the sprinkler and sweeper, a conveyer for receiving the sweepings in advance of the sweeper and discharging the same at the rear of said sweeper, and a receptacle at the rear of the sweeper for receiving the sweepings discharged from the conveyer.

Another object is to provide means whereby the operator may readily connect or disconnect the sweeper mechanism from the traction-wheels.

A further object is to construct the elevator-leg in sections, so that the lower section may be elevated or depressed, and to provide the movable section with a suitable dust-pan and flexible apron, whereby the sweepings may be easily deflected by the brush from the pavement into the conveyer-leg in the path of the moving conveyer-belt and its brushes.

A still further object is to provide manually-operated means for raising and lowering the sweeper and to connect the same to the dust-pan in such manner that when the sweeper is elevated the movable section of the elevator-leg and the dust-pan attached thereto are also elevated and said section and dust-pan are free to raise and lower independently of the sweeper.

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

Referring to the drawings, Figures 1 and 2 are respectively side elevation and top plan of a sweeper embodying the various features of our invention. Fig. 3 is a sectional view taken on line 3 3, Fig. 2. Fig. 4 is an inner face view of the detached elevator-leg. Fig. 5 is an isometric perspective view of the sweeper-shaft and the mechanism for operating the same. Figs. 6 and 7 are sectional views taken, respectively, on lines 6 6, Fig. 4, and 7 7, Fig. 1.

Similar reference characters indicate corresponding parts in all the views.

In the drawings we have shown a suitable truck for supporting the parts of our invention and generally consisting of a frame 1, front and rear wheels 2 and 3, and a suitable pole or tongue 4. Upon this truck are mounted a rotary sweeper 5, a sprinkler mechanism 6, a conveyer 7, and one or more receivers 8 and 9.

The frame 1 may be of any desired construction for properly supporting the parts of our invention, but usually consists of outer and intermediate lengthwise bars 10, 11, and 12 and cross-bars 13 and 14, the intermediate bar 12 being arranged closer to the bar 10 than to the bar 11, and the front cross-bar 13 is secured to the front ends of the bars 10, 11, and 12, while the bar 14 extends across the intermediate portions of the bars 10, 11, and 12, is secured to said bars, and extends laterally beyond the bar 11.

The space between the bars 11 and 12 is filled in with a suitable flooring 15, which serves as a supporting-platform for the operator, and interposed between the bars 10 and 12 and secured thereto and to the cross-bar 14 is an upright elevator leg or casing 16, which forms a portion of the frame and serves to inclose the greater portion of the conveyer 7, presently described. The front end of the bar 11 is connected to the adjacent extension of the bar 14 by a brace or plate 17, to the lower face of which is secured a second brace

or bracket 18, having a bearing 19, which serves to support a portion of the driving mechanism for the rotary sweeper.

We preferably employ but a single front wheel 2, while the rear end of the frame is carried by two wheels 3, the front wheel being mounted on a suitable axle, which is pivotally connected to the front end of the frame 1 in the usual manner for fifth-wheels, and the rear wheels are secured to the opposite ends of a shaft 20, which is journaled in the brackets 21, depending from the side bars 10 and 11, so that said shaft is rotated as the wheels are revolved.

The tongue or pole 4 is connected in any well-known manner to the front ends of the truck, whereby the sweeper may be drawn either by manual or animal power or by any other motive power desired.

The rotary sweeper 5 is movably supported beneath the frame 1 between the front and rear wheels and is arranged at an angle with the line of draft of the truck, being inclined forwardly from the rear end of the base of the elevator-leg for concentrating the sweepings toward said elevator. This sweeper consists of a cylindrical brush mounted on a rotary shaft 22, the opposite ends of which are supported in the free ends of suitable rock-arms 23 and 24. The opposite ends of these rock-arms may be pivotally connected to any suitable support, the arm 23 being illustrated by dotted lines at Fig. 2 as pivotally connected to a bracket 25, secured to the inner face of the outer wall of the elevator-leg, and the arm 24 as loosely mounted on an intermediary shaft 25′, which drives the rotary sweeper.

The means for rotating the sweeper 5 preferably consists of a bevel-gear 26, secured to the rear axle 20 and meshing with a pinion 27, provided on one end of a shaft 25′, and a sprocket 27′, secured to the opposite end of said shaft and connected by a chain or equivalent belt 28 to a sprocket 29, secured to the rotary sweeper. In order to start or stop the sweeper 5 during the movement of the truck along the pavement, we provide the shaft 25′ with a suitable device, such as a clutch 30, which is feathered on the shaft 25′ and is movable into and out of engagement with clutch-teeth on the pinion 27, said pinion being loose on the shaft except when interlocked with the clutch 30. This movement of the clutch is effected by a suitable handpiece or lever 31, which is pivoted to the frame 1, and its lower end is adapted to engage the opposite faces of an annular groove formed in the clutch 30.

The end of the shaft 25′ adjacent to the gear 26 is journaled in a bracket 33, depending from the bar 10, and is extended through the elevator-case, and its opposite end is supported in the bearing 19 of the bracket 18, previously described.

It is desirable to so support the sweeper as to permit the same to move readily over uneven surfaces, and we therefore provide suitable counterweights 34, which are mounted on levers 35, pivoted to the frame at 36 and connected by links 37 to the free ends of the arms 23 and 24, in which the sweeper-shaft is supported. These counterweights serve to relieve the drag of the sweeper on the pavement and are of such weight as to permit a uniform light contact of the sweeper with the pavement sufficient to remove the dirt therefrom. In order to make further provision for the raising of the sweeper from the pavement, we provide a rock-shaft 38 with arms 39 and a handpiece 40, the shaft 38 being journaled in bearings 41 on the frame 1, and the arms 39 are connected by flexible connections 42′ to the rods or links 37, so that when the shaft is rocked by the handpiece 40 the sweeper will be elevated, and when the sweeper is in normal contact with the pavement the sweeper is free to raise and lower to conform with uneven surfaces in the pavement without affecting the rock-shaft 38. During this raising and lowering of the sweeper the arm 24 causes the axes of the sprocket-wheels 27′ and 29 to maintain the same relation, and therefore keeps a uniform tension on the chain belt 28.

The conveyer 7 is movable in the casing 16, and, as here shown, consists of an endless belt 42, arranged in the form of a triangle and mounted on drums 43 and 43′ and having a plurality of brushes 44, flexibly connected thereto by suitable knuckles 45. One of these drums, as the upper one, 43, is fixed to a spindle 46, journaled in the side walls of the casing 16, said spindle being provided with a pinion 47, which meshes with a spur-gear 48, also journaled in the walls of said casing. This latter gear 48 meshes with a similar spur-gear 49 on the rear axle 20, and it is evident that as the truck is drawn forwardly the belt or conveyer is rotated in the direction indicated by arrows x and the sweepings are carried upwardly and discharged through an opening 50 in the upper end of the casing 16, which sweepings then fall into the receptacle 8. This casing 16 is also triangular in form, having outer and inner side walls 57 and 58 and bottom, front, or top, and rear walls 59, 60, and 61, and is divided transversely for forming lower and upper sections, the lower section being hinged to the upper section at 62, and its rear end is movable vertically to permit it to ride over uneven surfaces readily as the truck is moved forwardly.

The lower portion of the inner side wall of the casing 16, adjacent to the sweeper, is removed for permitting the sweepings to enter the lower section, which sweepings are deposited upon the bottom wall 59 in the path of the brushes on the conveyer-belt, and in order to facilitate the entrance of the sweepings to said conveyer-belt the edge of the lower wall 59, adjacent to the sweeper, is provided with a dust pan or collector, consisting of a flexible apron 62′ and a stiff end wall 63, the apron 62′ being secured at its upper edge to the inner edge of the lower wall 59, and its

lower edge trails along the pavement as the truck is drawn forward, it being understood that the sweeper being arranged at an angle with the line of draft with one end inclined forwardly from the end wall 63 the sweepings will be forced or continually rolled toward the dust-pan and by this deflected upwardly through the open side of the casing and into the path of the conveyer and that the end wall 63, which overlaps the adjacent end of the sweeper, prevents the escape of said sweepings laterally.

The end wall 63 of the dust-pan is flexibly connected by a chain or its equivalent 64, Fig. 1, to the adjacent free end of the supporting-arm for the sweeper-shaft for permitting the dust-pan to be elevated with the sweeper and also permit its independent upward movement when it contacts with any obstacle or uneven surface. The open joint between the upper and lower sections of the elevator-casing where the belt travels is closed by a suitable connection 65, Fig. 1, which forms a continuation of the rear wall of said casing and is arranged to slide in one of the sections as the lower section is moved vertically.

The sprinkler mechanism 6 is supported on the front end of the truck near the forward end of the sweeper and consists of a water-tank 66 and a discharge-conduit 67, having a perforated extremity 68, the apertures of which are arranged to discharge forwardly and on either side in advance of the forward end of the sweeper, thereby sprinkling lightly the pavement through only a portion of the length of the sweeper, it being apparent that the dust thus moistened is collected inwardly toward the dust-pan and moistens the dust in advance of the rear end of the sweeper, and the sweepings are finally forced into the path of the conveyer-belt and carried thereby to the receptacle 8.

Arranged between the forward end of the sweeper 5 and the sprinkler discharge-pipe is a flexible curtain or spatter-dash 69, which depends from the frame 1 into close proximity to the pavement and serves as a mud or dust guard and to deflect the sweepings toward the dust-pan and conveyer. The receiver 8 is trunnioned on the rear end of the frame 1 between the bars 10 and 11 and receives the sweepings discharged from the outlet-opening in the upper end of the conveyer-case 5, said receiver being arranged to tilt rearwardly for discharging its load when desired. The additional receptacle 9 is preferably loosely hung upon the axle of the rear wheels for receiving any sweepings which may be carried over by the sweeper and is also adapted to discharge rearwardly, being held in its normal position by a removable pin 70, which is passed through an aperture in the frame 1 or a bracket 71, depending therefrom. The rear end of the receptacle is formed with a shelf or projection 72, extending beneath the forward end of the receptacle 8, and this latter receptacle being weighted forwardly rests on said shelf.

The operation of our invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that any means may be employed for holding the receptacles 8 and 9 in their normal positions and that other changes may be made in the details of our invention without departing from the spirit thereof.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a sweeper, the combination with the frame, and a revolving brush of a dumping-box receiving the sweepings from the front of the brush, and an auxiliary receiver in the rear of the brush and between it and the box and receiving the sweepings discharged from the rear of the brush.

2. In a sweeper, the combination with a frame and a revolving brush, of a dumping-box receiving the sweepings from the front of the brush, and an auxiliary tilting receiver in the rear of the brush and between it and said box and extending under the box to prevent its dumping, and receiving the sweepings discharged from the rear of the brush.

3. In a sweeper, the combination with a main frame, a revolving brush thereon, and a curtain pendent from the frame, of a dust-pan at the rear end of the brush and a flexible extension thereof between it and the curtain.

4. In a sweeper, the combination with a main frame, a revolving brush thereon and a curtain pendent from the frame in front of the brush, of a dust-pan at the rear end of the brush, and a flexible and inwardly-inclined extension thereof between it and the curtain whereby the sweepings are primarily collected in a windrow along the edge of said dust-pan.

5. In a sweeper, the combination with a main frame, a revolving brush thereon and a curtain pendent from the frame in front of the brush, of a dust-pan at the rear end of the brush having a tapered flexible and inwardly-inclined extension extending forward to said curtain, whereby the sweepings are primarily thrown onto the incline of the dust-pan and are collected in a windrow along its edge.

6. In a sweeper, a main frame, a revolving brush and a dust-pan at the rear end of the brush, combined with an elevator-leg substantially horizontal for a part of its length and open along its inner side, of a flexible, inclined dust-pan extension having its outer edge secured to said elevator-leg and dust-pan.

7. In a sweeper, the combination with a revolving brush arranged at an angle with the line of draft, of a dumping-receptacle at the rear of the brush to receive the sweepings, an elevator and case therefor arranged to convey and to conduct the sweepings to the re-

ceptacle, said case being provided with a depending flexible dust-pan in front of the brush and having an opening in its inner side above the dust-pan to receive the sweepings and to conduct the same to the elevator, said brush and dust-pan being movable vertically for the purpose described.

In witness whereof we have hereunto set our hands this 18th day of August, 1900.

ARTHUR P. PALMER.
HOMER L. PHELPS.

Witnesses:
JAMES H. OWEN,
J. M. LYFORD.