March 18, 1930. F. D. WILSON 1,750,829

GUTTER BROOM STREET SWEEPER

Filed Feb. 16, 1925 4 Sheets-Sheet 1

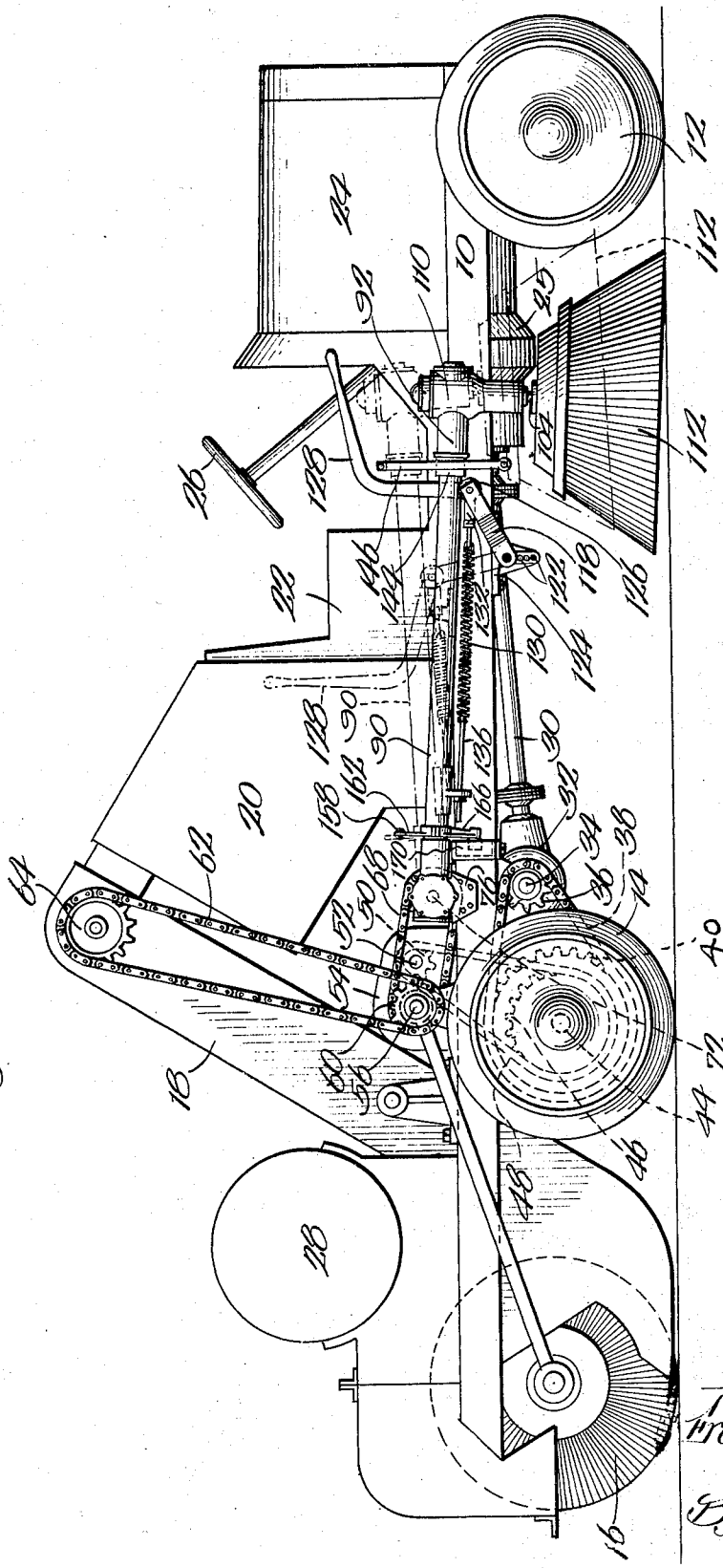


Fig. 1.

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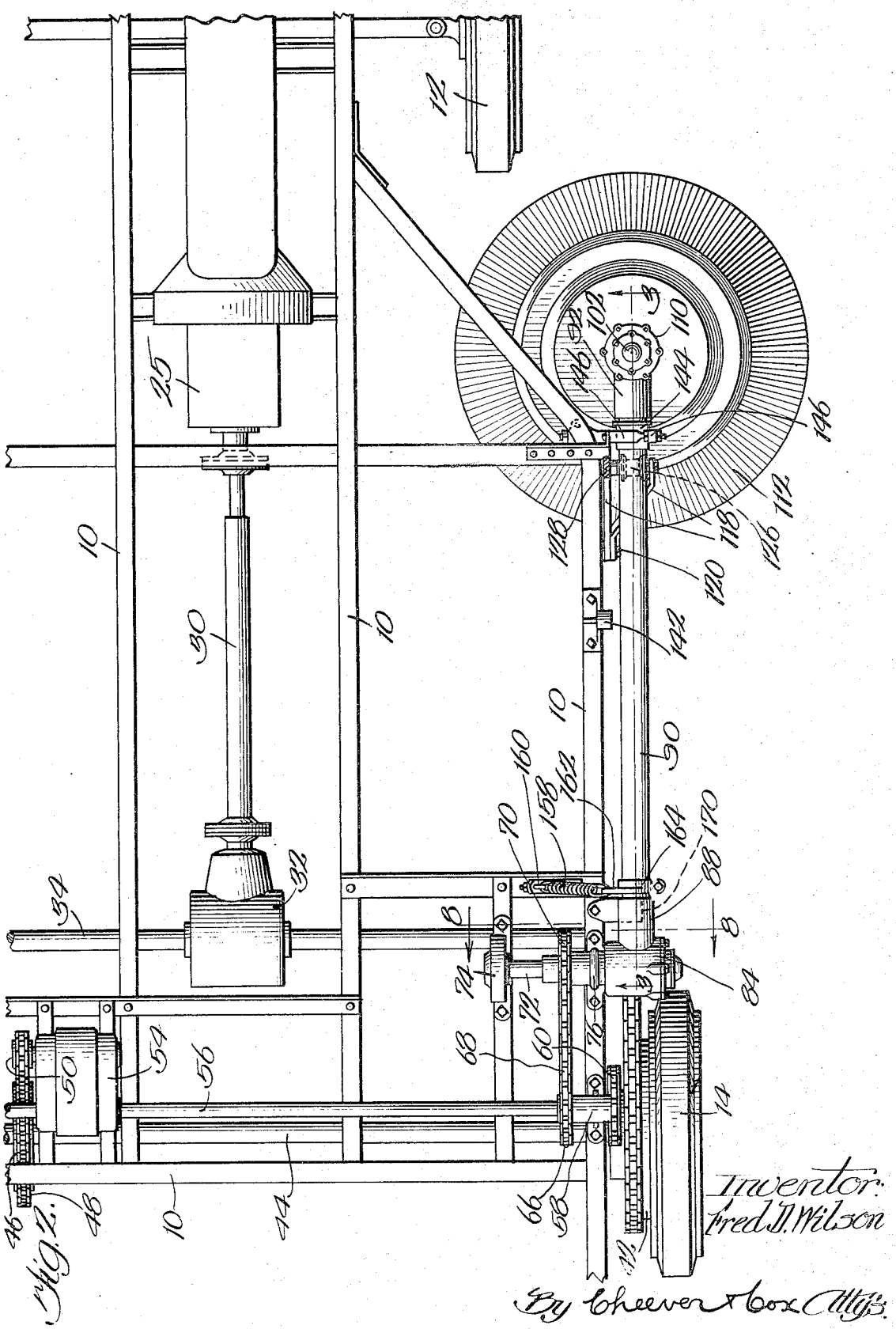


Fig. 2.

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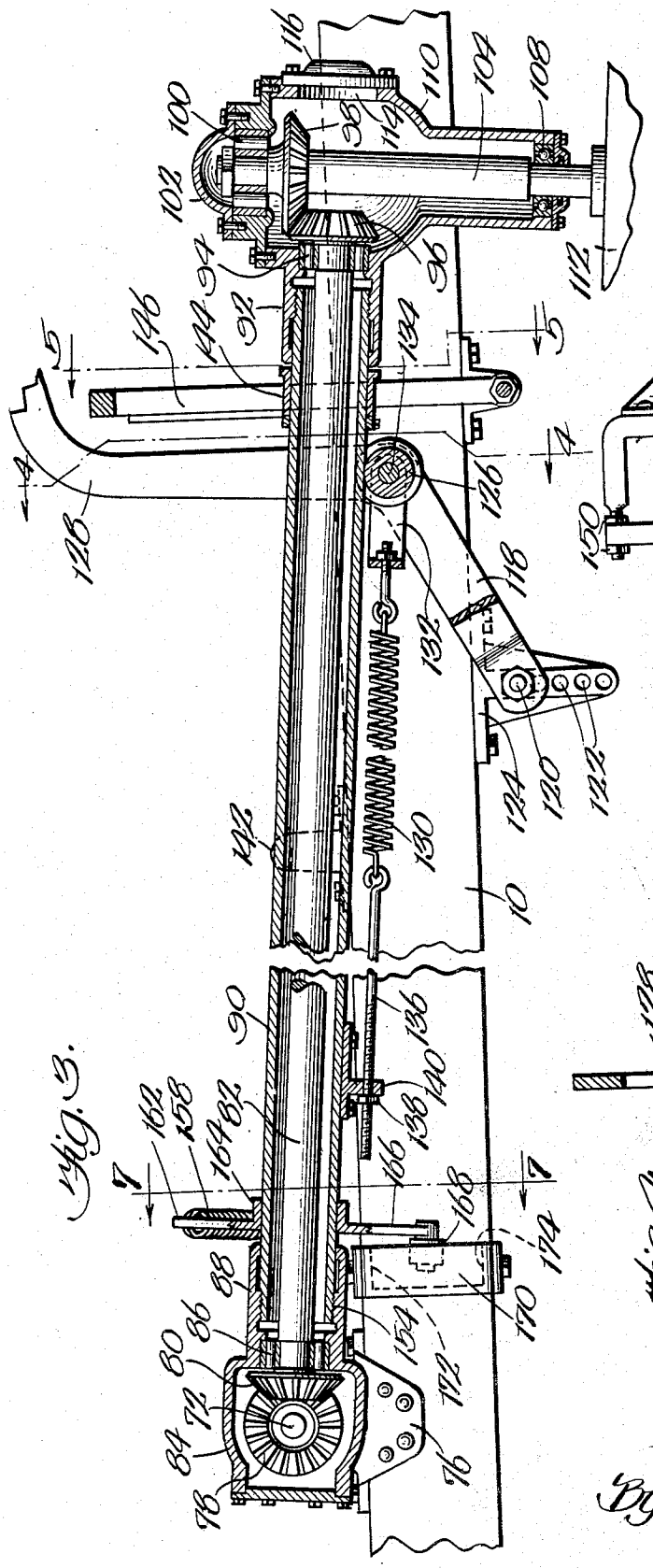


Fig. 3.

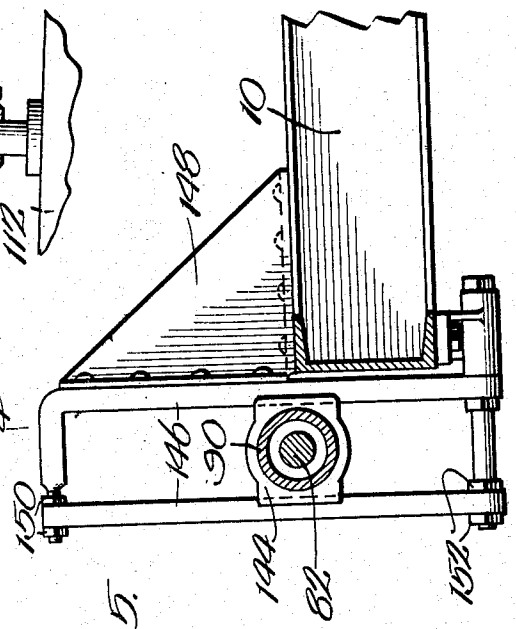


Fig. 5.

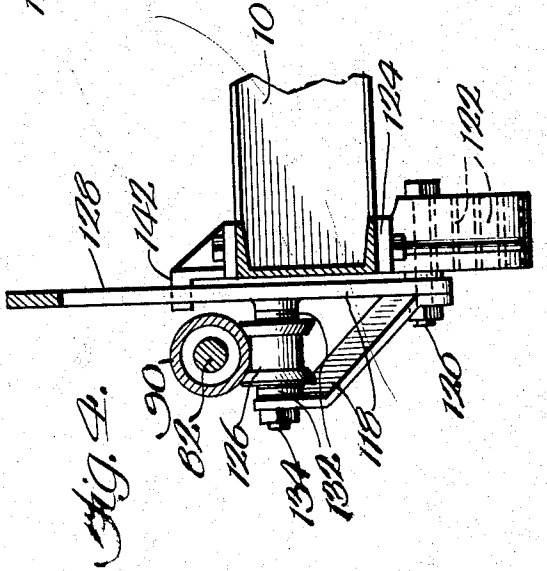


Fig. 4.

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GUTTER BROOM STREET SWEEPER

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Fig. 6.

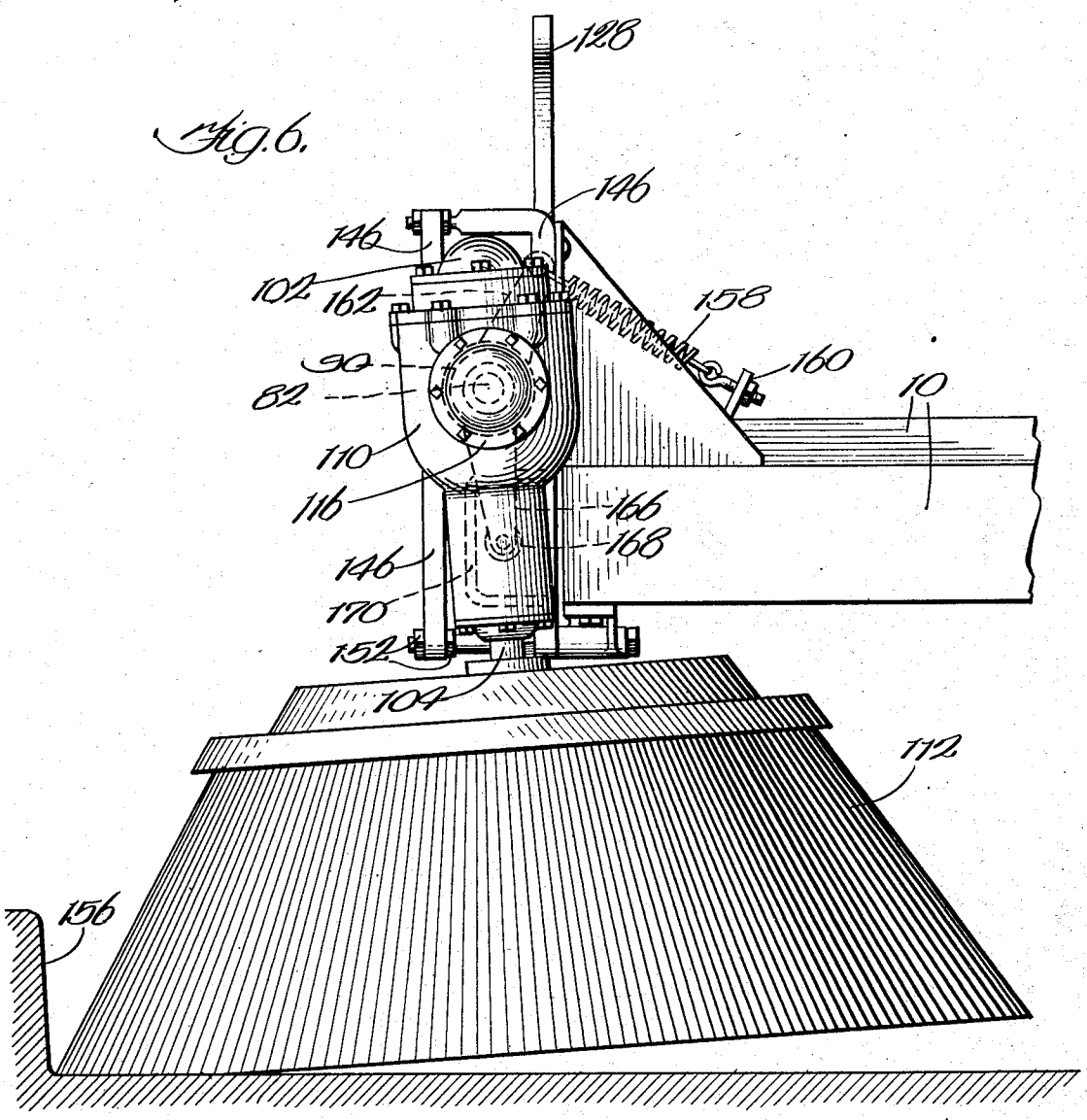


Fig. 7.

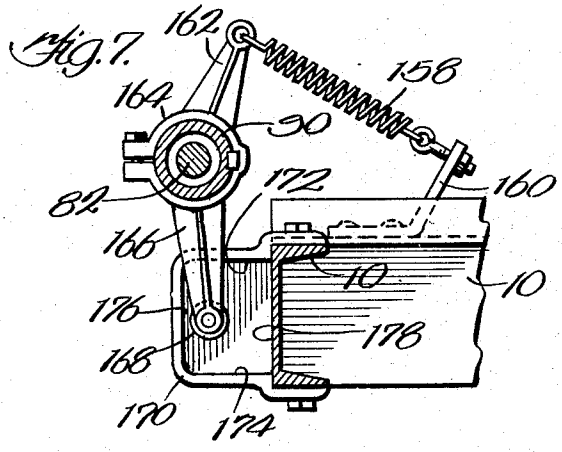
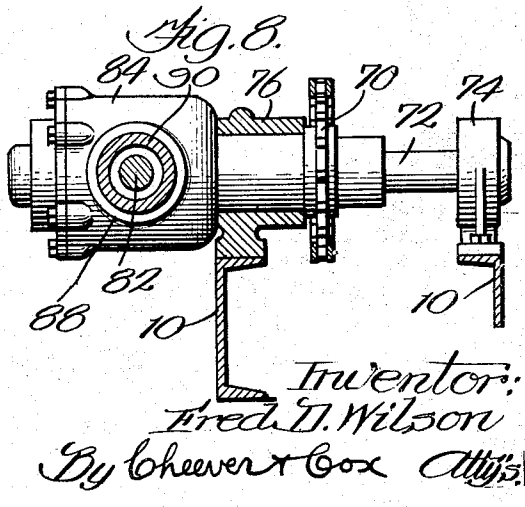


Fig. 8.



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UNITED STATES PATENT OFFICE

FRED D. WILSON, OF HARVEY, ILLINOIS, ASSIGNOR TO AUSTIN MANUFACTURING CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

GUTTER-BROOM STREET SWEEPER

Application filed February 16, 1925. Serial No. 9,600.

This invention relates to power driven street sweeping machines, and particularly to that type having among its equipment a gutter broom rotatable on a vertical axis. The object of this invention is to provide a novel mounting for such a gutter broom permitting its vertical elevation under the control of an operator and its lateral swinging to allow for obstructions encountered in sweeping the gutter or other part of the street.

The invention consists in mechanism capable of attaining the foregoing and other objects; which can be comparatively easily and cheaply made; which is very satisfactory in use and is not readily liable to get out of order. More particularly, the invention consists in numerous features and details of construction which will be hereafter more fully set forth in the specification and claims.

Referring to the drawings in which like numerals of reference refer to the same parts throughout the several views:

Figure 1 is a side elevation of a conventional street sweeper mechanism equipped with the mechanism of this invention in its preferred form.

Figure 2 is a plan view of the essential parts of Figure 1, taken at a point just above the mechanism especially entering into this invention.

Figure 3 is a detail, side elevation of the brush operating mechanism taken on the line 3—3 of Figure 2.

Figure 4 is a sectional, end view taken on the line 4—4 of Figure 3.

Figure 5 is a corresponding view taken on the line 5—5 of Figure 3.

Figure 6 is an enlarged, front end view of the gutter broom mechanism taken from the right of Figure 1.

Figure 7 is a sectional detail view on the line 7—7 of Figure 3.

Figure 8 is a sectional, end, detail view taken on the line 8—8 of Figure 2.

The more or less conventional street sweeper to which the gutter broom mechanism of this invention is applied, as shown in the drawings, includes a frame 10 sustained by front steering wheels 12 and rear traction wheels 14, respectively, and is equipped with the conventional, transverse, rotatable brush 16 delivering gathered dirt into an elevator 18 adapted to deposit the dirt in a storage bin 20 immediately behind the operator's seat 22 behind the hood 24 of a conventional form of internal combustion engine 25, the entire mechanism being steered along the street by proper manipulation of a conventional hand wheel 26 in front of the operator. The rear of the machine is provided with a conventional water storage tank 28.

The engine main shaft 30 through the agency of a conventional transmission mechanism 32 drives a transverse shaft 34 on which is at least one sprocket pinion 36 traversed by a sprocket chain 38 engaging and driving a sprocket gear 40 on an adjacent hub 42 of one of the rear wheels 14 of the machine. By this mechanism, the engine drives the street sweeper along the road in conventional manner.

The wheel 14 and its hub 42, just referred to, are rotatably mounted on a horizontal shaft 44, carrying at any convenient point thereon a sprocket gear 46 driving through a chain 48, a sprocket pinion 50 on a shaft 52 journaled in a gear case 54. This shaft 52, through the agency of conventional gears not shown in detail but located within gear case 54, drives transverse shaft 56, suitably journaled on the frame of the machine, as, for instance, brackets 58. Shaft 56 carries sprocket wheel 60, interfitting with a chain 62, which, through the agency of a conventional sprocket wheel 64, drives the conventional elevator mechanism 18, not shown in detail. Shaft 56 also carries a sprocket wheel 66 driving a sprocket chain 68 traversing a sprocket pinion on a short, transverse shaft 72 mounted in stationary brackets 74 and 76. The end of shaft 72, adjacent to bracket 76, carries a bevel gear 78 meshing with another bevel gear 80, rigid on a comparatively long and generally horizontal shaft 82, extending forwardly of the machine to a point above the gutter broom. Gears 78 and 80 are enclosed within an oil retaining, dust excluding gear case 84 rockable on shaft 72 and equipped with anti-friction bearings 86 within which

the adjacent end of shaft 82 rotates. Screw threaded, or otherwise rotatably secured to a hub extension 88 on the gear case 84 within which the bearing 86 is rotated is a tubular shaft enclosing member 90 extending along substantially the entire length of the shaft 82.

At the opposite or forward end of shaft 82 and screw threaded on the adjacent end of tubular case 90 is another gear case hub 92 provided with anti-friction bearings 94 for the adjacent end of shaft 82. On the extreme forward end of shaft 82, adjacent to these anti-friction bearings is a bevel pinion 96. Meshing with this pinion 96 is another bevel pinion 98 rigid on a vertically disposed gutter broom shaft 104 whose end above pinion 98 is carried by roller bearings 100 journaled in the cap or cover 102 of gear case 110 which encloses shaft 104. Shaft 104 below anti-friction bearings 108 in which it is journaled carries gutter broom 112. At the front end of gear case 110 is a perforation 114 closed by a detachable cap 116. When the cap is removed, the interior of this gear case may be filled with grease or the like for lubricating gears 96 and 98, bearings 94, 100 and 108.

From the foregoing, it is obvious that rotation of shaft 72 (driven through the mechanism described by engine 25) operates through gears 78 and 80, shaft 82 and gears 96 and 98 to rotate the gutter broom 112, and that shaft 82 may be rocked in a vertical plane about the axis of shaft 72 thus permitting elevation of the mechanism from the full line to the dotted line position of Figure 1. Manual elevation of the parts just referred to may be accomplished by many devices, particularly the ones shown in the drawings, consisting of a lever 118 pivoted on a bolt 120 selectively locatable at different heights in selected holes 122 in a bracket 124 located on the under side of the frame of the machine. This lever carries a roller 126 traversing the under side of shaft case 90. Above this roller 126 is a lever handle 128 graspable by the operator from the full line to the dotted line position of Figure 1 to thereby cause the roller to travel along the under side of the case and in so doing to elevate the entire gutter broom mechanism from the full line to the dotted line position. The operation of this lever is facilitated by providing a retractile spring 130, one of whose ends is pivotally connected through a yoke 132 to the shaft 134 on which roller 126 turns, the other end of said spring being adjustably connected through a rod 136 and a nut 138 to a lug 140 on the under side of shaft case 90. By properly adjusting this end of the spring mechanism, sufficient tension can be put upon lever 128 so that roller 126 will remain in practically any position between the dotted and full line positions of Figure 1 the operator may elect to leave the roller and, consequently, may elect to have the gutter broom elevated. Lever 128 is stopped in its movement to the left as viewed in Figure 3 by a suitably disposed stationary stop 142.

The movement of arm or case 90 and consequently of the gutter broom in a vertical plane is guided through the agency of a crosshead 144 sliding in vertical, parallel guides 146 suitably rigidly mounted upon a bracket 148 on the frame of the machine. Wear occurring in the guide mechanism may be taken out through the provision of suitable adjusting nuts 150 and 152 clearly shown in Figure 5 with the result that the lateral position of the shaft 82 is always positively controlled by the frame through this guide mechanism. Tubular case 90 is rotatable on its axis in crosshead 144 and the opposite or left hand end of the case is rotatable through such arc as may be required on the screw threads 154 entering hub 88. This rotation of case 90 and consequently of the gutter broom on a generally horizontal axis is required to allow the gutter broom to swing when required in a counterclockwise direction as viewed in Figure 6 away from the curb 156 in which it is working, should obstructions occur requiring such movement. This rotary movement of the gutter broom in a generally horizontal plane is resisted by a retractile spring 158 attached at one end to a fixed member 160 on the frame of the machine and at the other end to a lever 162 rigidly secured on case 90 by any suitable means, as, for instance, the clamp collar 164. Rigidly secured to case 90 by any suitable means, in the particular case here illustrated depending from and rigid with clamp collar 164 is a lever 166 having a roller 168 located within a stop cam 170, having sufficient vertical opening between its top 172 and its bottom 174 so that the mechanism now under consideration will not interfere with the vertical elevation of the gutter broom from the full line to the dotted line position of Figure 1, as heretofore described, said stop cam also having sufficient space between its inner front wall 176 and its inner rear wall 178 to allow for and yet limit the angular rotation of case 90, shaft 82 and consequently gutter broom 112 about the axis of shaft 82. In other words, gutter broom 112 can rock in a counterclockwise direction as viewed in Figure 6 to a position in which roller 168 strikes wall 178 of the cam, and no further; and spring 158 can rotate the gutter broom in a clockwise direction about the axis of shaft 82 until roller 168 strikes cam wall 176 and no further.

By the use of the mechanism just described, gutter broom 112 is therefore vertically elevatable from the full line to the dotted line position of Figure 1. Said broom can, on meeting obstacles, rock in a vertical plane about the axis of shaft 82 an angular distance determined by stop cam 170 and so far

as these movements are concerned can be driven continuously by the engine 25.

The power transmitting mechanism between shaft 72 and broom 112 is made of sufficient length so that as the broom is raised and lowered, the broom travels in a vertical arc which is as near as possible a straight line thus keeping the bottom of the brush as nearly horizontal as practical in all positions, thus enabling the brush to do most efficient work over variations in street surface.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a power driven street sweeper, a frame, power delivery means carried by said frame, a power tansmitting shaft operatively connected at one end to said power delivery means and extending a substantial distance therefrom lengthwise of the sweeper, a housing for said shaft and broom, a gutter broom operatively connected to the forward end of said shaft and mounted for rotation on a vertical axis, said broom being also mounted to rock about said power shaft as an axis, means for rocking said power shaft on a horizontal axis at the power delivery point to elevate the broom, said shaft rocking means being attached to the frame and engaging said housing, and yieldable means attached to said housing and connected to said frame for restricting the rotation of said housing about said shaft.

2. In a power driven street sweeper, a frame, power delivery means carried by said frame, a power transmitting shaft operatively connected at one end to said power delivery means and extending a substantial distance therefrom lengthwise and forwardly of the frame, a housing for said shaft and broom, a gutter broom operatively connected to the forward end of said shaft and mounted for rotation on an approximately vertical axis, said broom being also mounted to rock about said power shaft as an axis, means pivotally connecting said power shaft and casing to the frame at a position coinciding with said power delivery means, a lever movably engaging said housing so as to rock it and its shaft on said pivotal connection, yieldable means maintaining a tension on said housing tending to axially rotate it in one direction, and means for limiting said axial rotation.

3. In a power driven street sweeper, a frame, power delivery means carried by said frame, a power transmitting shaft operatively connected at one end to said power delivery means and extending a substantial distance therefrom lengthwise and forwardly of the frame, a housing for said shaft and broom, a gutter broom operatively connected to the forward end of said shaft and mounted for rotation on an approximately vertical axis, said broom being also mounted to rock about said power shaft as an axis, means pivotally connecting said power shaft and casing to the frame at a position coinciding with said power delivery means, means carried by said frame for guiding said housing during its pivotal movement, a lever movably engaging said housing so as to rock said housing and its shaft on said pivotal connection, yieldable means maintaining a tension on said housing tending to axially rotate it in one direction, and means for limiting said axial rotation in opposite directions.

4. A power driven street sweeper comprising a frame, a casing having a pivotal connection at one end with said frame, a gutter broom carried by the other end of said casing and rotatable on an approximately vertical axis, means for adjusting said casing on its pivotal connection so as to impart approximately vertical adjustments to said broom, said pivotal connection being a sufficient distance to the rear of said broom to cause the broom to move up and down in an approximately straight line, a source of power at said pivotal connection, means communicating power through said casing to said broom in all of its positions, means applying a yieldable tension on said casing tending to impart rotative movement thereto in one direction, and complemental means on the frame and the casing for limiting said rotative movement in opposite directions.

5. In a street sweeper, the combination with a frame provided with traction wheels and a source of power, of a power delivery shaft at approximately the longitudinal median line of the frame and actuated by said source of power, a transverse horizontally disposed shaft connected to said power delivery shaft, a longitudinal shaft geared to said transverse shaft and extending longitudinally and forwardly of the frame, a vertically disposed broom shaft geared to the forward end of said longitudinal shaft, a housing for said longitudinal shaft, said housing being mounted to rock about a horizontal axis, a gutter broom on the lower end of said broom shaft, means normally tending to rotate said housing in one direction, means for limiting rotation of said houisng in both directions, and manually operable means engaging said housing so as to raise and lower the same.

6. In a street sweeper, the combination with a frame having traction wheels and an engine, a power shaft rotated by the engine and located at approximately the middle of the frame, a transversely disposed horizontal shaft connected to said power shaft, a longitudinally disposed shaft geared at its rear end to said transverse shaft, an approximately vertically disposed broom shaft geared to the forward end of said longitudinal shaft, a gutter broom on the lower end of said broom shaft, said broom and its shaft being mounted to rock about said longitudinal shaft as an axis, manually operable means engaging said

longitudinal shaft to elevate the forward end thereof, yielding means normally effective to rotate said broom in one direction about said longitudinal shaft, and means for restricting the rocking movement of the broom in opposite directions.

7. In a street sweeping machine, a frame, front and rear wheels therefor, a transversely disposed, horizontal power shaft in front of a rear wheel, a housing surrounding said shaft and adapted to rock thereabout, a longitudinal shaft operable by said first mentioned shaft, a housing for said longitudinal shaft, a gutter broom carried by said last mentioned housing, power transmission mechanism connecting the longitudinal shaft and broom, a casing communicating with said second mentioned housing for positively positioning the broom radially relative to the power shaft and completely enclosing the transmission mechanism, said broom being rotatably carried by said second housing.

8. In a power driven street sweeper, a frame, front and rear wheels therefor, a transversely disposed power shaft in front of a rear wheel, a longitudinal power transmitting means operated by said power shaft, a gutter broom rotatable on a vertical axis, said longitudinal power transmitting means being pivoted to the frame at one end and at the other end rotatably supporting said broom, said broom being mounted to rock about said power transmitting means, means for placing said broom in different vertical positions, means for restricting the rocking of said broom about said power transmitting means, means on said transverse power shaft supplying power to the transmitting means to rotate the brush in all its adjusted positions, and guiding means on the frame controlling the lateral movement of the broom.

9. In a power driven street sweeper, a vertically disposed gutter broom, a horizontally disposed rotatable member supporting said broom, means supporting said member, means for rotating said broom, a lever connected to said member, said lever having oppositely extended arms, a spring connected to one of said arms so as to normally apply a tension tending to rotate said member in one direction, and means positioned to engage the other arm of said lever so as to limit said rotative movement in opposite directions.

In witness whereof, I have hereunto subscribed my name.

FRED D. WILSON.