

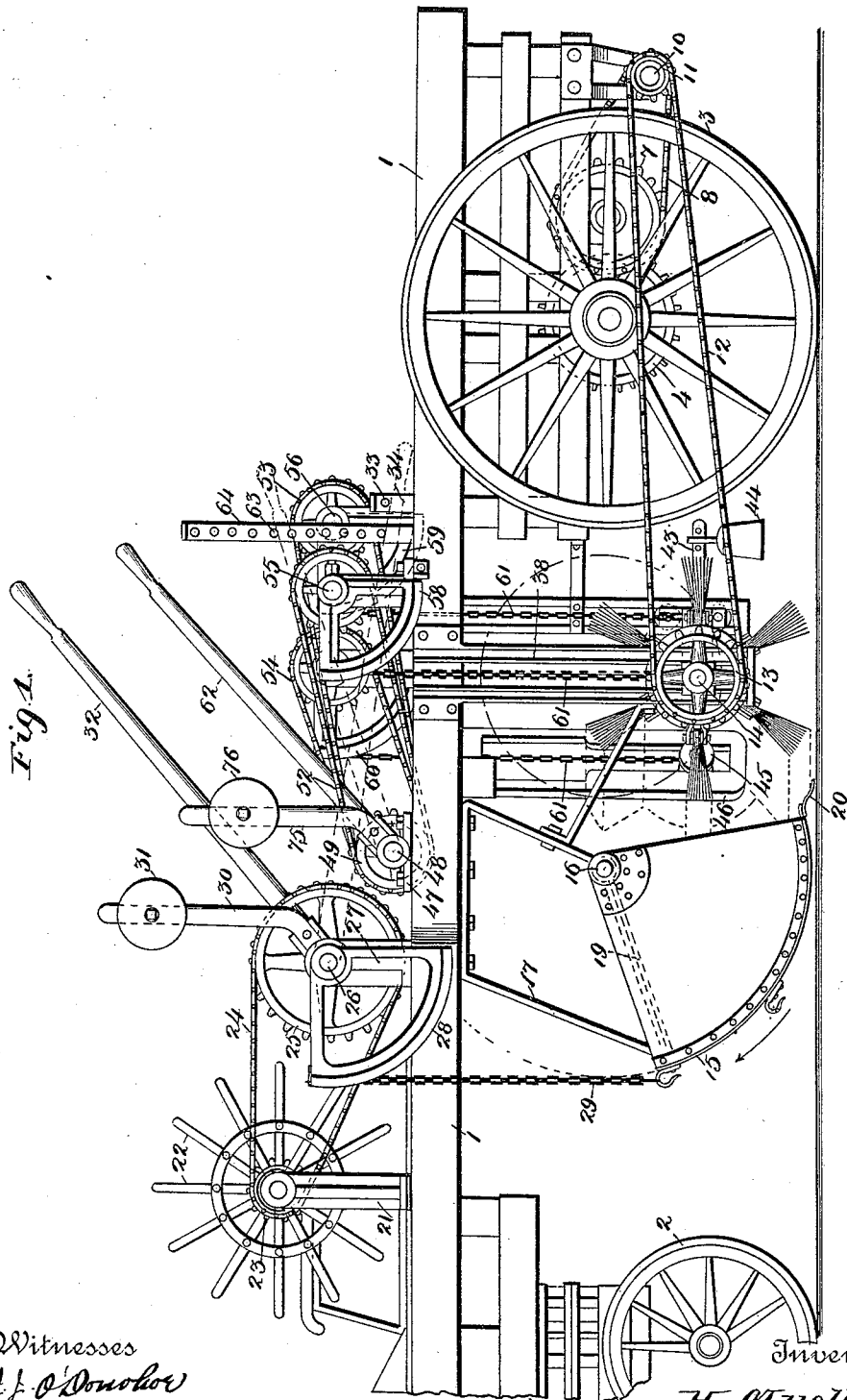
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4 Sheets—Sheet 1.

H. MUELLER, Jr.
STREET SWEEPER.

No. 525,815.

Patented Sept. 11, 1894.



Witnesses
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John D. Murphy

Inventor
H. Mueller Jr.
By his Attorneys
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(No Model.)

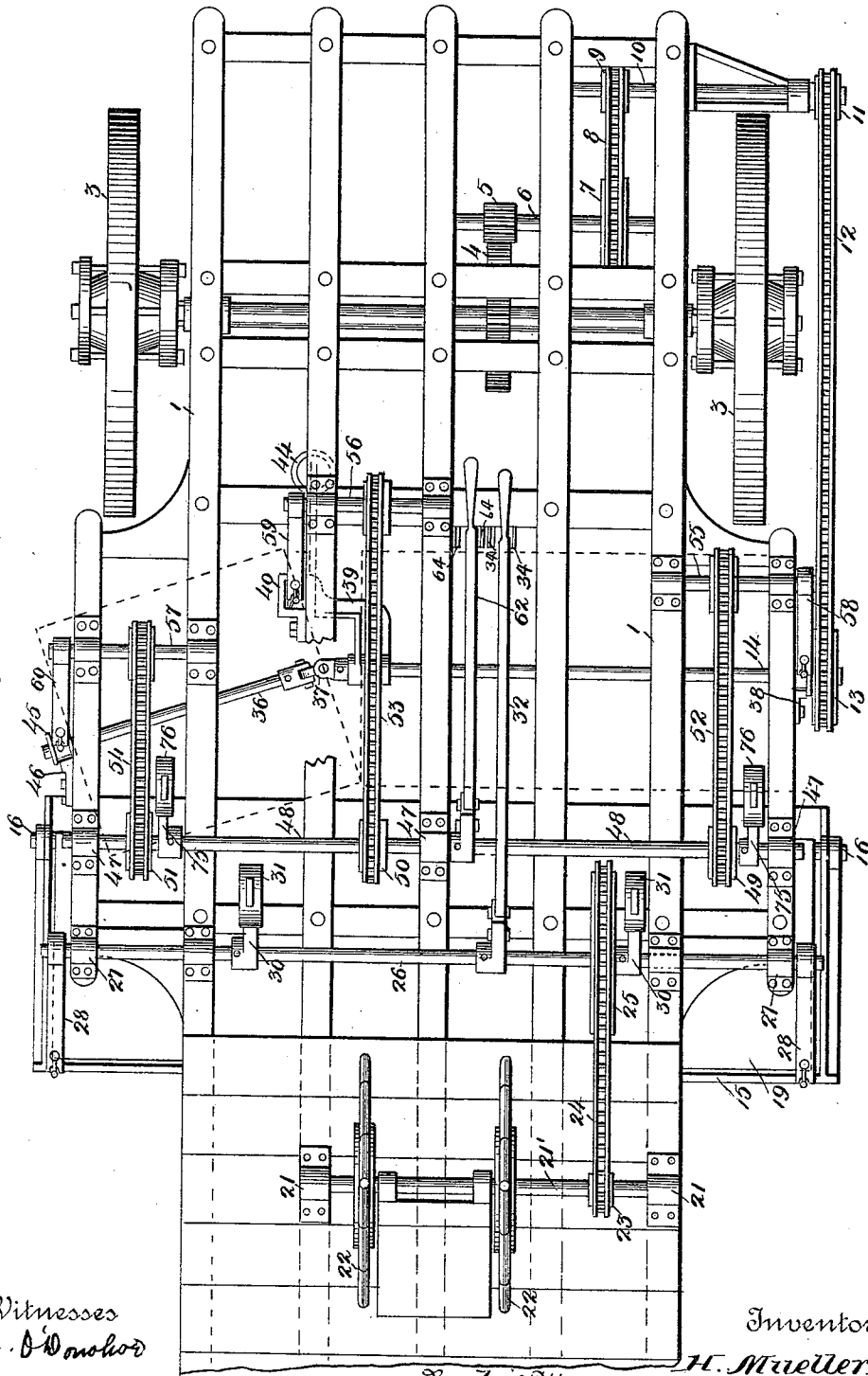
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Fig. 2.



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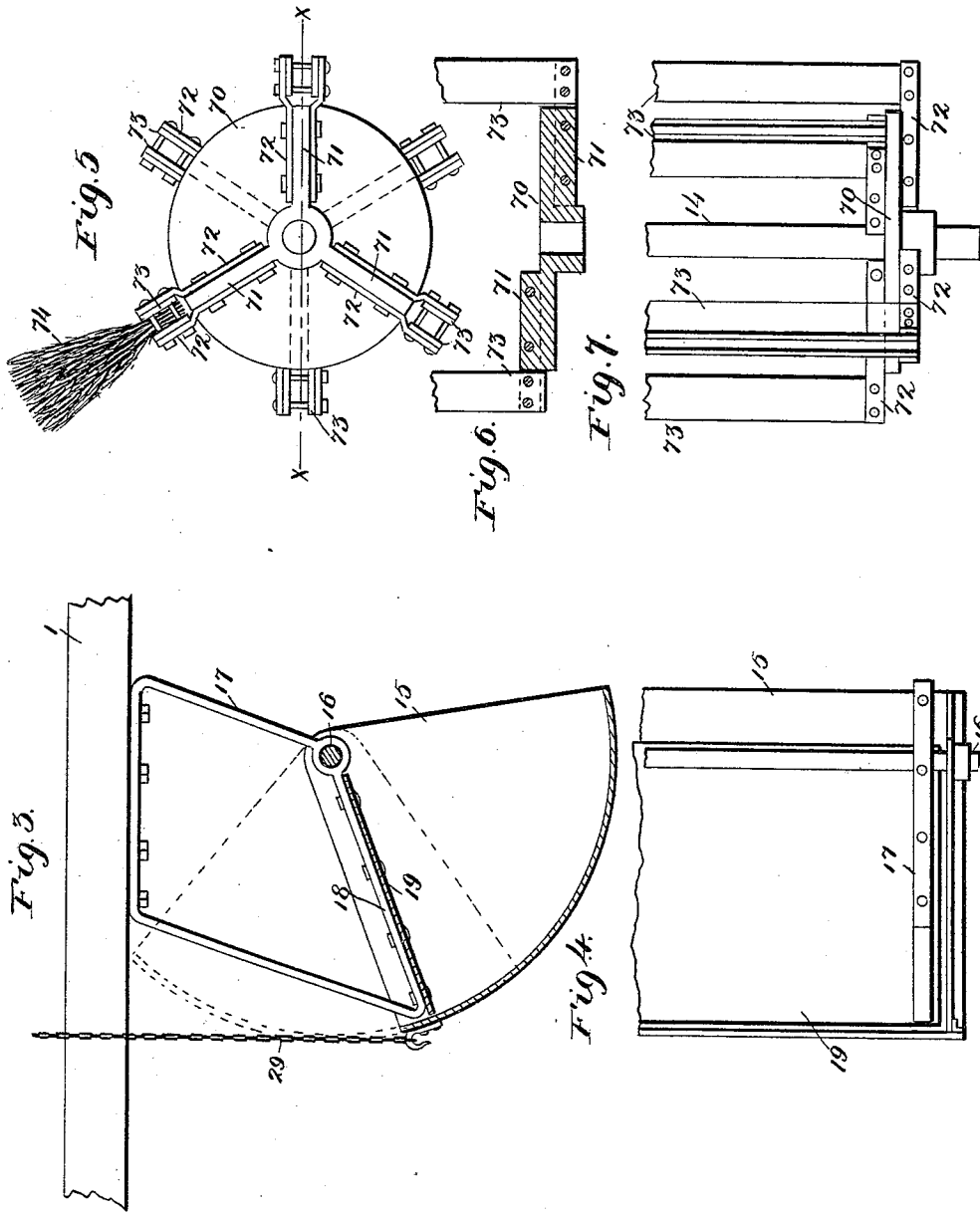
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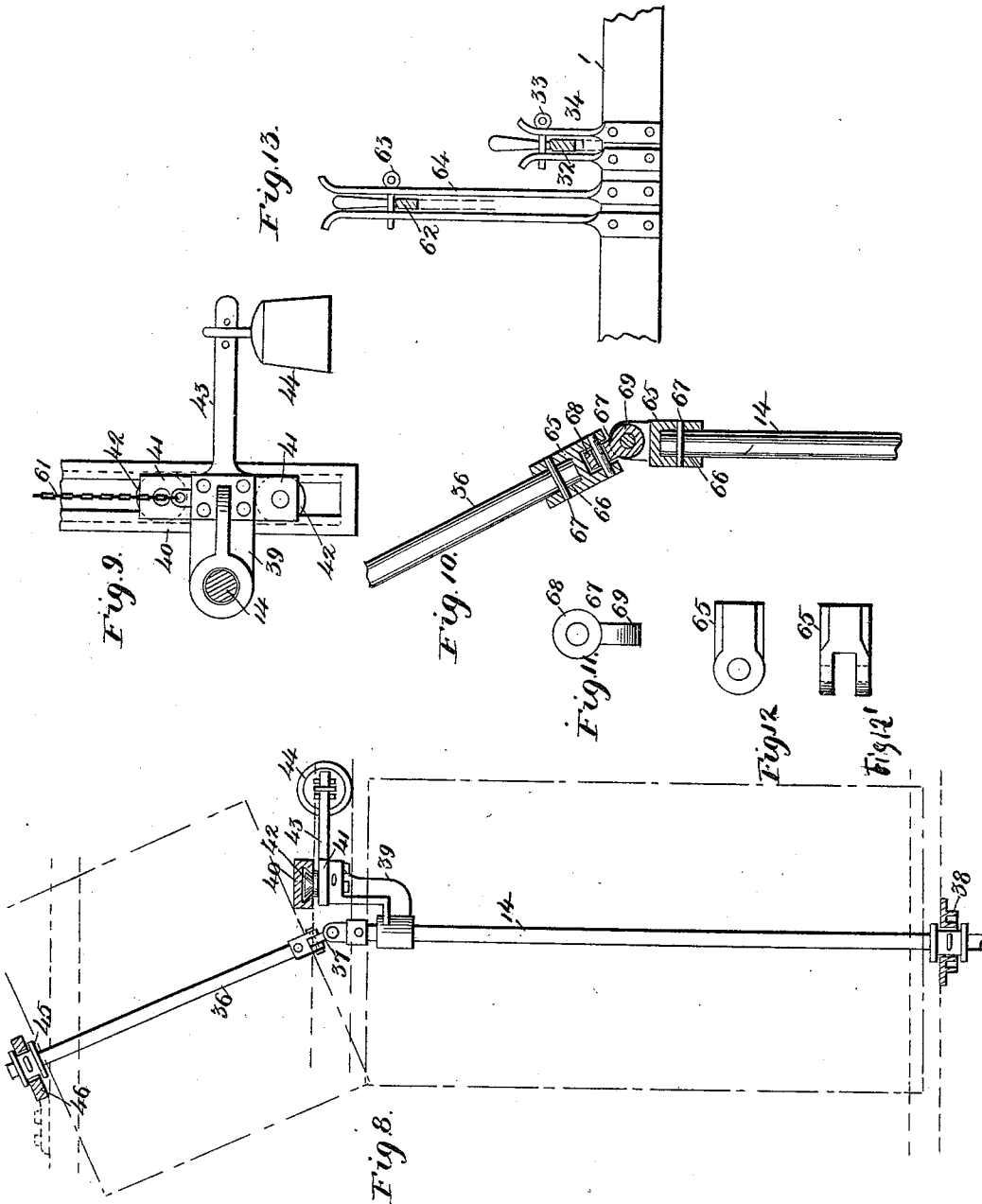
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4 Sheets—Sheet 4.

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UNITED STATES PATENT OFFICE.

HENRY MUELLER, JR., OF ST. LOUIS, MISSOURI.

STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 525,815, dated September 11, 1894.

Application filed May 21, 1894. Serial No. 511,944. (No model.)

To all whom it may concern:

Be it known that I, HENRY MUELLER, Jr., of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Street-Sweeping Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in street sweeping and piling machines and consists in the novel arrangement and combinations of parts more fully set forth in the specification and pointed out in the claims.

In the drawings Figure 1 is a side elevation of my complete invention. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical section of the dumping receptacle and hangers for supporting the same. Fig. 4 is a top plan view of Fig. 3 with parts broken away. Fig. 5 is a detail end elevation of the brush. Fig. 6 is a cross section taken on the line $x-x$ of Fig. 5. Fig. 7 is a top plan view of one end of the brush or frame of which the same is composed. Fig. 8 is a detail plan view of the shafts of the brushes and guides for the bearings of the same. Fig. 9 is a detail view of the supporting bracket serving as a bearing for that end of the main broom-shaft which is adjacent to the knuckle joint. Fig. 10 is a detail section of the knuckle joint. Fig. 11 is a side elevation of the link of the knuckle joint. Fig. 12 is a detail of one of the forks connected by the link. Fig. 12' is a detail of the second fork, and Fig. 13 is a detail of the forks for retaining the rock levers secured to the rock shafts operating the dumping receptacle and the brooms.

The object of my invention is to construct a street sweeping machine wherein the dirt will be swept into a receptacle forming a part of the same, and from which the dirt can be dumped at suitable intervals along the route of the sweeper and thus be piled in readiness to be transferred to a cart.

In general the invention consists of a swinging receptacle, a series of brooms adjacent to the open end of the same for sweeping dirt thereinto, said brooms being arranged as a rule at an angle to each other and connected by a suitable knuckle joint; and the brooms being preferably of unequal length, the

shorter broom being especially adapted to sweep along the gutters and near the curb stones, and the longer broom to sweep in the street directly in front of the main body portion of the receptacle. The receptacle is preferably made so as to have its front edge conform to the angle between the brooms, so that the dirt can be caught positively from each broom. The receptacle is an open one and in the rear thereof is a stationary plate which arrests the flying dirt as it is thrown from the revolving brooms, and at the same time is adapted to force positively all material from the receptacle in the act of dumping the latter.

The invention further consists of special devices for dumping the receptacle, devices for varying the pressure of the broom against the ground, devices for elevating the broom while the receptacle is dumped, and in other details to be now described.

Referring to the drawings, 1 represents the frame built of iron beams, suitable braces, &c., which is supported on the wheels 2 and driving wheels 3. The wheels 3 are firmly secured to their shaft, the latter carrying at its medial portion a driving gear wheel 4 which meshes with a pinion 5 on a short shaft 6 to which is secured at a suitable distance from the pinion 5 a sprocket wheel 7. Over said sprocket wheel 7 passes a sprocket chain 8 driving in turn the smaller sprocket wheel 9 on a rear shaft 10 to the outer projecting end of which is secured a sprocket wheel 11 of equal size, and from which passes the driving sprocket chain 12 over the sprocket wheel 13 mounted on the main broom-shaft 14. As the sweeper advances the broom-shaft 14 and hence the broom secured to the same will revolve in proper direction to throw or sweep the dirt into the swinging open receptacle 15 this being in the form of an open swinging trough extending the full width of the machine and with its sides pivoted at 16 to two depending hangers or castings 17. These hangers are in the form of a trapezoid and to the two bottom inclined bars 18 is secured a fixed plate 19 between the sides of the receptacle, the said plate serving to arrest the dirt as it is swept into the receptacle, and also for forcing out the contents of the recep-

tacle when the latter is dumped or swung about the said fixed plate 19. Along the open end of the receptacle, adjacent to the broom is secured a shield or plate 20 which passes over the ground as the machine advances, said plate preventing the dirt from being thrown under the receptacle as the sweeper advances. The plate is shown only in Fig. 1, and may, if the receptacle is low enough, be omitted altogether and is not claimed herein as it is a common provision.

To elevate the receptacle or swing the same about the fixed plate 19 and thus dump the same, I provide the following mechanism: Mounted between suitable standards 21 on top of the front of the frame 1 is a shaft 21' operated by the hand wheels 22. At a suitable point along the shaft is secured a sprocket wheel 23 over which passes a sprocket chain 24 and over a large sprocket wheel 25. The latter is secured to a shaft 26 mounted in suitable bearings 27 along the top of the frame. To the free outer ends of the shaft 26 are secured the quadrants 28 over which are adapted to wind the chains 29 having one end secured to the upper end of each quadrant and the other secured to the swinging receptacle by either of the hooks shown thereon. The rock shaft 26 has secured thereto two arms 30 each carrying suitable weights 31, to assist the operator in rocking said shaft. It is apparent that if the operator properly turns the hand wheels 22 to rock the shaft 26 through the medium of the connections described, the latter will be assisted by the weighted arms 30, and the quadrants 28 will be raised, winding up the chains 29 and swinging the receptacle about the plate 19 and thus dumping the dirt. The rocking of the shaft 26 is further assisted by the lever 32 secured to the same, the free end of which can be depressed by an attendant on top of the frame and said lever held down by bringing the free end under a pin 33 inserted into registering openings of a fork 34. (See Fig. 1).

As the receptacle 15 is dumped it becomes necessary at the same time to raise the broom from off the ground. This is accomplished by the following mechanism: The broom shaft in the present instance (and as a rule) is a compound one, the supplemental shaft 36 being connected to the main shaft 14 by a knuckle joint 37 the details of which are to be hereinafter described. Of course it becomes necessary that the angular shaft be raised simultaneously and without binding of any of its parts. The outer end of the shaft 14 has its bearing confined and guided by a suitable guide bar 38. The opposite end of the said shaft 14 has a bearing in one end of an angular bracket 39 whose opposite end is guided within a suitable depending guide plate 40. The bracket though shown as extending within the brushes is no impediment to the rotation of the broom, since the brushes are yielding and the friction is im-

perceptible with a large machine. That portion of the bracket confined within the guide plate 40 has lateral extensions 41 to each of which is secured an anti-friction roller 42 traveling in the guide way of the plate 40, and the bracket and the weight it carries is more-over balanced by an extending arm 43 carrying a weight 44. The object of this arrangement for supporting the inner end of the shaft 14 is to avoid coming in contact with the broom mounted on the shaft 36. The outer end of the shaft 36 is supported in a bearing 45 suitably guided within a depending plate 46.

At a suitable distance to the rear of the shaft 26, and mounted in suitable bearings 47 on top of the frame is a rock shaft 48 having disposed thereon the sprocket wheels 49, 50, and 51, over which respectively pass chains 52, 53, and 54, the chain 52 winding upon a sprocket wheel mounted on a short shaft 55, the chain 53 passing over a wheel mounted on a shaft 56, and the chain 54 passing over a sprocket wheel on shaft 57, each of which shafts are mounted in suitable bearings on top of the frame. Secured to the ends of the shafts 55, 56, and 57 which are adjacent to the guides 38, 40, and 46, are quadrants 58, 59, and 60 respectively, over each of which quadrants is adapted to wind a chain 61 having one end secured to each quadrant and the opposite ends of two of said chains being secured to the bearings of the free ends of the shafts 14 and 36, and the opposite end of the third chain being secured to that portion of the bracket 39 which is confined within the guide plate 40. The shaft 48 is provided with an operating lever 62 which when its free end is depressed will rock the said shaft, and this by virtue of the connections of sprocket wheels and chains already described will turn the shafts 55, 56, and 57, raising the quadrants 58, 59, and 60, winding up the chains 61 and thus elevating the brush-shafts secured to the lower ends of said chains. By the lever 62 the brush-shafts can be raised to any desirable elevation and retained there by inserting the free end of the lever 62 under a pin 63 passed through registering openings of the upright fork 64. The object of having the broom-shafts elevated to variable heights is to control the height of the broom as the latter sweeps over the ground, and to vary its elevation according to the degree to which the same is used up or consumed by wearing, and to vary the height of the broom according to the resistance offered by the surface over which it is passed.

The knuckle joint between the two shafts is best shown in Figs. 10, 11, and 12, and consists of two forked castings 65 having each a suitable socket 66 within which the adjacent ends of the shafts are secured by pins 67 said castings being so secured to the shafts that their adjacent forks shall be at right angles

to each other. Between the two forks is pivoted a connecting link 67 composed of two disks 68 and 69 secured at right angles to each other, one disk being pivoted between one fork and the other between the second fork. It is apparent from the construction that as shaft 14 revolves the shaft 36 will also revolve and thus turn the brooms.

The brooms are secured to the broom-shafts as follows: Secured to each of the shafts are two or more disks or plates 70 having disposed on either side thereof radial ribs 71 to the lateral faces of which are secured strips 72 projecting a suitable distance beyond the periphery of the plates, the projecting ends having secured between them a pair of longitudinal plates 73 running parallel to the respective shafts, said plates serving to fasten and hold between them the radially extending broom material 74. By having the ribs 71 disposed on each side of the plate 70 the strain is more evenly distributed.

A review of the description will show that the present device is adapted to sweep the dirt, and then dump the same at intervals as desired; that the broom can be retained with any desirable degree of pressure against the ground depending upon conditions already referred to, and that the parts are so arranged that the mechanism is readily under the control of the operator and his attendants. The attendant is assisted in rocking the shaft 48 by the arms 75 suitably weighted by weights 76 as fully appears from the drawings.

Having described my invention, what I claim is—

1. In a street sweeping machine, an angular broom shaft having suitable supports for the outer ends thereof, an open receptacle located adjacent to the same, suitable running gear for said broom-shaft, brooms on said shaft, a bracket for supporting the joint end of the shaft, a support for said bracket, lateral extensions on the free end of the bracket, rollers mounted on said extensions, a suitable guide for said rollers, and a weighted arm secured to the guided portion of the bracket to

balance the weight supported by the bracket, substantially as set forth.

2. In a street sweeping machine, a main broom or brush-shaft and a supplemental broom-shaft, a knuckle joint connecting the said shafts, suitable bearings for the outer ends of the said shafts, suitable guides for said bearings, a bracket for supporting the end of the main shaft adjacent to the knuckle, a suitable guide for said bracket, a balancing arm for said bracket, and suitable chains secured respectively to the bearings of the shafts and to the bracket for elevating the broom-shafts, substantially as set forth.

3. In a street sweeping machine, a suitable angular knuckle-jointed broom-shaft, bearings for the free ends of said shaft, suitable guides for said bearings, a supporting bracket adjacent to the joint of the shaft, guides for said bracket, a suitable balancing arm for said bracket, a rock shaft mounted on top of the frame of the machine, sprocket wheels mounted on said shaft, suitable sprocket chains passing over said wheels, a series of short shafts mounted on top of the frame and corresponding in number to the number of sprocket wheels on the rock shaft, the said chains adapted to pass over the respective wheels located on the rock shaft and the short shafts, a quadrant secured to each of the short shafts, chains passing from said quadrants and adapted to have their lower ends secured to the bearings of the broom shaft and to the bracket at the knuckle joint, an operating lever secured to the rock shaft, and a fork for receiving the free end of the lever at variable elevations and thus vary the height of the broom-shaft from the ground, the parts operating substantially as and for the purpose set forth.

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

HENRY MUELLER, JR.

Witnesses:

JAMES J. O'DONOHUE,
EMIL STAREK.