

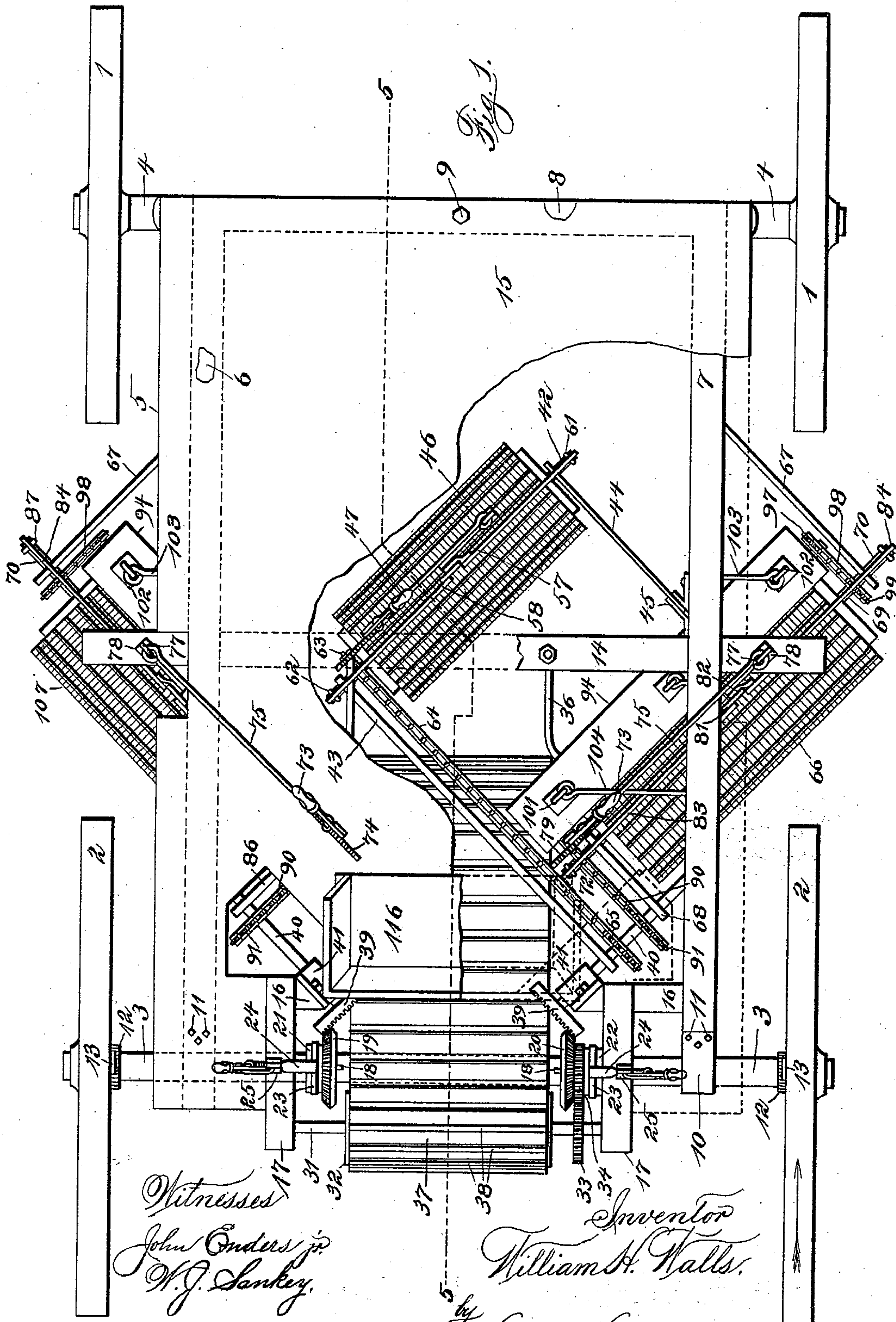
(No Model.)

8 Sheets—Sheet 1.

W. H. WALLS.  
STREET SWEEPER.

No. 518,168.

Patented Apr. 10, 1894.



Witnesses  
John Anders, Jr.  
W. J. Lankey.

Inventor  
William H. Walls.

by Higdon Higdon Longan Att'ys.

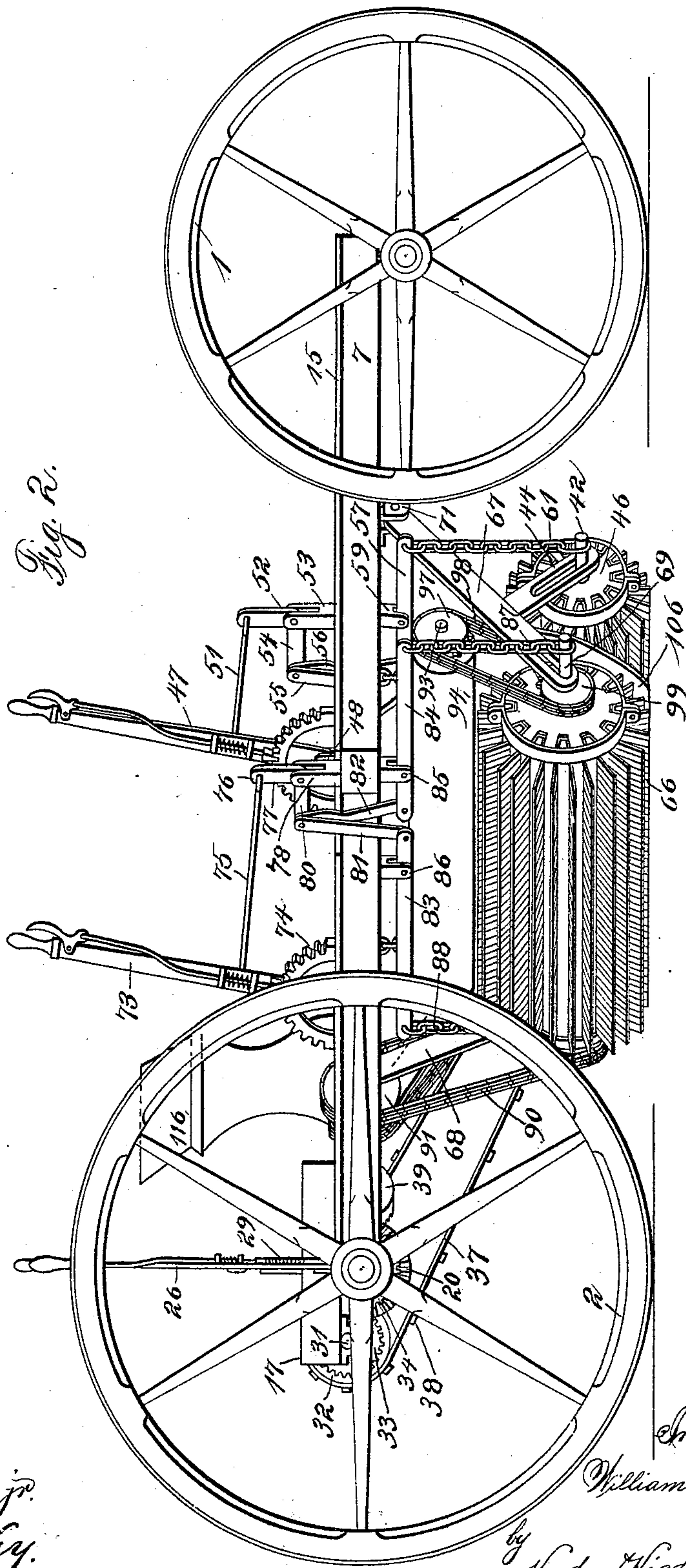
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Witnesses:  
John Anders jr.  
W. J. Sankey.

Inventor:  
William H. Walls  
by Higdon Higdon & Horgan  
Att'ys.



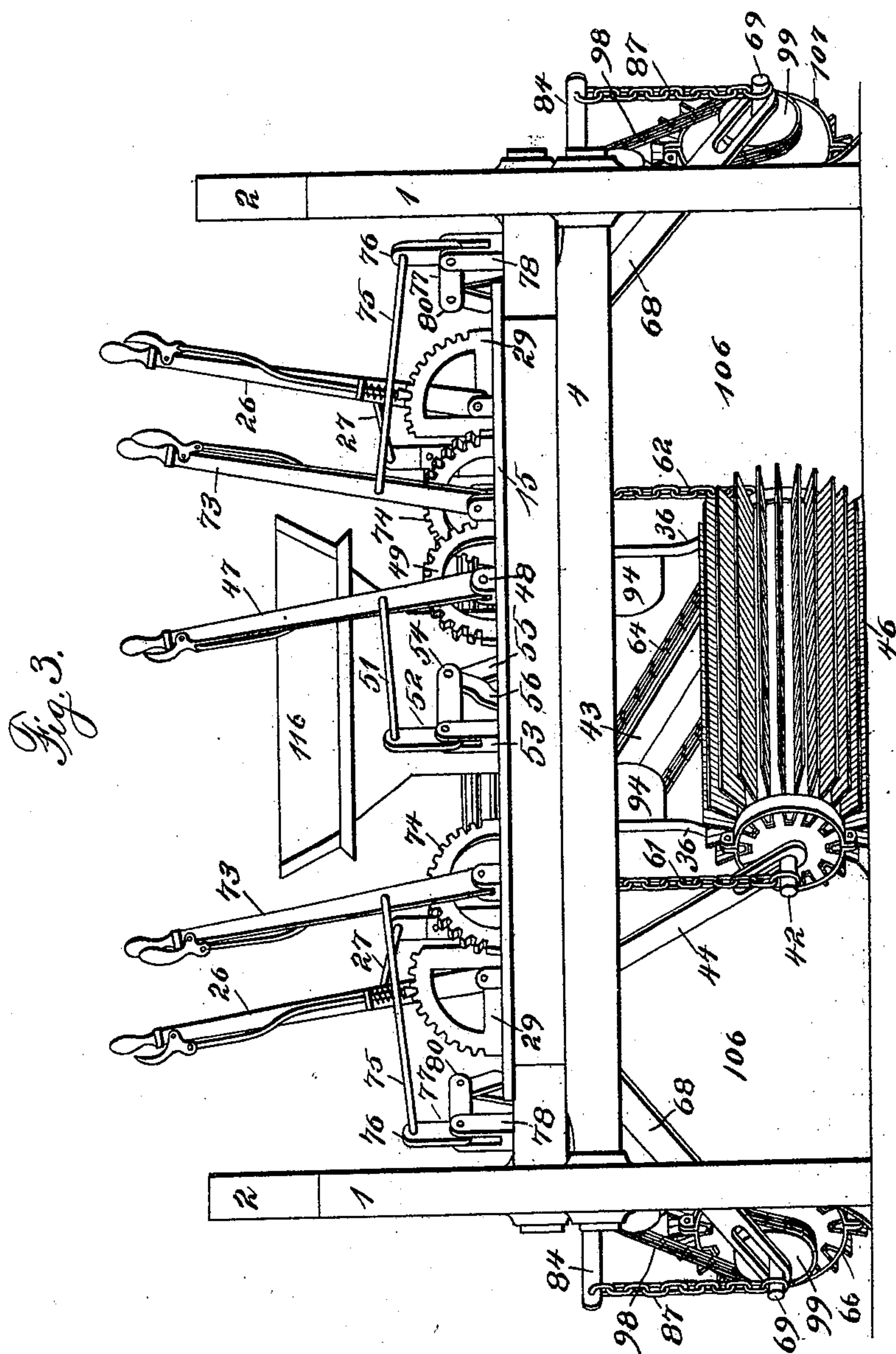
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Witnesses:  
John Enders, Jr.  
W. J. Sawyer

Inventor  
William H. Wells  
by Higdon Higdon Longan Att'ys

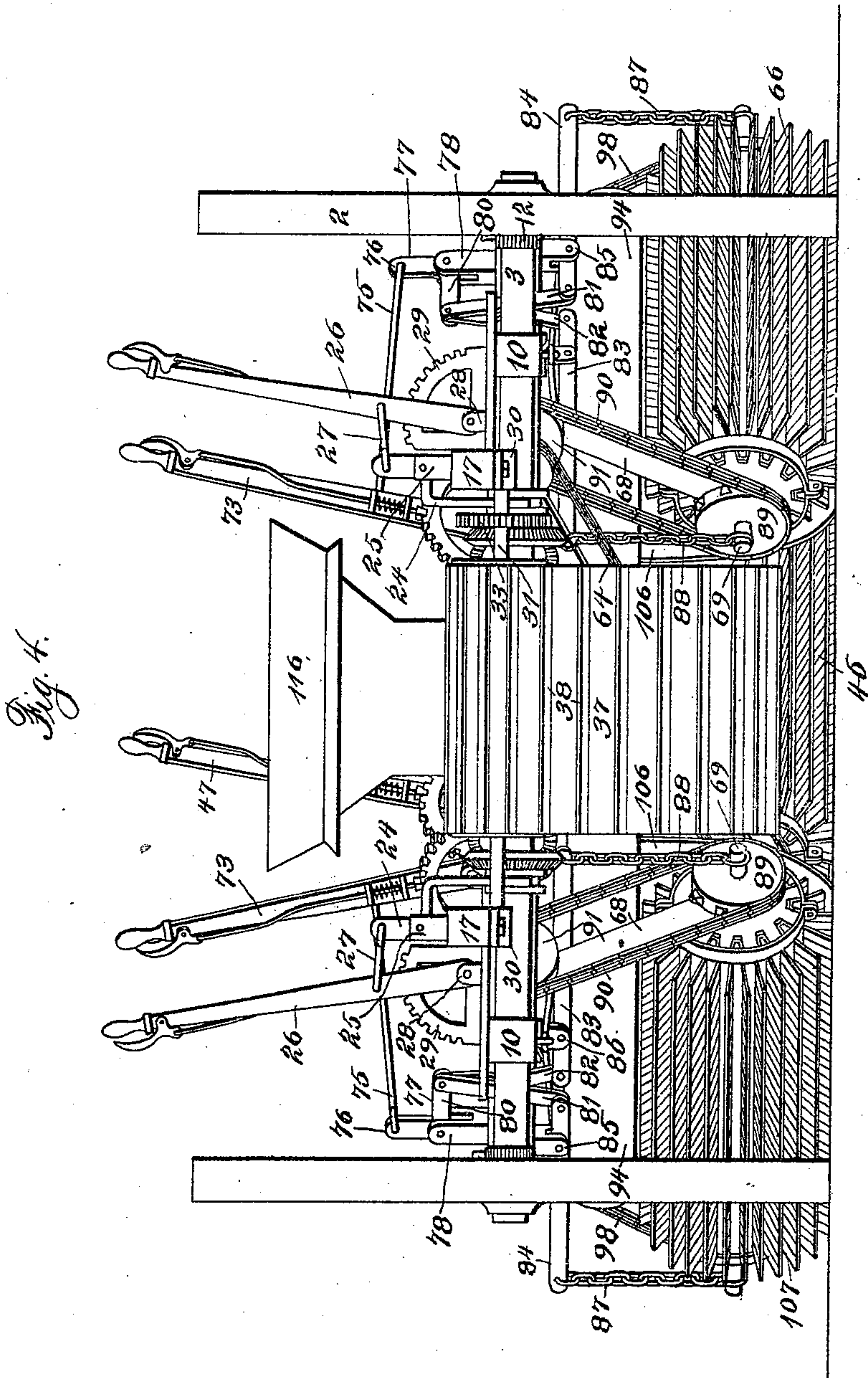
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Witnesses:  
John Enders, Jr.  
W. J. Sankey,

Inventor  
William H. Walls  
by  
Higdon Higdon Longan  
Att'ys



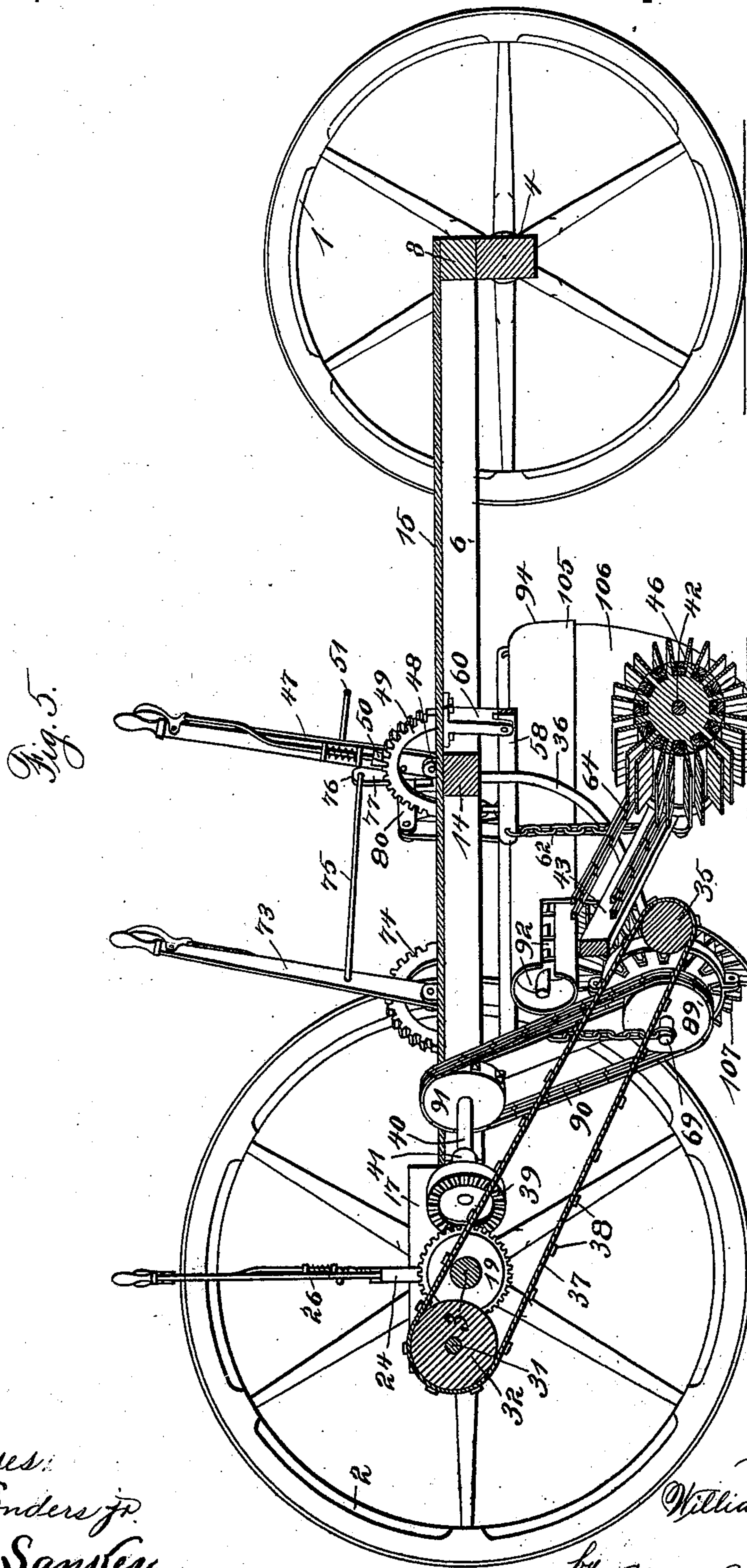
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No. 518,168.

Patented Apr. 10, 1894.



Witnesses:  
John Enders Jr.  
W. J. Sansley.

Inventor  
William H. Wells

by Higdon Higdon Tongan All 3s.

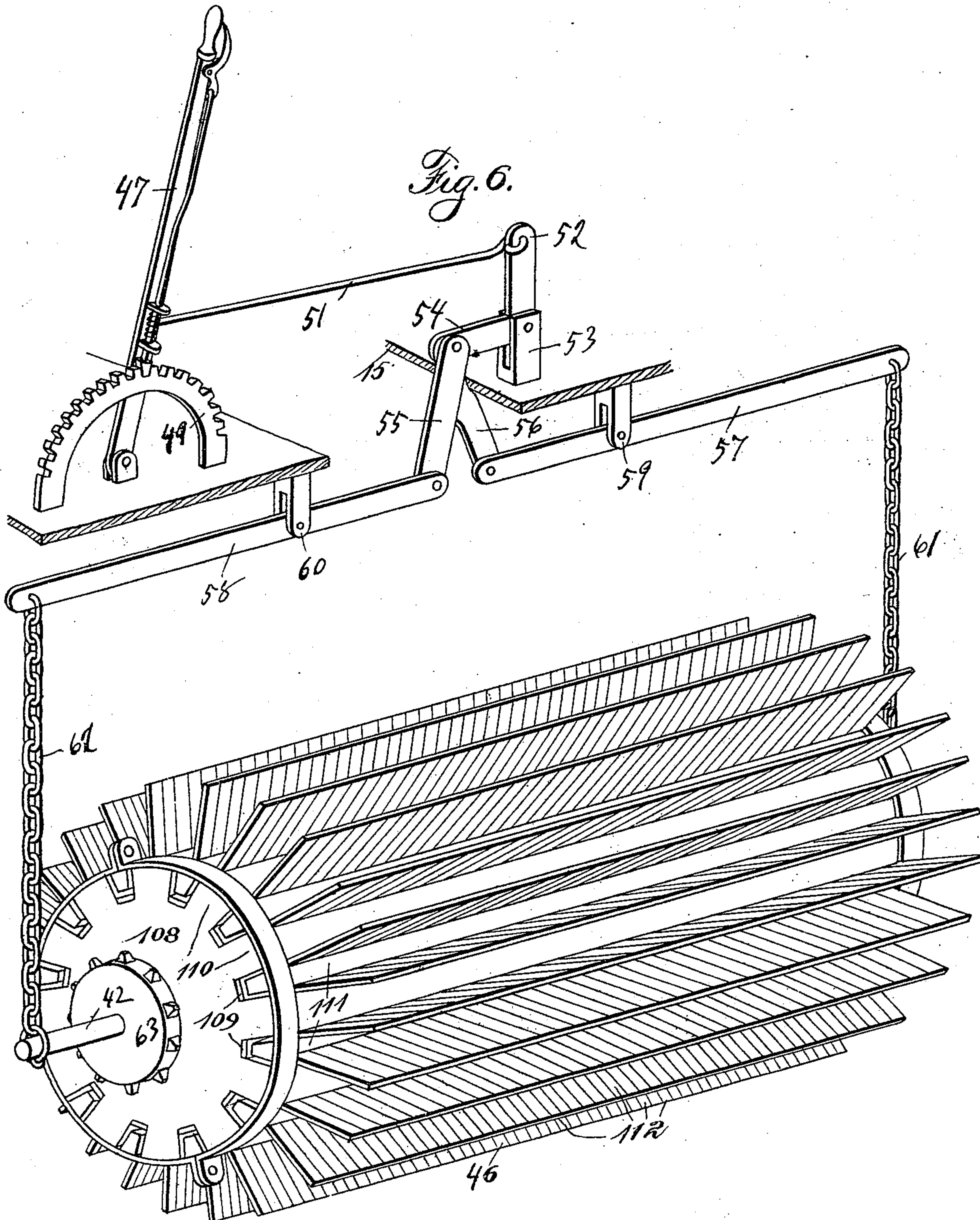
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STREET SWEEPER.

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Witnesses:  
John Anders Jr.  
W. J. Sankey.

Inventor  
William H. Walls  
by  
Higdon Higdon Longan  
Attys.



(No Model.)

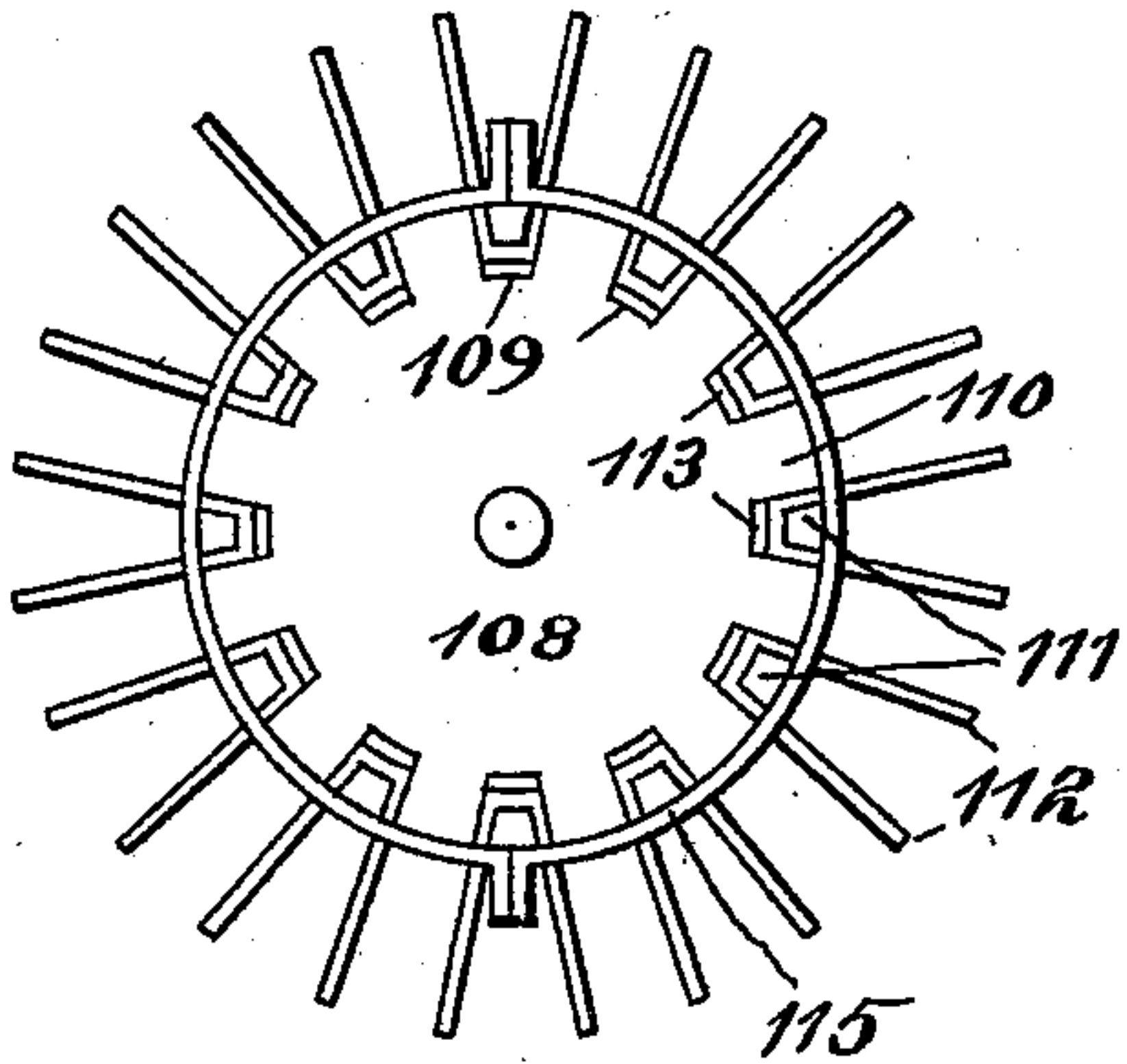
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W. H. WALLS.  
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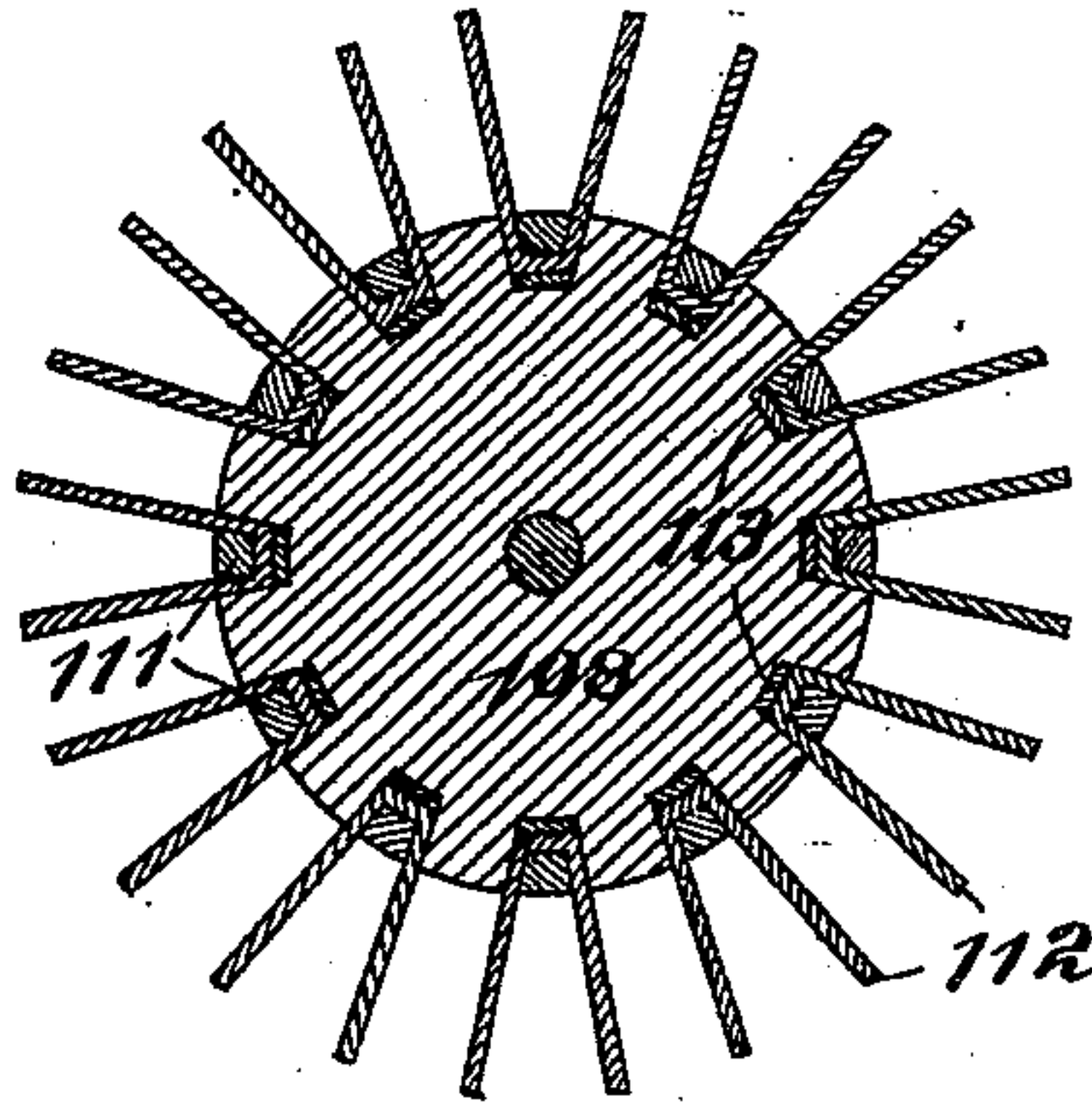
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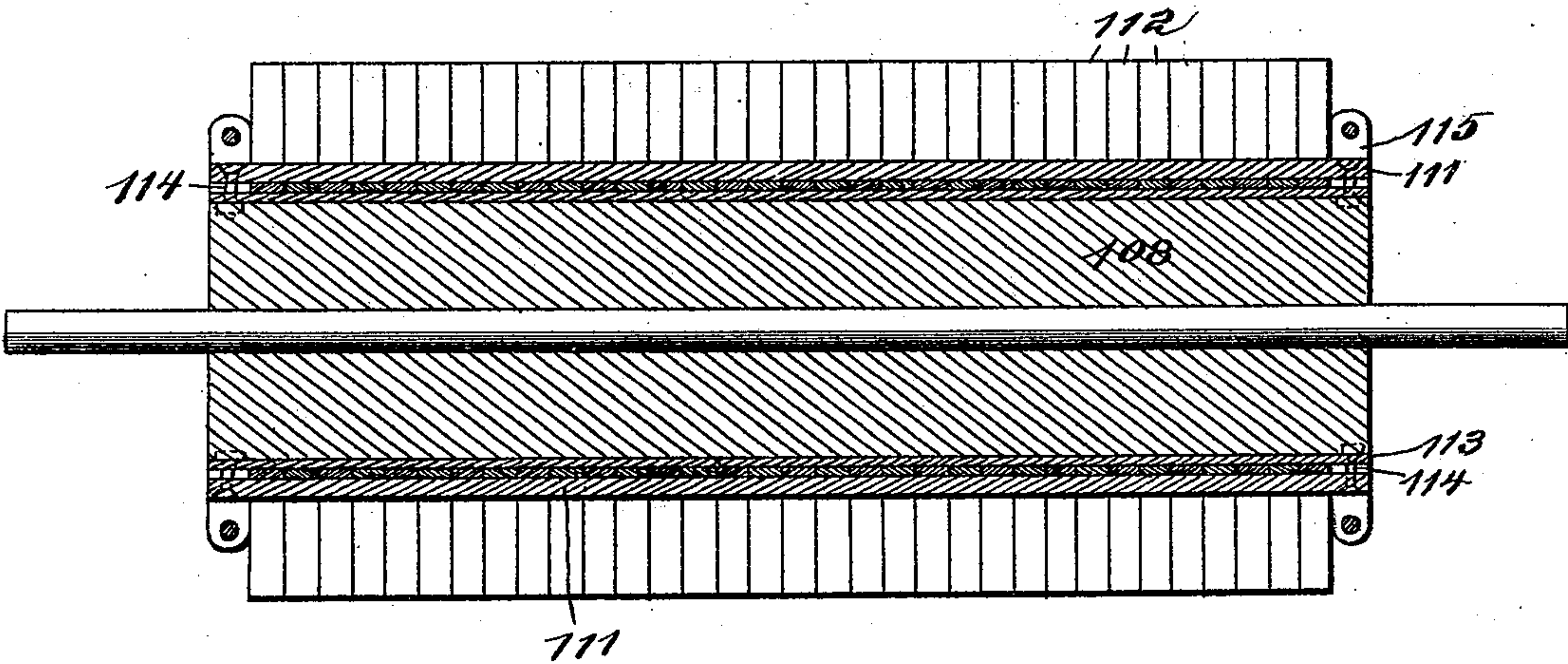
*Fig. 7.*



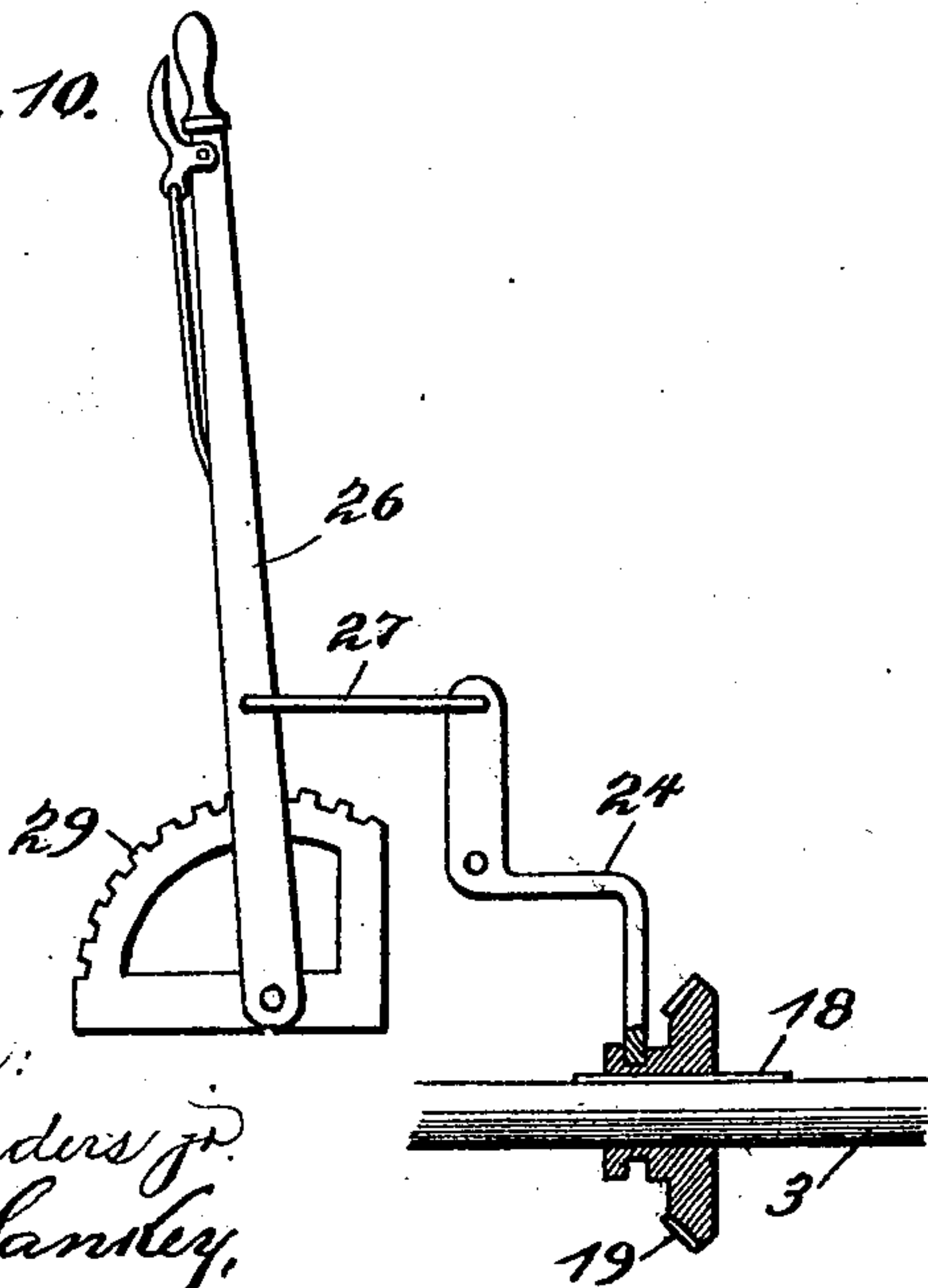
*Fig. 8.*



*Fig. 9.*



*Fig. 10.*



Witnesses:  
John Enders Jr.  
W. J. Sanders.

Inventor  
William H. Walls

by Higdon Higdon Horgan  
Attys.

(No Model.)

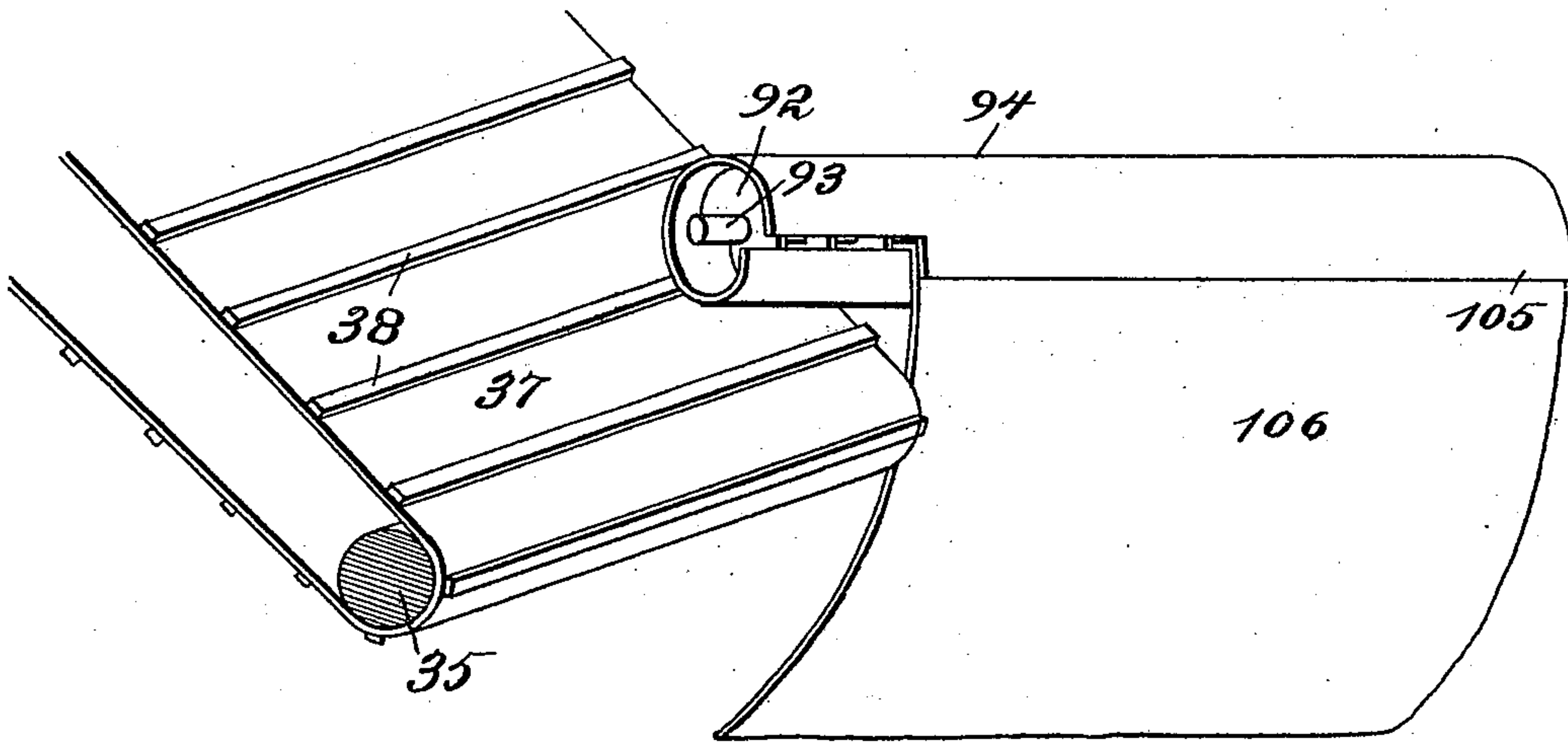
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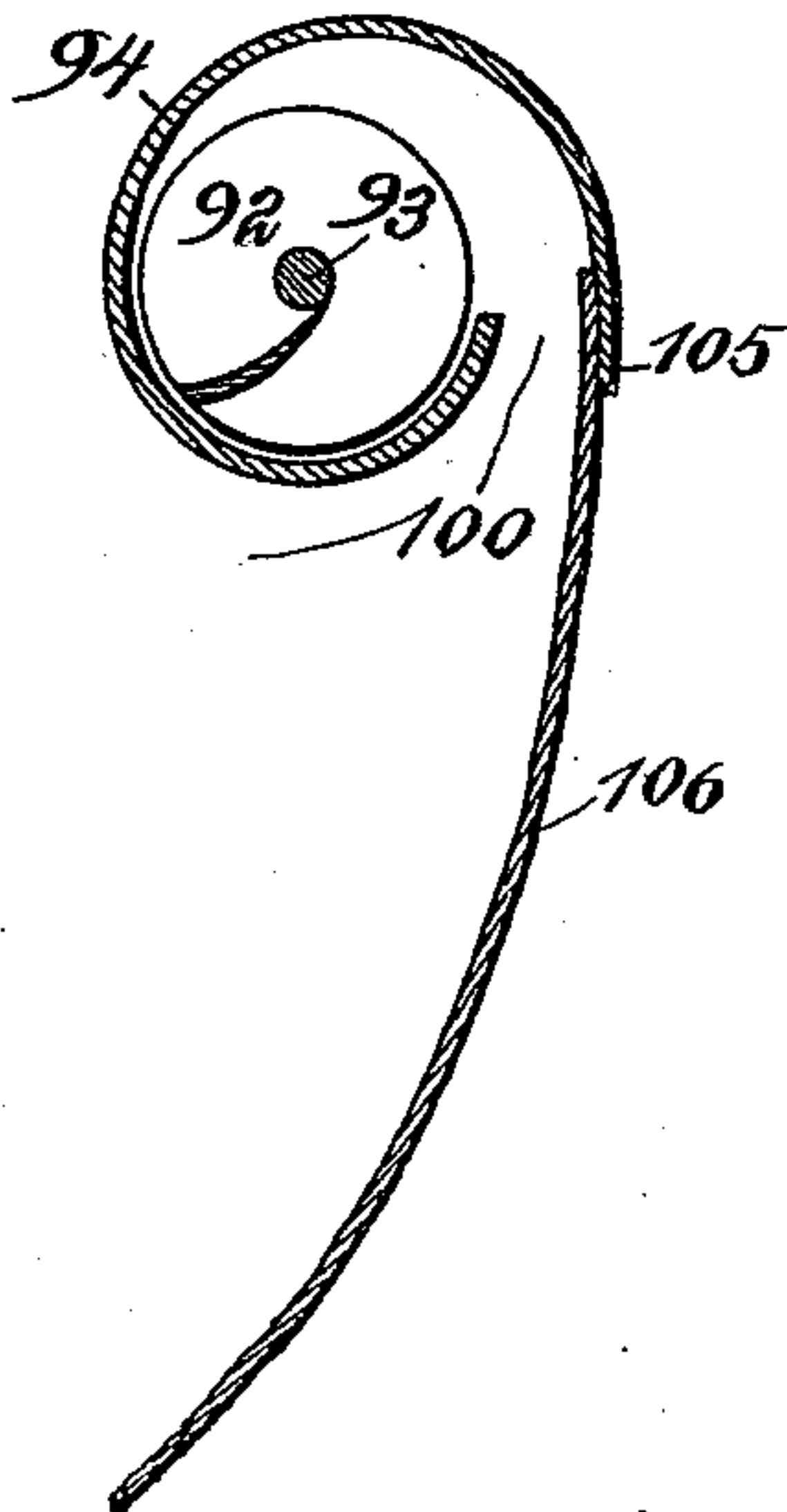
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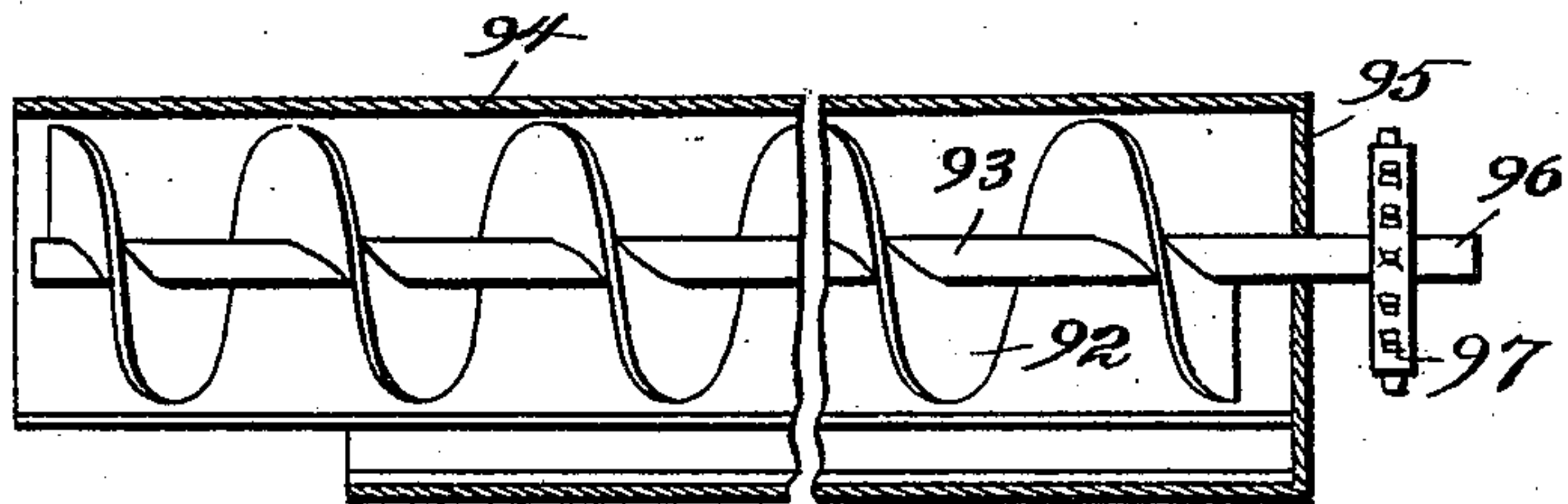
*Fig. 11.*



*Fig. 12.*



*Fig. 13.*



Witnesses  
John Enders jr.  
W. J. Sanders.

Inventor  
William H. Walls,

By  
Higdon Higdon Longan  
Att'ys



# UNITED STATES PATENT OFFICE.

WILLIAM H. WALLS, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO  
MICHAEL BECKER AND HENRY MUELLER, OF SAME PLACE.

## STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 518,168, dated April 10, 1894.

Application filed September 19, 1893. Serial No. 485,748. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. WALLS, of St. Louis, State of Missouri, have invented certain new and useful Improvements in a Combined Street Sweeper and Loader, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in street sweepers and consists in the novel arrangement, combination and construction of parts as will be more fully hereinafter described and designated in the claims.

In the drawings: Figure 1 is a plan view of my improved sweeper, parts being broken away to more clearly show the same, and Fig. 2 is a side elevation of the same. Fig. 3 is a front elevation more clearly showing levers which I use in carrying out my invention. Fig. 4 is a rear elevation more clearly showing the mechanism of my invention. Fig. 5 is a longitudinal sectional elevation. Fig. 6 is an enlarged detail perspective view of the smaller brush and a lever which I use to elevate said brush. Fig. 7 is an end elevation of one of the brushes and Fig. 8 is a cross-section of the same. Fig. 9 is a longitudinal central section of one of the brushes. Fig. 10 is a detail side elevation of one of the levers which I use to throw the brushes in and out of gear. Fig. 11 is an enlarged detail perspective view of a portion of a curtain and an endless conveying-belt which I use in carrying out my invention. Fig. 12 is a cross section of a curtain showing its connection with the cover of a rotating conveyer. Fig. 13 is a longitudinal central section of the cover showing the rotating conveyer located therein.

The object of my invention is to provide a street-sweeper with a series of revolving brushes, the aggregate length of which will be comparatively great, so that a comparatively wide surface may be swept by a single passage of the machine thereover, and which shall deliver the accumulated sweepings into an adjacent receptacle, whence they may be readily dumped at a convenient point.

1 indicates the front and 2 the rear wheels, the traction-wheels 2 being loosely mounted on a shaft or axle 3 which is circular in cross-

section and the front wheels being mounted on an axle 4 in the ordinary way. Mounted on these axles is a frame 5 which is constructed of two parallel side timbers 6 and 7 and a front end timber 8 which is connected to the axle 4 by a king-bolt 9. The rear ends of the timbers 6 and 7 are connected to the shaft 3 by straps 10 which are bent so as to conform to the contour of said shaft and their ends are connected to the ends of said timbers by bolts 11. By this construction the shaft 3 can rotate in the bearings thus formed. The traction-wheels 2 are connected to the shaft 3 by a ratchet wheel 12, which is rigidly connected to the said shaft, and a spring actuated pawl 13, which is connected to the wheels. By this construction when the sweeper moves forward it will rotate said shaft.

14 indicates a timber which is located on and halved into the timbers 6 and 7 about half way intermediate their ends. The ends of this timber extend a suitable distance outward from the timbers 6 and 7 for the purpose hereinafter mentioned.

A part of the frame 5 is covered with flooring 15 with the exception of its rear end, which is cut away to allow an endless conveying belt to move therein.

Mortised into the timbers 6 and 7 adjacent their rear ends and extending inwardly therefrom is a timber 16. Connected to the top of this timber and extending rearward over the axle 3 and parallel with the side timbers 6 and 7 are two additional timbers 17. Feathered on the shaft 3 by feathers 18 are two bevel-gear wheels 19 and 20 which are provided with annular projections 21 and 22. These projections are provided with collars 23 which engage grooves in said projections. Connected to these collars 23 and extending upwardly therefrom is a bar 24. There being two of these bars I will describe but one of them. The bar 24 is bent so as to engage bearings 25 connected to the upper side of the timber 17, and extends upwardly a suitable distance therefrom to allow a lever 26 to be connected thereto by a rod 27. The lower end of this lever is pivoted to an ear 28 which is formed on or fixed to the side of a common segmental rack 29 which is connected to the floor of the sweeper and the purpose of which



is to hold said lever in different adjustments. Mounted in bearings 30 which are located on the under side and adjacent the rear ends of the timbers 17 is a horizontal shaft 31 which carries a roller 32 said roller being rigidly connected to the shaft. Connected to this shaft adjacent the bevel gear-wheel 20 is a gear-wheel 33 which meshes with a gear-wheel 34 located on the projection 22 and adjacent the bevel gear-wheel 20.

35 indicates a roller which is located under the frame 5 and parallel with the roller 31, their ends being in alignment with each other. This roller 35 is held in position by bearings 36 which are connected to the timber 14 and extend downward and engage the ends of said roller, thus holding it in position. Mounted on these rollers 32 and 35 is an endless conveying belt 37 which carries parallel cross ribs 38.

Meshing with the gear wheel 20 is a side gear-wheel 39 which is mounted on one end of a horizontal shaft 40 which is mounted in bearings 41 which is connected to the free end of the timber 16 which is connected to the timber 7, the opposite end of said shaft being provided with bearings in the timber 7. The shaft 40 runs at an oblique angle relative the timber 7. There are two of these gear-wheels 29 and two shafts 40; they being substantially the same and operate in the same manner, the description and operation of one will be omitted.

42 indicates a horizontal shaft which is located under the frame 5 about midway its center and is parallel with the shaft 40. This shaft 42 is held in position by bars 43 and 44, one end of the bar 43 pivotally engaging the shaft 40 and the opposite end pivotally engaging one end of the shaft 42. One end of the bar 44 is pivotally engaged by ears 45 which are connected to the inner side of the timber 7, the opposite end of said bar being pivotally connected to the shaft 42. Located on the shaft 42 between the bearings 43 and 44 is a brush 46. By the shaft being mounted in bearings as hereinbefore described, the brush 46 can be readily raised up from the ground by means of a lever 47. The lever 47 is pivoted at its lower end to bearings 48 which are connected to the upper side of the floor 15 and a segmental rack 49 is located adjacent the lower end of the lever so that a spring actuated pawl 50 will come in contact with said rack. Connected to the lever 47 a suitable distance above the segmental rack is a rod 51 which extends outward from said lever and in alignment with the shaft 42, the outward end of which engages the upward projecting end of an angle-iron 52. This angle iron is provided with bearings 53 which are connected to the upper side of the floor 15. The end of the horizontal portion 54 of the angle iron 52 is engaged by two downwardly projecting links 55 and 56, the lower ends of which engage the adjacent ends of tilting bars 57 and 58. The bar 57 is ful-

crumed to a bearing 59 located on the under side of the floor 15. The tilting bar 58 is fulcrumed to a bearing 60 which is located on the underside of the floor 15. When the brush is down these bars are in alignment with each other. The outward projecting ends of the bars 57 and 58 are provided with chains 61 and 62, one being connected to each bar and extending downwardly and engaging the outward projecting ends of the shaft 42. By this construction the lever 47 being indirectly connected to the angle iron 52 when the lever is moved in the required direction it will push downwardly on the portion 54 of the angle iron 52, thus raising the brush from the ground.

Located on the shaft 42 adjacent one end of the broom 46 is a sprocket-wheel 63 which is engaged by a sprocket chain 64 which engages a sprocket-wheel 65 which is connected to the shaft 40.

66 indicates a brush which is parallel with the brush 46 and located a suitable distance in the rear and at one side of the brush 46. This brush is held in position by bars 67 and 68. A shaft 69 which carries said broom projects outward a suitable distance from each end. One end of the bar 67 is pivotally connected to the end 70 of the shaft 69 and extends upwardly and is pivoted in bearings 71 connected to the lower side of the timber 7. One end of the bar 68 is pivoted to the end 72 of the shaft 69 and the opposite end is loosely mounted on the shaft 40.

73 indicates a lever which is pivoted at its lower end and constructed with the usual segmental rack 74. This lever and segmental rack are located on and connected to the upper side of the floor 15 over the end 72 of the shaft 69. Connected to the lever 73 a suitable distance above the segmental rack is a rod 75 which engages the upward projecting end 76 of an angle iron 77. The angle iron 77 is pivoted in bearings 78 which are connected to the upper side of the timber 14 adjacent its outer projecting end. Connected to the horizontal projecting end 80 of the angle iron 77 are two downwardly projecting links 81 and 82, the lower ends of which engage the adjacent ends of tilting bars 83 and 84. These bars are in alignment with each other and the bar 84 is fulcrumed in a bearing 85 which is connected to the lower side of the timber 14 adjacent its end. The tilting bar 83 is fulcrumed in bearings 86 which are connected to the lower side of the floor 15. These bars are constructed so their outward projecting ends are over the ends 70 and 72 of the shaft 69. Connected to the outer projecting end of the bar 84 and extending downward and engaging the end 70 of the shaft 69 is a chain 87. Connected to the outer projecting end of the bar 83 and extending downward and engaging the projecting end 72 of the shaft 69 is a chain 88. By this construction when the lever 70 is moving in the required direction, the brush 66 can



be elevated from the ground. Connected to the end 72 of the shaft 69 is a sprocket wheel 89 which is engaged by a sprocket chain 90 which engages a sprocket wheel 91 connected to the shaft 40.

92 indicates a screw conveyer which is mounted on a shaft 93. This shaft and conveyer are mounted in a casing 94. One end of the shaft is provided with its bearings in the end 95 of said casing, the casing being of such a size that the screw conveyer will rotate therein and it forms a bearing for said screw conveyer. The outward projecting end 96 of the shaft 93 is constructed with a sprocket wheel 97 which is engaged by a sprocket chain 98 which engages a sprocket wheel 99 connected to the end 70 of the shaft 69. The casing 94 is so constructed of a piece of flat metal that when it is bent one edge will project outward from the opposite edge and form an opening 100 between said edges. The casing 94 and its connections are located above and a little to the front of the brush 66. The casing is held in position by eyes 101 and 102 which are connected to the top of said casing. The eye 102 is engaged by a rod 103 which extends upward and engages an eye located on the under side of the timber 7. The eye 101 is engaged by a rod 104 which extends upwardly and engages an eye located on the under side of the timber 7. Connected to the projecting edge 105 of the casing 94 is a curtain 106 which is of such a length that it extends downward in front of the brush 66. The conveyer 92 and the casing 94 extends outwardly over the lower end of the endless conveying belt 37 so that when dust and the like is discharged from the opening of said casing it will fall on the endless conveyer.

107 indicates a brush which is the same in construction as the brush 66 and is located on the opposite side of the sweeper from said brush 66 and at right angles therewith. This brush and its connections being the same as the brush 66 I will omit the description thereof. The brushes 46, 66 and 107 being the same in construction, I will describe but one of them.

108 indicates a roller which is provided with a series of grooves 109 formed longitudinally in the outer periphery of said roller. By the construction of these grooves there are formed projections 110.

111 indicates a bar which is of the same length as the roller 108. Located on this bar is a suitable number of V-shaped strips 112. These strips are held in position with the bar 111 by a bar 113. By the bar 113 being placed on the V-shaped strips 112 and connected to the bar 111 by a screw 114 at each end, the strips 112 will be held in engagement with the bar 111 so that they can be readily detached from the roller and the bar 113 will prevent them from coming apart. The bars 111 and 113 are located in the grooves 109 the grooves being of such a depth that the outward edge of the bars 111 will be in align-

ment with the outer projecting end of the projections 110, so that when a ring such as 115 is placed on the ends of said roller it will securely hold the bars 111 and their connections in position. The strips 112 are constructed so that when they are in engagement with the roller they will radiate from said roller and form a brush.

116 indicates a seat which is located on the floor 15 adjacent the rear end of the sweeper and in such a position that the operator will have free access to the levers.

The operation is as follows: By the sweeper moving forward and the traction wheels 2 turning in the direction indicated by the arrow in Fig. 1, they will rotate the shaft 3 which will rotate the bevel-gear wheels 19 and 20. The operation of both brushes being the same I will describe the operation of but one. The side gear wheel 39 meshes with the bevel gear wheel 20, and when the bevel gear wheel 20 rotates it will also rotate the said gear wheel 39 and by its rotating it will rotate the shaft 40 and the sprocket wheels 65 and 91. The sprocket wheel 65 is connected to the sprocket wheel 63 by a sprocket-chain 64. When the sprocket chain 64 is rotated it will rotate the brush 46 in a rearward direction which will brush or sweep the dirt from the center of the sweeper over in front of the brush 107. The brush 66 is also connected to the shaft 40 by a sprocket chain so that it will rotate in a rearward direction. When it so rotates it will sweep the dust up against the curtain 106 with sufficient force that it will go up through the opening 100 into the casing 94 and be carried up onto the endless conveying belt 37 by the screw conveyer 92, the endless conveying belt being rotated in a rearward direction by a gear wheel 33 connected to the shaft 31 carrying a roller 32, upon which the rear end of said conveying belt is mounted. The gear wheel 33 meshes with the gear wheel 34. When it is desired to throw the brushes 46 and 66 and the endless conveyer 37 out of gear, the operator moves the lever 26 in the required direction, which will disengage the bevel gear wheel 22 from the side gear wheel 39 and also disengage the gear wheel 34 from the gear wheel 33. The same means is performed to throw the brush 107 out of gear.

What I claim is—

1. In a street sweeper, brushes 66 and 107 located at right angles with each other and under the sweeper, means for raising and lowering said brushes, means for throwing said brushes in and out of operation, an endless belt conveyer located between the adjacent ends of said brushes, screw conveyers mounted in casings and located above said brushes, said screw conveyers projecting outward over the endless belt conveyer, and curtains in combination with said casings to guide the dust thereinto, substantially as set forth.

2. A street sweeper constructed with two



separate revolving brushes located in an angular position with relation to each other, a screw-conveyer located above each of said brushes, in combination with a cylindrical casing having a longitudinal opening in one side thereof, a curtain attached thereto for guiding the sweepings into said casing, and an endless conveying-belt arranged adjacent the ends of said screw-conveyer for elevating the sweepings into an adjacent receptacle, substantially as herein specified.

3. In a street sweeper, the combination with a main frame mounted on wheels of the following elements, to wit: three revoluble brushes 46, 66 and 107, said brushes 66 and 107 located at right angles relative to each other and beneath the edges of the main frame and a suitable distance apart so as to form a space between their adjacent ends, an endless-conveying-belt located in the space between the adjacent ends of said brushes for conveying the sweepings to a receptacle, the revoluble brush 46 located in front of the brushes 66 and 107 and parallel with said brush 66 so as to cover the space between the adjacent ends of said brushes 66 and 107, a cylindrical casing containing a screw-conveyer mounted over each of the brushes 66 and 107 for conveying the sweepings onto the endless conveying-belt, means for raising and lowering each of said brushes and mechanism driven by the traction-wheels for revolving said brushes, all arranged and combined to operate substantially as herein specified.

4. In a street sweeper, a series of revolving brushes, each of said brushes constructed with a longitudinal shaft which projects a distance beyond each end thereof, a bar, having a slot therein, engaging each end of each of said shafts, the opposite end of said bar pivoted to suitable bearings which are connected to the under side of the main frame, chains engaging the ends of each of said shafts, and

engaging tilting-bars which are mounted in suitable bearings beneath the main frame of the street sweeper, and are located between the brush and the main frame and parallel with said brush, a link engaging the adjacent end of each of said tilting-bars, which are connected to the horizontal portion of an angle-iron, which is mounted in bearings connected to the upper surface of the floor, the vertical portion of the angle-iron engaged indirectly by a lever for operating the same, substantially as herein specified.

5. In combination with a street sweeper, a series of revoluble brushes 66 and 107, said brushes 66 and 107 located at right angles relative to each other, and a suitable distance apart to form a space between them, the brush 46 located in front of said brushes 66 and 107 and parallel with said brush 66 in such a position as to cover the space between the adjacent ends of the brushes 66 and 107, a cylindrical casing having a longitudinal opening in its under side, located above and parallel with each of the brushes 66 and 107, a screw-conveyer located in each of said casings which is operated by a sprocket-chain mounted on sprocket-wheels carried by the shaft which carries the screw-conveyer and the shaft upon which the brush is mounted, a curtain in combination with each of said casings for directing the sweepings into said casings, and an endless conveying-belt located beneath the adjacent ends of the casings which carry the screw-conveyers for elevating and discharging the sweepings therefrom into a receptacle, substantially as set forth.

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

WILLIAM H. WALLS.

Witnesses:

W. J. SANKEY,  
E. E. LONGAN.