

A. D. JONES.
STREET SWEEPING APPARATUS.
APPLICATION FILED AUG. 30, 1909. RENEWED OCT. 24, 1910.

993,603.

Patented May 30, 1911.

4 SHEETS—SHEET 1.

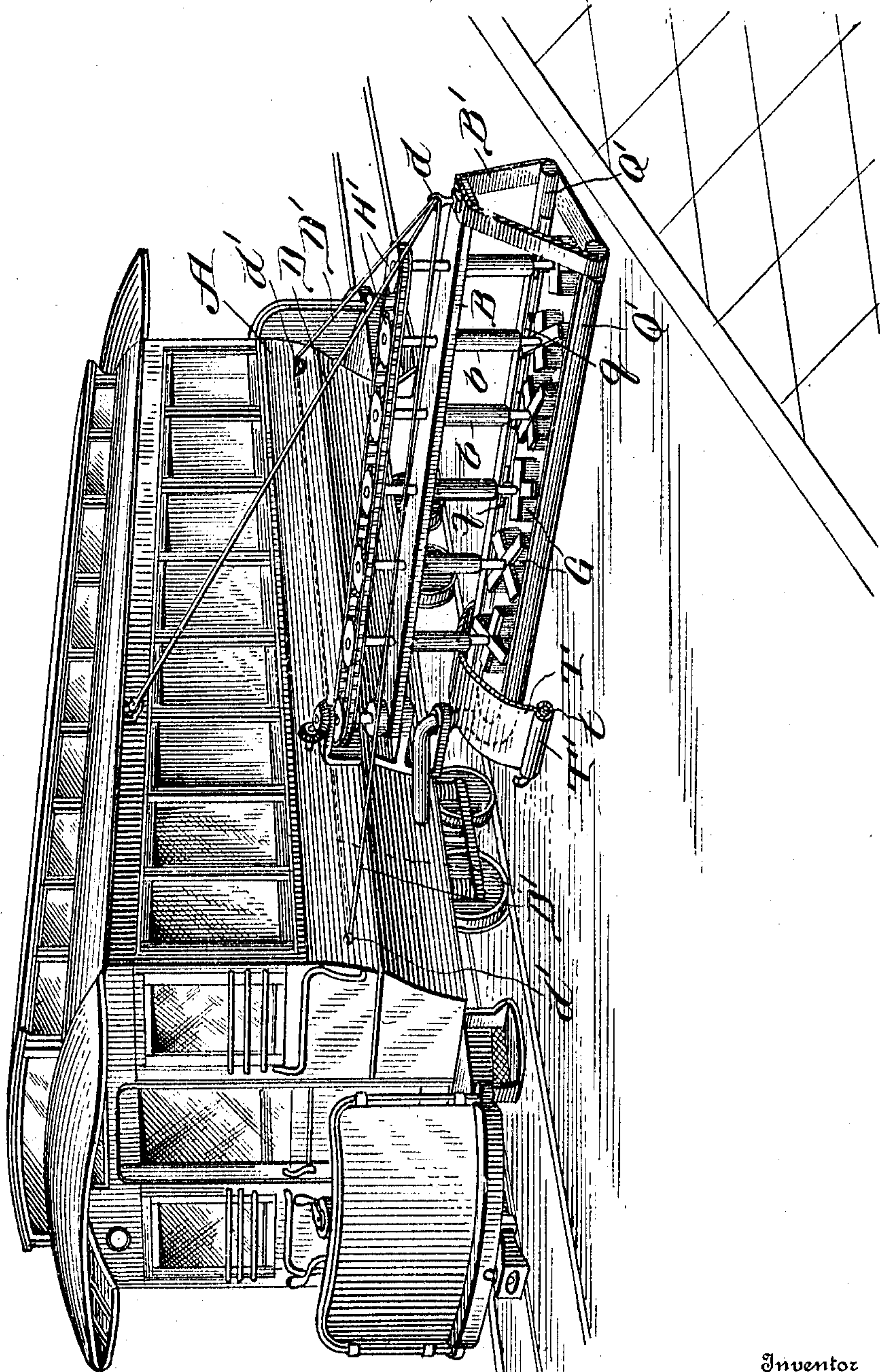


Fig. 1.

Inventor

A. D. Jones,

Witnesses

J. M. Fowler Jr.
W. M. D. Small.

By Milliken, Fisher & Witherspoon,
Attorneys

A. D. JONES.

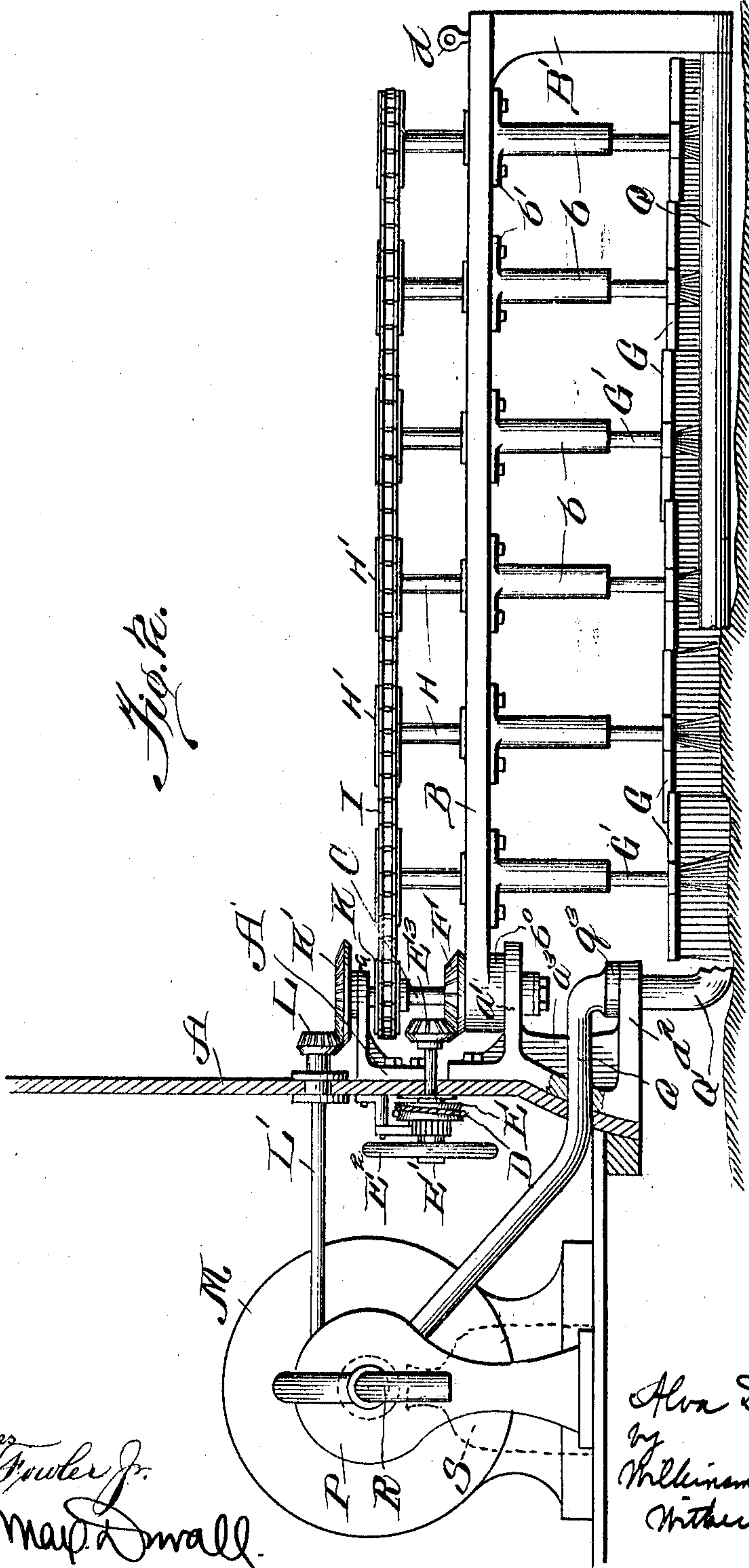
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Witnesses
J. M. Fowler Jr.
C. R. Map & Small.

Inventor
Alva D. Jones,
by
William, Fisher &
Witherspoon,
Attorneys.

A. D. JONES.

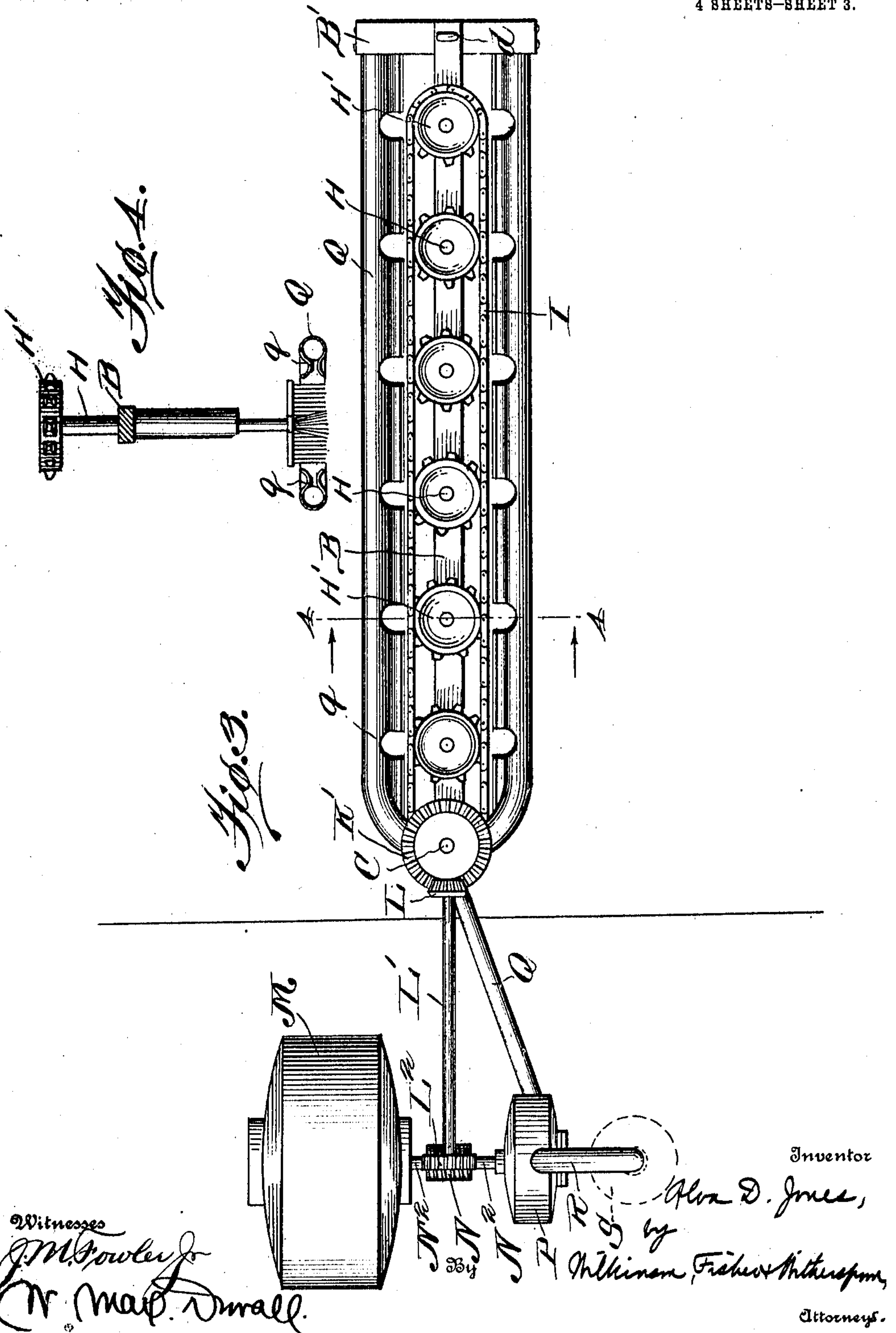
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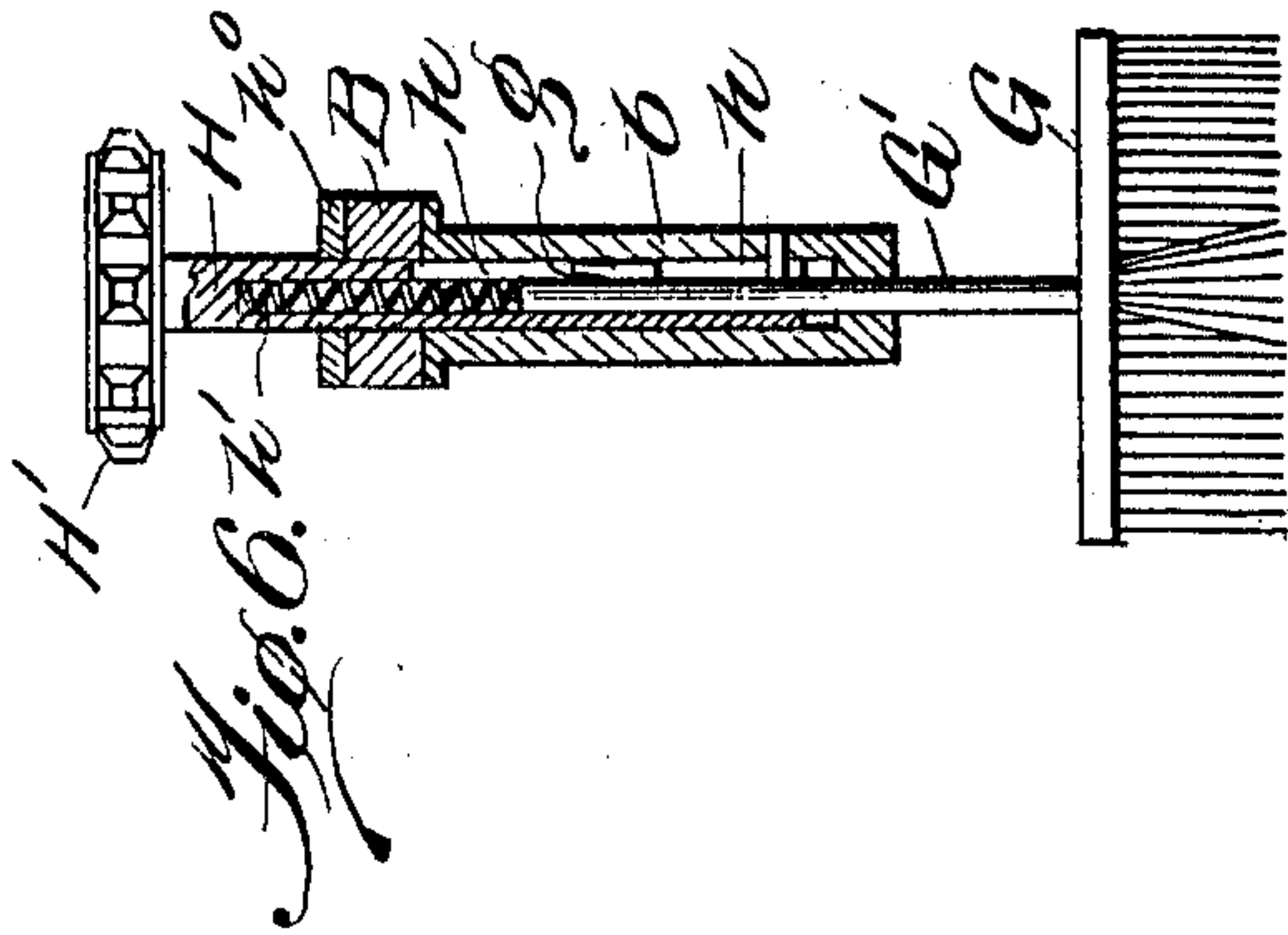
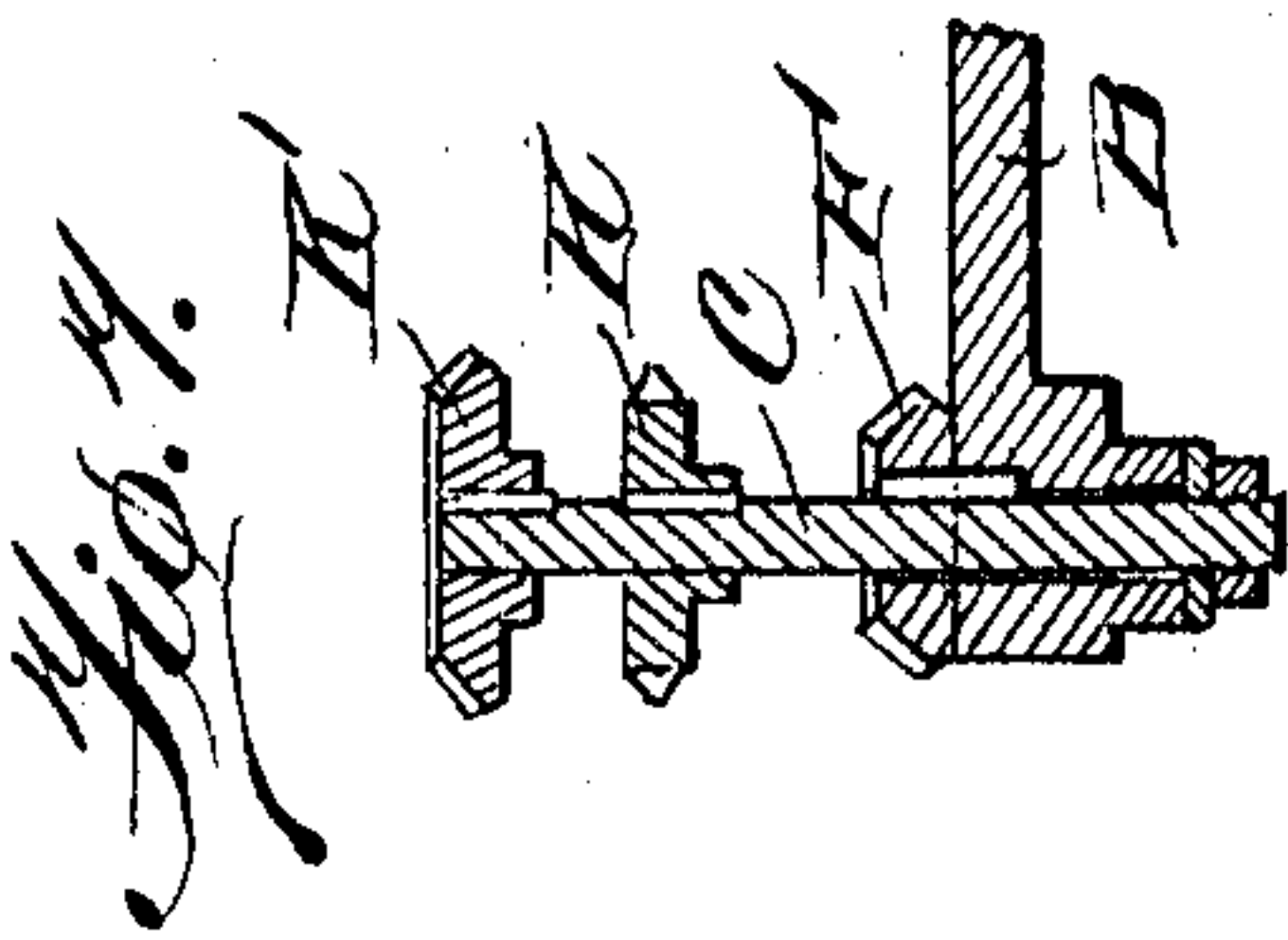
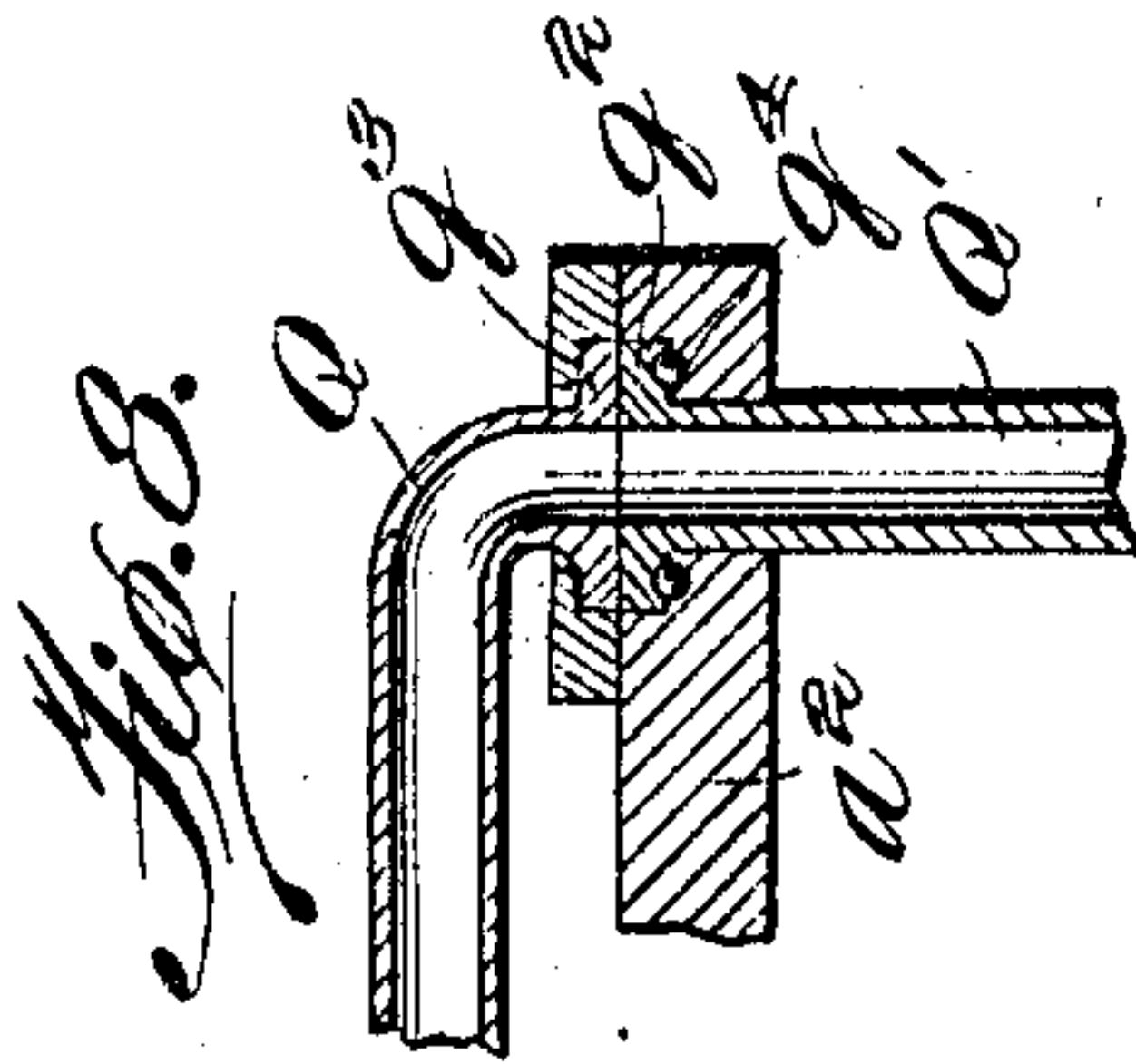
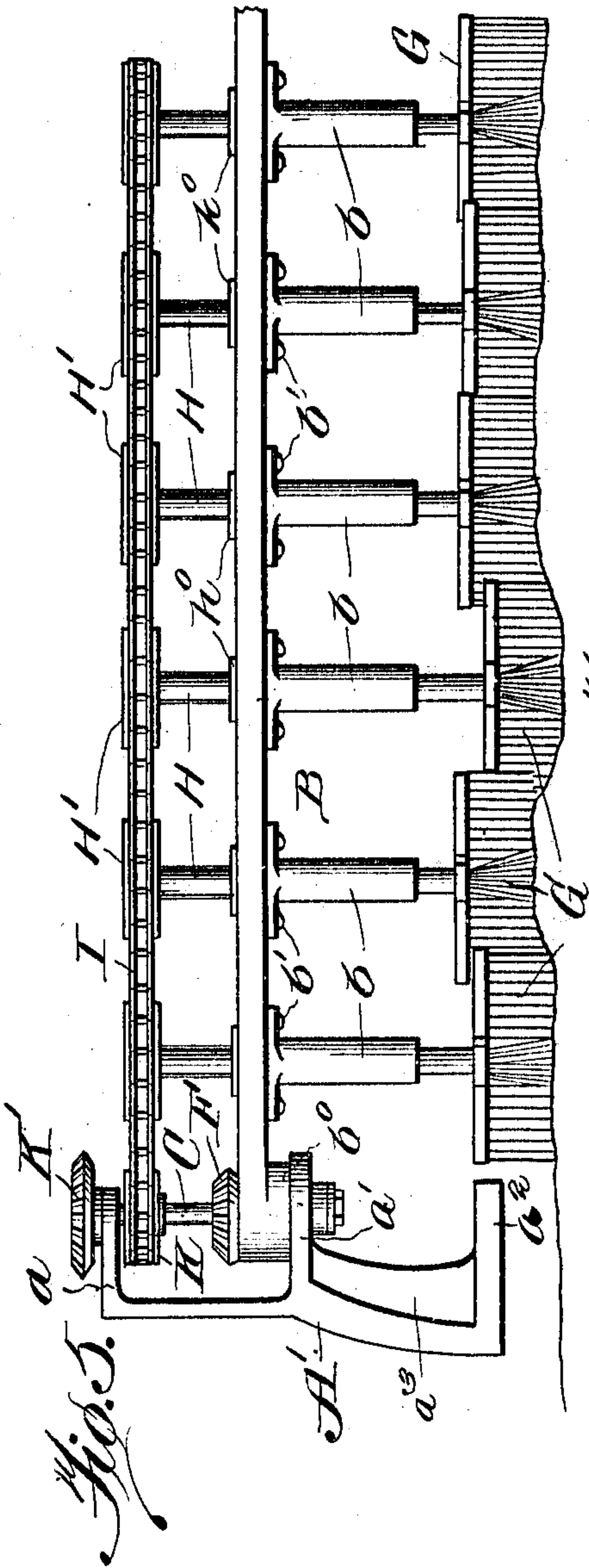
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4 SHEETS-SHEET 4.



Witnesses

J. M. Fowler Jr.
W. May. Small.

Inventor

A. D. Jones

By Wilkinon Fisher & Witherspoon,

Attorneys.

UNITED STATES PATENT OFFICE.

ALVA D. JONES, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO AMERICAN STREET CLEANER COMPANY, OF LOUISVILLE, KENTUCKY, A CORPORATION OF ARIZONA TERRITORY.

STREET-SWEEPING APPARATUS.

993,603.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed August 30, 1909, Serial No. 515,356. Renewed October 24, 1910. Serial No. 588,900.

To all whom it may concern:

Be it known that I, ALVA D. JONES, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Street-Sweeping Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it apper-
10 tains to make and use the same.

My present invention relates to improvements in street sweeping apparatus, in which arrangement is made for sweeping the
15 streets with rotary brushes, and removing the dust and other solid particles suspended in the air by pneumatic attachments, as will be hereinafter more fully described and claimed.

20 In the ordinary process of street sweeping, the brushes now generally used are either too large or too rigid to reach into the crevices or irregular depressions in the street, with the result that such depressions are
25 filled up with the dirt that is raised by the brushes and carried along by the machine.

According to my invention, I use a series of small brushes, which are rotated rapidly about a substantially vertical axis, and the
30 dust and other solid particles raised are sucked into openings in pneumatic pipes, whence the material is delivered to a suitable separator, the filtered air is allowed to escape and the dust is blown into bags, or
35 other suitable receptacles.

My invention will be understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

40 Figure 1 is a perspective view of an ordinary street car, fitted with my improved street sweeping apparatus. Fig. 2 is an end view of the apparatus, part of the car being shown in section, and part of the apparatus
45 being broken away. Fig. 3 is a plan view of the apparatus shown in Fig. 2. Fig. 4 shows a section along the line 4-4 of Fig. 3, parts being omitted. Fig. 5 is a similar view to Fig. 2, except that the suction pipes and
50 other parts of the apparatus are omitted. Fig. 6 is a detail showing the means for rotating one of the brushes and for allowing the same to yield to vertical pressure. Fig. 7
55 is a detail showing in section some of the driving gears. Fig. 8 is a detail showing in section the union between the suction pipes

A represents the body of the car or other propelled vehicle. In the drawings, the ordinary street car is shown, but it will be obvious that any other vehicle, whether mounted on tracks or not, may be used, and I do not mean to limit the invention to a street car, although many worn out cars might be readily adapted for use with this apparatus.

Attached to the body of the vehicle is a
65 frame A', having arms a , a' , and a^2 , with a strengthening rib a^3 on the arm a' of the frame A'. To this frame the hub b^0 of the beam B is pivoted, as by means of the shaft C. The outer end of this beam B carries an
70 angle iron B', and depending from the beam are a series of sleeves b , preferably connected to the beam B by flanges b' . The weight of this beam B and the parts carried thereby is supported from suitable stays, such as D,
75 connected to the eye-bolt d at the end of the beam B, as shown in Fig. 1. In order to swing the beam B and the parts carried thereby, and also to permit the swinging
80 backward of the same, a guy rope D' is provided, whose ends are secured to the eye-bolt d , and whose bight is rove over suitable pulleys d' in the vehicle body, as shown in Fig. 1, and is then rove around the axle E on the
85 shaft E', carrying the hand wheel E², after the manner of the steering wheel and tiller ropes, well known in sailing vessels. The other end of this shaft E' carries the bevel pinion E³, meshing in the bevel gear F,
90 which is loosely mounted on the shaft C, and is fast to the beam B, as shown in Fig. 7.

G are rotary brushes, preferably made cruciform, as shown in Fig. 1, which brushes are fast on the end of rods G', splined, as at g ,
95 into the slot h of the hollow sleeve H. In this hollow sleeve is mounted a spring h' , which normally presses the brush downward. This hollow sleeve is journaled in the bearing plate h^0 , and the beam B, as shown
100 most clearly in Fig. 6, and is driven by a sprocket wheel H', meshing in the sprocket chain I, which passes over the sprocket wheel K, fast on the shaft C, as shown in Fig. 7. This shaft C also carries the bevel
105 gear K', meshing with the bevel pinion L on the shaft L', which carries a worm wheel L², meshing with the worm M' on the shaft M² of the motor M. This motor is preferably an electric motor, and driven by its shaft M².
110 is a suction-pump P, which is connected by the pipe Q to the pipes Q', which latter have openings q abreast of the brushes G. Fig. 8

shows the connection between the pipes Q and Q', where q^2 and q^3 are flanges on the two pipes, respectively, the flange q^2 being supported by the ball bearing q^4 , so that the
 5 pipes Q' may be swung about on the shaft C with very little friction.

It will be noted that the center of the bearing shown in Fig. 8 is coincident with the axis of the shaft C, shown in Fig. 1.

10 The air sucked through the pipe Q is filtered in any convenient way, as by a screen, or other methods well known in the art, and the dirt is blown off through the pipe R into any suitable receptacle, such as the
 15 sack S, shown in dotted lines in Figs. 2 and 3.

In order to protect against excessive dust from the brushes, a curved hood such as T, shown in Fig. 1, is provided, consisting of
 20 a piece of sheet metal, with curved ends T' inclosing rods t , which curved ends and rods pass near the surface of the ground and are pressed upward by any obstruction that they may encounter.

25 The operation of the device is as follows:—The car, or other vehicle carrying the apparatus, being propelled along the street in the usual way, and the motor M being in operation, the shaft L' and gears
 30 L, K' and K³, will drive the sprocket chain I, rotating the various sleeves H, and rotating with the sleeves the brushes G. The springs h' will hold the brushes G down to their work, but allowing the same to yield
 35 to inequalities in the street. The air, mingled with dust and dirt thrown off by the brushes G, will be sucked in through the openings q to the pipes Q', and will be drawn through the pipe Q to the suction
 40 pump and separator R, and will be collected in the receptacles S. Should the apparatus strike a stone, or other obstruction on the street, the guy rope D' will reeve around the
 45 axle E, turning the wheel E², and allowing the beam B and the parts carried thereby to swing backward. This swinging backward will cause the stay D to automatically lift the framework until it clears the ob-
 50 struction, unless the obstruction be so great as to be noticeable to the driver of the car, in which case it would be preferable to remove or to avoid the same, as would be the case with any other kindred apparatus. As
 55 soon as the obstruction has been passed, the weight of the parts will automatically swing the frame back to the initial position, at right angles, or at practically right angles to the car. It will be obvious that an at-
 60 tendant at the wheel E² might swing the frame by hand, and thus himself avoid the obstruction before it is reached.

The brushes should preferably be set close together, with their arms interpenetrating, as shown in Fig. 2, which could be readily
 65 done, since all the sprocket wheels H' are

driven by the same chain I. By having the brushes so arranged, every particle of the ground passed over is covered, and by hav-
 ing the brushes adapted to yield vertically under the combined action of their own re- 70
 silient strands, supplemented by the pressure of the springs h' , the said brushes will press down into all ordinary depressions and holes usually found in rough streets
 from which it is desired to move the solid 75
 matter accumulated therein.

Various details are omitted for the sake of clearness in the drawings.

It will be obvious that various modifica-
 tions might be made in the hereindescribed 80
 apparatus, which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Pat-
 ent of the United States, is:— 85

1. In a street sweeping machine, the combination with a vehicle, of a swinging frame hinged to said vehicle, a support for the free end of said frame, means for swing-
 ing said frame laterally, a series of rotary 90
 brushes mounted in said frame, and having their axes substantially vertical, means for imparting vertical play to said brushes, suction pipes at each side of said brushes adapted to suck in the air and solid parti- 95
 cles raised by said brushes, and a suction pump carried by said vehicle and connected to said suction pipes, substantially as de-
 scribed.

2. In a street sweeping machine, the com- 100
 bination with a vehicle, of a swinging frame hinged to said vehicle, a support for the free end of said frame, a guy rope having its ends secured to the outer end of said frame and its bight passing through pulleys car- 105
 ried by said vehicle and wound about an axle, a wheel carried by said axle, whereby said frame may be swung laterally, a series of rotary brushes mounted in said frame, and having their axes substantially vertical, 110
 means for permitting vertical play to said brushes, suction pipes at each side of said brushes and adapted to suck in the air and the solid particles raised by said brushes, and a suction pump carried by said vehicle 115
 and connected to said suction pipes, substantially as described.

3. In a street sweeping machine, the combination with a vehicle, of a swinging frame hinged to said vehicle, a support for the free 120
 end of said frame comprising a stay connected thereto and to the upper part of said vehicle, means for swinging said frame laterally, a series of rotary brushes mounted in said frame, and having their axes substan- 125
 tially vertical, means for imparting vertical play to said brushes, suction pipes at each end of said brushes adapted to suck in the air and solid particles raised by said brushes, and a suction pump carried by said

vehicle and connected to said suction pipes, substantially as described.

4. In a street sweeping machine, the combination with a vehicle, of a swinging frame 5 hinged to said vehicle, a support for the free end of said frame comprising a stay connected thereto and to the upper part of said vehicle, a guy rope having its ends secured to the outer end of said frame and its 10 bight passing through pulleys carried by said vehicle and wound about an axle, a wheel carried by said axle, whereby said frame may be swung laterally, a series of rotary brushes mounted in said frame, and 15 having their axes substantially vertical, means for permitting vertical play to said brushes, suction pipes at each side of said brushes adapted to suck in the air and the solid particles raised by said brushes, and a 20 suction pump carried by said vehicle and connected to said suction pipes, substantially as described.

5. In a street sweeping machine, the combination with a vehicle, of a swinging frame 25 hinged to said vehicle, a support for the free end of said frame, means for swinging said frame laterally, a series of cruciform rotary brushes mounted in said frame having their arms interpenetrating and having their 30 axes substantially vertical, means for rotating said brushes all at the same rate of speed, means for permitting vertical play to said brushes, suction pipes at each side of said brushes adapted to suck in the air 35 and solid particles raised by said brushes, and a suction pump carried by said vehicle and connected to said suction pipes, substantially as described.

6. In a street sweeping machine, the combination with a vehicle, of a swinging frame 40 hinged to said vehicle, a support for the free end of said frame comprising a stay, a guy rope having its ends secured to the outer end of said frame and its bight passing 45 through pulleys carried by said vehicle and wound about an axle, a wheel carried by said axle, whereby said frame may be swung laterally, a series of cruciform rotary brushes mounted in said frame having their arms 50 interpenetrating and having their axes substantially vertical, means for permitting vertical play to said brushes, suction pipes at each side of said brushes adapted to suck in the air and the solid particles raised by 55 said brushes, and a suction pump carried by said vehicle and connected to said suction pipes, substantially as described.

7. In a street sweeping machine, the combination with a vehicle, of a swinging frame 60 hinged to said vehicle, a support for the free end of said frame, means for swinging

said frame laterally, a series of hollow sleeves journaled in said frame; a brush rod slidably mounted in each of said sleeves but held against turning therein, a coil spring 65 mounted in each sleeve and adapted to press the brush rod and brush downward, a sprocket wheel on each sleeve, a sprocket chain meshing in all of said sprocket wheels, means for driving said sprocket chain, suc- 70 tion pipes at each side of said brushes adapted to suck in the air and solid particles raised by said brushes, and a suction pump carried by said vehicle and connected to said suction pipes, substantially as described. 75

8. In a street sweeping machine, the combination with a vehicle, of a swinging frame hinged to said vehicle, a support for the free end of said frame, a guy rope having its ends secured to the outer end of said 80 frame and its bight passing through pulleys carried by said vehicle and wound about an axle, a wheel carried by said axle, whereby said frame may be swung laterally, a series of hollow sleeves journaled in said frame, a 85 brush rod slidably mounted in each of said sleeves but held against turning therein, a coil spring mounted in each sleeve and adapted to press the brush rod and brush downward, a sprocket wheel on each sleeve, 90 a sprocket chain meshing in all of said sprocket wheels, means for driving said sprocket chain, suction pipes at each side of said brushes adapted to suck in the air and the solid particles raised by said brushes, 95 and a suction pump carried by said vehicle and connected to said suction pipes, substantially as described.

9. In a street sweeping machine, the combination with a perforated suction pipe, of 100 a longitudinally movable and substantially vertical rotary brush rod, a brush secured at the lower end of said brush rod and in juxtaposition to said perforated pipe, and means for pressing downward vertically 105 upon said brush rod while it is in rotation, substantially as described.

10. In a street sweeping machine, the combination with a perforated suction pipe, of 110 a longitudinally movable and substantially vertical rotary brush rod, a brush secured at the lower end of said brush rod and in juxtaposition to said perforated pipe, and a coil spring mounted above and pressing downward vertically upon said brush rod while 115 it is in rotation, substantially as described.

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

ALVA D. JONES.

Witnesses:

T. A. WITHERSPOON,
R. M. PARKER.