

J. F. STEVENS.
SWEEPER.

APPLICATION FILED APR. 24, 1907.

920,209.

Patented May 4, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

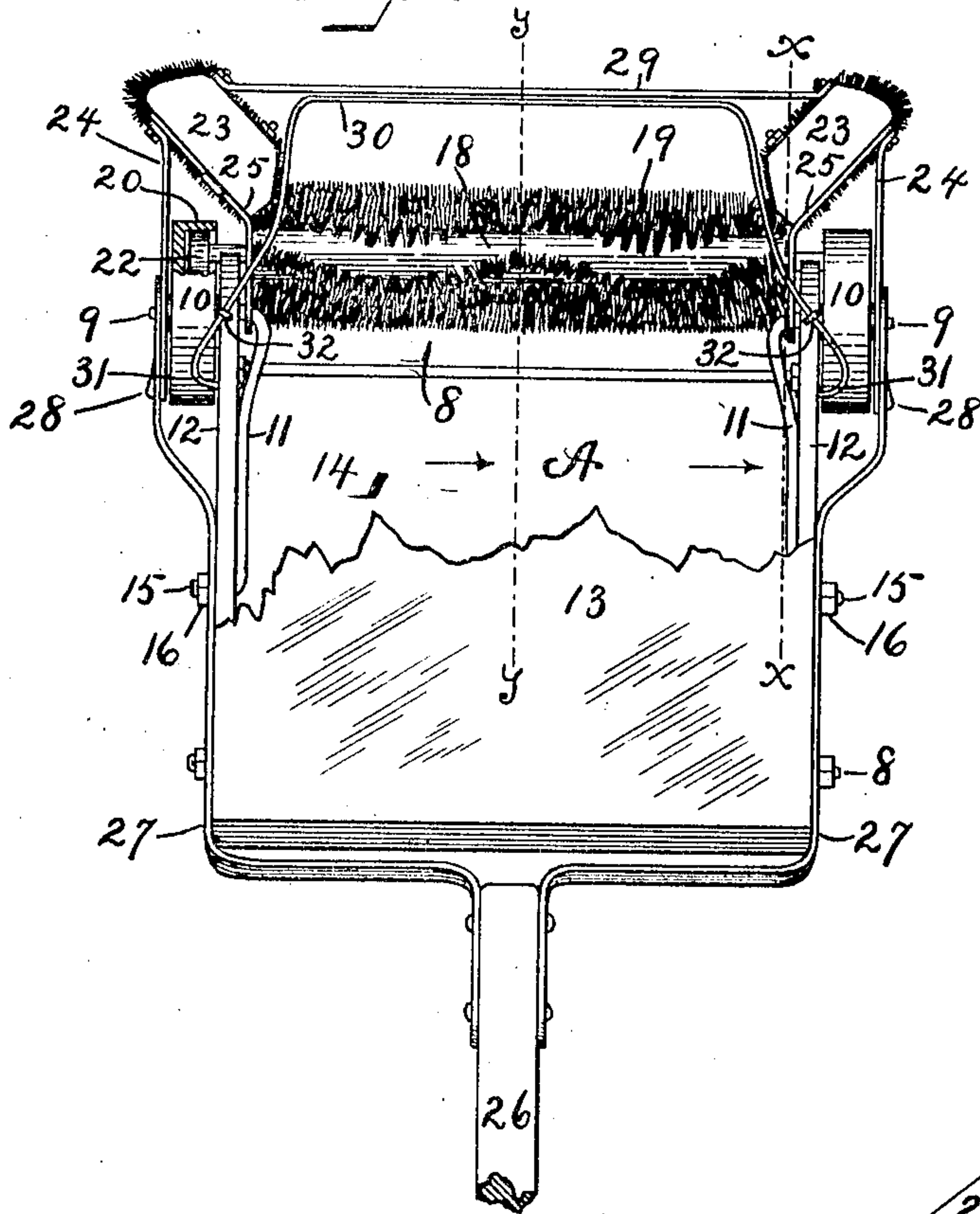
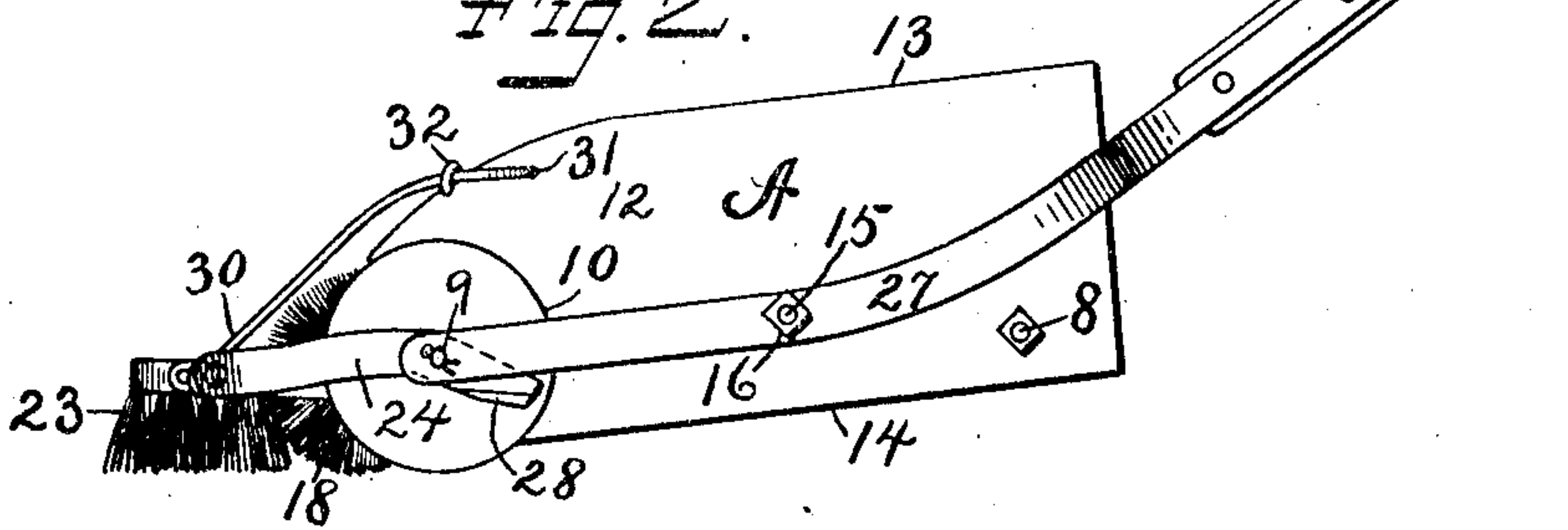


Fig. 2.



Witnesses.

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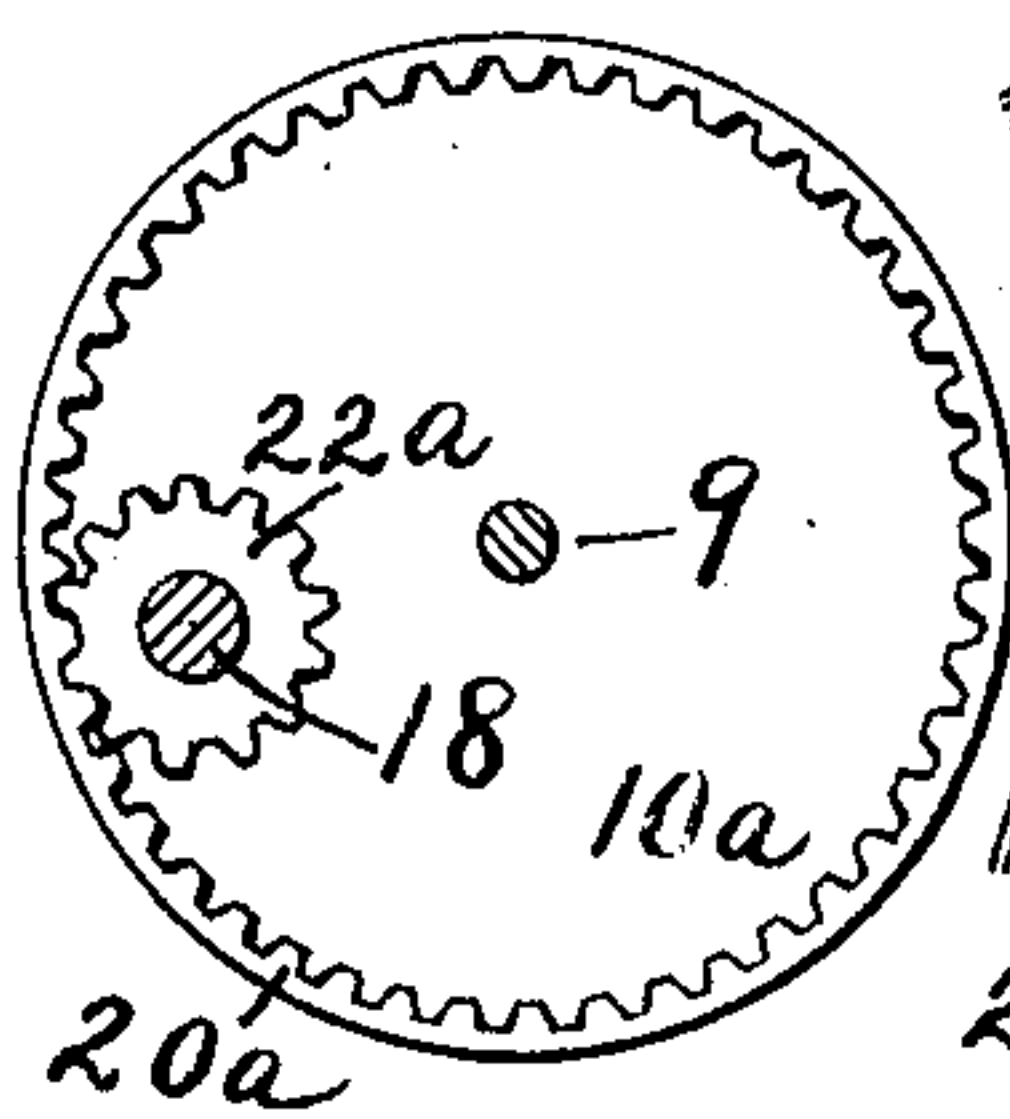
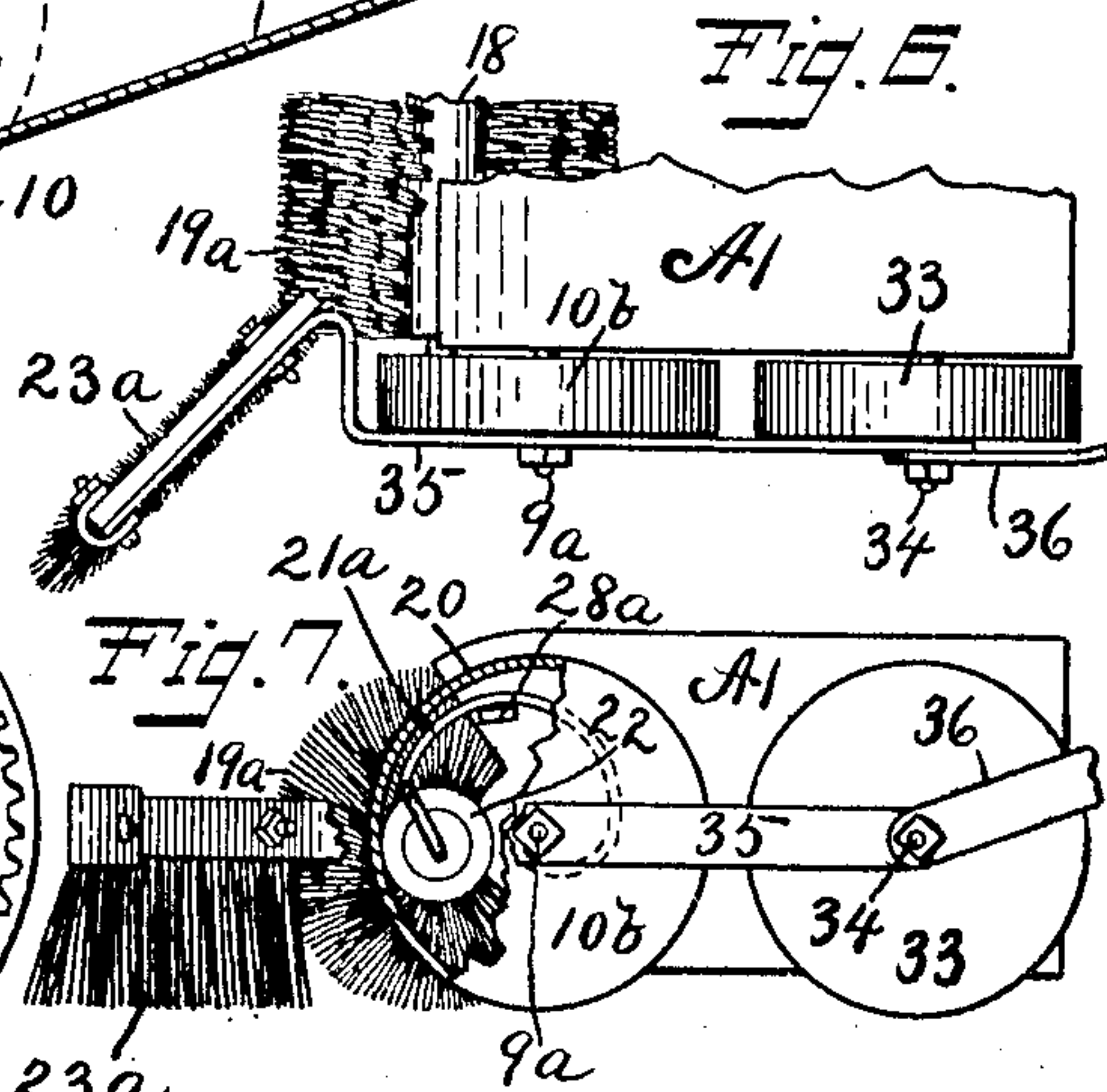
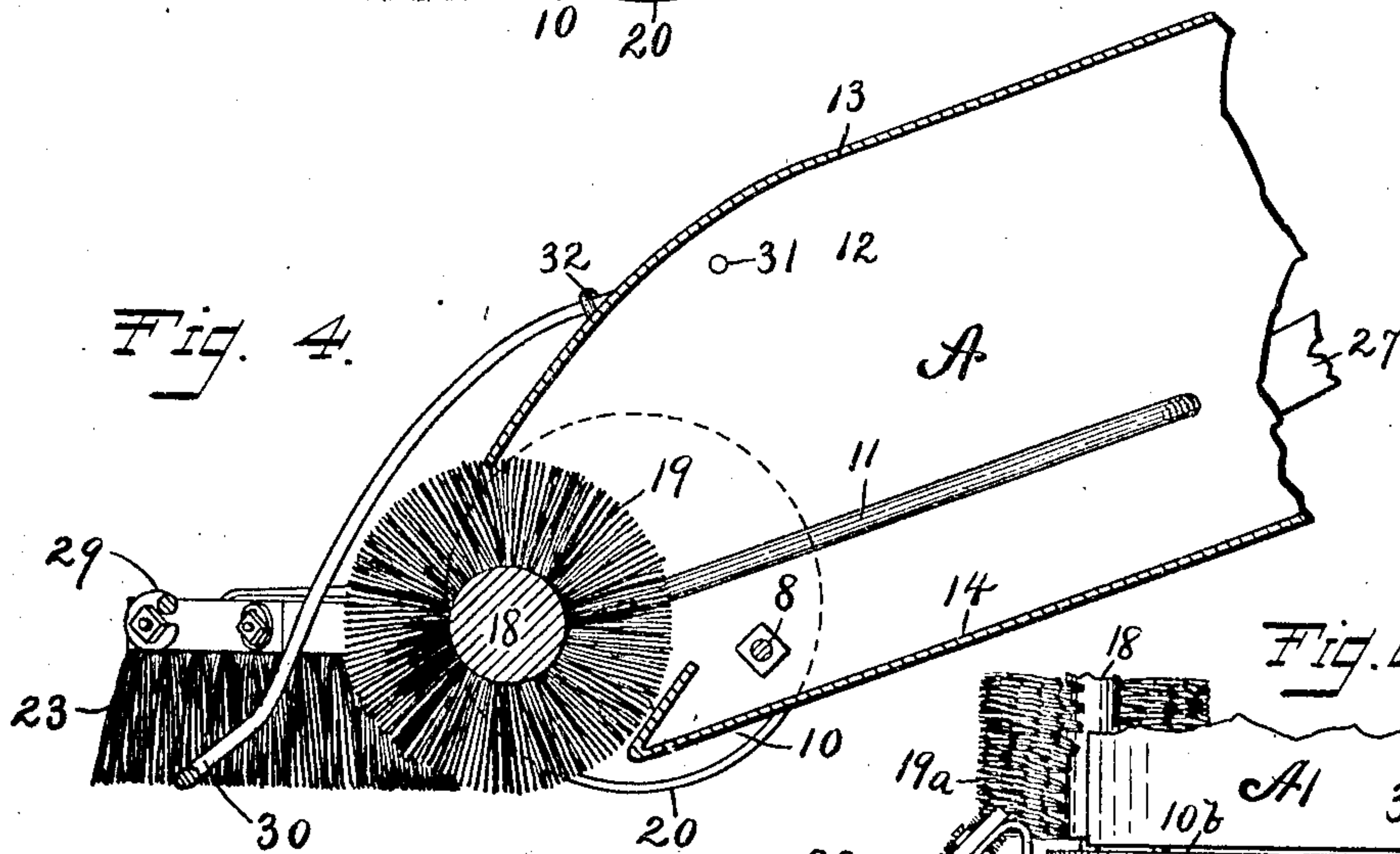
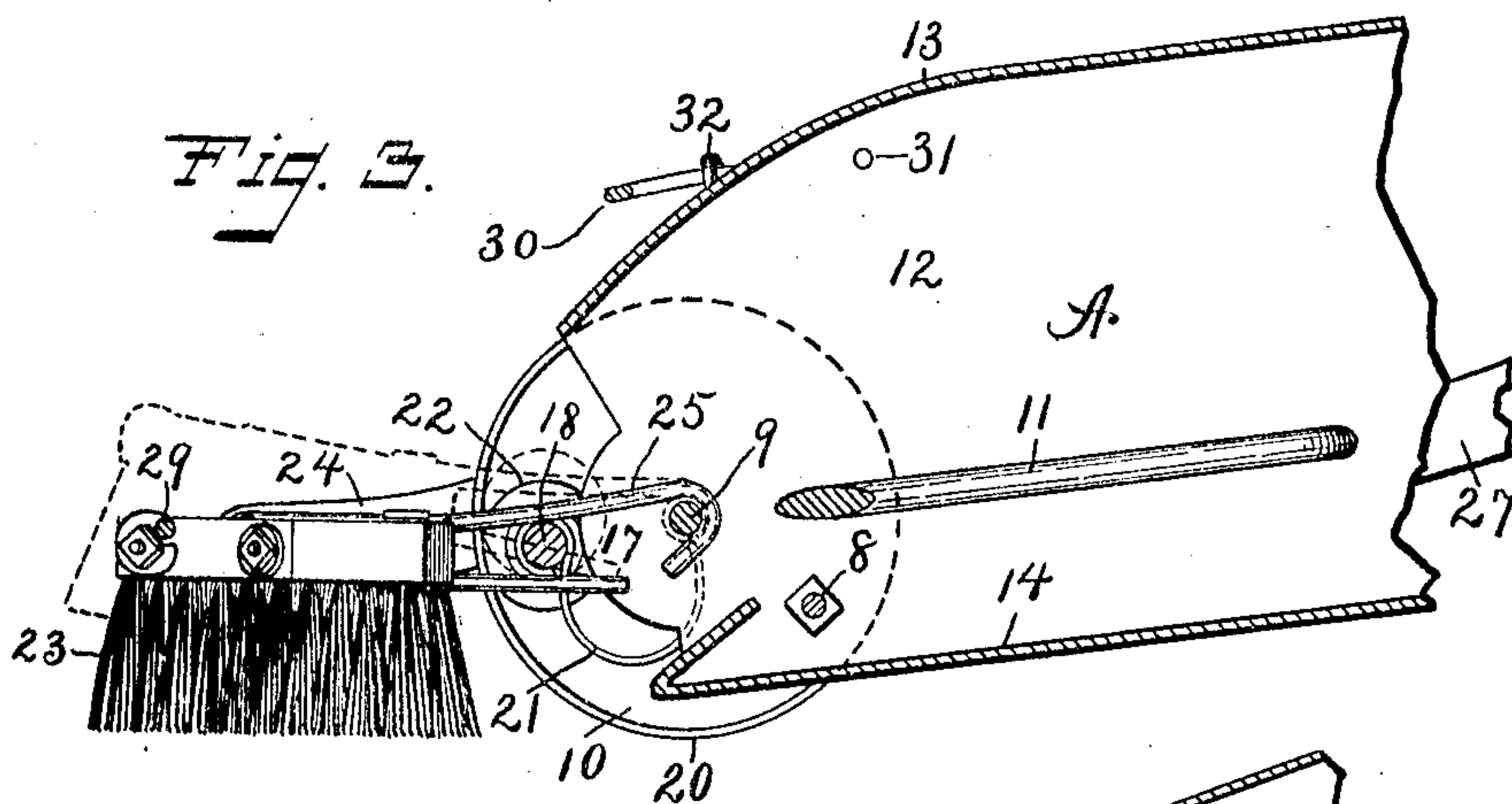
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JAMES F. STEVENS, OF PORT CHESTER, NEW YORK.

SWEEPER.

No. 920,209.

Specification of Letters Patent.

Patented May 4, 1909.

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To all whom it may concern:

Be it known that I, JAMES F. STEVENS, a citizen of the United States, residing at Port Chester, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Sweepers, of which the following is a specification.

My invention relates to improvements in sweepers for streets, floors or carpets, and the main objects of my improvement are efficiency and convenience in operation.

In the accompanying drawing:—Figure 1 is a broken out plan view of my machine, in that form which is more particularly designed for street sweeping. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged sectional side elevation of a portion of the same, on the line *x x* of Fig. 1. Fig. 4 is a sectional view of the same on the line *y y* of Fig. 1, and with the handle of the sweeper raised sufficiently to bring the scraper into action. Fig. 5 is a sectional side elevation, showing a form of gearing that may be used as a substitute for the friction gearing shown in Fig. 3. Fig. 6 is a plan view on a reduced scale, of a portion of my sweeper in that form which is more particularly designed for sweeping floors and carpets. Fig. 7 is a sectional side elevation of the same.

The box A constitutes the frame of the machine and may be of any desired or ordinary construction. It is formed of two sides 12, top 13 and bottom 14, and may be provided with cross rods 8 for giving the box the requisite strength. On each side near the front is a fixed post or stud 9 which studs serve as the axles or supports for the driving wheels 10. As shown, each of these studs is formed upon one end of a bent rod 11, the body of which is on the inside of the box, while the forward end forms the stud 9 that extends through the side 12 of the box and projects laterally therefrom on the outside to receive the driving wheel 10 and other parts hereinafter described. The rear end 15 of the rod 11 is screw threaded and in like manner is extended through the side of the box, where it is secured by a nut 16 on the outside. I prefer to make a small portion of the front end of each of the sides 12 of a circular form 17, adjacent to the studs 9 and concentric therewith, so as to leave an open space at the front for the axle or shaft 18 of the brush 19 to pass through

to the driving wheels 10 and for the said shaft to rise and fall as hereinafter described. The driving wheels, as shown are provided with inwardly projecting rims 20 to form an internal gear face for a friction gear, and the opposite ends of the brush shaft 18 are provided with friction pinions or rollers 22 that engage the said internal gear and are driven thereby. A spring 21 is applied to the brush at each end, one end of the said spring being connected with the brush shaft and the other end to a fixed support, as for example, to the inner end of the studs 9 that support the driving wheels. The said springs are under tension with a tendency to press the friction gears together, that is, to press the friction pinion or roller 22 against the inner face of the rims 20 of the driving wheels, whereby the said wheels as they rotate, drive the brush and make it rotate faster than the driving wheels and in the same direction.

I prefer to employ gathering brushes 23 that project obliquely from each front corner to catch the dirt and sweep it inwardly into the path of the main brush or rotary brush, so as to be caught thereby. These brushes are rigidly mounted on the swinging arms 24, which arms are pivoted on the studs 9 outside of the driving wheels 10. The brushes 23, are also provided with a secondary arm 25, preferably formed of wire doubled upon itself and hooked or pivoted to the studs 9 inside of the sides of the box, and consequently between the inner faces of the driving wheels at a point near the ends of the brush shaft 18. The two members of the wire arm 25 extend above and below the shaft 18 as shown in Fig. 3, whereby an up and down movement of the brush shaft and brush, necessitates an up and down movement of the gathering brushes 23.

If desired, a brace 29 may be secured by its opposite ends to the outer ends of the brushes 23, to assist in preventing them from spreading. The handle 26 for operating the sweeper is secured to two braces 27 which in turn are secured to the box A at their body portion by the rear ends 15 of the bent rods 11 and the nuts 16, while their forward ends are secured to or pivoted upon the outer ends of the studs 9 outside of the driving wheels 10 as shown, whereby the box A is pivoted on the same axis as the driving wheels and the rear end of the box

swings up and down on the said axis as the handle 27 is raised and lowered by the operator. In order to permit the brushes 18 and 23 to be lifted to bring them out of
 5 action by the downward movement of the handle, if desired when the machine is moving forwardly, or to make them act lightly, I provide the rear ends of the swinging arms 24 with stops 28 for engaging the lower
 10 edges of the braces when the handle is lowered beyond a certain point. These stops 28 in this connection, constitute means for tilting the arms 24 and brushes 18 and 23 upwardly by a downward movement of the handle,
 15 after the said handle has been lowered to a certain point. These stops are out of action when the handle is raised to the position shown in Fig. 2. In street sweeping there are spots that require scraping as well as
 20 sweeping, and therefore I provide the swinging box A of the sweeper with a scraper 30 that projects forwardly and downwardly between the brushes 23. This scraper can be of any suitable construction and secured
 25 in the position described in any ordinary manner. As shown, the scraper is formed of wire bent into proper shape with its middle portion 30 forming the active or street contacting part of the scraper, while
 30 the rear portion of the scraper is rigidly secured to the box by the bent ends 31 driven into the sides 12, and staples or other fastenings 32 a little forward of the said ends.

The gearing between the driving wheels
 35 10 and the rotary brush 19, for imparting a rotary movement to the brush through the rotary movement of the said driving wheels, may be either a friction gearing or a toothed gearing, as may be desired.

40 For heavy work like street sweeping the toothed gearing may be the best while the friction gearing is well adapted for light sweeping, as in a street sweeper of small size or in a house sweeper. The gearing shown
 45 in Figs. 1 and 3 is one form of friction gearing and may be of any suitable material.

In Fig. 5 I have shown one form of toothed gearing in which the driving wheels
 50 10^a are provided with teeth on the inner face of their rim 20^a, while the pinion 22^a is provided with teeth on its periphery to engage the said toothed rim, the other parts being the same as herein before described.

When the operator raises the handle 26
 55 far enough to let the brushes 23 and 18 strike the surface, and pushes the sweeper forward, the brushes 23 bear upon the surface and prevent the roller brush 18 from moving downward so as to bear with undue
 60 pressure, even when the handle is raised to the highest intended position. The forward movement causes the driving wheels to rotate and to drive the rotating brush in the same direction and at a greater speed whereby the
 65 periphery of the said brush moves back-

wardly over the surface being operated upon faster than the machine moves over the said surface and hence the dirt is swept backwardly into the box. By this arrangement of driving gear, I am enabled to place the
 70 rotary brush at the extreme forward end of the box and at the same time to make it throw the dirt rearwardly as the machine is pushed ahead.

The gathering brushes extend obliquely
 75 outward from the opposite front corners and brush or sweep the dirt for the extreme width of the path of the machine inwardly in front of the main brush. This they will do independently of the fact that the main
 80 brush is a rotating one. When the machine is pulled or drawn rearwardly, the motion of the driving wheels and rotary brush are reversed, but inasmuch as the said rotary brush has no fixed bearings and the gearing
 85 is still engaged, the pinions of the gearing ride upwardly on the inner sides of the rims 20 and carry the rotary brush upwardly with them so as to raise its periphery off from the surface and consequently the back-
 90 ward rotation of the said rotating brush does not sweep or throw any dirt from the front of the machine during its backward run. If the gathering brushes 23 are mount-
 95 ed as hereinbefore described, they also rise so as to clear the surface with the rising of the shaft 18 of the rotary brush 19, as shown by the broken contour lines in Fig. 3. When the operator raises the handle 26 so little,
 100 (or lowers it so much), that the stops 28 come into engagement with the lower edges of the braces 27, the brushes may be wholly lifted from the surface during the forward movement of the machine, or by a suitable elevation of the handle, the brushes may
 105 bear with a greater or less pressure as the operator may desire. The handle may be so elevated that the brushes 23 and 19 bear with all the force of the driving gear, while the scraper 30 is out of action and by raising
 110 the handle higher the scraper 30 may be forced down upon the surface to scrape and loosen the dirt where it is stuck down, and after it is thus loosened the rotating brush will sweep it back into the box.
 115

The construction shown in Figs. 6 and 7 is more particularly designed for house use. The box A¹, is provided with simple rollers or wheels 33 mounted on studs 34 for the
 120 rear end of the box to ride upon, while near the front end the driving wheels 10^b are arranged on fixed studs 9^a, the said wheels having the driving rims 20 as before described. The rotary brush 19^a has the same
 125 pinions 22 at each end and a spring 21^a is applied, substantially as before described to keep the pinion and rim in driving engagement with each other. In order to prevent the rotary brush 19^a from moving too far
 130 downwardly and bearing too hard on the

surface being swept, I provide the stop 28^a on the side of the box to limit the downward movement of the spring 21^a and rotating brush as the said spring swings up and down with the said brush. I also employ gathering brushes 23^a substantially the same as in the construction herein before described, only these brushes are lighter and are rigidly mounted on braces 35 that are in turn mounted on the studs 9^a and 34. Any suitable handle may be provided and pivoted to the box A¹ in any proper manner to swing up and down without carrying the box with it. I have only shown a portion of this sweeper with the proper wheels and gathering brush at one side thereof, the other side being substantially a duplicate of the side shown. The arms of the handle fork or bail by which to pivot the handle to the box may be connected with the studs of either pair of wheels as the one arm 36 of such a fork or bail is shown in Figs. 6 and 7 as pivoted to one of the studs 34 for the wheels 33. The operation of the driving wheels and rotary brush is the same as that of those before described, and the action of the gathering brushes is the same excepting that they do not rise and fall, but bear on the surface being swept when the machine moves either way.

In all the forms shown the connecting gearing of the driving wheels and rotary brush when the said brush is free from journal bearings on the frame, perform the function of forcing the rotary brush downwardly during the forward movement of the sweeper and upwardly during the rearward movement. Means of some kind must be employed for holding the connecting gearing in operative engagement. When hollow driving wheels are used and a spring is employed to force the driven member of the gearing toward the rim of the hollow driving wheel, the said rim of the driving wheel and the said spring together constitute means for holding the connecting gearing in operative engagement. In this connection, and in connection with the toothed gearing shown in Fig. 5, I wish to call attention to Fig. 3, and to the fact that the open space at the front of each of the sides of the frame for the shaft 18 of the rotary brush 19 to rise and fall within, is bounded on the side opposite the rim of the driving wheels by a small portion that is of a circular form 17, adjacent to the driving wheels and concentric therewith.

It is apparent that some changes from the specific construction herein disclosed may be made and therefore I do not wish to be understood as limiting myself to the precise form of construction shown and described, but desire the liberty to make such changes, in working my invention, as may

fairly come within the spirit and scope of the same.

I claim as my invention:—

1. A sweeper comprising a frame with driving wheels mounted thereon, a rotary brush having a movable axis in front of the axis of the said driving wheels, connecting gearing carried by the said brush and wheels, and means for holding the said connecting gearing in operative engagement, the said brush and that member of the connecting gearing which belongs to the said brush being free from journal bearings on the said frame whereby they are free to move up and down for having the driving wheels and gearing force the rotating brush downwardly during the forward movement of the sweeper and upwardly during its rearward movement.

2. A sweeper comprising a frame with driving wheels mounted thereon, a rotary brush mounted on a shaft and movably carried by the said frame in front of the axis of the said driving wheels, connecting gearing carried by the said driving wheels and brush for rotating the said brush in a direction to carry the lower side of the said brush backward when the machine is rolled forward, and springs acting on the said shaft of the brush for holding the gearing that is carried by the brush in engagement with the gearing that is carried by the driving wheels.

3. A sweeper, comprising a frame with driving wheels mounted on a fixed axis on the said frame, a rotary brush having a movable axis in front of the axis of the said driving wheels, connecting gearing carried by the said driving wheels and brush, means for holding the said connecting gearing in operative engagement, the said brush and that member of the connecting gearing that belongs to the said brush being free from journal bearings on the said frame and free to move up and down for having the driving wheels and gearing force the rotating brush downwardly during the forward movement of the sweeper and upwardly during its rearward movement, and a stop to limit the downward movement of the said rotary brush relatively to the said frame.

4. A sweeper, comprising a frame with driving wheels mounted thereon, a rotary brush carried by the said frame, connecting gearing carried by the said driving wheels and brush, means for holding the said connecting gearing in operative engagement, gathering brushes at the forward corners of the said frame, and swinging arms connecting the said brushes, the said arms being pivotally mounted on the frame to swing with the said brushes.

5. A sweeper, comprising a frame with

driving wheels mounted thereon, a rotary brush movably carried by the said frame, connecting gearing between the said driving wheels and brush, gathering brushes at
5 the forward corners of the said frame, swinging arms connecting the said brushes and mounted to swing with the said brushes on the said frame for the simultaneous up and down movement of the said arms and
10 brushes, and a handle fixed to the said frame for tilting the frame on the axis of the said driving wheels.

6. A sweeper, comprising a frame with driving wheels mounted thereon, a rotary
15 brush movably carried by the said frame, connecting gearing between the said driving

wheels and brush, gathering brushes at the forward corners of the said frame, swinging arms connecting the said brushes and mounted to swing with the said brushes
20 on the said frame for their simultaneous up and down movement, a handle fixed to the said frame for tilting it on the axis of the said driving wheels, and means for tilting the said arms and brushes upwardly by
25 a downward movement of the handle after the said handle has been lowered to a given point.

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Witnesses:

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