

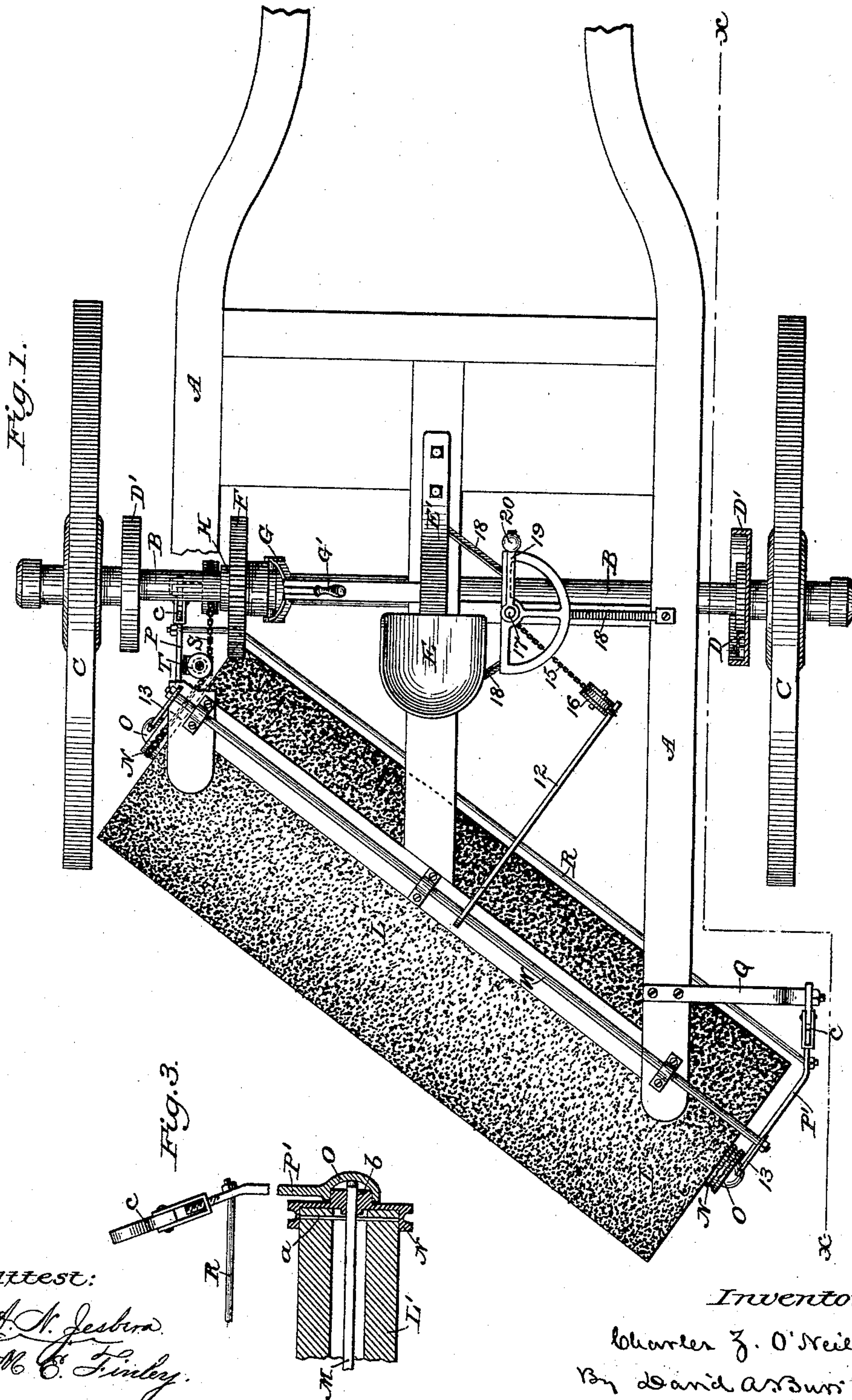
(No Model.)

2 Sheets—Sheet 1.

C. Z. O'NEILL.
STREET SWEEPING MACHINE.

No. 395,627.

Patented Jan. 1, 1889.



Attest:

A. N. Jespersen.
M. E. Finley.

Inventor:

Charles Z. O'Neill
By David A. Burr
Atty.

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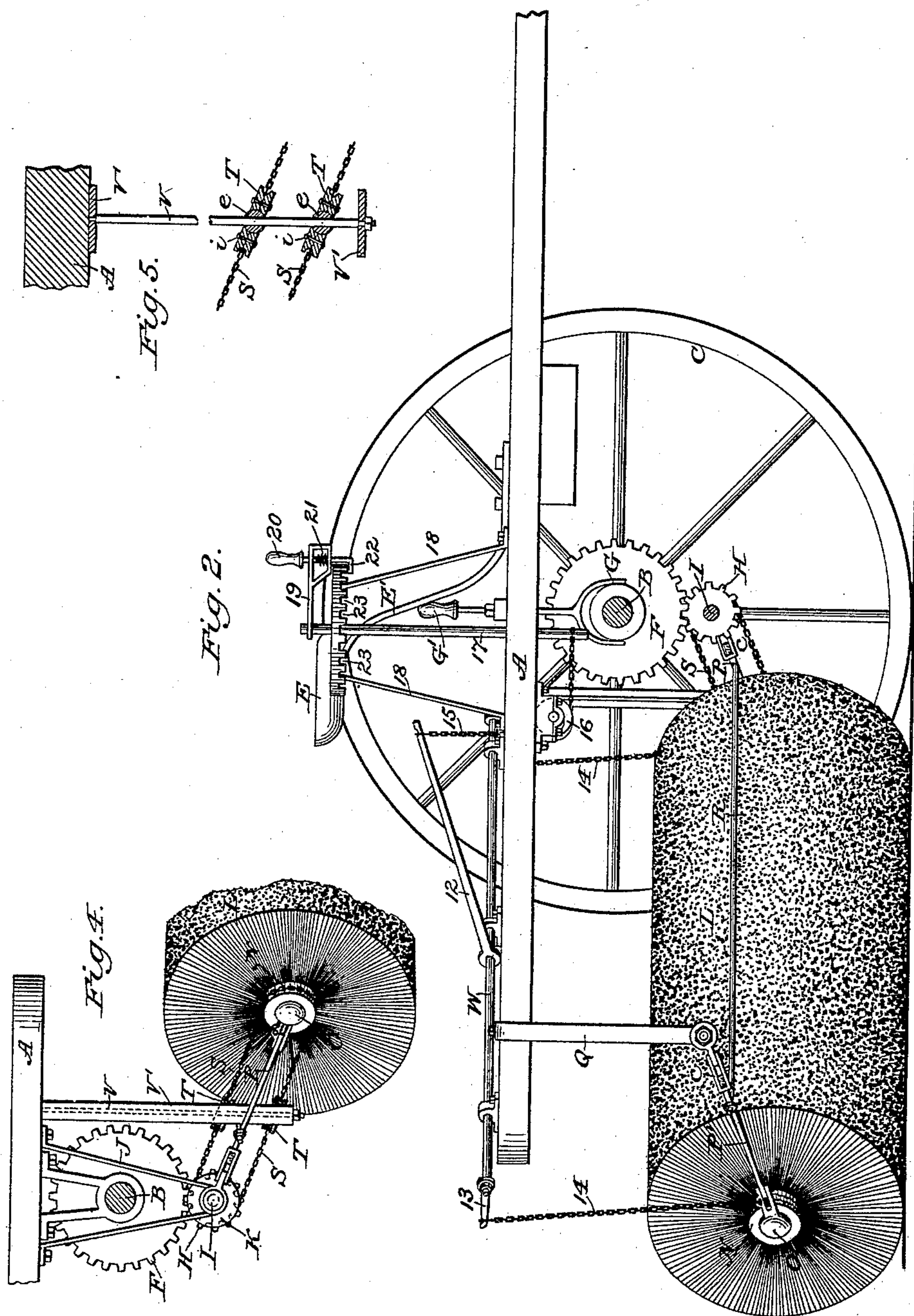
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UNITED STATES PATENT OFFICE.

CHARLES Z. O'NEILL, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM CHAPMAN, OF SAME PLACE.

STREET-SWEEPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 395,627, dated January 1, 1889.

Application filed August 24, 1887. Serial No. 247,727. (No model.)

To all whom it may concern:

Be it known that I, CHARLES Z. O'NEILL, of the city, county, and State of New York, have invented certain new and useful Improvements in Street-Sweeping Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a plan view of my improved street-sweeping machine with the case of the ratchet actuating one of the wheels in section; Fig. 2, a vertical section in line *xx* of Fig. 1; Fig. 3, a detached view of one end of the central body or core of the broom and of one of its journal-bearings in diametric section; Fig. 4, a detached side elevation of one end of the broom, illustrating its gearing with the axle; and Fig. 5, a sectional view of the hanger and guide-rollers for the chain gearing the broom to the axle.

Similar letters indicate like parts in all of the figures.

My invention relates to that class of street-sweeping machines in which the broom is set at an angle with the axle instead of parallel therewith. In these machines the broom is customarily geared by a chain-gear to a counter-shaft driven by the axle, but placed at some distance in front thereof. In consequence of this arrangement of gears there is a constant downward pull upon the shaft, which tends to lift the broom, and which, moreover, creates an unnecessary and injurious strain upon the horse.

The object of my present invention is to remedy this defect in this class of street-sweeping machines and to simplify the gearing and the construction of the apparatus, so as to obtain a much lighter and easier-running machine, with fewer and simpler parts, than any heretofore made and used.

It consists, mainly, in the combination, substantially as hereinafter described and claimed, with the rotary axle of the machine, a broom having vertical play and mounted to revolve at an angle with said axle, and a sprocket-wheel upon the shaft carrying said broom, of a rotating shaft mounted immediately beneath the axle and geared thereto

to be driven thereby, a sprocket-wheel upon said shaft, a drive-chain coupling the two wheels, and interposed guide-rollers mounted to rotate upon freely-oscillating axes and to have vertical play in suitable bearings.

It consists, also, in devices, as described and claimed, for securing the broom to the rotating shaft which carries it and for facilitating its movements.

In the accompanying drawings, A represents the frame of the machine; B, the rotating axle upon which the frame is mounted in the customary manner; C C, the wheels secured to the axle as usual; D, the customary pawl and ratchet inclosed in a suitable case, D', at the inner end of each wheel-hub, and by which a reverse movement of the wheels and axle is prevented; and E, the driver's seat fixed upon an elastic curved standard, E', above the center of the axle, as in the ordinary forms of street-sweeping machines.

A toothed wheel, F, is fitted upon the axle B at one end thereof, just inside of the journal-bearing in the frame A, and is coupled and uncoupled with the axle to turn with it or be free therefrom by a simple clutch, G, of ordinary form, operated by a vibrating lever, G', extending up within reach of the driver's hand when upon the seat E.

The toothed wheel F gears with a pinion, H, (see Fig. 2,) upon a short counter-shaft, I, supported in hangers J, depending from the frame A, as shown in Fig. 4. Upon this counter-shaft I is secured a sprocket-wheel, K. (See Fig. 4.)

L represents the cylindrical broom formed upon a hollow wooden shell, L', through which is inserted centrally its axial rod M. This rod is secured to the shell by means of a transverse pin, *a*, (see Fig. 3,) passing diametrically through each end of the wooden shell and through the axial rod. Each end of the broom is furthermore fitted with a metallic cap, N, made to embrace the same closely and which is pierced centrally with a rectangular aperture to fit over and embrace the projecting end of the axial rod M, squared to pass snugly through it, whereby independent revolution of the cap and rod is prevented.

The periphery of each cap N is circumferentially grooved and notched, (see Fig. 3,) to

adapt it to engage an endless chain by which to gear the broom with the driving-axle. A central hub, *b*, is formed upon each end of said end caps, *N*, of the broom to receive an outer band or cap plate, *O*, and form a bearing for the same. The cap-plates *O O* are connected, respectively, by iron arms *P P'*, the one *P* with the end of the counter-shaft *I* at the foot of the hanger *J*, and the other, *P'*, with a curved hanger, *Q*, secured to the frame *A* on the opposite side of the machine to extend out and depend therefrom in such manner as that its lower end shall bear the same relative position to the end of the broom on that side of the machine as does the lower end of the hanger *J* to the end of the broom on the opposite side of the machine.

The arms *P P'* are attached to the hangers *J* and *Q* by pivotal connections, and are furthermore provided each with a swivel-joint, *c*, as shown in Fig. 3, formed in the length thereof, so as to permit freedom of movement to the broom in order that it may accommodate itself to the inequalities of the ground and admit of being readily raised and lowered, as hereinafter described.

The two arms *P P'* are coupled together and the bands or cap-plates *O O*, in which the axle *M* of the broom is journaled, are held upon the axle by means of a cross-bar, *R*, extending parallel with said axle and made fast at its ends to said arms, as shown in Figs. 2 and 3.

The broom *L* is geared to the sprocket-wheel *K* by means of an endless chain, *S*, carried over said sprocket-wheel *K* at one end and over the notched periphery of the cap *N* on the proximate end of the broom at the other, as shown in Fig. 4, and the chain is guided intermediate said wheels by means of adjustable guide-rollers *T T*, (see Fig. 5,) so as to be free to play vertically upon said rod. The central spherical axial bearings, *e e*, for the rollers permit them not only to rotate freely about said pivotal axes, but also to oscillate therein in any direction, so that each roller turns upon a universal joint, and is also free to play vertically upon the supporting-rod *V*. The lower end of the rod *V* is stayed by means of a bracket or hanger, *V'*, depending from the frame *A*. (See Fig. 5.) The rollers *T T* are each made in two divisions, which, after being united upon the central spherical bearing, are secured by means of transverse bolts *i i*. (See Fig. 5.) The periphery of each guide-roller is properly notched to engage the bight of chain carried over it.

The broom *L* is elevated and lowered in the customary manner by means of a rock-shaft, *W*, (see Fig. 2,) supported in suitable bearings on the top of the frame in line parallel with the axis of the broom and actuated by a lever, *12*, which projects forward from the rock-shaft to a point in line with the driver's seat. At either end of the rock-shaft arms

13 13 are secured to project rearwardly over the bearings of the broom, and the outer ends of these arms are connected to the outer ends of the arms carrying the broom by suspension-chains *14 14*, as shown in Fig. 2. A chain, *15*, is carried from the outer end of the lifting-lever *12* over a friction-pulley, *16*, (fixed to rotate in bearings upon the frame *A*,) and out to the lower end of a vertical rotating rod, *17*, to which it is secured. This vertical rod *17* is fitted to rotate in suitable bearings in the frame *A* and in the upper end of a tripod or pedestal, *18*, supported by the frame over the axle *B*, and on the side of the seat *E* opposite that upon which the clutch-lever *G* is placed. A crank-arm, *19*, is secured to the upper end of the rod to project longitudinally therefrom above the top of the pedestal *18* in ready reach of the driver's hand, when he is on the seat *E*. The handle *20* on the outer end of the crank is left free to have a limited vertical play in the crank-arm, but is kept automatically in an elevated position by means of a spiral spring, *21*, as shown in Fig. 2. The lower end of said handle below the crank-arm is formed in the shape of a hook, *22*, adapted to engage a series of notches, *23 23*, formed on the under side of a segmental plate fixed to the pedestal *18*, and which describes an arc having the axis of the rod *17* as its center. As the handle *20* is forced upward by its spring *21*, the hook *22* is automatically made to engage one of said notches, and thereby lock the crank and prevent a rotation of the rod *17*. By releasing the rod and partly rotating it in one direction the chain *15* will be wound up thereon, so as to lift the broom *L* more or less from the ground, while by a reverse movement of said rod the broom will be allowed to drop.

In the operation of this improved machine the draft of the chain *S*, by means of which the broom is geared to the axle, is at a point immediately under the axle instead of in front thereof, and the gearing is far more easy and direct than in the old style of machines. The friction and guide rollers *T T* operate to conduct the gearing-chain to the broom with the least possible friction, and by their universal movements permit the chain to accommodate itself readily to all heights and inclinations of the broom. As the bearings for the broom are supported by pivotal arms of equal length provided with swiveled joints in the length thereof, they allow the broom to adjust itself automatically to all the inequalities of the ground without strain upon the gearing or other parts of the machine, while the broom may be readily lifted by the driver when not required, and as readily lowered again for use by a simple movement of the crank *19*, which is within the driver's reach on one side, while the broom is thrown in and out of gear, as required, by the lever *G'*, which is within reach on the other side.

I do not claim as new the adjustment of the

height of the broom from the ground by means of a rock-shaft mounted in the frame parallel with the axis of the broom, and which is provided with crank-arms, to which the arms carrying the broom are suspended, and with a radial lever or crank-arm, by means whereof the rock-shaft is oscillated. My invention relates to the combination, with said mechanism, of a horizontal crank mounted within ready reach of the driver, provided with a catch, by which it is automatically held in any given position, and which operates by means of a vertical shaft (to which it is secured) and an interposed winding-chain to actuate the rock-shaft lever so as to raise or lower it, and thereby lift or depress the broom, in manner as described.

I claim as my invention—

1. The combination, in a street-sweeping machine, of a broom revolving upon an axis inclined at an angle with the axle of the machine, a driving-shaft rotating parallel with the axle and geared thereto, sprocket-wheels upon the proximate ends of the driving-shaft and broom-shaft, intermediate guide-rollers whose pivotal axes oscillate freely and have

free vertical play in their bearings, and a drive-chain carried over the two sprocket-wheels and said interposed guide-rollers, substantially in the manner and for the purpose herein set forth.

2. The combination, with the hollow wooden core of the cylindrical broom in a street-sweeping machine, of a central shaft carried through said core, transverse pins passing diametrically through the core and shaft at or near the ends thereof, a circular cap-plate fitted upon the ends of the core to embrace the same and formed with a central rectangular aperture to receive the counterpart angular end of the shaft, and a notched peripheral groove adapted to engage the links of a drive-chain, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHS. Z. O'NEILL.

Witnesses:

A. N. JESBERA,
M. E. FINLEY.