

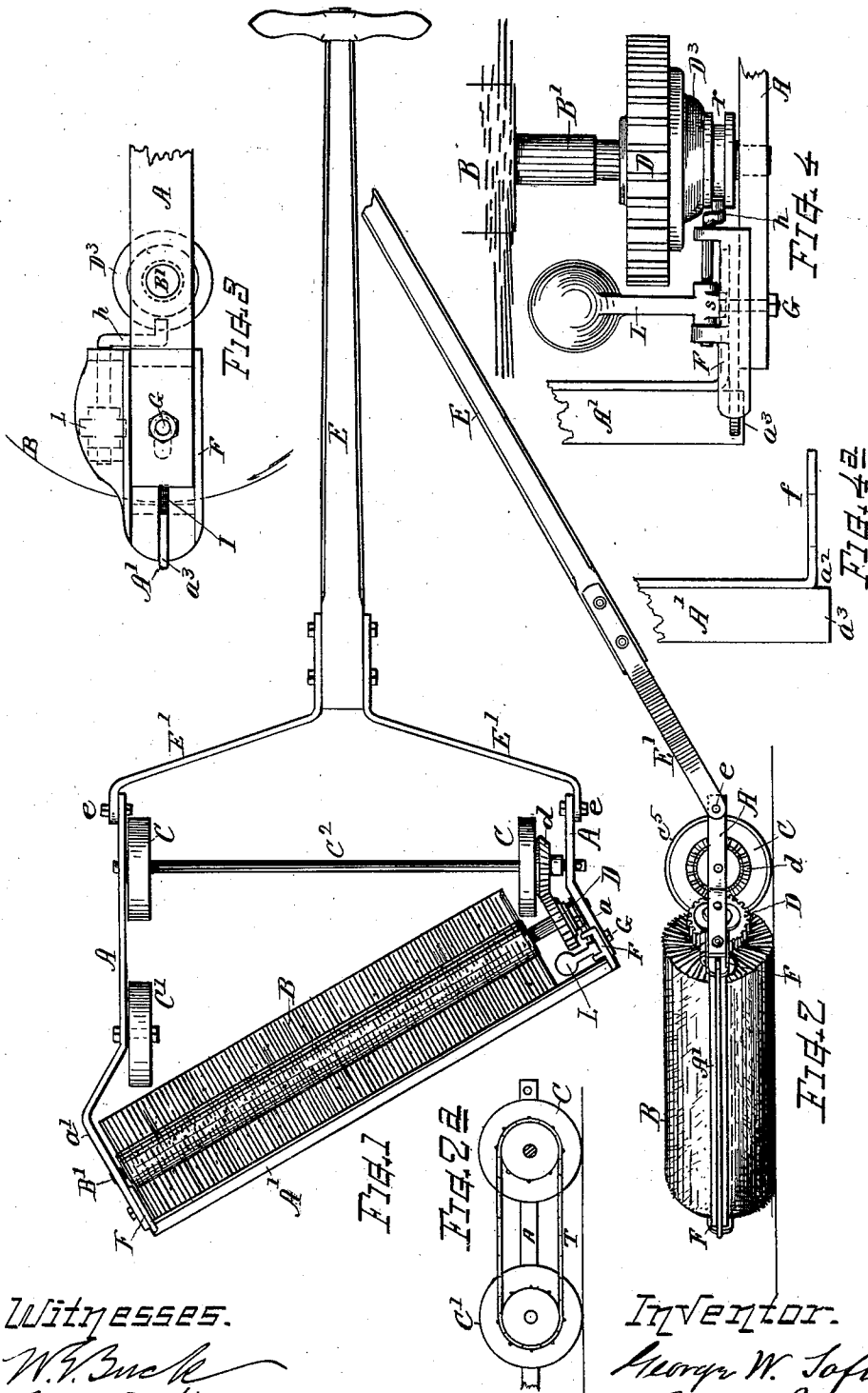
(No Model.)

2 Sheets—Sheet 1.

G. W. TAFT.
SWEEPING MACHINE.

No. 588,250.

Patented Aug. 17, 1897.



Witnesses.
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(No Model.)

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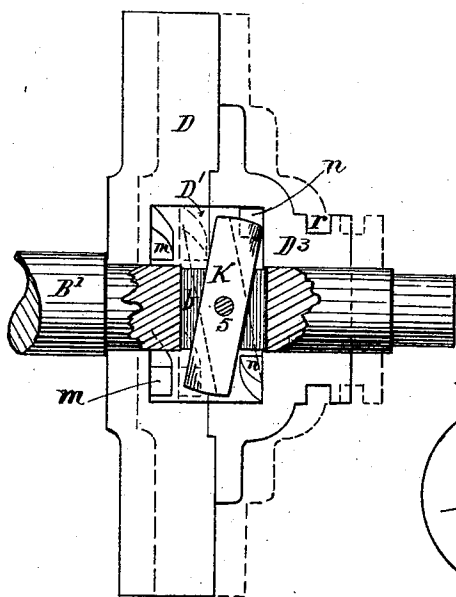


FIG. 5

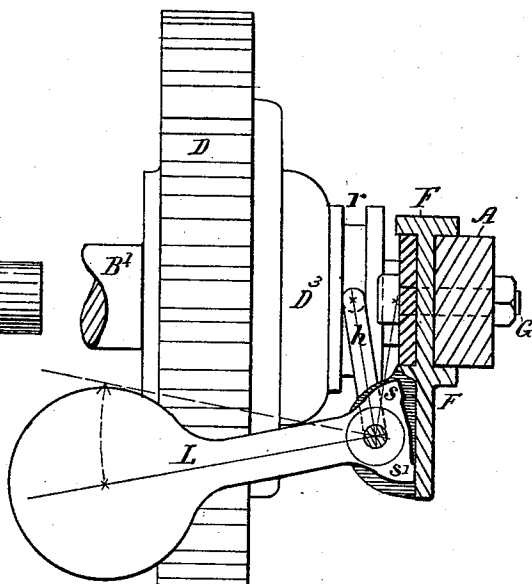


FIG. 6

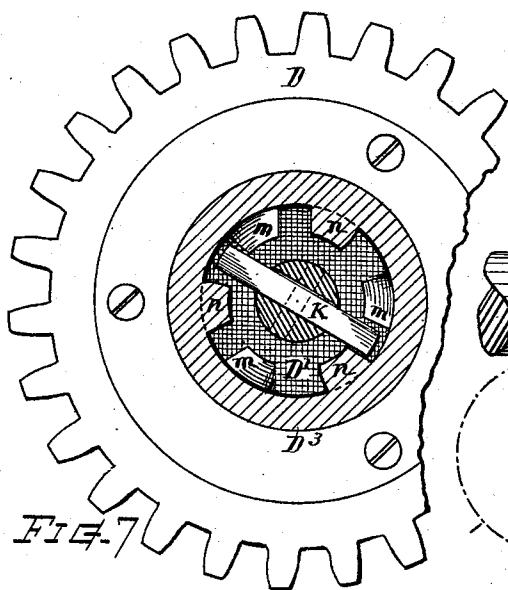


FIG. 7

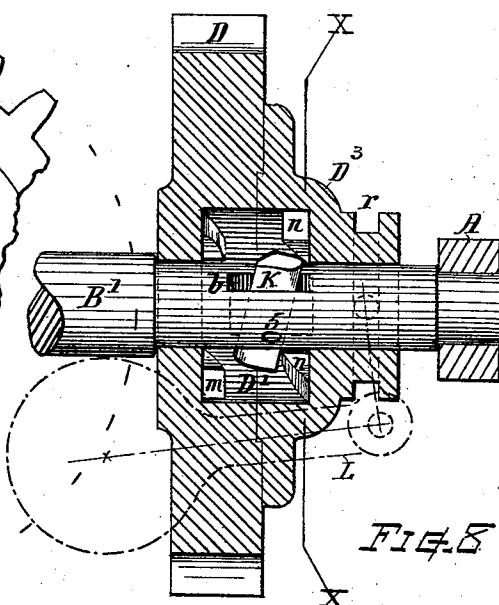


FIG. 8

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UNITED STATES PATENT OFFICE.

GEORGE WARNER TAFT, OF KENNETT SQUARE, PENNSYLVANIA.

SWEEPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 588,250, dated August 17, 1897.

Application filed February 2, 1897. Serial No. 621,661. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WARNER TAFT, a citizen of the United States, residing at Kennett Square, in the county of Chester and State of Pennsylvania, have invented a new and useful Sidewalk-Sweeping Machine, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to produce an efficient machine adapted for sweeping sidewalks, railway-station platforms, and similar uses, said machine provided with a diagonally-disposed rotary broom or brush and a carrying-frame that is radially invertible for changing the direction of operation; also, to provide an invertible sweeping-machine with a dual brush-operating clutch or ratchet device and with means for automatically shifting or reversing the action of said brush-operating ratchet to accord with the required direction of rotation for the brush when the machine is inverted.

Another object is to afford a simple and inexpensive means for attaching the front guard-bar at the angles of the frame and to render the same adjustable to the face of the brush as the latter is reduced in diameter by wear.

These objects I attain by the mechanism illustrated in the accompanying drawings, wherein—

Figure 1 represents in plan view a sweeping-machine embodying my invention. Fig. 2 is a side view of the same. Fig. 2^a shows a modification. Fig. 3 is a side view on somewhat larger scale, showing the angle connection of the side frame and front bar. Fig. 4 is a plan view of the angle connection, the gear, and automatic shifting device. Fig. 4^a shows the end of the front bar. Fig. 5 is a sectional view showing the ratchet or clutch mechanism for the gear and brush-shaft. Fig. 6 is a vertical section showing the means for shifting the gear and ratchet. Fig. 7 is a transverse section at line *xx* on Fig. 8, and Fig. 8 is a vertical section of the drive-gear and ratchet mechanism.

My improved sweeper consists of an open

horizontal frame provided with carrying-wheels and having a diagonally-disposed rotatable cylindrical brush mounted in the front part thereof, with suitable gearing for operation of said broom, and having a tongue or handle flexibly joined to the rear part of the frame. The brush, the carrying-wheels, and other parts are arranged to axially correspond with the plane of the frame or in a manner that renders the machine conveniently invertible and practically operative either side up, so that by inversion of the sweeper for its respective runs back and forth upon the walk or platform the sweepings will be brushed or driven laterally and in the same direction at both passes of the machine, as more fully hereinafter described.

Referring to parts, A denotes the frame; B, the rotary cylindrical brush; C, C, and C', the carrying-wheels; D, the brush-operating gear, and E the tongue or handle by which the machine is propelled.

The frame A is composed of two side pieces made of flat bar-iron and formed horizontally straight, but bent or offset laterally near the fore ends to afford diagonal bearings for the brush-shaft and having their forward extremities connected by a T-iron bar A', that is arranged parallel with the axis of the brush and at such distance therefrom as will just allow passage of the bristles across the inner face of said front bar. The rear ends of the frame-bars are connected by the fork E' of the handle E, which are horizontally pivoted thereto, as indicated at *e*, in a manner that will allow the handle to swing up and down whether the machine is one side up or the other.

The wheel C' runs upon a stud fixed in the longer side of the frame, while two wheels C are mounted upon an axle or transversely-disposed shaft C², the respective ends of which are journaled in the frame-bars. The brush-shaft B' is journaled in the diagonal portions of the frame, the brush B being preferably about thirty inches, more or less, in length and of a diameter of some six or eight inches, more or less. Said brush is disposed with its axis about thirty degrees diagonal in relation to the longitudinal line of travel of the carrying-wheels. The wheels C and C' are prefer-

ably arranged at the inner side of the frame and to run within the space swept by the brush.

The front bar A' is best attached to the fore end of the side bars by a small casting or joint-piece F, (see Figs. 3, 4, and 5,) that permits adjustment of the bar A' relatively to the face of the brush B. The piece F has an outside groove that receives the end of the side frame A and an inner side groove that receives the end of the bar A', the latter being preferably formed as indicated in Fig. 4^a—that is, with the web of the T-iron cut back at a^2 and the flange-plate bent backward at proper angle, as at f , to fit the joint-piece, which latter is provided with a horizontal slit or groove I in its fore end to receive and support the projecting end a^3 of the T-iron in the manner illustrated. A bolt G passes through the several parts and secures them firmly together. The part F being slotted for the bolt and the slit I extending inward some distance beyond the width of the web a^3 affords facility for adjusting the bar A' to the face of the brush as it wears away and also makes a very simple, inexpensive, and strong connection for the frame. One of the joint-pieces is provided with ears for the gravity-lever and the other is formed without ears. In some instances the front bar may be made solid or permanently joined to the side bars, and I desire to include such structure of frame as within my claim.

A suitable gear d is provided on the shaft or wheel C, which engages with gear D on the brush-shaft for imparting rotary motion to the brush from the traveling wheels, but in opposite direction of rotation.

The gear D is arranged to turn loose upon the brush-shaft and is provided with a reversible ratchet-clutch and means for shifting the same to change the direction of its action automatically when the sweeper is inverted. The preferred construction for the reversible ratchet and its shifting appliances is shown in detail in Figs. 5 to 8.

The gear D and the grooved hub D³ attached thereto are formed with an internal chamber D' and provided at one end of said chamber with three ratchets or inwardly-projecting detents m , having square faces in one direction and beveled in the other, while at the opposite end of the chamber there are three similar ratchets or detents n of similar form, but facing in the opposite direction. The shaft B' is provided with a transverse mortise b , through which there is arranged a centrally-pivoted swinging bar or pawl K, the ends of which project into the chamber D' and are adapted on one face to engage the detents m or n , while their opposite face is beveled or rounded to pass over the inclined back of the detent when the latter is moved in backward direction, the pawl-bar K swinging on its pivot δ , so as to allow one detent

to pass one of its ends while its other end is in the space between two detents. (See Fig. 5.) Thus when the machine is backed the brush is not rotated, but when the machine is run forward the detents engage the pawl-bar and cause rotation of the shaft and brush.

The gear and hub have a limited sliding action longitudinally on the shaft B sufficient for bringing either of the respective sets of detents m or n into engagement with the pawl-bar K and at the same time carrying the opposite detents out of reach of said pawl-bar. Hence when the gear is moved to the left the ratchet effects rotation of the shaft in one direction, and when moved to the right rotation in the opposite direction is effected, backward release being afforded in either instance in opposite order according with the ratchet action.

A gravity-lever L is pivoted on the frame or its corner-piece F, said lever having a crank or arm h , that enters the groove r in the hub D'. A movement or drop of the weighted end of said lever effects the shifting of the drive-gear and ratchet for bringing the proper set of detents into action with the pawl-bar.

The heel end of the lever L is best formed with stop-lugs s and s' , that strike the frame and sustain the lever at a given limit of movement, thus preventing the constant drag and wear on the groove of the gear-hub that might otherwise occur if the downward fall of said lever was limited only by the traverse of the drive-gear on the shaft.

In some instances, if desired, the wheel C' may be connected with the shaft and wheel C by a band or sprocket-chain T, as indicated in Fig. 2^a, thus utilizing the power of said wheel C' to aid in operating the brush. Ordinarily, however, such connecting-chain is not employed. The carrying-wheels may in some instances be provided with removable peripheral bands, as at c^3 , to be removed for reducing the size of the wheels as the face of the brush becomes worn away, thereby decreasing its diameter.

In the operation the operator taking hold of the handle E pushes the sweeper along the walk or surface to be swept. The rotary motion from the wheel C is imparted to the brush B through the gearing and ratchet-clutch. The sweepings are driven laterally by the brush and left in a row from the rear end of the brush. At the end of the run the operator raises the handle and carries it forward over the sweeper, causing the machine to be overturned or inverted, thereby reversing the diagonal relation of the brush and setting the machine in condition for traveling or returning in opposite direction to the first run and for sweeping the row of debris laterally and in the same general direction as before. Thus by inverting the machine at the end of each run and running it back and forth along a sidewalk or platform of any

width the surface can be cleaned of dirt or light snow in an efficient and expeditious manner.

When the machine is inverted, the gravity-lever L drops or swings within its limit of action and automatically slides the gear on the brush-shaft, shifting the relation of the ratchet devices to change the direction of their operative engagement, so that the brush will be rotated by forward movement of the machine and released when backing the machine regardless as to which side up the machine is being used.

The bar A' serves as a front guard for preventing injury to the brush and also by just hitting the tip end of the bristles prevents leaves and other light refuse from being carried over upon the face of the brush. The frame extending around the brush and wheels at their central horizontal plane serves to guard the mechanism against injurious contact with objects and enables the machine to be overturned readily and used either side up with equal facility and effect.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. A sweeping-machine comprising a diagonally-disposed rotatable brush, and an invertible supporting-frame therefor mounted on carrying-wheels, said parts being arranged for use with either side uppermost, and adapted for reversal in the direction of operation by inversion or overturn of the machine, substantially as set forth.

2. The sweeping-machine comprising in combination the invertible supporting-frame mounted on wheels and provided with the pivotally-attached handle, the diagonally-disposed rotatable brush, connecting-gears for driving said brush, the reversing-ratchet clutch for the brush-shaft and means for automatically shifting said clutch to reverse the ratchet action when the machine is inverted, substantially as set forth.

3. The combination with the invertible sweeper-frame, and the rotatable brush diagonally mounted therein, of the guard-bar A' arranged across the front, the brush adjacent

to the face thereof, and having its ends adjustably connected with the side bars of the frame, for the purposes set forth.

4. The combination, with the invertible frame, of the brush axle, or shaft, having a transverse mortise therethrough, the swinging pawl-bar pivoted in said mortise with its ends projecting at either side of the shaft, the drive-gear wheel and its hub arranged to slide on said shaft and having an internal chamber inclosing said pawl-bar, and provided with oppositely-directed ratchet-detents at the respective ends of said chamber, the gravity-lever pivoted on the frame and provided with an arm engaging the groove in the drive-gear hub and adapted for shifting said gear endwise on said shaft to automatically bring the respective ratchets alternately into engagement, for the purpose set forth.

5. In an invertible sweeping-machine frame, the combination, with the drive-gear, the brush-shaft, and the ratchet-clutch devices; of a gravity-lever for shifting the ratchet-clutch, said lever provided with stops or lugs s and s' that contact with the frame for limiting movement of said lever.

6. In a sweeping-machine the combination, substantially as described, of the frame composed of horizontal side bars with laterally-inclined fore ends joined by a front guard-bar, the handle pivoted to their rear ends, two carrying-wheels on an axial shaft journaled in the central part of said frame, a front carrying-wheel supporting the longer side bar, the diagonally-disposed rotary brush, the gearing for operating said brush, the dual ratchet-clutch mechanism for engaging said gear and its shaft, and the gravity-lever fulcrumed on the frame and connected for shifting the ratchet automatically when the machine is inverted, substantially as set forth.

Witness my hand this 27th day of January, A. D. 1897.

GEORGE WARNER TAFT.

Witnesses:

EDWIN S. PHILIPS,
WILLIAM K. WALDRON.