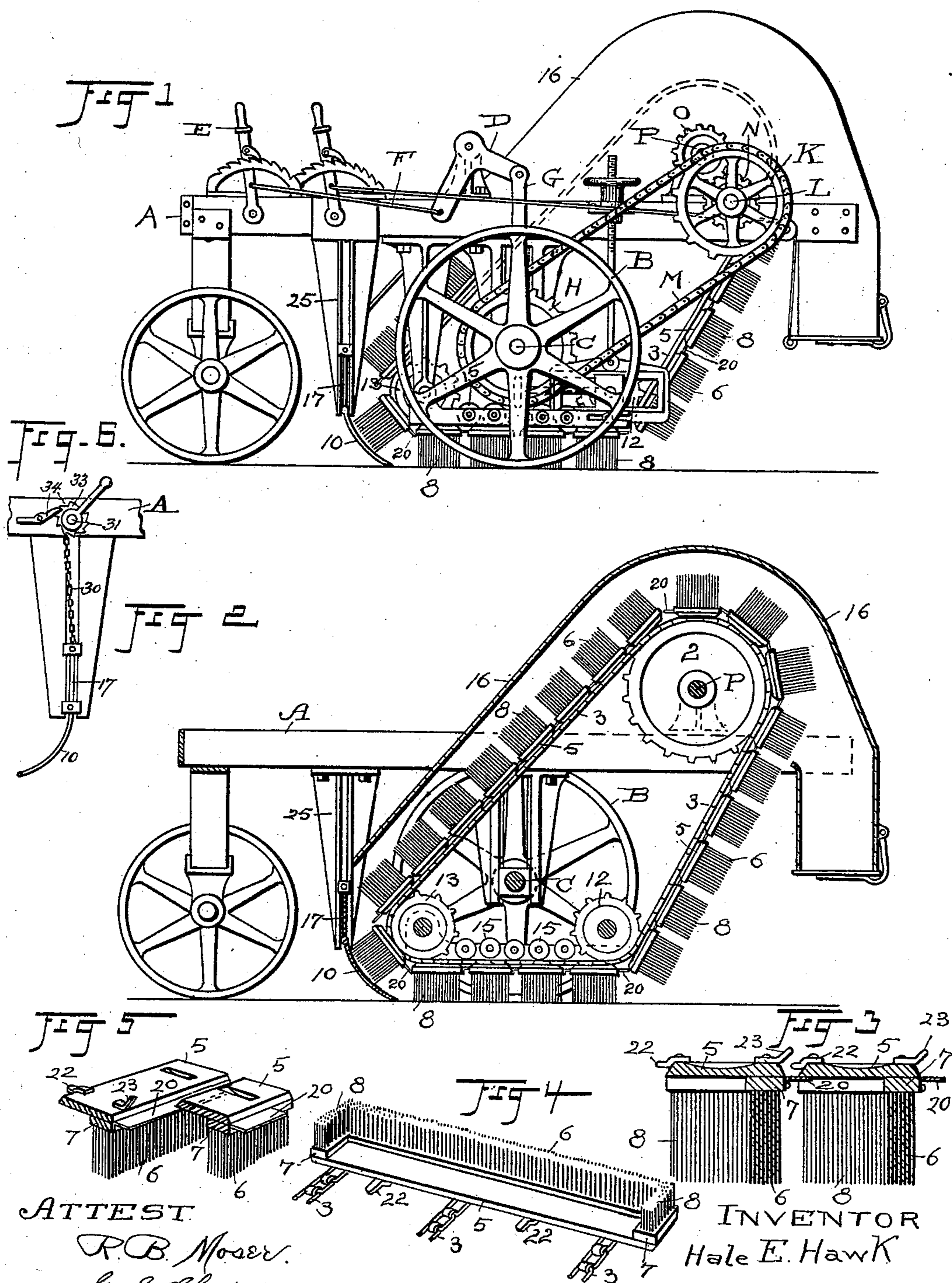


(No Model.)

H. E. HAWK.  
STREET SWEEPER.

No. 594,397.

Patented Nov. 30, 1897.



ATTEST

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HALE E. HAWK, OF CLEVELAND, OHIO.

## STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 594,397, dated November 30, 1897.

Application filed August 17, 1893. Serial No. 483,321. (No model.)

### *To all whom it may concern:*

Be it known that I, HALE E. HAWK, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Street Sweeping and Cleaning Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to street sweeping and cleaning machines; and the object of the invention is to provide a machine which is adapted to be used for cleaning streets of dirt or snow and to collect and deposit the sweepings in a receptacle or conveyer at the rear of the machine, all substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved machine. Fig. 2 is a longitudinal sectional elevation of the machine designed to illustrate more especially the sweeping and carrying mechanism and omitting the other parts of the machine not directly associated with these elements. Fig. 3 is a cross-section of two of the brushes shown in working relation to one another and enlarged somewhat over the other views and showing especially the relation of the plate which overlaps the space between the brush-supports. Fig. 4 is a perspective view of one of the brushes inverted and showing the three several sprocket-chains by which the brushes are connected and carried. Fig. 5 is a perspective and inverted view of sections of two of the brushes and is designed more especially to show the overlapping plate between the brushes seen in cross-section in Fig. 3. Fig. 6 is a section of the main frame on the opposite side of the machine from that shown in Fig. 1 and reversed in position, so as to bring the mechanism to the front, and showing in connection with said section of the frame the hangers for the movable plates 10 and 17 and also the means for raising and lowering said plates.

A represents the main frame of the machine, and B the main carrying and driving wheels which come near or about the center

of the main frame and beneath the same relatively about as shown.

C is the main axle, and the main frame and its supported parts are adjustable or movable up and down in respect to the wheels B and the axle C by means of the bell-crank lever D, the operating-lever E, the connecting-rod F, and the link G, fixed to one arm of the bell-crank D. This mechanism for raising and lowering the frame and the operating mechanism thereon from the surface of the street is not presented here as in itself novel and does not form a part of my present invention except in combination with other and novel features.

The drive mechanism for the endless brush-carrying apron or carrier consists in a sprocket-wheel H, fixed on the axle C, the sprocket-wheel K on the shaft L across the rear of frame A, and a sprocket-chain M, running over said wheels. The shaft L carries a gear-wheel N, which meshes with a gear O on the shaft P, and this causes the said shaft P to rotate in the right direction to carry the endless brush-carrier forward in the direction of travel of the machine. This mechanism, except the cross-shafts L and P, is on the outside of the machine, as seen in Fig. 1, and is designed simply to provide means for actuating the brushes and brush-carrier. Obviously the said mechanism might be changed or modified and yet give the same result, and I am not therefore limited to what is shown, and especially since these parts are subsidiary and not in themselves important.

Now, referring to Fig. 2, it will be seen that shaft P carries sprocket-wheels 2, one for each of the sprocket-chains 3, Fig. 4, and the endless apron or carrier equipped with the brushes is caused to travel by the power applied through the foregoing mechanism to shaft P, on which these sprocket-wheels are mounted. This endless carrier consists, primarily, of three endless chains 3, to which are fixed the flat carrier-pieces 5, placed in such close proximity to one another as to leave just about room enough to comfortably turn around the sprocket-wheels. The brushes proper, 6, have the base-pieces 7, into which they are set and which are fixed upon the outside of the flat pieces 5, along the rear

edge thereof. This leaves much the larger part of the piece 5 uncovered, except at the ends, where I secure short cross-brushes 8. I discovered that in the use of a machine of  
 5 this kind with a series of transverse brushes at work at the same time over the same surface there would be a continual working out of dirt at the ends of the brush, and this was objectionable, particularly at the end which  
 10 overlapped the cleaned part of the street. I have therefore provided against this effect and wholly overcome it by means of the end brushes 8, which serve as end guards for the cross-brush and, being flexible, answer a bet-  
 15 ter purpose than would a rigid guard fixed to the board in their stead or long side plates or boards fixed to the suspended frame of the machine and arranged to stand at the ends of the transverse brushes. The dirt or snow  
 20 that is swept along by the main brush is confined at the ends of the brush until it is carried up the inclined dirt-plate 10, and each succeeding brush is constructed and operated in the same way.

25 It will be seen that at the bottom the endless brush-carrier passes over two sets of sprocket-wheels 12 and 13, corresponding to wheels 2 at the top of the frame and traversed by chains 3, and these wheels 12 and  
 30 13 are on the same horizontal plane and at such distance apart that about four of the brushes will be at work at the same time. This arrangement of wheels and the intermediate transverse small rollers 15 between the  
 35 wheels to bear the carrier down uniformly and horizontally causes the brushes to effectively work and each to do its part in turn like the one that has gone before until the plate 10 is reached and the elevation of the sweep-  
 40 ings begins.

From the sprocket-wheels 13 to the upper wheels 2 the brush-carrier lies at an inclination of about forty-five degrees to a vertical plane, or about that angle, and is covered  
 45 with the usual housing or casing 16. It will be noticed that this incline begins from and after the turn about the sprocket-wheels 13, and that since the side brushes extend forward from the main brushes and owing to  
 50 the inverted position of the parts when these sprockets are passed the brushes and their base-boards become carriers for the sweepings. The sweepings are really retained or held by each brush all the way to the point  
 55 of discharge, first as the brushes travel up over the plate 10 and the plate 17 at the angle above and then by reason of the inverted position of the brushes. The flat pieces 5 are as near together as they can well be to  
 60 operate satisfactorily, and the intervening space is bridged or protected by angle-plates 20, which are fixed to one of the pieces 5 and overlap the other, and thus traverse the said space and prevent leakage.

65 When the carrier reaches the top of the machine and turns the upper sprocket-wheels, it

discharges its load into whatever may be provided for that purpose, and any desired arrangement may be made to take care of the sweepings delivered at this point. 70

Each of the brush base-pieces 5 has projections 22 at one edge and corresponding projections 23 of somewhat different form at its outer edge, and these projections on adjacent boards touch when the corners or short  
 75 turns around the smaller sprockets are made.

In case the machine is used to sweep heavy snow the plate 10 and the plate 17, above the plate 10 and jointed thereto, are simply slid  
 80 up in the slots or grooves of the pendants or hangers 25, which support said parts, suitable mechanism being used for the purpose of raising and lowering the plates 10 and 17. The snow would then be gathered from the bank that would form at the front of the  
 85 sweeper. The means here adopted for raising the said plates 10 and 17 when occasion offers are shown in Fig. 6, wherein I have employed a chain 30, connected with the plate 17 at its top, a similar chain being employed  
 90 upon the opposite side of the machine, and said chain running over a rod 31, which extends across the machine and has a handle 32 affixed thereto to turn the rod. Upon this  
 95 rod is a small ratchet-wheel 33 and a pawl 34 on the frame to engage said wheel. Then in order to raise the said plates 10 and 17 I simply turn the crank or handle 32 to bring them to such elevation as I may desire. In case  
 100 the snow is deep I raise them well up in the said hangers, so that the brushes will come directly in contact with the snow and convey it up on the endless carrier to be dumped into the receptacle at the rear, or wherever arrangement may be made for unloading. 105

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The apron consisting of the sprocket-chains, a series of flat pieces secured to said  
 110 chains, sweeping-brushes fixed along one edge of said flat pieces, plates attached to said flat pieces and adapted to bridge the spaces between said flat pieces, and guards at the ends of said pieces to prevent dirt from escaping, 115 substantially as set forth.

2. In a street-sweeping machine, an endless sweeper-apron having sprocket-chain connections and a series of flat pieces and brushes along the rear edges of said pieces and flexi-  
 120 ble guards across the ends thereof, and the plates attached to said flat pieces and adapted to bridge the spaces, in combination with the wheels 12 and 13 arranged in the same plane and the wheels 2 carrying the said apron, 125 substantially as described.

Witness my hand to the foregoing specification this 10th day of August, 1893.

HALE E. HAWK.

Witnesses:

H. T. FISHER,  
 R. B. MOSER.