

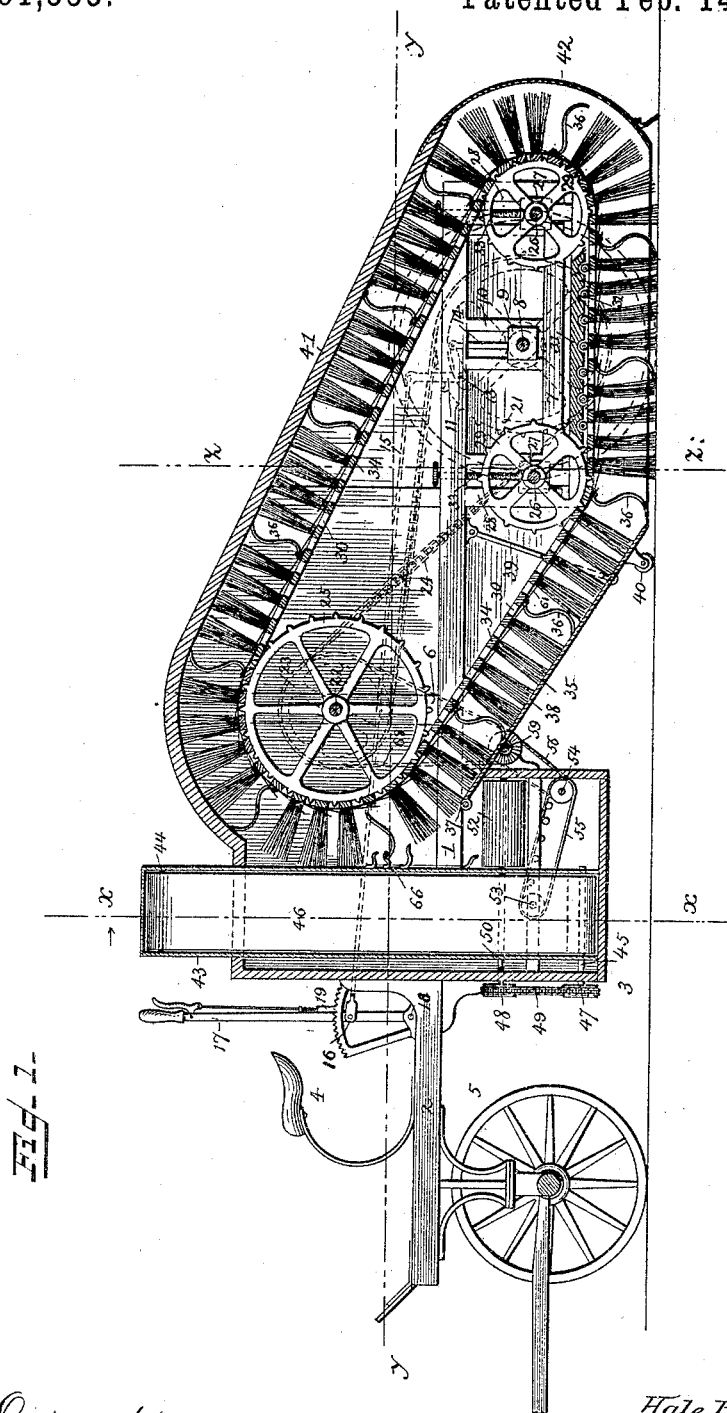
(No Model.)

4 Sheets—Sheet 1.

H. E. HAWK & O. W. JOHNSON.  
STREET SWEEPER.

No. 491,555.

Patented Feb. 14, 1893.



Witnesses:

Charles C. Orrand.

W. S. Duval.

Inventors:

Hale E. Hawk

O. W. Johnson.

By their Attorneys,

C. A. Snow & Co.

(No Model.)

4 Sheets—Sheet 2.

H. E. HAWK & O. W. JOHNSON.  
STREET SWEEPER.

No. 491,555.

Patented Feb. 14, 1893.

Fig. 4-

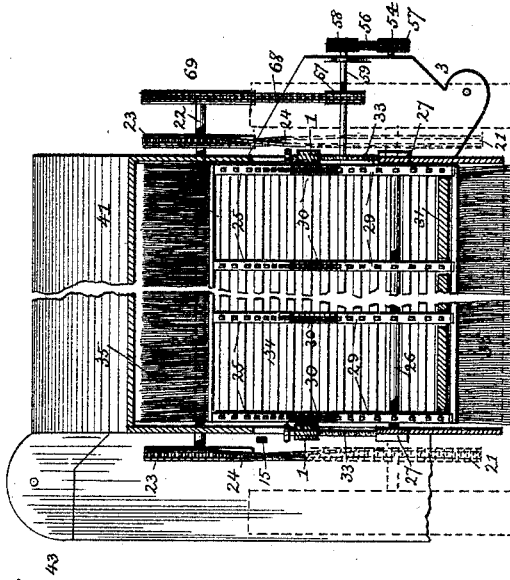


Fig. 5-

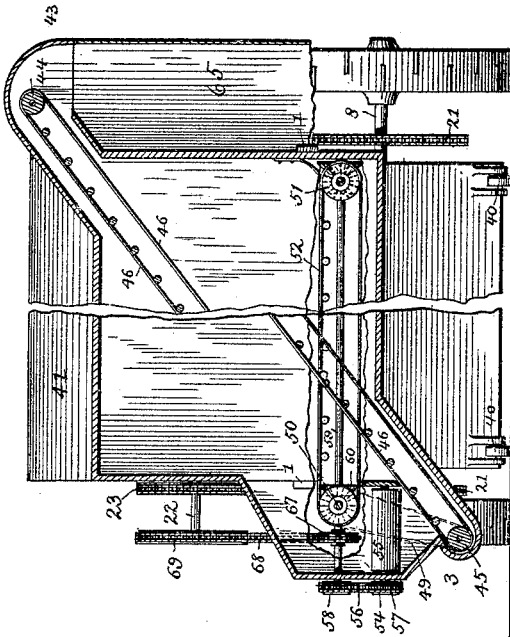
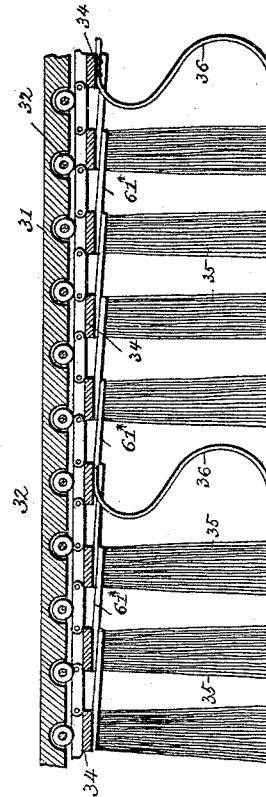


Fig. 6-



Witnesses:

Charles C. Curand

W. S. Duval.

Inventors

Hale E. Hawk &

By their Attorneys, O. W. Johnson

C. A. Snow & Co.

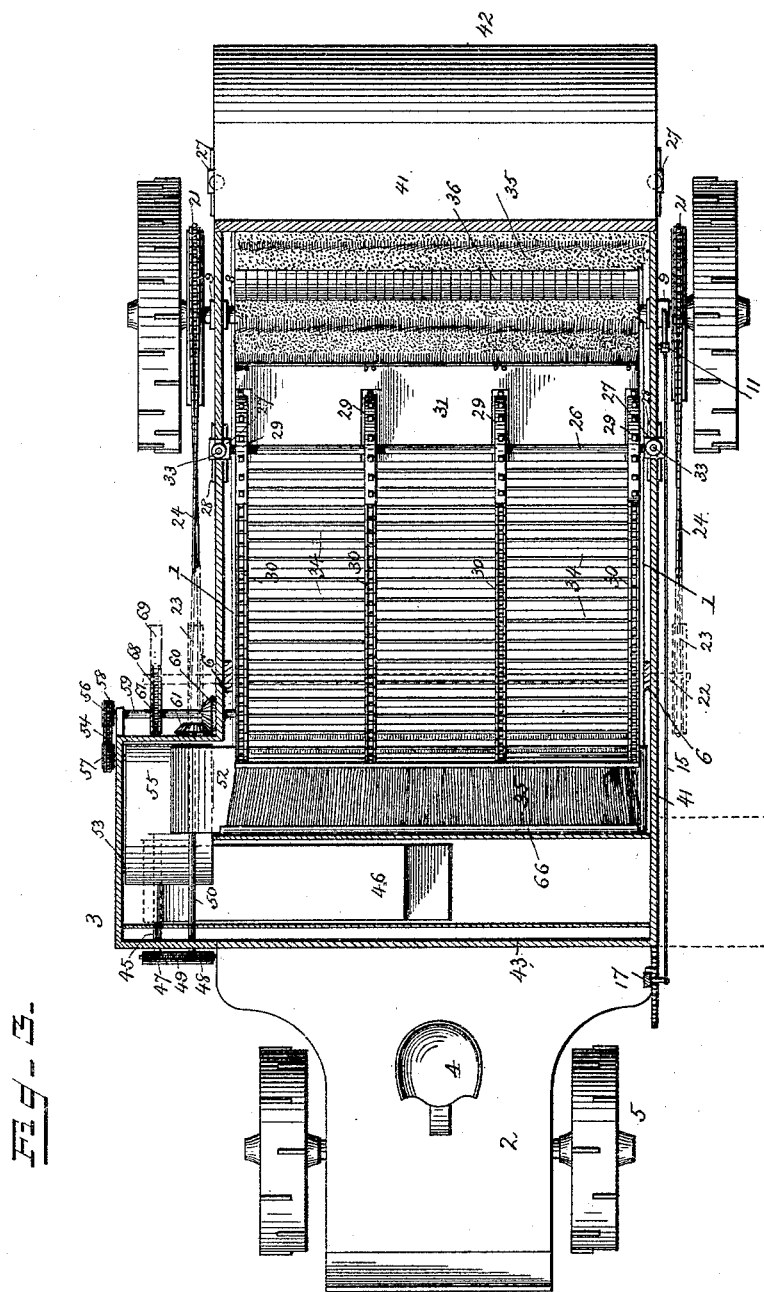
(No Model.)

4 Sheets—Sheet 3.

H. E. HAWK & O. W. JOHNSON.  
STREET SWEEPER.

No. 491,555.

Patented Feb. 14, 1893.



Witnesses:

Charles Ourand

*W. S. Duval*

Inventors

H. E. Hawk

O. W. Johnson

By their Attorneys,

*C. A. Snow & Co.*

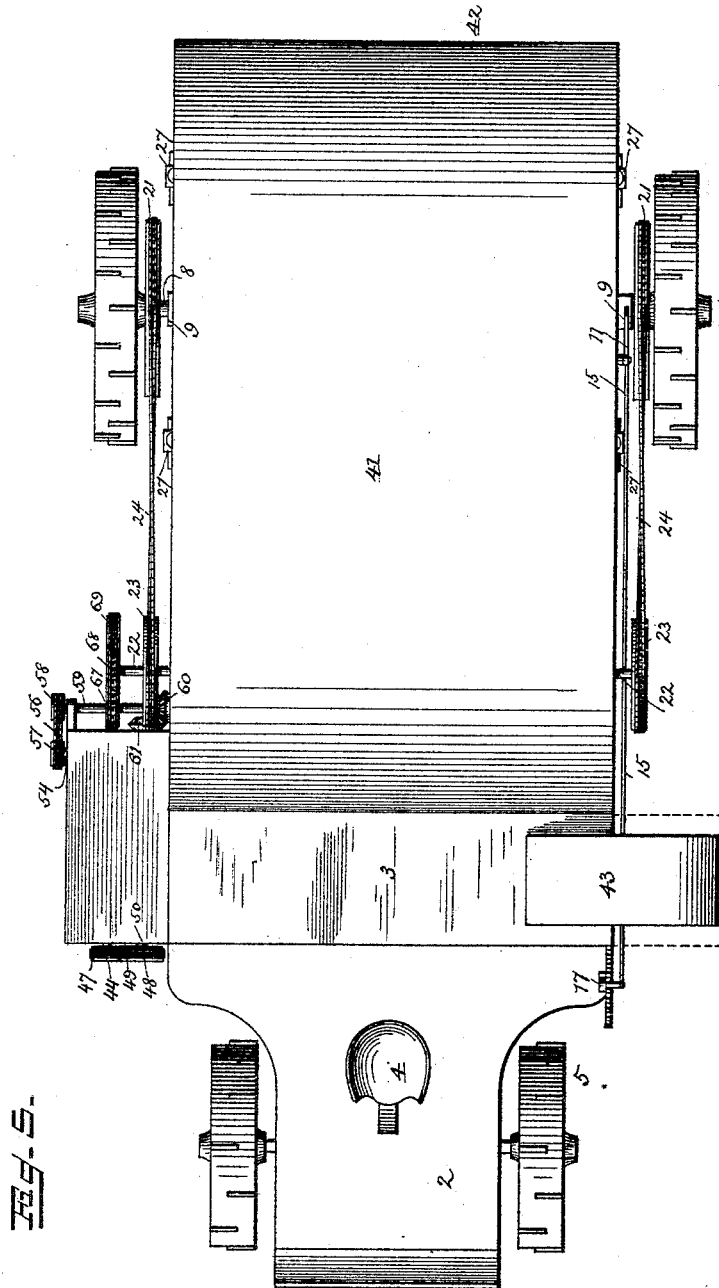
(No Model.)

4 Sheets—Sheet 4.

H. E. HAWK & O. W. JOHNSON.  
STREET SWEEPER.

No. 491,555.

Patented Feb. 14, 1893.



Witnesses:

Charles C. Oursand

W. S. Duval

Inventors

Hale E. Hawk

O. W. Johnson

By their Attorneys,

C. A. Snow & Co.

# UNITED STATES PATENT OFFICE.

HALE E. HAWK AND OLIVER W. JOHNSON, OF BUCYRUS, OHIO; SAID JOHNSON ASSIGNOR TO SAID HAWK, OF ALLIANCE, OHIO.

## STREET-SWEEPER.

**SPECIFICATION** forming part of Letters Patent No. 491,555, dated February 14, 1893.

Application filed June 30, 1891. Serial No. 398,074. (No model.)

*To all whom it may concern:*

Be it known that we, HALE E. HAWK and OLIVER W. JOHNSON, citizens of the United States, residing at Bucyrus, in the county of Crawford and State of Ohio, have invented a new and useful Street-Sweeper, of which the following is a specification.

This invention relates to improvements in street sweepers; and the objects in view are to provide a street sweeping machine of cheap and simple construction, adapted to automatically and thoroughly scrape, brush and elevate the refuse, to collect the same and at intervals deliver it.

A further object of the invention is to provide for an adjustment of the brushes and scrapers, and also for the belt connections between the moving parts.

With the above objects in view the invention consists in certain features of construction hereinafter specified and particularly pointed out in the claims.

Referring to the drawings:—Figure 1 is a vertical longitudinal section of a street sweeping machine constructed in accordance with our invention. Fig. 2 is a vertical transverse section on the line  $x-x$  of Fig. 1. Fig. 3 is a horizontal section on the line  $y-y$  of Fig. 1. Fig. 4 is a vertical section on the line  $z-z$  of Fig. 1. Fig. 5 is a plan view. Fig. 6 is an enlarged detail of the lower portion of the machine, or what we term the brush-guide.

Like numerals of reference indicate like parts in all the figures of the drawings.

In practicing our invention we construct a framework of suitable shape and proportions, the same being adapted to carry the mechanism hereinafter described. In this instance the framework comprises a pair of side-bars 1, connected at intervals by suitable cross-bars and having bolted thereto at the front end thereof, a depending rectangular frame 3, the front vertical bar of which extends some distance above the side-bars 1. An extension 2 of the bars 1 constitutes a platform for the driver's seat 4, and to the under side of said platform is located the front truck 5, which may be of any ordinary construction. Near their forward ends there rise from the side bars 1 vertical bars 6, and near their rear ends there are bolted to the side bars depending rectangular frames 7.

8 designates the axle, at the rear end of the machine, and the same is mounted in boxes 9, located in vertical guides 10, supported by the stirrup or frame 7, and adapted for vertical movement. A bell-cranked lever 11 is pivoted as at 13 to the framework, and at its rear end is connected by a link 14 to the axle 8. The forward end of the lever is by a connecting rod 15, pivotally connected as at 16 to a hand-lever 17, pivoted at 18 to the platform 2, by which the axle may be adjusted vertically. The lever 17 carries a locking-pawl 19, designed to engage with the toothed sector 20 at any point of adjustment of said lever and the axle. The axle is also provided adjacent to each of the ground wheels with a pair of spocket-wheels 21. In journals in the standards 6 is mounted for rotation a shaft 22, upon which opposite the sprockets 21 are mounted sprocket wheels 23. The opposite pairs of sprocket wheels 21 and 23 are connected by crossed sprocket-belts or chains 24.

At intervals upon the shaft 22, between the sprocket wheels 23 are mounted large sprocket wheels 25, and upon shafts 26, journaled in boxes 27, movable in pairs of vertical guides 28 of the stirrup 7, are mounted sprocket-wheels 29, corresponding in number and location with the wheels 25, and being connected thereto by endless sprocket chains 30. The two wheels 29 are in the same vertical plane or may be adjusted to different elevations, and between them there is attached rigidly to the boxes 27 in any suitable manner, (not shown on account of intervening parts,) a flat table 31, under which the endless sprocket chains 30 are designed to run, said table being provided with a series of small rollers 32. By raising and lowering the wheels 29, the table is also raised and lowered, and in a manner as will be hereinafter made obvious the endless sweeping-belt may be made to travel closer to the surface upon which it is operating. The elevation of the wheels 29 is secured by means of a pair of threaded rods 33, connected with the boxes 27.

To the series of chains 30 is secured a series of transverse cleats 34, and to some of them are secured steel wire brushes 35, while to others are secured steel scrapers 36. In the present instance we employ a series of

four brushes to every scraper, though their relative numbers may be altered. In this instance, also, the scrapers are shown as S-shaped, though it will be understood that their forms may be changed.

To the side-bars 1, slightly in front of the sprocket wheels 23, there is pivoted as at 37 an apron 38, the same being rearwardly inclined and supported by braces or suspension rods 39. The apron terminates close to the ground or adjacent to that point of the brushes that deviate from the ground, and is there provided upon its under side with wheels 40.

The entire mechanism thus described, with the exception of the sprocket-wheels 23 is inclosed by a bottomless casing 41, the rear end of which is provided with a canvas curtain 42.

An elevator casing 43 is located in the framework in front of the brushes and their supports, and upon two transverse shafts 44 and 45 is mounted for travel an endless elevator 46, the latter shaft being provided with a sprocket wheel 47, which gears with and is operated by a sprocket wheel 48, connected by a chain 49, located at the front side of the elevator casing. The sprocket wheel 48 is mounted at the front end of a shaft 50, which is located opposite a companion shaft 51, the two supporting a horizontal endless carrier 52, located directly under the front end of the brushes. Upon shafts 53 and 54 there is mounted for rotation a carrier 55, operated by means of a chain 56, passing over a sprocket 57 on the end of the shaft 54, and over a sprocket 58 on the end of the shaft 59, which shaft also carries a beveled-gear 60, engaging and driving a gear 61 on the rear end of shaft 50.

The blocks constituting the backs of the brushes and scrapers are securely fastened to opposite links of the endless sprocket-chains, and secured to the opposite ends and to the undersides of each of these blocks is a pair of rearwardly disposed flat bars or plates 61\*, the rear ends of each pair of bars taking under and resting flatly against the next succeeding pair of bars or plates. By such construction it will be seen that the blocks are prevented from turning when the brushes and scrapers are in contact with the ground.

In the casing 3 there is secured a series of knockers 66, immediately over the endless carrier 52, against which the scrapers and brushes successively come as they arrive at that point; and by the same, mud and other refuse adhering thereto are knocked therefrom and fall upon the carrier 52. A sprocket 67, is located upon the shaft 59, and receives motion from the shaft 22 by means of a sprocket-chain 68, which passes over a sprocket 69 upon the shaft 22. A receptacle 65 is located at one side of and depends from the elevator-casing 43, and may deliver the dirt collected in any suitable manner.

This completes the construction of the sweeper, and the operation may be briefly stated as follows:—The machine is first adjusted by the means specified, so as to press lightly or well down against the surface to be swept and scraped, after which it is ready for operation. Being set in motion either by steam or horse power, motion is transmitted from the rear ground wheels to the axle 8, which latter is rotated and transmits motion to the sprockets 21, which in turn through the medium of the chains 24 transmit motion to the upper shaft 22. This shaft operates the series of sprockets 25 and moves the chains 26 and consequently the sprockets 29. The dirt located between the rear end of the apron 38 and the rear end of the casing, is scraped and loosened by the brushes and scrapers and carried by them up the apron, where it is delivered over the front end of the same upon the horizontal carrier 52, from thence it is delivered upon the intermediate carrier 55 and passes onto the carrier 46, by which it is elevated and discharged over the upper end of the same into a suitable receptacle 65, from which it is subsequently delivered. A sprocket 67 is located upon the shaft 59 and receives motion from the shaft 22 by means of a sprocket chain 68, which passes over a sprocket 69 upon the shaft 22.

It will be seen that the driver has full control of the machine and from his position upon his seat may raise and lower the brushes, pressing them with more or less force against the surface of the street.

Having described our invention, what we claim is:—

1. In a street sweeping machine, the combination with the framework, the upper and lower sprockets, and the endless brush-carrying belts, of an axle mounted in boxes, vertical guides for the boxes, and means for vertically adjusting said boxes in their guides, substantially as specified.

2. In a street sweeping machine, the combination with the framework having vertical guides, upper and lower sprockets, broom-carrying belts mounted on the sprockets and means for operating the sprockets, of an axle, boxes for the same mounted in the guides, wheels mounted on the axle, a lever pivoted to the frame and provided with a locking means, a bell-crank mounted in the frame, a link connecting the same with the boxes and a connecting rod between the bell-crank lever and the first mentioned lever, substantially as specified.

3. In a street-sweeper, the combination with a frame-work having bearings 9, vertically-arranged front and rear guides, and upper bearings located beyond the said front guide, of an axle mounted in bearings 9 and carrying drive-wheels, a shaft mounted in the upper bearings, sprocket-wheels mounted on the shafts, a brush-carrying belt connecting the same, driving mechanism between this axle and one

of the shafts, and means for vertically adjusting the shaft-bearings which are mounted in the guides, substantially as described.

5 4. In a street sweeping machine, the combination with the framework having the upper bearings and the pairs of vertical guides, of boxes mounted in the guides, set screws for raising and lowering the same, shafts mounted in the boxes and in the upper bearings mounted on the shafts, means for driving the same, and brush-carrying belts mounted on the sprocket wheels, substantially as specified.

10 5. The combination with the endless chains, of the blocks secured to the opposite links thereof and provided with cleaning agents, and the bars 61 secured to the ends of the blocks, each of the bars being rearwardly extended and taking under the next succeeding bar, substantially as specified.

20 6. In a street sweeper, the flat table 31, arranged directly over the point where the sweeper comes in contact with the ground and provided with rollers 32, combined with the sprocket chains 30 arranged to run under the table against the rollers, and carrying the brushes, as set forth.

25 7. In a street sweeper, the chains 30 provided with transverse cleats 34, some of which are provided with brushes 35, while the others 30 are provided with curved steel scrapers 36,

arranged between the brushes, and the flat bars or plates 61\* secured to the cleats and overlapping one another whereby the cleats are prevented from turning when the brushes and scrapers are in contact with the ground, 35 as set forth.

8. In a street-sweeper, the framework provided with the ground wheels combined with the endless chains carrying the sweepers, supports therefor, the inclined apron hinged to 40 the framework and over which apron the endless chain with its sweepers travels, and the braces or suspension-rods 39 39 for supporting the apron, and the wheel 40 carried by the apron to run on the ground, as set forth. 45

9. In a street-sweeper, the combination with the sprocket-chains 30 arranged to run in operative relation with the ground, of brushes carried by said chains, sprocket-wheels for the chains, and adjusting boxes for the shafts 50 of the sprocket-wheels, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

HALE E. HAWK.

OLIVER W. JOHNSON.

Witnesses:

M. J. MONNETH,

R. V. SEARS.