(No Model.)

3 Sheets—Sheet 1.

# M. HAGARTY.

## STREET SWEEPING MACHINE.

No. 457,586. Patented Aug. 11, 1891.

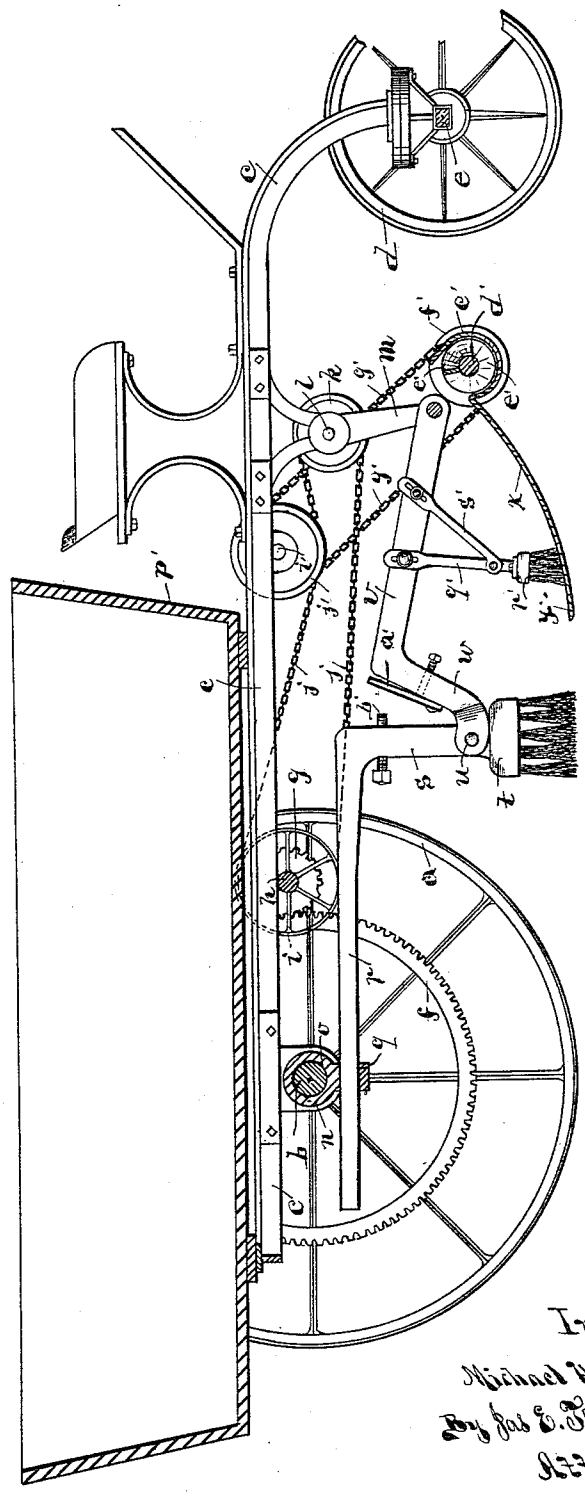


Fig. 1.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

# M. HAGARTY.

## STREET SWEEPING MACHINE.

No. 457,586. Patented Aug. 11, 1891.

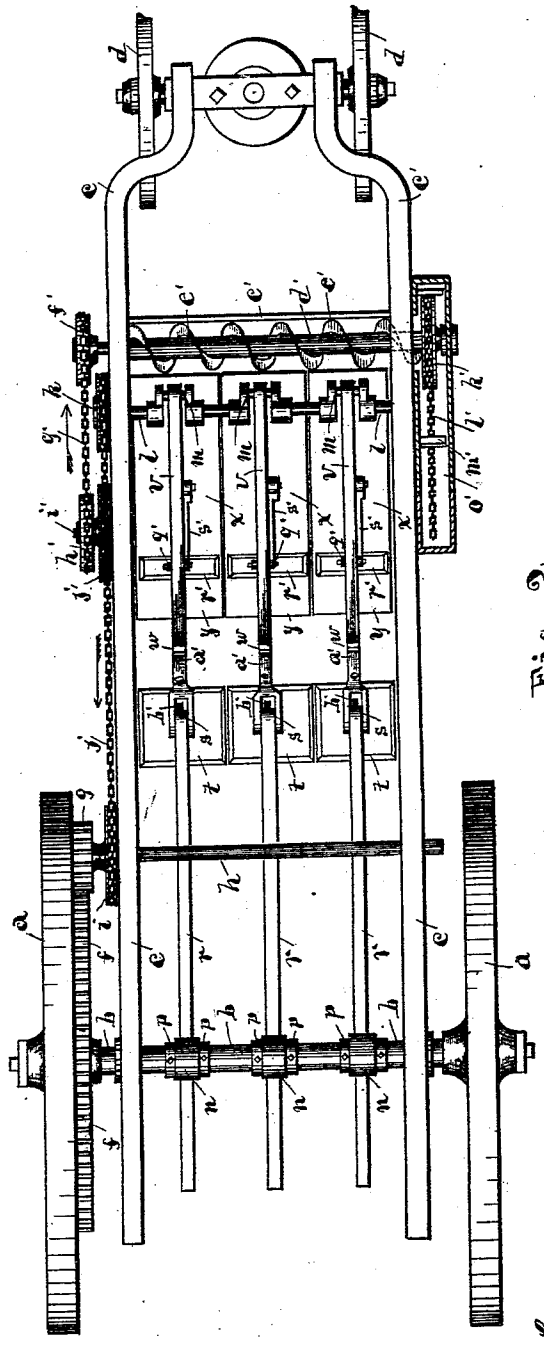


Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

# M. HAGARTY.

## STREET SWEEPING MACHINE.

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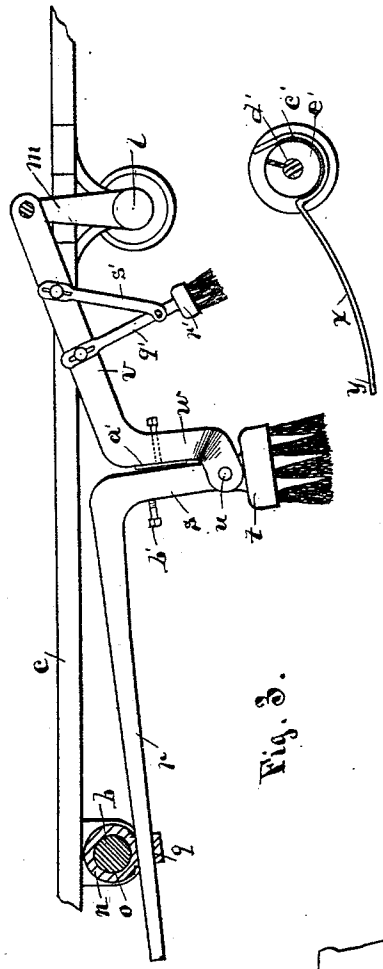


Fig. 3.

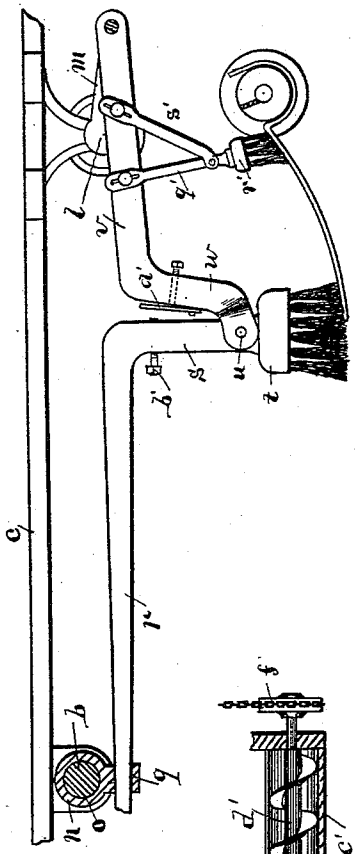


Fig. 4.

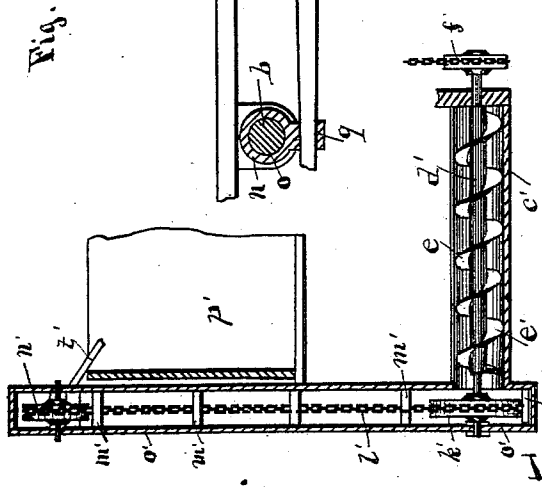


Fig. 5.

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# UNITED STATES PATENT OFFICE.

MICHAEL HAGARTY, OF WEST BAY CITY, MICHIGAN.

## STREET-SWEEPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,586, dated August 11, 1891.

Application filed January 17, 1891. Serial No. 378,073. (No model.)

*To all whom it may concern:*

Be it known that I, MICHAEL HAGARTY, a citizen of the United States, residing at West Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Street-Sweeping Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in street-sweeping machines of the class in which reciprocating brooms are arranged to effect the sweeping operation; and the invention consists in the combination of the several parts, together with the construction and arrangement of the same, which will be hereinafter described in detail, and specifically designated in the claims of this specification.

The object of this invention is to provide an easy and effective means for operating the reciprocating brooms in contact with the surface of the pavement during their forward motion and free from contact with the pavement during their rearward motion.

Another object is to provide a means for removing into a conveyer the dirt and refuse which has been removed from the pavement to the receiving-apron by the brooms.

Another object of my invention is to arrange and construct devices for operating the brooms, by means of which sudden jars and jerks as the brooms are raised from the pavement are avoided and a smooth and noiseless operation of the mechanism is obtained.

The mechanism by which I attain these objects is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a street-sweeping machine embodying my invention and with the brooms in position in the middle portion of their forward movement. Fig. 2 is a plan view of the machine with the upper portion or dirt-receptacle removed and partly sectional. Figs. 3 and 4 show the street-sweeping mechanism detached and with the parts in position for lifting the brooms. Fig. 5 is a transverse section through the conveyer and elevator devices.

A vehicle for carrying the mechanism, &c., is arranged with the rear wheels *a*, the axle *b* for carrying the rear ends of the frame-pieces *c*, and the front wheels *d* and axle *e* for carrying the forward end of the frame-pieces, and to the front axle is secured any suitable means for propelling and guiding the vehicle over the street.

To the inner side of one of the rear wheels *a* is secured a gear-wheel *f*, so as to revolve therewith, and this gear-wheel intermeshes with the pinion *g*, carried by a shaft *h*, journaled in suitable supports or boxes carried by the frame-pieces *c*, and on this shaft is also mounted a chain sprocket-wheel *i*, over which is passed an endless chain *j*, which, being carried toward the forward portion of the frame, is passed over a chain sprocket-wheel *k*, mounted upon the shaft *l*, which shaft is also provided with a crank *m* between the frame-pieces *c*, and which is suitably supported in position by boxes carried by the frame-pieces.

*n* are supporting-pieces which have an opening *o* passed over the axle *b*, so as to allow the axle to turn in the openings, and these pieces are held in a proper position upon the axle by collars *p*, and are also provided on their lower portions with transverse openings *q*, through which are passed the rear-end portions of the broom-levers *r*, while the forward-end portions *s* of the levers are turned downwardly and have their ends firmly attached to the brooms *t*.

To the lower portions of the vertical portions *s* of the broom-levers is secured by pivots *u* the rear ends of the pitmen *v*, while the forward ends of the pitmen are pivotally secured by suitable boxes upon the cranks *m*, the rear portions of the pitmen being bent to form vertical portions *w*, to the rear side of which are secured cushioning-springs *a'*, while adjusting-screws *b'* are passed through the upper portions of the vertical parts *s* of the broom-levers, the forward ends of the screws being arranged to project beyond the front edges of the parts *s* toward the springs to any desired distance, for a purpose which will be presently explained.

*x* are aprons corresponding in number to

the brooms $t$, in front of which they are arranged with their rear edges $y$ resting upon the pavement, while their front edges are raised sufficiently to connect with the upper edge of the rear side of a horizontal conduit $c'$, the front edges of the aprons being located so that the brooms at the end of their forward movement will reach slightly over the edges of the aprons. The conduit $c'$ extends across the machine, and longitudinally within the conduit is located a shaft $d'$, around which is arranged a spiral web $e'$, and the ends of the shaft are journaled in suitable boxes, so that the shaft may be revolved, and upon one end of the shaft is mounted a chain sprocket-wheel $f'$, upon which is arranged an endless chain $g'$, which is also passed over a sprocket-wheel $h'$, mounted upon a shaft $i'$, and upon this shaft is also mounted a sprocket-wheel $j'$, arranged to engage the lower edge of its periphery with the upper side of the driving-chain $j$, so that the motion of the sprocket-wheels $j'$ will be in reverse to that of the cranks $m$.

Upon the opposite end of the shaft $d'$ is mounted a chain sprocket-wheel $k'$, and over this wheel is passed the lower portion of a chain $l'$, having at intervals conveyer buckets or flights $m'$, and the upper portion of the chain is passed over a sprocket-wheel $n'$, suitably journaled at the upper end of a conduit or casing $o'$, arranged to properly inclose the chain, and has its upper portion extending rearwardly and upwardly beside a dirt receptacle or box $p'$, arranged to rest on the frame-pieces $c$ or other suitable support.

Upon the middle portions of the pitmen $v$ are secured in any convenient manner by their upper ends the downwardly-extending levers $q'$, and to the lower ends of these levers are secured the brooms $r'$, and these brooms are held in a proper position by braces $s'$, which are adjustably secured to the broom-levers and to the forward portions of the pitmen, and the brooms are so located as to sweep over the aprons during the forward movement of the pitmen, the aprons being provided with a proper concaved upper surface to conform to the line of motion of the sweeping-brooms.

In working, the machine is drawn by horses or other suitable means over the street, and as the wheels $a$ revolve motion is imparted to the pinion $g$ by the gear $f$, and through the chain $j$ and $g'$ and wheels $i$ and $k$ to the cranks $m$, which by means of the pitmen $v$ impart a reciprocating or to-and-fro motion to the brooms $t$, the cranks $m$ being arranged to bring the brooms forward on the lower half portion of their revolution, with the brooms resting upon the surface of the pavement, and as the forward ends of the pitmen are raised by the cranks with their upward motion the pitmen turn upon the pivots $u$ until the springs $a'$ come in contact with the screws $b'$ and the brooms are then lifted free from the pavement and propelled rearward by the further revolution of the cranks until the cranks on their downward movement deposit the brooms again upon the pavement to be drawn forward by the forward movement of the cranks and pitmen, the springs $a'$ leaving the adjusting-screws as the forward ends of the pitmen are carried downwardly through the lower arc of the movement of the cranks, and as the brooms $t$ are drawn forward over the pavement the dirt and débris thereon are carried forward and deposited upon the rear portions of the aprons and are swept by the brooms $r$ on the next revolution of the cranks into the conduit $c'$, to be moved by the spiral conveyer into the lower end of the casing $o$; from whence they are carried by the chain conveyer $l'$ upward and deposited into the dirt-receptacle $p'$ over the chute $t'$.

It will be observed that in order to insure a proper action of the brooms upon the pavement as they are carried along a proper speed has to be imparted to the reciprocating brooms, so that the entire surface will be swept, and in order to lift the brooms from the pavement at the end of their forward stroke a sudden and jarring action on the pinions is the result when no cushioning of the contact is provided; but the interposition of the springs $a'$, together with the location of the cranks in the forward part of the machine and at some distance above the brooms, provides an upward draft on the brooms as they near the end of their forward movement which nearly compensates for the weight of the brooms and levers, so that but a slight additional force is required to lift the brooms, and thus force or sudden exertion on the pitman is relieved by the springs, so that an easy, steady, and uniform motion is obtained for the brooms, which relieves the mechanism from all jar, jerk, or vibration, and the brooms $q'$, operating to sweep the aprons, remove the débris thence into the conveyer with slight additional cost of construction, so that the machine may be manipulated to sweep the pavement in a thorough and effective manner without a skilled operator.

Having therefore described my invention, what I claim as my invention is—

1. In a street-sweeping machine, the combination, with the frame and the cranks supported upon the forward portion of the frame, of the broom-levers having their rear ends passed through supports capable of oscillation, and having their front end portions turned downward and secured to sweeping-brooms, the pitmen having their forward ends secured to the said cranks and with their rear-end portions turned downwardly and pivotally secured to the broom-levers in proximity to the broom-heads, means for rendering the broom-levers and pitmen connections rigid while the cranks pass the upper arc of their revolution, and means for imparting revolution to the cranks, substantially as set forth.

2. In a street-sweeping machine, the combination of the frame mounted on wheels

and the cranks mounted upon the front portion of the frame, the broom-levers having their rear horizontal portions passed through supports capable of oscillation and having on their forward ends vertically downward-turned portions with their ends secured to the brooms, with the pitmen pivotally secured by their front ends to the said cranks and provided on their rear ends with vertical portions in front of the vertical portions of the broom-levers and having their ends pivotally secured to the broom-levers near the brooms, a cushioning-spring between the upper portions of the said vertical portions of the broom-levers and pitmen, and an adjusting-screw passed through the broom-lever for engaging with the said cushioning-spring when the cranks are moving upwardly, substantially as and for the purpose set forth.

3. In a street-sweeping machine, the combination, with the frame *c*, mounted on wheels having the rear axle *b*, of the supports *n*, mounted on the axle *b* and provided with the openings *o*, the broom-levers *r*, having their rear portions passed through the openings *o* and provided on their forward portions with vertical portions *s* reaching downward and with their ends secured to the brooms *t*, the pitmen *v*, provided on their rear-end portions with the vertical parts *w* in front of the portions *s* and with their lower ends pivoted to the portions *s* near the broom-levers, the cushioning-springs *a'* between the vertical portions *s* and *w*, the cranks *m*, carried on the front portion of the frame and pivotally secured to the front ends of the pitmen, and mechanism for imparting revolution to the cranks, substantially as set forth.

4. The combination, in a street-sweeping machine, of the frame, the sweeping-brooms supported by the frame and provided with mechanism for moving the brooms forward in contact with the pavement and rearward free from contact therewith, and inclined aprons having their rear edges resting upon the pavement in front of the said brooms, as described, of the brooms *r'* above the said aprons, and devices for supporting and for actuating the brooms forwardly in contact with the aprons and rearwardly free from contact therewith, substantially as and for the purpose set forth.

5. In a street-sweeping machine, the combination of the frame carrying on its front portion a shaft having a series of cranks *m*, the broom-levers *r*, having their rear ends supported beneath the rear portions of the framework and having their forward ends *s* turned downward and secured to the brooms *t*, the inclined aprons *x* in front of the brooms, and the conduit *c'* in front of the aprons, and the pitmen *v* above the aprons and with their front ends pivotally secured to the said cranks *m* and with their rear ends pivoted to the broom-levers with the levers *q'*, having their upper ends secured to the pitmen, and with the brooms *r'*, secured to their lower ends, for sweeping over the aprons with the forward movement of the said cranks, substantially as set forth.

6. In a street-sweeping machine, the combination, with the frame, the cranks *m*, mounted on the forward portion of the frame, and means for revolving the cranks, the brooms *t*, the levers *r* for carrying the brooms and having their rear ends supported by the rear portion of the machine, the inclined aprons *x*, with their rear edges upon the pavement in front of the brooms, the pitmen *v*, reaching over the aprons and pivoted by their rear ends to the broom-levers and having their forward ends pivotally secured to the said cranks, of the brooms *r'* upon the aprons, and means for moving the brooms *r'* forwardly in contact with the aprons and for moving the brooms rearwardly free from contact therewith, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL HAGARTY.

Witnesses:
GEO. P. THOMAS,
JAS. E. THOMAS.