

No. 647,395.

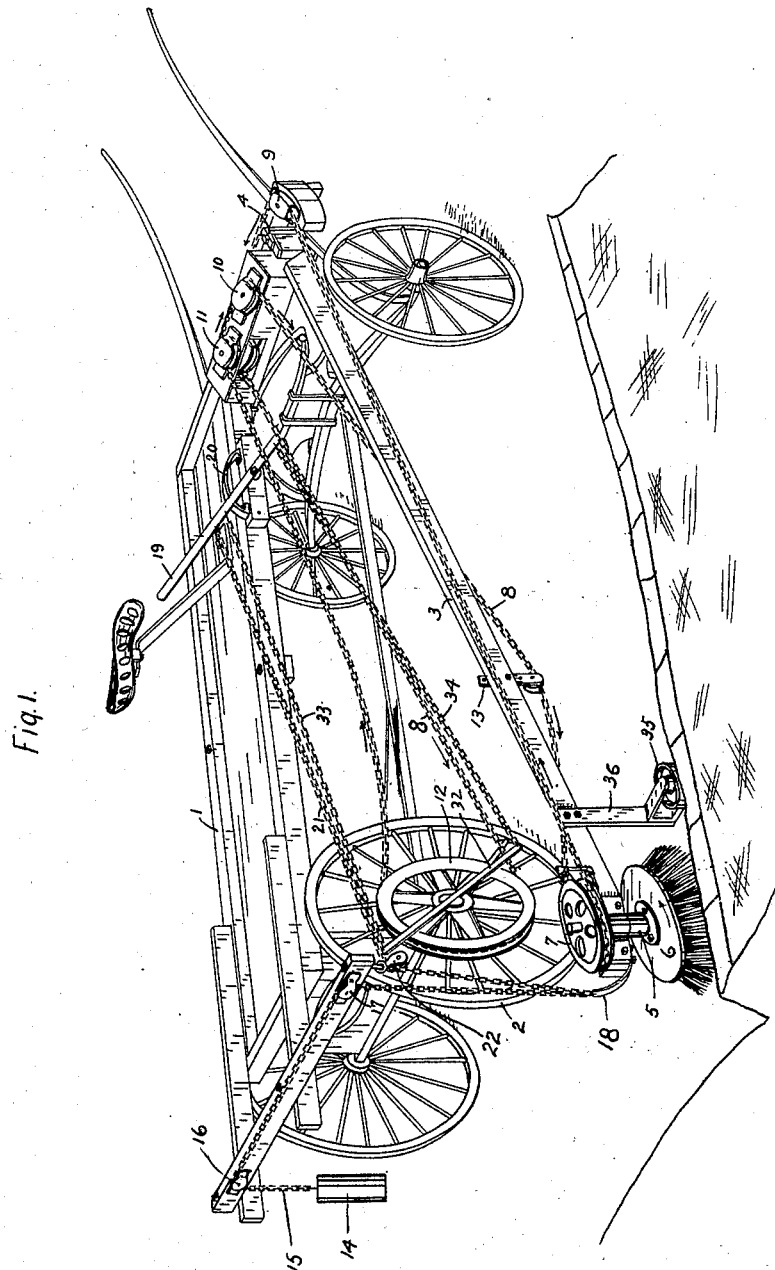
Patented Apr. 10, 1900.

R. W. FURNAS.  
STREET GUTTER CLEANING MACHINE.

(Application filed Nov. 10, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
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R. D. Hawkins.

Inventor  
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By W. H. Lockwood  
His Attorney.

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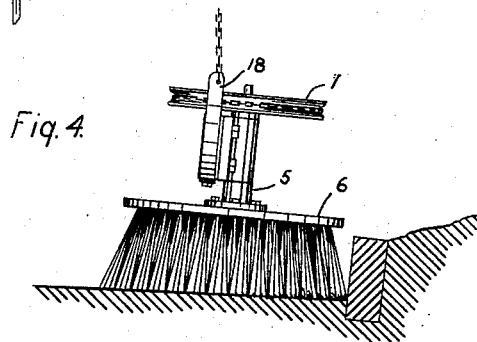
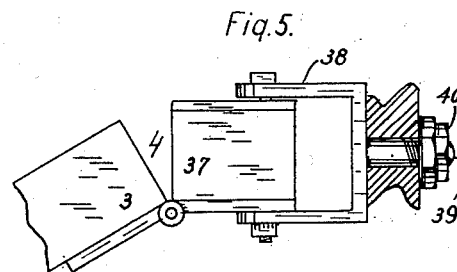
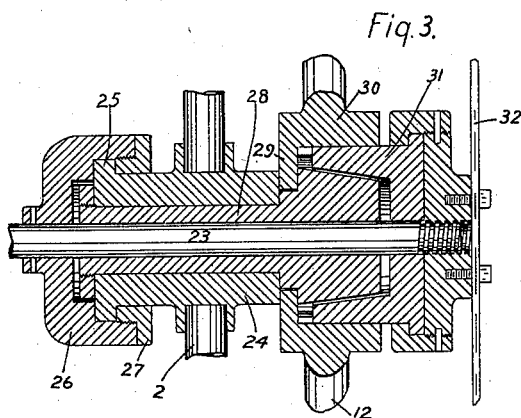
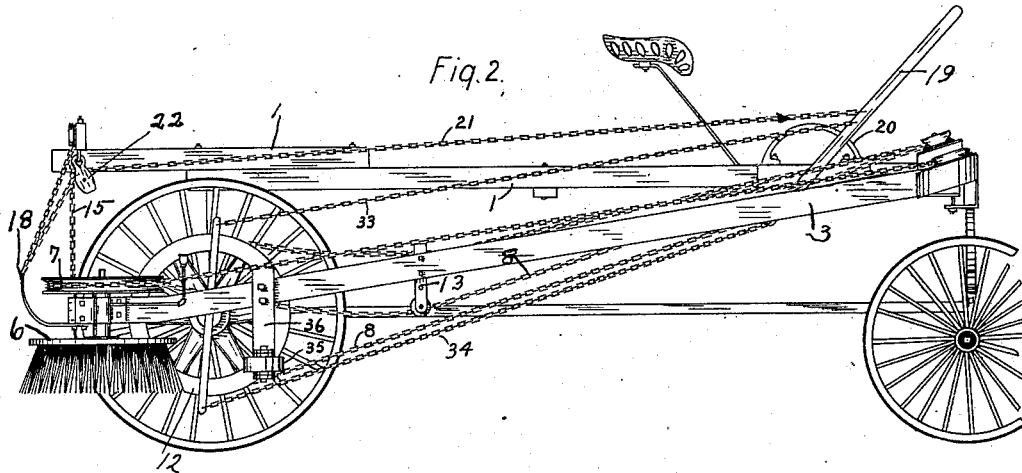
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

ROBERT W. FURNAS, OF INDIANAPOLIS, INDIANA.

## STREET-GUTTER-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 647,395, dated April 10, 1900.

Application filed November 10, 1897. Serial No. 658,000. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT W. FURNAS, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Street-Gutter-Cleaning Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

The object to be accomplished by this machine is cleaning the gutter of a street by sweeping the dirt out of the gutter to a position far enough away from the curbstone to permit the ordinary street-cleaning machines to take it up. The ordinary street-cleaning machines cannot remove the dirt close to the curbstone or clean the gutter. Such machines, however, can take up the dirt when it is removed a foot or so from the curb. In accomplishing this object I employ a horizontally-rotatable brush whose fibers extend downward from the brush-head. While in operation it is kept in contact with the street-surface by gravity. It is kept from contact with the curbstone by a fender, preferably a horizontally-mounted caster-wheel connected with the bar in which the brush is mounted. The brush is mounted by means of a vertical spindle in one end of a bar that is connected at its other end to the carriage by means of a universal joint of some kind, whereby the free end may have vertical and horizontal movement. The weight of the free end of the bar is counterbalanced by a counterbalancing-weight. I provide a vehicle whose front portion, including both the running-gears and the frame, is considerably wider than the rear portion, so that one half of the front portion projects laterally from the rest of the frame and carriage. To this lateral extension the bar in which the brush is mounted is pivoted, and in this extension suitable chain-wheels are mounted, about which a chain passes from a drive-wheel at the rear of the machine to the brush, so that the brush can be elevated or lowered without disturbing its driving mechanism. A tightener is provided for the chain. Means for elevating and lowering the brush is provided, and the machine is thrown in and out of gear by the same lever and operation that elevates or lowers the brush. There is also a coopera-

tion of the lever for elevating the brush and the counterbalancing-weight. The full nature of my invention will appear from the following description and claims and the accompanying drawings.

In the drawings, Figure 1 is a perspective of the machine with the brush in position for operation. Fig. 2 is a side elevation of the machine with the brush elevated. Fig. 3 is a cross-section of the hub and axle of the drive mechanism, showing the means for throwing the machine in and out of gear. Fig. 4 is a rear elevation of the brush and attached parts, showing the relation to the street and curb.

The details of construction of my machine may be such as herein shown and described, and this is the form in which I have found it preferable to construct it: I take a vehicle comprising front and rear running-gears, the rear running-gears being about one half as wide as the front gears. On this a frame 1 of similar shape is mounted—that is, the front portion of the frame is about twice as wide as the remaining portion, so that I have at the front part of the frame a lateral extension of considerable length. One of the rear wheels is constructed so as to be in line with one of the front wheels, but the other rear wheel 2 is located to run about midway between the tracks of the two front wheels. To the lateral extension of the frame I attach a bar or beam 3 by some kind of universal joint 4, that permits the free end of the bar or beam to move horizontally, vertically, or obliquely and also have a slight rotary or twisting movement. I here show the bar 3 hinged to a block 37, that is pivoted in a bracket 38, connected with the frame-piece by a bolt 39, so held by a check-nut 40 as to be rotatable. The bar extends from its connection with the frame to the rear beside the rear wheels. In its rear end a vertical shaft or spindle 5 is so mounted as to be rotatable. To the lower end of said spindle the brush 6 is secured in a horizontal position, so that the rotation of the spindle will cause the brush to rotate horizontally. The brush consists of a head formed, preferably, like a disk placed horizontally and with the brush fibers extending downward therefrom. To the upper end of the spindle 5 I secure a chain-wheel 7 in a horizontal position, where-

by the brush can be rotated. The brush is driven by a chain 8, that passes about the chain-wheel 7 and the chain-pulleys 9, 10, and 11 and a fourth pulley beneath pulley 11, all on the extension of the front of the framework to which the bar or beam 3 is pivoted. The chain is driven by the chain-wheel 12, that is connected with the hub of the rear wheel 2, as will hereinafter be explained. In operation the parts of the chain move in the direction indicated by the arrows, which causes the brush to rotate in the direction indicated by the arrow, whereby the dirt is swept away from the curbstone and out of the gutter into the street, where it will be accessible to the ordinary street-cleaning machines. By extending the drive-chain 8 from the framework to which the beam 3 is pivoted the brush can be elevated or lowered without interference with its drive mechanism because of the long distance between the brush and the extension of the framework. Furthermore, by extending the chain from the pivotal point of the beam 3 in which the brush is mounted the chain will remain parallel, substantially, with said beam wherever its free end may be held, whether it be long or short. A chain-tightener 13 is adjustably secured by bolts to the bar or beam 3, as shown. It consists of a bracket with a wheel secured to its lower end.

It is observed that in operation the brush 6 rests upon and is directly over the surface of the gutter, being held to the street-surface by gravity; but to counterbalance the weight of the beam 3 and prevent the weight of the brush mechanism being so great as to break down and mash the fibers of the brush I provide a counterbalancing-weight 14, that is connected by the chain 15, extending over the pulleys 16 and 17 to the bracket 18, that is secured to the rear end of the beam or bar 3. The weight 14 can be altered to bring about the downward pressure of the brush on the street-surface that may be desired.

The brush is elevated by the hand-lever 19, pivoted in the framework opposite the rack-bar 20. A chain 21 extends from said lever above its pivotal point through a block and tackle 22, secured to the framework at the rear to the bracket 18. It is seen that when the upper end of said lever 19 is pulled forward said brush will be elevated, and in such elevation of the brush the weight 14 coöperates with the hand-lever.

The mechanism that drives the brush is thrown in and out of gear as follows, although any other clutch mechanism now employed in various machines could also be here employed to accomplish this purpose: In Fig. 3, 23 is the rear axle of the vehicle, and 24 is the hub of the rear wheel 2, provided at its inner end with an upturned annular flange 25. A stationary collar 26 is secured to the axle, provided with a nut 27, which when in place engages the flange 25 and prevents the lateral movement of the hub of the rear

wheel. The rear wheel 2 of the vehicle is mounted on the sleeve 28, whose outer end is enlarged and tapered, and the hub of the wheel is clamped tight to such sleeve by a nut on the inner end of the sleeve. Between the outer end of such part and the hub 24 an annular recess is formed, in which is mounted an inwardly-extending annular flange 29 from the hub 30 of the chain-wheel 12. Between the interior surface of said hub 30 and the tapered end of the journal 28 a friction-collar 31 operates, which is screwed upon the threaded end of the axle 23. When said friction-collar 31 is rotated somewhat by reason of its threaded connection with the axle, it is forced inward and wedges between the hub of the chain-wheel 12 and the bearing 28, thus causing said chain-wheel to rotate with said bearing 28 and the rear wheel 2. When the friction-collar 31 is rotated somewhat in the opposite direction, it is withdrawn from its engagement with the tapered end of the bearing 28, so that the wheel 12 will not turn. The rotation of said friction-collar 31 is caused by the bar 32, secured to said collar, and the chains 33 and 34, which extend from the ends of said bar 32 to the hand-lever 19 at a point above and a point below its pivotal point. Therefore when the hand-lever 19 is thrown forward the drive mechanism of the brush is thrown out of gear, and when it is drawn backward the drive mechanism is thrown in gear. By reason of the connection of the elevating mechanism and the drive mechanism with the hand-lever 19, as has been described, the forward movement of said hand-lever will simultaneously elevate the brush and throw the drive mechanism out of gear, and when it is drawn rearward it will simultaneously let the brush down to the street-surface and throw the drive mechanism in gear. By means of the rack 20 the hand-lever 19 can be locked in its two positions.

Inasmuch as the front of the brush 6 rotates away from the curbstone as the vehicle moves, it should not engage the curbstone, and to prevent this engagement I place a fender on the bar 3, consisting of the bracket or bar 36, having secured to it a horizontally-operating caster-wheel 35. This fender should extend laterally only far enough to merely prevent contact of the body of the brush, it being desirable that the fibers of the brush be permitted to engage the curbstone, but not the body of the brush.

One of the important features of my invention so far as the effect of operation of the brush is concerned is that the bracket 18 or attachment of the counterbalancing-weight is on the side of the center of the brush next to the machine, so that the constant lift of the weight while the brush is in operation will slightly tilt the brush toward the curbstone and will cause it to press heavier on the portion of the gutter next to the curb. This is a valuable feature because of the large deposit of dirt in that portion of the gutter.

It is observed that by reason of the universal joint connecting the bar 3 to the frame the brush will not only be movable vertically, horizontally, and obliquely, but it will have a rocking movement also, whereby it will accommodate itself to the varying surface of the street and gutter.

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

10 1. A street-gutter-cleaning machine including a vehicle, a lateral extension from the front portion of the frame thereof, a rearwardly-extending bar pivoted to such extension and a horizontally-rotatable brush  
15 mounted in the rear end of said bar.

2. A street-gutter-cleaning machine including a vehicle, a vehicle whose frame and running-gears at the front end extend laterally beyond the rear portion of the frame and the  
20 rear running-gears, a rearwardly-extending bar pivoted to such lateral extension, and a horizontally-rotatable brush mounted in the rear end of said bar.

3. A street-cleaning machine including a

vehicle, a bar or beam pivoted at one end to  
the frame thereof, a horizontally-rotatable  
brush mounted at the other end, a drive-  
wheel connected with one of the rear wheels  
of the machine, a chain extending from said  
drive-wheel to the brush for rotating it, a  
30 hand-lever pivoted to the framework of the  
machine, a clutch mechanism connected with  
said hand-lever for throwing the drive-wheel  
in and out of gear, and means connected with  
said hand-lever for elevating the brush so  
35 arranged that when the hand-lever is operated in one direction it will lower the brush  
and throw the drive mechanism in gear and  
when operated in the opposite direction it  
will elevate the brush and throw the drive  
40 mechanism out of gear simultaneously.

In witness whereof I have hereunto set my hand this 25th day of October, 1897.

ROBERT W. FURNAS.

Witnesses:

V. H. LOCKWOOD,  
ZULA GREEN.