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GUTTER CLEANING ATTACHMENT FOR STREET CLEANING MACHINES.
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GUTTER-CLEANING ATTACHMENT FOR STREET-CLEANING MACHINES.

1,407,180.


To all whom it may concern:

Be it known that I, DANIEL M. TODD, citizen of the United States, residing at Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in a Gutter-Cleaning Attachment for Street-Cleaning Machines; and I do hereby 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.

My invention relates to street cleaning machines, and more particularly to means for effectively cleaning the gutters which cannot readily be reached by the main brush or cleaning element of the machine. In street cleaning machines employing a brush revolving on a horizontal axis, it is usually customary to make the length of this brush less than the spread of the wheels of the machine. Consequently, the greater lateral spread of these wheels will prevent the brush from reaching the gutters. Moreover, even if the brush were lengthened, it could not effectively clean the ordinary gutters, as these depart considerably in inclination from the adjacent portion of the street and the inclination is apt to vary even in different portions of the same block.

It has therefore been customary either to clean the gutters by hand, or to employ auxiliary brushes mounted at the side of the machine and adapted for engaging the gutter. For this latter purpose, brushes have been used at the lower ends of shafts which were either vertical or slightly inclined to the vertical, but such brushes have been only partly satisfactory because of the wide variations in the slope of the gutters and also because of the excessive friction and power due to the same when the machine equipped with such brushes was operating on portions of the street at a distance from the curbing.

My invention aims to overcome these and other objections to the arrangements heretofore employed, by providing simple means under control of the driver of the machine for adjusting the gutter-cleaning brush to a variety of positions suitable for various shapes of gutters, for raising the gutter-cleaning brush entirely out of contact with portions of the street, and for disconnecting the gutter-cleaning brush from the driving mechanism when so raised. More particularly, my invention aims to provide a gutter-cleaning attachment for a street sweeping machine, including simple means for adjusting the inclination of the brush in directions longitudinal of the path of the machine; to provide easily manipulated means for varying the inclination of the brush in directions laterally of the machine; to provide means for latching the tilting mechanism in any of its various positions; to provide means operable by the driver of the machine without stopping the latter for raising the gutter-cleaning brush entirely off the surface of the street or gutter, and means for latching it in its raised position; and to provide means for operatively disconnecting the said brush from the driving mechanism when in its raised position. Preferably, my invention also aims to provide a single handle or lever within reach of the driver of the machine whereby he can raise or lower the brush and can automatically connect the brush to the driving mechanism or disconnect it from the latter, according as he lowers or raises the brush. Still further and more detailed objects will appear from the following specification and from the accompanying drawings in which—

Fig. 1 is a side elevation of the forward portion of a street sweeping machine equipped with my invention.

Fig. 2 is an enlarged and fragmentary vertical section through the gutter-cleaning brush and the driving mechanism for the same, taken along the correspondingly numbered lines in Fig. 6, and showing the gutter-cleaning brush in a position suited for cleaning a gutter which aligns with the surface of the street.

Fig. 3 is an enlarged elevation of the swiveling member of the machine through which the tilt-controlling lever extends and about which the latter is rocked when raising the gutter-cleaning brush out of its operative position.

Fig. 4 is an enlarged section through the same member, taken along the correspondingly numbered line in Fig. 3.

Fig. 5 is an enlarged view taken transversely of the machine and showing the member which latches the control lever either
in its operative or in its inoperative position.

Fig. 6 is a side elevation of a street sweeping machine equipped with a somewhat modified embodiment of my invention, namely one in which the swivel member is pivoted on a fixed vertical axis.

Fig. 7 is a fragmentary and enlarged section taken along the correspondingly numbered line in Fig. 6 and showing the lever-latching member used with this embodiment.

Fig. 8 is an enlarged view taken from the correspondingly numbered line in Fig. 6 and showing the gutter-cleaning brush as fitted for a gutter sloping downwardly toward the curb, and Fig. 9 is a similar view showing the same brush tilted for a gutter sloping upwardly toward the curb.

Fig. 10 is an enlarged detail view showing the arrangement of the swivel member used on the machine of Fig. 6.

Fig. 11 is a fragmentary plan view showing the gutter cleaning brush and the adjacent end of the main brush.

While my invention may be employed in connection with street cleaning machines of various types, it is particularly adapted for use with machines of the revolving brush type, such as the one disclosed in U. S. Patent No. 1239253 of J. M. Murphy and I am therefore illustrating and describing my invention in such a connection, although I do not wish to be limited in this respect.

In the embodiment of the drawings, Fig. 1 shows a street sweeping machine including a three wheeled automobile propelled by a chain 1 connecting a sprocket 2 on an engine driven shaft 3 with one of the drive wheels 4. Rotably mounted under the chassis of the vehicle is the main brush 5 which is connected to the engine by suitable means not shown in the drawings and which rotates in a counter-clockwise direction in Fig. 1, so as to sweep the refuse towards a hopper 6 carried by the vehicle. Depending from the chassis of the vehicle and in this case substantially in alignment with the medial plane of the wheel 4 is a shaft 7 carrying the frusto-conical brush 8 which I provide for cleaning the gutter. This shaft is connected through a clutch as hereafter described to a stem 9 and a universal joint 10 with a short vertical shaft 11 carrying a bevel gear 12 which meshes with another gear 13 on a horizontal shaft 14. The last named shaft carries a sprocket 15 which is continuously driven by any suitable means when the vehicle is in motion, as by a chain 16 leading to a sprocket on the shaft 3.

With the parts thus arranged, it will be obvious from the drawing that the universal joint 10 will permit, the gutter brush shaft 7 to depend either vertically or at various degrees of obliqueness, but for maximum effectiveness I preferably hold this shaft so that it always slopes towards the rear of the vehicle (as shown in Fig. 1) thereby causing the auxiliary or gutter-cleaning brush to touch the street at its forward edge. To accomplish this, I guide the shaft 10 through a collar 17 disposed immediately above the brush and pivot this collar by pins 18 to a fork 19 in the end of a control rod 20. This control rod is desirably made of steel tubing and extends slidably through a swivel member 22 which is supported by a vertical rod 23 depending from the chassis of a vehicle, so that the control rod may be moved about the axis of the rod 23 as a pivot. The swivel member 22 also has a part fastened to the control rod 20 which prevents both gravity and the resistance offered to the auxiliary brush during its sweeping action from swinging the brush shaft 10 out of its rearward inclination.

With this brush tilted as described, the shaft 10 may desirably be in a vertical plane parallel to that side of the vehicle when the brush is used on a gutter extending in substantially a common plane with the adjacent portion of the street on which the vehicle travels. However, if the gutter slopes downwardly towards the curb 55 as shown in dotted lines in Fig. 8, the auxiliary brush will be more effective if its shaft is tilted towards the vehicle, while for a gutter sloping upwardly toward the curb as in Fig. 9, the brush shaft is preferably inclined away from the vehicle. Either of these inclinations can readily be obtained by correspondingly moving the swivel member 22 laterally with respect to the rod 23 so as to move the fork 19 laterally of the vehicle, or in other words by rocking the control rod 20 about this rod 23. To effect this lateral movement of the swivel member, I desirably do not pivot it directly to the depending rod 23 but mount it on a threaded stem 24 which permits the swivel member to be adjusted laterally of the machine. For example, Fig. 4 shows the rigid depending stem 23 as carrying a collar 25 which supports a sleeve 26 while leaving the latter free to rotate on the stem, and this sleeve 26 has a horizontal stem 24 pinned to it. Threaded upon this stem 24 is a bushing 27 which affords a bearing for the swivel member 22 through which the control rod 20 extends and to which the latter is clamped by set screws 28. Upon loosening these set screws, the control rod 20 can be slid backward or forward through the swivel member 22, thereby changing the inclination of the auxiliary brush forwardly or rearwardly of the machine.

Somewhat back of the depending stem 23 I provide a latching member 29 rigidly secured to the frame of the machine and having for its purpose either of which the control rod 20 may extend, so that this rigid guide will cooperate with the swivel member 22.
22 in determining the position of the fork 19 on the forward end of the control rod. Consequently, by moving the swivel member laterally outward of the machine, I move 5 the fork 19 in the same direction and hence can secure such a tilting of the shaft of the auxiliary brush as is shown in Fig. 9, while by moving the swivel member 22 laterally toward the machine (which is done by adjusting the bushing 27) I can tilt this brush shaft in the opposite lateral direction as shown in Fig. 8.

The latching member 29 desirably has at least two forks, of which one (marked 30 in Fig. 5) is relatively short, so that an engagement of the control rod with this shorter fork will rock the control rod about the stem 24 supporting the swivel member and hence will lift the brush clear of the gutter or other street portion. The other fork extends considerably higher, so that the control rod when snapped into the latter will be at a more oblique angle to the street and hence will lower the brush to the surface of the street. This taller fork may be provided with simple means for effectively varying its height, as by providing it with transverse bores interchangeably adapted to receive a spring cotter 31 against which the control rod can be swung by the action of the weight of the auxiliary brush in rocking the swivel member about the horizontal stem 24. The rear end of the control rod desirably is bent upward and terminates in a handle within convenient reach of the driver of the machine so that the driver can readily move the control rod to snap the latter into one or the other fork of the latching member according to the extent to which the auxiliary brush is to be lowered in practice, which in turn may depend on the extent to which this brush has become worn.

To avoid a waste of power when the gutter-cleaning brush is not in use, I preferably do not connect the stem 29 directly to the shaft 7 of this auxiliary brush, but interpose a clutch arranged for automatically severing the driving connection when the auxiliary brush is raised off the surface of the gutter or street. Thus, Fig. 2 shows the shaft 7 of the brush as splined to a sleeve 32 which is fastened on a collar 33 having downwardly directed lugs engaging corresponding notches in a clutch disk 34 fastened to the stem 9 which has heretofore been described as driven through the gears 12 and 13 during the operation of the vehicle. When the brush is lowered, the lugs on the collar 33 engage the continuously rotating clutch disk 34, so that the latter rotates the sleeve 32 with it and consequently also rotates the brush shaft 7 and the brush carried by the latter. However, a raising of the brush lifts with the clutch disk 34, thereby discontinuing the rotation of the auxiliary brush when the latter is in its raised position.

From the above it will readily be seen that after adjusting the swivel member to afford the desired lateral tilting of the gutter-cleaning brush and likewise adjusting the control rod to afford the desired rearward tilting, the operator can instantly throw the auxiliary brush into or out of service by simply depressing the handle on the control rod and snapping the latter from one fork of the latching member 29 to the other. Then, if a different slope of the gutter should require an altered tilting of the auxiliary brush, the needed adjustment can easily be made at the side of the machine, and the vertical stop means (here shown in the form of a cotter pin 31) can likewise be moved to allow for the gradual wear on the brush.

However, while I have heretofore described the appliance of my invention in a highly desirable embodiment, I do not wish to be limited to the details of construction and arrangement thus disclosed, it being obvious that many modifications might be made without departing from the spirit of my invention or from the appended claims. For example, the lateral adjustment of the swivel member as provided by the horizontal stem 24 might be omitted and the swivel member might be pivoted directly on the depending stem 23 as shown in Fig. 10, in which case the desired change in the lateral tilting of the gutter cleaning brush can be effected by providing the latching member with a plurality of forks spaced laterally of the machine after the manner of Fig. 7.

I claim as my invention:
1. In a street sweeping machine, a power-driven gutter-cleaning brush mounted on a downwardly directed shaft articulated for permitting adjustment thereof in directions both laterally and rearwardly of the machine, and separate adjustable means for maintaining predetermined lateral and rearward inclinations of the said shaft regardless of the movement of the machine.
2. In a street sweeping machine, a gutter-cleaning brush mounted on a downwardly directed shaft arranged for permitting adjustment thereof in directions both lateral and rearwardly of the machine, means for adjusting the rearward inclination of the shaft, means for varying the lateral inclination of the shaft, and means under control of the driver for raising and lowering the brush without effectively altering the inclination of the shaft in either of the said directions.
3. In combination with a street sweeping vehicle, a downwardly and rearwardly directed rotating shaft mounted for permitting a variation in the downward direction of the shaft laterally of the machine, a brush on the
lower end of the shaft, and means controlled by the driver of the vehicle from his seat for varying the said lateral adjustment and for latching the said adjustment at any one of a number of definite points.

4. In combination with a street sweeping vehicle, a downwardly and rearwardly directed rotating shaft mounted for permitting a variation laterally of the machine in the downward direction of the shaft, a brush on the lower end of said shaft, means for varying the said lateral adjustment, means controlled by the driver of the vehicle from his seat for moving the shaft longitudinally to raise or lower the brush, and means for adjusting the extent to which the brush may be lowered by the driver when operating the last named means.

5. In a street cleaning machine, a rotating brush mounted on a downwardly and rearwardly directed shaft, means operatively connecting the shaft to the driving mechanism of the machine, means associated with the shaft to permit the adjustment of the shaft as to its inclination in directions lateral of the machine, means for latching the shaft as to such adjustment while freely permitting the rotation thereof, means under control of the operator for raising the brush, and automatic means for disconnecting the brush from the driving mechanism.

6. In a street cleaning machine, a downwardly directed shaft arranged for permitting longitudinal movement thereof, a brush mounted on the lower end of the shaft and adapted to engage the ground, means under control of the operator of the machine for moving the shaft longitudinally to raise the brush off the ground, and driving mechanism.

7. In a street sweeping machine, a gutters cleaning brush, a pendent shaft carrying the same, a control member connected to the pendent shaft, and a pair of guides through which the control member extends, one of the guides being adjustable laterally of the machine to vary the inclination of the said shaft laterally of the machine.

8. In a street sweeping machine, a vehicle, an articulated shaft depending from the same, a brush carried by the shaft, a pair of guide members carried by the frame of the machine and spaced longitudinally of the latter means for adjusting one of the guide members laterally of the machine, and a control member connected to the pendent shaft and pivoted to one of the guide members and releasably interlocked with the other guide member.

9. In a street sweeping machine, a vehicle, an articulated shaft depending from the same, a brush carried by the shaft, a pair of guide members carried by the frame of the machine and spaced longitudinally of the latter means for adjusting one of the guide members laterally of the machine, and a control member connected to the pendent shaft and pivoted to one of the guide members and releasably interlocked with the other guide member.

10. In a street sweeping machine, a gutter cleaning brush, a pendent shaft carrying the same, a control member connected to the pendent shaft, and a pair of guides through which the control member extends, one of the guides being adjustable laterally of the machine to vary the inclination of the said shaft longitudinally of the machine.

11. In a street sweeping machine, a vehicle, an articulated shaft depending from the same, a pair of guide means carried by the frame of the machine and spaced longitudinally of the latter, a control member connected to the pendent shaft and pivoted to one of the guide members and releasably interlocked with the other guide member, and means associated with the last named guide member for varying the extent of the said interlocking so as to vary the approaching of the pendent shaft to the street level.

12. In a street sweeping machine having a main brush mounted on a substantially horizontal axis, an auxiliary power-rotated brush mounted on an axis disposed laterally of the main brush, said brush being pivotable towards the main brush, adjustable means controlled by the driver of the machine from his seat for tilting the auxiliary brush in directions substantially parallel to the axis of the main brush, and means under control of the driver of the machine for rendering the auxiliary brush inoperative without disconnecting the adjustment thereof and without altering the position of the main brush.

Signed at Elgin, Illinois, July 26th, 1923.

DANIEL M. TODD.