

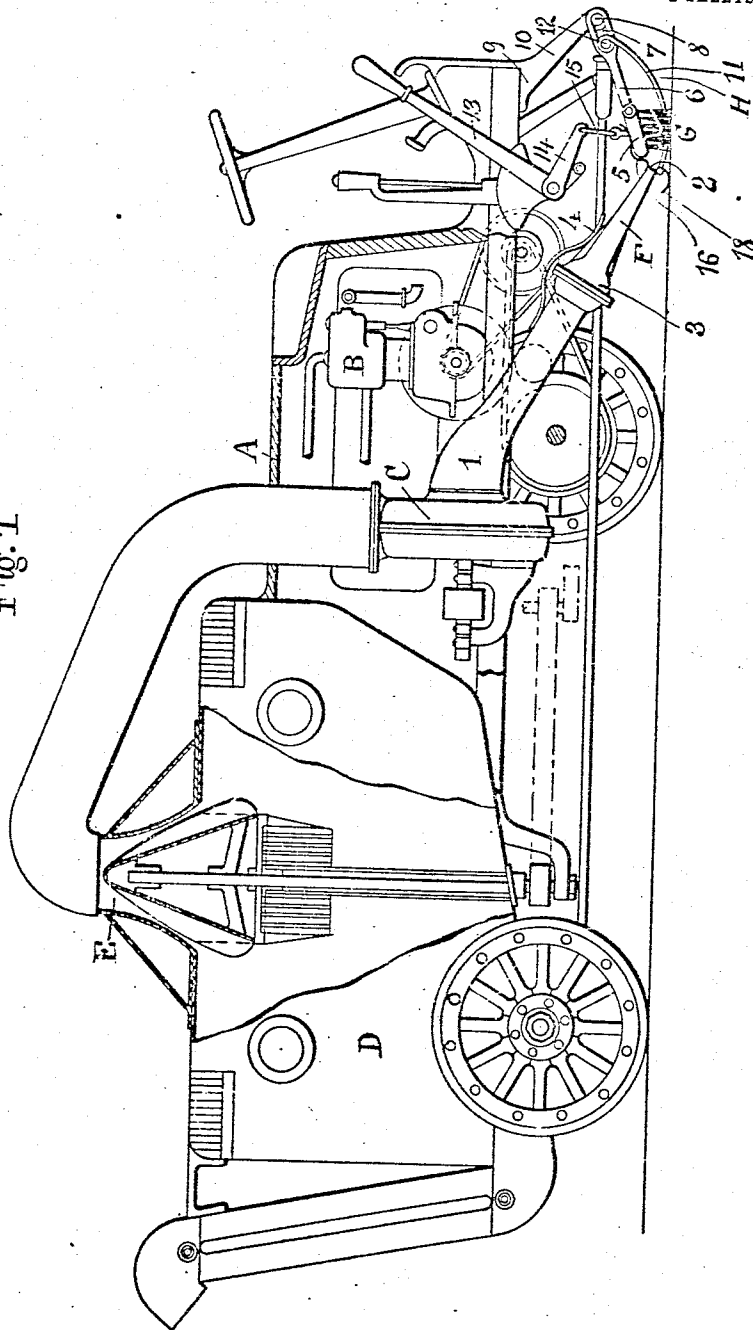
R. A. RUTHERFURD.
STREET SWEEPING MACHINE.
APPLICATION FILED SEPT. 2, 1908.

978,784.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses
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2 SHEETS-SHEET 2.

Fig. 2

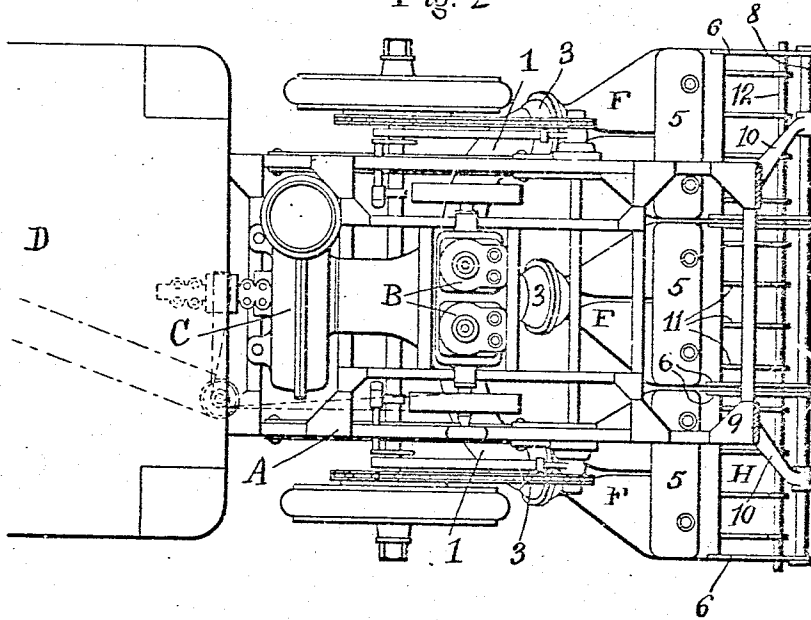
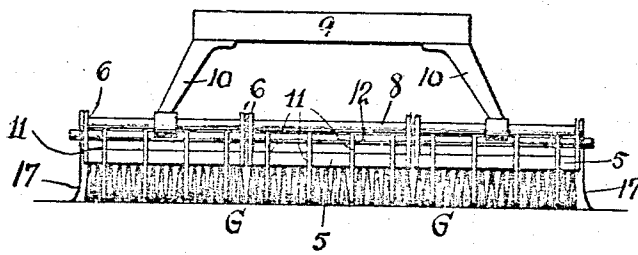


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE

ROBERT A. RUTHERFURD, OF NEW YORK, N. Y.

STREET-SWEEPING MACHINE.

978,784.

Specification of Letters Patent. Patented Dec. 13, 1916.

Application filed September 2, 1908. Serial No. 451,327.

To all whom it may concern:

Be it known that I, ROBERT A. RUTHERFURD, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Street-Sweeping Machines, of which the following is a specification.

This invention relates to street sweeping machines of the type wherein a loosener of adherent dirt and means through which the dust and dirt are drawn by air from the surface to be cleaned, are arranged adjacent to each other, and consists in certain peculiarities in the construction and arrangement of parts, and in certain novel combinations of elements substantially as hereinafter described and particularly pointed out in the subjoined claims.

The principal object of the present invention is to provide simple, durable and effective means whereby both the mouth of the suctional means and the loosener referred to will be free to follow the inequalities in the surface operated on, or will be raised over the obstructions on the surface being cleaned, and will move synchronously in following such inequalities or obstructions. This and other objects which will hereinafter appear are fully subserved by the construction illustrated in the accompanying drawings, which exemplify what is at present regarded to be the best form of the invention but to the details of which the invention is not in all respects limited.

In the drawings wherein like characters of reference designate the same parts in the several views: Figure 1 represents partly in side elevation and partly in section, a street sweeper comprising the present improvements. Fig. 2 is a plan view of a portion of the same. Fig. 3 is a detail front view of the means for loosening the dirt from the surface to be cleaned and for causing said means to follow inequalities in, or to be raised over obstructions on said surface.

The part marked A on the drawing represents an appropriate wheeled frame which carries a driving engine B of suitable construction and type, preferably a two-cylinder gasoline engine, and the other working parts of the sweeper. The other working parts herein shown, comprise a blower C, a dirt receptacle D and a centrifugal dust-

and-air separator E, all of which are driven by the engine B, which also propels the vehicle, by suitable connections therewith.

The parts referred to herein may be of any suitable construction and arrangement.

From the casing of the blower C, pipes lead downward and terminate in suction nozzles F, the mouths 2 of which are suitably arranged to receive the dust and dirt, which is drawn thereinto from the surface to be cleaned, by the blower C, and passes from the blower to the separator E where it is freed from air and finally is deposited in the receptacle D, while the air is discharged directly into the atmosphere or otherwise disposed of. Each suction nozzle F, which may include the entire connection between the fan casing and the suction mouth, but preferably is, as shown, connected to the blower casing by an intermediate pipe, is intended to have a free up-and-down movement for which provision may be made by making the pipe of flexible material or providing it with a flexible section; or as herein shown and as preferred, a ball and socket joint 3 is provided between the pipe 1 and nozzle F to permit such movement. The nozzle F is broadened and flattened, toward its free end or mouth 2 and is yieldably pressed toward the pavement by a spring 4.

The dust loosener hereinbefore referred to, is arranged in front of the suction nozzles and contiguous thereto. It preferably is a broom G, as shown, comprising a head 5 and arms 6, the forward ends of which arms are provided with elongated slots 7, by which the broom is pivotally mounted upon a suitable support, such as the shaft 8, which extends across the front of the sweeper. The shaft is supported by a bracket 9, or other suitable device, having arms 10, in the ends of which the shaft is mounted.

H designates a shoe, herein shown as formed of a plurality of spaced and bent fingers or prongs 11, the ends of which are suitably connected with the suction nozzles F, and the intermediate parts of which pass under or through the broom G, and occupy such relation to the surface to be cleaned as to be engaged and lifted by elevated portions thereof or obstructions thereon, thus correspondingly elevating the suction nozzles and broom with both of which it is connected.

As already stated, each suction nozzle is yieldably held downward by a spring 4 which is adapted to force it to follow depressions in the pavement; and the broom is free to follow such depressions, by gravity, (assisted to some extent under certain conditions by the spring 4, owing to the connection of the nozzle and broom with each other) the elongated slots 7 permitting the broom freely to rise and fall correspondingly with the deviations of the pavement from a horizontal plane, or the obstructions on the pavement. In practice, the broom is preferably made in a plurality of independently movable sections extending across the machine. A plurality of suction nozzles F, similarly, preferably are employed, each having its broadened mouth extending the full length of the broom section with which it acts, said nozzles having communication through separate pipes 1, with the blower casing, as shown best in Fig. 2.

A suitable means for connecting the prongs 11 with the broom consists of a shaft 12 which extends through the openings 7 in the arms 6 and is adapted to move with the broom, so as not to interfere with the rising or falling movements thereof. The prongs are loosely pivoted on said shaft.

Suitable means are provided for raising and lowering the broom G, manually, out of and into operative position. As herein shown, the means preferred comprise a pivoted operating lever 13 having an arm 14 at its lower end which has a link connection 15 with the broom G so as to not interfere with the automatic rising and falling movement of the latter when the parts are in their operative position.

The dust and loosened dirt are confined within the area of the suctional force exerted through the nozzle F, by means of a hood having elements arranged to inclose the ends of the brooms and the spaces between the nozzles and brooms and below the nozzles; said hood preferably comprising a flexible top flap or flaps 16 which extend from the nozzles to the brushes, preferably somewhat loosely as shown, end flaps 17 and bottom or rear flaps 18.

It will be noted that each spring 4 presses the suction nozzle with which it is associated yieldingly toward the surface to be cleaned and, acting through said nozzle, also tends to hold the shoe in operative relation with said surface. It will also be observed that movement of the shoe is communicated to the suction nozzle to which it is attached and also to the sweeping element, by exerting pressure on the shaft 12, or upon the brush fibers, or both, as well as upon the lower end of the suction nozzle. At the same time the illustrated correlation of the parts is such that a slight range of relative movement between the suction nozzle and

sweeping element is permitted, the flap or flaps 16 having some degree of looseness between the nozzle and sweeping element and the connection of the shoe with the broom permitting some degree of play. The use of a flap 16 permitting this relative movement between the broom and nozzle is preferred but is not essential to the invention considered in its broader aspects, nor is it essential to the invention in its broad aspects that the shoe be connected both to a suction element and a sweeping element. If a flap capable of transmitting force from the suction nozzle to the broom be employed, the suction nozzle will press the broom forward and pull it rearward, in its rising and falling movements, respectively, the slots 7 permitting movement of the broom.

The operation and advantages of the invention will be readily understood without further description, and it will be apparent that many changes may be made in the construction herein illustrated and many apparently widely different embodiments of the invention produced without departing from the scope thereof, for which reason it is intended that all matter contained in the description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is to be understood that I do not restrict myself to the specific details shown and described herein, and various changes may be made therein without departing from the spirit of my invention as claimed.

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

1. In a street sweeper, a pivotally mounted broom and a shoe connected therewith and adapted to engage the surface to be cleaned and, when elevations or obstructions are reached, to automatically lift the broom correspondingly, said shoe comprising a plurality of fingers or prongs which extend in front and beneath the broom.

2. In a street sweeper, a suction element and a sweeping element, severally free to follow inequalities in the surface to be cleaned within defined limits and connected to move together beyond said limits, the connection including a shoe which is disposed in operative relation to said surface and is connected to the suction element and sweeping element.

3. In a street sweeper, a suction nozzle and a broom, in combination with a shoe disposed in operative relation with the surface to be cleaned and connected with said nozzle and broom, said shoe comprising bent fingers or prongs which extend from the suction nozzle to a place in front of the broom fibers.

4. In a street sweeper, a suction nozzle

and a broom, in combination with a shoe disposed in operative relation with the surface to be cleaned and connected with said nozzle and broom, said shoe comprising bent fingers or prongs which extend from the suction nozzle to a place in front of the broom, and a spring which acts to press the shoe yieldably toward said surface.

5. In a street sweeper, a suction nozzle and a broom, said nozzle having a spring for pressing it toward the surface to be cleaned, and said broom having an arm provided with an elongated slot, a shaft extending into said slot, a shoe which is connected with the shaft and nozzle and is disposed in operative relation with the surface to be cleaned and is adapted to raise the nozzle and broom when inequalities in or obstructions on such surface are reached.

6. In a street sweeper, a suction nozzle and a broom, said nozzle having a spring for pressing it toward the surface to be cleaned, and said broom having an arm provided with an elongated slot and a shaft extending into said slot, a shoe which is connected with the shaft and nozzle and is disposed in operative relation with the surface to be cleaned and is adapted to raise the nozzle and broom when inequalities in or obstructions on such surface are reached, said shoe comprising bent fingers or prongs which extend from the suction nozzle to a place in front of the broom.

7. In a street sweeper, a broom composed of a series of sections free to independently follow inequalities in the surface to be cleaned, a suction nozzle for each of said sections, free to follow such inequalities, and a shoe connected with each suction nozzle and the corresponding broom-section and disposed in operative relation with the surface to be cleaned and to raise said nozzle and section when elevations in or obstructions on such surface are reached.

8. In a street sweeper, a suction element and a sweeping element severally free to follow inequalities in the surface to be cleaned within defined limits and connected to move together beyond said limits, the connection including a means which is acted upon by irregularities in said surface or obstructions thereon to raise the sweeping element and suction element.

9. In a street sweeper, a suction element and a sweeping element severally free to follow inequalities in the surface to be cleaned within defined limits and connected to move together beyond said limits, the connection including a shoe which is disposed

in operative relation to said surface and is loosely connected to the sweeping element.

10. In a street sweeper, a pivoted suction element, a movable sweeping element, and a shoe having one end connected to the suction element, its other end connected to the sweeping element and its intermediate part disposed in operative relation to the surface to be cleaned.

11. In a street sweeper, a pivoted suction element, a movable sweeping element, a connection between said elements and a shoe having one end connected to the suction element, its other end connected to the sweeping element, and its intermediate part disposed in operative relation to the surface to be cleaned.

12. In a street sweeper, a pivoted suction element, a movable sweeping element having an arm, a connection between said elements, and a shoe having one end connected to the suction element, and its other end connected to said arm by a shaft-and-slot connection, said shoe having its part between its ends disposed in operative relation with the surface to be cleaned.

13. In a street sweeper, a frame, a pivoted suction element and a movable sweeping element supported from the frame, the sweeping element having a slotted connection with the frame, and means for imparting movement to the suction element and sweeping element according to variations in or obstructions on the surface to be cleaned, said means including a shoe which is disposed in operative relation to the surface to be cleaned and has one end attached to the suction element.

14. In a street sweeper, a frame, a pivoted suction element and a movable sweeping element supported from the frame, the sweeping element having a slotted arm connected to the frame, and means for imparting movement to the suction element and sweeping element according to variations in or obstructions on the surface to be cleaned, said means including a shoe which is disposed in operative relation to the surface to be cleaned and has one end attached to the suction element and its other end mounted in the slot in said arm of the sweeping element.

In witness whereof I have hereunto set my hand at the city, county and State of New York, this seventh day of August, 1908.

ROBERT A. RUTHERFORD.

In presence of—

ISABEL RICHARDS,
AGNES C. O'CONNELL.