

(No Model.)

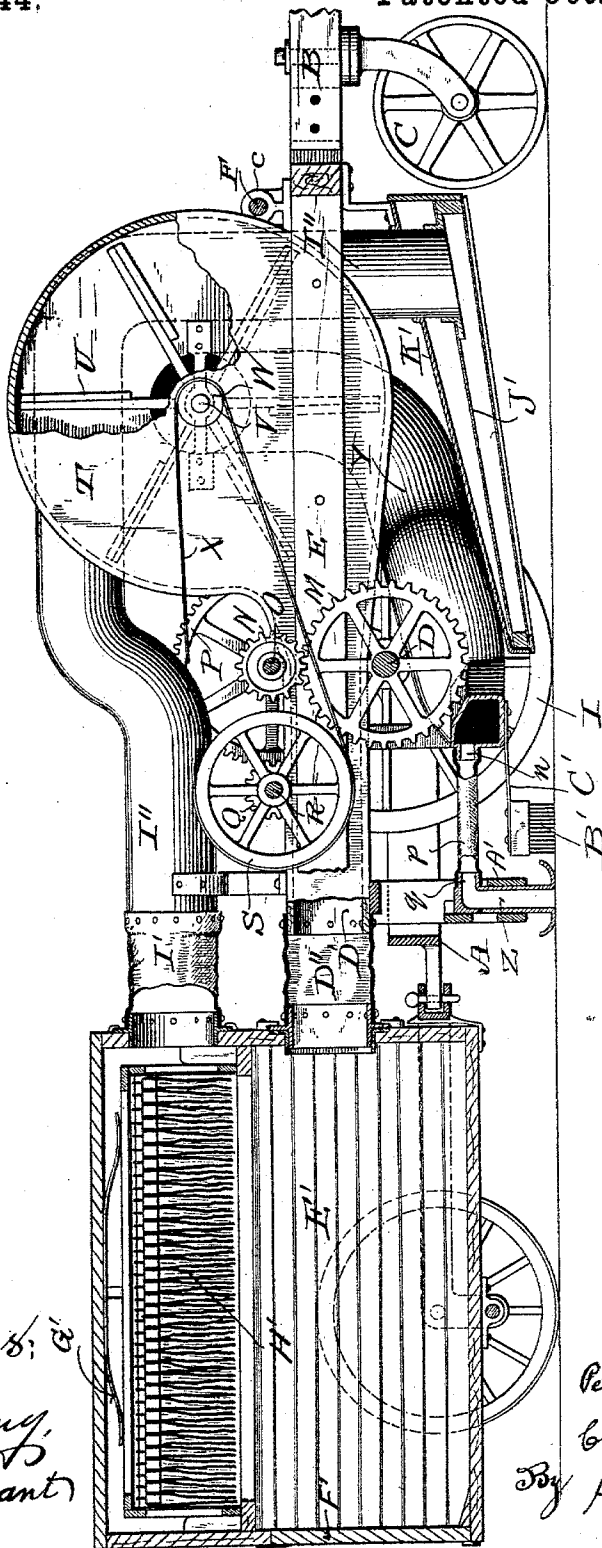
4 Sheets—Sheet 1.

P. JACOBSON & C. E. CAIN.
STREET SWEEPER.

No. 569,644.

Patented Oct. 20, 1896.

Fig. 1.



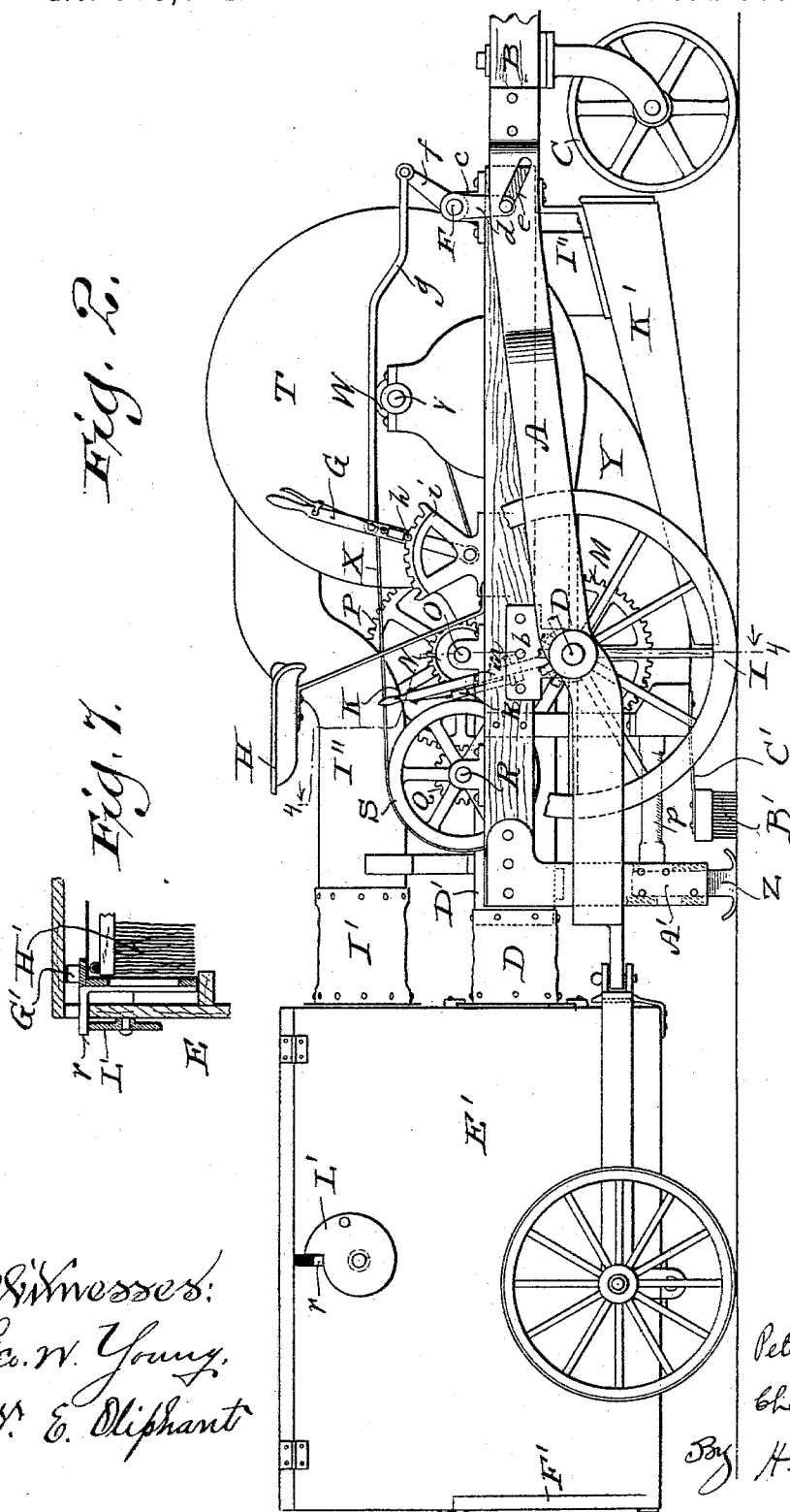
Witnesses:
Geo. W. Young,
H. E. Cliphant

Inventors:
Peter Jacobson
Charles E. Cain
By H. G. Underwood
Attorneys

P. JACOBSON & C. E. CAIN.
STREET SWEEPER.

No. 569,644.

Patented Oct. 20, 1896.



Witnesses:
Geo. W. Young,
N. E. Oliphant

Inventors:
Peter Jacobson
Charles E. Cain
By H. G. Underwood
Attorney

(No Model.)

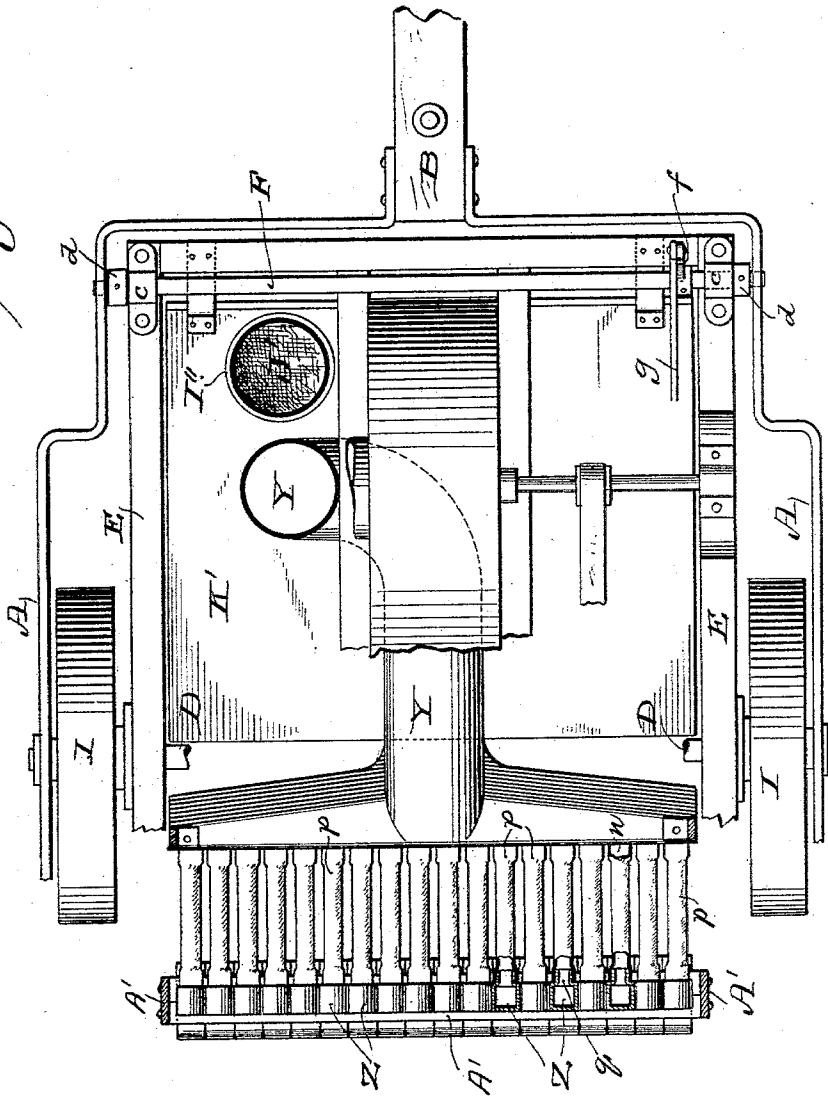
4 Sheets—Sheet 3.

P. JACOBSON & C. E. CAIN.
STREET SWEEPER.

No. 569,644.

Patented Oct. 20, 1896.

Fig. 3.



Witnesses:
Geo. W. Young.
H. E. Oliphant

Inventors:
Peter Jacobson
Charles E. Cain
By H. G. Underwood
Attorneys

(No Model.)

4 Sheets—Sheet 4.

P. JACOBSON & C. E. CAIN.
STREET SWEEPER.

No. 569,644

Patented Oct. 20, 1896.

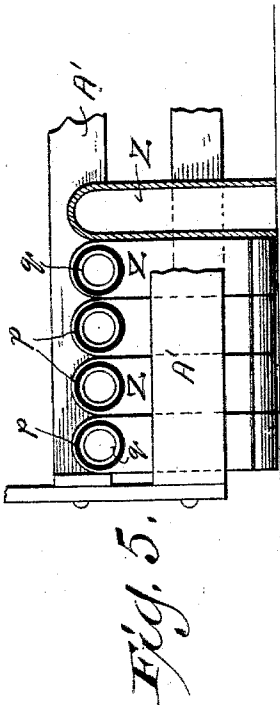


Fig. 4.

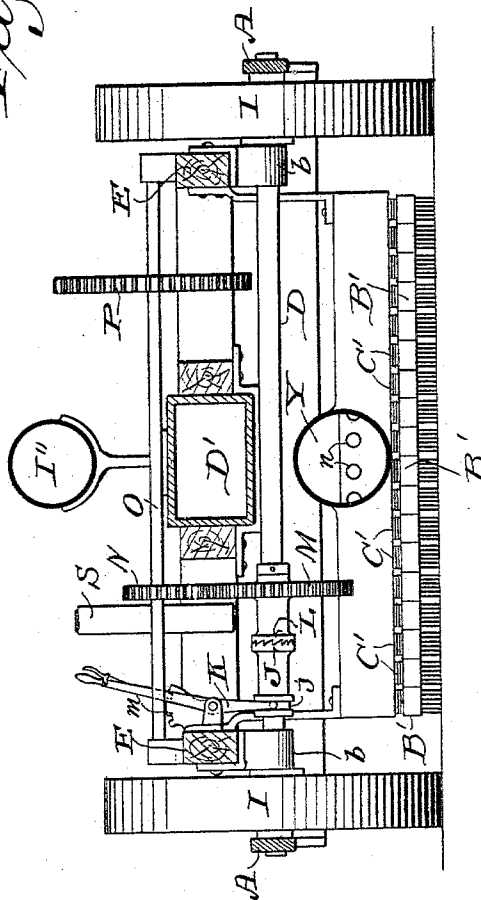
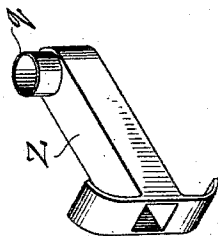


Fig. 6.



Witnesses:
Geo. W. Young
H. E. Oliphant

Inventors:
Peter Jacobson
Charles E. Cain
By H. G. Underwood
Attorney.

UNITED STATES PATENT OFFICE.

PETER JACOBSON AND CHARLES E. CAIN, OF MILWAUKEE, WISCONSIN.

STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 569,644, dated October 20, 1896.

Application filed April 27, 1896. Serial No. 589,160. (No model.)

To all whom it may concern:

Be it known that we, PETER JACOBSON and CHARLES E. CAIN, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Street-Cleaning Machines; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention has for its object to provide a simple, economical, and efficient machine for cleaning streets without scattering dust; and it consists in certain peculiarities of construction and combination of parts hereinafter set forth with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents our machine as it appears with certain parts broken away and in section, the plane of the section being longitudinally of the machine; Fig. 2, a side elevation of said machine; Fig. 3, a plan view of the dirt-elevating portion of the aforesaid machine, having portions thereof broken away; Fig. 4, a transverse section indicated by line 4 4 in Fig. 2; Fig. 5, a detail view of a series of pipes embodied in the machine; Fig. 6, a perspective view of one of said pipes, and Fig. 7 a detail sectional view illustrating an air-strainer and knocker mechanism for the same embodied in the dirt-collector portion of said machine.

Referring by letter to the drawings, A represents an annular stay-frame provided with a central front tongue extension B, to which a steering-wheel C is swiveled, and an axle D has its bearings in sides of said frame. The frame A surrounds another frame having longitudinal timbers E thereof provided with shackles *b*, loosely engaged by the axle D, and a transverse rod F, mounted in bearings *c* on the front ends of said timbers, is provided with cranks *d*, that engage inclined slots *e* in the sides of the former frame. An arm *f* of the rod F is connected by a link *g* with a hand-lever G, fulcrumed on the inner frame, and by operating this lever said frame is tilted on the axle D to bring certain hereinafter-specified parts of the machine in and out of working position. The lever G is shown provided with a latch-dog *h*, engagable with a suitably-arranged rack *i* to hold the tilt-frame in adjusted position, and said lever is also

within easy reach of a person occupying a seat H, mounted on said frame.

Traction-wheels I are herein shown fast on the axle D between the stay and tilt frames, and a ratchet-tooth clutch-sleeve J is also shown arranged on said axle to move longitudinally of the same under control of a spanner-lever K, engaged with a grooved collar *j* at the outer end of said sleeve. The spanner-lever is pivoted on the tilt-frame, and a latch-dog *k*, in connection with said spanner, co-operates with a suitably-arranged rack *m* on said frame to lock said sleeve in adjusted position.

The inner ratchet end of sleeve J comes in and out of engagement with the ratchet end of the hub L, belonging to a spur-wheel M, loose on axle D and in mesh with a pinion N, fast on a shaft O, mounted in bearings on the tilt-frame. A spur-wheel P, fast on shaft O, is shown in mesh with a pinion Q, fast on a counter-shaft R, also mounted in bearings on the tilt-frame, and a pulley S is also fast on the counter-shaft.

While we have shown a simple speed-multiplying train of gearing connecting the axle D and pulley-carrying counter-shaft R, it is practical to further increase the speed of said shaft by the employment of additional gearing in suitable arrangement. We have also shown the clutch-sleeve J and clutch-hub L as having their opposing ends in the form of ratchets, the teeth of the latter being so disposed that when said sleeve and hub are engaged the gearing in train with the clutch will not have motion, except when the machine is moving forward, but it is practical to have the traction-wheels in pawl-and-ratchet engagement with the axle to accomplish the same result, this way of connecting wheels with an axle being a well-known mechanical expedient.

Carried by the tilt-frame is a suitable casing T for a rotary fan U, having its shaft V mounted in bearings on said frame, and a pulley W, fast on this shaft, is connected by a belt X with pulley S aforesaid, the spur and pinion gearing and relative diameters of the belt-pulleys being such that the fan is run at a high rate of speed.

Leading into one side of the fan-casing, central of the same, is a spout Y, having its

rear lower end laterally extended in opposite directions. Each of a series of nipples *n*, extending rearward from the lower end of the spout, is connected by a flexible tube *p* with the elbow upper end or nipple *q* of a vertical pipe *Z*, loose in a guideway *A'*, suspended from the tilt-frame of the machine. The pipes set close together in their guideway, and a bar of this guideway being directly under the elbow ends or nipples of said pipes the latter are limited in the matter of descent, so that they may be brought away from the surface over which they travel by a suitable tilt of the frame from which said guideway is suspended.

It is preferable, as herein shown, to provide the lower end of each pipe *Z* with front and rear upturned shoes, and said pipes being brought into contact with the surface over which they travel they will automatically adjust themselves to inequalities of such surface.

One of the essential features of our invention is to have the whole area of the lower ends of the pipes parallel to the surface with which they are brought into close yielding contact, whereby we establish a partial vacuum that insures a suction of dirt by the power of the fan.

Forward of each pipe we show a brush *B'*, having a spring-hanger *C'*, attached to the under side of the rear lower end of spout *Y*, this brush serving to loosen dirt in the path of said pipe.

Dirt elevated into the fan-casing is discharged through a spout *D'* of this casing having a flexible extension *D''*, leading into a closed cart *E'*, that is coupled to the rear of stay-frame *A* above specified and provided with a tail-gate *F'*, in order to permit removal of the accumulated dirt. The cart is shown provided with a hinged cover having bow-springs *G'* depending therefrom, and supported on ledges within said cart is a strainer *H'* intermediate of the dirt-entrance, and an air-outlet into which is fitted a flexible extension *I'* of a spout *I''*, supported on the aforesaid tilt-frame and led into a dust-collector *J'*, detachably arranged in a hanger *K'*, suspended from said tilt-frame forward of the brushes and dirt-pipes hereinbefore set forth.

The strainer *H'* may be of any suitable construction; but the one shown in Figs. 1 and 7 comprises a crate-like structure having its top, ends, and sides lined with a porous fabric, such as ordinary flannel, rods supported in the frame, bars hung on the rods, and strands of yarn depending from the bars. The springs *G'*, depending from the top of the cart, exert pressure against the frame portion of the strainer, and this frame has lugs *r*, that extend through notches in the sides of said cart to bear on crank-controlled cam-disks *L'*, the latter being pivoted on the aforesaid cart. Rotation of the cam-disks elevate the strainer away from its supporting-ledges against re-

sistance of springs *G'*, and the drop in said disks permit contraction of said springs to force said strainer back on said ledges with a sudden jar for the purpose of dislodging accumulated dust.

The strainer *H'* will catch the greater portion of the dust rising in the cart, but such dust as may be carried on by the blast through spout *I''* will be diffused in dust-collector *J'*, where said air is free to expand. It also follows that any dust passing through the collector *J'* tends to settle in the path of the dirt-pipes, so that the cleaned surface is not affected.

The dust-collector may be of any suitable construction; but the one shown in Fig. 1 is a frame supporting upper and lower sheets of flannel or other porous fabric, the forward lower end of the blast-spout *I''* being engaged with a collar *s*, set in said upper sheet of porous fabric.

The various structural details of our machine may be indefinitely varied in practice without departure from the most essential features of the invention; these features being a series of pipes adjustable to have the whole area of their lower ends in close yielding contact with the surface to be cleaned, a suction and blast apparatus in communication with the pipes, a closed dirt-receptacle in suitable connection with said apparatus, and an air-strainer in the dirt-receptacle, together with an air-conveyer leading from said receptacle, and a dust-collector in conjunction with the conveyer ahead of the aforesaid pipes, this conveyer and dust-collector being auxiliary features that in no way affect the action of those previously enumerated, it being understood that suction and blast are relied upon to elevate and collect street-dirt, the dust-laden air being thoroughly strained before it is permitted to escape into the atmosphere.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A street-cleaning machine comprising a suitable frame provided with a guideway, a series of vertical pipes loose in the guideway for close yielding contact with the surface to be cleaned, a suction and blast apparatus in communication with the pipes, a dirt-receptacle in connection with said apparatus, and an air-strainer in the receptacle.

2. A street-cleaning machine comprising a suitable frame provided with a guideway, a series of vertical pipes loose in the guideway for close yielding contact with the surface to be cleaned, a suction and blast apparatus in communication with the pipes, a dirt-receptacle in connection with said apparatus an air-strainer in the receptacle, an air-conveyer leading from said receptacle, and a dust-collector in communication with the conveyer.

3. A street-cleaning machine comprising a suitable frame provided with a guideway, a series of vertical pipes loose in the guideway

for close yielding contact with the surface to be cleaned, surface-brushes in advance of the pipes, a suction and blast apparatus in communication with said pipes, a dirt-receptacle in connection with said apparatus, and an air-strainer in the receptacle.

4. A street-cleaning machine comprising a stay-frame, a traction-wheel axle having its bearings in the frame, another frame in tilt connection with the axle and former frame, suitable means for adjusting the tilt-frame and maintaining the same in adjusted position, a guideway hung from said tilt-frame, a series of vertical pipes loosely arranged in the guideway, a suction and blast apparatus on the aforesaid tilt-frame in communication with the pipes, a dirt-receptacle in connection with said apparatus, and an air-strainer in the receptacle.

5. A street-cleaning machine comprising a stay-frame a traction-wheel axle having its bearings in the frame, another frame in tilt connection with the axle and former frame, suitable means for adjusting the tilt-frame and maintaining the same in adjusted position, a guideway hung from said tilt-frame, vertically-yielding pipes arranged in the guideway, a rotary fan and its casing arranged on the aforesaid tilt-frame, clutch-controlled speed-gear in train with said axle and fan, flexible tubes connecting the aforesaid pipes and fan-casing, a closed cart coupled to the stay-frame and provided with an air-outlet, a spout of the fan-casing in flexible connection with the cart, and an air-strainer in said cart.

6. A street-cleaning machine comprising a stay-frame, a traction-wheel axle having its bearings in the frame, another frame in tilt connection with the axle and former frame, suitable means for adjusting the tilt-frame and maintaining the same in adjusted position, a guideway hung from said tilt-frame, a series of vertical pipes loosely arranged in the guideway, spring-hung brushes arranged forward of the pipes, a suction and blast apparatus on the aforesaid tilt-frame in communication with the pipes, a dirt-receptacle, in connection with said apparatus, and an air-strainer in the receptacle.

7. A street-cleaning machine comprising a stay-frame, a traction-wheel axle having its bearings in the frame, another frame in tilt connection with the axle and former frame, suitable means for adjusting the tilt-frame and holding the same in adjusted position, a guideway hung from the said tilt-frame, vertically-yielding pipes arranged in the guideway, a rotary fan and its casing arranged on the aforesaid tilt-frame, clutch-controlled speed-gear in train with said axle and fan, flexible tubes connecting the aforesaid pipes and fan-casing, a closed cart coupled to the

stay-frame, a spout of the fan-casing in flexible connection with the cart, an air-strainer in said cart, an exhaust-air spout in flexible connection with the aforesaid cart, and a dust-collector in communication with the discharge end of the latter spout.

8. A street-cleaning machine comprising a suitable frame, a series of vertically-disposed pipes adjustable to have the whole area of their lower ends in parallel yielding contact with the surface to be cleaned, a suction and blast apparatus in communication with the pipes, a dirt-receptacle in connection with said apparatus, and an air-strainer in the receptacle consisting of an angular frame having its top sides and ends lined with porous fabric, bars hung in the frame and strands of yarn suspended from the bars.

9. A street-cleaning machine comprising a suitable frame, a series of pipes for close yielding connection with the surface to be cleaned, a suction and blast apparatus in communication with the pipes, a dirt-receptacle in connection with said apparatus, and an air-strainer in the receptacle consisting of a crate-like frame having the top, sides and ends thereof lined with porous fabric, bars hung in the frame and strands of yarn suspended from the bars, together with suitable means for jarring said strainer to dislodge dust therefrom.

10. A street-cleaning machine comprising a suitable frame, a series of pipes for close yielding contact with the surface to be cleaned, a suction and blast apparatus in communication with the pipes, a dirt-receptacle in connection with said apparatus, an air-strainer in the receptacle, an air-conveyer spout leading from said receptacle, and a dust-collector consisting of a suspended frame, upper and lower sheets of porous fabric on the frame, and a collar on said upper sheet for the engagement of the discharge end of said spout.

11. A street-cleaning machine comprising a suitable frame provided with a guideway a series of vertical pipes loose in the guideway for close yielding contact with the surface to be cleaned and provided at their surface-contact ends with upturned shoes longitudinally of the machine, a suction and blast apparatus in communication with said pipes, a dirt-receptacle in connection with said apparatus, and an air-strainer in the receptacle.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

PETER JACOBSON.
CHARLES E. CAIN.

Witnesses:

N. E. OLIPHANT,
B. C. ROLOFF.