

Sept. 25, 1923.

M. SCHIESARI

1,468,977

METHOD OF AND APPARATUS FOR REMOVING SNOW

Filed Nov. 28, 1922

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Fig. 1.

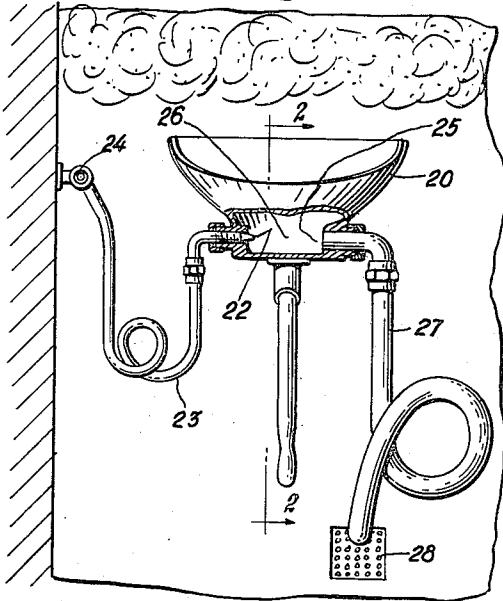


Fig. 2.

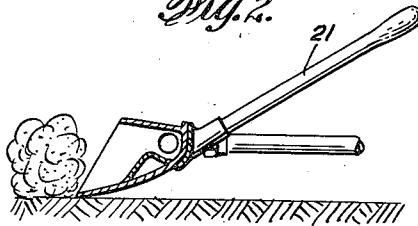


Fig. 3.

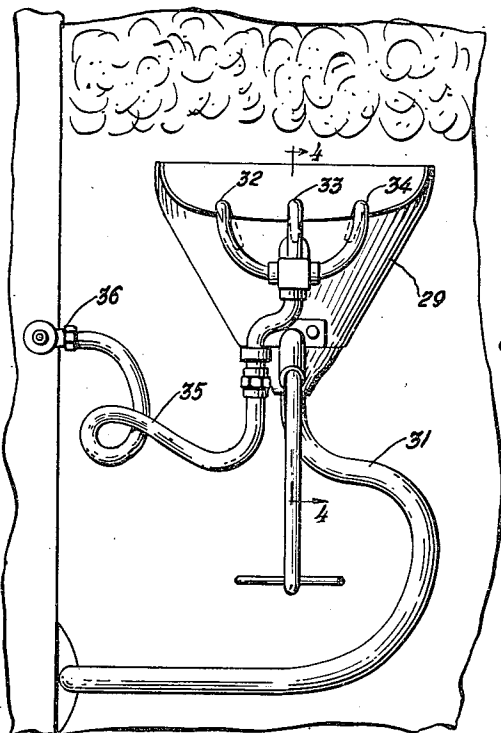
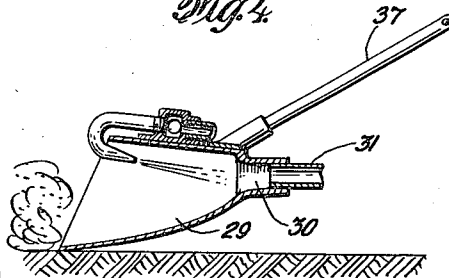


Fig. 4.



INVENTOR

Mario Schiesari

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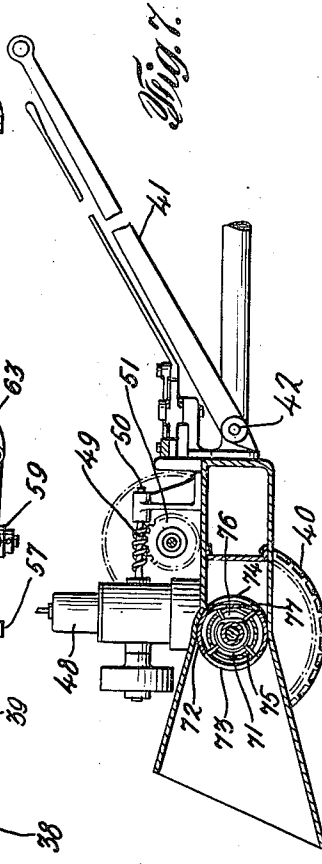
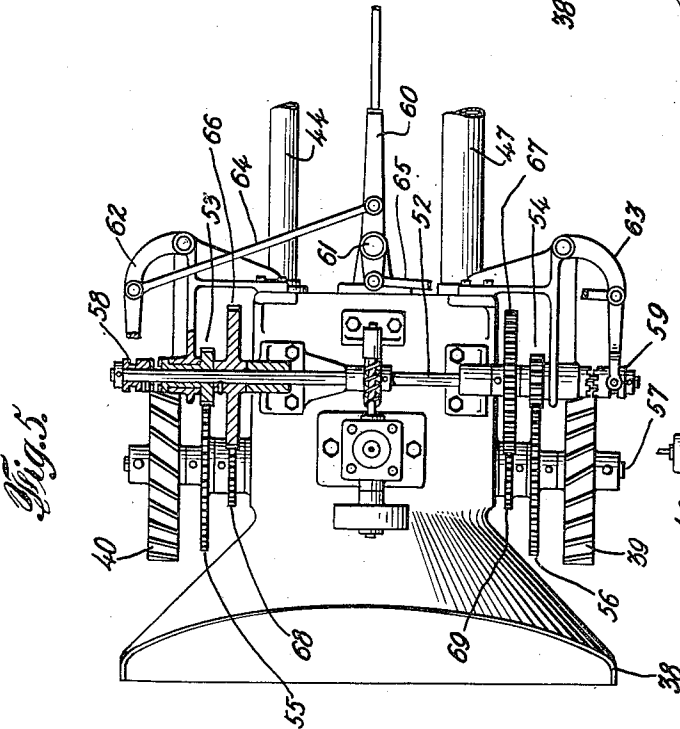
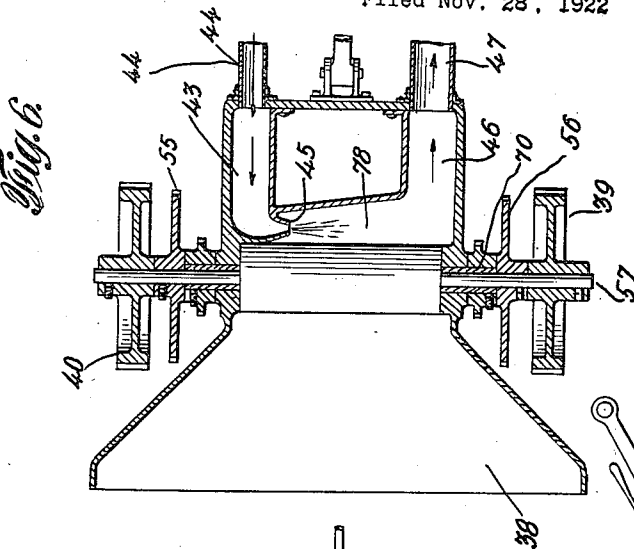
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INVENTOR

Mario Schiesari

Sept. 25, 1923.

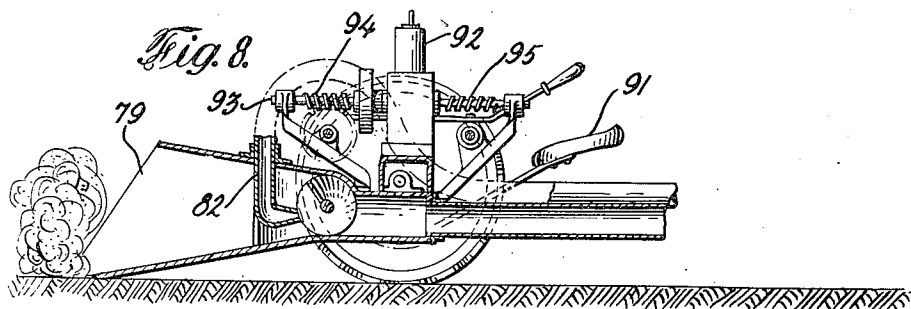
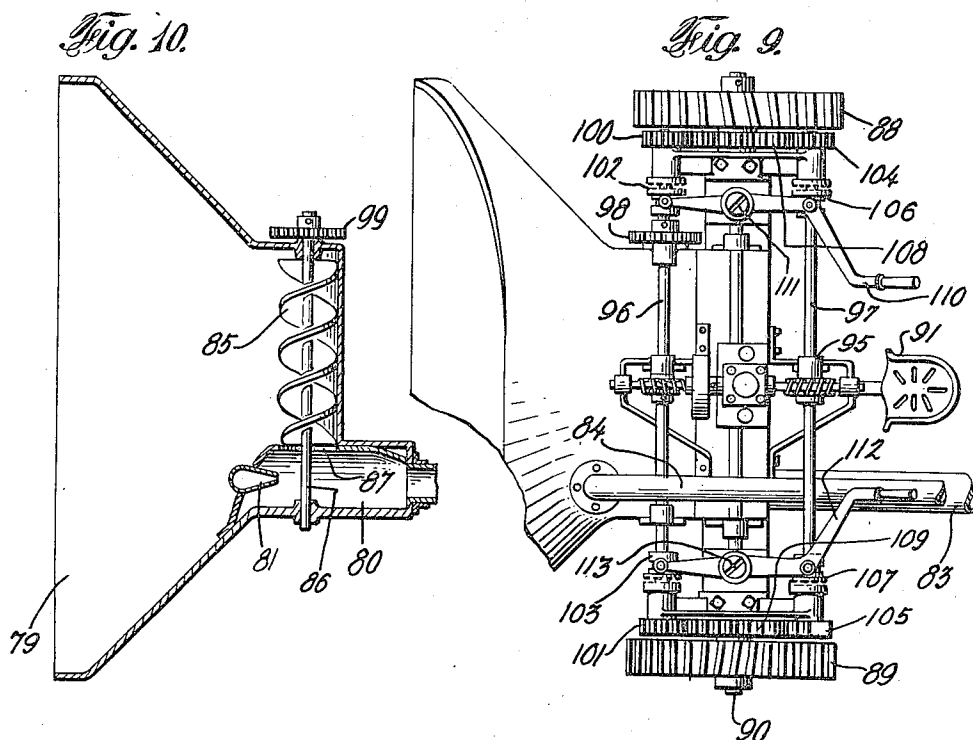
M. SCHIESARI

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INVENTOR

Mario Schiesari

Sept. 25, 1923.

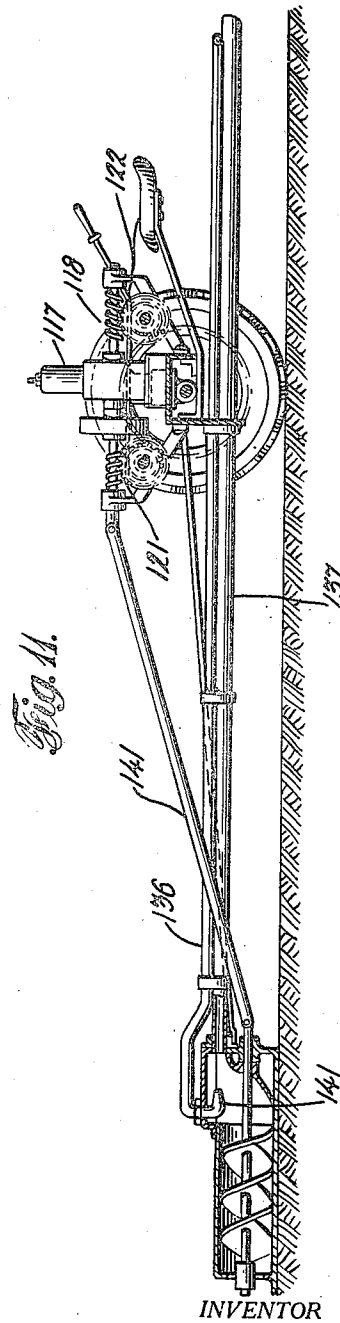
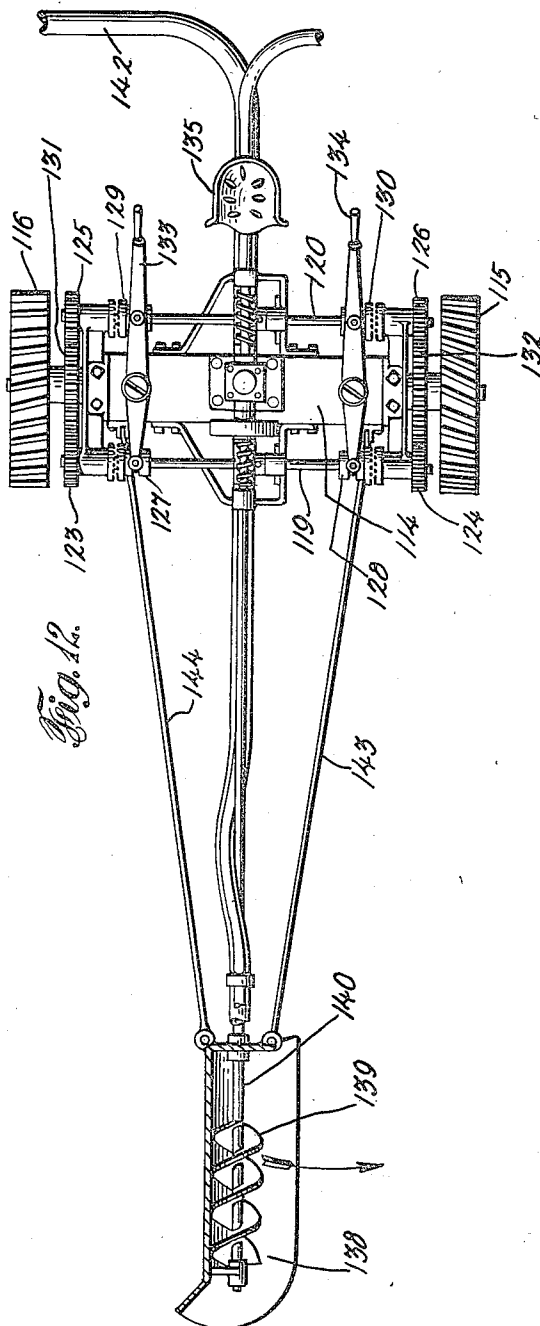
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Mario Schiesari

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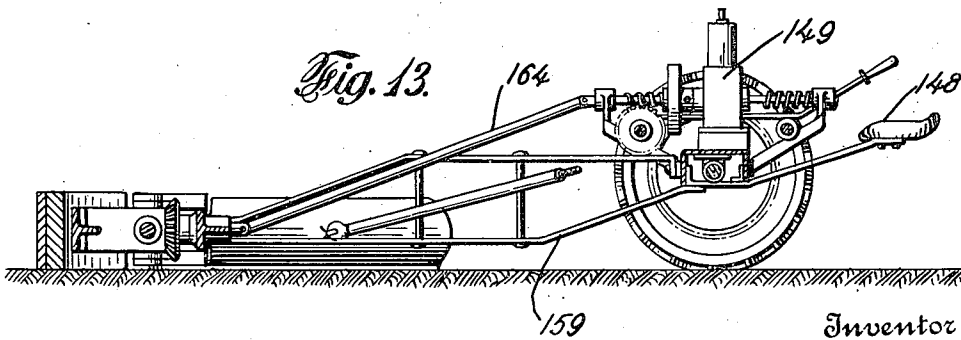
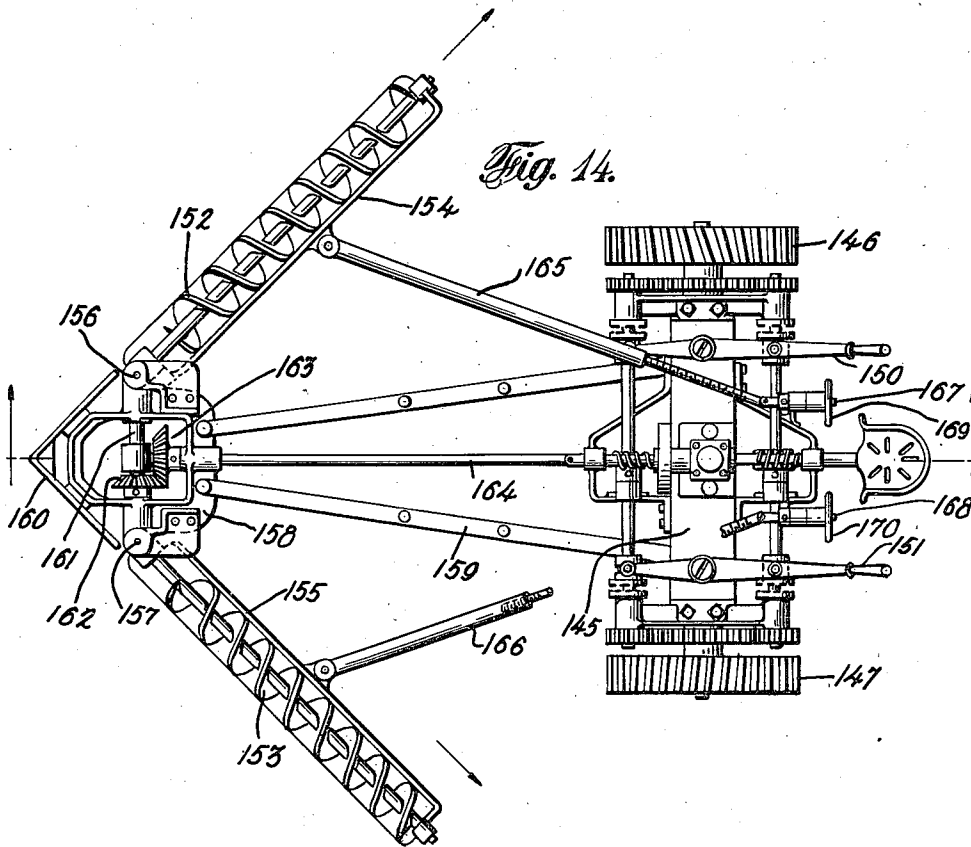
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Inventor

Mario Schiesari

UNITED STATES PATENT OFFICE.

MARIO SCHIESARI, OF NEW YORK, N. Y.

METHOD OF AND APPARATUS FOR REMOVING SNOW.

Application filed November 28, 1922. Serial No. 603,880.

To all whom it may concern:

Be it known that I, MARIO SCHIESARI, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Methods of and Apparatus for Removing Snow, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to methods of and apparatus for removing snow, and its principal object is to provide a novel and improved method of removing snow from streets and other thoroughfares, whereby the snow may be quickly and effectively removed, at comparatively small cost.

Another object of this invention is to provide apparatus embodying a novel principle on which my method of removing snow is based, permitting the operator to remove snow from streets in a rapid and effective manner.

A still further object is to provide a novel and improved design of apparatus for removing snow, embodying a novel principle on which my method of removing snow is based, and also embodying in its construction other improvements whereby a rapid and easy manipulation of the same is assured.

With these and other objects in view, as will more fully appear as the description proceeds, this invention furthermore consists in certain novel and improved constructions and arrangements of parts, as will be hereinafter fully described, and claimed in the appended claims.

The removal of snow in city streets is usually a costly and lengthy operation, carried out with rather crude methods requiring the expenditure of considerable labor, and causing delays and inconveniences without number to ordinary traffic.

My improved method, which can be applied by means of apparatus of various designs, affords a convenient and practical solution of this problem, and makes it possible to dispose of the snow in a rapid and effective manner, and with a comparatively small expenditure of labor.

The same is particularly adapted for use in city streets and other thoroughfares where water hydrants are generally available, because its application requires the use of water under pressure; the snow, which is fed into a suitable hopper, being removed therefrom by the suction exerted by water running under pressure, or by the carrying power of said water, or by the combined action of both.

The water available from the hydrants is thus the agent through which the snow is carried to its ultimate destination, usually the sewers, the actual removal of the snow from the street, however, taking place by the preliminary operation of feeding the same into the hopper.

My method is illustrated in the drawings, where various devices embodying the same are shown; and in the same:

Fig. 1 is a plan view, partly sectional, of a simple form of hand driven apparatus;

Fig. 2 is a side view in elevation, partly sectional, of the same;

Fig. 3 is a plan view of another hand driven apparatus of a different design;

Fig. 4 is a side sectional view in elevation of the same;

Fig. 5 is a plan view of an apparatus of a still different design, mounted on wheels;

Fig. 6 is a detail plan sectional view of the same;

Fig. 7 is a partly sectional side view in elevation of the same;

Fig. 8 is a side sectional view in elevation of a power driven apparatus with a different type of feed;

Fig. 9 is a plan view of the same, partly broken away;

Fig. 10 is a detail plan sectional view of the same;

Fig. 11 is a partly sectional side view in elevation of another apparatus of a still different type;

Fig. 12 is a partly sectional plan view of the same;

Fig. 13 is a side view in elevation, partly sectional, of an apparatus with a purely mechanical feed; and

Fig. 14 is a plan view of the same.

My method consists, substantially, in feeding snow in the path of a stream of

water under pressure issuing from an outlet or nozzle, for which an exhaust conduit, conveniently placed in relation to the line of travel of said water, is provided; and its practical applications include the use of flexible hose connecting said outlet or nozzle to the source of supply, and flexible hose connecting said exhaust conduit to the point of discharge; said flexible hose permitting the necessary mobility for the apparatus used.

The combined action of the suction created by the water thus issuing from said outlet or nozzle, and directed towards said conduit, and its carrying power, will result in the snow which is fed in the path of the water being carried away by it through the conduit, to its ultimate point of discharge.

An apparatus embodying my method, in its most elementary form, is shown in Figs. 1, 2, where 20 designates a funnel shaped shovel or scoop provided with a handle 21 by means of which the same may be propelled on the pavement, collecting snow as it proceeds. Within the inner end of the scoop, and at right angle to its line of travel, issue a nozzle 22, which may be connected by means of a flexible hose 23 to a hydrant 24, and a conduit 25 in line with said nozzle, at the opposite side of the scoop. A space 26, in which the snow collects, is interposed between nozzle 22 and conduit 25, and a jet of water under pressure, issuing from the nozzle, and entering the conduit, will carry along the snow, as the same reaches the path of the stream of water.

Conduit 25 is provided with a flexible hose 27, by means of which the water and snow may be discharged wherever convenient, for instance into a sewer 28.

The useful range of the device is limited, of course, by the length of the flexible hose, which, when a given section of street has been cleared, may be connected to the next hydrant and sewer, respectively.

A slightly modified form of this device is shown in Figs. 3, 4, where the scoop, 29, is provided with a conduit 30 coaxial therewith, to which is attached a flexible discharge hose 31. Three jets of water are directed against the conduit from three nozzles 32, 33, 34, located at the upper front part of the scoop, and connected to a single flexible hose 35, attached to a hydrant or valve 36. Like in the previous case, the device is propelled by means of a handle 37, but the arrangement is more effective because the travel of the water is more direct.

In Figs. 5, 6, 7, I illustrate another type of hand propelled device in which, by means of mechanical feeding means, the action is rendered more positive, and the possibility of clogging eliminated.

In the same, 38 designates a scoop, which is mounted on two wheels 39, 40, and pro-

vided with a handle 41 pivotally mounted at 42. At the rear end of the scoop, and integral therewith, are provided an inlet 43, to which may be connected a flexible hose 44, and terminating in a nozzle 45, and an outlet or conduit 46, to which may be connected a flexible discharge hose 47.

A motor 48 is mounted on the scoop, driving the feeding means, and through the same, the device may also, when desired, be propelled mechanically. By means of a worm 49 mounted on its shaft 50, said motor drives a worm wheel 51, and therefore a shaft 52 on which the same is fixed.

Said shaft 52 carries two pinions 53, 54, in mesh with gears 55, 56, respectively, which are mounted on shaft 57 of wheels 39, 40. Pinions 53, 54, are loose on shaft 52, but may be connected thereto by means of clutch members 58, 59, respectively, the same being simultaneously actuated by a controlling lever 60, pivoted at 61, and connected to clutch levers 62, 63 by connections 64, 65, respectively. These various members are so arranged that pinions 53, 54 will be simultaneously connected to or disconnected from shaft 52.

On shaft 52 are also fixed two gears 66, 67, driving pinions 68, 69, respectively, which are mounted on a sleeve 70, loose on shaft 57, and carrying the feeding means, which are interposed between the scoop, proper, and its rear portion.

Said feeding means consist of a cylinder 71 rotating within a chamber 72, which is provided with an inlet opening 73 towards the scoop, and an outlet 74 towards the rear. Said cylinder carries a plurality of radially movable blades 75, the radial movement of which is controlled by two cam-shaped grooves 76, one at each end of chamber 72.

Accordingly, said blades project outwardly when facing the scoop, and retract when opposite outlet 74, at each revolution, therefore, carrying some snow from the front to the rear, where a stripper plate 77 compels the same to fall into passage 78, leading to conduit 46.

The snow which is collected within the scoop in front, therefore, is gradually fed in front of the stream issuing from nozzle 45 by the rapidly rotating cylinder, and a more positive action is thus assured.

The device shown in Figs. 8, 9, 10, is entirely motor driven, and is also provided with a positive mechanical feed of a different design.

In the same, 79 is the scoop, provided with a discharge conduit 80, and 81 is the nozzle of feed tube 82, opening into said conduit. A flexible discharge hose 83 is attached to said conduit, while another flexible hose 84 is attached to supply tube 82.

Within the inner end of the scoop is rotatably mounted a feed screw 85, carried by

a shaft 86, and forcing the snow which comes in contact therewith through an opening 87 into conduit 80, in the path of travel of a stream of water issuing from nozzle 81.

As the device progresses, the scoop collects the snow, which is gradually forced into conduit 80 by the action of feed screw 85.

The device is mounted on two wheels 88, 89, loosely mounted on shaft 90, and is provided at the rear with a seat 91 for the operator. The same is actuated by a motor 92, the shaft of which, 93, carries two worms 94, 95, in mesh with worm wheels respectively mounted on shafts 96, 97. Shaft 96 carries a gear 98, which being in mesh with another gear 99 mounted on shaft 86, drives feed screw 85.

Shafts 96, 97, are furthermore used to propel and to steer the device, and to this end at the ends of shaft 96 are loosely mounted pinions 100, 101, adapted to be connected to or disconnected from said shaft by means of clutch members 102, 103, slidably keyed thereon. In a similar manner, at the ends of shaft 97 are loosely mounted pinions 104, 105, adapted to be connected to or disconnected from said shaft by means of clutch members 106, 107, respectively.

Pinions 100, 104, are both in mesh with a gear 108, integral with wheel 88, while pinions 101, 105, are both in mesh with a gear 109, integral with wheel 89.

By means of a clutch lever 110, pivoted at a point 111 intermediate between shaft 96 and shaft 97, clutch members 102, 106, may be controlled so that both pinion 100 and pinion 104 may be disconnected from shafts 96, 97, at the same time, or else while one of said pinions is connected to its respective shaft, the other one is disconnected from the other shaft. In a similar manner, by means of another clutch lever 112, pivoted at 113, pinions 101, 105, may be both disconnected from their respective shafts, or may be one connected to, and the other disconnected from their respective shafts. The control of the various clutch members is very easily obtained through the operation of clutch levers 110, 112, which are arranged within convenient reach of the operator, one at each side of the seat.

With the arrangement described, when all the pinions are disconnected from shafts 96, 97, the device remains stationary. If levers 110, 112 are both moved outwardly, pinions 104, 105, will both become connected to shaft 97, and the device will move in one direction; if, on the other hand, levers 110, 112 are both moved inwardly, pinions 100, 101 will become connected to shaft 96, and the device will move in the opposite direction. If lever 110 is moved inwardly and lever 112 is moved outwardly, pinions 100, 105, will become respectively connected to shafts 96, 97, and the device will turn to one side; and

if lever 110 is moved outwardly, and lever 112 inwardly, pinions 104, 101, will become connected to shafts 97, 96, respectively, and the device will turn to the opposite side. The device may thus be propelled and steered to any desired point, within the range allowed by the flexible hose connections.

In Figs. 11, 12, I show a modified form of device, which is propelled and steered in the same manner, but which has a different arrangement of feeding means.

In the same, 114 designates a frame, which is mounted on two wheels 115, 116, and which carries a motor 117. Like in the previous case, the motor shaft, 118 causes the rotation of two shafts 119, 120, by means of worm gearings 121, 122, and said shafts control the propelling and steering of the device, through pinions 123, 124, 125, 126, and clutch members 127, 128, 129, 130, adapted to interlock therewith; pinions 123, 125, being in mesh with gear 131 integral with wheel 116, and pinions 124, 126, being in mesh with gear 132, integral with wheel 115, and the clutch members being operated by means of clutch levers 133, 134, arranged one at each side of the seat 135.

The frame 114 carries a forwardly extending supply tube 136, and a forwardly extending discharge conduit 137, to which is attached a side acting scoop 138, which may be caused to scoop snow off the street by a fan-like motion in the direction of the arrow, which may be caused to extend from one side of the street to the other.

Against the inner wall of said scoop is mounted a feed screw 139 on a longitudinal shaft 140, which by means of a flexible connection 141 is driven by the motor shaft 118, and the action of said screw is to force the snow inwardly towards the opening of conduit 137. At this point the stream of water issuing from nozzle 141, integral with supply tube 136, and directed towards said opening, will force said snow within said conduit, and to flexible discharge hose 142 attached thereto. Scoop 138 is reinforced by tie rods 143, 144, attached to frame 114.

The action of the device just described is progressive in removing the snow from the entire width of the street, or for the amplitude of the sweep of the scoop, one slice at a time, all the motion being easily controlled by proper manipulation of clutch levers 133, 134.

The form of control described may also be applied in connection with snow removing devices comprising purely mechanical means for handling the snow, and a possible application along these lines is shown in Figs. 13, 14.

In the same, the device comprises, like in the previous case, a frame 145, mounted on two wheels 146, 147, a seat for the operator

148, a motor 149 mounted on said frame, and two clutch levers 150, 151 through the operation of which the movements of the device may be controlled.

5 The snow removing mechanism, proper, consists of two feed screws 152, 153, rotating within two side scoop members 154, 155, pivotally mounted at 156, 157 respectively at the sides of a frame 158, which is carried
10 by a forwardly extending armature 159 attached to frame 145.

Frame 158 terminates in a wedge 160, which separates the snow as the device progresses, forcing the same towards the feed
15 screws, which extend towards the sides of the street, and will therefore discharge and arrange the snow in two side rows. Said feed screws are operated by a shaft 161, to which the same are connected by universal
20 joints, said shaft carrying a gear 162 in mesh with another gear 163, operated by the motor shaft by means of a flexible connection 164.

The spread of the two feed screws may be
25 adjusted to suit conditions, by means of telescoping adjustable connections 165, 166, pivotally connecting the same to shafts 167, 168, mounted on the rear frame, and controlled by the operator by means of hand
30 wheels 169, 170.

From the foregoing, it appears that I provide a novel and improved method of removing snow which may be carried into practice by means of simple and easily operated devices. I also provide improved types
35 of devices whereby my invention may be carried into practice, it being understood that those shown in the drawings are intended for illustrative purposes only, but not in a limiting sense.
40

By means of the same, the snow may be partially or entirely drawn in the path of the water by the suction exerted thereby, or the same may be bodily fed directly into the
45 stream; in all cases, once the snow has reached the discharge conduit, it is carried away by the force of the stream.

I claim:

50 1. The method of snow removal, which consists in simultaneously collecting snow and directing it in the path of a stream of water under pressure, and in directing the resulting mixture to a predetermined point of discharge.

55 2. The method of snow removal, which consists in collecting snow, at the same time forcing the same in the path of a stream of water under pressure, and in directing the resulting mixture to a predetermined point
60 of discharge.

3. The method of snow removal, which consists in scooping up snow directly in the path of a stream of water under pressure, and in directing the resulting mixture to a
65 predetermined point of discharge.

4. In a device of the class described, the combination with means for producing a stream of water, of means integral therewith adapted to collect snow directly from pavements, and to feed said snow in the path of
70 said stream.

5. In a device of the class described, the combination with means for producing a stream of water, of means adapted to collect snow directly from pavements, and
75 means for mechanically feeding said snow in the path of said stream.

6. In a device of the class described, the combination with means for producing a stream of water, of means adapted to collect
80 snow directly from pavements, and means cooperating therewith mechanically feeding said snow in the path of said stream.

7. In a device of the class described, a nozzle, a stream of water under pressure issuing therefrom, a discharge conduit, and means adapted to collect snow from a pavement direct, and to feed the same close to the space interposed between said nozzle
85 and said discharge conduit.

8. In a device of the class described, a nozzle, a stream of water under pressure issuing therefrom, a discharge conduit, and means adapted to collect snow from a pavement direct, and to feed the same within
90 the space interposed between said nozzle and said discharge conduit.

9. In a device of the class described, a nozzle, a flexible supply hose connected thereto, a stream of water under pressure issuing
100 therefrom, a discharge conduit, and means adapted to collect snow from a pavement direct and to feed the same within the space interposed between said nozzle and said discharge conduit.
105

10. In a device of the class described, a carriage, means for producing a stream of water mounted thereon, and means, also mounted on said carriage, adapted to collect snow from a pavement direct, and to feed
110 the same in the path of said stream.

11. The method of snow removal, which consists in collecting snow and mechanically feeding the same in the path of a stream of water under pressure, and in directing the
115 resulting mixture to a predetermined point of discharge.

12. In a device of the class described, a scoop, means for producing a stream of water at the rear of said scoop, and means for
120 feeding snow collected by said scoop in the path of said stream.

13. In a device of the class described, a scoop, means for producing a stream of water at the rear of said scoop, and mechanically operated means for feeding snow collected by said scoop in the path of said
125 stream.

14. In a device of the class described, a carriage, a scoop mounted thereon, means
130

for producing a stream of water, and means for feeding snow collected by said scoop in the path of said stream.

- 5 15. In a device of the class described, a carriage, a scoop mounted thereon, means for producing a stream of water, means for feeding snow collected by said scoop in the path of said stream, and means operating said feeding means.
- 10 16. In a device of the class described, a carriage, a scoop mounted thereon, means for producing a stream of water, means for feeding snow collected by said scoop in the

path of said stream, and means operating said feeding means and propelling said carriage. 15

17. In a device of the class described, a carriage, a scoop mounted thereon, means for producing a stream of water, means for feeding snow collected by said scoop in the path of said stream, means operating said feeding means and propelling said carriage, and means controlling the propelling and the steering of said carriage. 20

MARIO SCHIESARI.