(No Model.) 4 Sheets—Sheet 1.

T. WRIGHT.

SNOW SWEEPER AND MELTER.

No. 343,353. Patented June 8, 1886.

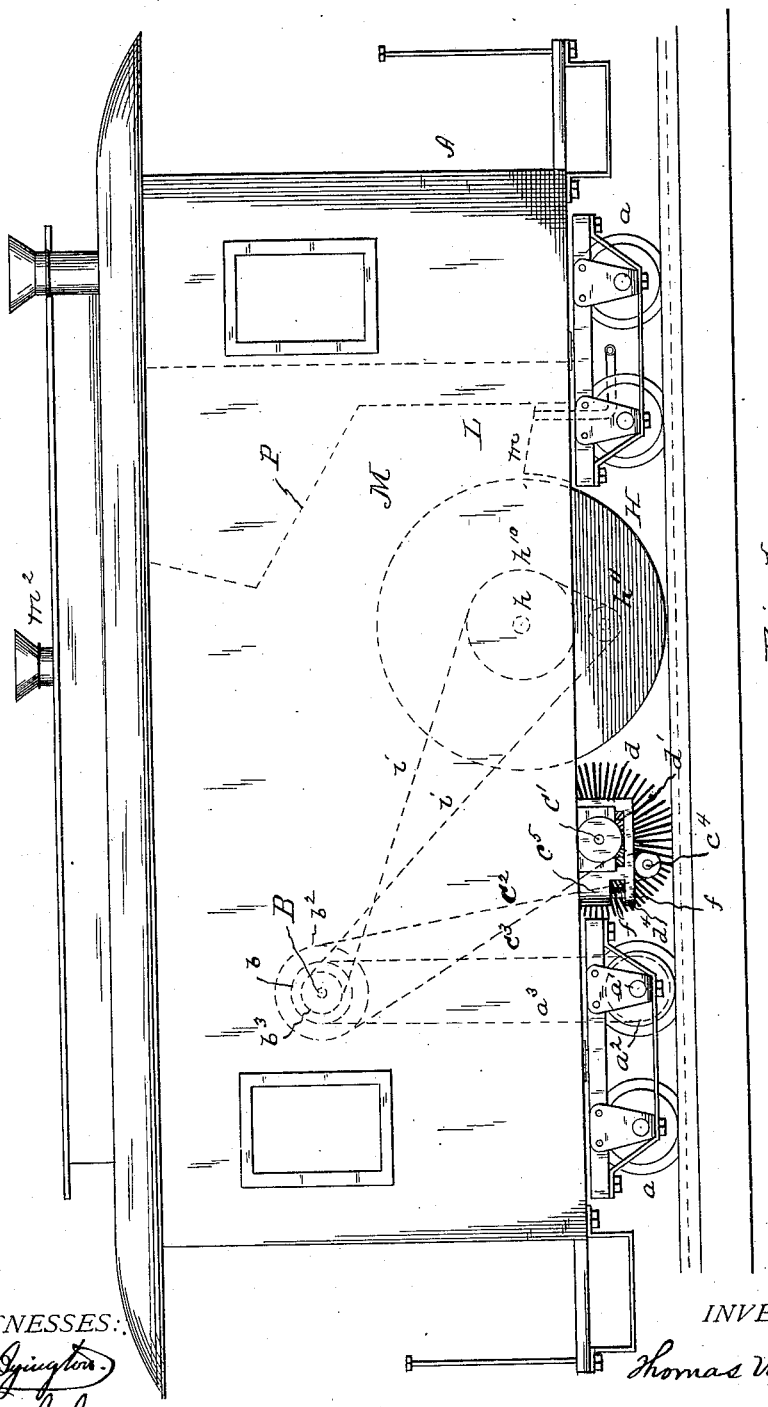

Fig. 1

WITNESSES:

Geo. P. Byington.

T. F. Holden.

INVENTOR,

Thomas Wright

By S. F. VanSavoren

ATTORNEY

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 2.

T. WRIGHT.

SNOW SWEEPER AND MELTER.

No. 343,353. Patented June 8, 1886.

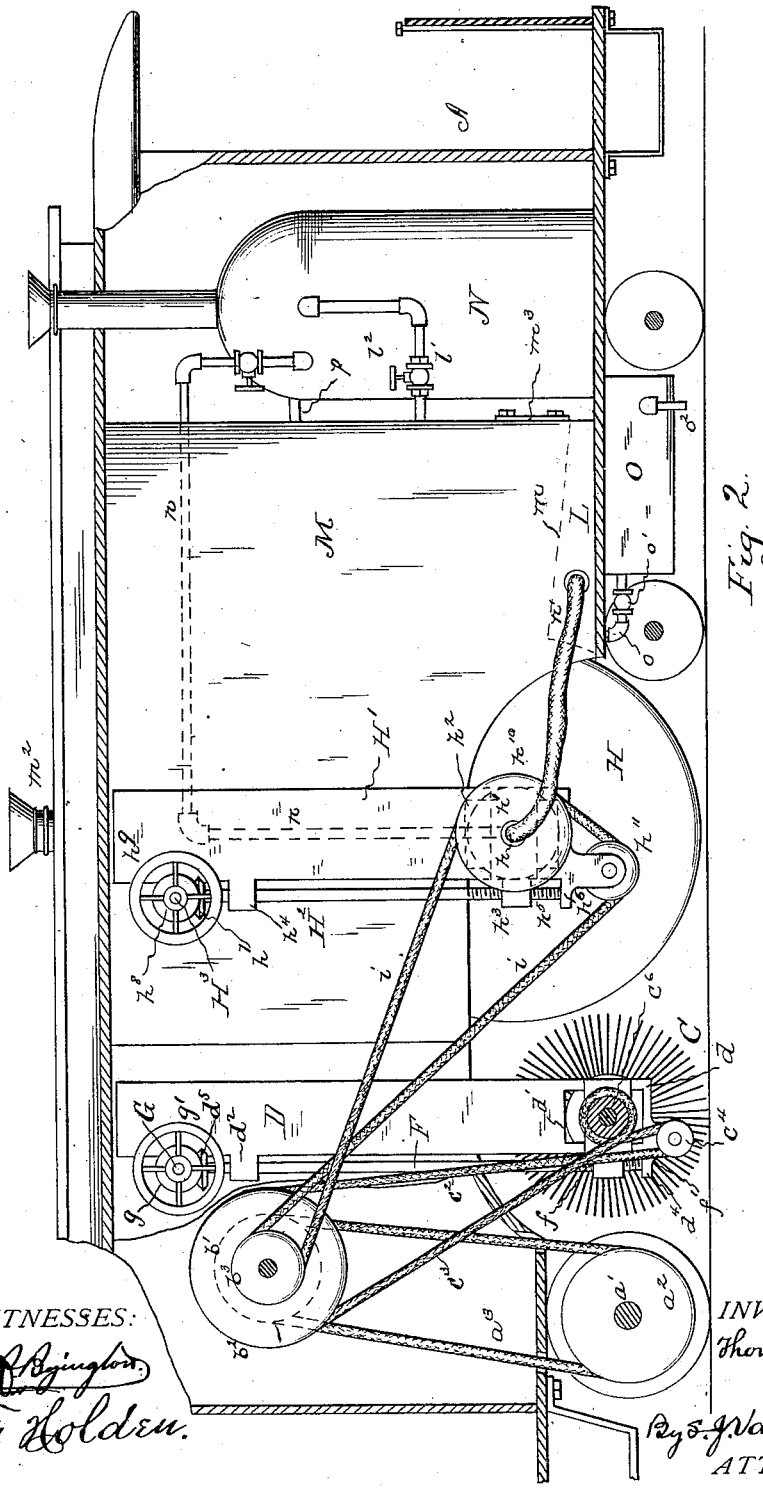

Fig. 2.

WITNESSES:

Geo. P. Bjinglow.

T. F. Holden.

INVENTOR

Thomas Wright

By S. J. Van Staveren

ATTORNEY

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 3.

T. WRIGHT.

SNOW SWEEPER AND MELTER.

No. 343,353. Patented June 8, 1886.

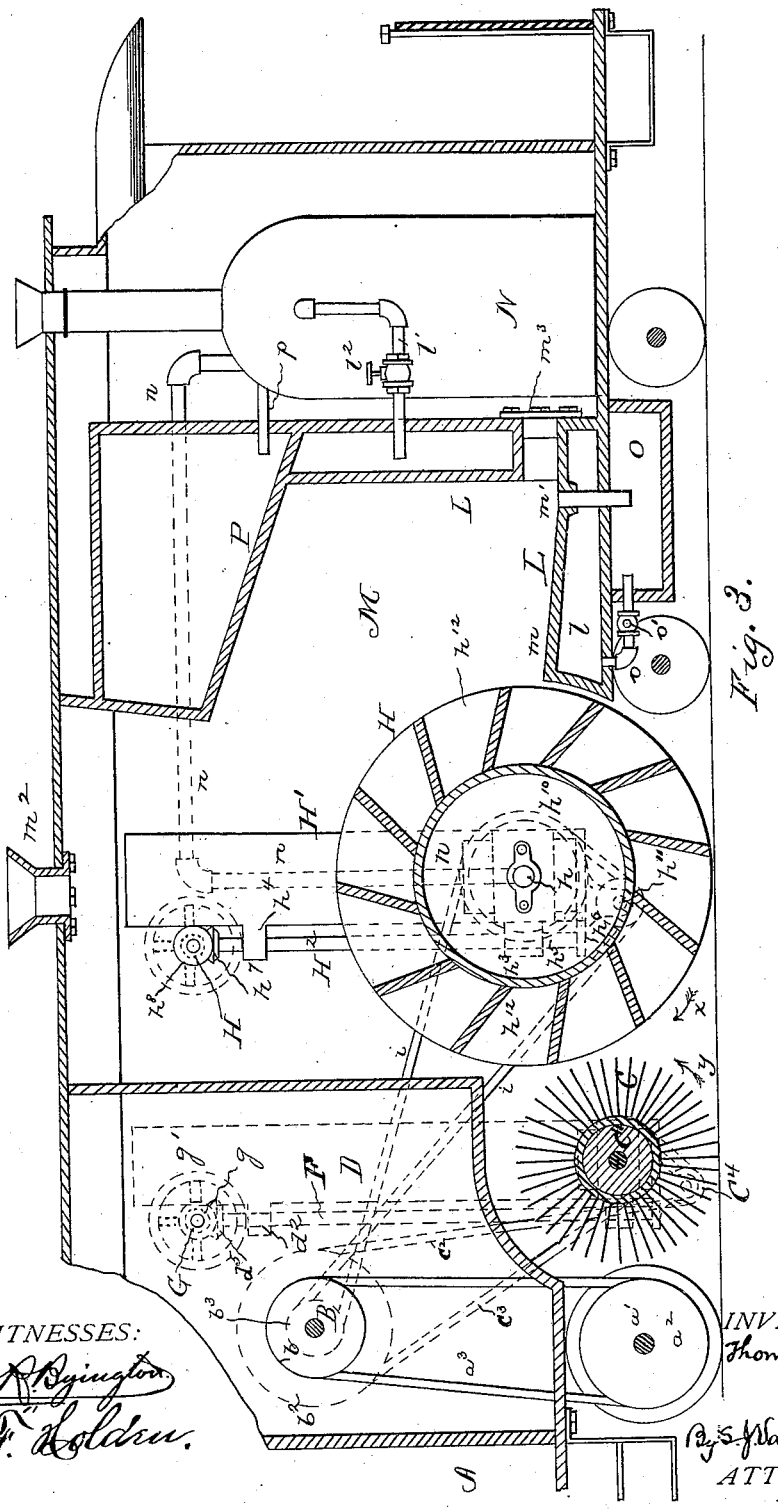

Fig. 3.

WITNESSES:

Geo. K. Bjington

T. F. Holden.

INVENTOR

Thomas Wright

By S. J. VanStavoren

ATTORNEY

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 4.

T. WRIGHT.

SNOW SWEEPER AND MELTER.

No. 343,353. Patented June 8, 1886.

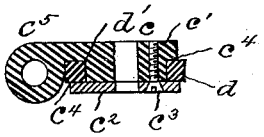

Fig. 6.

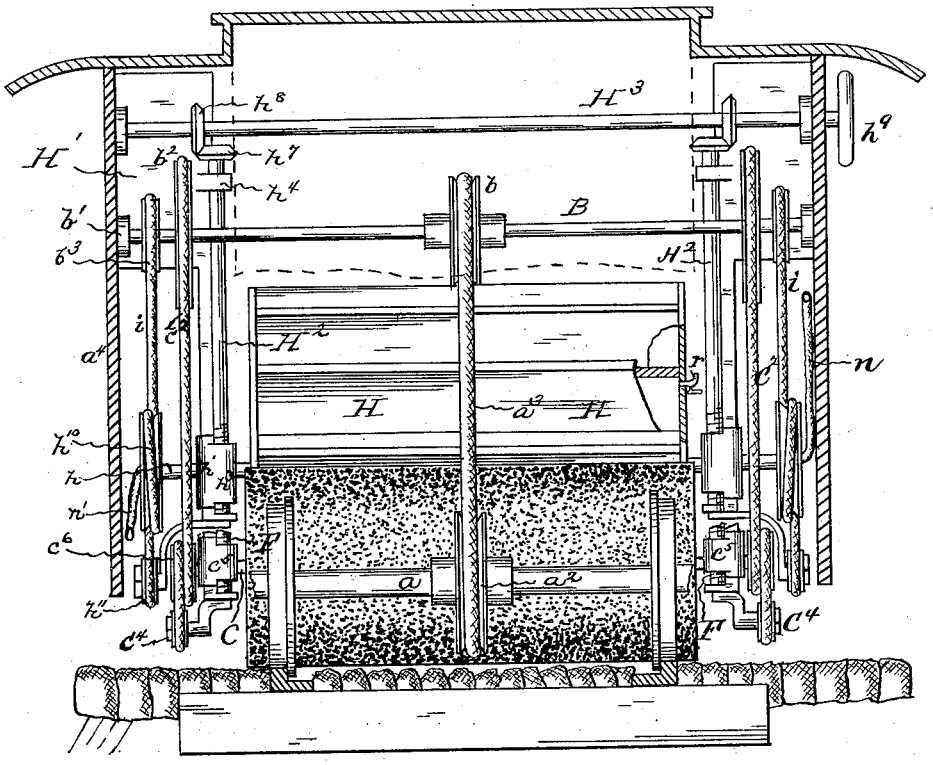

Fig. 4.

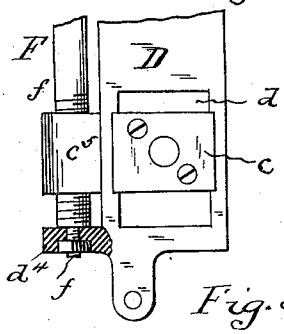

Fig. 5.

WITNESSES:

Geo. H. Byington.

T. F. Holden.

INVENTOR,

Thomas Wright

By S. J. VanStavoren

ATTORNEY

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

THOMAS WRIGHT, OF CAMDEN, NEW JERSEY.

SNOW SWEEPER AND MELTER.

SPECIFICATION forming part of Letters Patent No. 343,353, dated June 8, 1886.

Application filed January 27, 1886. Serial No. 189,892. (No model.)

To all whom it may concern:

Be it known that I, THOMAS WRIGHT, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Snow Sweepers and Melters, of which the following is a specification, reference being had therein to the accompanying drawings, wherein—

Figure 1 is an elevation of a snow-sweeper embodying my improvements. Fig. 2 is a longitudinal section at or near one side of the sweeper. Fig. 3 is a central longitudinal section. Fig. 4 is a transverse section showing sweeping-brush, cylinder, driving-axle of the sweeper, and power-transmitting devices for the brush and condenser. Fig. 5 is an elevation, partly sectional, drawn to an enlarged scale, of one of the adjustable bearings for the sweeping-brush and for the cylinder or condenser and a part of the frame or support for said bearing; and Fig. 6 is a horizontal section of same.

My invention has relation to snow-sweeping vehicles or devices which are particularly adapted for street-railway and other purposes; and it has for its object to sweep the snow off of the street or roadway into a rotary condenser or chamber wherein the snow is either wholly or partially condensed into water, then emptying the partially-condensed snow or the condensations into a chamber wherein the condensation is completely, if not already, effected, and then to either retain the water of condensation in the device or vehicle and draw it off periodically or permit it to drain away from the vehicle or device continuously.

My invention accordingly consists of the combination, construction, and arrangement of parts, as hereinafter described and claimed, having reference particularly to a rotating sweeping-brush, a rotary condenser or cylinder connected with a heating device, a heating-chamber back of said condenser for receiving the contents of the latter, and a chamber for containing the water of condensation, from which it is drawn off periodically or permitted to drip or drain continuously, and to adjustable bearings for the sweeping-brush and rotary condenser or cylinder, and power-transmitting devices interposed between said sweeping-brush, condenser, and one of the axles of the vehicle.

In the drawings, A represents a car or vehicle, either mounted upon trucks *a*, as shown in Fig. 1, or otherwise having its wheels attached thereto, as indicated in Figs. 2 and 3. One of the axles, *a'*, of the vehicle is the driving-axle, having preferably a centrally-located pulley, a^2, which is in gear by means of a rope or chain, a^3, with a like pulley, *b*, on a counter-shaft, B, having suitable bearings, *b'*, in the sides a^4 of the vehicle, as more plainly indicated in Fig. 4.

Preferably at the forward end of the car is placed a rotary sweeping-brush, C, of any suitable construction, the shaft C' of which is journaled in boxes or bearings *c*, composed of two plates, *c'* and c^2, (seen more plainly in Figs. 5 and 6,) suitably screwed or otherwise fastened together, as indicated at c^3, to form edge grooves c^4, which are adapted to the sides *d* of an elongated slot, *d'*, formed in the lower ends of frames or supports D for the bearings *c* of the brush-shaft C'. These frames are suitably fastened to the interior sides of the vehicle, as more plainly shown in Fig. 4.

At the upper end of the frames D are lugs or bearings d^2, and upon the plates *c'* of each bearing *c* is a lug, c^5, which is threaded to engage with the screw portion *f* of a rod, F, one for each bearing, which passes up through lugs d^2 on frames D. The lower ends of rods F have step or other suitable bearings, *f'*, in lugs d^4 on the lower ends of frames D, and their upper ends are provided with miter or bevel wheels d^5, which mesh with like wheels *g* upon a counter-shaft, G, having suitable bearings in the sides of the vehicle, (see Fig. 2,) and a hand-wheel, *g'*, so that by turning the latter in either direction the rods F are rotated to cause their threaded portions *f* to raise or lower the bearings *c* in slots *d'* for the purpose of either elevating or lowering the brush C to and from the roadway to either regulate the extent or depth of sweeping or to take up wear of the brush. At or near the ends of shaft B are grooved or other suitable driving-wheels, b^2 b^2, for transmitting power to brush-shaft C' by means of belts or chains C^2 engaging with like pulleys c^6 c^6 on the ends of shaft C'. As the brush

and its shaft-bearings are vertically adjustable, the chains or belts C^2 must be in gear with pulleys c^6 in such manner that the belts or chains C^2 will not slack or sag when the brush is raised and will not become taut when the brush is lowered. To provide for this described result, I secure idler-wheels or grooved-pulleys C^4 to the lower ends of the frames D, or said pulleys may be otherwise located on the frames, so as to be in line with the shaft pulleys or wheels c^6, and coil or pass one side, C^3, of the ropes or chains C^2 completely or once around the pulleys c^6, and then pass the same under or over the idler pulleys or wheels C^4, as plainly shown in section of Fig. 2, and also in Fig. 4. As the brush and its shaft is either raised or lowered the wheels or pulleys c^6 revolve within the coil of chain or belting around them to ride up or down upon the side C^3 of chains or belting C^2 without producing any slack or tightening the same.

To the rear of brush C, and preferably in as close proximity to the brush as it is possible to get without touching it, is placed a hollow rotary metal wheel or cylinder, H, of a length equal, or nearly equal, to that of the sweeping-brush. This cylinder has suitable hollow trunnions or shafts, h h, journaled in bearings h', adjustable or sliding in frames H′ in the manner above described for the brush-shaft bearings c, so that the cylinder H is adapted to be raised or lowered—that is to say, the bearings h' are composed of two plates suitably screwed together, having side grooves adapted to elongated slots h^2 in the lower ends of frames H′, one of the plates of each bearing h having a threaded lug, h^3, which engages with a screw-rod, H^2, one for each bearing h, each of which rods passes through a lug, h^4, on the upper end of the respective frame H′, upon which it is mounted, and has a step-bearing, h^5, in a lug, h^6, at the bottom of the frames, and also at its upper end a bevel-wheel, h^7, which engages with a like wheel, h^8, on a counter-shaft, H^3, having suitable bearings in the sides of the vehicle, and a hand-wheel, h^9, by means of which the cylinder is raised or lowered, as desired.

Upon the cylinder-shaft, at each end, are fastened grooved or other suitable wheels or pulleys, h^{10}, which are connected by chains or belts i to like pulleys or wheels b^3 upon the shaft B, and one side of each of these chains or belts i is coiled once around the pulleys h^{10}, and then passed under or over idler-pulleys h^{11}, secured to frames H′, as above described for chains or belts C^2 and pulleys c^6, to permit the cylinder H and its shaft to be either raised or lowered without slacking or tightening said belts or chains; hence both the brush C and cylinder H can be raised or lowered without adjustment of their power-transmitting devices.

The power-transmitting devices or the belts and chains i for cylinder H are arranged to rotate it in direction opposite to that in which the brush is rotated, for a purpose hereinafter described, the direction of rotation of said parts being indicated by arrows x and y, respectively, (see Fig. 3,) and as the sweeping-brush C is preferably rotated at a greater speed than is the cylinder H the pulleys b^2 on shaft B for driving the brush are shown of a larger diameter than that for the pulleys b^3 on said shaft for driving the cylinder. This difference in diameter may, however, be varied or regulated as desired, according to the work to be accomplished.

Upon the circumference of the cylinder are formed longitudinal buckets or receptacles h^{12}, and to one end of its shaft is suitably swiveled or coupled a flexible or partly yielding and partly rigid pipe, n, which leads to a steam, hot-air, water, or other heating furnace, N, preferably located at the rear end of the car, and to the other end of said shaft is likewise swiveled a similar pipe, n', leading to a steam, hot-air, water, or other heating jacket, L, formed upon the floor and on the end and sides of a chamber, M, so as to surround it, or nearly so, and which is located between the cylinder H and the furnace N, as more plainly shown in Fig. 3. The floor m of chamber M, or the top of its bottom heating-jacket, l, inclines downwardly from the cylinder rearwardly, and has an outlet-pipe, m', leading into a receptacle or tank, O, located just below or adjacent to the floor-heating jacket l, and the latter and the tank O are connected by a pipe, o, having a check or stop valve, o'. The heating-jacket L is connected by a pipe, l', having cock l^2, with the heating-furnace N, and if the latter be a steam or hot-water furnace a water tank or reservoir, P, is provided, which is preferably placed so as to form the roof of chamber M, as indicated in Fig. 3, and connected by a pipe, p, with furnace N.

If desired, an outlet or vent, m^2, may be formed in the roof of the car, (see Fig. 3,) for escape of vapor or steam from chamber M, and tank O is provided with an outlet-pipe, o^2, and chamber M has a cleaning-out opening, m^3.

The operation is as follows: The hot air or steam from furnace or boiler N is circulated by way of pipe n to the interior of cylinder H and by way of pipe n' to jacket L, and, if desired, by way of pipe o, when its valve is open, to tank O, and also by way of pipe l' to said jacket and tank, to warm or render hot the metal cylinder and the sides and bottom of chamber, which are also preferably made of metal. The heating of chamber M keeps the water in tank P at a high temperature, to prevent freezing and for economizing in the amount of fuel required for the furnace or boiler N. The snow swept by the brush into the buckets of cylinder H melts more or less as it is carried around by the cylinder, so that as each successive bucket arrives at or near to the floor of chamber M the partially-melted snow slides out of the buckets into chamber M, or the buckets empty themselves at the proper time, they being made or fixed at an angle, as shown, to do so. The snow not

melted in the cylinder is fully condensed or melted after it is deposited in chamber M, and the water of condensation passes through pipe m' into tank O, and if retained therein is kept warm and cannot freeze by reason of the proximity of said tank to heating-jacket L, and also by the hot air or steam passing into it from the pipe *o*. The water of condensation may be drawn off periodically along the route of sweeping by stopping the vehicle at sewer-inlets or other suitable places and leading such water by attaching a hose to outlet-pipe o^2 to the inlet, or, if desired, the water of condensation may be permitted to continuously overflow or drain away from tank O through pipe o^2, in which case it may form the outlet-pipe of chamber M, and the tank O and pipe *o* are then dispensed with. (See Fig. 1.)

As the chamber M has a vent, m^2, undue heating of the same or the parts of the vehicle or the accumulation of vapor therein is avoided.

The cylinder H is preferably provided with a drip or drain cock, *r*, for drawing off any water of condensation collecting therein when in use. (See Fig. 4.)

I do not confine myself to the particular arrangement and construction of the various parts comprising my improvements, as it is obvious that they may be differently arranged and constructed without departing from the spirit of my invention.

What I claim is—

1. A snow-sweeping vehicle or device having a rotary sweeping-brush, a rotary cylinder for receiving the sweepings, and a heating device for said cylinder, substantially as and for the purpose set forth.

2. A snow-sweeping vehicle having a rotary sweeping-brush, a rotary cylinder for receiving the sweepings, a heating device for said cylinder, a condensing-chamber, and heating devices for the latter, substantially as set forth.

3. The combination, in a snow-sweeping car or vehicle, of a rotary sweeping-brush, a rotary cylinder, a condensing-chamber, and a heating device for said cylinder and chamber, substantially as set forth.

4. The combination, in a snow-sweeping car or vehicle, of a rotary sweeping-brush, a rotary cylinder, a condensing-chamber, a heating-furnace for said cylinder and condensing-chamber, and a reservoir for the water of condensation having an outlet-pipe, substantially as set forth.

5. The combination, in a snow-sweeping car or vehicle, of a rotary brush, a rotary cylinder for receiving and more or less melting the snow or sweepings, bearings for said brush and cylinder, and means for adjusting or raising and lowering said bearings to elevate or depress said brush and cylinder, substantially as set forth.

6. The combination, in a snow-sweeping car or vehicle, of a driving-axle, a counter-shaft in gear with said axle, a rotary sweeping-brush, a rotary cylinder, heating devices for said cylinder, and belt or chain connection between said counter-shaft and the brush and cylinder for revolving the latter in opposite directions, substantially as set forth.

7. The combination of a car or vehicle, a rotary brush having a driving-pulley, and a driving belt or chain one side of which is passed or coiled once around the driving-pulley on the brush and over or under an idler-pulley, a bracket or support for the brush and idler-pulley, and actuating devices for raising or lowering the brush without producing slack or tension of its driving-belt, substantially as set forth.

8. The combination of a rotary brush having bearings adjustable to raise and lower the brush pulleys or wheels on said shaft, idler-pulleys secured to the frames supporting the bearings and chains or belts having one side coiled once around the pulley on said shaft and passing under or over the idler-pulleys, as and for the purpose set forth.

9. In a snow-sweeping machine, the rotary cylinder H, having adjustable bearings, a shaft having pulleys or wheels on each end, frames or supports for said bearings, idler-wheels on said frames, and driving belts or chains each of which have one side coiled once around one of the pulleys on said shaft and engaging or passing around one of the idler-wheels, as set forth.

10. In a snow-sweeping machine, the combination of a rotating hollow cylinder having outside rim or circumferential buckets placed lengthwise of the cylinder, a heating device for the latter, and a rotary brush for sweeping the snow into the cylinder-buckets, substantially as shown and described.

11. The combination of a shaft having driving pulleys or wheels at each end, sliding bearings for said shaft, frames or supports, and adjusting-screws for said bearings, an idler-pulley attached to each of said frames, and driving belts or chains for each pulley on said shaft, arranged to have one of their sides coiled once around a pulley on said shaft and passed under or over one of the idler-pulleys to permit the shaft to be raised or lowered without slacking or tightening the belt, substantially as set forth.

12. In a snow-sweeping car or vehicle, the combination of a rotary sweeping-brush, means for raising and lowering it, a rotary snow receiving and melting cylinder, means for raising and lowering it, a condensing-chamber, a water-of-condensation reservoir, a pipe-connection between said chamber and reservoir, a heating device for the two latter and for the cylinder, substantially as set forth.

13. In a snow-sweeping machine, the combination, with a rotating brush and a cylinder for receiving and melting the snow, of a condensing-chamber having at its roof a water-tank, and on its sides, bottom, and rear end heating-jackets, a heating device or furnace,

and connection between it and said cylinder and jackets, substantially as shown and described.

14. A snow-sweeping car or vehicle having a heating furnace or boiler, a rotary cylinder having buckets on its periphery, a stationary condensing-chamber having bottom, side, and end heating-jackets, connection between said chambers and the furnace or boiler, and a reservoir for receiving the water of condensation from said chamber, as set forth.

15. In a snow-sweeping car or vehicle, the combination of chamber M, having bottom, side, and end heating-jackets, L, tank O, and valve-pipe connection between said tanks and jackets, substantially as shown and described.

16. In a snow-sweeping car or vehicle, the combination, with a rotary brush, of a cylinder having buckets on its rim, pipe-connection with a heating-furnace, and a drip-cock, *r*, as and for the purpose set forth.

17. In a snow-sweeping car or vehicle, the condensing-chamber having outlet *m'* for the water of condensation and air-vent m^2, substantially as set forth.

18. In a snow-sweeping machine or vehicle, a tank, O, for receiving the water of condensation, having an outlet, o^2, and a heating device for said tank, substantially as shown and described.

19. In a snow-sweeping car or vehicle, the combination of a rotary and vertically-adjustable sweeping-brush, a rotary snow receiving and melting cylinder, a condensing-chamber, a tank for receiving the water of condensation, and a heating device for said cylinder, chamber, and tank, substantially as set forth.

20. A snow-sweeper and melter composed of a car-body having a rotating brush, rotary and stationary snow receiving and melting chambers, and a furnace or heating device for said chambers, substantially as set forth.

21. In a snow sweeper and melter, a rotary and vertically-adjustable sweeping-brush, and a rotary cylinder for receiving and more or less melting the snow, and power-transmitting devices for revolving said brush and cylinder in opposite directions, as set forth.

22. In a snow sweeper and melter, a rotating cylinder having buckets on its face or periphery, and a central or interior heating-chamber, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS WRIGHT.

Witnesses:
S. J. VAN STAVOREN,
CHAS. F. VAN HORN.