

W. N. LUX.
 SNOW MELTING MACHINE.
 APPLICATION FILED JAN. 11, 1910.

977,109.

Patented Nov. 29, 1910.

4 SHEETS—SHEET 1.

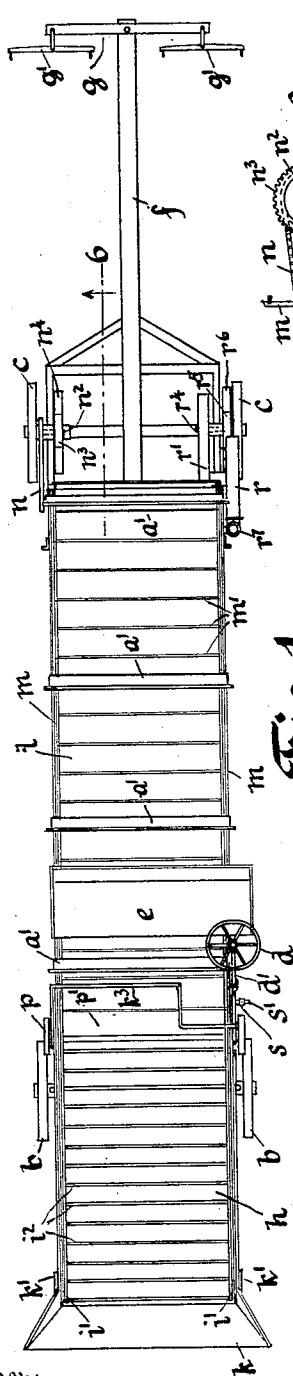


Fig. 1

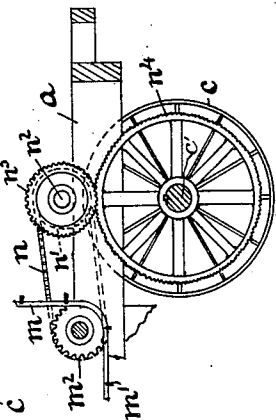


Fig. 6

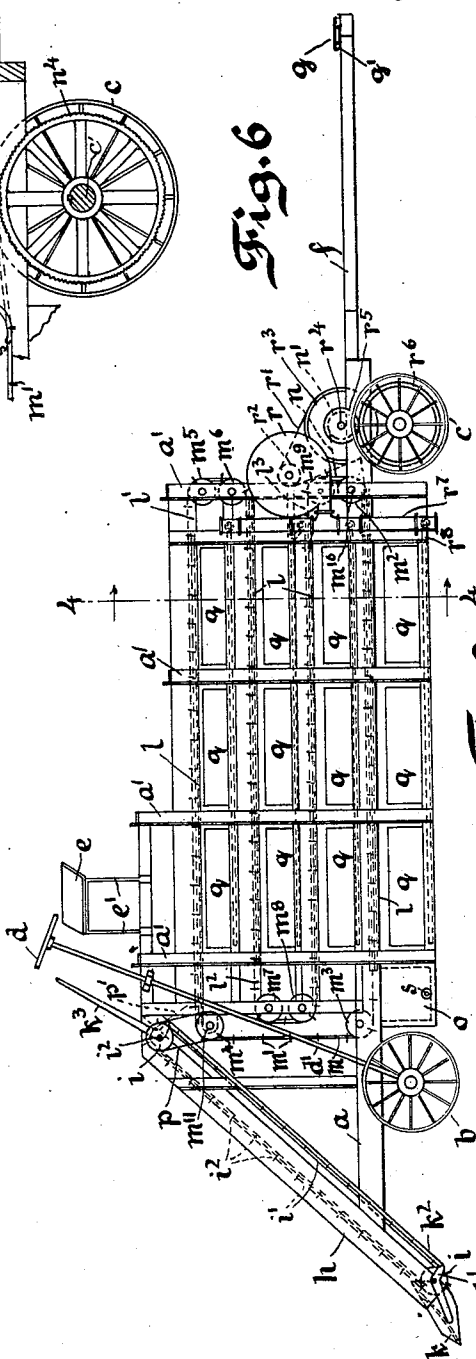


Fig. 2

Witnesses

H. J. ...
E. M. Bond

William N. Lux, Inventor

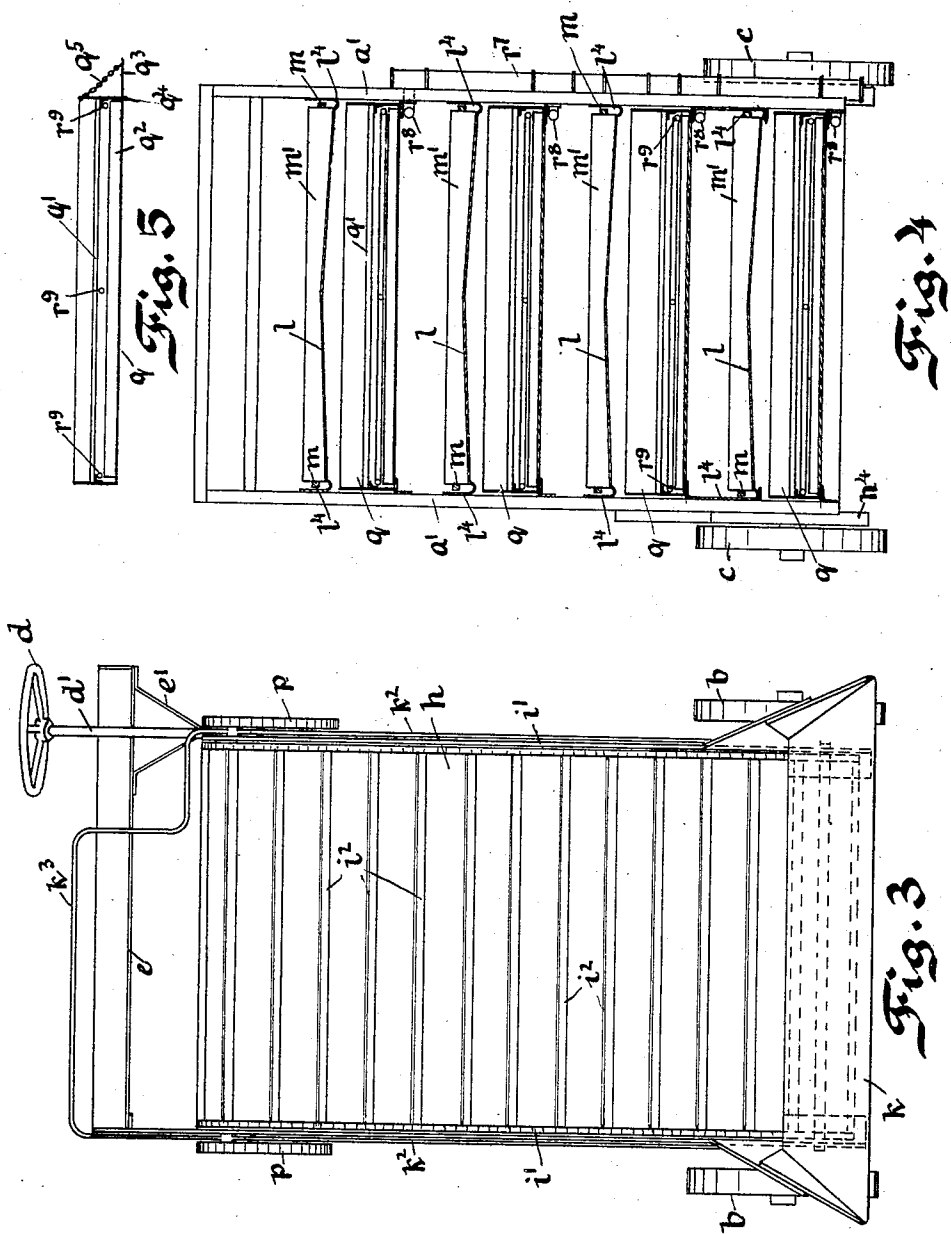
Conquer Moore Colles
 Attorney

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4 SHEETS-SHEET 2.



Witnesses
H. Joseph Dyer
E. N. Bond

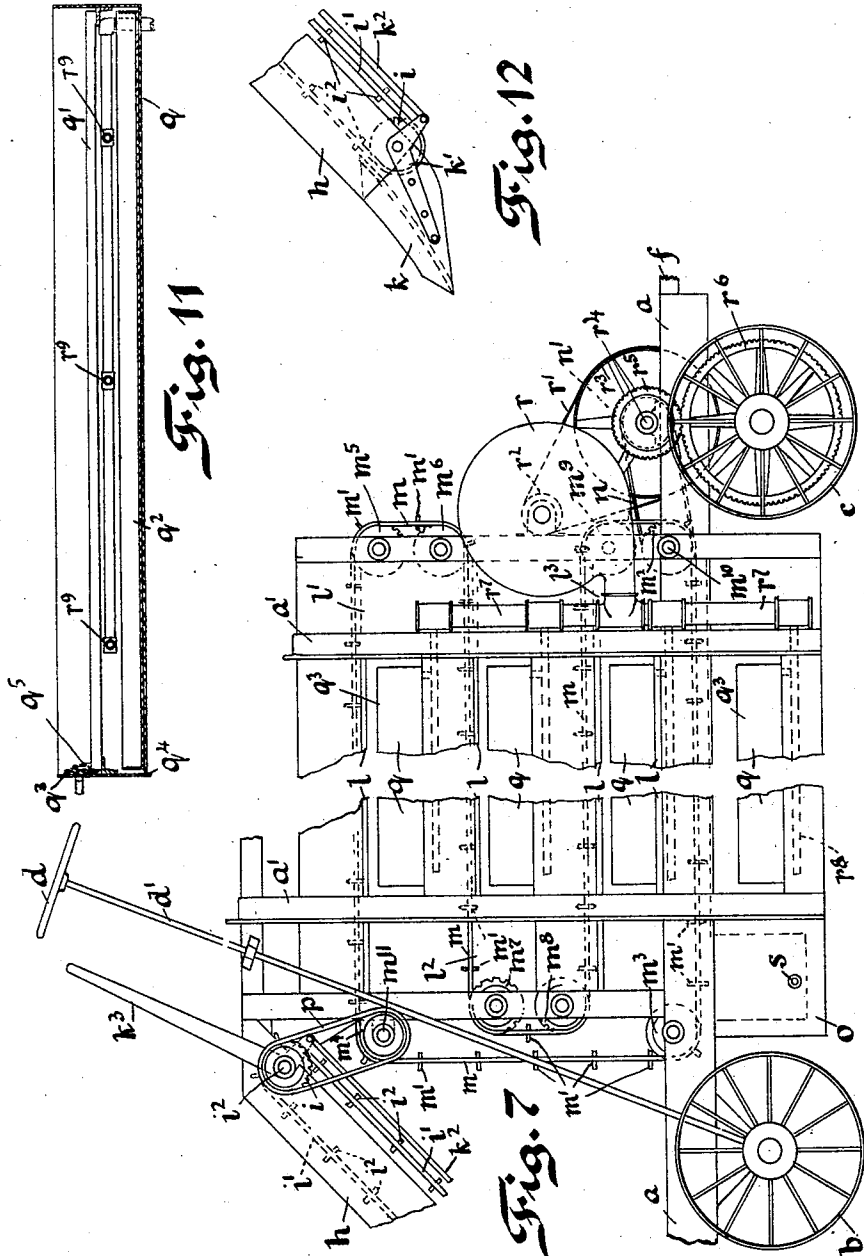
William N. Lux, Inventor
 by *George H. Moore*, Attorney

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4 SHEETS—SHEET 3.



William N. Lux, Inventor.

Witnesses

Rose Holstene
 M. A. Blackburn

By *George F. Moore* Attorney

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4 SHEETS—SHEET 4.

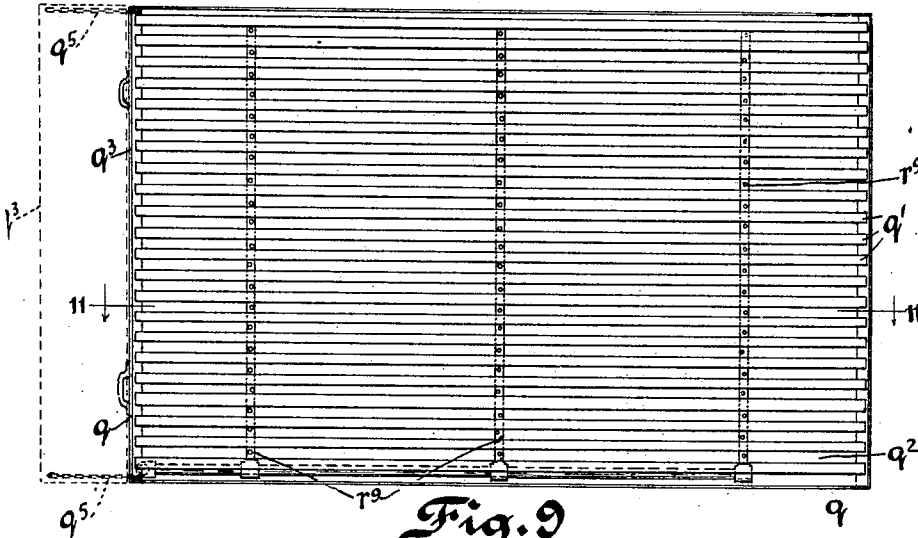


Fig. 9

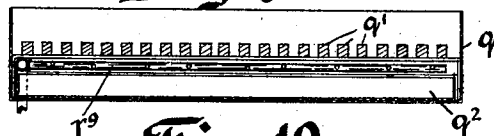
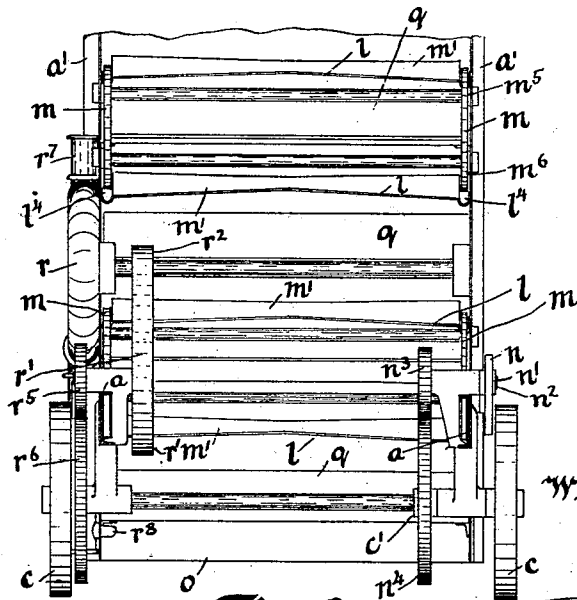


Fig. 10



William D. Lux,
 Inventor

Witnesses

Rose Holstene

N. W. Blackburn

Fig. 8

By *George DeMure*
 Attorney

UNITED STATES PATENT OFFICE.

WILLIAM N. LUX, OF SOUTH MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO
ANDREW KUBERT, OF MILWAUKEE, WISCONSIN.

SNOW-MELTING MACHINE.

977,109.

Specification of Letters Patent. Patented Nov. 29, 1910.

Application filed January 11, 1910. Serial No. 537,517.

To all whom it may concern:

Be it known that I, WILLIAM N. LUX, of South Milwaukee, Wisconsin, have invented a Snow-Melting Machine, of which the following is a specification.

This invention relates to apparatuses or devices for disposing of accumulations of snow upon city streets by melting the same instead of loading it into carts and transporting it a distance to some place of disposal, which is at the present time the practice generally followed.

Although the melting of snow in large quantities consumes as is well known a large quantity of heat, yet the expense of handling it in bulk involving the time of teams and laborers in large numbers is so great that, if only some means can be found for applying the heat economically, the melting process of disposal will be the cheaper in many instances. This is especially true in the case of comparatively light snow-falls. Moreover it consumes much time, generally many days, before a heavy snow-fall can be disposed of by transportation with the number of laborers usually obtainable, and in the meantime the public is subjected to great inconveniences of travel.

It is the object of this invention to produce a machine which shall be able to take up and melt the snow economically and without dissipating the heat evolved to other ends than the actual melting of the snow, and moreover which can be propelled over a roadway or street and take up and melt the snow as it goes along.

To this end my invention comprises a series of melting-ovens mounted upon wheels; an adjustable scoop and an elevator at the front adapted to take up the snow and carry it to the top of the machine; a series of melting-tables disposed in coöperative relation to the melting-ovens; conveying means for taking the snow as it falls from the elevator and propelling it successively over the melting-tables; a tank into which the resulting water is delivered; a blower operated by the driving-wheels and acting to convey air to the melting ovens; and means for propelling the vehicle, which consists generally of a pole and draft-gear for horses extending back from the rear of the machine. While these constitute the principal elements of the invention they are, as will be seen, not all essential thereto.

My invention can best be understood from a consideration of a concrete form as I have illustrated the same in the accompanying drawings, wherein—

Figure 1 is a plan of the complete machine; Fig. 2 is a side elevation thereof; Fig. 3 is a front view; Fig. 4 is a vertical cross-section on the plane 4; and Fig. 5 is a section through one of the ovens also sectioned on the plane 4. Fig. 6 is a longitudinal cross-section on the plane 6 showing the details of the conveyer-driving mechanism on an enlarged scale. Fig. 7 is a fragmentary side elevation on a larger scale, the front middle and rear portions of the machine being broken away. Fig. 8 is a rear end view of the machine, the portions at the rear of the wheels being cut away. Fig. 9 is a plan, Fig. 10 a transverse section, and Fig. 11 a longitudinal section on the plane 11 of one of the fire-boxes separately; and Fig. 12 is a side elevation on a larger scale of the scoop.

In these drawings every reference letter and numeral refers always to the same part.

The machine may rest upon a frame having a pair of longitudinal sills *a* supported on wheels *b*, *c*, at its front and rear ends. The front wheels are capable of an angular movement to guide the machine steered by means of a hand-wheel *d* on the upper end of a shaft *d'* connected to the wheels in any suitable manner so that the rotation of the wheel *d* will act to turn the wheels *b* about their steering centers as usual in such cases. A seat *e* mounted upon standards *e'* is set at the top of the machine near the hand-wheel *d* for the operator. At the rear is a pole *f* carrying on its rear-end whiffletrees *g*, *g'*, for attaching draft-animals, or any other means of propulsion which is found desirable may be substituted for that shown.

At the front of the machine is set a sloping elevator-trough *h*, at top and bottom of which are arranged sprocket-wheels *i*, over which pass a pair of endless chains *i'*, connected by cross-bars or conveying-flights *i²*, and at the bottom, turning on the shaft of the lower pulleys *i* as a pivot, is a scoop *h*, to the ends of which are attached bell crank-levers *h'* looped, whose free arms are connected by link-rods *h²* to a looped manual lever *h³* pivoted on the shaft *i²* of the upper wheels *i*; whereby an oscillation of the lever

h^3 causes a corresponding movement of the scoop h and the latter may be raised from the ground by depressing the lever h^3 , as would be necessitated in meeting with obstructions in the roadway or holes, ditches and the like into which the end of the scoop h may fall and become caught.

Longitudinally along the frame of the apparatus are mounted a series of vertical yokes a' which carry a number of melting-tables l , being as herein shown four in number; and cooperating with these is an endless conveyer consisting of a pair of chains m connected by cross-flights m' and passing successively over pairs of sprocket-pulleys $m^2, m^3, m^4, m^5, m^6, m^7, m^8$ and m^9 , the first-named of which is or may be mounted on the driving-shaft m^{10} and driven by another chain or belt n which passes around a pulley n' on an auxiliary shaft n^2 , which shaft carries a gear-pinion n^3 meshing with a gear-wheel n^4 secured to the axle c' on which the right-hand wheel c is keyed.

The tables l are arranged one under the other, but the right-hand end of the uppermost table l lies to the left of the right-hand end of the next lower table, thus leaving an aperture l' through which the snow remaining on the table drops upon the second table. Similarly the left-hand end of the second table lies to the right of the same end of the third table, leaving an aperture l^2 through which the snow remaining on the second table drops onto the third table. The right-hand end of the third table in like manner lies to the left of the same end of the fourth table, leaving an aperture l^3 through which the snow remaining on the third table drops onto the fourth table; and finally, the left-hand end of the fourth table ends at a point immediately over the edge of a receiving-tank o , into which all the water resulting from the melting of the snow will be delivered. As will be seen from Fig. 4, each of these tables is crowned, that is to say longitudinally convexed in the center, and provided at its side edges with longitudinal troughs l^4 , whereby as the snow melts the water runs out to the sides into the gutters l^4 , thence down the gutters to the table next below and so on over the successive tables until the receiving-tank o is reached. From the driving-connection already described between one of the rear wheels c and the conveyer m , it will be seen that this conveyer acts to propel the snow received from the elevator h from left to right along the first table and thence in opposite directions along the other tables successively until the tank o is reached, at which point all the snow will be melted, a sufficient number of tables being provided for the capacity of the machine.

The conveyer l' is operated by a sprocket-chain-connection p which connects the shaft

m'' with the shaft i^2 , and to prevent any possible spilling of the elevated snow over the left hand-end of the upper melting-table a delivery-chute p' is placed so as to deliver the snow well over the end of the table.

Immediately below each of the melting-tables l are placed a row of melting-ovens q , these being various in number and size in accordance with the capacity of the machine, and provided with means for burning fuel and directing the heat therefrom onto the lower side of the melting-table immediately over. As these ovens will necessarily be very shallow in depth compared to their length and width, it will generally be desirable to provide an artificial air-supply, which is produced by a centrifugal fan r mounted on the rear of the machine and operated by means of a belt r' passing over pulleys r^2, r^3 , the latter of which is mounted on a counter-shaft r^4 carrying a gear-pinion r^5 , which meshes with a gear-ring r^6 on the opposite wheel c from that which drives the conveyers as already described. From the blower r the air is conveyed by a wind-trunk r^7 to longitudinal twyer-pipes r^8 which deliver it to the several ovens. One of these ovens is shown in longitudinal section in Fig. 5, comprising according to the preferred arrangement a grate q' supporting the fire, an ash-box q^2 under said grate, and a door q^3 , which is hinged at q^4 upon its horizontal lower edge and may be supported when open in a horizontal position by a chain q^5 , thus forming a convenient rest for the fuel which is being charged in, while at the same time the ash-box q^2 is removable through said door. Branches r^9 of the twyer-pipes r^8 pass transversely across the oven at two, three or more points, and are perforated along their length so as to effect an equable distribution of air.

At the bottom of the tank o on one side is provided a valve s with hose-coupling s' , and it is to be understood that in places where a sewer or other outlet for the melted snow is readily accessible a hose-pipe may be connected up and the valve s be left open during operation, thus draining off the water as fast as it accumulates, while at points where the water cannot be conveniently delivered it may be stored in the tank o until some point of disposal is reached.

While I have hereinabove shown the most improved form of my invention, I wish it understood that not all of the features are essential thereto or necessarily made in the exact form shown, but various changes and modifications in the constructions as herein shown may be made without departing from the spirit of my invention, and I wish it understood therefore that the latter is not otherwise limited than by the scope of my claims.

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

5 1. A snow-melting machine comprising an elevator, a plurality of melting-tables in different planes one above another, a conveyer adapted to receive the snow from said elevator and convey it over the tables, and means for heating said tables.

10 2. A snow-melting machine comprising, in combination, an elevator adapted to receive the snow from the roadway, a plurality of melting-tables disposed one below the other and so formed that the snow as it reaches the end of each table drops to the table next below, means for propelling the snow longitudinally over each table, and means for melting the snow as it passes over the tables.

15 3. A snow-melting machine comprising, in combination, an elevator adapted to receive the snow from the roadway, a plurality of melting-tables disposed one below the other and so formed that the snow as it reaches the end of each table drops to the table next below, means for propelling the snow longitudinally over each table, and a series of heating-devices arranged below said tables.

20 4. A snow-melting machine comprising, in combination, an elevator adapted to receive the snow from the roadway, a plurality of melting-tables disposed one below the other and so formed that the snow as it reaches the end of each table drops to the table next below, means for propelling the snow longitudinally over each table, and a series of ovens arranged below said tables.

25 5. A snow-melting machine comprising, in combination, means for elevating the snow from the roadway, a series of melting-tables disposed one below the other, each table being arranged to deliver the snow from the end of it to the table next below, means for heating the snow as it passes along said tables, and a belt-conveyer passing successively over said tables from bottom to top and propelling the snow in opposite directions on the successive tables.

30 6. A snow-melting machine comprising, in combination, means for elevating the snow from the roadway, a series of melting-tables disposed one below the other, each table being arranged to deliver the snow from the end of it to the table next below, means for heating the snow as it passes along said tables, a belt-conveyer passing successively over said tables from bottom to top and propelling the snow in opposite directions on the successive tables, wheels on which the apparatus is supported, and a driving-connection between one of said wheels and said conveyer.

35 7. A snow-melting machine comprising, in combination, means for elevating the snow from the roadway, a series of melting-tables disposed one below the other, each table be-

ing arranged to deliver the snow from the end of it to the table next below, means for heating the snow as it passes along said tables, a belt-conveyer passing successively over said tables from bottom to top and propelling the snow in opposite directions on the successive tables, wheels on which the apparatus is supported, a driving-connection between one of said wheels and said conveyer, and a second driving-connection between said conveyer and said elevator.

40 8. A snow-melting machine comprising, in combination, means for elevating the snow from the roadway, a series of melting-tables disposed one below the other, each table being arranged to deliver the snow from the end of it to the table next below, a belt-conveyer passing successively over said tables from top to bottom and propelling the snow in opposite directions on the successive tables, wheels on which the apparatus is supported, a driving-connection between one of said wheels and said conveyer, a second driving-connection between said conveyer and said elevator, and means at the rear of the machine for attaching draft-animals.

45 9. A snow-melting machine comprising, in combination, means for elevating the snow from the roadway, a series of melting-tables disposed one below the other, each table being arranged to deliver the snow from the end of it to the table next below, means for heating the snow as it passes along said tables, a belt-conveyer passing successively over said tables from top to bottom and propelling the snow in opposite directions on the successive tables, wheels on which the apparatus is supported, a driving-connection between one of said wheels and said conveyer, a second driving-connection between said conveyer and said elevator, a pole extending back from the rear of the machine and a draft-gear attached to the rear end of said pole.

50 10. In a snow-melting machine, the combination with a frame, wheels on which said frame is supported, snow-melting devices carried by said frame, an elevator at the front of said frame adapted to deliver the snow to said melting-devices, a pivoted scoop at the base of said elevator, a lever mounted at the top of the machine, and a link-connection between said lever and said scoop, whereby the position of said scoop may be angularly varied.

55 11. In a snow-melting machine, the combination with a frame and wheels on which it is supported, a plurality of melting-tables, a plurality of melting-ovens adapted to heat the snow which is carried on said tables, means for delivering the snow to said tables and propelling it along them, a blower, and twyer-pipes connected to said blower and delivering air into said ovens.

12. A snow-melting machine comprising, in combination, a frame, wheels supporting said frame, a plurality of horizontal melting-tables disposed one under the other on said frame and positioned so that the snow drops from any one table to the table next below as it reaches the end thereof, means driven from one or more of said wheels for propelling the snow along said tables, a series of melting ovens located adjacent to the respective tables, a blower driven by one of said wheels, and twyer-pipes connected to said blower and adapted to deliver air into the respective ovens.
13. In a snow-melting machine, a melting-table of convex cross-section whereby melted snow runs to the sides thereof, and means for propelling snow along said table.
14. In a snow-melting machine, a melting-table of convex cross-section whereby melted snow runs to the sides thereof, means for propelling snow along said table, and gutters at the sides of said table adapted to collect the water which drains therefrom.
15. In a snow-melting machine, the combination of a frame, wheels supporting said frame, a plurality of horizontal melting-tables mounted on said frame one under the other, an endless conveyer extending back and forth along the tables and adapted to convey snow successively thereover in opposite directions on the successive tables, means for heating the snow on said tables, a driving-connection between said conveyer and one of the wheels of said vehicle, an elevator mounted at the front of the machine and adapted to deliver snow onto the uppermost table, a driving-connection between said conveyer and elevator, an adjustable scoop at the lower end of said elevator, a lever at the upper front of the machine connected with said scoop for operating it, means for varying the angular position of the front wheels of the machine, a shaft extending from the upper part of said machine to said front wheels and connected therewith to vary their angular position, and a draft-gear mounted on the rear end of the machine.
- In witness whereof I have hereunto set my hand this 27th day of December, 1909.
- WILLIAM N. LUX.
- Witnesses:
 JOHN KUCZYNSKI,
 PETER KUCZYNSKI.