

C. M. BROOKER.
ROAD MACHINE FOR MELTING SNOW.
APPLICATION FILED MAY 27, 1910.

987,343.

Patented Mar. 21, 1911

4 SHEETS-SHEET-1.

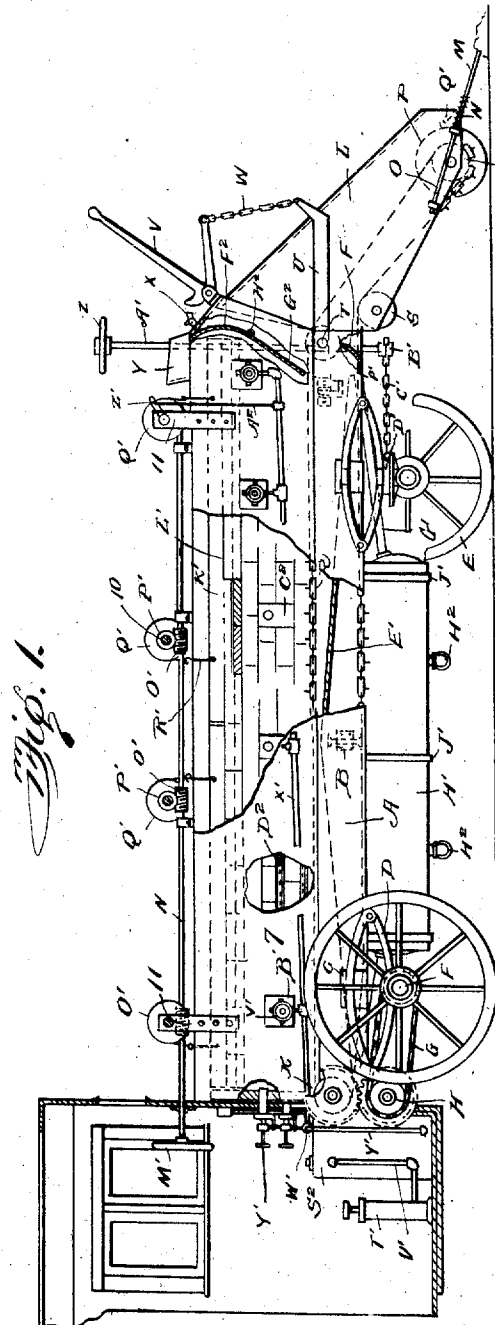
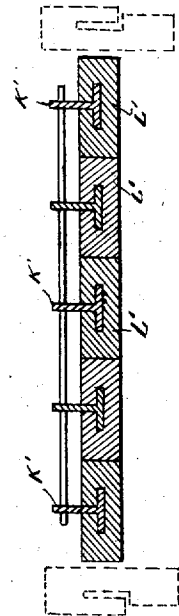


Fig. 1.

Fig. 10



Fig. 11.



Witnesses

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4 SHEETS—SHEET 2.

Fig. 2.

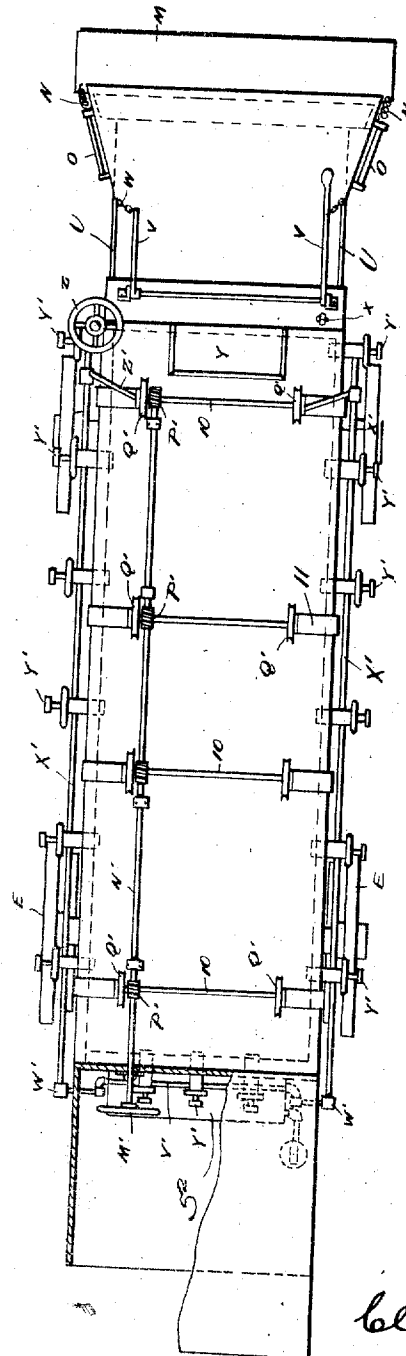
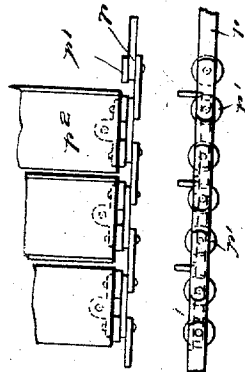


Fig. 3.



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4 SHEETS—SHEET 3.

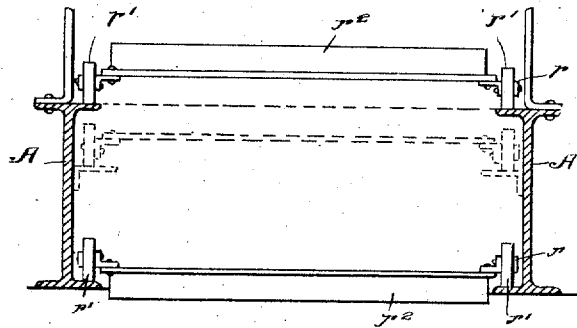


Fig. 5.

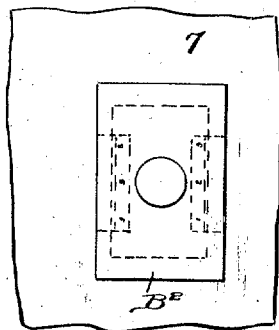


Fig. 6.

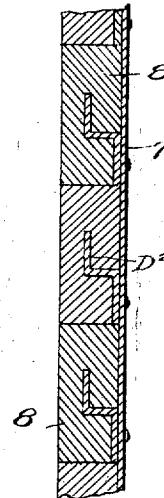


Fig. 5.

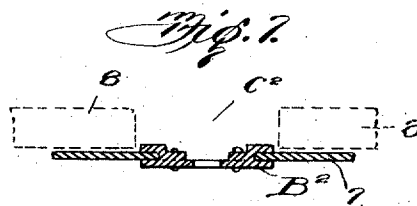


Fig. 7.

Witnesses

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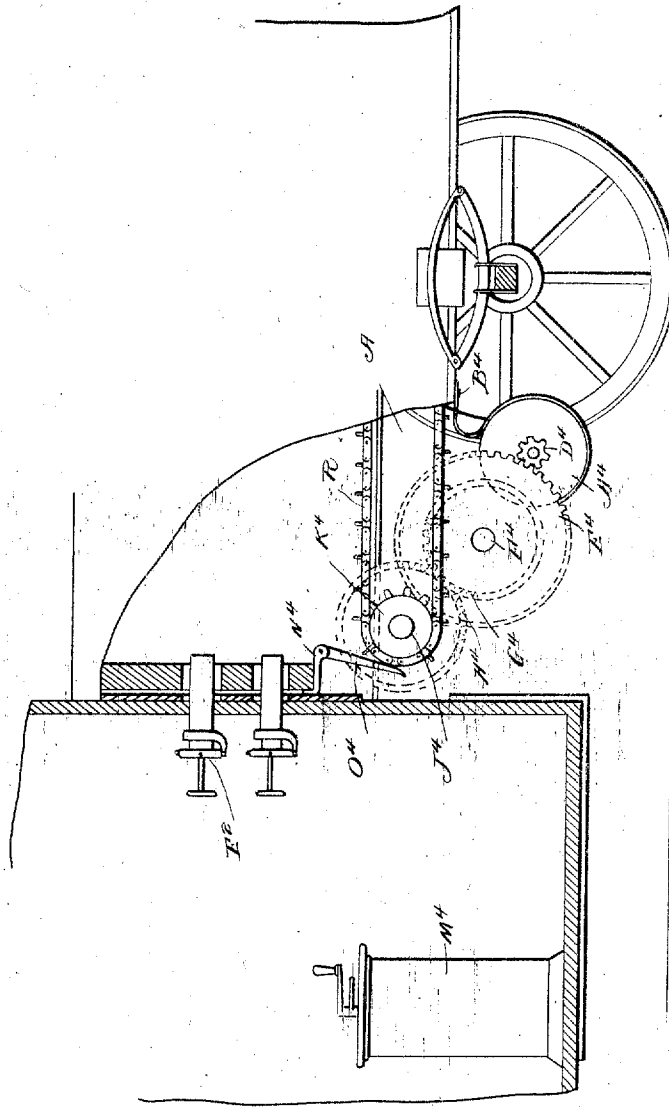
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4 SHEETS—SHEET 4.

Fig. 9.



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UNITED STATES PATENT OFFICE.

CLEM M. BROOKER, OF LAKEWOOD, OHIO.

ROAD-MACHINE FOR MELTING SNOW.

987,343.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLEM M. BROOKER, a citizen of the United States, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Road-Machines for Melting Snow, of which the following is a specification.

This invention relates to road machines for melting snow, whereby a road may be cleared of snow in a speedy and convenient manner.

The machine may be mounted upon a self-propelling truck driven by a gasoline engine, an electric motor, or otherwise, or may be hauled or pushed by animal power.

The machine embodies a portable furnace supplied with a number of gasoline burners for heating the same, these burners being arranged for a symmetrical and efficient distribution of heat, the burners being located at the rear end and the sides of the fire box. The furnace includes an inclosed fire box with an endless conveyer traveling therein, above and below the floor thereof, and extending down and into an adjustable scoop at the front end of the machine which carries a scoop or scraper which excavates the snow as the machine proceeds, and the conveyer transfers it to the furnace where it is melted. As the snow is melted the water falls through the conveyer to the inclined floor of the fire box, which carries it to basins at the ends of the furnace, whence it is transferred through pipes to a water tank underneath the fire box. The tank may be omitted in cases where it is possible or desirable to let the water flow off as fast as it is supplied.

The machine is arranged for a steersman at the front, who guides the truck and also raises and lowers the snow scoop as required. At the rear end is a cab for an operator who controls the fires, and who also controls an adjustable roof in the fire box, which roof may be raised or lowered according to the various depths of the snow or the speed of the conveyer, in order to confine the heat as closely as possible to the snow to be melted.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the machine, partly broken away. Fig. 2 is a plan,

partly in section. Fig. 3 is a cross section of the fire box. Fig. 4 is a detail in cross section of the adjustable roof of the fire box. Fig. 5 is a detail in section of the side wall construction of the fire box. Figs. 6 and 7 are details in elevation and horizontal section of one of the side openings through which a burner projects into the fire box. Fig. 8 is a detail of the conveyer belt. Fig. 9 is a sectional elevation of a modification. Fig. 10 is a detail in section.

Referring specifically to the drawings, the furnace is built on two main I-beams or sills A, one of which is located at each side, and which are connected by cross bars B. The beams are mounted on cross supports C which rest on springs D carried by the trucks which have wheels E. One rear wheel has a suitable sprocket on its hub F from which a chain G transmits power to a sprocket H, and through a gear J propels sprocket K on a roller 6 around which the conveyer R passes, and by means of which the conveyer is driven. This conveyer consists preferably of two side chains r with rollers r' and cross slats r'' which are spaced apart to allow the water to flow therebetween. This conveyer runs on the upper and lower flanges of the I-beams A, as shown clearly in Fig. 3, which flanges thus form convenient tracks for the conveyer.

The side walls of the fire box are indicated at 7, conveniently formed of sheet metal with a lining of fire brick 8, the bricks being supported by Z bars D² riveted to the shell. The fire box is open at the front end, and is provided with a covered scoop L hinged on a cross rod T by means of bars U fastened to the sides of the scoop, and the scoop can be raised or lowered by a bent lever V and chains W. The lever V can be locked by a catch X when the scoop is raised. The lever V is located in convenient position for operation by the steersman who will sit on the seat Y.

At the front end of the scoop is a scraper plate M behind which is fixed plate Q. This plate M is supported by springs N at the front ends of rods O attached to the sides of the chute, and the scoop has a roller P which travels on the ground under the front end thereof. The plate M slides along the surface of the road, and in case of strik-

ing an obstacle it is forced back against the tension of the springs N, allowing the roller P to take the load, and permitting the plate to lift over the obstruction.

- 5 A steering wheel Z is located adjacent to the seat Y, and the truck may be steered through the shaft A', on which the wheel Z is mounted, the lower end of the shaft being connected by a sprocket B' and chain C' to the fifth wheel D' which turns the front truck.

The conveyer belt passes over guide rollers S at the top of the scoop and around a roller S' at the bottom thereof.

- 15 The fire box has a bottom or floor E' inclined downwardly from the middle toward each end, and located between the upper and lower runs of the conveyer. The snow taken up by the scoop and the end of the conveyer therein is carried backwardly over the inclined floor, and when melted the water flows down said inclined floor to basins K' at each end of the furnace, whence it passes through pipes G' to the storage tank H' which is suspended by straps J' from the side beams A. The tank has suitable outlet cocks H².

- The fire box is provided with a vertically adjustable roof which may be made in one or more sections and consists of T irons K' which hold in place fire brick L' as shown in Fig. 4. This roof is suspended by rods R' and suitable cables from wheels Q' mounted on cross shafts 10 supported by suitable brackets 11, on the side walls of the furnace, and these shafts have worm wheels P' which mesh with worms O' on a longitudinal shaft N' which at the rear end has a wheel M' in the cab, for operation by the attendant, who may thereby raise and lower the roof.

- The gasoline tank S² is supplied with air pressure by a pump T', and gasoline is supplied from the tank through a pipe V' which connects by a swinging joint W' with pipes X' leading to burners Y'. These pipes and burners are located beside the rear end and the two sides of the fire box, and the burners at the sides project into the fire box through plates B² arranged to slide up and down over openings in the side walls 7, the fire bricks 8 being cut out behind said openings, as indicated at C². The front ends of the side pipes X' are connected by rods A² to cranks Z' at the ends of one of the shafts 10, and accordingly when the adjustable roof is raised or lowered by the means above described the pipes X' and the burners carried thereby are also raised and lowered, the plates B² sliding up and down to permit such motion of the burners.

At the front end the fire box has a curved deflector plate F² extending across the same, to direct the escaping hot air above the ad-

justable roof, and a door G² is hinged at 65 L¹² to the lower edge of said plate, and swings inwardly so that it is opened by the snow as it passes into the furnace on the conveyer, said door serving to confine the heat in the furnace.

The truck may be provided with a suitable propelling engine or motor not shown, or it may be drawn or pulled by team or other power.

In the modified form shown in Fig. 9 a different, and for many reasons preferable, construction is shown for operating the conveyer. In the machine as above described, the conveyer is driven by a belt gearing from the rear axle. Inasmuch as heavy snow or a large drift might prevent normally forward progress of the machine as a whole, the conveyer under such circumstances would stop, or operate too slowly to carry off the snow, and the machine under such conditions might become clogged or inoperative. To avoid this result, I show in Fig. 9 a motor drive for the controller, the motor to be controlled by an operator in the cab. Thus referring to said figure the motor A⁴ is supported by brackets B⁴ secured to the sills A and the motor pinion D⁴ drives gear E⁴ and shaft F⁴ on which is a gear G⁴ which drives gear H⁴ on the shaft J⁴ which carries the sprockets K⁴ which drive the conveyer R. The motor is governed by a controller M⁴ located in the cab. By these means the operator can drive the conveyer at any speed desired, irrespective of the forward progress of the machine, and for various reasons this construction is preferred to the construction first above described, although the latter will be entirely suitable for operation on light snow. Furthermore, in Fig. 9 is shown a trap door O⁴ hinged at N⁴ at the rear end of the furnace, and resting against the conveyer R, said trap door being free to swing away from the conveyer so as to allow stones, dirt and other matter to drop out of the rear end of the furnace, in case such stones or the like are collected by the conveyer. Normally the door O⁴ will hang close to the conveyer and thereby confine the heat, but it will swing away to allow stones or other material to drop out upon occasion.

It is believed that the operation of the machine will be evident from the above description.

The invention is not limited to the exact embodiment shown but various changes may be made within the scope thereof.

The device can be used in removing and melting snow from steam, electric or other railroads and from streets, pavements or roadways, as well as from side-walks and other places where snow may accumulate, while it is evident that the apparatus may be

mounted on any suitable vehicle and propelled by horses or other suitable power.

The apparatus will also permit the storage of water to be dispensed with in which case the water resulting from the melting of the snow may be allowed to run into the gutter by the side of the road or street and thus be permitted to turn off in usual manner.

By the use of this apparatus in cities, the streets, alleys, pavements, highways, etc., can have the snow removed therefrom and melted in a very short time and without the employment of the great number of men and wagons usually engaged in such work, thereby cheapening the cost very greatly for this kind of work and enabling traffic and comfort to be had rapidly and conveniently.

What I claim as new is:—

1. In a snow melting machine, the combination of a fire box, a conveyer traveling within the fire box, and means to feed snow onto the conveyer by forward movement of the machine.

2. In a snow-melting machine, the combination of a fire box, and a conveyer traveling within the same, the top of the fire-box being adjustable toward and from the conveyer.

3. In a snow melting machine, the combination of a fire box, a series of burners disposed along the sides of the box and directed into the same, means to supply fluid fuel to said burners, and a conveyer traveling within the fire box.

4. In a snow melting machine, the combination of a fire box, a conveyer traveling within the same, and a series of fluid fuel burners directed into the fire box through the wall thereof, the top of the fire box being vertically adjustable to vary its distance from the conveyer, and the burners being connected to said top, for vertical adjustment therewith.

5. In a snow melting machine, the combination of a fire box, a scoop connected to the front end thereof and extending downwardly and forwardly therefrom, and a conveyer traveling within the fire box and scoop and adapted to convey snow from the front of the scoop through the fire box.

6. In a snow melting machine, the combination of a fire box having an inclined bottom and a water outlet therefrom, an endless belt conveyer traveling through the fire box and over and under said bottom, and means to feed snow to the conveyer.

7. In a snow melting machine, the combination of a fire box, a traveling conveyer within the same, means extending into the fire box, above the conveyer, to heat the interior of said box and melt snow on the conveyer, and means to feed snow to said conveyer.

8. In a snow melting machine, the combination of a fire box, a traveling conveyer

within the same and projecting beyond the front end thereof to receive snow, and a swinging door located above said conveyer and in front end of the fire box, for the purpose stated.

9. In a snow melting machine, the combination of a wheeled frame, a fire box supported thereon and provided with fluid fuel burners discharging into said box, an endless belt conveyer extending through the fire box and beyond the front end thereof, and means to gather snow from the ground and deliver same onto said conveyer.

10. In a machine for collecting material from roads or the like, a scoop, a roller supporting said scoop, and a spring supported scraper plate at the front end of the scoop, arranged to yield to pass obstacles in the road.

11. The combination of a fire box having openings in the walls thereof and sliding plates covering said openings a traveling conveyer within the fire box, and burners projecting through said plates and into said openings, the burners being vertically adjustable, to vary the position thereof according to the amount of material on the conveyer.

12. The combination of a fire box having a vertically adjustable roof formed of bars and fire-brick attached thereto, means connected to said bars to raise and lower the roof, a conveyer for material located in the lower part of the fire box, and fluid fuel burners projecting through the wall of the fire box, between said roof and conveyer.

13. In a snow melting machine, the combination of a wheeled frame having side beams, an endless traveling conveyer supported on said beams, a fire box mounted on said beams, above said conveyer, with an inclined bottom located between said beams and under the upper run of the conveyer, and means at the front end of the machine to collect snow and deliver same to the conveyer.

14. In a snow melting machine, the combination of a wheeled frame, a scoop projecting downwardly from the front end thereof, and provided with a scraper at its lower end, a fire box on the frame, an endless belt conveyer located within the fire box and scoop and arranged to carry material from the lower end of the scoop into the fire box, and means to carry off water from the fire box.

15. In a snow melting machine, the combination of a movable carrying frame, a fire box on said frame, a conveyer traveling within the fire box, means to feed snow onto the conveyer, and a motor carried by the frame and operatively connected to the conveyer to drive the same.

16. In a snow melting machine, the combination of a portable fire box, a traveling conveyer within the same and extending through the rear end of the fire box, and a
5 door at the said end of the fire box, arranged to swing toward and from said conveyer, for the purpose stated.

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

CLEM M. BROOKER.

Witnesses:

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E. M. BOWDEN.