

Dec. 8, 1925.

1,564,901

R. H. SCROGGINS

SNOW REMOVING AND DESTROYING APPARATUS

Filed April 3, 1925

5 Sheets-Sheet 1

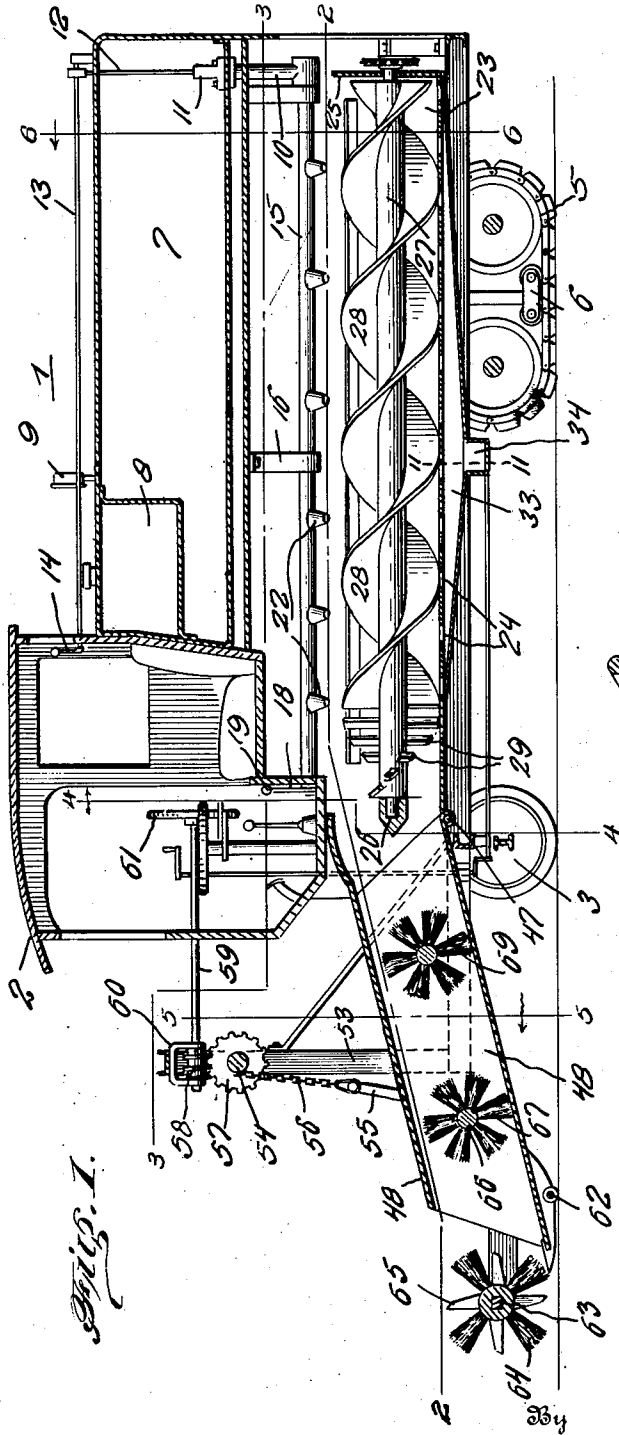


Fig. 1.

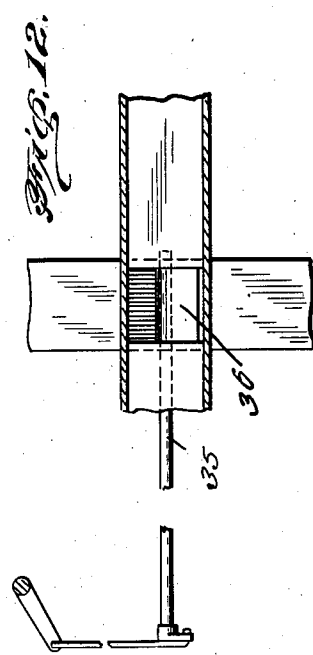


Fig. 12.

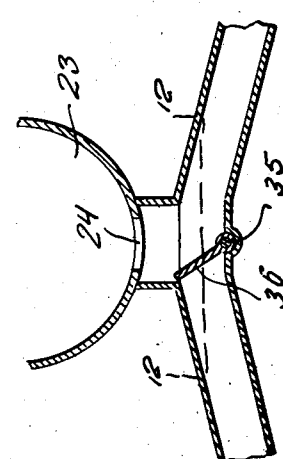


Fig. 11.

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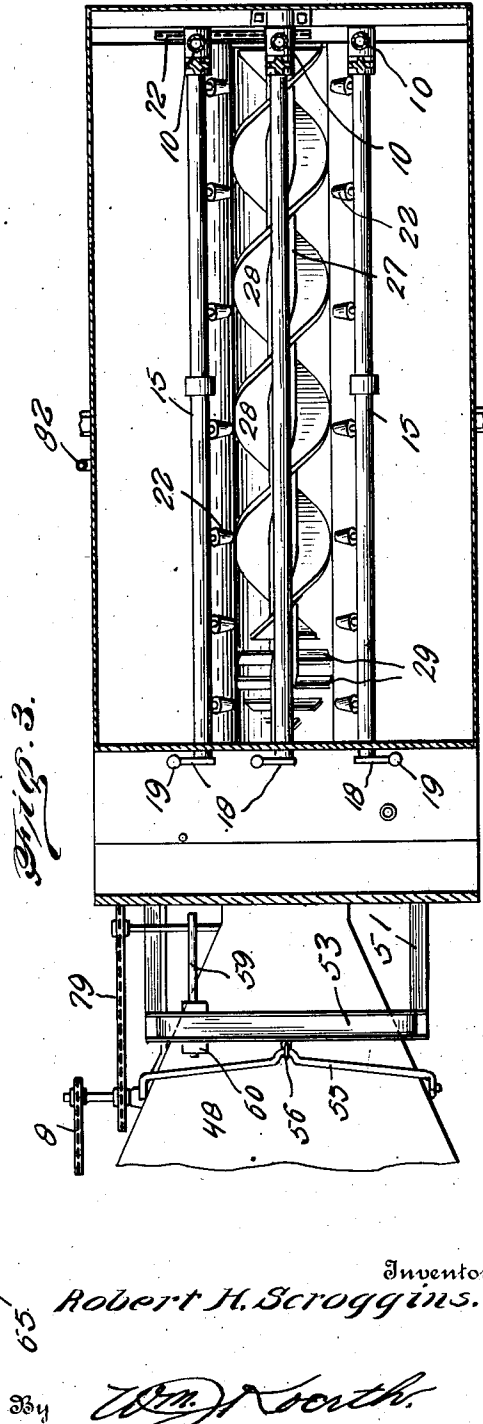
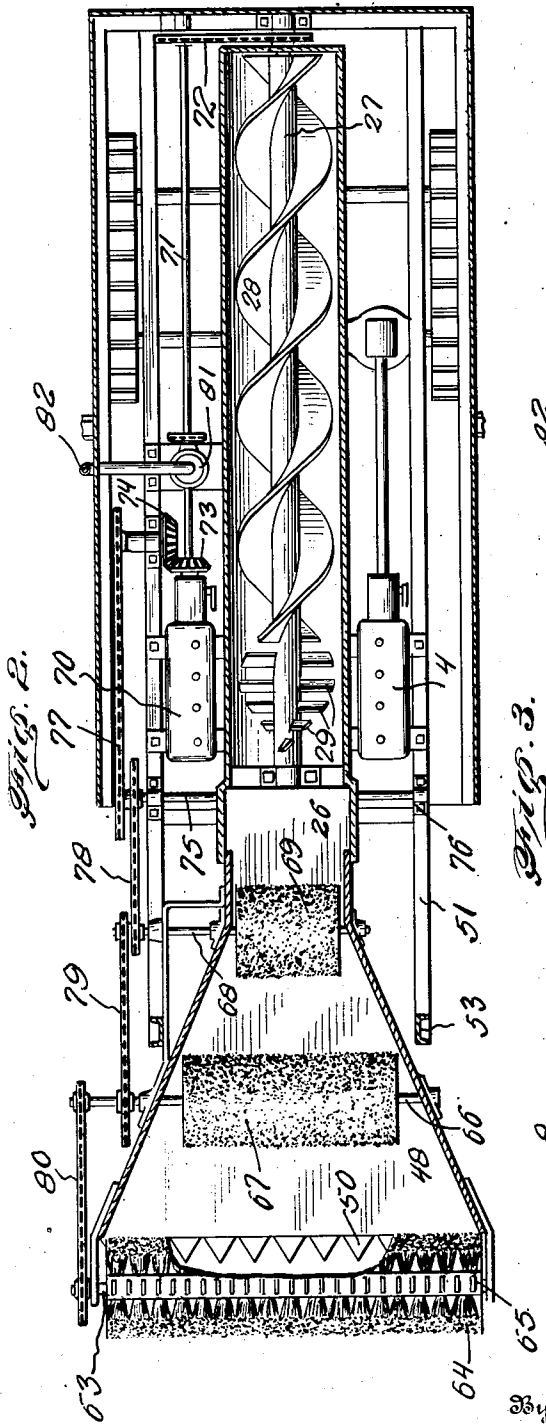
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5 Sheets-Sheet 2



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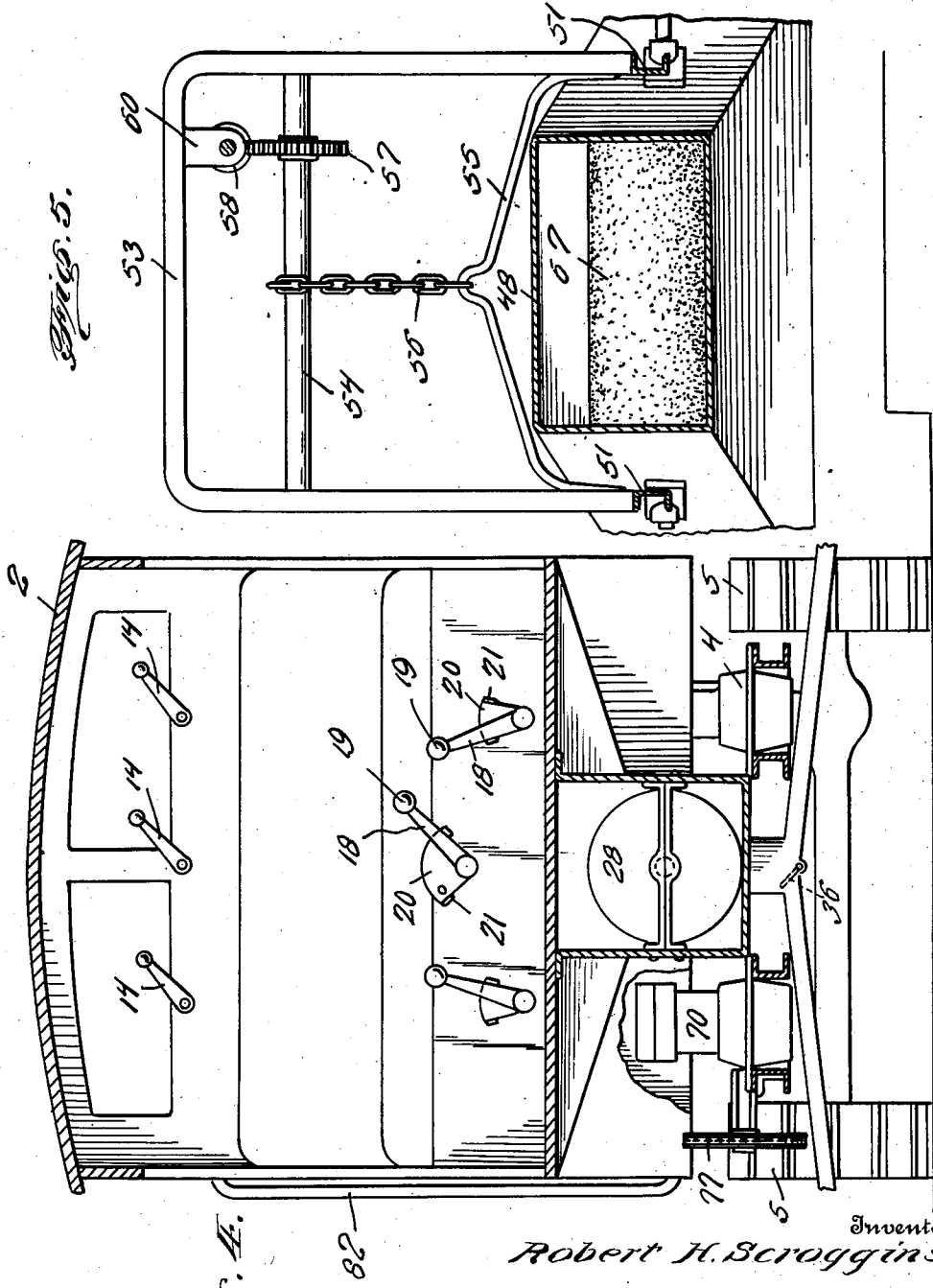
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SNOW REMOVING AND DESTROYING APPARATUS

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5 Sheets-Sheet 3



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SNOW REMOVING AND DESTROYING APPARATUS

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5 Sheets-Sheet 4

Fig. 6.

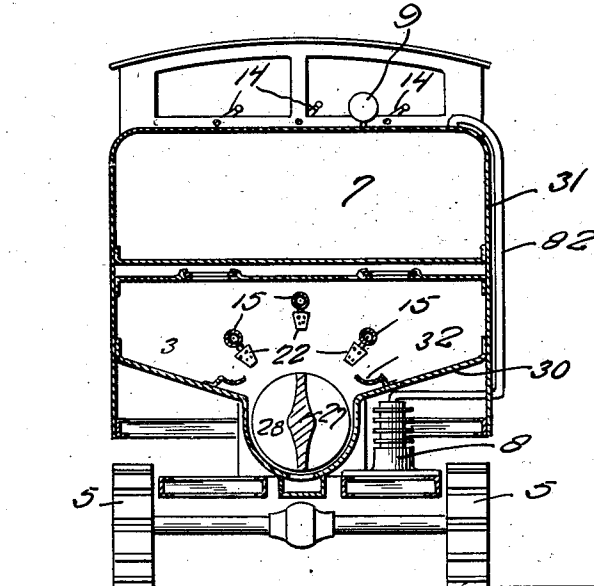


Fig. 7.

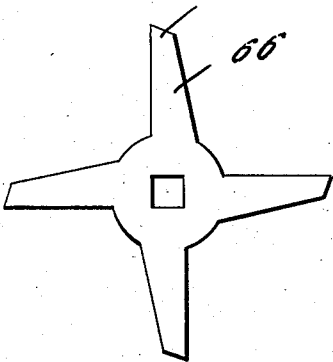


Fig. 8.



Fig. 9.

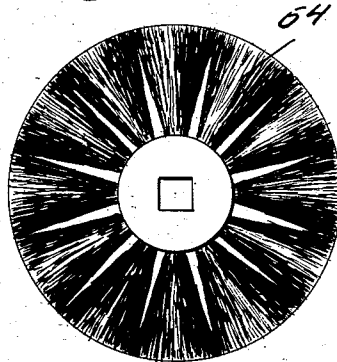
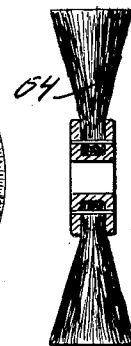


Fig. 10.



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5 Sheets-Sheet 5

FIG. 13.

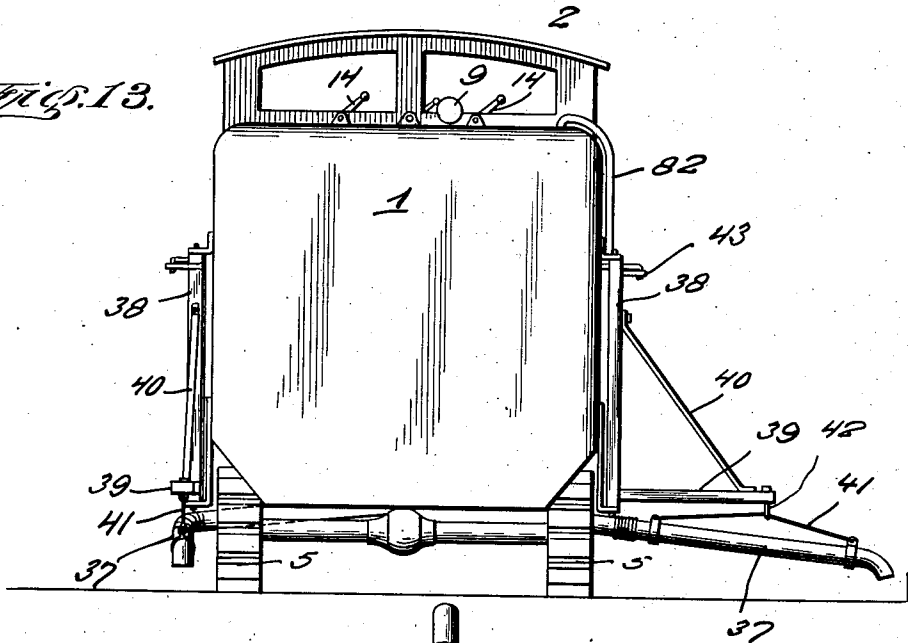
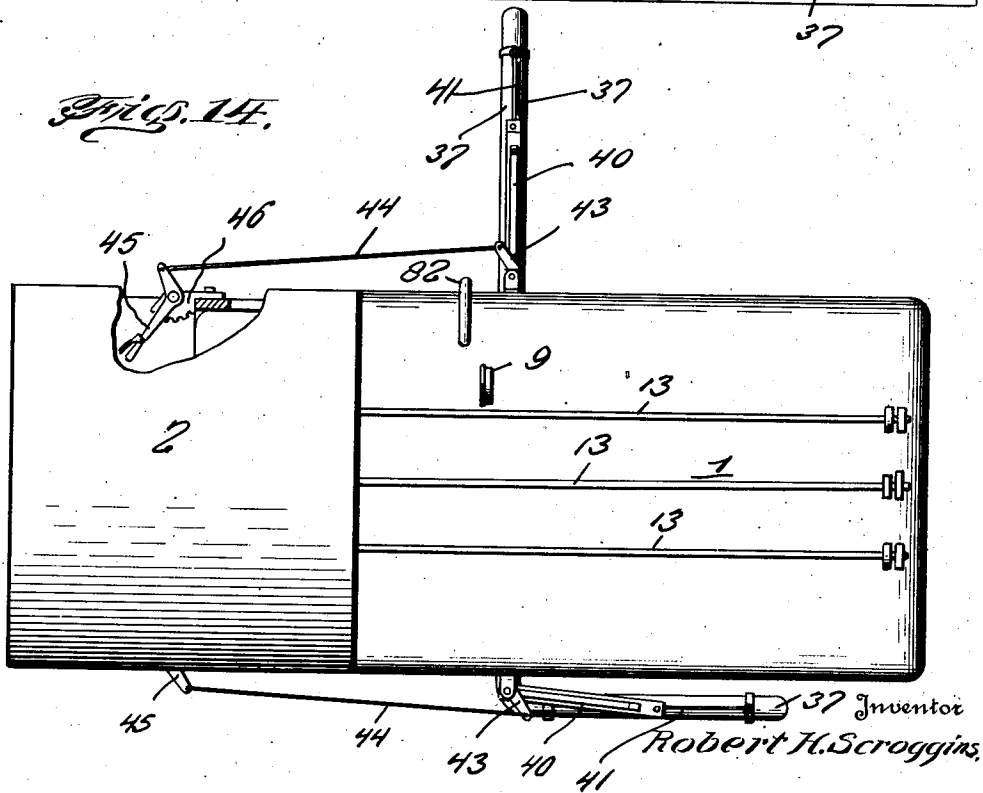


FIG. 14.



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UNITED STATES PATENT OFFICE.

ROBERT H. SCROGGINS, OF UPPER DARBY, PENNSYLVANIA.

SNOW REMOVING AND DESTROYING APPARATUS.

Application filed April 3, 1925. Serial No. 20,411.

To all whom it may concern:

Be it known that I, ROBERT H. SCROGGINS, a citizen of the United States, residing at Oakmont, Upper Darby, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Snow Removing and Destroying Apparatus, of which the following is a specification.

My present invention has reference to a snow removing and destroying apparatus and has for its primary object the provision of a machine for removing snow and ice from streets and roads, in an expeditious and satisfactory manner.

Another object is the provision of an improved means for scooping snow from a street or road, melting it and conducting the water eliminated from the snow away from the machinery to deposit the same in the gutter at either side of the street or road.

Another object is the provision of a motor propelled apparatus for removing and destroying snow in which a novel combined brush and combined cutting means is employed for gathering and directing snow from the street onto means that deliver the said snow to a tritulating mechanism which also compresses the material, and in which means is employed for reducing the triturated mass into a fluent body for delivery through either side of the apparatus.

Another object is the provision of a motor driven apparatus for this purpose which carries at its forward end a vertically adjustable scoop of a novel construction, the said scoop being provided with snow and ice cutting teeth and having arranged forward of said teeth combined brushing and cutting means for delivering the snow into the scoop, the said scoop being further provided with revoluble means for directing the snow to a tritulating mechanism of a novel construction, and wherein the massed and powdered snow is melted by heat delivered thereagainst, and the water eliminated from the snow is delivered from either side of the machine in accordance with the will of the operator.

Another object is the provision of a snow removing and destroying apparatus in which the mechanism constituting the same is arranged on a motor propelled wheeled body, of a novel construction, and in which a second motor is employed for operating said

mechanism, with the result that the body and the mechanism can be separately or simultaneously operated and whereby the device may be propelled from place to place without the actuation of the said mechanism.

A still further object is the provision in a snow removing and delivering apparatus of novel means for collecting the snow from the street and delivering the same to a destroying mechanism which includes oil burners whose flames melt the collected snow so that the water eliminated therefrom may be delivered through either side of the machine and in which simple means is employed for swinging the manifold pipes of the burners to arrange the same in horizontal position so that the flames therefrom will not be directed against the tritulating device associated with the destroying mechanism and whereby the extinguishing of the burners will not be necessitated when no snow is received in the apparatus, or when the device is propelled from place to place.

A still further object is the provision, in a device of this character, of a combined snow gathering brush and cutter disposed forward of rotary brushes which deliver the snow into a destroying mechanism, and in which the gathering brush is caused to turn at a slower rate of speed than the directing brushes, the latter being also rotated at different speeds.

A still further object is the provision in a snow removing and destroying apparatus of fluid burners for directing the flame against gathered and triturated snow in which an air pump is actuated by the travel of the device for supplying air to the oil tank and reservoir, and in which the burner nozzles may be directed toward or away from the gathered snow in an easy and expeditious manner.

Another object is the provision of a novel construction of outlet pipes for water eliminated from the snow gathered in the machine and in which said pipes may be arranged at any desired angle with respect to the sides of the machine, and further in which the delivery to either of said pipes is controlled by a simple valve mechanism readily actuated by the operator.

A still further object is the provision of a snow removing and destroying apparatus that is mounted on a motor propelled body and in which all of the mechanism consti-

tuting the apparatus is controlled from the cab of the body, and also wherein the propelling mechanism of the said body is likewise controlled from the cab.

5 For a full and comprehensive understanding of the invention, reference is to be had to the accompanying drawings in which there is illustrated a simple and satisfactory embodiment of the improvement reduced to
10 practice.

In the drawings:—

Figure 1 is a substantially central vertical longitudinal sectional view through the improvement.

15 Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on the line 3—3 of Figure 1.

20 Figure 4 is a sectional view on the line 4—4 of Figure 1.

Figure 5 is a sectional view on the line 5—5 of Figure 1.

Figure 6 is a sectional view on the line 6—6 of Figure 1.

25 Figure 7 is a plan view of one of the cutters associated with the gathering brush.

Figure 8 is an edge view thereof.

Figure 9 is a side elevation of one of the brush sections.

30 Figure 10 is a substantially central sectional view therethrough.

Figure 11 is a detail sectional view approximately on the line 11—11 of Figure 1.

35 Figure 12 is a sectional view on the line 12—12 of Figure 11.

Figure 13 is a rear elevation of the device, illustrating a slight modification.

40 Figure 14 is a top plan view of the construction illustrated in Figure 13, parts being broken away and parts being in section.

As disclosed by the drawings, I make use of a motor-propelled vehicle, preferably in the nature of a truck 1. The body of the vehicle may be covered, but the front thereof is provided with a cab 2. In this cab there is a driver's seat and the control for the steering and propelling mechanism of the truck. The truck has its forward end mounted on guide wheels 3, but its rear or
50 propeller wheels are in the nature of endless members or caterpillars. The caterpillar belt is provided with the usual cogs, and the said belt travels around two spaced wheels, one of which having its axle directly
55 connected to the drive shaft from the motor 4. The caterpillar traction members are indicated by the numerals 5, and the lower lead of the endless belt therefor is held in ground-contacting engagement by means 6.

60 This means consists of spaced rollers mounted on a vertically adjustable shaft or standard.

On the top of the vehicle or truck there is an oil tank 7, which, at its forward end,
65 is divided by a partition into a gasoline tank

8. The gasoline is, of course, fed to the motor 4 in the usual manner, and is also fed to a second motor which will hereinafter be described.

On the top of the oil tank 7 there is a
70 gauge 9, and the outlet pipe 10 for the oil tank have their passages controlled by valves arranged in suitable casings 11. The stems 12 for the valves project through suitable openings in the top of the oil tank 7
75 and are eccentrically or otherwise connected with operating rods 13. There rods lead to the cab 2, and each of the said rods is provided with an operating or control handle
80 14. Of course both the oil and the gasoline tanks are provided with suitable inlets which are normally closed.

Swivelly connected with each of the oil outlet pipes 10 is a pipe 15. Each of the pipes 15 is mounted for turning in suitable
85 bearings 16. The pipes 15 are longitudinally arranged, but the end pipes are disposed below the central pipe. All of these pipes have ends which lead into the cab 2, the said ends, of course, being closed. On
90 each of the closed ends there is an actuating lever 18. The levers have weighted ends 19. The levers are raised for travel in segments 20. Each of the segments has its edges provided with lugs 21. Each pipe 15
95 is in the nature of a manifold and is provided with spaced nozzles 22 that provide the burners for the liquid fuel from the tank 7. The weighted levers 18 may be swung to bring one of their edges into engagement with one of the contacts 21 on
100 each of the segments 20 to arranged the burners or nozzles 22 in a downward and angular direction with respect to the bottom of the truck. By simply swinging the levers
105 so that the same will engage with the opposite contacts on the segments 20 the burners 21 will be sustained substantially horizontally. This is an important feature of the invention which will presently be manifest.
110

Below the burners 22 the truck or vehicle 1 is provided with a longitudinally extending trough 23, the bottom of which being reticulated or provided with spaced openings 24 and the rear thereof being closed.
115 Journaled in a suitable bearing opening in the closed end 25 of the trough 23 and in a bearing 26 at the forward open end of the trough there is a shaft 27. This shaft provides the operating medium for the
120 triturating mechanism of the improvement. The triturating mechanism includes a grinding screw 28 which is, of course, spirally wound around and secured to the shaft 27 and spirally arranged mutilating
125 blades 29 at the forward or receiving end of the screw.

The trough 23 terminates in angle side portions 30 which are secured directly to
130 the sides 31 of the vehicle 1. The sides 30

are provided with inwardly arched flanges 32 disposed opposite the end burners 22, and these arched members are in the nature of guides for directing the flame of the said burners away from the tritulating device when the manifold pipes 15 are swung to bring the burners to horizontal position, as when no snow has been delivered into the tritulating device or apparatus and when the vehicle is to be propelled without directing the flame against said apparatus.

Below the trough 23 there is arranged a spout 33. The spout is inclined downwardly from its ends to its center, and its said center is provided with a transversely arranged duct 34. Journaled centrally in the duct 34, that is at the portion thereof communicating with the spout 33, there is a shaft 35. On this shaft there is a gate valve 36. The shaft 35, when turned to bring the valve 36 against either of the side walls provided by the passage between the spout and duct, will direct melted snow to either side of the vehicle. This is especially desirable, inasmuch as the vehicle will travel adjacent to the curbs of a street or the gutters of a road so that the water eliminated from the snow will be directed nearest the curb or gutter of a street or road.

In an instance where the vehicle is arranged a considerable distance from the gutter of a road or street, and as illustrated in Figures 13 and 14 of the drawings, there is connected to the ends of the duct 34 outlet pipes 37. Each of the pipes 37 has its inner end pivotally connected to a beam 38 which is revolvably supported on the sides of the vehicle 1. The beam 38 has an outstanding arm 39, braced to the said beams by means 40. The pipe members 37 have secured thereon collars or the like to which are connected flexible elements 41 trained through an eye member 42 on the arm 39. Each beam 38 has secured thereon an angle arm 43, and to each of these arms 43 there is secured a rod 44. Each rod 44 is pivotally connected to the angle end of a lever 45. Each lever is pivoted to a segmental rack 46. Each lever carries a hand-actuated spring-influenced pawl to engage with the teeth of the rack 46. By this arrangement it will be noted that the pipe members or spouts 37 may be arranged against the sides of the vehicle or disposed at any desired outward angle with respect thereto.

Hingedly secured, as at 47 to the bottom of the trough 23 there is a scoop 48. The scoop has its inner end of a substantially rectangular formation, and is from thence gradually widened to its outer end. The scoop has flanged sides and a top. The scoop, at the widened mouth thereof, has its lower wall provided with cutting ele-

ments in the nature of saw teeth 50. The side members 51 of the vehicle frame project a suitable distance beyond the cab 2 and are each provided at its outer end with an upstanding portion or standard 53. These standards are preferably connected at their upper ends. The standards 53 provide bearings for a shaft 54. On the sides of the scoop 48 there are secured, preferably by links 55, flexible elements such as chains 56. Each of these chains is secured around the shaft 54. The shaft 54 has keyed thereto a toothed wheel 57. This wheel 57 is in mesh with a worm wheel 58. The shaft 59 for the worm wheel is journaled in a yoke-like bearing 60 on the top or connecting member for the standards 53. The shaft 59 leads into the cab 2 and has on its end an operating wheel 61. By turning the wheel the flexible elements will be wound around the shaft 54 so that the spout 48 may be raised above or lowered to ground-contacting engagement. The spout 48 has journaled at its forward and lower end ground-engaging rollers 62.

The sides of the scoop have brackets projecting from the forward or mouth end thereof, and these brackets provide bearings for the rounded end of the cross-sectionally squared shaft 63. On the squared portion of the shaft there is removably secured the ground-engaging street-contacting rotary brush of the improvement. The brush is made up of broom sections 64 that have arranged therebetween cutting sections 65. The cutter sections or members are in the nature of metal spiders each having arms 66 radiating from the center thereof and terminating in sharpened cutting edges 67. The hubs of the broom or brush sections and those of the metal cutting sections have squared bores so that the same may be easily arranged on or removed from the squared portion of the shaft 63. This ground-contacting rotary sweep, in connection with the cutting tooth 50 of the scoop 48 are important features of the invention.

Journaled in suitable bearing openings between the sides, and adjacent to the mouth of the scoop 48, there is a shaft 66, and fixed on this shaft there is a rotary brush 67. At the straight inner end of the scoop 48 there is also journaled between the sides thereof a shaft 68 which carries a brush 69.

The numeral 70 designates a motor of the internal combustion type, such as is true with respect to the motor 4. The drive shaft of this motor is indicated by the numeral 71. The drive shaft has one end journaled in a bearing in the rear end of the housing or body of the vehicle 1. On the shaft 71 there is secured a sprocket wheel disposed opposite a similar sprocket

wheel which is secured on the shaft 27 of the triturating device. Around these sprocket wheels there is trained a sprocket chain 72. Thus the drive shaft 71 of the motor 70 imparts motion to the triturating mechanism.

On the shaft 71 there is a gear 73, in mesh with a small gear 74 whose shaft is journaled in a suitable bearing on one of the side members of the frame of the vehicle. The shaft for the gear 74 has secured thereon a sprocket wheel disposed opposite a larger sprocket wheel on a shaft 75 which is journaled in suitable bearings 76 on the side members of the frame. Around these last mentioned sprocket wheels there is trained a sprocket chain 77. On the shaft 75 there is secured a sprocket wheel disposed opposite a smaller sprocket wheel on the shaft 68, and around these sprocket wheels there is trained an endless chain 78. On the outer end of the shaft 68 there is secured a comparatively small sprocket wheel, and alining with this sprocket wheel and secured on the shaft 66 there is a larger sprocket wheel. Around these wheels there is trained an endless sprocket chain 79. On the outer end of the shaft 66 there is secured a comparatively small sprocket wheel, and on the end of shaft 63 there is secured a larger sprocket wheel. Around these sprocket wheels there is trained an endless chain 80. By this arrangement it will be noted that to the sweeping brush 64 is imparted a comparatively slow rotary movement, the brush 67 a faster movement, and the brush 68 a still faster movement. In this manner the brush 64 will have ample time to sweep into the chute all of the snow gathered thereby and cut by the teeth 50, the brush 67 delivering the said sweepings upwardly in the chute toward and in contact with the brush 69, and the said brush 69 rapidly delivering the snow and sweepings to the snow destroying apparatus previously described.

As the gas control and the wiring for the motors 4 and 70 are of the well known type and are controlled by mechanism forward of the driver's seat in the cab, a detailed description thereof will not be attempted.

The shaft 71 for the motor 70 operates an air pump 81, the said pump having a pipe connection 82 with the oil tank 7 and whereby the air acting on the oil in the said tank 7 serves as a forced feed for the burners 22 in the manifolds 16. The air conducting pipe 82 is preferably valve-controlled so that too great a pressure of air will not be delivered into the tank 7. The drive shaft from the motor 4 is associated with the usual transmission mechanism for the drive shafts of the caterpillars, so that the vehicle may readily turn corners.

The simplicity of my construction and the operation thereof, will, it is thought, be perfectly apparent to those skilled in the art to which the invention relates. The snow swept by the ground brush which has the metal spiders associated therewith, will, as previously inferred, be effectively broken and delivered into the chute and from thence the said snow will be delivered by the brushes 67 and 69 into the triturating mechanism. The flame from the burners reduces the triturated material into a liquid mass and this liquid is delivered to either side of the machine as desired. The lighted burners at all times heat the device sufficiently to prevent freezing or clogging of the material therein, and the improvement may be mounted upon any ordinary truck construction.

The invention is, of course, not to be restricted to the precise detailed features of construction herein set forth as such changes therefrom as fall within the scope of my claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having described the invention, I claim:—

1. A snow removing and destroying apparatus comprising a vehicle, triturating mechanism therein, including a grinding screw having a mutilating paddle at the receiving end thereof, an apertured trough in which the same is journaled, a gutter below the trough having lateral outlets, a valve controlling the passage from the gutter to either of said outlets and means for revolving the triturating device.

2. A snow removing and destroying apparatus comprising a vehicle, triturating mechanism therein, including a grinding screw having a mutilating paddle at the receiving end thereof, an apertured trough in which the same is journaled, a gutter below the trough having lateral outlets, a valve controlling the passage from the gutter to either of said outlets, a pipe in the sides of the machine flexibly connected with each of the outlets and means for sustaining the pipes against the sides or at outward angles with respect to the vehicle.

3. A snow removing and destroying apparatus, comprising a vehicle, snow triturating mechanism therein, revoluble means for gathering snow from a street and directing the same onto the triturating means, an oil tank in the vehicle, horizontally arranged revoluble pipes associated with said tank and providing manifolds for burners, means for turning the said manifolds to direct the flame from the burners onto the triturated snow to melt the same, means for directing the water eliminated from the snow through one of either side of the vehicle, means for simultaneously actuating the tri-

triturating device and the snow delivery means therefor, and an air pump operated by said actuating means and having a pipe connection with the oil tank and independent means for operating the vehicle.

5 4. A snow removing and destroying apparatus, comprising a vehicle, a triturating device therein, means for delivering snow from the street to the triturating device, 10 a fuel tank above the triturating device, pipes communicating therewith and extending longitudinally over the triturating device, burners on said pipes designed to direct flames therefrom onto the triturated 15 snow, means for automatically holding the burners in such position, means for swinging the pipes to bring the burners away from the triturating device, and a laterally extending valve controlled outlet for the 20 water eliminated from the snow.

5. A snow removing and destroying apparatus, including a triturating mechanism, means for delivering snow thereonto, means for actuating said mechanism, an oil tank 25 above said mechanism, manifold pipes provided with burners leading therefrom, a valve controlling the passage of oil from the tank to the pipes, means for revolving said burners for automatically holding the 30 same to direct the flames onto the triturated material or to direct the flames away therefrom, and a laterally extending valve controlled duct for conducting the water elim-

inated from the snow to either side of the vehicle.

35 6. In a snow removing and destroying apparatus, comprising a vehicle having a central trough at the bottom thereof, said trough being round in cross section and having inclined sides connected to the sides 40 of the vehicle, the center of the trough being apertured, a spout disposed longitudinally below the trough, secured thereto and having its bottom inclined from its ends to its center, a transversely arranged duct com- 45 municating with the said center of the spout, a valve controlling the passage from the spout to either sides of the duct, a screw conveyor disposed longitudinally in the trough, mutilating blades at the forward 50 end of the conveyor, means for delivering snow into the trough, spaced burner manifolds arranged longitudinally above the trough and communicating with a common 55 fuel supply, valve controlled means for regulating the supply of fuel to the manifolds, means for independently turning any one of the manifolds to bring the burners thereof toward or away from the trough and means 60 actuated by the movement of the vehicle for revolving the screw and the mutilating blades thereon.

In testimony whereof I affix my signature.

ROBERT H. SCROGGINS.