Dec. 30, 1952 A. LAMY 2,623,308

SNOW PROJECTOR

Filed Nov. 14, 1947 2 SHEETS—SHEET 1

Fig. 1

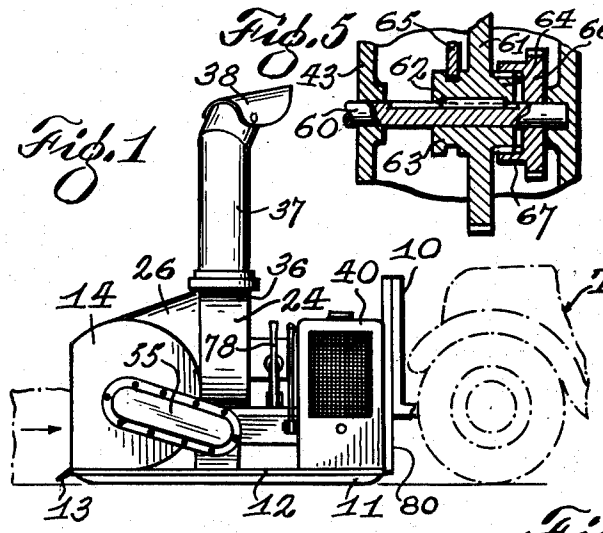


Fig. 5

Fig. 6

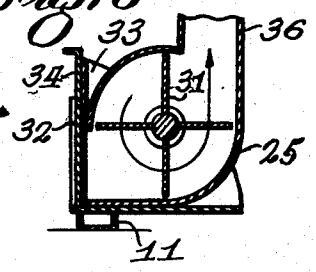


Fig. 7

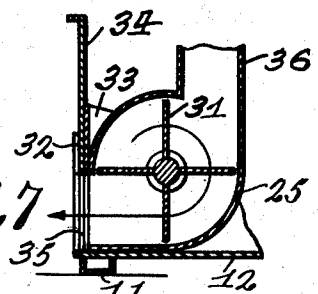
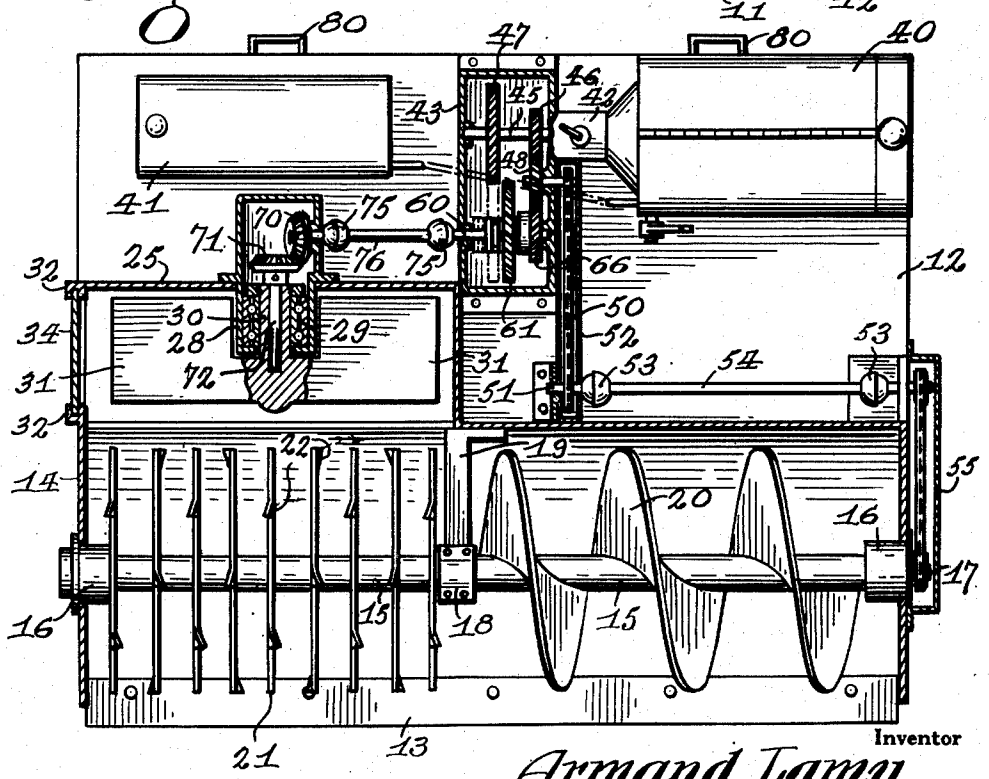


Fig. 4



Inventor

Armand Lamy

By Bobie & Bastien

Attorneys

Dec. 30, 1952 A. LAMY 2,623,308

SNOW PROJECTOR

Filed Nov. 14, 1947 2 SHEETS—SHEET 2

Fig. 2

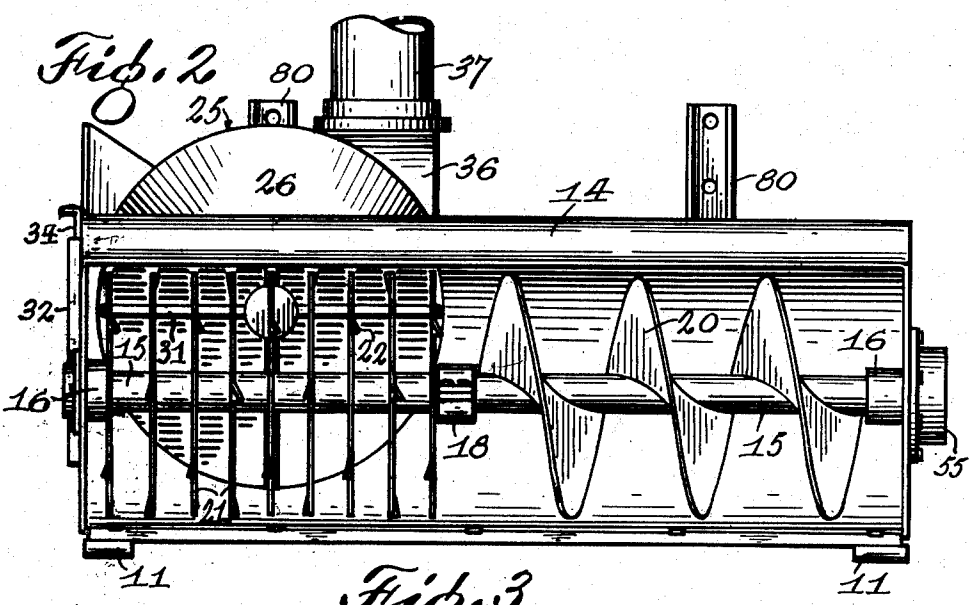
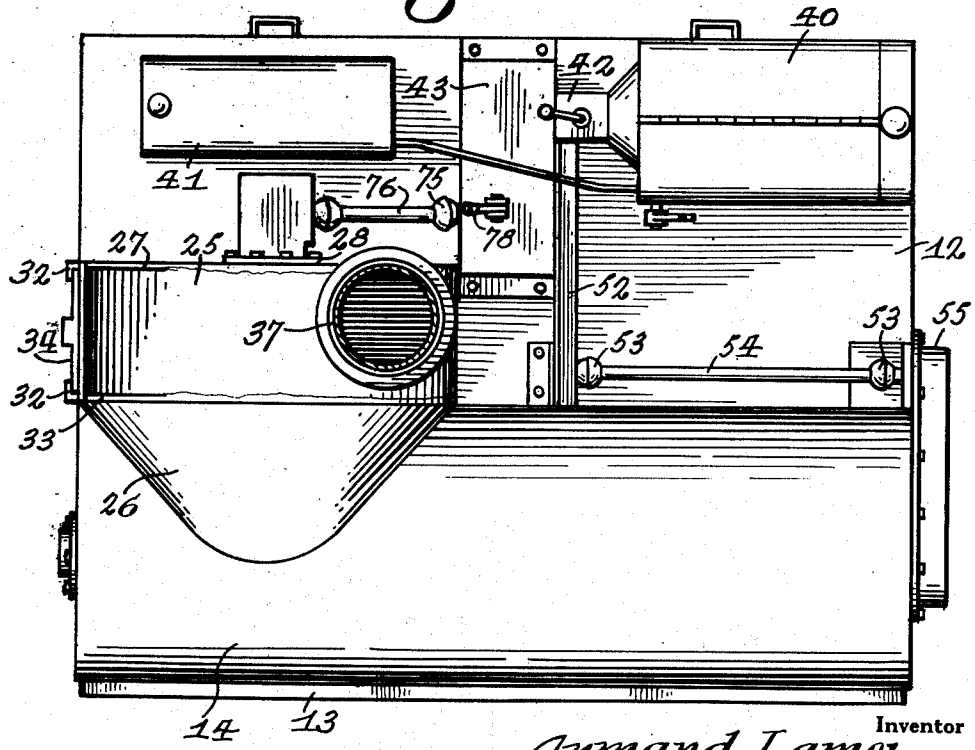


Fig. 3



Inventor

Armand Lamy

By Rodier & Bastien

Attorneys

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SNOW PROJECTOR

Armand Lamy, Montreal, Quebec, Canada, assignor of one-half to Ubald Boisvert, Outremont, Quebec, Canada

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1 Claim. (Cl. 37—43)

1

The present invention relates to snow-removing devices and, more particularly, to a rotary apparatus adapted to project snow at a distance.

The main object of the invention resides in the provision of highly efficient means for removing snow from roads, streets and the like.

Another object is the provision of means of the character described which are in the form of a light-weight attachment for light trucks and similar vehicles.

A further object envisages a snow projector having its own source of motive power.

Still another object concerns a snow projecting attachment which is compact and inexpensive.

A still further object contemplates a snow-removing apparatus of extremely simple character, rugged, foolproof and easily manufactured.

Other objects and advantages of the invention will become apparent, or be pointed out further, during the description to follow.

As an example, and for purposes of illustration only, an embodiment of the invention is shown in the annexed drawings wherein—

Figure 1 is a side elevational view of the snow projector attachment connected in front of a truck indicated in dotted lines,

Figure 2 is a front elevational view of the attachment,

Figure 3 is a plan view thereof,

Figure 4 is a part horizontal section taken through the mechanism at approximately halfway therethrough,

Figure 5 is an enlarged constructional detail of a gear changing mechanism,

Figure 6 is a vertical section through the projector showing the same arranged for vertical projection, and

Figure 7 is a similar view with the projector in position for lateral horizontal discharge.

Referring to the drawings, wherein similar reference characters represent corresponding parts throughout, it will be seen that, in Figure 1, the attachment of the invention is adapted to be secured to the front part of a motor vehicle, indicated in general by the reference character T. For that purpose, a bracket 10 may be disposed in front of said vehicle and properly secured to the frame or chassis thereof and to which bracket the attachment is adapted to be connected by means to be described subsequently. The mechanism, as a whole, is supported on skids or runners 11 consisting of a channeled iron disposed longitudinally at both sides of the bed 12 acting as a base for the various elements of the attachment. To the front edge of said bed, a

2

cutter bar 13 is provided, which is downwardly directed to act as a lip for scraping and facilitating the entry of snow into the conveying casing 14.

Said casing affects very much the general shape of a cylinder, a segment of which has been cut longitudinally to form the mouth into which the snow is admitted; this mouth is directed towards the front of the apparatus, or in the direction in which the said apparatus is normally propelled.

Disposed within the cylindrical casing 14, there is mounted a rotary shaft 15 suitably journalled at 16 in both ends of the casing and one end of which extends slightly out at 17 to receive a sprocket gear the purpose of which will be described later on. Said shaft is additionally supported in the middle by an intermediate bearing 18, held at the end of a bracket 19 for reinforcing purposes and to prevent whipping of the shaft. As shown to advantage in Figs. 2 and 4, the said bearing 18 is disposed substantially in the middle of the shaft 15 and, accordingly, the conveying screw 20 is mounted over the right hand portion of the shaft, when viewed at the front. Obviously, when the screw 20 is rotated in proper direction, material engaged thereby, such as snow, will be displaced from the right to the left towards the comminuting discs 21.

Said discs 21 are mounted on the left hand portion of the shaft 15 in mutually spaced relation and provided with circumferential teeth 22 alternately bent in opposed directions. Said teeth act very much like the teeth of a saw to cut and disintegrate whatever ice formation may be encountered during the snow clearing operation.

In other words, the discs above have no conveying action other than comminuting or disintegrating the snow or ice immediately in front thereof and also the snow conveyed by the conveying screw 20.

As depicted more particularly in Figures 2, 3 and 4, the left hand side of the casing 14 is provided, at the back thereof, with a circular housing 25 the centre of which is slightly higher than the centre of shaft 15, as shown in Fig. 2. The said housing opens into the casing 14 and the upper part thereof connects to the top of the casing by means of a sector-shaped hood 26 so that the entire area of the housing shall communicate with the casing. In the back wall 27 of the housing, in the center thereof, there is mounted a sleeve 28 supporting a ball bearing 29 which, in turn, is adapted to journal the hub 30 of an impeller comprised of radial blades 31, four of which are shown in Figures 2, 6 and 7.

The housing just described is completed by the addition of slides 32 disposed vertically at the left end thereof (see Figures 3 and 4) and which slides are additionally reinforced by means of the web 33; said slides are adapted to receive a sliding trap 34 which, when raised as in Figure 7, is calculated to free an outlet aperture 35 through which the snow is to be expelled. Finally, the other end of the housing, at the right hand stop thereof, is provided with an outlet 36 to which an outlet pipe 37 is adapted, which pipe may be surmounted by the deflector 38 for a purpose to be pointed out later on.

The actuating means for the mechanisms just described comprise the gasoline engine 40 which acts as a power plant separate from that of the truck or other propelling vehicle, which engine, disposed at the right rear of the bed 12, being fed from fuel stored in the tank 41 to the rear left of said bed. The said engine may include the normal and usual multi-speed transmission 42, which transmission is connected directly to a reversing gear-box 43 disposed in the approximate rear center of the bed and through which box the actuating power for the impeller, conveyor and comminuting discs is transmitted.

Referring to Figure 4, it will be seen that the gear-box 43 includes a main shaft 45 which may be a continuation of the shaft in transmission 42 or suitably connected therewith, which shaft has mounted thereon a driving gear 46 and a reversing gear 47. The driving gear 46 meshes with an intermediate gear 48 mounted on a shaft which extends outside of the gear box and the outer end of which is provided with a sprocket or the like over which a sprocket chain 50 is suitably trained for driving a second shaft 51 mounted remotely from the first and which shaft 51 extends out of a protective casing 52 enclosing the above sprocket and the driving chain. The shaft 51, through the intermediary of universal joints 53 and an intermediate shaft 54, is adapted to actuate a sprocket and chain mechanism enclosed in casing 55 and adapted to drive shaft 15 through the medium of a sprocket mounted over extension 17 of shaft 15. Thus, the pinion 48 revolving constantly in a given direction, the conveyor 20 and the discs 21 are adapted to be driven in one direction at a speed controlled by the transmission 42.

A third shaft 60 is journalled in the gear box 43 parallel to the shaft 45 and so mounted as to extend at the left, outside the said box. A sliding gear 61 is movable longitudinally on said shaft and keyed therewith by the key 62. This gear includes a grooved hub 63 on one side thereof and a toothed extension 64 on the other side. A fork 65 engages the groove of the hub to move the gear in or out of engagement with the reversing gear 47. Securely mounted on the shaft 60, and meshing with the intermediate gear 48, there is disposed a pinion 66 having an annular extension 67 toothed internally and adapted to mesh with the teeth of the gear extension 64. Thus, according to the movement of the fork 65, the gear 61 may be meshed with 47 and the extension 64 thereof withdrawn from engagement with the annular extension 67 of the gear 66. Therefore, the shaft 60 will be driven in one direction and, when the gear is pushed so as to be disengaged from 47 and the teeth of 64 and 66 mesh together, the shaft 60 will revolve in the opposite direction due to the introduction of the gear 48 reversing the movement. (See Figures 4 and 5.)

As shown in Figure 4, the shaft 60 is intended to drive a bevel pinion 70 enclosed within an extension of the sleeve 28, which pinion meshes with another pinion 71 disposed at the end of a shaft 72 engaging the hub 30 of the impeller. The connection between the pinion 70 and the shaft 60 is made by means of the universal joints 75 and a connection shaft 76 to permit taking up small errors of alignment.

From the foregoing description partaining to the gear-box 43, it will be evident that the impeller may be actuated in clockwise or counter-clockwise direction as shown in Figures 6 and 7. This is easily effectuated by proper manipulation of the lever 78 which is an extension of the fork 65 extending outside of the gear box.

When the impeller is rotated in clockwise direction (Fig. 7) and the slide 34 raised to uncover the opening 35, the impeller is adapted to project the snow directly out of the housing 25 by means of a scooping action quite unlike the centrifugal action of the conventional snow blowers. In other words, the blades of the impeller acts as so many spades which might be said to simply shovel the snow directly outside. Whenever it is desired to project the snow in opposite directions, the slide 34 is closed and the rotation of the impeller reversed, whereby its movement will now be counter-clockwise as shown in Figure 6. In that case, the snow will be projected into the outlet pipe 37 which may be rotated and the snow spray more or less elevated according to the position of the deflector 38.

From the foregoing description, it will be apparent that the present invention is a useful advance of the art in that it enables, in an extremely simple mechanism, the efficient removal of snow from streets, roads and other public thoroughfares. The said mechanism, due to the particular arrangement of the impeller which projects the snow directly outside of the housing without use of centrifugal force, considerably diminishes the friction losses present in conventional devices and, therefore, enables the apparatus to operate with a minimum of power. The entire device is easily attachable to ordinary vehicles which, in summer time, are available for other functions. The attachment is easily made by means of the bracket 16 already described and vertical extensions 80 disposed at the side of the bed 12. Since the apparatus is self-driven by means of its own power plant, the vehicle is left in its original form and complicated transmission systems dispensed with.

It must be understood that various changes as to the size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claim.

Having thus described my invention, I claim:

A snow projector adapted to be attached in front of a motor vehicle, comprising an open front substantially cylindrical casing disposed transversely to the direction of movement of said vehicle, a housing secured behind one end of said casing and in communication therewith, a rotary bladed impeller mounted in said housing having its axis disposed at right angles to the axis of said casing, a rotary shaft journalled in both ends of said casing and coaxial therewith, an endless screw conveyor mounted on the end portion of said shaft away from said housing, a plurality of comminuting closely spaced parallel discs keyed to the other end portion of said shaft immediately in front of said impeller and extend-

ing substantially the whole length of the communication between said casing and housing, said discs having circumferentially spaced sideways projecting integral teeth alternately bent in opposite directions, and means for actuating said impeller and said shaft, the diameters of said endless screw and discs being substantially the same and slightly smaller than the diameter of said casing whereby the impeller will only receive comminuted snow.

ARMAND LAMY.

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