

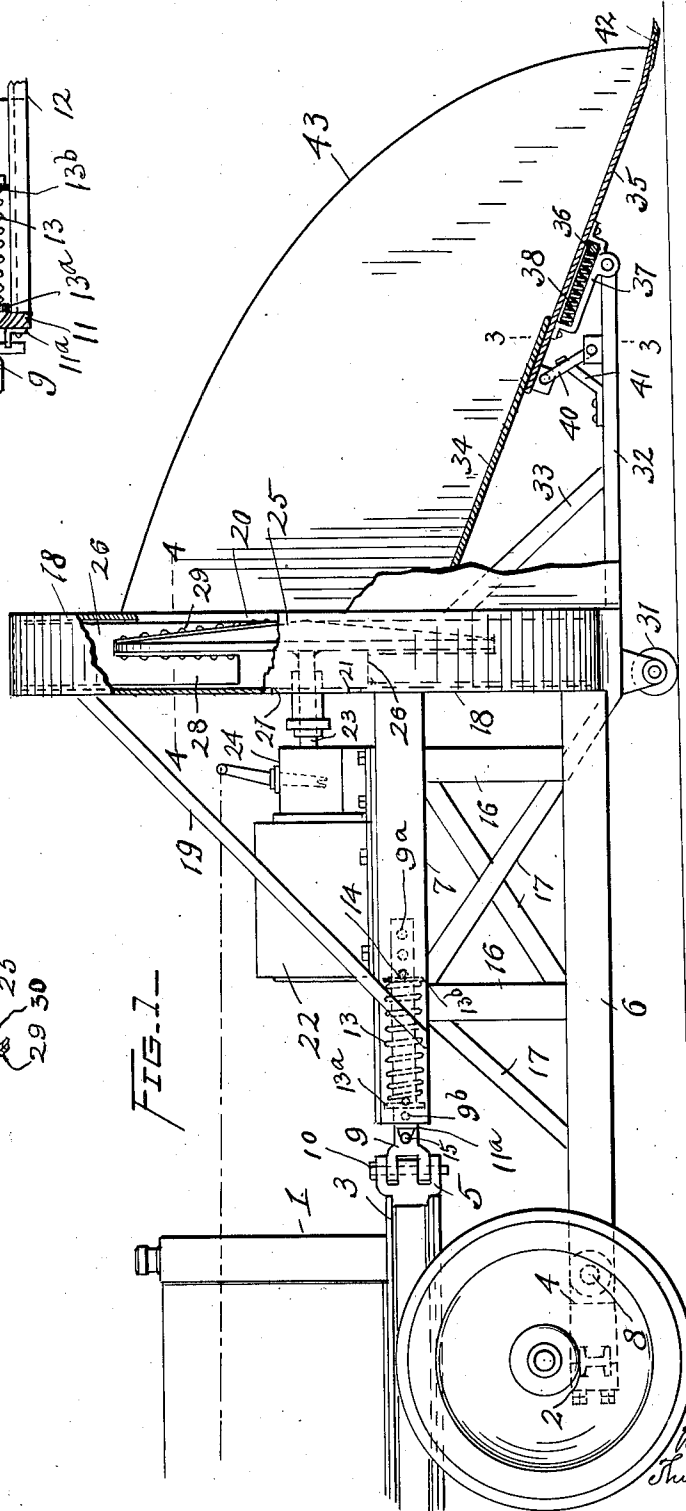
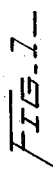
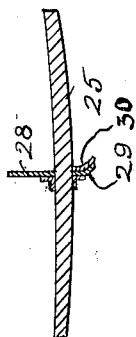
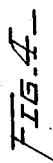
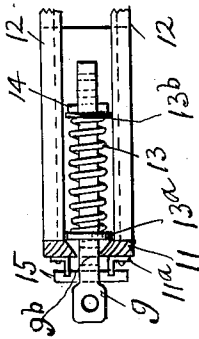
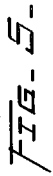
March 16, 1926.

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SNOWFLOW

Filed Oct. 22, 1924

2 Sheets--Sheet 1



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March 16, 1926.

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SNOWPLOW

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2 Sheets-Sheet 2.

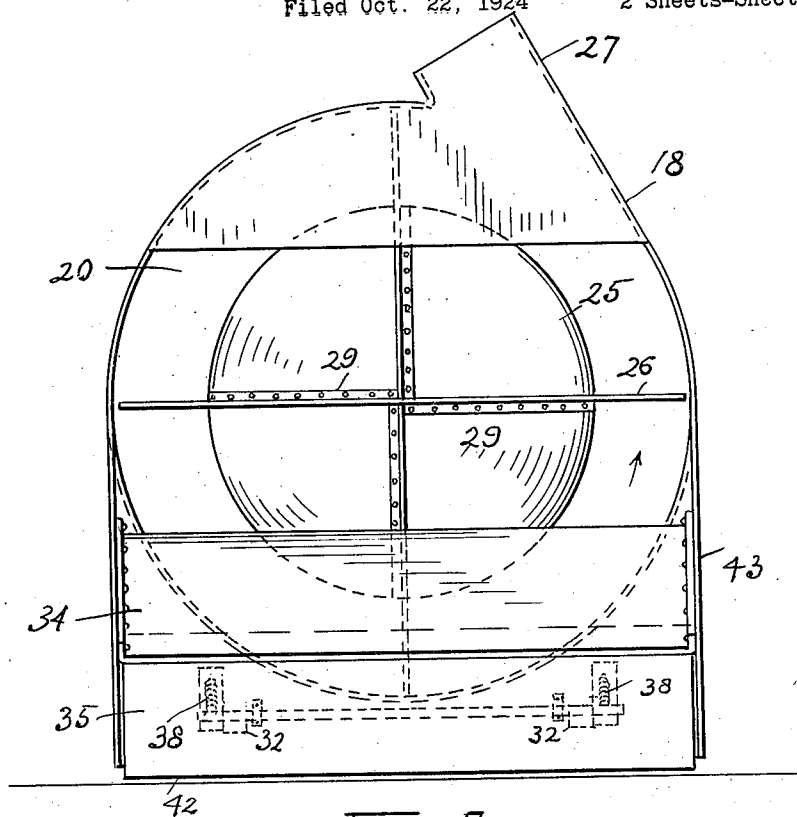


FIG. 2-

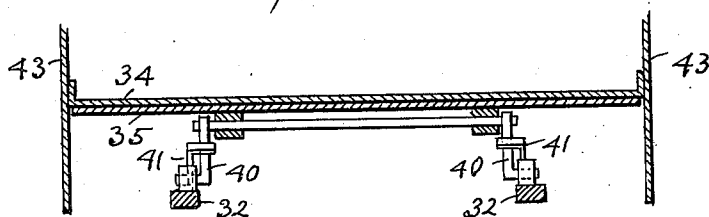


FIG. 3-

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UNITED STATES PATENT OFFICE.

WILLARD B. LAING, OF BEDFORD, OHIO.

SNOWFLOW.

Application filed October 22, 1924. Serial No. 745,073.

To all whom it may concern:

Be it known that I, WILLARD B. LAING, a citizen of the United States, residing at Bedford, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Snowplows, of which the following is a full, clear, and exact description.

This invention relates to a snow plow particularly adapted to remove snow from streets and has for its object to provide a plow by means of which the snow can be rapidly removed from a roadway and discharged to one side of the road or conveyed to trucks to be hauled away.

A further object is to provide a snow plow of the rotary thrower type which is adapted to handle snow which has become caked and frozen as well as loose snow.

A further object is to provide a plow adapted for attachment to a motor truck and provided with means for so mounting the ground engaging part thereof that it will automatically yield and move upward to clear obstructions which would otherwise cause damage to parts of the plow.

A further object is to provide a rotary fan or thrower which is of rugged construction capable of standing the severe usage incident to handling frozen blocks of ice or snow and which is so constructed that it will effectively break up blocks of ice or snow delivered thereto.

With the above and other objects in view, the invention may be said to comprise the device as disclosed in the accompanying drawings hereinafter described, and particularly set forth in the appended claims, together with such variations and modifications thereof as will be apparent to one skilled in the art to which the invention appertains.

Reference should be had to the accompanying drawings forming a part of this specification in which Fig. 1 is a side elevation of the snow plow showing the same attached to the front end of a motor truck; Fig. 2 is a front elevation of the plow; Fig. 3 is a section on line 3—3 of Fig. 1; Fig. 4 is a section on line 4—4 of Fig. 1; Fig. 5 is a detailed view of a yielding buffer interposed between the frame of the plow and the motor vehicle to which it is attached.

The snow plow embodying the present in-

vention is designed to be attached to the front end of a motor vehicle such as a motor truck, the forward end of such a vehicle being shown in Fig. 1 of the drawing. The snow plow extends forwardly from the front end of the motor truck 1 and is connected to the front axle 2 and the front bumper 3 thereof, suitable attaching members 4 being fixed to the axle 2 and attaching member 5 being attached to the bumper 3 adjacent the center thereof. The supporting frame of the plow has lower longitudinal bars 6 extending horizontally in a forward direction from the axle 2 and upper bars 7 extending horizontally forward from the bumper 3, the bars 6 being connected to the members 4 by horizontal pivots 8 and the upper portion of the frame being connected to the members 5 through an adjustable intermediate bar 9. The bar 9 is loosely connected to the member 5 by means of vertical pins 10 and is connected to the frame. The bar 9 extends loosely through an apertured plate 11 fixed to the rear end of the frame and extends forwardly between a pair of longitudinally extending channel bars 12 arranged, back to back centrally of the frame. A coil spring 13 is interposed between washers 13^a and 13^b bearing against the plate 11 and a stop pin 14 extending through one of the apertures 9^a in the forward end portion of the bar 9. The bar 9 adjacent the rear end thereof has spaced apertures 9^b to receive a thrust pin 15 which engages with notched bearing flanges 11^a attached to the rear face of the plate 11. The spring 13 provides a yielding connection between the snow plow frame and motor vehicle and prevents excessive strains on the frame work when the vehicle is backed. The pivotal connections 8 and the yielding connection between the top portion of the snow plow frame and vehicle permit sufficient relative movement between the vehicle and snow plow to permit the snow plow to pass freely over irregularities in the roadway. The upper and lower bars of the snow plow supporting frame are rigidly connected by vertical posts 16 and diagonal braces 17 the said posts and braces forming a rigid supporting structure for the snow plow mechanism.

A vertically disposed fan casing 18 is rigidly attached to the forward ends of the

frame bars 6 and 7, the casing 18 being disposed transversely with respect to the bars and extending considerably above the same, the upper portion of the fan casing being rigidly supported by a diagonal brace 19 extending upwardly from the rear end portion of the arms 7 and connected to the upper portion of the casing. The fan casing is provided adjacent the center thereof with a front opening 20 through which the snow enters the casing and a rear opening 21 through which air may be admitted to the interior of the casing. Rigidly mounted upon the top bars 7 of the frame at the rear of the casing 18 is a motor 22 which is preferably an internal combustion engine provided with suitable gearing for driving the horizontal shaft 23 which extends forwardly from the gear casing 24 at the forward end of the engine casing. Suitable means may be provided for controlling the engine 22 from the driver's seat of the vehicle and the usual change speed transmission gearing may be provided within the casing 24. The shaft 23 extends through the opening 21 in the rear wall of the casing 18 and has fixed thereto within the casing a heavy conical disk 25 which is preferably in the form of a casting. The disk 25 has attached thereto at spaced points circumferentially thereof fan or thrower blades 26 which serve to impel the snow entering through the inlet opening 20 through the peripheral outlet 27 of the casing. The conical disk 25 is of considerably less diameter than the casing 18 and is so mounted in the casing that its apex lies substantially in the plane of the inlet opening 20. The fan blades 26 have their outer end portions beyond the periphery of the disk 25 and extend into proximity to the peripheral wall of the casing 18. The inner end portions of the fan blades 26 are slotted to receive the disk 25 and have a portion 28 which extends outwardly from the rear face of the disk and terminates adjacent the periphery of the opening 21 in the rear wall of the casing and another portion 29 overlying the conical front face of the disk and extending substantially to the apex thereof, the fan blades being rigidly secured to the disk along the inner edges of the portions 28 and 29 thereof which overlie the opposite faces of the disk. The portion of the fan blade overlying the conical face of the disk is of greatly increasing depth toward the periphery of the disk as clearly shown in Fig. 1 and the forward edge of the blade is curved forwardly and has attached thereto a steel cutting blade 30 as shown in Fig. 4. The inlet opening 20 extends clear across the front side of the casing 18 and is of a height somewhat less than the diameter of the disk. It will thus be apparent that as the snow is delivered into the casing through the inlet opening 20, the reenforced forwardly curved

cutting edges of the blades 26 will act to shear and break up cakes of ice or snow delivered through the inlet.

The forward end of the snow plow supporting frame is supported upon wheels 31 which are mounted directly beneath the fan casing 18 in such manner as to normally support the snow plow frame in horizontal position. The snow plow frame has an extension 32 which extends forwardly from the lower portion of the frame, the extension 32 being reenforced by diagonal braces 33 extending upwardly and rearwardly to the main portion of the supporting frame. Snow is delivered from the roadway to the inlet opening 20 of the casing by means of a scraper or scoop 34 which extends forwardly and downwardly from the lower edge of the opening 20, the scraper 34 having a yieldably supported ground engaging portion 35 at its forward end. The yieldable section 35 is normally supported with its rear end engaging the underside of the stationary body portion 34 and is mounted for rearward sliding and vertical swinging movement with respect thereto. The yieldable section 35 has attached to its under side a horizontal bar 36 the ends of which extend into longitudinally slotted inclined guide members 37 pivoted to the forward end of the extension 32, the bar 36 being pressed forwardly and downwardly by compression coiled springs 38 which are interposed between the bar 36 and the rear ends of the slots in the guide members. The rear end of the yieldable section 35 is connected to the extension 32 by a link 40 which is pivoted at its upper end to the section 35 at the rear end thereof and at its lower end to the frame extension 32 at a point forwardly of its connection with the section 35. When the yieldable scraper blade 35 engages an obstruction the blade is pressed rearwardly against the tension of the spring 38 and the link 40 causes the rear end of the blade to swing downwardly about the forward pivot of the link as a center to raise the point of the blade to clear the obstruction. A stop bracket 41 is fixed to the extension 32 at the rear of the link 40 and this bracket has an inwardly extending projection in the path of movement of the link 40 which is engaged by the link as it is swung upwardly and serves to take the thrust exerted upon the forward portion of the section 35 in the operation of the machine. The forward edge of the blade 35 is preferably provided with a steel reenforcement 42 and the scoop 34 is provided with integral side walls 43 which extend from the casing 18 at opposite ends of the opening 20 to adjacent the forward edge of the scraper.

In the operation of the machine the engine 22 will be started into operation to drive the rotary fan or thrower at a suitable

rate of speed and the motor truck 1 will be propelled forwardly to push the scraper blade 35 into the snow. As the machine moves forwardly the snow will be guided up the inclined scraper or scoop and delivered into the inlet opening 20 of the fan casing. The incoming snow which may include solid cakes of snow and ice is engaged by the cutting blades 28 and broken into relatively small pieces and discharged through the outlet 27. The relatively wide portions 28 of the fan at the rear of the disk 25 serve to entrain a relatively large volume of air through the opening 21 at the rear of the casing and the large volume of air thus drawn into the fan and discharged with the snow greatly facilitates the discharge of the snow through the outlet 27 and prevents clogging of the thrower. As above explained the scraper blade 35 is so mounted that the point thereof is automatically lifted when an obstruction such as would be liable to distort or break the same is encountered. In the event that the movement provided for the blade 35 is not sufficient to clear the obstruction further movement will lift the forward end of the plow bodily swinging the frame about the pivots 8. The connections to the frame allow sufficient vertical movement of the snow plow frame to permit the passage thereof over irregularities in the roadway encountered by the supporting wheels 31 at the forward end of the snow plow frame, the wheels 31 normally serving to support the scraper in proper working position.

Having described my invention, I claim:—

1. A snow plow comprising a frame adapted to be secured to the front end of a motor vehicle, a casing secured to the frame, said casing having openings in the front and rear sides thereof and a peripheral discharge outlet, a fan in the casing comprising a disk and blades secured to the disk, said blades extending beyond the periphery of the disk and having portions overlying opposite faces of the disk and extending from the periphery toward the center thereof, and means in advance of the casing for directing snow to the opening in the front thereof.

2. A snow plow comprising a frame adapted to be secured to the front end of a motor vehicle, a casing secured to the frame, said casing being transversely disposed and having central openings in the front and rear walls thereof and a peripheral discharge outlet, a longitudinally extending shaft on the frame having its forward end in the casing, means for driving the shaft, a disk within the casing and secured to said shaft, said disk being spaced from the front and rear walls and blades secured to the front face of the disk, said blades having

forwardly curved cutting edges lying closely adjacent the front wall of the casing, and means in advance of the casing for directing snow to the opening in the front wall thereof.

3. In a device of the character described, the combination with a motor vehicle, of a rigid frame extending forwardly therefrom, a spring buffer interposed between the frame and vehicle, a rotary thrower mounted on the frame adjacent the forward end thereof, and a scraper yieldably attached to the frame and extending forwardly from the thrower for directing snow thereto.

4. In a device of the character described, the combination with a motor vehicle, of a rigid frame yieldingly attached to the front end of the vehicle and extending forwardly therefrom, a scraper yieldingly attached to the forward end of the frame, and a rotary thrower adapted to receive snow from the scraper.

5. In a device of the character described, the combination with a motor vehicle, of a rigid frame having upper and lower forwardly extending members connected to the vehicle, one of said members being connected to the frame by a horizontal pivot and the other of said members having a yielding connection to the frame, and snow conveying means carried by said frame.

6. In a device of the character described, the combination with a motor vehicle, of a rigid frame secured to the front end of the vehicle and extending forwardly therefrom, the lower portion of said frame being connected to the vehicle by a horizontal pivot and the upper portion of said frame having a yielding connection to the vehicle, and snow conveying means carried by the frame.

7. In a device of the character described, the combination with a motor vehicle, of a rigid frame secured to the front end of the vehicle and extending forwardly therefrom, said frame being mounted for vertical swinging movement, a yielding buffer interposed between the vehicle and frame, and adapted to yieldingly resist upward movement of the frame, a scraper secured to the forward end of the frame and adapted to swing vertically with respect thereto, and yielding means for resisting upward movement of the scraper.

8. A snow plow comprising a frame having snow conveying means thereon, a forwardly and downwardly inclined scraper carried by the frame for delivering snow to said conveying means, means connecting the scraper to the frame permitting bodily movement of the scraper in a rearward direction and vertical swinging movement thereof, means including a spring for normally holding the scraper in working position, and means acting to swing the forward end of the scraper upwardly when the scraper is

moved rearwardly in opposition to said spring.

9. A snow plow comprising a frame, a casing mounted adjacent the forward end of the frame, said casing having openings in the front and rear sides thereof and a peripheral outlet, a shaft extending into the casing means for driving the shaft, a disk fixed to the shaft within the casing, said

disk having a conical outer face, blades secured to said disk, said blades being slotted to receive the disk and having portions projecting from opposite sides of the disk, and a downwardly inclined scraper extending forwardly from the casing.

In testimony whereof, I hereunto affix my signature.

WILLARD B. LAING.