Jan. 2, 1962 O. PARNAS 3,015,172

SNOW AND ICE REMOVAL APPARATUS

Filed May 31, 1957 2 Sheets-Sheet 2

FIG. 4

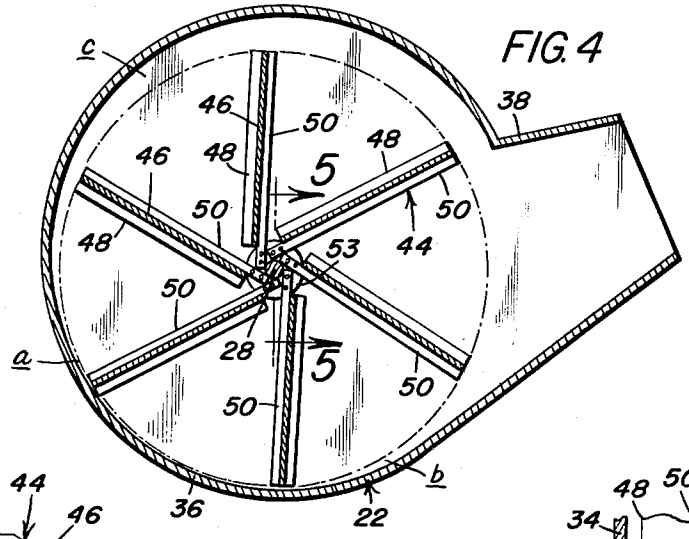



FIG. 5

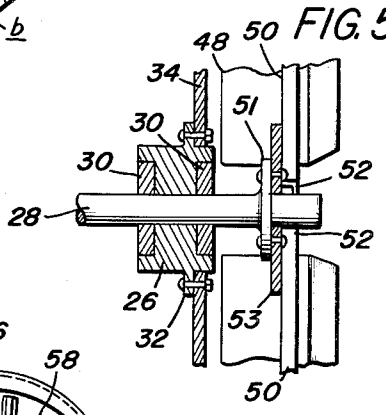



FIG. 6

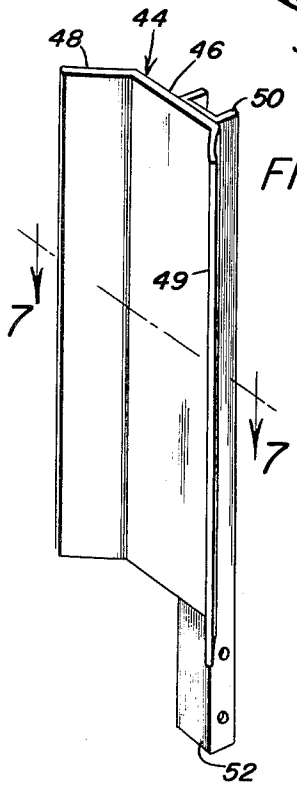
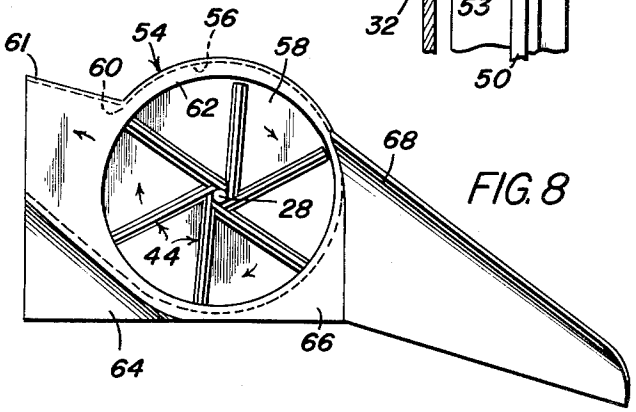



FIG. 8




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# SNOW AND ICE REMOVAL APPARATUS

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1 Claim. (Cl. 37—43)

This invention relates to apparatus for removing snow and ice, and more particularly has regard to a snow and ice removal machine that includes a large diameter fan rotating at a comparatively slow speed within an open front, circular housing, in a manner to scoop up snow and impel the same at substantial force through a discharge conduit extending outwardly from one side of the housing.

The invention has reference to snow removal apparatus having particular adaptability for heavy duty snow removing functions, as for example, the clearing of a road or the right-of-way of a railroad; the clearing of a parking area for automobiles; the clearing of construction areas, etc.

Previously, the conventional practice was to blow the snow off the area on which the same had accumulated, through a comparatively small diameter pipe which is generally projected laterally, outwardly from the area, with the snow being blown by means of a relatively small diameter fan operating at a particularly great rate of speed. This, however, has the disadvantage that the snow removal apparatus cannot clear a sufficiently great area of snow in a comparatively short time. In emergency conditions, of course, it is important that snow removal apparatus be adapted for clearing the area swiftly, since it is essential that considerable progress be made along a road, railroad, etc. over a comparatively short period of time for the purpose of completing the clearing operations with a minimum of delay.

One important object of the present invention is to provide snow removal apparatus that will include a large diameter fan, having arms particularly formed to have scoop-like surfaces facing in the direction of rotation of the fan, said surfaces acting as shovel-like blades that will scoop up the snow and hurl it through a side discharge conduit of the casing, in an arrangement in which the scoop-like blades are in contact with the snow only for a comparatively short period of the full rotational cycle of the blades.

Another object is to provide snow removal apparatus as stated which will effect the removal of substantial quantities of snow or ice, while operating at a relatively low rate of speed, no greater, in fact, than 60 to 250 revolutions per minute in a preferred embodiment of the invention.

Yet another object is to provide snow removal apparatus that will be so formed as to include a casing having a particular shape so as to facilitate the gathering of the snow so that it will enter the open front of the housing, with all snow that enters the housing being disposed in position to be engaged by the scoop-like blades instantly, and hurled laterally outwardly from the area being cleared without the necessity of traveling through the discharge pipe heretofore used.

These together with other objects and advantages which will subsequently become apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a front elevational view of snow removal apparatus formed according to the present invention;

FIGURE 2 is a side elevational view of said apparatus as seen from the right of FIGURE 1;

FIGURE 3 is a top plan view of the head end portion of the apparatus;

FIGURE 4 is a vertical sectional view on an enlarged scale of the apparatus as seen from the line 4—4 of FIGURE 2;

FIGURE 5 is a still further enlarged detail sectional view of the hub assembly of the blower, taken substantially on line 5—5 of FIGURE 4;

FIGURE 6 is a perspective view, on an enlarged scale, of one of the blades per se;

FIGURE 7 is a transverse sectional view, on a scale reduced slightly below that of FIGURE 6, taken substantially on line 7—7 of FIGURE 6; and

FIGURE 8 is a front elevational view of a modified construction.

Referring to the drawings in detail, in the apparatus shown in FIGURES 1 and 2, the construction is such as to provide a relatively small snow removal machine, that is adapted to be pushed by a user. However, it will be understood at this point that the principles of the invention can be embodied in snow removal apparatus of any size, including heavy duty, truck or tractor-mounted snow removal devices used for clearing railroads, highways, etc.

In the illustrated example, the apparatus includes a frame generally designated 10, and extending rearwardly from the frame is a handle 12 adapted to be grasped by one pushing the snow removal apparatus. The handle 12, it will be understood, is of the general type used on power lawn mowers, and therefore would be provided, at its grip end, with conveniently accessible controls 13 for controlling the operation of an internal combustion engine 14 mounted upon the frame 10.

The internal combustion engine 14 is of conventional construction, and can be of any desired size. In the illustrated example, the engine 14 is the same type of engine as is used on a conventional power lawn mower.

A drive pulley 16 is mounted upon the shaft of the engine 14, and trained about the pulley 16 is a belt 18 which would be trained also about a driven pulley rotating with the ground wheels 20, so that the snow plow will be self-propelled.

The snow removal head has been generally designated at 22, and is mounted upon and forwardly of a forwardly projecting support frame, which includes approximately C-shaped frame members 24 secured at their forward ends to a bearing 26, in which is journaled a shaft 28, said shaft 28 having a driving connection, not shown, to the engine 14. In the driving connection between the shaft 28 and the engine, there would be included a gear reduction means such as to effect the rotation of the shaft 28 at a speed of approximately 60 to 250 revolutions per minute, according to the desires of the particular manufacturer. Further, it is understood that the showing is somewhat diagrammatic, and of course there would be included means for preventing damage to the engine, drive assembly, etc., in the event that the snow removal head encounters an overload. Still further, clutch means would be employed for the purpose of engaging or disengaging the blower shaft 28 with the driving connection or power take-off extending from the engine 14. All this is considered to be sufficiently obvious as not to require special illustration herein.

Referring to FIGURE 5, while the bearing construction may vary, in the illustrated example there is provided, in a block-like member, spaced bearing bushings 30, 30. The bearing block has a circumferential flange 32, secured by angularly spaced bolts or equivalent means to the back wall 34 of a circular, open front housing 36 of substantial diameter. The diameter can of course be varied, and in the illustrated example, in which the snow removal apparatus is to be used for clearing driveways or relatively small areas, the housing might be two to three feet in diameter. In any event, at one side the housing is integrally provided with a

skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

Snow removal apparatus comprising a cylindrical housing having a back wall and open over its entire area at the front, a mobile support, means mounting said housing on said mobile support with the lower portion of the housing in tangential relation to the support surface to be cleared, and an impeller journaled entirely within said housing on an axis of rotation normal to said back wall, said impeller including radially disposed arms for centrifugally discharging snow laterally from said housing, said housing including a fixed, lateral discharge conduit having a lower portion merging tangentially, adjacent the lowermost portion of the periphery of said open front housing and extending upwardly and angularly in a single continuous plane from said lower peripheral portion for receiving centrifugally discharged material from said blower as it passes into the open front of the housing, said lateral discharge conduit having a circumferential inlet extending substantially from said lowermost peripheral portion of said open front housing over an uninterrupted span of more than 90 degrees from said lowermost peripheral portion of said housing, said housing including integral, forwardly projecting extension plates spaced at opposite sides of a vertical plane passing through the axis of rotation of said blower for directing material directly into the open front of the housing over its entire area, said extension plates having a triangular, scoop-like configuration and extending downwardly and forwardly from the open front



of said housing, said plates including coplanar lower marginal edges disposed in a plane tangential to the lowermost peripheral portion of said open front housing and spaced on opposite sides of said vertical plane passing through the blower axis of rotation, said extension plates including inclined surface portions oblique to said vertical plane and a plane perpendicular to said vertical plane and passing through said axis of rotation, one of said plates including an outer margin disposed in a plane tangential to one side of said open front housing, the other of said plates including an outer margin parallel to the outer margin of said one of said plates and terminating at the lower terminal end of said discharge conduit, the upper margin of said other plate being integral with and extending the entire length of said discharge conduit, the two extension plates defining from the outer marginal edges a scoop span equal to the diameter of said open front housing plus the length of said lateral discharge conduit.

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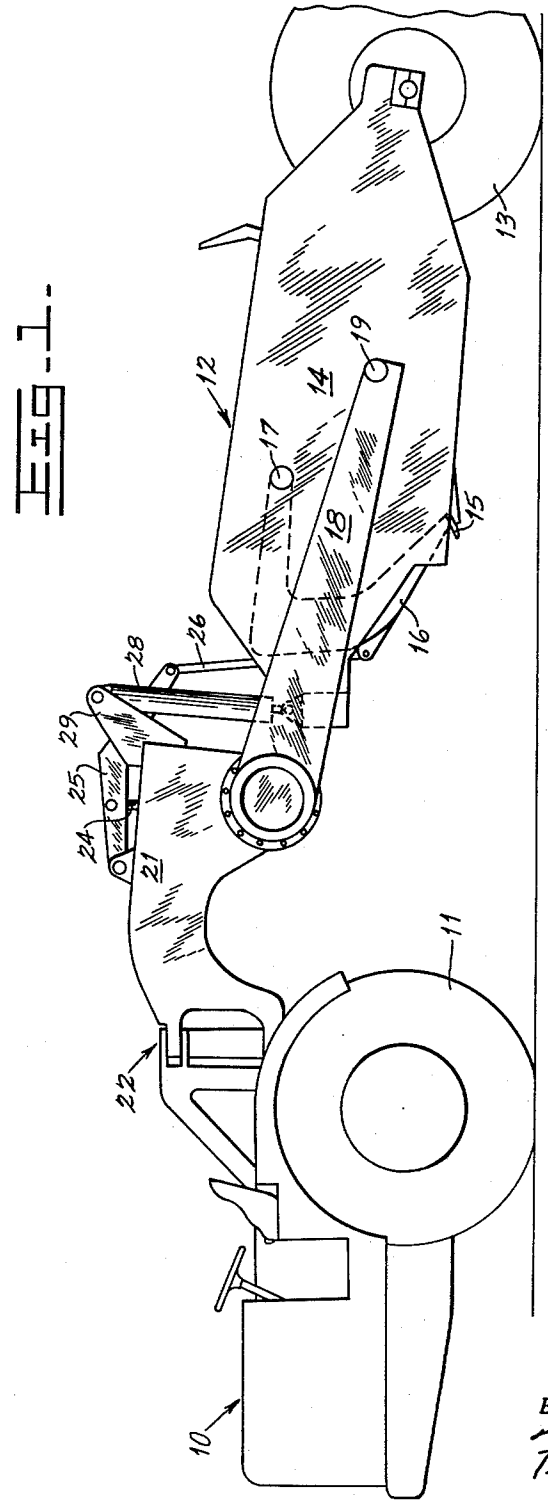
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SHIPPING ACCESSORY FOR TRACTOR DRAWN SCRAPERS

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Fig. 1.




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