POWERED SNOW THROWER OF THE AUGER TYPE

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ABSTRACT OF THE DISCLOSURE

A snow thrower having a frame supporting a prime mover and rotatably supporting an auger. A housing encloses the auger and has a chute for directing the discharge of the auger away from the snow thrower. A handle is attached to the frame and extends therefrom for steering and lifting the snow thrower, which has wheels for moving over the ground. A housing encloses the prime mover and the handle portion adjacent the frame.

BACKGROUND OF THE INVENTION

Snow throwers known heretofore are generally large and heavy if they are provided with a pick-up auger and a discharge chute for directing the snow away from the thrower. Generally, these prior art throwers are difficult to maneuver in operation, and they are clumsy and difficult to store. It will of course be appreciated that it is desirable to have a snow thrower which can be moved into small spaces, and which can be placed on steps or lifted to porches or other raised places even while the blower is operating and during the snow throwing process and for clearing the raised places of snow.

Accordingly, it is the object of this invention to provide a snow thrower which is light weight, easily maneuvered during operation, can be used on the steps and like elevations, can be readily and easily lifted, can be secured in an inoperative and stored space with a requirement of only a minimum of space, and is compact. Still further, the snow thrower of this invention accomplishes the aforesaid purposes and objects, and it is efficient in its operation in throwing snow to any desired direction and for a reasonable distance. Still further, the snow thrower is easily operated, is sturdy in its construction, and is easily manufactured, maintained, and repaired. It is also significant to state that the snow thrower is safe for use in that it does not require any propeller or paddle for throwing the snow in a separate stage of snow removal. In the present instance, the snow is both picked up and impelled through the chute by a single auger.

Still further objects of the invention are the provision of a snow thrower wherein the several parts thereof are disposed in alignment and balanced relationship with respect to each other, including considering the center of gravity of the parts. That is, the thrower is provided with standing support means, and the parts are disposed to be directly above the base of the support means so that it will be stable in the standing position. Also, a frame is provided in the snow thrower for assisting the positioning between the auger and a prime mover and to assure maintaining the positioning, particularly the spacing, between these two parts.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a front perspective view of a snow thrower of this invention.

FIG. 2 is a side perspective view of the snow thrower.

FIG. 3 is a rear elevational view of the snow thrower and showing it on a reduced scale, and with certain parts not shown.

FIG. 4 is a view of the internal parts of the snow thrower, with parts thereof broken away.

FIG. 5 is a right side elevational view of FIG. 4, with parts added thereto and broken away.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The snow thrower is of the powered type, and it includes handles 10 and 11, a frame 12, and an auger housing 13, a discharge chute 14, and covers or housings generally designated 16. FIG. 4 shows the gasoline engine 17, which is a prime mover, in driving relation with the auger 12 by means of the chain 18. Thus the engine crank shaft 19 carries a sprocket 21, and the auger 12 has a sprocket 22 secured to the bearing housing 23 by conventional and suitable means, such as bolts indicated at 24. Therefore the sprocket 22 and auger 12 rotate in unison, as they are driven by the prime mover 17 through the chain 18.

The auger 12 includes the barrel cylinder 26 and the auger flights 27. Thus rotation of the auger 12 will cause pick-up of snow, and it will also cause the impelling of the snow out of the housing 13 and through the chute 14, and this impelling is by means of the paddles 28 included in the auger flights. FIG. 5 shows the auger housing 13 includes the rearwardly disposed cylindrical portion 29 spaced immediately adjacent the tips of the auger flights 27. An outlet portion 31 of the housing 13 is in snow-flow communication with the auger portion 29, so snow is impelled up the cylindrical outlet 31, as desired. Finally, the chute 14 is in flow communication with the portion 31, and is adjustable on the portion 31 so that the chute 14 will direct the snow away from the thrower and preferably either downwardly or to the left or right side. A control handle or the like 32 on the chute 14 permits the operator to rotate the chute 14 on the outlet portion 31 for throw direction desired.

The housing 13 also has side end or base plates 33 and 34. It also has a lip 36 which may be detachable and separately provided for extending along the curved piece 29 and for engaging the ground or being disposed at least near the ground in the operation of the snow thrower. In actual manufacture, it is desirable to make the housing parts described, and to even make the auger 12, of a plastic material so that it is both durable and light weight, as well as having other advantages. Thus the piece 36 can be made of a material appropriate for serving as the forward lip in the advance of the snow thrower along the ground. Also, two wheels 37 are rotatably mounted on the housing ends 33 and 34, respectively, for mobilizing the snow thrower during operation.

It will therefore be noticed that the handle portion 11 has hand-grip means 38 for pushing and steering the snow thrower in operation thereof. Also, the handle portion 10 has hand-grip means 39 which are available for lifting the snow thrower either for transporting it or for controlling it during operation such as when the operator has one hand on the grip 38 and another hand on the grip 39 and is standing to the side of the snow thrower. This may be when the snow thrower is being used on a step or small porch or any other similar structure.

FIGS. 4 and 5 show a cross frame piece 41 extending between the prime mover 17 and the auger 12 and providing the mounting and support for these two parts. That is, a bracket 42 and a bracket 43 are suitably secured to the frame 41 by means of bolts, such as the bolt 44, and the brackets 42 and 43 extend to the prime mover 17 and are bolted thereto for supporting the prime mover 17 in a fixed position with respect to the frame piece 41. Also, brackets 46 and 43 are shown bolted to the opposite ends
of the frame piece 41, and these brackets 46 and 43 extend upwardly and provide a means for mounting the handles, such as the handle portion 10, which are secured by the bolts 48 and the like.

Finally, brackets 49 and 51 are also bolted to the opposite ends of the frame piece 41 and extend forwardly thereof and provide the rotatable mounting for the auger 12. That is, a shaft 52 extends between the brackets 49 and 51 and through the auger 12, as an auger shaft but being fixed or nonrotatable in the arrangement shown. Bearings 53 are piloted on the dead shaft 52 and the bearings are shown bolted to the auger ends 54 and 56, by means of bolts 57 so that the bearing outer housing shown will rotate with the auger body 26, as desired.

Thus the shaft 52 provides the desired spacing between the brackets 49 and 51 at the forwardly extending portion of these brackets, and screws 60 secure the shaft 52 to the brackets 49 and 51. This arrangement presents only a minimum of strain on the auger proper, and it permits the auger 12 to be made of a plastic material and light weight so that it can be maneuvered and operated for the purposes mentioned herein.

Thus the frame means, including the brackets described, provide the desired spacing and relative location of the prime mover 17 and the auger 12. FIG. 5 shows that the auger 12, and designated X in FIG. 5, lies along a plane defined by line B, which plane also lies along the handle means 10. The axis or center of gravity of the prime mover 17, and the axis or center of gravity being designated Y, lies on the line defined by the length direction of the brackets 43 and 51. This line is designated A, and it is close to, if not on, being coincident with the line or plane B. Thus the handle portion 10 extends on a plane on which the prime mover 17 is also located. Also, the grip portion 39 of the handle portion 10 is adjacent the prime mover 17. This is all for the purpose of providing an easily lifted and maneuvered snow thrower.

FIG. 5 also shows, along with FIGS. 1 and 2, that the auger housing ends 53 and 54 have a flat supporting edge 55 which is disposed on a plane designated F, and this plane may be referring to the floor. That is, the edges 59 would rest along a floor or the plane F, and the entire thrower would be balanced and can stand in that position. This is true since the plane F is transverse to the plane A, which defines the plane extending through the center of gravity of at least the bulk of the snow thrower, as mentioned.

Of course with this elongated arrangements of parts described, that is with the engine and the auger extending substantially straight off from the handle means, the snow thrower could also be hung in a vertical position and occupy only a minimum of space against a wall or the like on which it may be hung.

It is further significant to notice that the wheels 37 have their axes designated Z imposed on a plane designated C which is shown upright in FIG. 2 and which therefore extends between the auger axis X and the center of gravity designated Y with regard to the prime mover 17. Therefore, the wheels 37 are only two in number, but they are arranged for optimum balancing of the thrower with a portion of the thrower extending forwardly of the wheels and with a portion of the thrower extending rearwardly of the wheels, both with respect to the vertical plane C extending through the axes of the wheels 37. Of course the lower edges of the wheels extend below the auger lower housing edge 61, shown in FIGS. 1 and 2, so the wheels 37 will support the entire snow thrower on the ground in a mobile position, when the snow thrower is disposed at the operative positions shown in FIGS. 1 and 2.

An important feature of the frame, including the rearwardly and forwardly extending brackets, is both to provide and maintain the mounting and relationship of spacing and stability between the prime mover and the auger. A fixed spacing between the prime mover and auger, as assured by this frame means, provides proper tensioning and adjustment of the drive from the prime mover to the auger, for both normal and shock conditions. Of course the prime mover may also be an electric motor powered by a source remote from the unit itself and having an extension cord extending thereto, much in the manner of running electric motors to mobile implements, such as lawn mowers. The electric motor shaft would be in a position of the engine shaft 19, and it would also be mounted on the brackets 42 and 43.

What is claimed is:

1. In a snow thrower of the type movable in a forward direction along a fore-and-aft axis through said snow thrower, a prime mover, a prime mover housing, an auger operatively connected to said prime mover to be driven thereby and being disposed forwardly of said prime mover, an auger housing, a chute disposed on said auger housing and in direct snow-flow communication therewith for directing snow from said auger and away from said snow thrower, handle means included in said snow thrower for manual control of said snow thrower, extending rearwardly on said said auger housing, and means, provided first mounting means on said frame piece and extending to said auger for rotatably supporting the latter, second mounting means on said frame piece and extending to said auger for rotatably supporting the latter, and third mounting means on said frame piece and extending in the direction of said first mounting means, said handle means being rigidly connected to said third mounting means and being elongated and extending rearwardly on said snow thrower in an extent along a plane which lies along the axis of rotation of said auger, said prime mover housing being arranged and disposed to enclose said prime mover and said frame piece and the portion of said frame means adjacent said third mounting means, the center of gravity of both said prime mover and said auger being disposed on a common plane extending along said centers, said auger housing including two opposite side portions disposed at the ends of said auger and each having a flat edge disposed at the extremity of said housing and on a plane transverse to said common plane for standing said snow thrower on said floor in a self-supporting position with said common plane being vertically disposed.

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