Nov. 20, 1956 J. H. JACOBS 2,770,893

ROTARY SNOW PLOW

Filed June 11, 1951

FIG. 1

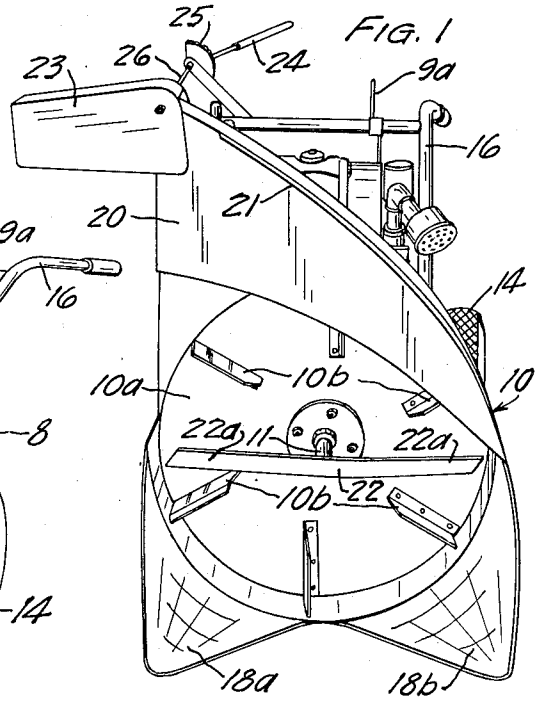


FIG. 2

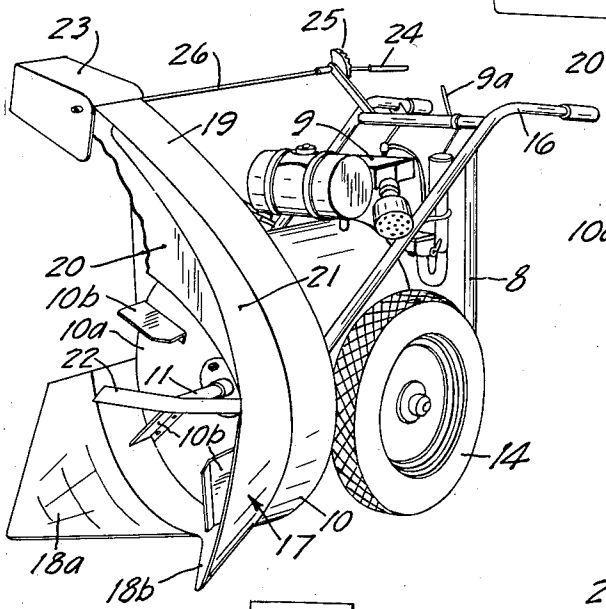


FIG. 4

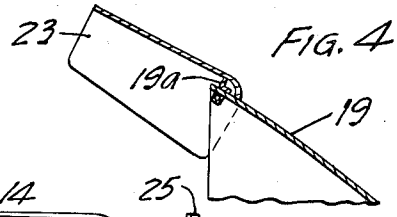
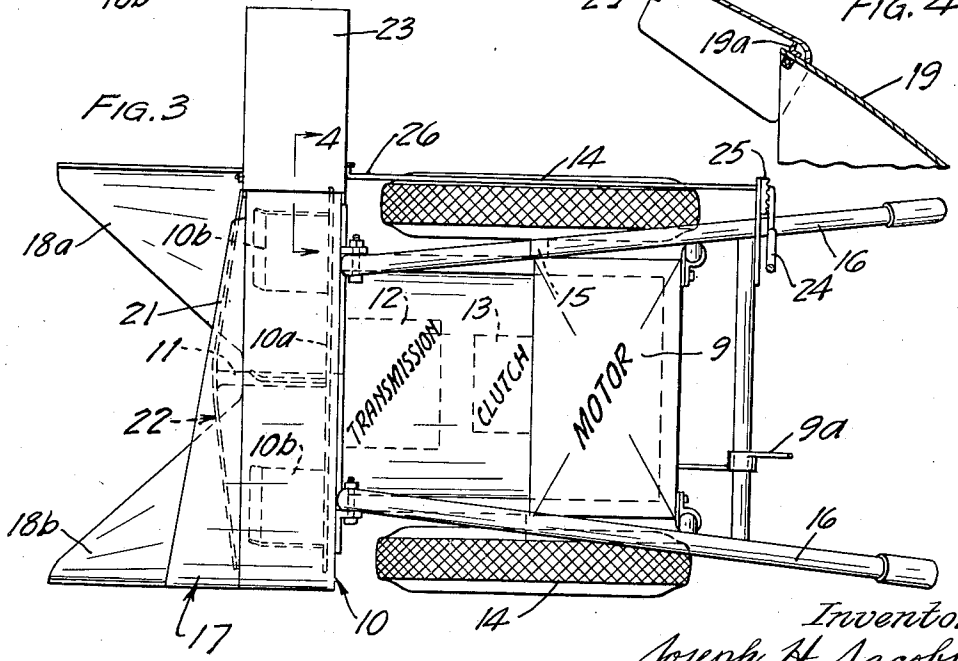


FIG. 3



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ROTARY SNOW PLOW

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1 Claim. (Cl. 37—43)

This invention relates generally to rotary type snow plows and particularly to a plow designed for sidewalk and driveway use.

It is an object of my invention to provide a highly efficient rotary type plow constructed to remove crusted, as well as extremely wet, snow without clogging and designed to maintain the rotor speed in synchronized relation to the forward driving speed of the plow.

It is another object to provide an easily maneuverable rotary type plow having the weight of the elements thereof equally distributed longitudinally with the forward extremity of the plow mold board or scoop structure disposed in relatively closely spaced relation forwardly of the plow driving wheels and shaped to hold the forward portion of the plow in ground engaging position.

It is a further object to provide a plow having substantially cylindrical segments forming the forwardly extending elements of the mold board for delivering the snow rearwardly to a rotor traveling at a relatively slow speed whereby the snow to be removed is scooped or thrown with a shoveling action outwardly through a chute disposed tangentially of the rotor housing, said housing being of a size to provide spacing therebetween and the blades of said rotor and being open for a substantial distance downwardly from the upper discharge end of said chute to prevent clogging of the snow therein.

It is another general object to provide a rotary type snow plow which is designed to throw the snow with a shoveling action rather than a blower action.

It is still another object to provide an adjustable deflector hood at the discharge of the tangential chute to control the angle of discharge therefrom, the deflecting surface of the hood being vertically offset from the discharge end of said chute to provide a stepped construction and thereby prevent suction of the snow against the discharge surface from retarding the flow of the snow outwardly.

More specifically, it is an object to provide a rotary type snow plow adapted for use in packed snow conditions as well as in thawing conditions to successfully remove the snow and having a pair of forwardly extending scoop elements transversely spaced apart no farther than the diameter of the rotor housing disposed immediately therebehind, the discharge side of said rotor housing being entirely open from a horizontal plane through the rotor axis upwardly to the top discharge end of the chute disposed tangentially of said housing, said housing providing a substantial clearance between the rotor blades and the adjacent portions thereof to prevent clogging during the snow removal operation and to permit a relatively slow moving rotor to throw the snow outwardly from the discharge of said chute.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same at similar parts throughout the several views and in which;

Fig. 1 is a front perspective view of my improved rotary plow;

Fig. 2 is a side perspective view thereof;

Fig. 3 is a top plan view of my plow; and

Fig. 4 is a fragmentary vertical section taken substantially along the line 4—4 of Fig. 3.

As illustrated in the accompanying drawings, I provide a rotary type plow having a supporting structure, such as the frame structure **8**, having a motor such as the gas engine **9** mounted on the rear portion thereof. A rotor housing **10** is mounted in fixed relation on the forward portion of the frame structure **8** and has a rotor **10** mounted therein for rotation on a horizontally longitudinally disposed central shaft **11** which is driven by the gas engine **9** through a suitable transmission unit **12** and clutch mechanism **13**. This transmission and clutch are of conventional design and are similar to the clutch and transmission described in the co-pending application of myself and M. L. Jacobs entitled, Power Saw-Automatic Type, Serial No. 95,332, filed May 25, 1949, now Patent No. 2,691,392. This clutch mechanism **13** is governor controlled and is responsive to the speed of the new engine **9** for engagement to drive the rotor shaft **11** through the transmission **12**. A suitable throttle control **9***a* is provided to vary the speed of engine **9**. A pair of wheels **14** are fixed to a transversely disposed driving axle **15** which is driven by a driving connection with the transmission **12** through the clutch **13**. Both wheels are simultaneously and uniformly driven as by the integral shaft or axle **15** to permit the operator to easily maintain a straight line of travel, and the speed of the wheels is always directly related to the speed of the rotor since both are being driven through the transmission **12**. A pair of gripping handles **16** are fixed to the supporting structure **8** and serve to control the direction of movement of the plow.

A mold board and rotor housing **17** is fixed at the front of said frame structure with the rear thereof disposed in closely spaced relation to the front of the wheels **14** to minimize the distance forwardly of said wheels which said mold board structure extends. The lower portion of said mold board **17** is cylindrical in shape to form a housing for the rotor **10** and a pair of scoop elements **18***a* and **18***b* extend directly forwardly and are actually segments of an extension of the housing cylinder with the lower central portion thereof cut away. The upper portion of the housing is tangentially disposed relative to the cylindrical lower portion and forms a discharge chute **19** having a depending front skirt or flange **20**. In the form shown, a snow confining member **21** is tangentially disposed relative to the outer scoop **18***b* and extends upwardly along the discharge chute **19** in forwardly extending relation from the upper edge of the flange **20**.

The rear housing closure is fixed across the rear of the lower cylindrical portion thereof as well as extending upwardly to interconnect with the rear edge of the tangential chute **19**. The central portion thereof is of course apertured to receive the drive shaft **11** therethrough. The rotor **10** has a rear rotary disc member **10***a* fixed to shaft **11** and has a plurality of spaced snow shoveling or throwing blades **10***b* radially disposed around the outer portion thereof. The forward edge portions of said blades are bent slightly to form snow confining flanges which urge the snow carried thereby rearwardly into engagement with the rotor blade **10***a*. A disintegrator **22** is fixed to the forward end of shaft **11** and in the form shown has a pair of arms **22***a* having the leading edges thereof sharpened and the outer ends thereof disposed slightly rearwardly of the central portion thereof to produce a rearwardly sloping front surface.

The discharge deflecting hood **23** is pivotally mounted at the discharge end of tangential chute **19** and the top

deflector plate thereof is disposed in upwardly offset relation to the top tangentially disposed guiding plate of chute **19** to form a step at the end thereof and thereby break any suction that might develop between the engaged tangential surface and the wet snow. An upstanding baffle **19***a* is formed at the end of the chute **19** to prevent back flow of soft fluffy snow and the top of the hood **23** is curved downwardly to combine with said baffle to form a substantial air lock therewith. A crank handle **24** selectively held in adjusted position by a locking segment **25** is provided to turn oscillating shaft **26** which in turn is fixed to the head **23** to permit easy shifting thereof and vary the angle of discharge of snow therefrom.

My snow plow is extremely easy to operate and guide when plowing therewith. There are several factors which contribute to this ease of operation; First, the uniform driving of both wheels resists any turning force produced by any sudden obstruction which may engage the plow scoops **18***a* or **18***b* tending to swing the machine to one side or the other; Secondly, the close longitudinal association between the front ends of the scoops **18***a* and **18***b* and the wheels **14** minimizes the turning leverage produced by striking any such obstruction; Third, by extending said scoops directly forwardly of the side extremities of the rotor housing and not flaring the same outwardly, considerably less turning leverage is produced by any such obstruction; and Fourth, when extremely difficult plowing conditions arise and the resistance to rotation of rotor **10** slows down the engine **9**, the driving speed of the power transmitted to the wheels **14** will be similarly reduced to prevent increasing of the resistance applied to the rotor **10** and thus clogging the same.

The clogging of wet snow and crusted snow in the rotor and housing of the machine is substantially eliminated by the forwardly disposed disintegrating blade **22** and the wide open discharge area disposed below the tangentially disposed guiding plate of chute **19**, as well as the clearance provided between the front edges of the blades **10***b* and the front depending flange **20** of the chute **19**. An extremely important feature of my machine is the shoveling action of the relatively low speed rotor blades which engage the snow and throw the same outwardly through the chute **19** rather than blowing said snow through the chute. Surprisingly less clogging is produced by operating the rotor at a low speed than at an extremely high speed. I have found that the optimum speed for operating under heavy snow conditions is between 300 and 400 R. P. M.'s. This of course permits the spaced relation to be maintained between the blades and the housing since no great volume of air is blown by the rotor **10** and there is no need for a closely associated rotor housing as is required in most snow blowers. The substantially radially disposed blades with their bent forward marginal edge portions receive the snow from the forwardly extending scoops **18***a* and **18***b* and discharge the same in a succession of relatively large masses with a throwing or shoveling action. This could not be done with a high speed blower and materially reduces the clogging in wet snow conditions.

It will be seen that I have provided a highly efficient rotary type snow plow which is extremely easy to handle and operate and in which the rotor and housing are particularly designed to prevent clogging during difficult and heavy operating conditions. It should be noted that the scoops **18***a* and **18***b* engage the snow and tend to hold the bottom of the mold board in engagement therewith and prevent any lifting of the front end even though the motor **9** disposed behind the wheel axle **15** counterbalances the weight of the rotor and mold board disposed in front of said wheel.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention.

What I claim is:

A rotary type snow plow particularly designed for hand guided operation, said plow comprising a support structure, a rotor housing having a generally segmental cylindrical lower portion terminating on one side in a free edge portion and having an upwardly inclined discharge portion disposed substantially tangentially to the other side of the lower housing portion, a bladed rotor journaled on a horizontal axis for rotation within said housing with the blades thereof traveling in a path disposed in closely spaced relation to the cylindrical portion of the housing and rotating in a direction to travel downwardly from said free housing edge and upwardly with respect to said tangentially disposed discharge portion, said free housing edge portion being disposed at least as low as a horizontal plane through the axis of said rotor so that all of the snow discharged by said rotor will pass freely out of said housing laterally thereof, a pair of lower forwardly extending segmental scoop elements having the rear portions thereof connected in fixed relation to the lower cylindrical housing portion and having their lateral extremities spaced apart only a distance equal to the diameter of the lower cylindrical housing portion, said lateral extremities extending downwardly into the same horizontal plane as the bottom of said housing to form a scraping edge adjacent the ground surface extending the full width of the housing, the inner edges of said scoop element converging rearwardly so that the lowered curved portions thereof hold down the housing to maintain engagement with the ground surface.

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