Feb. 20, 1962 H. L. ROSENTHAL 3,021,620

SNOW PLOW

Filed June 10, 1958

Fig. 1.

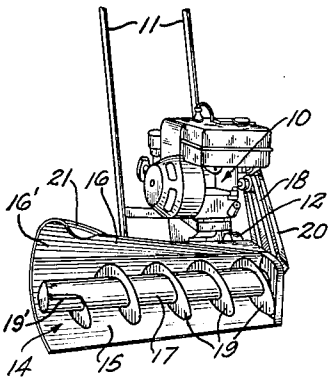


Fig. 2.

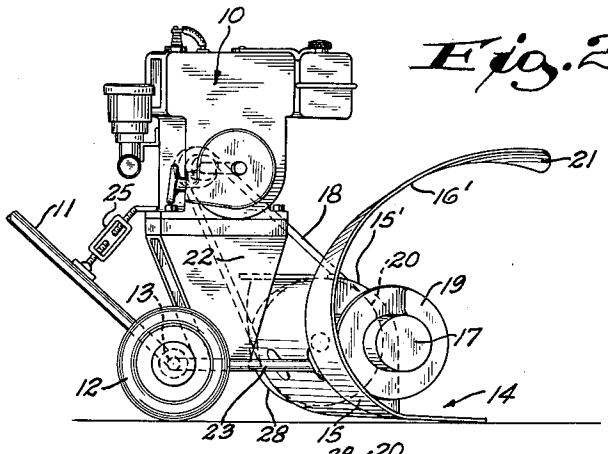


Fig. 3.

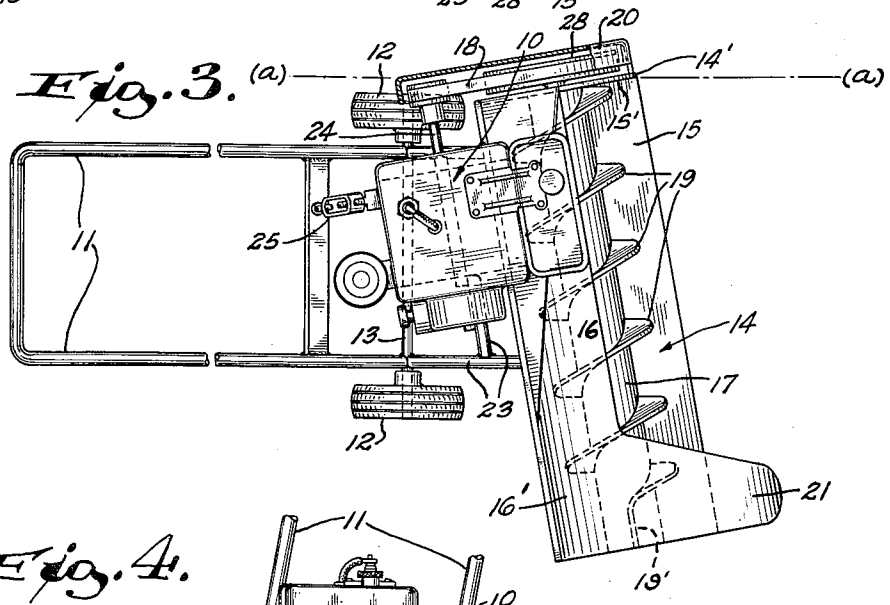
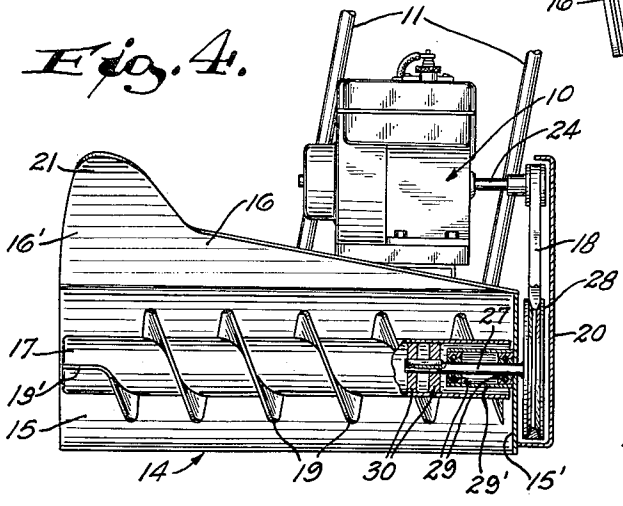


Fig. 4.



INVENTOR.
Henry L. Rosenthal
BY
Mosell & Mosell
ATTORNEYS.

United States Patent Office 3,021,620 Patented Feb. 20, 1962

3,021,620

SNOW PLOW

Henry L. Rosenthal, Box 36 Oconomowoc, Wis.

Filed June 10, 1958, Ser. No. 741,136
6 Claims. (Cl. 37—43)

This invention relates to improvements in snow plows.

A general object of the present invention is to provide a hand-propelled snow plow having a power-driven screw adapted to continually clear snow from the blade. The unique design of the present invention causes such snow to be thrown forwardly and well to the side of the path being cleared. With conventional snow plows the angle is the reverse of the present invention with the discharge end of the blade trailing the other end.

A more particular object of the present invention is to provide a snow plow wherein a lightweight gasoline engine is employed to drive a snow-displacing rotary screw, thereby substantially reducing the physical effort required to remove and redeposit the snow, and making it practical to use the unusual discharge angle of the present invention.

A further object of the present invention is to provide a power snow plow wherein the blade portion and snow deflector are mounted to extend laterally at an oblique angle to the frame, the forwardmost portion of the blade being an open discharge end which is laterally offset a substantial distance from the drive mechanism and handle. With this arrangement the thrust of the screw is counteracted, the operator pushing against such thrust.

A further specific object is to provide a power snow plow wherein a flared chute is formed at the discharge end of the snow deflector to permit snow to be thrown upwardly and well to the side of the path being cleared.

A further object of the invention is to provide a device as above described wherein the end of the screw is directed axially to provide a thrower which throws the laterally moving snow outwardly to coact with the flare of the chute.

A further specific object is to provide a wheeled snow shovel may be manually tilted to conform to the height and composition of the surface being cleared, thereby lessening the possibility of scraping on gravel or uneven cement, and consequent injury to the plow.

A still further object is to provide a power snow plow which is mounted on a pair of wheels to enhance the maneuverability of the plow and to ease the task of the operator.

A further specific object is tto provide a wheeled snow plow wherein the wheels are spaced apart a distance less than the width of the plow, and are disposed inwardly of the ends of the plow, thereby permitting snow removal close to the edges of buildings or other obstacles, and wherein the angle of the blade is such as to clear a path for such wheels.

Another object is to provide a power snow plow which is relatively light and easy to handle. Constructed of lightweight materials, the present plow requires a minimum of fuel and is therefore economical to operate.

Other objects of the present invention are to provide a power snow plow which is attractive in appearance, rugged, simple in design, relatively inexpensive to manufacture, and well adapted for the purposes described.

With the above and other objects in view, the invention consists of the improved power snow plow, and all of its parts and combinations, as set forth in the claims, and all equivalents thereof.

In the accompanying drawings illustrating one complete embodiment of the preferred form of the invention, wherein the same reference characters designate the same parts in all of the views:

FIG. 1 is a perspective view of the power snow plow;

FIG. 2 is a side view

FIG. 3 is a top view of the plow illustrating the angled mounting of the blade; and

FIG. 4 is a front view, with a part of the rotary shaft and blade being broken away to show the shaft mounting structure.

Referring now more particularly to the drawings, the power snow plow comprising the present invention includes a gasoline engine **10**, an engine mounting **22**, and a wheeled or mobile frame **23**, said frame including a pair of rearwardly projecting handle bars **11** and an axle **13**. A pair of spaced wheels **12** are rotatably attached to said axle, and a snow-engaging unit **14** is mounted on the forward end of said frame, said unit **14** including a curved blade **15** and an attached snow deflector **16** having a flared chute **16'** formed at one end, which end is a laterally open discharge end, the opposite end being closed as at **15'**. A sleeve **17** forming a shaft for the screw is rotatably carried within said curved blade, and is adapted to be driven by the engine in a manner to be hereinafter described. A helical screw **19** is mounted on said rotary sleeve **17** and is designed to clear snow from said snow-engaging unit **14** and to cause discharge of the same from the chute **16'**.

The engine **10** employed in the present invention may be a 2.5 horsepower, four cycle gasoline engine and is adapted to drive the screw at approximately 12000 revolutions per minute. The drive transmission means **18** utilized with said engine is preferably of the V-belt type. A housing **20** has been provided to shield said drive belt **18** from snow and to prevent sticks or other items from becoming entangled with the belt and hindering the operation of the plow. The handle bars **11**, frame, and blade are tiltable on the wheels **12**.

As will be seen in FIG. 3, the wheels are spaced a distance less than the width of the snow-engaging unit **14** of the plow, which permits the clearance of snow close to the edges of buildings or the like, the outer wheel being inwardly of the blade corner **14'** so that the latter clears a path for said wheel, said corner being a forward corner for the closed end of the blade.

The blade **15**, which is mounted on and projects forwardly from the frame, is formed of strong sheet steel and is designed to withstand considerable wear and rugged use. The curved cross-sectional contour of said blade, as illustrated in FIG. 2, enables it to engage snow close to the ground and to direct the same upwardly against the deflector **16**. As will be seen in the drawings, said deflector **16** is of an unusual design and incorporates novel features heretofore lacking in snow plows of this general type.

Formed on one end of the snow deflector **16** is a flared chute **16'**, as shown in FIG. 1, which is designed to direct the snow thrown by the thrower **19'** upwardly and well to the side of the path being cleared, due to the fact that the screw has imparted a lateral force. The outer end of said chute has a forwardly overhanging and downwardly extending lip **21** which covers and directs the snow as the same is discharged from the plow. As indicated above, and as illustrated in FIG. 3, the entire snow receiving unit **14** is mounted reversely to the usual angle with respect to the axle **13**, with the discharging or flared end **16'** of the unit forming a lead end rather than a trailing end. With this arrangement the snow is thrown ahead, as well as to the side of the snow plow, rather than to the rear and it clears a path ahead of the drive mechanism, with the latter inside of the line (*a*)—(*a*) of FIG. 3. In addition, this unusual angle counteracts the thrust of the screw, the operator pushing against said thrust.

The rotatable mounting of the sleeve 17 is illustrated in FIG. 4. A stud shaft 27, rigid with the pulley 28, driven by a belt 18 from the engine shaft 24, is projected rotatably into the open end of the sleeve 17 and is anchored therein in spaced disks 30 which are rigidly mounted within said sleeve, the shaft being supported in bearings 29 within a short bearing housing 29' which is rigid with the closed end 15' of the blade. A conventional belt tightener 25 may be used.

The function of the screw 19 is to clear snow from the snow-receiving unit 14 and forcibly propel said snow laterally from the chute 16' which is in a lead position. By use of the power screw the discharge end may be made to lead without increasing the operator's work. It is necessary, of course, that the screw 19 be pitched in a direction so as to combine with an axial thrower portion 19' of the screw to drive the snow in the direction of said chute 16'. It has been found that the rapid rotation of the power-driven sleeve 17 enables said helical screw 19 to discharge the snow effectively, and to throw the same well clear of the path being plowed.

In operation, when the wheeled plow is manually pushed along the path to be cleared, snow is scooped up by the blade 15 and directed rearwardly and upwardly on the snow deflector 16 by the force of additional snow entering the forwardly-moving shovel. Simultaneously, the rotating helical screw 19 engages the snow on said blade and propels the same laterally toward the flared chute 16', in a direct reverse of the direction that the snow would normally travel considering the angle of the blade. As will be readily appreciated, the high speed action of said screw, which is rotating at approximately 1200 revolutions per minute, drives said snow with considerable force and tends to throw the same violently from the chute. The latter feature insures that said snow is deposited well to the side of the path being cleared, and prevents the same from sliding back onto the walk after the plow has passed, which is a source of difficulty and considerable annoyance with conventional snow plows. Moreover, the angled mounting of the snow-receiving unit, which is illustrated in FIG. 3, insures that said discharged snow is directed laterally and forwardly, rather than laterally and to the rear and onto the operator.

As previously mentioned, the manner in which the wheels 12 are mounted, behind the trailing end of the blade, is an important feature of the invention. This permits the clearing of snow immediately adjacent buildings or other obstacles, and is designed to provide maximum balance and maneuverability. Positioned directly under the engine, the wheels permit effortless handling of the plow, and permit easy tilting of the blade to avoid scraping on uneven surfaces.

Due to the unconventional angle of the blade, with the open end leading, the corner 14 of the blade at the trailing end is positioned laterally outwardly of the wheels and power unit to travel along the line (*a*)—(*a*) of FIG. 3. This enables the blade to clear a path for the wheels and power unit. In addition, the angle is such as to counteract the normal thrust of the screw, and the operator pushes against this thrust. By use of the power screw the unusual angle of the blade is made possible without increasing the work of the operator.

The improved power snow plow comprising the present invention is light in weight, and economical to operate. Designed to quickly and effectively dispose of snow and slush, the invention saves considerable time and effort and eliminates much of the tediousness formerly associated with the task of snow removal.

Various changes and modifications may be made in the structure above described without departing from the spirit of the invention, and all of such changes and modifications are contemplated as may come within the scope of the following claims.

What I claim is:

1. In a snow plow having a wheeled frame with a front, a snow engaging plow blade connected to the front of said frame and having an open discharge end and an opposite closed end, screw means extending longitudinally within said blade for moving snow from within the blade toward and out of said open end, a motor carried by said wheeled frame, and means between said motor and screw means for driving the latter in a direction to move snow out of said open end, said blade being so angled a substantial amount on the frame that said open discharge end is in a leading position and said closed end is in a trailing position.

2. In a snow plow having a mobile wheeled frame with a front, a snow engaging plow blade connected to the front of said frame and having a closed end with a forward corner and an open discharge end, said wheeled frame being located a substantial distance off center with respect to the width of the blade and behind that portion of the blade which is adjacent said closed end, and said blade being disposed at an oblique angle with respect to the direction of movement of the plow so that the open discharge end is in a leading position and projects laterally a substantial distance beyond the frame, screw means extending longitudinally within said blade for moving snow toward and out of said open discharge end, and means carried by said frame for driving said screw means in a direction to move snow toward said discharge end.

3. In a snow plow having a mobile wheeled frame with a front, a snow engaging plow blade connected to the front of said frame and having a closed end with a forward corner and an open discharge end, said wheeled frame being located a substantial distance off center with respect to the width of the blade and behind that portion of the blade which is adjacent said closed end, and said blade being disposed at an oblique angle with respect to the direction of movement of the plow so that the open discharge end is in a leading position and projects laterally a substantial distance beyond the frame, screw means extending longitudinally within said blade for moving snow toward and out of said open discharge end, and means carried by said frame for driving said screw means in a direction to move snow toward said discharge end, said wheeled frame being laterally inwardly of the forward corner at said closed end so that the blade clears a path for said wheeled frame.

4. In a snow plow having a mobile frame with a front, a snow engaging plow blade connected to the front of said frame and having a closed end and an open discharge end, said frame being located a substantial distance off center with respect to the width of the blade and behind that portion of the blade which is adjacent said closed end and said blade being disposed at an oblique angle with respect to the direction of movement of the plow so that the open discharge end is in a leading position and projects laterally a substantial distance beyond the frame, screw means extending longitudinally within said blade for moving snow toward and out of said open discharge end, means carried by said frame for driving said screw means in a direction to move snow toward said discharge end, and snow deflecting means connected to an upper portion of said blade and projecting forwardly over said screw means and being flared toward said discharge end.

5. In a snow plow having a mobile frame with a front, a snow engaging plow blade connected to the front of said frame and having a closed end and an open discharge end, said frame being located a substantial distance off center with respect to the width of the blade and behind that portion of the blade which is adjacent said closed end and said blade being disposed at an oblique angle with respect to the direction of movement of the plow so that the open discharge end is in a leading position and projects laterally a substantial distance

beyond the frame, screw means extending longitudinally within said blade for moving snow toward and out of said open discharge end, means carried by said frame for driving said screw means in a direction to move snow toward said discharge end, and snow deflecting means connected to an upper portion of said blade and projecting forwardly over said screw means and being flared toward said discharge end, and having a forward overhanging and downwardly extending lip at the end of said flare.

6. In a snow plow having a mobile frame, with a front, a snow engaging plow blade connected to the front of said frame and having a closed end and a laterally open discharge end, screw means extending longitudinally within said blade for moving snow longitudinally of the blade toward and out of said open discharge end, said open discharge end being in alinement with the axis of said screw means, snow deflecting means connected to an upper portion of said blade for a substantial part of the length of the blade and projecting forwardly over said screw means a progressively increasing amount upwardly toward said discharge end, means for driving said screw means in a direction to move snow toward said discharge

end, said snow deflecting means being flared toward the discharge end of the blade, and a thrower blade at the end of said screw means adjacent the open discharge end and within said flared portion of the snow deflecting means, part of the latter being directly above said thrower blade to cause the snow to be discharged laterally from said open discharge end in the direction of movement of the screw means.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 17,297	Curtis	May 21, 1929
1,524,518	Johnson	Jan. 27, 1925
2,241,252	Garland	May 6, 1941
2,632,263	Cooper	Mar. 24, 1953
2,769,255	Mead	Nov. 6, 1956
2,811,792	Cork	Nov. 5, 1957
2,879,611	Voigt	Mar. 31, 1959

FOREIGN PATENTS

623,498	Germany	Dec. 23, 1935
517,479	Canada	Oct. 18, 1955