

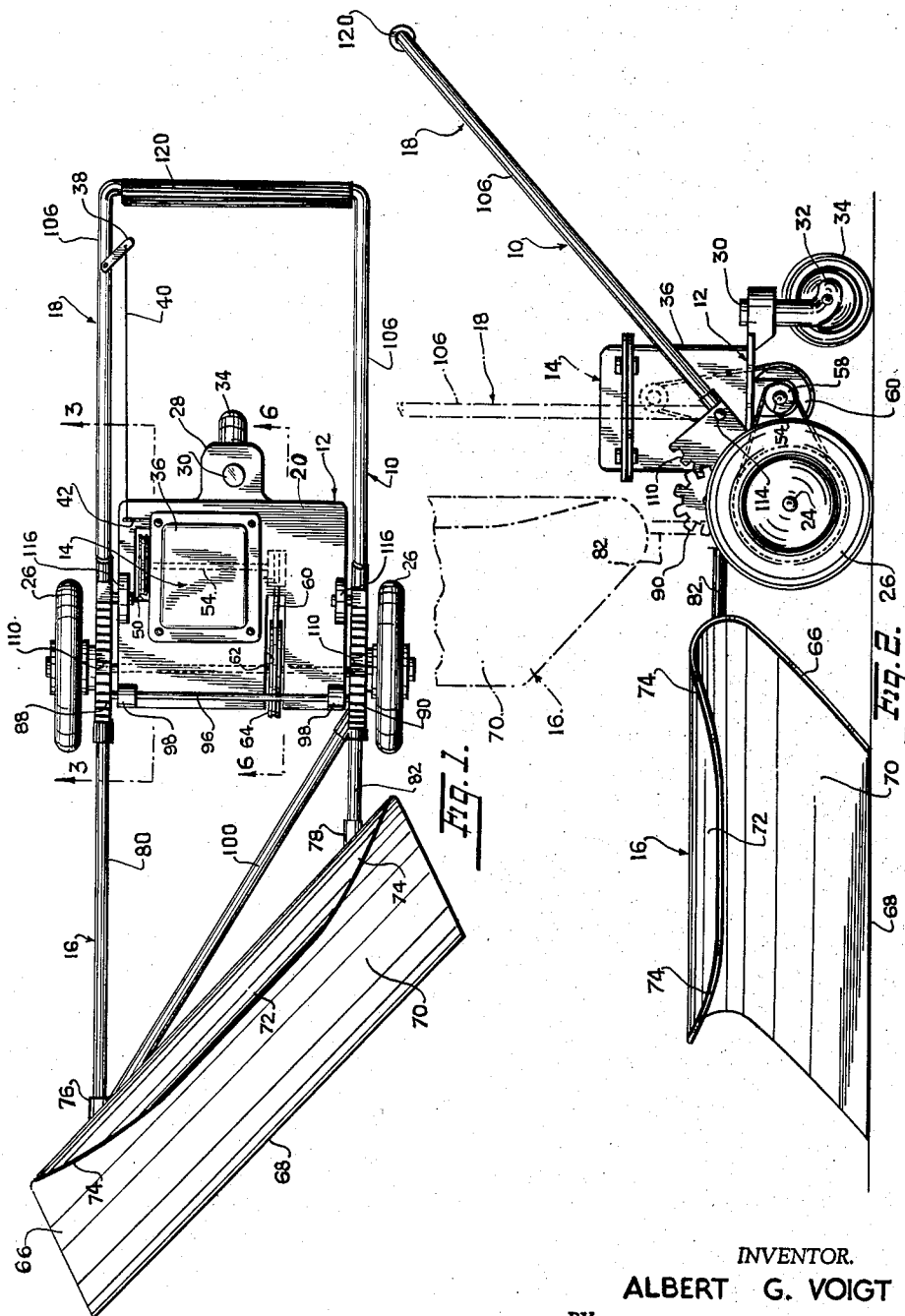
March 31, 1959

A. G. VOIGT
POWER SHOVEL

2,879,611

Filed Jan. 31, 1958

3 Sheets-Sheet 1



INVENTOR.
ALBERT G. VOIGT
BY
Robert P. Polach
ATTORNEY

March 31, 1959

A. G. VOIGT
POWER SHOVEL

2,879,611

Filed Jan. 31, 1958

3 Sheets-Sheet 2

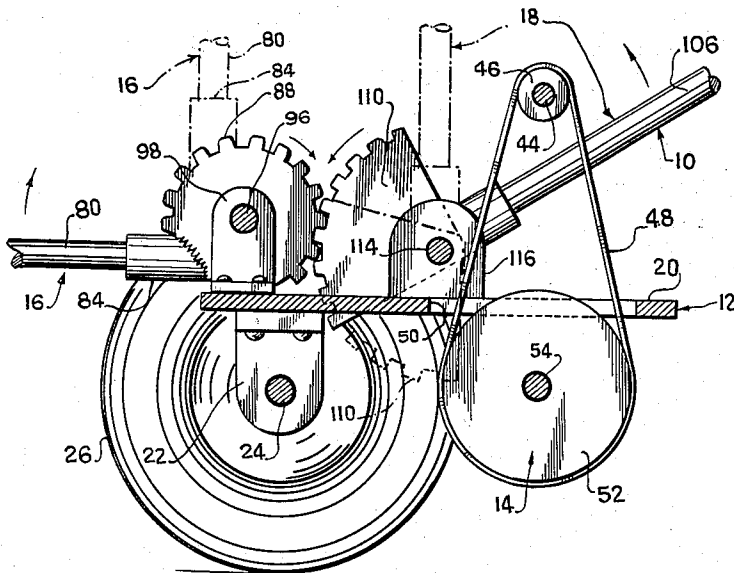


Fig. 3.

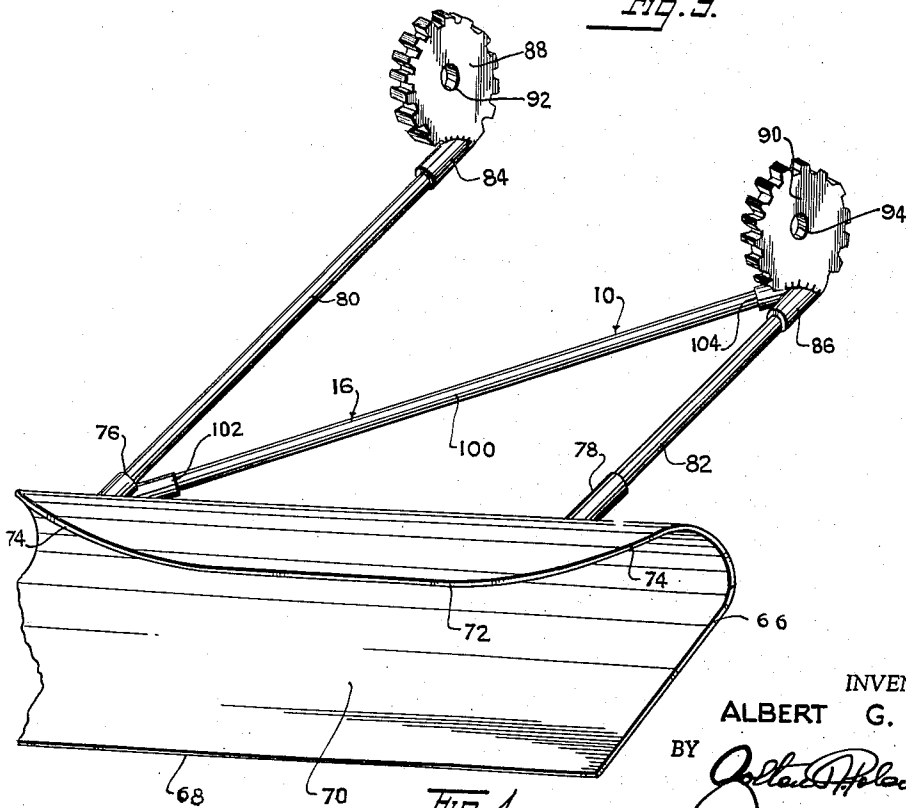


Fig. 4.

INVENTOR.
ALBERT G. VOIGT
BY *John D. H. Black*
ATTORNEY

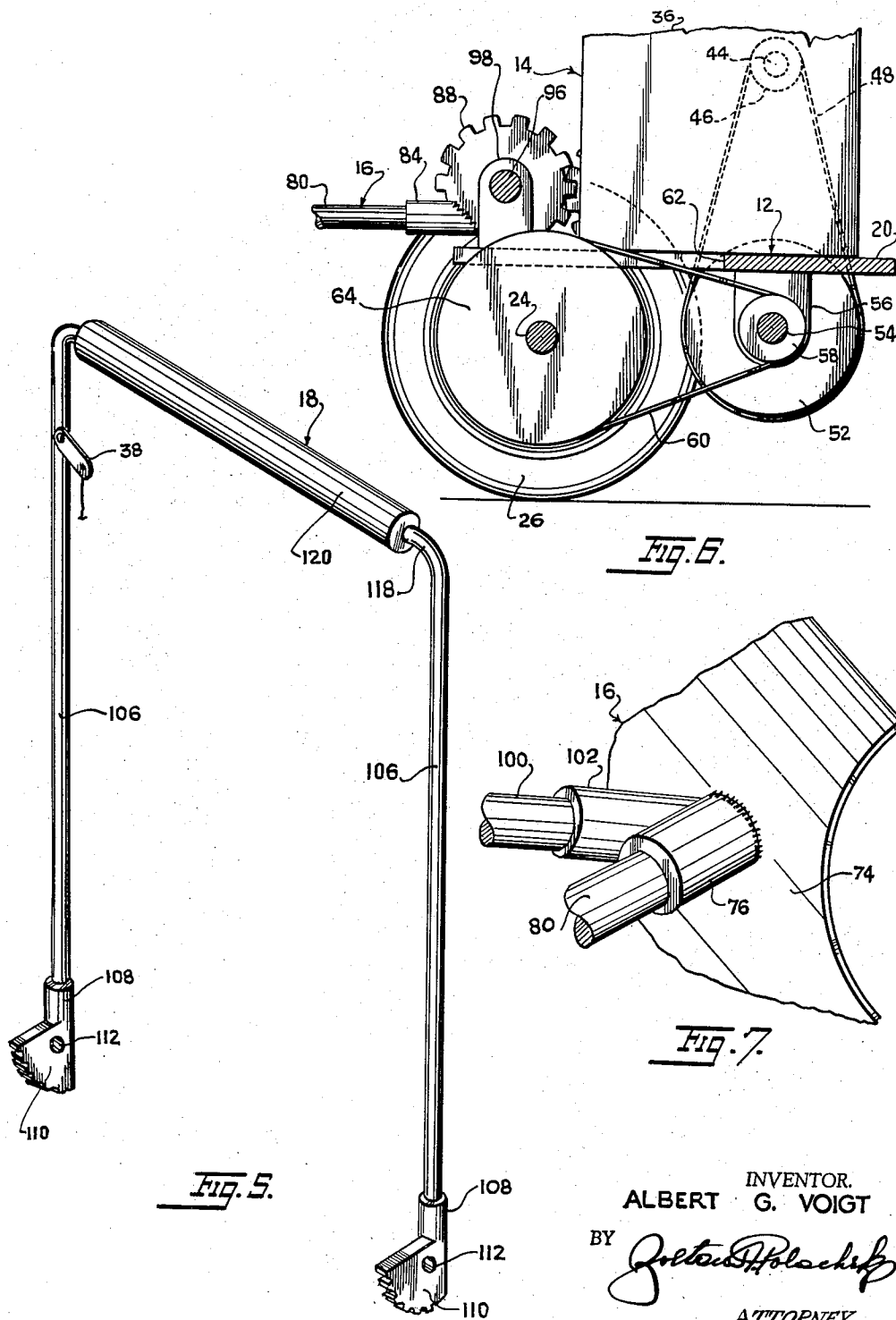
March 31, 1959

A. G. VOIGT
POWER SHOVEL

2,879,611

Filed Jan. 31, 1958

3 Sheets-Sheet 3



INVENTOR.
ALBERT G. VOIGT
BY *John H. Polach*
ATTORNEY

1

2,879,611

POWER SHOVEL

Albert G. Voigt, Clifton, N.J.

Application January 31, 1958, Serial No. 712,387

10 Claims. (Cl. 37—50)

This invention relates to devices for removing snow, and more particularly has reference to a walking type of self-propelled snow plow or shovel, which is particularly designed for use on sidewalks, in driveways, adjacent curbs, etc.

The main object of the present invention is to provide a generally improved device of the character stated, which will be characterized by its compactness, its relatively low cost, its simplicity of design, and its efficiency of operation.

A more specific object is to provide means, in a device of the character stated, which will facilitate folding of ordinarily projecting portions thereof for storage of the device in a minimum amount of floor space. Thus, the device is particularly designed for use by the householder, or by the custodians of small office buildings, apartment houses, etc., where space may be at a premium so far as the storage of equipment is concerned.

A further object of importance is to provide a device as stated, the design of which will provide for a particularly effective, braced mounting of the blade of the device, intended to insure to the maximum extent against breakdowns.

Still another object is to provide a connection between the handle and blade which will result in the mentioned components being conjointly swingable upwardly and downwardly about parallel axes. This arrangement not only facilitates storage, by folding of the handle and blade to upwardly projecting positions, but also, one may move the handle upwardly or downwardly while guiding the device, for the purpose of adjusting the elevation of the blade while the machine is in operation.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a top plan view of a self-propelled snow plow according to the present invention.

Fig. 2 is a side elevational view thereof in which the blade and handle are shown in collapsed positions in dotted lines.

Fig. 3 is an enlarged longitudinal sectional view through the device substantially on line 3—3 of Fig. 1, the handle and blade assemblies being shown fragmentarily, in full line and dotted positions in their operative and folded positions respectively.

Fig. 4 is an enlarged perspective view of the blade assembly per se, a portion being broken away.

Fig. 5 is an enlarged perspective view of the handle assembly per se.

Fig. 6 is a view on the same scale as Fig. 3, taken substantially on line 6—6 of Fig. 1.

Fig. 7 is an enlarged, fragmentary perspective view

2

showing the connections of the blade support arms at one end of the blade.

Referring to the drawings in detail, designated generally at 10 is the self-propelled snow plow constituting the present invention. This includes a plurality of main components or assemblies, which may be readily identified, generally, as a rollable frame structure 12, a propulsion and drive assembly 14, a blade assembly 16, and a handle assembly 18.

Considering first the construction of the frame structure 12, this includes a generally rectangular, horizontally disposed base plate 20, from the opposite sides of which depend transversely aligned bearings 22 in which is journaled a transversely extending drive shaft 24, to the opposite ends of which are secured road wheels 26, for rotation with shafts 24. Projecting rearwardly from and rigidly secured to the plate 20, medially between opposite sides of said plate, is a horizontally disposed bearing plate 28 in which is journaled, for rotation about a vertical axis, a shaft 30 having a rearwardly projecting bifurcated bearing 32 at its lower end in which is rotatably supported a castor wheel 34.

Mounted upon plate 20 is the propulsion and drive assembly 14. Considering now the construction of said drive assembly, this includes an internal combustion engine 36, which of course may be of any suitable design, type, or rating. The engine is of the type used on power lawn mowers, and the size of the engine would be selected, to be such as to drive the device forwardly, against the restraint of the snow being moved.

In any event, a suitable speed-reducing driving linkage extends between the prime mover 36 and the drive shaft 24. Said speed-reducing linkage can be designed to include a suitable reducing gear train, but in any event, the speed is reduced sufficiently to permit the movement of the device in a forward direction at a speed sufficiently slow to permit it to be accurately controlled. Further, although one is not shown, a clutching mechanism can be embodied in the linkage, to permit the forward movement only when the clutch is engaged. Still further, a suitable throttle means, capable of remote control, is illustrated only diagrammatically in the device, including a pivoted arm 38, mounted upon the handle assembly 18, to which arm is connected a flexible cable 40, connected to a throttle control arm 42 of the prime mover 36. A clutch can, of course, also be provided, controlled from a location adjacent the grip of the handle assembly.

In the illustrated example, rotatable with the shaft 44 of the motor (see Fig. 3) is a small drive pulley 46, about which is trained a belt 48, that extends downwardly through a slot 50 formed in plate 20, said slot 50 being disposed adjacent the motor and extending in a fore-and-aft direction. Belt 48 is trained about a large diameter pulley 52 projecting upwardly through slot 50 but disposed mainly below the base plate. Pulley 52 is connected to a transversely extending jackshaft 54 disposed rearwardly from and parallel to the drive shaft 24. Jackshaft 54 is journaled in bearings 56 (see Fig. 6) depending from and secured to the base plate 20, and connected to the shaft 54 for rotation therewith is a small transmission pulley 58 about which is trained a belt 60 extending forwardly with its upper flight projecting through a slot 62 formed in plate 20. Slot 62 opens upon the forward edge of the plate 20, with the belt 60 being trained about a large pulley 64 connected to shaft 24 for rotation therewith.

Referring now to the blade assembly 16, this includes an elongated blade 66, which is disposed transversely of the snow plow, as shown in Fig. 1, in a position oblique to the length of the snow plow. Thus, the blade is obliquely disposed in respect to the path of movement of

3

the structure, so that snow scooped up by the blade or scoop 66 will be caused to move toward the trailing end of the blade and laterally outwardly from the blade through said trailing end.

The scoop 66 is inclined rearwardly upwardly from its leading edge 68, with the scoop having a transverse configuration such that it is bowed rearwardly, producing a forwardly concave, snow-contacting face 70 thereon. At its upper edge, scoop 66 is formed with a forwardly, downwardly projecting lip or overhang 72 which is progressively reduced in width as at 74 in a direction from its midlength point toward its opposite ends. Fixedly secured to the back surface of the scoop 66, adjacent the opposite ends thereof, are sockets 76, 78 (see Figs. 1 and 4), and fixedly engaged in said sockets are the forward ends of support arms 80, 82 respectively of the blade assembly, the arm 80 being substantially greater in length than the arm 82. The rear ends of the arms are transversely aligned, on a line perpendicular to the lengths of the arms, and are engaged in sockets 84, 86 (see Fig. 4) welded to and projecting forwardly from the peripheries of gear segments 88, 90, having transversely aligned center openings 92, 94 receiving a shaft 96, that is fixedly engaged in the center openings, so as to cause conjoint rotation of the gear segments. Shaft 96 is journaled adjacent its opposite ends in upwardly projecting bearings 98, that are fixedly mounted upon the base plate 20.

Bracing the blade structure is a diagonally extending brace arm 100, one end of which is fixedly engaged in a socket 102 that is fixedly secured to the socket 76 in oblique relation to said socket 76. The other end of the arm 100 is similarly engaged in a socket 104, that is rigid with the socket 86, and extends obliquely to the length of said socket 86.

By reason of this arrangement, a strong blade structure is provided, wherein the scoop is supported at the forward ends of arms that are rigid with gear segments, said gear segments being rotatable about a horizontal, transversely extending axis to permit the blade assembly to swing through substantially 90° between the full and dotted line positions shown in Figs. 2 and 3.

Referring now to the handle assembly 18, this includes side rails 106, the forward ends of which are engaged in rearwardly projecting sockets 108 fixedly secured to gear segments 110, each of which is of approximately quadrantal shape. Gear segments 110 have transversely aligned openings 112, receiving stub shafts 114 that are journaled (see Fig. 3) in upwardly projecting bearings 116 fixedly mounted upon plate 20. The gear segments 110 are in mesh with the corresponding segments 88, 90, so that when the blade assembly swings to its dotted line position, the gears will rotate in opposite directions as shown by the arrows in Fig. 3, causing the handle assembly 18 to swing to an upwardly projecting, vertical position.

At their rear ends, side rails 106 are rigid with a transversely extending right portion or connecting arm 118, which passes through a tubular, exteriorly roughened grip 120 formed of soft rubber or the like.

By reason of the arrangement illustrated, it will be apparent that as the device moves along, the operator of the device may raise or lower the blade, by effecting a corresponding movement of the handle. Thus, if the operator desires to first take off a portion only of a layer of snow, as he might desire to do in the event there is a layer of ice at the bottom of the snow, he can elevate the blade above the ground surface. Then, a second path can be made, with a blade lowered to a greater degree for the purpose of removing the coating of ice.

Due to this arrangement, there will be full control of the elevation of the blade, responsive merely to raising and lowering of the handle. Ordinarily, of course, the handle is lowered to an extent sufficient to maintain the blade in full contact with the surface from which the snow is being removed.

4

When the device is not in use, one need merely swing the handle assembly upwardly to its maximum extent, so as to cause corresponding upward swinging of the blade assembly, to the dotted line positions shown in Fig. 3, whereby the device can be stored in a floor space no greater than that required by the rollable frame structure itself.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A snow plow comprising a rollable frame structure, a blade assembly, and a handle assembly, said assemblies being carried by the frame structure, the blade assembly being pivoted on the frame structure for swinging movement between a substantially horizontal, forwardly projecting, operative position and a substantially vertical, upwardly projecting, inoperative position, the handle assembly also being pivoted on the frame structure, said handle assembly pivoting between an operative position in which the handle structure extends rearwardly upwardly at an incline from the frame structure, and an inoperative position in which the handle assembly projects substantially vertically upwardly from the frame structure, said assemblies being connected for conjoint swinging movement between their operative and inoperative positions, the connection between the assemblies including gears on the respective assemblies in mesh with one another, whereby upward swinging movement of one assembly will cause upward swinging movement of the other assembly.

2. A snow plow comprising a rollable frame structure, a blade assembly, and a handle assembly, said assemblies being carried by the frame structure, the blade assembly being pivoted on the frame structure for swinging movement between a substantially horizontal, forwardly projecting, operative position and a substantially vertical, upwardly projecting, inoperative position, the handle assembly also being pivoted on the frame structure, said handle assembly pivoting between an operative position in which the handle structure extends rearwardly upwardly at an incline from the frame structure, and an inoperative position in which the handle assembly projects substantially vertically upwardly from the frame structure, said assemblies being connected for conjoint swinging movement between their operative and inoperative positions, the connection between the assemblies including gears on the respective assemblies in mesh with one another, whereby upward swinging movement of one assembly will cause upward swinging movement of the other assembly, said gears being arranged in pairs, each assembly including a pair of transversely aligned gears.

3. A snow plow comprising a rollable frame structure, a blade assembly, and a handle assembly, said assemblies being carried by the frame structure, the blade assembly being pivoted on the frame structure for swinging movement between a substantially horizontal, forwardly projecting, operative position and a substantially vertical, upwardly projecting, inoperative position, the handle assembly also being pivoted on the frame structure, said handle assembly pivoting between an operative position in which the handle structure extends rearwardly upwardly at an incline from the frame structure, and an inoperative position in which the handle assembly projects substantially vertically upwardly from the frame structure, said assemblies being connected for conjoint swinging movement between their operative and inoperative positions, the connection between the assemblies including gears on the respective assemblies in mesh with one another, whereby upward swinging movement of one assembly

9. A snow plow comprising a rollable frame structure, a blade assembly, and a handle assembly, said assemblies being carried by the frame structure, the blade assembly being pivoted on the frame structure for swinging movement between a substantially horizontal, forwardly projecting, operative position and a substantially vertical, upwardly projecting, inoperative position, the handle assembly also being pivoted on the frame structure, said handle assembly pivoting between an operative position in which the handle structure extends rearwardly upwardly at an incline from the frame structure, and an inoperative position in which the handle assembly projects substantially vertically upwardly from the frame structure, said assemblies being connected for conjoint swinging movement between their operative and inoperative positions, the connection between the assemblies including gears on the respective assemblies in mesh with one another, whereby upward swinging movement of one assembly will cause upward swinging movement of the other assembly, said gears being arranged in pairs, each assembly including a pair of transversely aligned gears, the gears of each pair being rotatably supported upon the frame structure with the axis of rotation of the gears of each pair comprising the pivot axis of the assembly on which the pair is mounted, the blade assembly including a pair of gear segments constituting the gears of the blade assembly, the blade assembly including a scoop disposed obliquely to the path of movement of the snow plow, and additionally including support arms for said scoop, said support arms having rear ends connected to the gears of the blade assembly.

10. A snow plow comprising a rollable frame structure, a blade assembly, and a handle assembly, said assemblies being carried by the frame structure, the blade assembly being pivoted on the frame structure for swinging movement between a substantially horizontal, forwardly projecting, operative position and a substantially vertical,

upwardly projecting, inoperative position, the handle assembly also being pivoted on the frame structure, said handle assembly pivoting between an operative position in which the handle structure extends rearwardly upwardly at an incline from the frame structure, and an inoperative position in which the handle assembly projects substantially vertically upwardly from the frame structure, said assemblies being connected for conjoint swinging movement between their operative and inoperative positions, the connection between the assemblies including gears on the respective assemblies in mesh with one another, whereby upward swinging movement of one assembly will cause upward swinging movement of the other assembly, said gears being arranged in pairs, each assembly including a pair of transversely aligned gears, the gears of each pair being rotatably supported upon the frame structure with the axis of rotation of the gears of each pair comprising the pivot axis of the assembly on which the pair is mounted, the blade assembly including a pair of gear segments constituting the gears of the blade assembly, the blade assembly including a scoop disposed obliquely to the path of movement of the snow plow, and additionally including support arms for said scoop, said support arms having rear ends connected to the gears of the blade assembly, said blade assembly further including a diagonally disposed brace connected between the forward end of one support arm and the rear end of the other support arm.

References Cited in the file of this patent

UNITED STATES PATENTS

236,655	Van Vleet	Jan. 11, 1881
2,513,230	Bourne et al.	June 27, 1950

FOREIGN PATENTS

333,739	Germany	Mar. 4, 1921
---------	---------------	--------------