Aug. 15, 1950 O. A. INGERSOLL 2,518,622

SNOWPLOW

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FIG 1

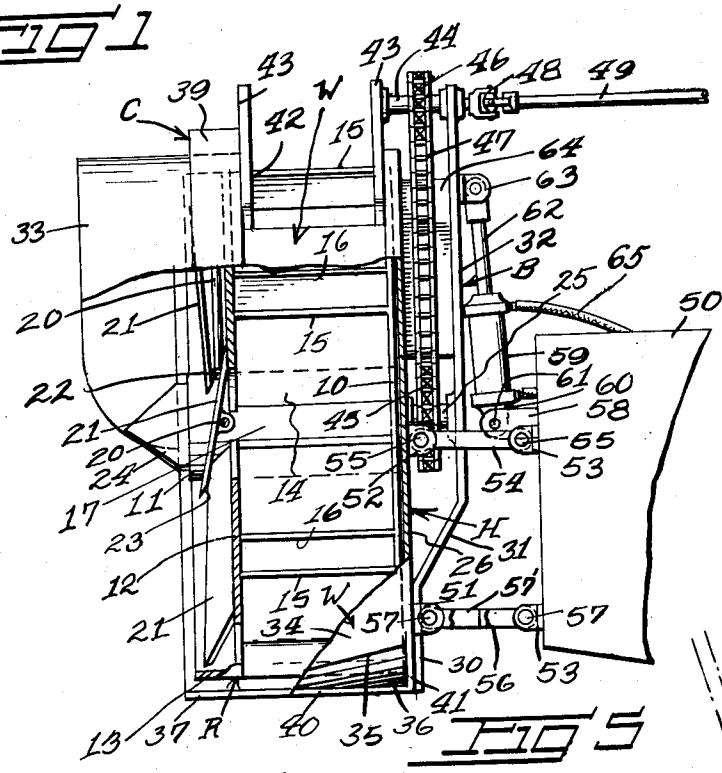


FIG 5

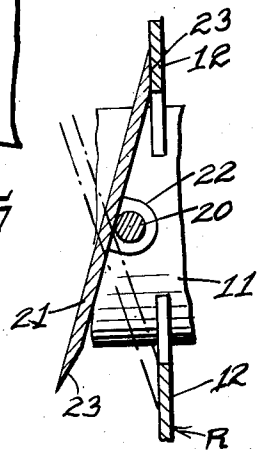
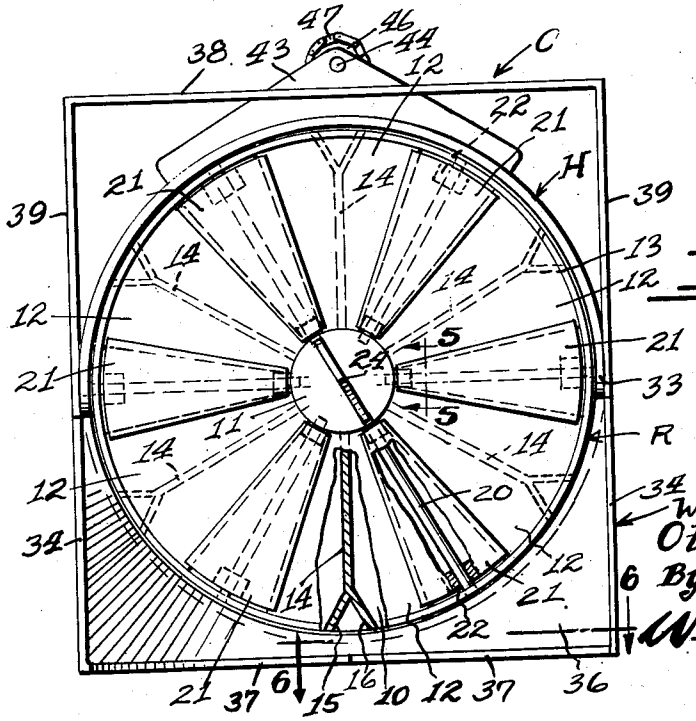


FIG 2



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SNOWPLOW

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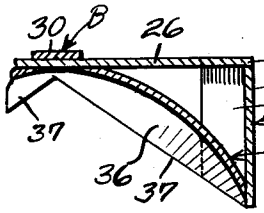
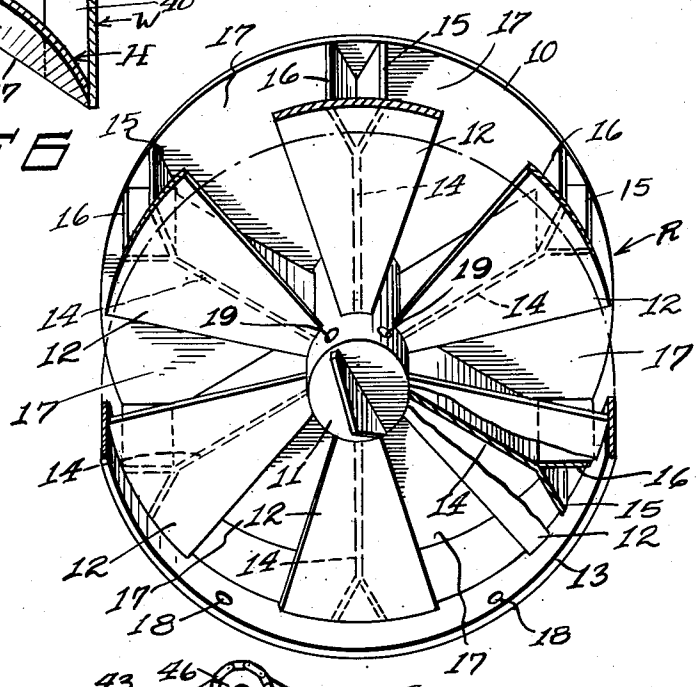


FIG 6

FIG 4



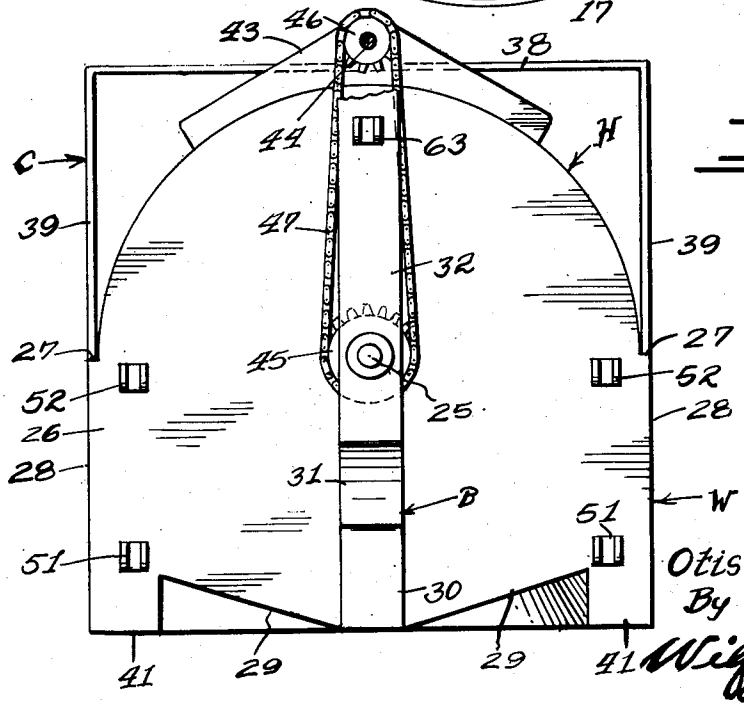


FIG 3

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UNITED STATES PATENT OFFICE

2,518,622

SNOWPLOW

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Application July 16, 1948, Serial No. 38,982

1 Claim. (Cl. 37—43)

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The invention relates to apparatus for removing snow from streets, highways and the like, and the primary object of the invention is to provide a snow remover adapted to be adjustably mounted on an automotive vehicle.

Another object of the invention is to provide a snow remover of the character indicated above comprising a rotor adapted to be actuated by driving means operatively connected with a source of power mounted on the vehicle.

A further object of the invention is to provide a snow remover of the character indicated above, the rotor of which comprises adjustable fan blades adapted to cut and feed snow to expeller plates forming parts of the rotor and arranged radially therein.

A still further object of the invention is to provide a snow remover of the character indicated above, the rotor of which is mounted in a casing with an open front, the sides and bottom of which form relatively stationary snow cutters.

Other objects of the invention not specifically mentioned may appear in the following specification describing the invention with reference to the accompanying drawing illustrating a preferred embodiment of the invention. It is, however, to be understood that the invention is not to be limited or restricted to the exact construction and combination of parts, but that such changes and alterations can be made which fall within the scope of the claim appended hereto.

In order that my invention may be better understood I will now proceed to describe the same with reference to the accompany drawings, wherein:

Figure 1 is a side view in elevation of the snow remover in accordance with the invention a portion of the rotor housing and of the rotor being broken away.

Figure 2 is a front elevation, partly in section, of the snow remover in accordance with the invention.

Figure 3 is a rear elevation, partly in section.

Figure 4 is a view in perspective of the rotor, a portion of the annular cutting blade being cut away and the adjustable cutter fan blades and the shafts supporting them omitted.

Figure 5 is a sectional view taken on line 5—5 of Figure 2, and

Figure 6 is a sectional view taken on line 6—6 of Figure 2.

The snow remover or plow embodied herein comprises a rotor R rotatably supported by a housing H. The rotor R has a circular rear wall 10 and a substantially cylindrical central element

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11 is mounted on said rear wall coaxially therewith, and extends forwardly therefrom. A plurality of relatively stationary flat fan blades 12 of equal size are secured equidistantly from each other about the circumferential outside surface of the cylindrical element 11, intermediate the ends of said elements, so that they are arranged parallel to the rear wall 10. The side edges of the relatively stationary blades 12 extend radially to the cylindrical element 11 and on the outer edges of said blades 12 an annular forwardly projecting cutting blade 13 is mounted. On the rear surface of each relatively stationary blade 12 a central longitudinal expeller rib 14 is formed or mounted so that it projects at right angles to the respective fan blades 12, and the outer end portion of each rib 14 is bifurcated so that its two portions 15 and 16 respectively extend outwardly at an acute angle to each other. The ribs 14 abut the rear wall 10 and may be secured thereto in any conventional manner so that a plurality of open pockets 17 is formed by the rear wall 10, the relatively stationary fan blades 12, the cylindrical element 11 and the expeller ribs 14. A hole 18 is provided in the annular cutting blade 13 adjacent to the forward edge thereof and centrally between each pair of relatively stationary fan blades 12 and in the cylindrical element 11 holes 19 are arranged coaxially with the holes 18. In each pair of a coaxial holes 18 and 19 a shaft 20 is journalled, on which a flat cutting fan blade 21 is mounted by means of bearing eyes 22 formed or secured on the rear surface of each cutting fan blade 21. The side edges of these blades extend radially with respect to the annular cutter blade 13, and are of a size that a comparatively small clearance is left between the end edges of the same, the cylindrical element 11 and the annular blade 13, while the side edges of each oscillating blade 21 overlap the adjoining relatively stationary blades 12. Said side edges are preferably beveled as shown at 23 so that each edge is adapted to abut flatly on the adjacent stationary fan blade 12 or to serve as a cutting edge. On the front end surface of the cylindrical element 11 a forwardly projecting pointed blade 24 is secured or formed. A stub shaft 25 is coaxially mounted on or integrally formed with the circular rear wall 10 and projects rearwardly therefrom.

The housing H comprises a rear wall 26 the upper end portion of which is shaped semicircular. On the base diameter of this portion a laterally projecting shoulder 27 is formed, at each side, and the side edges 28 of the housing rear wall 26 extend straight downwardly from

said shoulders. The bottom edge of the housing rear wall 26 slopes downwardly from the lower end of each side edge 28 toward the longitudinal center line of said rear wall at an obtuse angle to the adjacent side edge as shown at 29. On the rear side of the rear wall 26 and centrally thereof a longitudinal bracket bar B is arranged having a flat lower end portion 30 secured in any conventional manner to the rear wall 26, an intermediate portion 31 extending upwardly and rearwardly and a main portion 32 extending upwardly parallel to the rear wall 26. The stub shaft 25 on the circular rear wall 10 of the rotor R extends rotatably through the rear wall 26 of the housing H and the main bracket bar portion 32 so that it is located centrally of the semi-circular portion of the rotor rear wall 10. A wall W extends forwardly from and at right angles to the rear wall 26 of the housing H and follows the outlines of the upper and side edges of the said rear wall, the size of which is such that the wall W is spaced from the annular cutting blade 13 to permit the rotor R to rotate freely. The semi-circular upper portion of the wall W projects forwardly beyond the rotor R as shown at 33 and the forward edges of the downwardly extending straight side portions 34 of the wall W form cutting edges. The lower edges 35 of the side wall portions 34 slope upwardly toward the rear and a bottom wall 36 is curved rearwardly and upwardly, so that its rear edge which is secured to the rear housing wall 26 is arcuate coaxially with the rear wall 26 of the rotor 10. Each side edge of the bottom wall 36 is secured to the adjacent straight side portion of the wall W and the front edge of the bottom wall 36 is located in the same plane with the lower front corners of the straight side portions of the wall W and is cut back from said corners toward the center, so that said front edge forms two cutting edges 37 joining each other in the center of the bottom wall and forming an obtuse angle with each other. A cutter C comprises an upper central blade 38 and two side blades 39 extending in the same direction at right angles to the central blade. The cutter C is secured to the wall W so that the end portions of the side blades 39 are arranged tangentially to the arcuate upper portion of the wall W. The front edges of the side blades form continuations of the cutting edges on the side wall portions 34. The length of the side blades 39 is such that the central blade 38 extends above the arcuate portion of the wall W.

On each forward lower corner of the bottom wall 36 a rearwardly extending glide shoe 40 is fastened in any conventional manner and is provided at its rear end with an upwardly projecting portion 41, secured with its upper end portion to the housing rear wall 26.

A substantially rectangular slot 42 is provided in the upper semi-annular portion of the wall W and is located symmetrically about the highest portion of said wall portion and so that the expeller ribs 14 pass directly underneath said opening, when the rotor R is rotated. Upwardly extending flanges 43 are securely mounted on the wall W along the front and rear edges of the opening 42 in any conventional manner and a shaft 44 is rotatably supported by the rear flange 43 and the main portion 32 of the bracket bar B parallel to the stub shaft 25. A comparatively large sprocket gear 45 is rigidly mounted on the stub shaft 25 and a comparatively small sprocket gear 46 is rigidly mounted on the shaft 44. A sprocket chain 47 is trained over the two sprocket gears. The shaft 44 extends rearwardly beyond the bracket bar B and is operatively connected by means of a universal joint 48 and a shaft 49 with a source of power (not shown) in the vehicle indicated at 50, on which the snow remover is mounted.

On the rear surface of the rear wall 26 of the housing H a pair of U-shaped pivot brackets 51 is securely mounted at the same level with each other and at equal distances from the side edges of said rear wall. A second pair of U-shaped pivot brackets 52 is securely mounted right above the first pivot brackets approximately at the same level with the shoulders 27 on the housing rear wall. On the vehicle 50 four U-shaped pivot brackets 53 are firmly mounted so that they approximately correspond with the pivot brackets 51 and 52 on the snow remover housing H. The corresponding upper pivot brackets 52 and 53 are connected with each other by push bars 54, pivotally secured to said brackets by means of pivot pins 55. The corresponding lower pivot brackets 51 and 53 are connected with each other by push bars 56 pivotally secured to said brackets by means of pivot pins 57. The lower push bars 56 are reinforced by means of cross braces 57' to prevent lateral movement of the snow remover embodied herein. The pivot pins 55 and 57 extend transversely through the pivot brackets 52 and 51 respectively to permit up and down movement of the snow remover in conformance with the ground to be cleaned. A pivot bracket 58 is mounted on the vehicle 50 and a hydraulic cylinder 59 has at its closed end an eye bracket 60 pivotally connected with the pivot bracket by means of a pivot pin 61. The piston rod 62 of a piston (not shown) mounted in said cylinder is pivotally connected with a bracket 63 fastened on the bracket bar 32 adjacent to the upper end thereof. A substantially rectangular stiffener plate 64 is secured in any conventional manner with one of its longitudinal edges to the rear wall 26 of the housing H and with its other longitudinal edge to the bracket bar B to reinforce the latter.

The cylinder 59 is connected with a compressor or the like (not shown) in the vehicle by means of flexible tubes 65 adapted to conduct compressed air or the like into the cylinder to move the piston and piston rod 62 downwardly or upwardly respectively whereby the snow remover is pivoted about the pivot pins 55 and 57 at will.

The above described snow remover operates as follows: Compressed air is admitted into the cylinder 59 to pivot the housing H in such position that the lower cutting blades 37 are located adjacent to the surface of the street to be cleaned. The vehicle 50 is set in motion to push the snow remover into the snow in front of it. The blades 34, 37, 38 and 39 are forced into the snow and the rotor R is driven selectively either clockwise or counter-clockwise, whereby the snow cut by the blades mentioned above is cut into smaller portions by the annular blade 13, and the adjustable fan blades 21. The snow slides through the openings between the acting cutting edges of the blades 21 and the adjacent relatively stationary fan blades 12 into the pockets 17 from where it is expelled by centrifugal force. The snow leaves the snow remover through the opening 42 in the housing H. If it is desired to remove the snow toward the right of the direction of travel of the vehicle, the rotor R is rotated counter-clockwise and when the snow is to be placed at the left of the direction of

travel the rotor is rotated clockwise, when looking at it from the front. The snow scooped up by the lower cutting blades 37 is partly conducted directly into the pockets 17 in the rotor R.

I claim:

In a snowplow attachment for motor vehicles, a housing adapted to be supported at the front end of the vehicle, a rotor mounted in said housing, means for operatively connecting said rotor with a power source on the vehicle, said rotor having a circular rear end wall, a hub extending axially forward from said end wall, a plurality of flat fan-shaped elements extending radially from and equidistantly spaced about said hub and disposed in spaced parallel relation with respect to said end wall, a rib extending radially outward from said hub and between the center of each of said elements and said end wall and forming substantially triangular shaped pockets between the same, an annular cutting blade carried at the outer ends of said elements and projecting forwardly therefrom, a plurality of radially disposed shafts journalled in said hub and said annular cutting blade, each

of said shafts being centered with respect to the space between adjacent of said elements, and a fan-shaped cutting blade mounted for oscillatory movements on each of said shafts.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,387,576	Worth	Aug. 16, 1921
1,517,190	Bryan	Nov. 25, 1924
1,531,742	Fahrney	Mar. 31, 1925
1,844,706	Wandscheer	Feb. 9, 1932
1,848,554	Smith et al.	Mar. 8, 1932
1,977,871	Christopherson	Oct. 23, 1934
2,132,790	Jeswine	Oct. 11, 1938
2,387,959	Wandscheer	Oct. 30, 1945

FOREIGN PATENTS

Number	Country	Date
59,817	Norway	Apr. 16, 1937