

July 18, 1944.

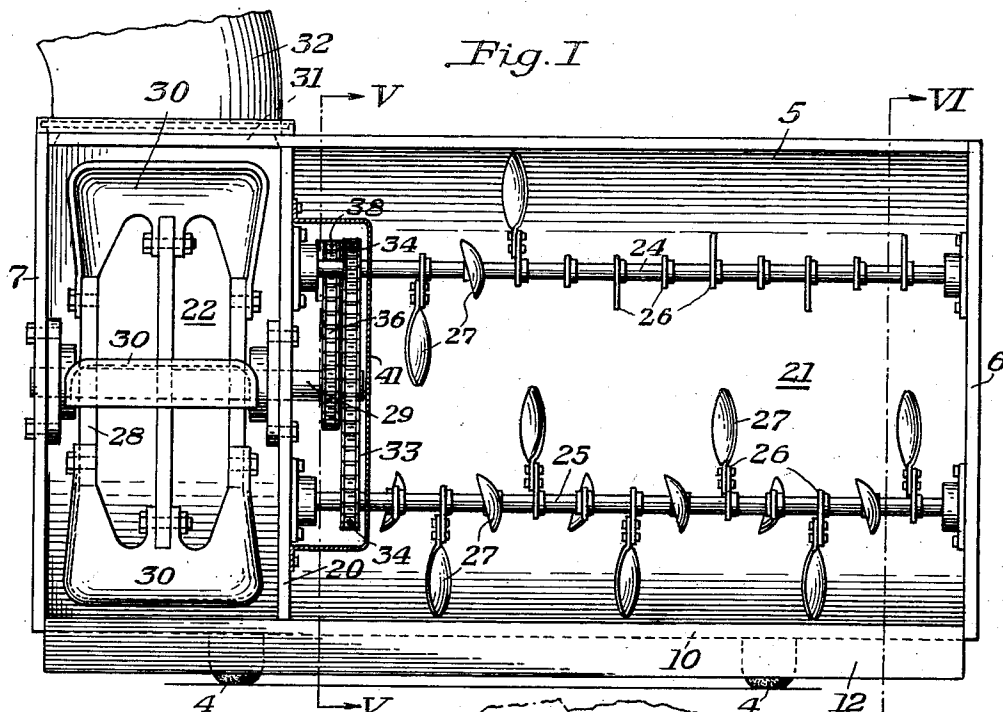
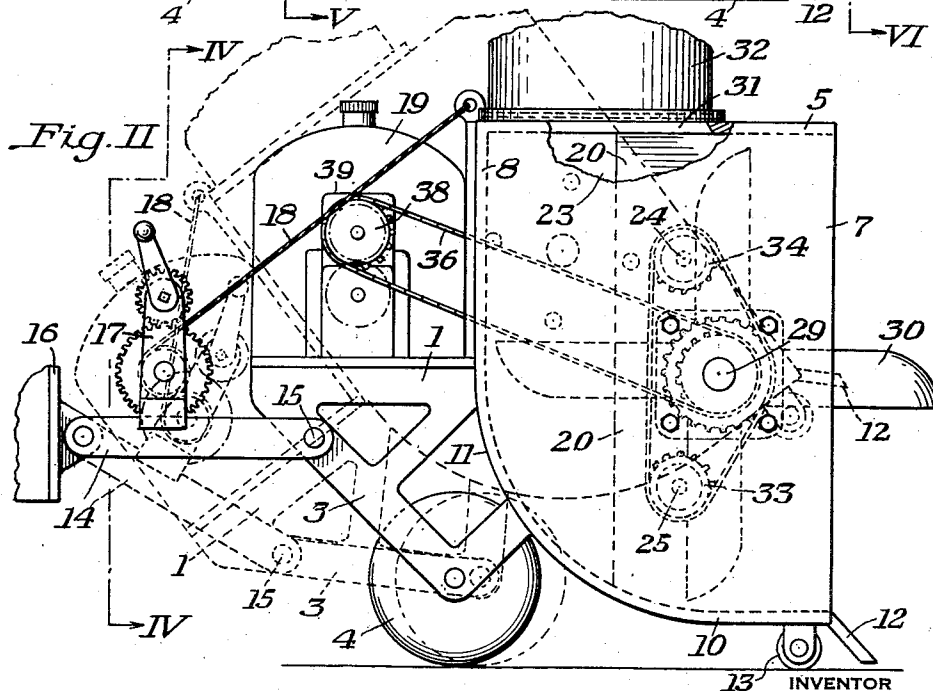
M. M. PILTZ

2,353,928

SNOWPLOW

Filed Feb. 27, 1943

3 Sheets-Sheet 1



INVENTOR
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July 18, 1944.

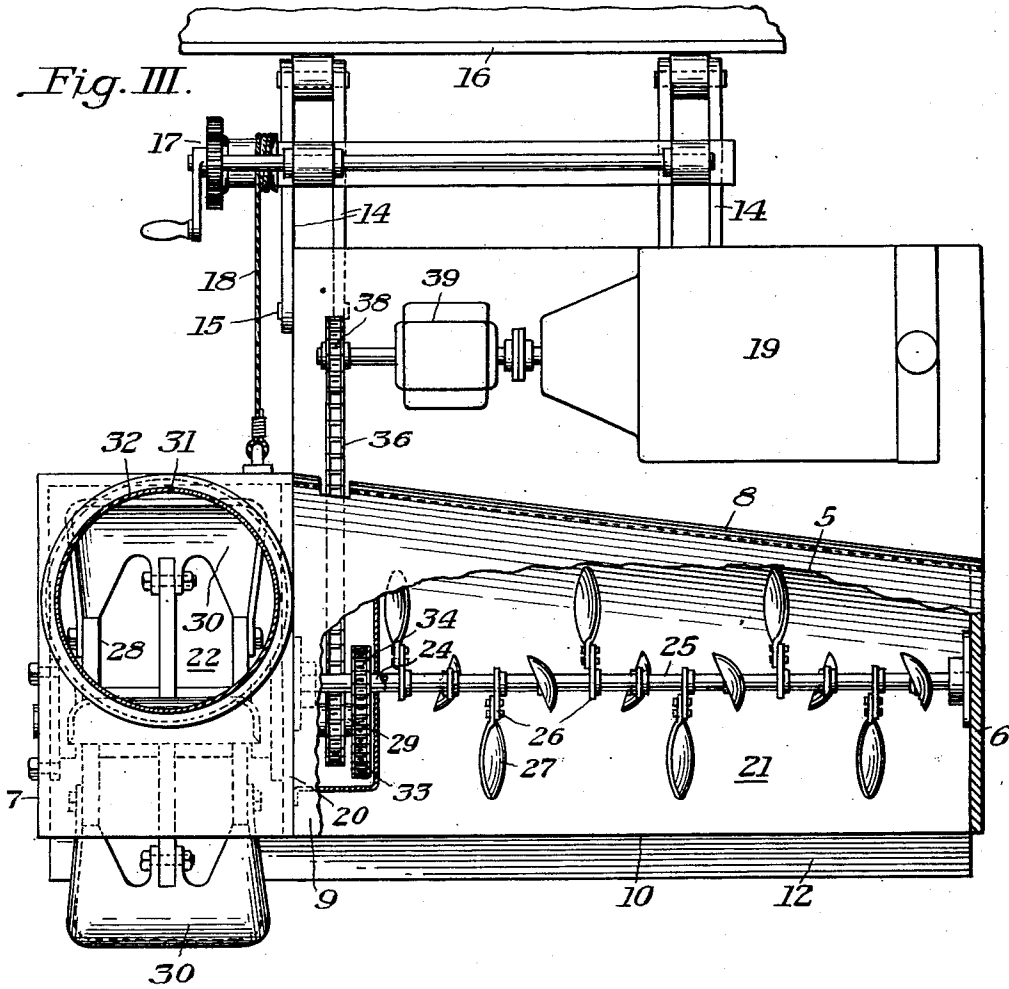
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3 Sheets-Sheet 2

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Fig. IV.

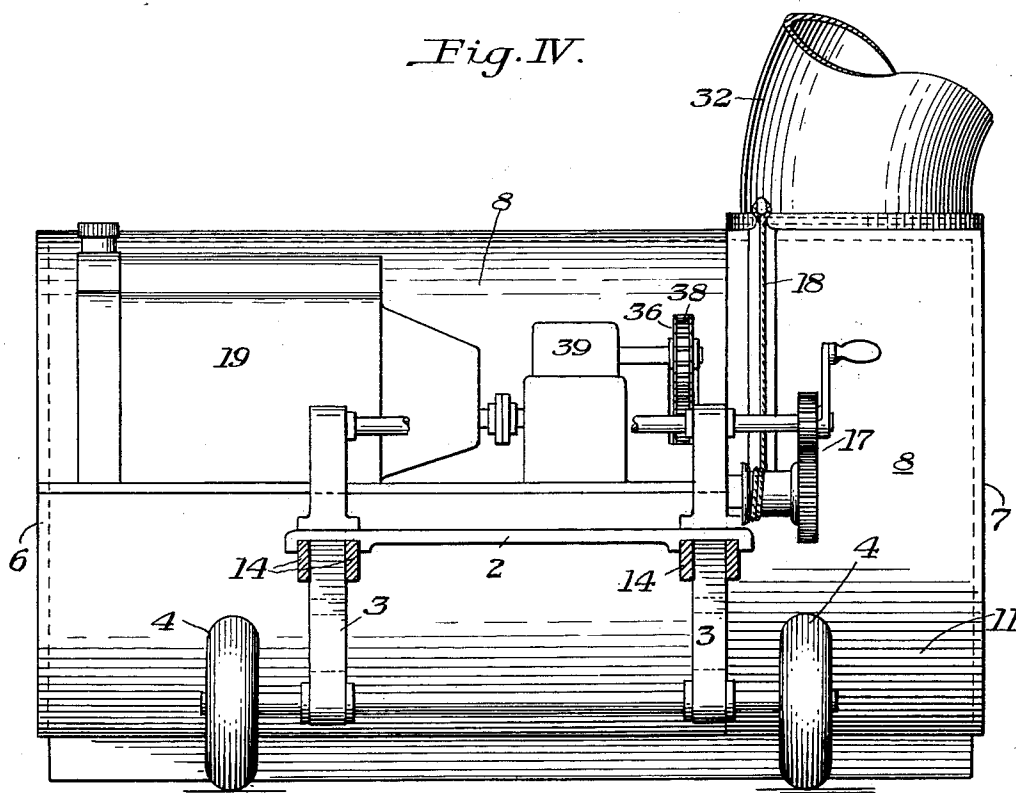


Fig. V.

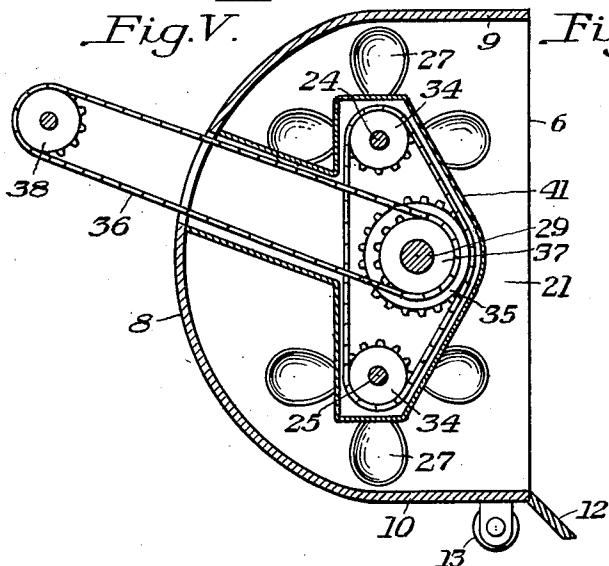
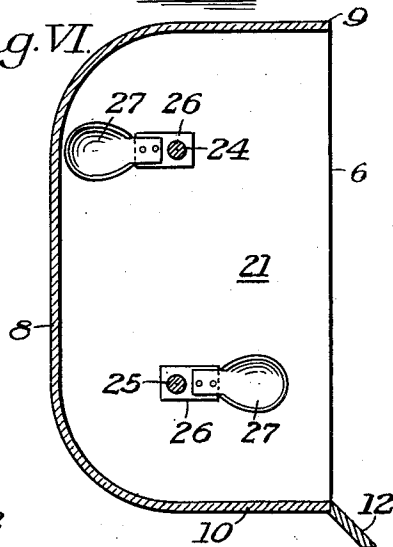


Fig. VI.



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UNITED STATES PATENT OFFICE

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SNOWPLOW

Michael Miller Piltz, Halifax, Pa.

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4 Claims. (Cl. 37-43)

This invention relates to rotary snow plows of the kind intended for use on vehicular roads rather than railroads.

The primary object of the invention is an improvement in snow plows of this type, whereby material savings in the construction and operation may be effected with the accomplishment of improved efficiency.

Another object of the invention is the provision of a snow plow that is effective for use in removing ice or hard-packed snow with the same efficiency as soft snow.

Still another object is the provision of a self-contained power snow plow having a novel arrangement by means of which the organization is rendered sufficiently compact to be mounted upon the front of a vehicle without interfering with its ready operation.

Another object is the provision of a novel wheel-mounted supporting structure providing operating and transportation positions for the plow assembly, so that the snow plowing mechanism may be quickly and easily raised from the road surface for non-operating transportation.

In the accompanying drawings:

Fig. I is a front elevation of the plow assembly.

Fig. II is a side elevation.

Fig. III is a top plan with part of the plow casing broken away.

Fig. IV is a rear elevation.

Figs. V and VI are vertical sectional views on lines V-V and VI-VI of Fig. I.

Describing the drawings in detail, the plow assembly is supported upon a chassis frame that comprises longitudinally disposed horizontal elements 1, transverse elements 2, and angularly disposed elements 3 that extend forwardly and downwardly from the rear extremities of the elements 1. These angularly disposed elements 3 function as supports for ground wheels 4 upon which the assembly runs.

The snow-removal unit of the assembly comprises a scoop-like casing 5 that is mounted to the front of the chassis frame and forwardly of the wheels 4. This housing comprises spaced side walls 6 and 7, a rear wall 8 that inclines rearwardly and laterally from the side wall 6 to the side wall 7, a top wall 9, and a bottom wall 10 that is curved at its rear to merge with the rear wall 8 by an arcuate reach 11. A scraper blade 12 is extended along the forward edge of the bottom wall, and gauge wheels 13 are mounted in its rear beneath the bottom wall 10. The snow-removal unit is mounted forward of the axis of rotation of the wheels 4.

The snow plow is designed to be detachably mounted at the front of a propelling vehicle such as a truck or tractor, and to permit ready mounting and dismounting from such a vehicle, substantially horizontal push bars 14 are pivoted at 15 to the chassis frame elements 3, the other ends of the bars being arranged for pivotal coupling with a transverse element 16 of a propelling vehicle. A winch assembly 17 is mounted on the push bars 14 to the rear of the pivot connections 15, and through a cable 18 is connected with the upper and rearward extremity of the housing 5.

The snow-removal mechanism within the casing 5 is powered by an internal combustion engine 19 arranged in transverse disposition of the chassis and supported on the horizontal elements 1 to the rear of the casing 5 and partially overlying and extended rearwardly of the axis of rotation of the wheels 4. This arrangement of the motor relative to the wheels and casing provides a partial counterbalance for the snow-removal unit comprising the casing 5 and the mechanism therein contained.

Within the casing 5 is a vertical plate 20 extended between and secured to the top and bottom walls 9 and 10, with its flat surfaces disposed parallel to the side walls 6 and 7, and its rear edge spaced forwardly from the rear wall 8. The plate 20 is positioned near the side wall 7, dividing the interior of the casing with a large chamber 21 bounded laterally by the side wall 6 and rearwardly by the inclined rear wall 8, and a smaller chamber 22 bounded laterally by the side wall 7. These two chambers communicate by spaces 23 between the rear edge of the plate 20 and the rear wall 8.

Within the larger chamber 21 are two horizontally disposed, vertically spaced and parallel shafts 24 and 25, opposite ends of which are journaled in the plate 20 and side wall 6. Each of these shafts carries a plurality of chopping elements 26 that are spaced longitudinally of the shafts and project radially from them. Paddle blades 27 may be attached to the elements 26 of one or both shafts, and preferably are applied to the elements of the lower shaft 25, in such arrangement as to impart to material within the chamber 21 lateral movement towards the plate 20. The lower shaft 25 is so positioned relative to the bottom wall 10 of the casing that the extremities of the paddle blades 27 pass in close proximity to the upper surface of the wall.

In the smaller chamber 22 is mounted a centrifugal scoop wheel 28, carried by a horizontal shaft 29 that is journaled in the side wall 7 and

plate 20. The scoop wheel is of such diameter that the outer edges of the buckets 30 describe a circle that projects forwardly of the casing 5, and that rearwardly closely approaches the surface of arcuate reach 11 of the rear wall 8. The buckets 30 of the wheel 28 are heavily constructed so that their outer edges form effective chopping surfaces. The wheel is rotated in such direction that its forward sweep moves downwardly and its rearward sweep moves upwardly towards a delivery opening 31 in the top wall 9. A curved stack 32 is mounted over the opening 31 in such a way as to be reversible so that it may be arranged to deliver snow ejected by the wheel to either side of the plow.

The shafts 24 and 25 are driven in the same directions by a sprocket chain 33 that is trained about sprocket wheels 34 that are mounted on them from a sprocket wheel 35 mounted on the shaft 29. The shaft 29 is driven by a sprocket chain 36 trained around a sprocket wheel 37 that is mounted on the shaft 29 and that is driven from a sprocket wheel 38 driven through reduction gears in a gear housing 39 by the motor 19. The chain 36 passes through an opening 40 in the rear wall 8 of the casing 5. The sprocket wheels 34, 35 and 37, and the chains 33 and 36 are all enclosed in a housing 41 that is closed at its forward side and that protects the driving organization from contact with snow and ice.

In operation the vertical position of the casing 5 and its container mechanism is adjusted by suitable operation of the winch 17, to bring the scraper blade 12 into correct proximity to a surface to be cleared. Usually, the cable 18 is slacked off until the gauge wheels 13 contact the surface to be cleared. The motor 19 having been started, and the shafts 24, 25 and 29 being thereby rotated, the assembly is by the propelling vehicle pushed forward into the snow and ice to be cleared away. The chopping elements 26 and the edges of the buckets 30 break up snow and ice against which the plow is driven, and churn such material to a division sufficiently fine to be ejected by the centrifugal wheel 28. The wheel 28 ejects this broken material by way of the delivery opening 31 and stack 32. Pressure of the material entering the chamber 21, and the influence of the paddle blades 27, urge broken material in the rear of the chamber 21 laterally, along the inclined rear wall 8, and through the openings 23 to the rear of chamber 22 where the upward sweep of the centrifugal wheel buckets 30 slings the material out of the chamber by way of the opening 31.

The advantages of the snow plow herein disclosed may be summarized as follows: Combination of a centrifugal wheel with chopping devices provides an organization that will effectively clear hard packed snow or ice, the centrifugal wheel being capable of ejecting hard material broken into pieces of a size too large to be effectively disposed of by a fan. Employment of a centrifugal bucket-equipped wheel eliminates necessity of providing an organization capable of pulverizing hard frozen material to a degree of fineness permitting its ejection by a fan.

The additional refinement of utilizing a centrifugal wheel as a chopping instrumentality as well as an ejector, by positioning it alongside the chopping assembly, permits utilization for snow clearing of the full width of the assembly, and yet permits restriction of the longitudinal extent of the assembly to such a degree as permits the construction of the plow as a device so com-

pact that it can be practically mounted on the front of a tractor or truck. Devices wherein ejectors are mounted to the rear of chopping instruments are of such length as to preclude this simple and effective type of connection with a propelling vehicle. The longitudinally compact nature of the assembly also permits the employment of the very simple expedient herein disclosed, of pivoting the plow on the axis of rotation of the ground wheels, so that the plow may be tilted back to lift it from operative relation to a road. This simple feature is of great importance, as readiness of transportation is an important qualification of practical snow plows.

These advantageous features combine to produce a plow that can be mounted on or dismounted from a standard type vehicle, such as a truck or tractor, with such ease that conversion of the propelling vehicle between snow plowing and other uses as occasion demands is practical, so that no particular vehicles need be continuously diverted from their normal work during winter seasons. The self-powered nature of the plow adapts it more generally for use with standard vehicles, since to operate it a vehicle having only sufficient power to propel it is required.

The construction and operation of the plow are simple and inexpensive, giving it a tremendous advantage over the complex and very large plows that are in present common use, in original cost, and in maintenance and operating expenses.

I claim as my invention:

1. A snow plow comprising a forwardly open housing having side walls, a rear wall rearwardly inclined towards one side of the housing, a vertical supporting plate having its flat surfaces arranged in the direction of travel mounted within the housing adjacent the side wall towards which the rear wall inclines rearwardly, the said plate being spaced forwardly from the rear wall, a centrifugal wheel mounted upon a transverse shaft between the said side wall and the said plate for rotation in a direction parallel to the direction of travel of the housing, the periphery of the said wheel being exposed at the open front of the housing, and a plurality of chopping elements mounted upon transverse shafting extended between the vertical plate and the opposite side wall, the said chopping elements being spaced in advance of the rear wall of the housing and being exposed at the open front of the housing, the said housing having a delivery opening in proximity to the centrifugal wheel.

2. A snow plow comprising a forwardly open housing having a top wall, side walls, a rear wall rearwardly inclined towards one side of the housing, a vertical supporting plate arranged in the forward portion of the housing and dividing it into two chambers, the said plate being spaced in advance of the rear wall to provide communication between the chambers adjacent the said inclined rear wall, a centrifugal wheel mounted in the chamber to one side of the supporting plate for rotation in the direction of travel of the housing, the rear sweep of the wheel being closely adjacent the rear wall of the housing and within the area of the communicating opening behind the supporting plate, means for so rotating the wheel that its rear sweep travels upward, the top wall having a delivery opening overlying the upward sweep of the wheel, and plural rotary chopping elements mounted in the chamber to the opposite side of the plates, and means for

rotating the said chopping elements in the direction of travel of the housing.

3. A snow plow comprising a pair of ground wheels, a snow removal housing mounted forwardly of the wheels, rotary chopping means and rotary ejecting means arranged in side by side relation in the housing and rotatable on horizontal axes extended transversely thereof, substantially horizontal push bars pivotally coupled with the assembly and extended rearwardly of the wheels for attachment to a propelling vehicle, and a winch mounted on the said push bars rearwardly of their pivotal coupling with the assembly and connected through a cable with the upper part of the housing.

4. A snow plow comprising a pair of ground

wheels, a snow removal housing mounted forwardly of the wheels, rotary chopping means and rotary ejecting means arranged in side by side relation in the housing and rotatable on horizontal axes extended transversely thereof, a motor mounted relative to the wheels and housing for counter balancing the latter, substantially horizontal push bars pivotally coupled with the assembly and extended rearwardly of the wheels for attachment to a propelling vehicle, and a winch mounted on the push bars rearwardly of their pivotal coupling with the assembly and connected through a cable with the upper part of the housing.

MICHAEL MILLER PILTZ.