Dec. 18, 1928. 1,695,775

J. MUSIL ET AL

SNOWPLOW

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Fig. 1.

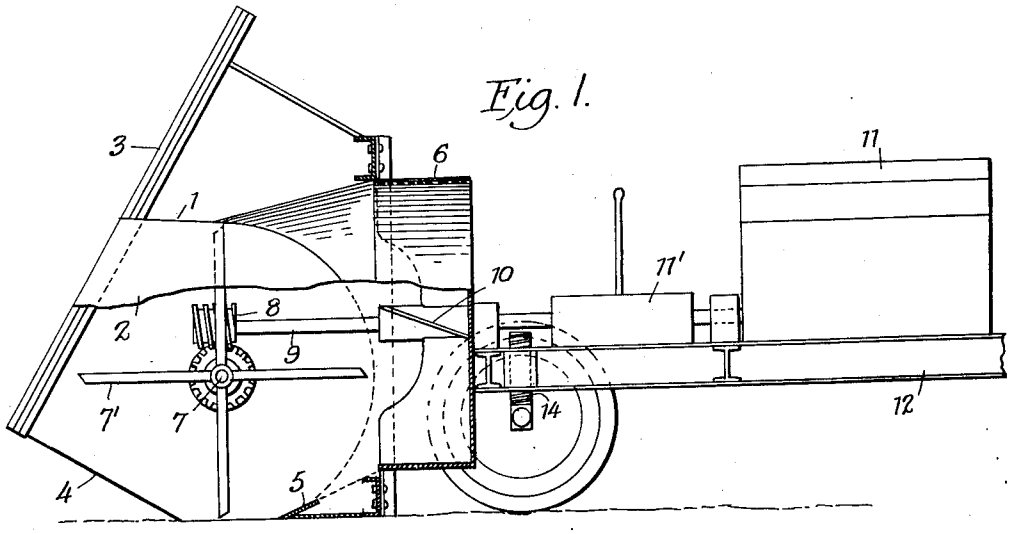
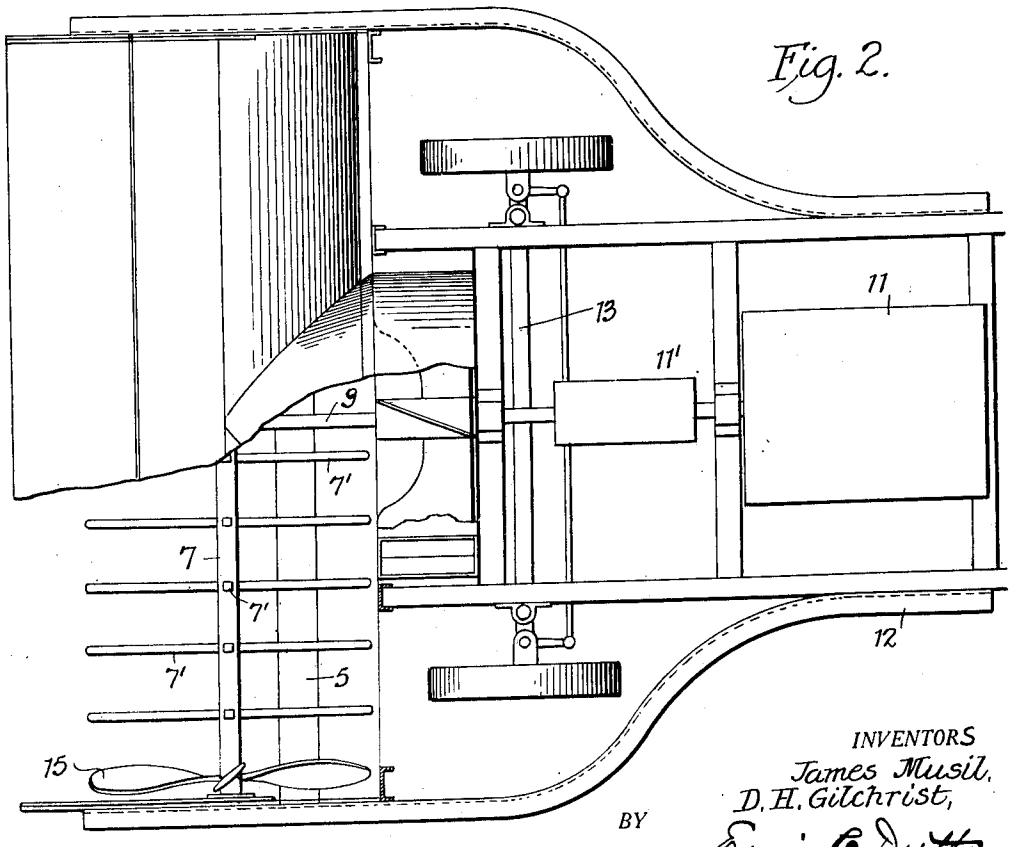


Fig. 2.



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Fig. 3.

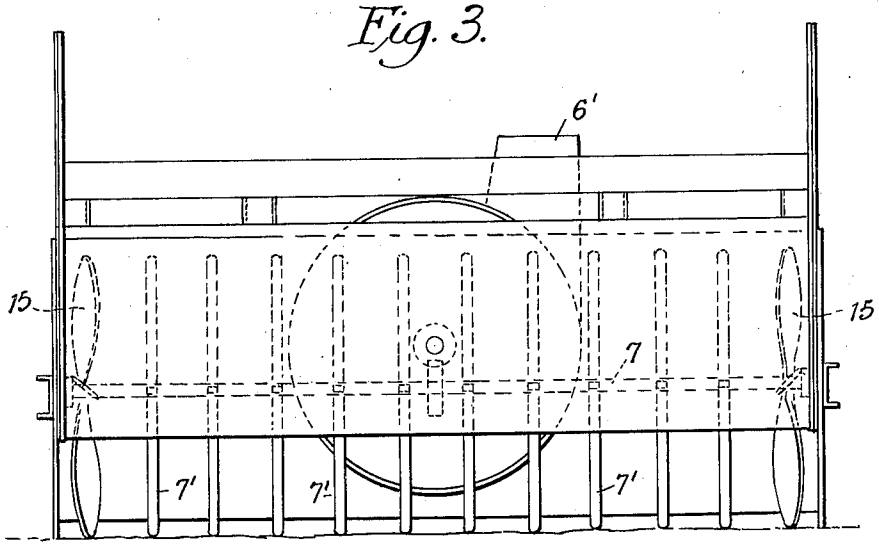


Fig. 4.

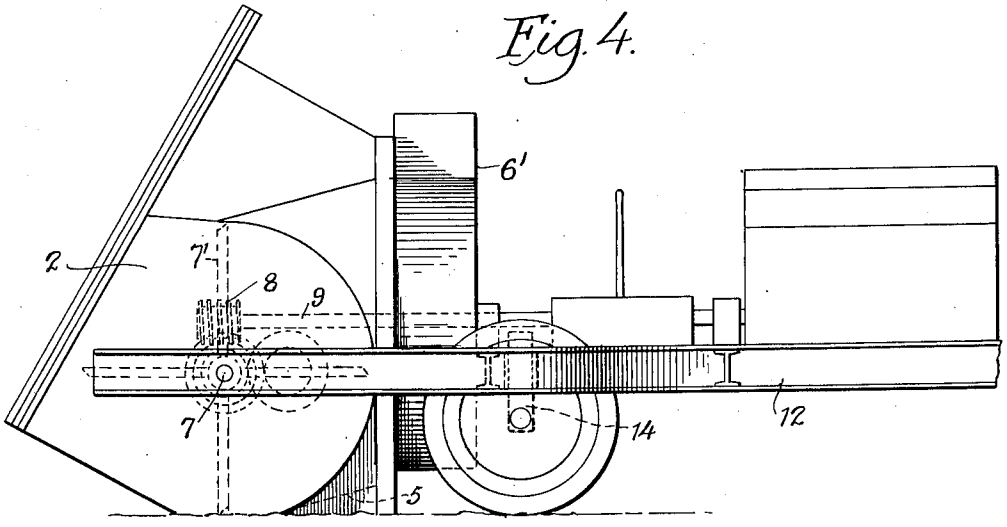
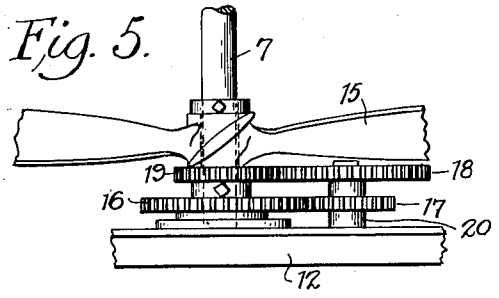


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SNOWPLOW.

Application filed September 27, 1927. Serial No. 222,339.

This invention relates to snow plows particularly adapted for clearing snow from roadways and adapted to be driven by a tractor or other suitable propelling means which may be either permanently or temporarily attached to the snow plow proper, as may be desired.

One object of our invention is to provide a snow plow of strong and relatively simple construction, which is efficient in operation and which, when in use, is not likely to require frequent mechanical adjustments or replacements.

Another object of our invention is to provide a snow plow which is adapted to remove from roadways snow deposits of varying thickness and to convey the snow after removal to a location off of the roadway.

With the above and other objects in view, which will be hereinafter apparent, the invention consists in certain novel details of construction and combination of parts hereinafter fully described, illustrated in the accompanying drawings and defined in the claims.

In the accompanying drawings like characters of reference indicate like parts in the several views and:

Figure 1 is a side view of a snow plow constructed in accord with our present invention with part of the side cut away to show the agitating or snow breaking device and other parts of the apparatus;

Fig. 2 is a plan view with part of the top cut away also to show the agitating devices and fans;

Fig. 3 is a front view of the apparatus;

Fig. 4 is a side view showing in dotted lines the driving gears by which the agitator and fans mounted at the end of the agitator shaft may be driven at relatively different speeds;

Fig. 5 is a detail plan view of the agitator shaft showing one of the fans as mounted thereon, together with gearing for driving the shaft and fan at different speeds.

In the embodiment of the invention as illustrated, there is provided a casing 1 at the forward portion of the apparatus, which casing is closed at its ends by end walls 2 and which at its front is provided with a slidable closure 3 suitably mounted in the side walls 2 so that it may be raised or lowered to provide an opening 4 of any desired height or width within certain limits between the roadway and the lower edge of the slidable closure or adjustable door 3.

At the lower rear portion of casing 1 a cutter 5 is mounted so that it may operate in close and adjustable proximity to the roadway. In the rear of the casing 1 another casing 6 is mounted within which rotates a suction fan 10. Transverse of the casing 1 is a horizontal shaft 7 mounted and having its ends positioned in suitable bearings at the sides of the casing 1 and upon this shaft a plurality of agitating arms or snow breaking devices 7′ are fixedly mounted for rotation with the shaft 7. As shown, the radial agitating or snow breaking arms 7′ may be provided at their ends with sharpened points to facilitate breaking up of snow, with which they may come in contact during their rotation. The shaft 7 is provided with a suitable device for positively driving the same, which may comprise a gear wheel fixed upon the shaft, which may be driven by a worm gear 8 through a shaft 9 by an engine 11 or other suitable desired source of power. Such engine or source of power may be arranged for operation of the snow plow mechanism exclusively or may, if desired, be utilized both for the purpose of operating the snow plow mechanism and for driving a tractor or propelling device (not shown), by means of which the snow plow may be propelled over a roadway. A suitable clutch mechanism 11′ of any usual or desired construction may be provided between the primary source of power 11 and the shaft 9.

A suitable frame 12 carries the casings 1 and 6 and associated mechanism together with the engine or other suitable source of power 11 and is mounted upon wheels carried on an axle 13, between which and the frame suitable worm gearing 14 or other mechanism may be provided for raising or lowering the front of the snow plow and associated mechanism to meet varying conditions of operation.

Adjacent the ends of the shaft 7, fans 15 are mounted, the blades of which are inclined so as to exert a propelling force or draught from the sides of the casing 1 inwardly towards the center of the casing. These fans may either be mounted fixedly upon the shaft 7 (as shown in Fig. 2) or may, if desired and preferably, be mounted (as shown in Fig. 5) loosely upon the shaft 7, in connection with a suitable gear system which may comprise

gears 16, 17, 18 and 19 mounted, respectively, upon the shaft 7, which carries the gear 16, upon a stub shaft 20 carried by the frame 12 (upon which the gears 17 and 18 are mounted for rotation together) and upon the hub or collar of the fan 15 to which the gear 19 is fixedly attached, by means of which (or any desired equivalent gear system) the fans 15 may be rotated at a different or greater speed than the shaft 7 and its attached agitating arms 7', in order that the fans 15 may have a sufficient speed to effect the desired propulsion of the snow disintegrated by the breaking arms or agitators 7'.

In the operation of the snow plow, constructed as described and in accord with our present invention, the apparatus as an entirety will be driven or pushed by any suitable source of power or traction (which as heretofore stated may be operated by the engine 11, or may be a separate and independent source of traction mounted rearwardly of the snow plow itself).

By means of the adjusting device 14, the front of the snow plow will be adjusted so that the cutter 5 and ends of the snow breaking and agitating arms 7' will make desired contact with the snow at a suitable depth below its surface and in suitable proximity to the surface of the roadway itself, as may be required, or desirable for varying conditions of snow deposits and road surfaces. The agitating arms 7' being driven together with the shaft 7 from the engine 11 or other suitable source of power serve to disintegrate the snow deposit and the arms 7' in cooperation with the cutter 5 cause the snow to be taken into the casing 1, in which the snow will usually be disintegrated and disseminated in finely divided condition. The disintegrated particles of snow agitated with air within the casing 1 will be subjected to the impelling force or draught of fans 15, which impel the particles of snow from the sides of the casing 1 toward the center of the latter and from the central portion of the casing 1 the suction fan 10 will draw the particles of snow and the air current associated therewith into the fan casing 6, whence by the action of the fan 10 the snow is blown out through the conduit 6' with sufficient force to remove the snow from the roadway proper which is being cleared.

The sliding closure or door 3 will ordinarily be adjusted so that its lower edge will be adjacent to or slightly below the surface of the snow deposit, thus avoiding any tendency for snow to be blown out in the front of the apparatus by the force of the fans 15.

A special advantage of our present invention in its preferred embodiment, as shown in Fig. 5, is that by suitable ratios of gearing, the fans 15 and disintegrators or snow breaking arms 7' may each be driven at a speed which is most efficient for their independent primary functions. However, it may be satisfactory, under certain conditions of operation, to mount the fans 15 fixedly upon the shaft 7 so that in operation they will have the same speed of rotation as the arms 7'. Whether or not the snow plow is constructed with the fans 15 fixedly mounted upon the shaft 7, or whether they are mounted for rotation at a different or higher speed than the shaft 7 (as shown in Fig. 5) will in part depend upon the conditions under which the apparatus is particularly designed for operation.

The direction of revolution of the shaft 7 and agitator arms is such that the ends of the agitator arms 7' move from the bottom position toward the front of the snow plow and by their action the snow is broken up into very fine particles even when very hard and frozen.

Having thus described our invention, what we claim and desire to protect by Letters Patent is:

1. In a snow plow, in combination, a series of agitating arms, a rotatable shaft on which said arms are mounted, and fans mounted on said shaft at the ends thereof adapted to blow snow toward the central portion of the shaft, a casing within which the shaft, agitating arms and fans are mounted, means for rotating the shaft, agitating arms and fans, and means for conveying snow from the casing.

2. In a snow plow, in combination, agitator arms and fans adapted to operate in proximity to the surface of a roadway and to remove, disintegrate and propel snow therefrom, a shaft upon which both the agitator arms and fans are mounted for rotation, driving means therefor, a casing within which the agitator arms, shaft and fans are mounted, a conduit for conveying snow from said casing and a fan mounted adjacent said conduit for assisting in the discharge of snow through the conduit.

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