Oct. 27, 1931. C. SPEER 1,829,198

DELIVERY MECHANISM FOR SNOWPLOWS

Original Filed July 29, 1929 2 Sheets-Sheet 1

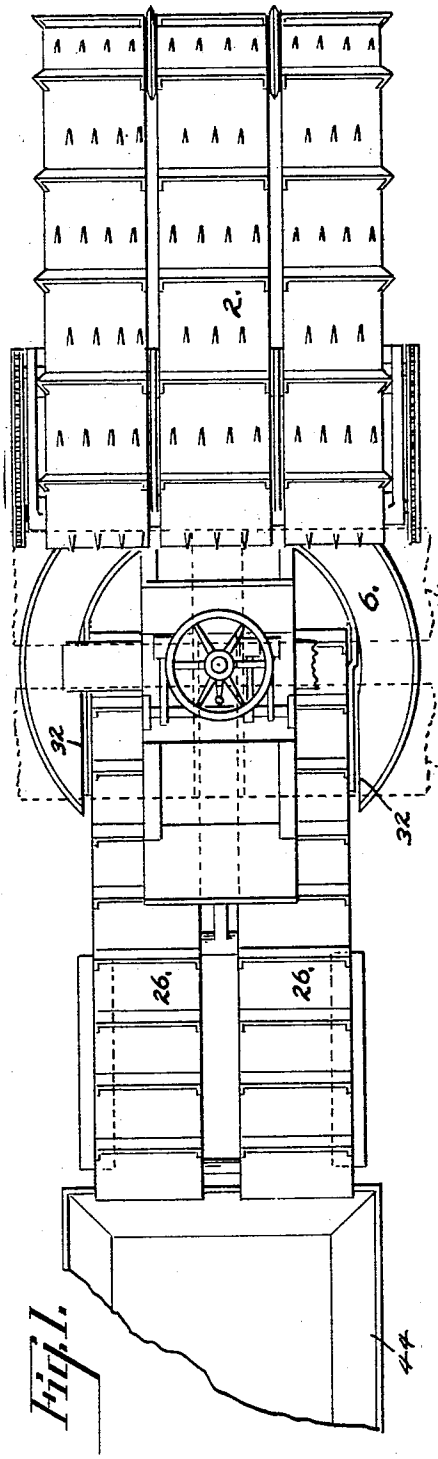


Fig. 1.

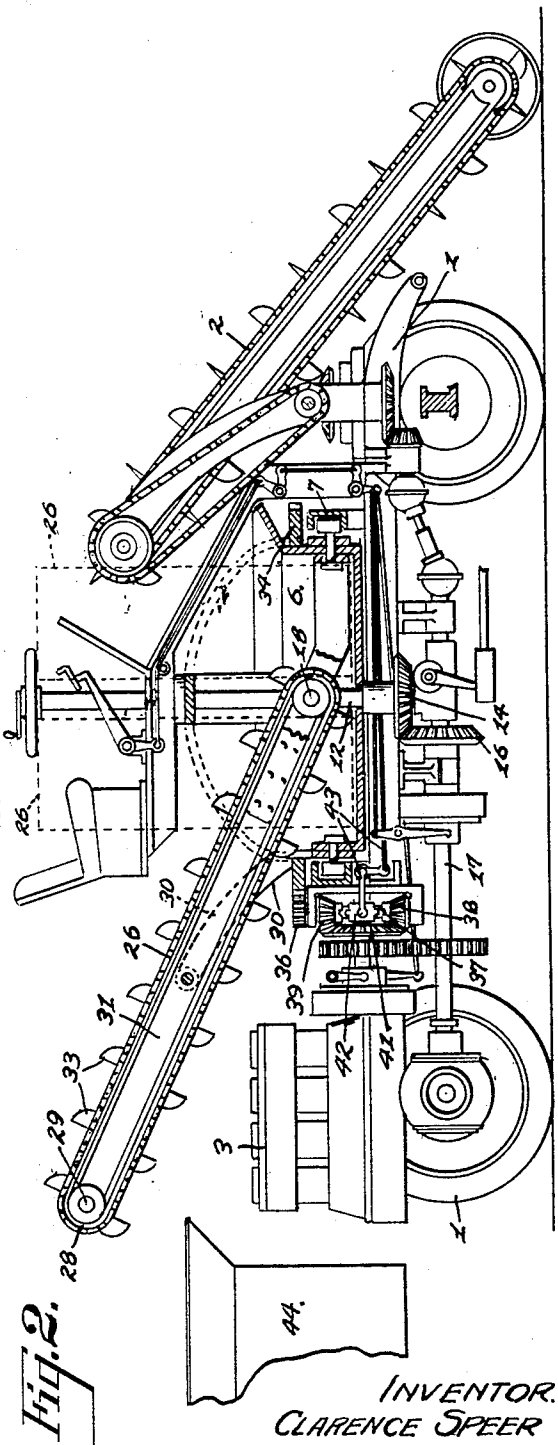


Fig. 2.

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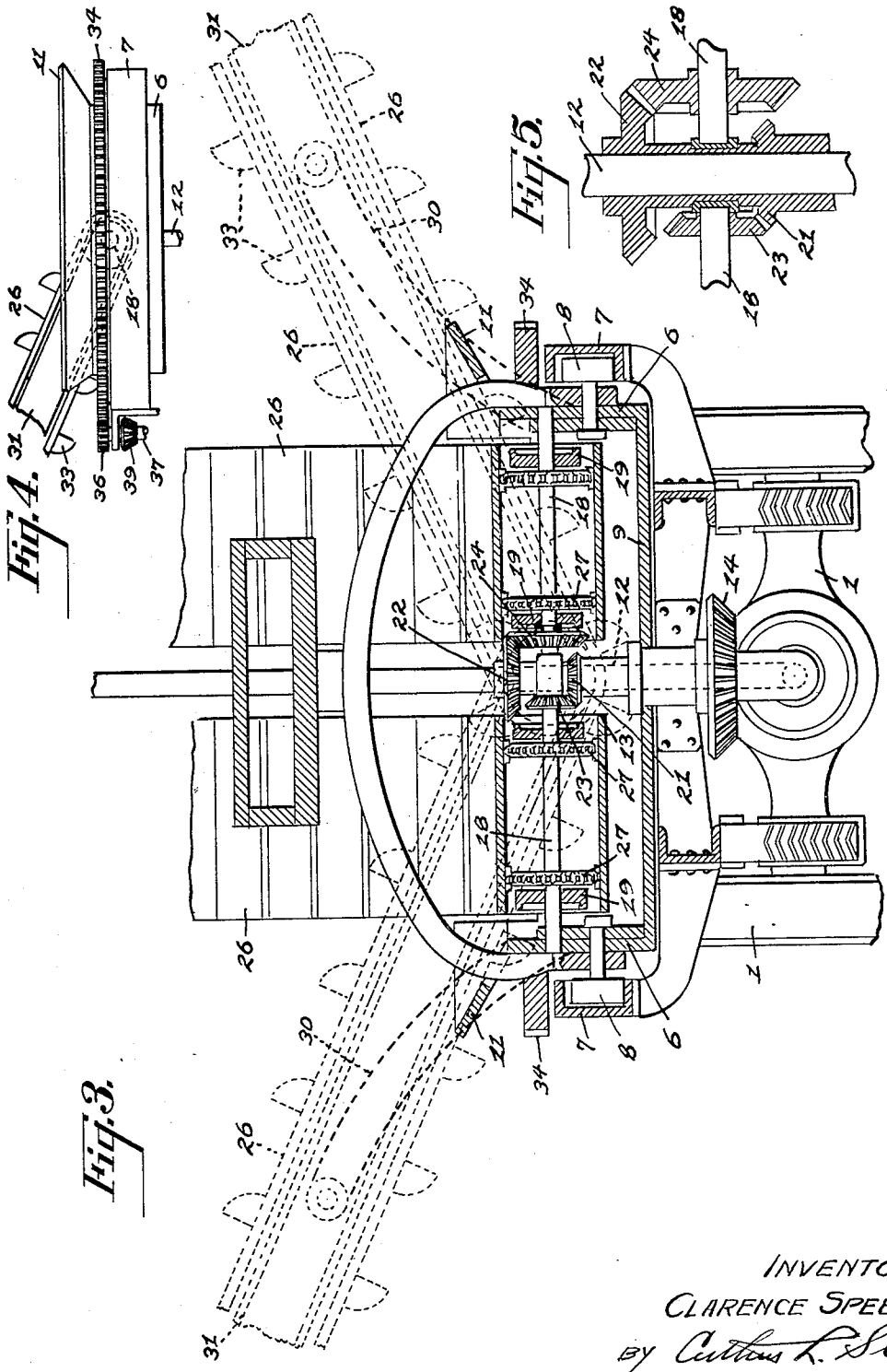


Fig. 3.

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE

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DELIVERY MECHANISM FOR SNOWPLOWS

Original application filed July 29, 1929, Serial No. 381,866. Divided and this application filed August 18, 1930. Serial No. 475,957.

My invention relates to improvements in delivery mechanism for snow plows wherein a hopper is rotatably mounted upon a carriage to receive snow from elevating means mounted thereon, said hopper having conveying means, mounted thereon and movable therewith, independently of the movement of the carriage and elevating means, to deliver snow in a desired direction.

This invention consists in improved features of construction and arrangement of the delivery mechanism of a snow plow such as disclosed in my co-pending application, Serial No. 381,866, filed July 29, 1929, now Patent No. 1,793,523, patented February 24, 1931, of which original application this present application is a division; and reference to which is hereby made.

The primary object of this invention is to provide improved means for receiving and delivering snow from elevating means whereby the snow may be delivered rearwardly or to either side of a roadway as desired.

Another object is to provide an improved means for mounting and actuating delivery conveyors mounted upon and movable with a rotatable hopper whereby the operation of the conveyors is unaffected by the adjustment of the hopper and conveyors to various positions.

A further object is to provide an improved mechanism wherein a hopper and delivery conveyor may be readily moved by power actuating means to any of a plurality of delivery positions.

Another object is to provide improved driving means whereby parallel conveyors may be driven simultaneously, at the same speed by a common driving shaft, and permitting movement of the conveyors about the driving shaft to various delivery positions.

A still further object is to provide an improved device embodying improved details of construction and arrangement to produce a rugged, compact, and highly efficient mechanism simplifying the structure and operation of the machine.

I accomplish these and other objects by means of the improved device disclosed in the drawings forming a part of the present application wherein like characters of reference are used to designate similar parts throughout the specification and drawings, and in which—

Fig. 1 is a plan view of my improved delivering mechanism as applied upon a snow plow of the character disclosed in my co-pending application above referred to;

Fig. 2 is a side elevation of the machine as shown in Fig. 1, parts being broken away and shown in section;

Fig. 3 is a broken transverse vertical section of the hopper, disclosing the driving connections of the delivery conveyors, the figure being drawn upon a larger scale;

Fig. 4 is a side elevation of the hopper and track; and

Fig. 5 is a broken vertical sectional detail of the conveyor actuating gears.

Referring to the drawings, the numeral 1 is used to designate in general a carriage provided with snow cutting and elevating means, designated in general by the numeral 2, mounted upon the forward end thereof. The carriage is provided with a source of power 3, for operating the carriage and the elevating means. As the elevating mechanism is fully disclosed and explained in my co-pending application above referred to, a detailed description of the same is herein unnecessary and is therefore omitted from this specification.

A hopper designated in general by the numeral 6 is mounted upon the carriage 1 by means of an annular track 7, secured in any suitable manner upon the frame, and consisting preferably of an annular inwardly faced channel. Anti-friction rollers 8 are mounted upon the hopper 6 to engage the track 7 and rotatably support the hopper thereof. The hopper consists of a cylindrical body portion closed across the bottom, as at 9, and having an open top provided with a flaring edge 11. The track 7 extends around the body of the hopper between the bottom thereof and the flaring edge 11.

A power shaft 12 extends axially upwardly through an opening 13 in the bottom 8 of the hopper. The shaft 12 is driven by means of a gear 14 meshing with a gear 16 which is

driven by a shaft 17 and to which power is delivered from the engine 3 in any suitable manner. A pair of conveyor shafts 18 are mounted within the hopper 6 upon suitable bearings 19 secured therein. The shafts 18 are arranged upon opposite sides of the power shaft 12 and in axial alinement with each other, the common axis of the shafts 18 inter-secting with the axis of the shaft 12 at right angles.

Driving gears 21 and 22 are secured upon the power shaft 12 within the hopper. The gears 21 and 22 are faced preferably toward each other at points spaced upon opposite sides of the axis of the shafts 18, and are of different diameters so that one of the gears, as 22, will overhang the other gear. A driven gear 23 is mounted upon one of the shafts 18 to mesh with the gear 21 and a gear 24 is mounted upon the other shaft 18 to mesh with the gear 22. The gears 23 and 24 bear the same ratio to the gears 21 and 22 respectively, the difference in the size of said gears being such that said gears may rotate past each other and drive the shafts 18 simultaneously in the same direction and at the same speed.

Conveyors 26 are mounted over sprockets 27 secured upon the shafts 18. The conveyors 26 are extended outwardly from the hopper 6 and over sprockets 28 mounted upon shafts 29. The shafts 29 are mounted upon the outer ends of arms 31, the inner ends of said arms being mounted upon the shafts 18. Braces 30 are mounted upon the sides of the hopper and connected to the arms 31 to support the outer ends of the arms and conveyors. The conveyors extend upwardly and outwardly from the hopper, one side of the hopper being partially cut away, as at 32, to permit movement of the lower flights of the conveyors therepast. The conveyors are arranged in parallel relation upon opposite sides of the power shaft 12, and are provided preferably with buckets 33 whereby snow delivered into the hopper is carried outwardly over the outer ends of the conveyors.

The hopper 6 is provided with a ring gear 34 secured thereon, preferably above the plane of the track 7. The gear 34 is engaged by a driving pinion 36 mounted upon a shaft 37. Oppositely facing gears 38 and 39 are mounted upon the shaft 37 in meshing relation with a driving gear 41 driven in any convenient manner from the engine 3. A clutch member 42 is feathered onto the shaft 37 and arranged to be moved by suitable actuating connections designated in general by the numeral 43 to engage either of the gears 38 or 39 and thereby cause the pinion 36 and ring gear 34 to be turned in desired directions to rotate the hopper 6 about its vertical axis. The clutch member 42 is normally held in a neutral position permitting free rotation of the gears 38 and 39 upon the shaft 37.

In operation, the carriage is propelled along a roadway to be cleared of snow, and the snow is elevated into the hopper 6 as fully explained in my co-pending application referred to. The snow received in the hopper is picked up by the delivery conveyors 26 and carried outwardly from the hopper to a desired point of delivery. Where it is possible to dump the snow along either side of the roadway, the hopper is turned to direct the conveyors in the desired direction as indicated in dotted lines in Fig. 3 of the drawings. Thus, in the case of roads built along a hillside, the conveyor may be turned to deliver the snow to the lower side, and where the road is paralleled upon either side by a ditch, the conveyor may be turned to either side, as indicated, to deliver the snow into such ditch. Where it is necessary to remove the snow in trucks, or the like, the conveyors are directed rearwardly, as shown in full lines in Figs. 1 and 2 of the drawings, whereby the snow may be delivered rearwardly into a truck body 44.

In the improved structure herein disclosed, the annular track affords a rigid support for the hopper and conveyors, and permits the entire hopper and conveyor mechanism to be readily turned by power to a desired position without altering the driving connections to the delivery conveyors, and permitting a single operator to shift the delivery conveyors from side to side, as conditions vary, without leaving the operator's position. Specific details of the construction are of course subject to modification in various ways without departing from the spirit of my invention, and I therefore desire to avail myself of all modifications which may fall within the scope of the appended claims.

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

1. Delivery mechanism for snow plows comprising a hopper mounted upon a movable carriage to receive snow from elevating means mounted upon the carriage; a power shaft axially disposed within the hopper; a pair of conveyor shafts mounted within the hopper in axial alinement upon opposite sides of the power shaft; a pair of parallel endless conveyors supported upon the hopper and having their inner ends connected to the conveyor shafts; a bevel gear mounted upon the power shaft and a gear mounted upon one of the conveyor shafts in meshing relation with said bevel gear; a second bevel gear mounted upon the power shaft and a gear mounted upon the other conveyor shaft in meshing relation therewith, said second bevel gear and its meshing gear being of the same ratio, but of different diameter, with respect to the first bevel gear and its driven gear, whereby the conveyor shafts are actuated simultaneously in the same direction and

at the same speed; and means to turn the hopper about its vertical axis to direct the conveying means in a desired direction independently of the movement of the carriage and its elevating means.

2. Delivery mechanism for snow plows comprising a hopper mounted upon a movable carriage to receive snow from elevating means mounted upon the carriage; a power shaft axially disposed within the hopper; a pair of conveyor shafts mounted within the hopper in axial alinement upon opposite sides of the power shaft; a pair of parallel endless conveyors supported upon the hopper and having their inner ends connected to the conveyor shafts; a pair of oppositely facing bevel driving gears mounted in spaced relation upon the power shaft, said gears being of different diameters; driven gears mounted upon the conveyor shafts and engaging the driving gears, said driven gears being of different diameters corresponding to the difference in diameter of the driving gears meshing therewith, whereby the conveyor shafts are actuated simultaneously in the same direction and at the same speed; and means to turn the hopper about its vertical axis to direct the conveying means in a desired direction independently of the movement of the carriage and its elevating means.

3. Delivery mechanism for snow plows comprising a hopper mounted upon a movable carriage to receive snow from elevating means mounted upon the carriage; a power shaft axially disposed within the hopper; a pair of conveyor shafts mounted within the hopper in axial alinement upon opposite sides of the power shaft; a pair of parallel endless conveyors supported upon the hopper and having their inner ends connected to the conveyor shafts; a pair of oppositely facing bevel driving gears mounted in spaced relation upon the power shaft, said gears being of different diameters; driven gears mounted upon the conveyor shafts and engaging the driving gears, said driven gears being of different diameters corresponding to the difference in diameter of the driving gears meshing therewith, whereby the conveyor shafts are actuated simultaneously in the same direction and at the same speed; a ring gear mounted upon the hopper; and means engaging the ring gear to turn the hopper about its vertical axis to direct the conveying means in a desired direction independently of the movement of the carriage and its elevating means.

In witness whereof, I hereunto set my signature.

CLARENCE SPEER.