Feb. 19, 1924. 1,484,555

J. B. GHIONE

SNOW REMOVAL DEVICE

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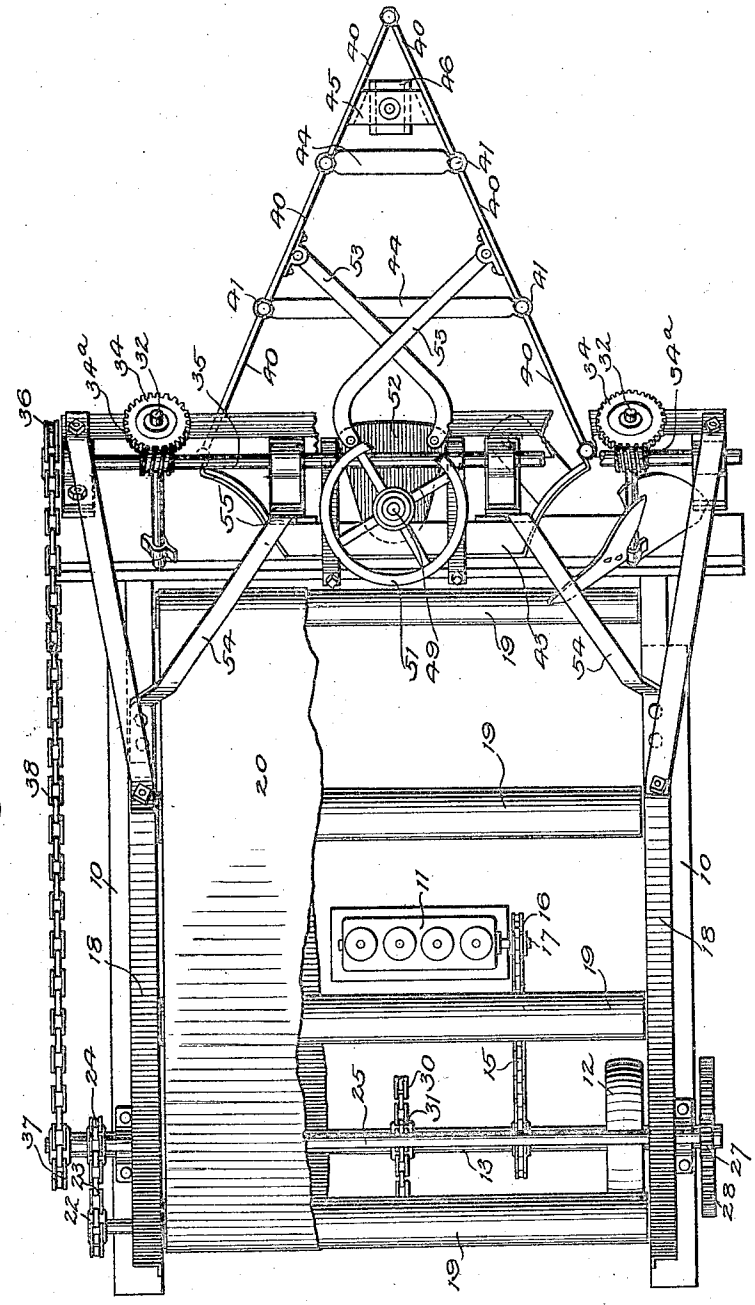


Fig. 1.

WITNESSES

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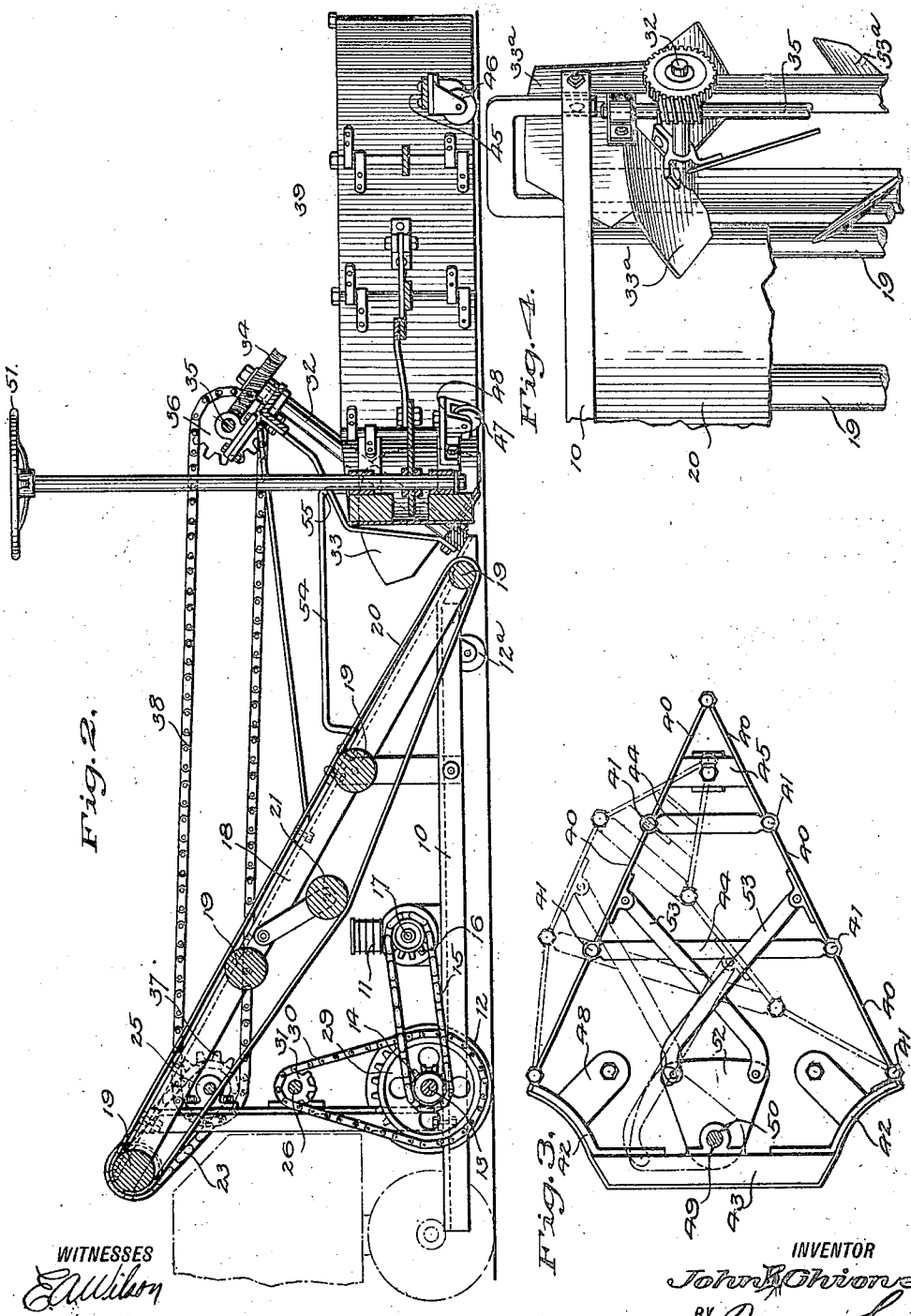


Fig. 2.

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN B. GHIONE, OF NEW YORK, N. Y.

SNOW-REMOVAL DEVICE.

Application filed November 14, 1922. Serial No. 600,874.

To all whom it may concern:

Be it known that I, JOHN B. GHIONE, a subject of the King of Italy, and a resident of the city of New York, borough of Manhattan, in the county of New York and State of New York, have invented a new and Improved Snow-Removal Device, of which the following is a full, clear, and exact description.

This invention has relation to an apparatus for cleaning and removing snow from the streets of cities, and aims for its principal object to provide means which will economically, expeditiously and efficiently accomplish the work for which it is designed.

More specifically the invention contemplates a device which includes means for plowing through the snow and means for successively gathering in, elevating and discharging the same into a suitable receptacle or vehicle for transporting the same.

The invention furthermore contemplates a snow removal apparatus which includes a plurality of elements capable of utilization in various ways to accomplish the clearing and removal of the snow from the street.

With the above recited and other objects in view, the invention resides in the novel construction set forth in the following specification, particularly pointed out in the appended claims and illustrated in the accompanying drawings, it being understood that the right is reserved to embodiments other than those actually illustrated herein to the full extent indicated by the general meaning of the terms in which the claims are expressed.

In the drawings—

Figure 1 is a plan view of a snow removal device constructed in accordance with the invention, parts being broken away to disclose the underlying structure.

Fig. 2 is a longitudinal sectional view therethrough.

Fig. 3 is a sectional plan view of the plow element removed and illustrating in dotted lines the manner in which the same is steered.

Fig. 4 is a fragmentary plan view illustrating a modified use of the invention.

Referring to the drawings by characters of reference, 10 designates the side rails of the chassis or frame of a self-propelled vehicle from which is supported a suitable prime mover or motor 11. The frame is supported upon rear driving wheels 12 and front supporting wheels 12ª, the former being connected to a driven axle 13 having a driven gear 14 keyed thereto and operatively connected by a sprocket chain 15 to a driving sprocket 16 on the motor shaft 17. An upwardly and rearwardly inclined frame-work 18 is supported from the chassis 10 and a plurality of transversely disposed guide rollers 19 are journaled in the frame-work 18 to constitute a support for an endless conveyor belt 20 which is maintained under a suitable driving tension by swinging a weighted roller 21 operating against the upper face of the lower lead to said conveyor belt. The upper lead of the conveyor belt is continuously driven toward the rear of the device during its forward movement by means of a sprocket 22 which is connected by a sprocket chain 23 to a driving sprocket wheel 24 on a countershaft 25, which countershaft is driven from a second countershaft 26 by the intermeshing gears 27 and 28 keyed respectively to the countershafts 25 and 26. The countershaft 26 is in turn driven from a sprocket 29 on the driven axle 13 and a sprocket chain 30 which is trained over the sprocket wheel 31 on said countershaft 26. A gathering mechanism for feeding the snow to the endless conveyor belt 20 is located at the front of the chassis and said mechanism consists of a pair of forwardly and upwardly inclined shafts 32 located at opposite sides of the chassis and projecting at right angles to the frame-work 18. A plurality of shoveling blades 33 project radially from the lower end of the shafts 32. The shafts 32 are driven by means of worm gears 34 which are secured to their upper ends and mesh with worms 34ª on a common transverse drive shaft 35, which worm drive shaft 35 has keyed thereto a sprocket wheel 36 connected to a sprocket wheel 37 on the countershaft 25, by means of a sprocket chain 38. Under this arrangement the driving of the vehicle forwardly causes the shoveling blades 33 to rotate inwardly for gathering in the snow and pitching the same toward the center and up to the endless conveyor belt 20. In order to provide means for plowing and splitting the snow in advance of the shoveling blades, a plowing element 39 is connected to the forward end of the vehicle. The plowing element 39 is of substantially V-shaped formation in plan view with the wider end at the rear and the apex at the front, said plowing element consisting of divergent sides com-

posed of a plurality of blades 40 hingedly connected to each other as at 41 and to the brackets 42 of the rear transverse beams 43. The intermediate hinged connections 41 are connected to each other by crossbars 44 and the foremost blades 40 are maintained in constantly spaced and divergent relation by a cross brace 45 which further serves as a mounting for a caster roller 46. The rear portion of the plow element is supported by caster rollers 47 which are mounted in the bearing brackets 48. The plow element 39 is adapted to be flexed as illustrated in dotted lines for the purpose of steering the same and adhering to the contour of the street or roadway or in turning corners, by means of a steering mechanism which includes a steering post 49. The steering column 49 is mounted in bearing elements 50 attached to the front face of the beams 43 and said steering column is provided with a manipulating wheel 51 at its upper end and a steering arm 52 at its lower end. The steering arm 52 is in turn connected by crossed links 53 to the intermediate blades 40 whereby the flexing of the plow element is accomplished as illustrated in dotted lines in Fig. 3. The plow element is associated with the forward end of the vehicle frame by the bracket bars 54, the downturned forward extremities 55 of which are connected to the crossbars 43.

In some instances the plow element may be connected to any suitable means for pushing the same while the conveyor and gathering vehicles may follow at either side of the same in lieu of having the plow elements directly attached thereto. Under this method or practice of using the device the shoveling blades and shafts 32 upon which the same are mounted are preferably moved inwardly toward the center of the machine whereby larger blade elements 33^a may be employed as illustrated in the modified adaptation in Fig. 4. The driving mechanism and construction, however, is precisely the same as that illustrated in Figs. 1 and 2. Preferably the enlarged form of blades 33^a are designed to overlap at the center and are so timed that the blades will not interfere in their movements.

I claim:

1. A device for clearing and removing snow from roadways comprising a self-propelled vehicle, means following in rear of said vehicle for receiving and conveying the snow, means on the vehicle for gathering up, elevating and discharging the snow in the path of movement of the vehicle into the receiving and conveying means, and laterally flexible means disposed in advance of the vehicle for splitting, separating and guiding the snow to be acted on by the gathering up means, said laterally flexible means being operable to effect the steering of the device upon flexing of the same.

2. A device for clearing and removing snow from roadways comprising a self-propelled vehicle, an inclined endless conveyor on said vehicle having its lowermost end at the front of the vehicle, a receiving and conveying element at the rear upper end of the conveyor, means adjacent the lower forward end of the conveyor for gathering up and feeding the snow in the path of movement of the vehicle onto the lower end of the conveyor, mechanism operable by the vehicle propelling means for actuating the conveyor and gathering-in means, a plow element disposed in advance of the forward end of the vehicle for splitting and feeding the snow to the gathering-in means, said plow element being flexible, and means for flexing the same to guide the vehicle over the roadway.

3. A device for clearing and removing snow from roadways comprising a self-propelled vehicle, an inclined endless conveyor on said vehicle having its lowermost end at the front of the vehicle, a receiving and conveying element at the rear upper end of the conveyor, means adjacent the lower forward end of the conveyor for gathering up and feeding the snow in the path of movement of the vehicle onto the lower end of the conveyor, mechanism operable by the vehicle propelling means for actuating the conveyor and gathering-in means, a plow element disposed in advance of the forward end of the vehicle for splitting and feeding the snow to the gathering-in means, said plow comprising rearwardly diverging sides consisting of hingedly connected plates, and a steering column having a steering arm, and a linked connection between the steering arm and certain of the plates for flexing the plow element for steering and guiding the device over the roadway.

JOHN B. GHIONE.