April 9, 1929. D. B. COOK 1,708,376

APPARATUS FOR HANDLING SNOW

Filed July 29, 1927 2 Sheets-Sheet 1

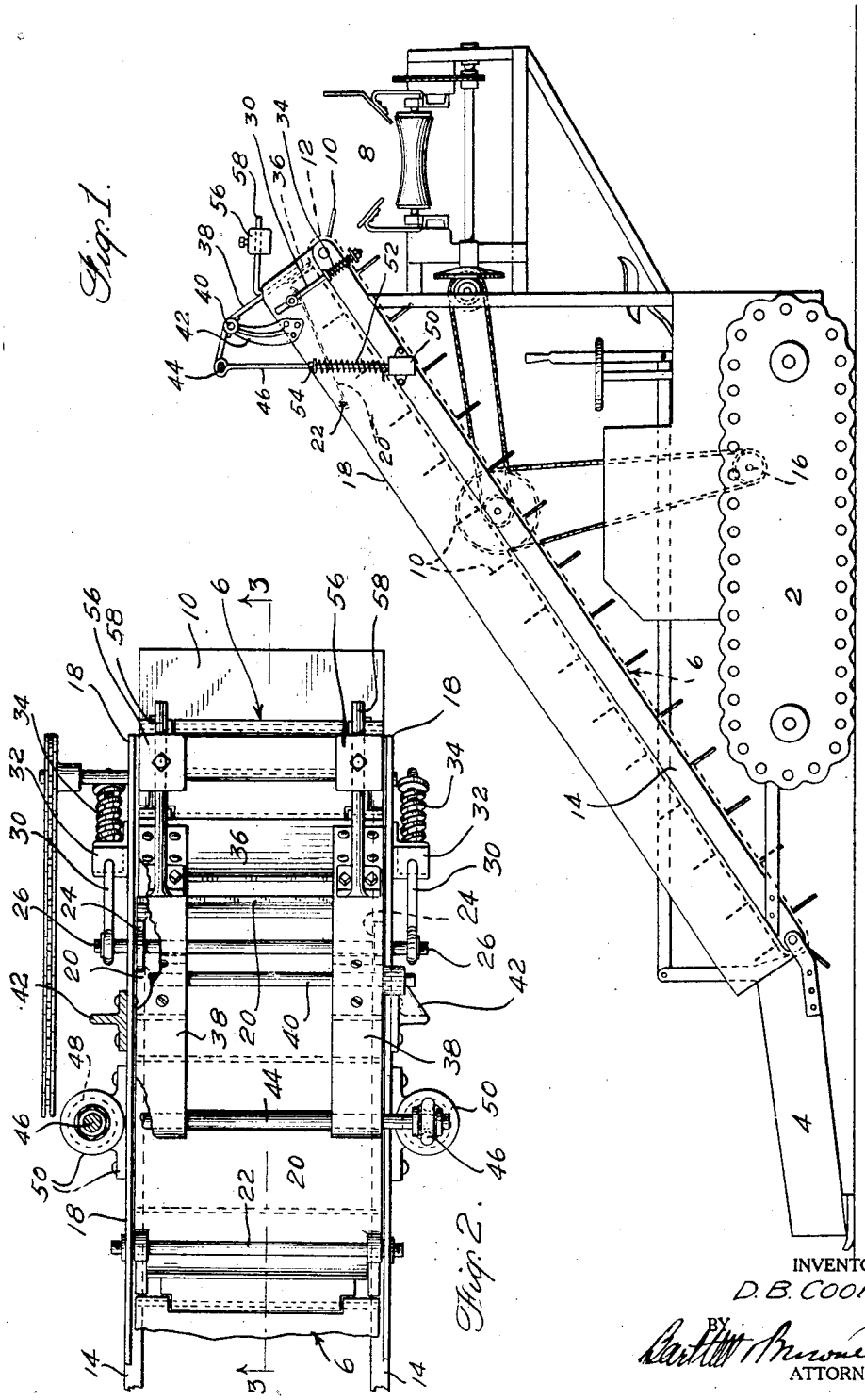


Fig. 1.

Fig. 2.

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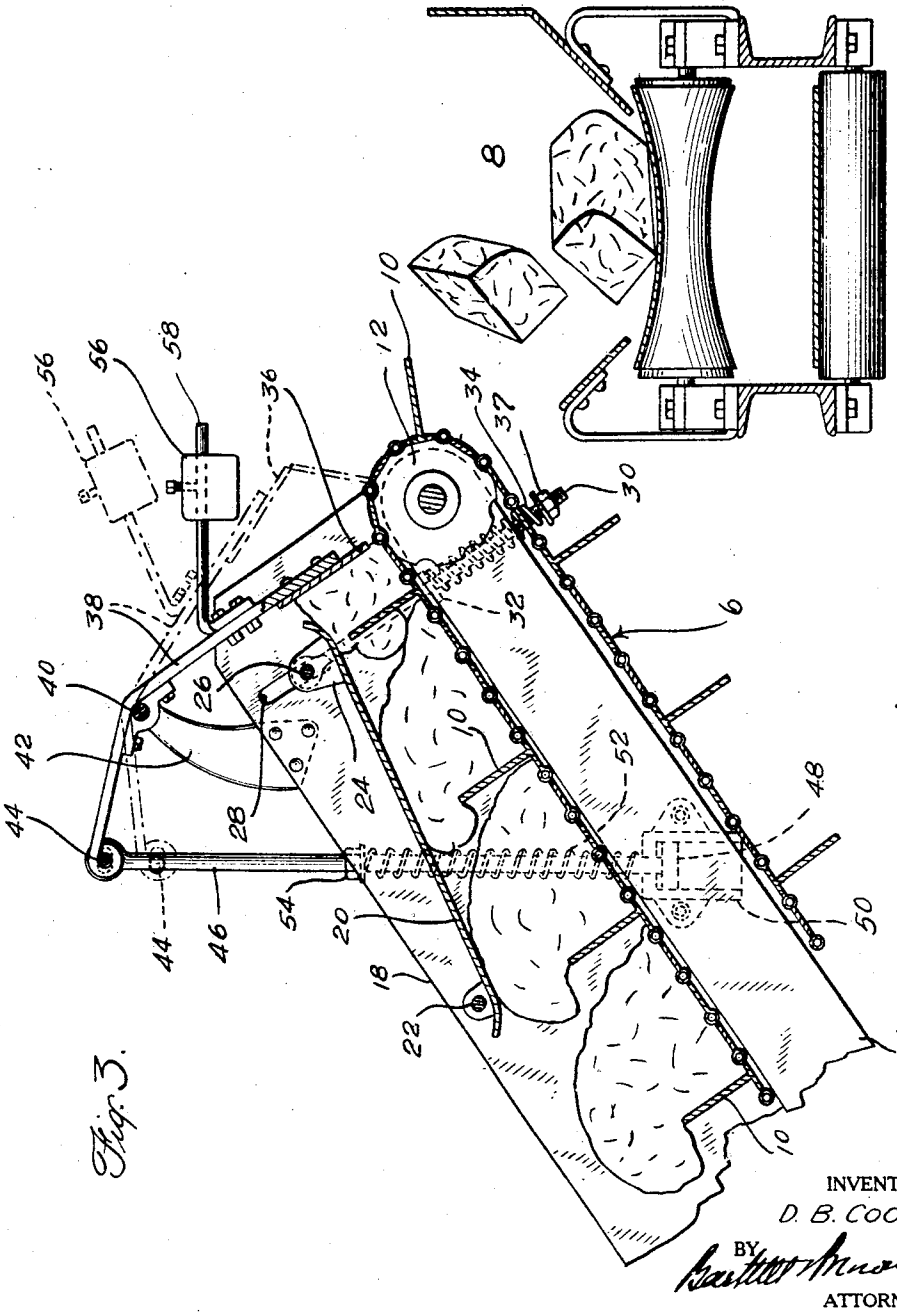


Fig. 3.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR HANDLING SNOW.

Application filed July 29, 1927. Serial No. 209,207.

My invention relates to apparatus for handling snow, and has special reference to apparatus for removing snow from the road and depositing it into carts or trucks, or in a windrow along the side of the road.

An object of the invention is to provide an apparatus of this character of novel and improved construction.

Another object of the invention is to provide an apparatus for removing snow in which there is provision of means for reducing the volume of the snow while it is being removed.

Another object of the invention is to provide an apparatus for removing snow in which there is provision of means for compressing the snow into briquets as it is being removed.

The several features of the invention, whereby the above mentioned and other objects may be attained, will be clearly understood from the following description and accompanying drawings, in which:

Figure 1 is a side elevation, partly diagrammatical, of an apparatus for removing snow embodying the features of the invention in their preferred form;

Fig. 2 is a detail plan view, on an enlarged scale, of the rear portion of the apparatus; and

Fig. 3 is a longitudinal sectional view taken on the line 3—3 of Fig. 2.

The apparatus illustrated in the drawings is mounted upon a tractor 2 of the crawler type for propelling it along the road. A flat pan shaped scoop 4 of a common construction is suitably mounted in front of the tractor for scooping the snow from the road, and an elevator 6 is provided which picks the snow from the scoop and carries it upwardly and rearwardly, and discharges it from its upper end. The apparatus is further provided with a belt conveyor 8 suitably mounted at the rear of the tractor and in position to receive the snow that is discharged from the upper end of the elevator 6. This belt conveyor 8 extends transversely of the tractor and is adapted to deliver the snow into a cart or truck or in a windrow along the side of the road. The elevator 6 comprises a belt of any suitable construction having blades 10 that pick the snow in separate masses from the scoop 4. The conveyor passes over drums 12 that are supported by the ends of upwardly and rearwardly extending beams 14 suitably mounted on the tractor, the belt of the elevator being driven through connection with the power take-off shaft 16 of the tractor engine. The transverse belt conveyor 8 may also be driven from said power take-off shaft 16 through suitable connections.

In the illustrated construction means is provided for compressing the masses of snow into briquets while they are carried by the elevator blades 10 so that they are deposited in that form upon the transverse conveyor 8. To provide for this the blades 10 consist of flat plates that extend substantially the width of the elevator belt, are equally spaced apart, and are arranged substantially perpendicular to the belt. The outer edges of the blades are arranged closely adjacent to boards or plates 18 that have their lower edges secured to the beams 14 of the elevator and extend substantially the length thereof. A presser plate 20 is arranged between the upper portions of the side plates 18 with its rear end spaced a distance from the rear ends of said side plates 18 and has its forward end pivotally mounted upon a pin or rod 22 that extends through ears on the plate 20 and has its ends secured in said side plates. The rear end portion of the presser plate 20 is provided with upstanding ears 24 through which a rod or pin 26 extends. The ends of the pin 26 extend through clearance slots 28 in the side plates 18, and eye-bolts 30 are pivotally connected with the ends of the pin and extend through bracket lugs 32 projecting from the supporting beams 14. A spring 34 is coiled about each of the bolts 30 and is interposed between the bracket lug 32 and a nut 37 screw-threaded on the lower end of the rod. The coiled springs 34 act through the eye-bolts 30 to yieldingly press the top presser plate 20 downwardly about the axis of its pivotal connection at its forward end. The presser plate 20 is inclined downwardly and rearwardly with relation to the upper stretch of the elevator belt, and its forward end is spaced in proximity to the upper edge of the rearmost blade carried by the upper stretch of the elevator belt.

The apparatus is further provided with an abutment or presser plate 36 which is adapted to enter the space between each two adjacent blades with its ends closely adjacent to the side plates 18, and is arranged substantially perpendicular to the elevator belt. The presser plate 36 is secured on the ends of arms 38 that are pivotally mounted upon a fixed shaft or rod 40 which is arranged directly

above the axis of the rearmost elevator drum 12, and has its ends secured in upwardly projecting brackets 42 secured on the side plates 18. The forward ends of the arms 38 are connected by a pin 44, the ends of which extend through the upper ends of vertically arranged rods 46, which have their lower ends provided with plunger heads 48 arranged in dash pots 50 secured to the elevator beams 14. The rods 46 are pressed upwardly to tend to swing the presser plate 36 forwardly by means of a spring 52 coiled about each rod and interposed between a nut 54 secured on the rod, and the upper end of the associated dash pot 50. Also, as illustrated in the drawings, adjustable weights 56 are mounted on bracket rods 58 that project rearwardly from the lower portions of the arms 38 so that these weights cooperate with the springs 52 to swing the presser plate 36 downwardly and forwardly. It will be apparent that either the springs 52 or the weights 56 may be employed alone, or if desired, both may be employed as illustrated in the drawings.

With this construction it will be apparent that as the masses of snow are carried upwardly by the blades 10, the ends of the masses slide over the side plates 18, and as the masses pass beneath the top presser plate 20 they are compressed in a direction substantially perpendicular to the upper stretch of the elevator belt and to a degree depending upon the tension of the presser plate springs 34. As each mass reaches the upper or rear end of the elevator and is about to pass over the rear drum 12 thereof, the presser plate 36 rides off of the blade adjacent the rear side of the mass and through the action of the springs 52 and weights 56 is swung forwardly and downwardly to cooperate with the blade 10 carrying the mass of snow to compress the mass between them, the pressure thus being applied in the direction of the travel of the mass. When the mass of snow has thus been compressed to a predetermined degree, depending upon the tension of the springs 52 and the gravity of the weights 56, the continued movement of the blade 10 carrying the mass overcomes the tension of the springs 52 and the action of the weights 56 and forces the presser plate 36 rearwardly and upwardly to permit the mass of snow and its blade to ride beneath said plate, the mass of snow as thus compressed being discharged over the rear drum 12 and deposited upon the transverse conveyor belt 8. As said blade 10 passes beneath the outer or lower edge of the presser plate 36, the latter is swung downwardly and forwardly to cooperate with the next advancing blade to compress the mass of snow carried thereby in a similar manner.

It will be apparent that the side plates 18, the top presser plate 20, and the end abutment or presser plate 36, all cooperate to successively compress the masses of snow carried by the elevator blades into briquets and discharge them in that form upon the transverse conveyor belt, which may deliver them into a cart or truck, or in a windrow along the side of the road. Thus the apparatus illustrated in the drawings is not only adapted to expeditiously remove the snow, but also to materially reduce the volume of the snow to be handled, which permits the snow to be much more easily carted away than would otherwise be possible.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. Apparatus for handling snow having, in combination, an endless conveyor having upstanding blades for conveying snow, and means entering the space between each two adjacent blades as they reach a predetermined point in their travel for compressing the snow between each two adjacent blades.

2. Apparatus for handling snow having, in combination, an endless conveyor having upstanding blades for conveying snow in one direction, and means comprising a longitudinally fixed plate under which the blades pass for compressing the mass of snow between each two adjacent blades against the portion of the conveyor extending between said blades.

3. Apparatus for handling snow having, in combination, an endless conveyor having upstanding blades for conveying masses of snow, and means cooperating with said blades for compressing the masses of snow successively comprising an abutment member of substantially the width of each blade and adapted to enter in upright position the space between the adjacent blades, a carrier for said member pivotally mounted above said conveyor and adapted to be turned to swing said member toward and from said conveyor, means acting to turn said carrier in a direction to yieldingly press said member toward said conveyor whereby each blade during its advancing movement may cooperate with said member to compress the mass of snow carried thereby and after the snow has been compressed to a predetermined degree to act to force said member upwardly and outwardly from the space between it and the next preceding blade so as to permit it and the snow carried thereby to ride beneath said member.

4. Apparatus for handling snow having, in combination, an endless conveyor for removing snow from a point in proximity to the ground and conveying it in separate masses upwardly and rearwardly and discharging the masses over the upper end of the conveyor, and means acting automatically at a predetermined point in the travel of the conveyor to

compress each mass of snow in the general direction of the travel thereof.

5. Apparatus for handling snow having, in combination, an endless conveyor of the bucket type for removing snow from a point close to the ground and conveying it in separate masses upwardly and rearwardly and successively discharging the masses over the upper end of the conveyor, and means acting automatically at a predetermined point in the travel of the conveyor to compress each mass of snow in the general direction of its height and in the general direction of the travel of the conveyor so as to cause the snow to be in the form of compressed lumps when discharged over the upper end of the conveyor.

6. Apparatus for handling snow having, in combination, an endless conveyor having upstanding blades for removing snow from a point in proximity to the ground and conveying it in separate masses upwardly and rearwardly, and means comprising a member mounted to move into the space between each two adjacent blades as each space reaches a predetermined position in the travel of the conveyor to co-operate with the advancing blade to compress the mass of snow between them.

7. Apparatus for handling snow having, in combination, an endless conveyor having upstanding blades for removing snow from a point in proximity to the ground and conveying it in separate masses upwardly and rearwardly and successively discharging the masses over the upper end of the conveyor, and means co-operating with each blade as the blade reaches a predetermined position in the travel of the conveyor to compress the advancing mass of snow against the blade.

8. Apparatus for handling snow having, in combination, an endless conveyor having upstanding blades for removing snow from a point in proximity to the ground and conveying it in separate masses upwardly and rearwardly and successively discharging the masses over the upper end of the conveyor, and means acting automatically as each mass of snow approaches the upper end of the conveyor to compress the mass.

9. Apparatus for handling snow having, in combination, an endless conveyor having upstanding blades for removing snow from a point in proximity to the ground and conveying it in separate masses upwardly and rearwardly and successively discharging the masses over the upper end of the conveyor, and means acting automatically as each mass of snow approaches the upper end of the conveyor to compress the mass both in the general direction of its height and in the general direction of the travel of the conveyor.

10. Apparatus for handling snow having, in combination, an endless conveyor having upstanding blades forming pockets with the bottom of the conveyor for removing snow from a point in proximity to the ground and conveying it in separate masses upwardly and rearwardly, and means acting automatically as each pocket reaches a predetermined position in its travel to compress the snow therein.

In testimony whereof, I have signed my name to this specification this 20th day of July, 1927.

DAVID B. COOK.