May 5, 1942. E. H. OLSEN 2,282,205

SPREADER

Filed March 20, 1939 3 Sheets-Sheet 1

Fig. 1.

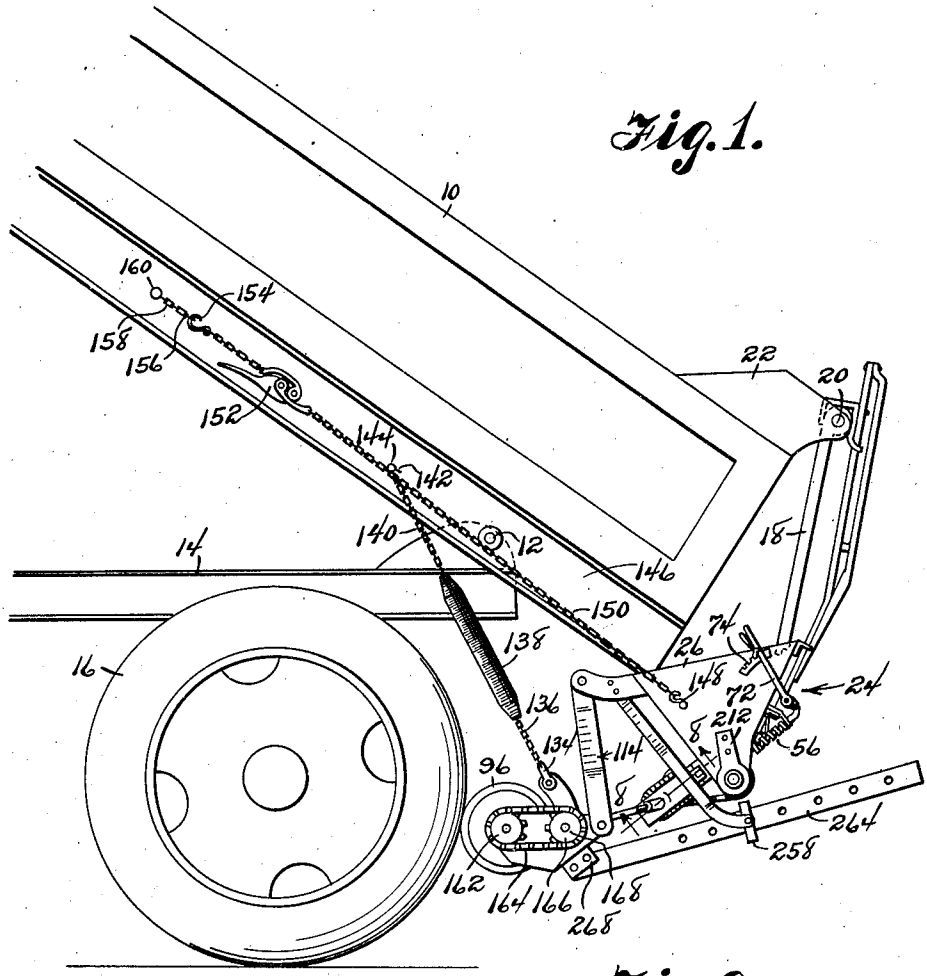



Fig. 8.

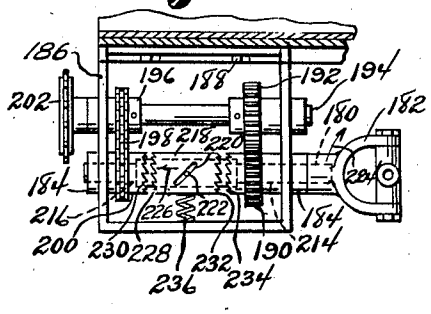
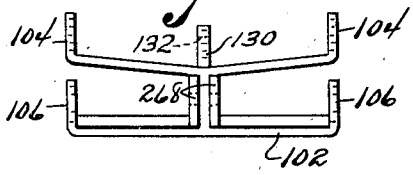



Fig. 9.




Eric H. Olsen

INVENTOR

BY Victor J. Evans & Co.

ATTORNEYS

May 5, 1942. E. H. OLSEN 2,282,205

SPREADER

Filed March 20, 1939 3 Sheets-Sheet 2

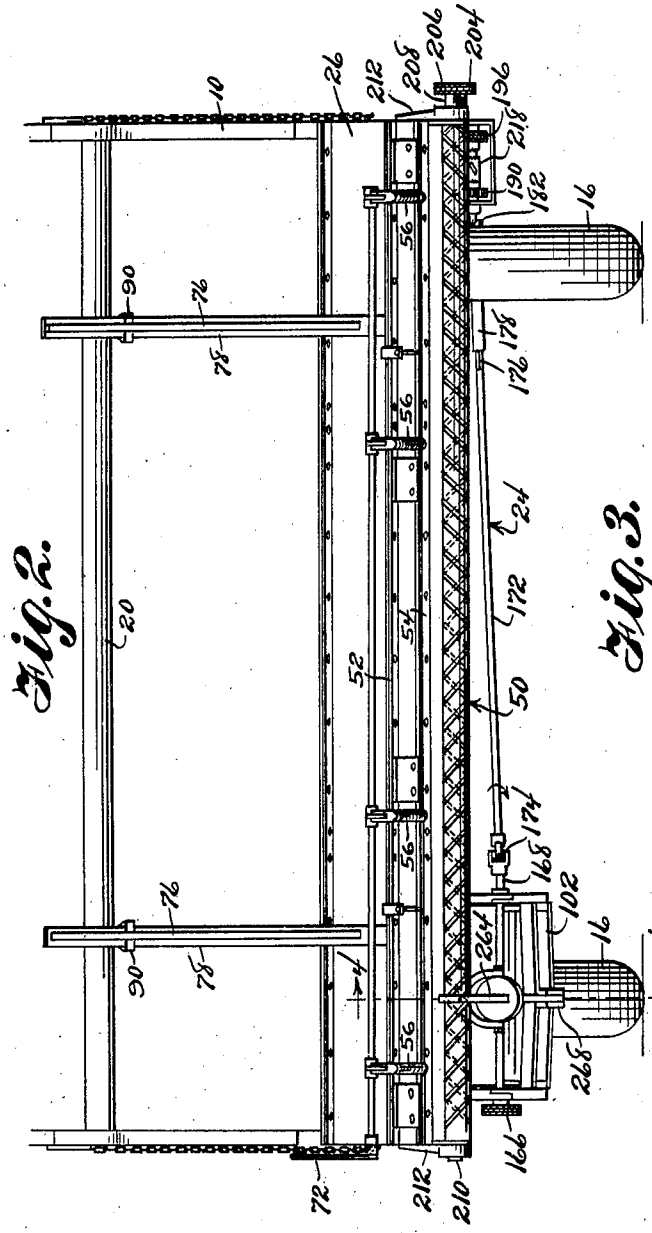


Fig. 2.

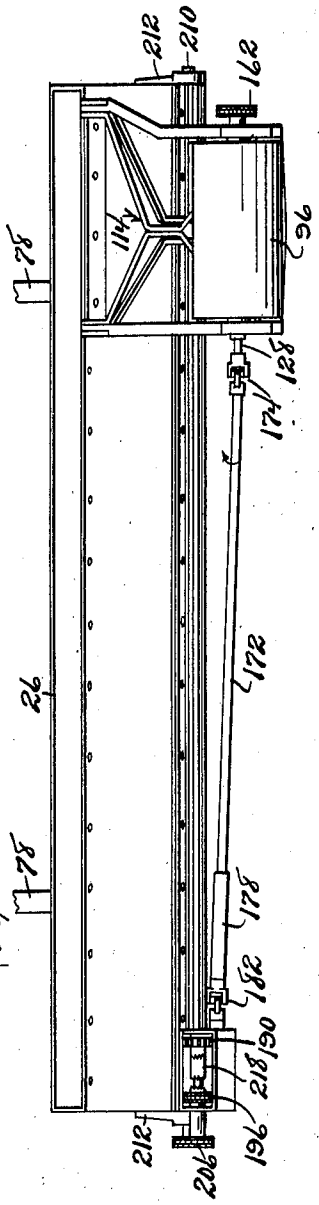


Fig. 3.

Eric H. Olsen
INVENTOR

BY Victor J. Evans & Co.
ATTORNEYS

May 5, 1942. E. H. OLSEN 2,282,205

SPREADER

Filed March 20, 1939 3 Sheets-Sheet 3

Fig. 5.

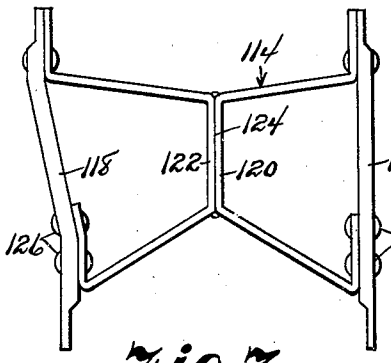



Fig. 6.

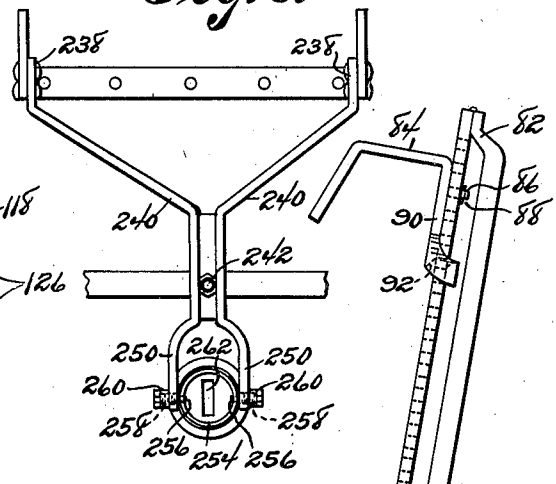



Fig. 7.

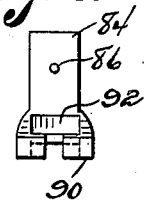
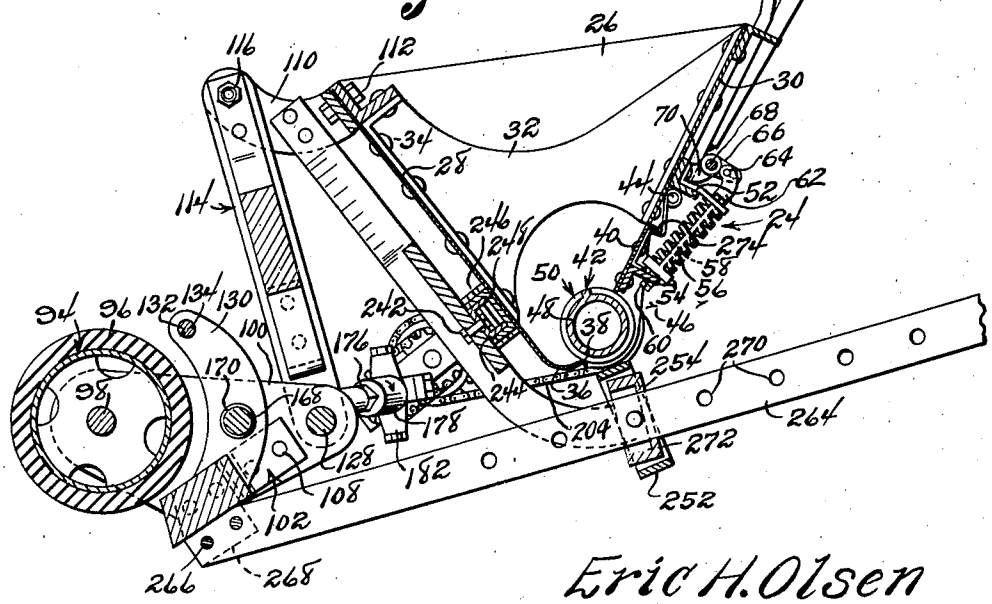



Fig. 4.




Eric H. Olsen
INVENTOR

BY Victor J. Evans & Co.
ATTORNEYS

Patented May 5, 1942

2,282,205

# UNITED STATES PATENT OFFICE

2,282,205

## SPREADER

Eric H. Olsen, Salt Lake City, Utah, assignor of one-half to David B. Harman, Midvale, Utah

Application March 20, 1939, Serial No. 263,070

3 Claims. (Cl. 275—2)

My invention relates to the treatment of road surfaces with material such as sand, gravel, salt, cinders, etc., and has among its objects and advantages the provision of an improved spreader.

An object of my invention is to provide a spreader in the nature of a hopper mechanism which may be attached to a conventional dump truck in which a novel material feeding element is incorporated to be driven by one of the wheels of the truck wherein the hopper mechanism is provided with suspension hooks so designed as to accurately adapt the hopper mechanism to the dump truck.

A further object is to provide a spreader adapted for connection with a dump truck for receiving material therefrom in which a novel discharge feeder is incorporated in the hopper unit together with an adjustable door to facilitate delivery of predetermined amounts of treating material to the road surface. The feed element is of the rotary type driven through the medium of a transmission frictionally related to one of the truck wheels in which reversing means are incorporated in the transmission so as to impart positive rotary motion to the feed element in both forward and rearward movement of the truck.

In the accompanying drawings:

Figure 1 is a side elevational view of a portion of a dump truck illustrating my invention applied thereto;

Figure 2 is a rear elevational view of my invention;

Figure 3 is an elevational view of the forward side of the hopper unit;

Figure 4 is an enlarged sectional view taken along the line 4—4 of Figure 2;

Figure 5 is a view of one of the bracket units associated with the hopper;

Figure 6 is a view of another bracket;

Figure 7 is a view of one of the hopper suspending hooks;

Figure 8 is a view taken along the line 8—8 of Figure 1; and

Figure 9 is a view of another bracket.

In the embodiment selected to illustrate my invention, I make use of a dump truck which may be any one of the many conventional types. Figure 1 illustrates a portion of a conventional dump truck, wherein the body 10 is pivotally mounted at 12 on the vehicle supporting frame 14, the rear end of which is associated with the rear traction wheels 16 in the usual manner. Body 10 may be pivoted to different angular positions for dumping its load from the open rear end, which end is normally closed by an end gate 18 pivotally connected at 20 with a suitable supporting structure 22. Figure 1 illustrates the body 10 tilted for dumping its load into the hopper and spreader unit 24 which comprises my invention.

Unit 24 comprises end walls 26, a front wall 28 and a rear wall 30, the walls 28 and 30 being arranged in converging relation downwardly as illustrated in Figure 4. End walls 26 and the walls 28 and 30 are connected into a unitary structure through the medium of brackets 32 riveted to their respective walls at 34. Wall 28 is somewhat wider than the wall 30 and is bent rearwardly at 36 with its curved edge 38 located substantially in a plane common to the wall 30, but spaced from its lower edge.

In a plane with the wall 30 I position a door 40 which has its lower edge lying in close relation with the feed screw 42 which extends the full length of the hopper. Door 40 is hingedly connected at 44 with the wall 30 and may be swung outwardly in the direction of the arrow 46 to vary the amount of material to be fed onto the road surface. Feed screw 42 is rotatably mounted and includes a cylindrical body 48 and spiral vanes 50 for imparting positive action to the material being spread. Wall 30 is provided with a longitudinal angle 52 and the door 40 is provided with a similar angle 54, both of which may be riveted to their respective parts. Compression springs 56 are mounted on bolts 58 slidable through openings in the angle 54 and provided with nuts 60 underneath the angle, see Fig. 4. The upper ends of the bolts terminate in heads 62 against which the springs 56 bear, and the heads are pivotally connected at 64 with arms 66 fixedly connected with a shaft 68 rotatably supported in brackets 70 riveted to the angle 52. One end of the shaft 68 is provided with a lever 72 associated with a quadrant 74 through the medium of which the lever may be latched in different positions. Figure 1 illustrates the lever adjusted for supporting the door 40 in its maximum closed position of Figure 4. In the position of Figure 4, the door may be swung open against the tension of the springs 56 in the event that a large piece of material should wedge between the feed screw 42 and the lower edge of the door. The door may be swung to a more open position in the direction of the arrow 46 through adjustment of the lever 72. In all positions of the lever 72, the springs 56 may yield to accommodate an occasional large piece of material so as to afford protection for the door.

Means for connecting the hopper with the

truck body 10 comprises two upstanding bars 76 each provided with a perforated bar 78 fixedly related thereto through the medium of a spacer 80 and the offset end 82. Bars 76 and 78 may be welded into a unitary structure and the unit may be welded to the wall 30. Each bar 78 is provided with a hook 84 which hook includes a pin 86 arranged to pass through one of the perforations in the bar. A cotter pin 88 may be passed through an opening in the pin 86 for latching the hook against accidental disconnection from the bar. Each hook includes a depending reach 90 provided with an opening 92 for slidably receiving its respective bar 78 so that the hook may be adjusted longitudinally of the bar and latched in different positions depending upon the requirements of the particular end gate 18 of the truck. Hooks 84 are hooked over the upper edge of the end gate 18 in the manner of Figure 1 for supporting the load of the hopper.

In Figures 1 and 4, I illustrate the means for imparting rotation to the feed screw 42. A roller or drum 94 is provided with a rubber covering 96 arranged to frictionally engage one of the traction wheels 16 for imparting rotation to the drum. Lining 96 is fixedly connected with the drum and provides a frictional surface which imparts positive rotation to the drum through rotation of the traction wheel 16. Drum 94 is provided with a shaft 98 rotatably journaled in spaced plates 100 which are supported in spaced and fixed relation through the medium of a bracket 102, see Figure 9. The bracket includes flanges 104 and 106 which are riveted to the plates 100, as at 108. Bracket 102 is made up of bars welded into the configuration of Figure 9.

To the wall 28 I connect two brackets 110 through the medium of bolts 112 between which brackets I pivotally connect a frame 114, see Figure 5, through the medium of bolts 116. Frame 114 is made up of straps 118, 120 and 122. Straps 120 and 122 are welded into a unitary structure at 124 and the straps are riveted to the side straps 118 at 126. The lower end of the frame 114 is pivotally connected with a shaft 128 carried by the plates 100. Bracket 102 includes a projection 130 provided with an opening 132 for the reception of a clevis 134, see Figure 1, which is connected with a chain 136 connected with a tension spring 138. The opposite end of the tension spring is connected with a chain 140 provided with a hook 142 arranged to hook over a pin 144 anchored in the bed 146 of the truck body 10. Thus the spring 138 yieldingly holds the drum 94 in frictional relation with the traction wheel 16. Each end wall 26 is provided with a hook 148 connected with a chain 150 in which I interpose a chain tightener 152. The opposite end of the chain includes a hook 154 arranged to hook into the link 156 of a chain 158 anchored at 160 to the bed 146. Chains 150 cooperate with the hooks 84 for holding the hopper mechanism in proper operating relation with the truck body.

The shaft 98 of the drum 94 is provided with a sprocket 162, see Figure 1, connected with a chain 164 which passes around a sprocket 166 connected with a shaft 168 rotatably journaled in the plates 100. Projection 130 is provided with an opening 170 for loosely accommodating the shaft 168, see Figure 4. Referring to Figure 2, the shaft 168 is connected with a shaft 172 through the medium of a universal joint 174. Shaft 172 is provided with a square end 176 telescopically related to the shaft part 178 connected with a shaft 180 through the medium of a universal joint 182, see Figures 3 and 8. Shaft 180 is rotatably journaled in bearings 184 carried by a frame 186 bolted at 188 to the wall 28. Upon the shaft 180 I mount an idle gear 190 arranged in mesh with an idle gear 192 fixedly connected with a shaft 194 rotatably journaled in the frame 186. Shaft 194 is provided with a fixedly connected sprocket 196 for connection with a chain 198 passing around a sprocket 200 idling upon the shaft 180. Shaft 194 is provided with a sprocket 202 for connection with a chain 204 passing around a sprocket 206 fixedly connected with the shaft 208 comprising an extension of the feed screw 42. The screw is also provided with a shaft part 210. Shafts 208 and 210 are rotatably journaled in bearings 212 welded to the end walls 26.

Figure 8 illustrates the shaft 180 as being provided with reduced reaches 214 and 216 upon which the gear 190 and the sprocket 200 are respectively mounted to restrain the same from relative longitudinal shifting. The central part of the shaft is provided with a loose sleeve 218 provided with an angular slot 220 through which a pin 222 extends, which pin is fixedly connected with the shaft 180. Rotation of the universal joint 182 in the direction of the arrow 224 causes the pin 222 to cam the sleeve 218 in the direction of the arrow 226 which moves a plurality of dogs 228 on one end of the sleeve into connected relation with dogs 230 on the hub of the sprocket 200 for rotating the feed screw 42 in a clockwise direction when viewing Figure 4. This is the normal direction of rotation of the screw during forward travel of the truck. Backward travel of the truck will cause the pin 222 to shift the sleeve 218 in the opposite direction for bringing a plurality of dogs 232 on the other end of the sleeve into engagement with the dogs 234 on the idle gear 190 which rotates the shaft 194 through the medium of the gear 192. Thus the feed screw 42 will be rotated in a clockwise direction even though the truck is moved backwardly. To effect positive shifting of the sleeve 218 I provide a compression spring 236 which is interposed between the frame 186 and the sleeve to resist rotary motion of the sleeve to such a degree as to insure endwise movement thereof through the medium of the pin 222.

To the brackets 110 I rivet the ends 238 of a frame 240, see Figure 6, which frame is bolted at 242 to a channel 244 bolted at 246 to a channel 248 welded to the wall 28. Frame 240 includes spaced ends 250 which are welded to a ring 252 within which I pivot a disc 254 upon pins 256 constituting extensions of bolts 258 threaded into the bosses 260 welded to the ends 250. Disc 254 is slotted at 262 for slidably receiving a bar 264 fixedly connected at 266 with a flange 268 carried by the frame 102. Thus the drum 94 may be pulled away from the traction wheel 16 through the medium of the bar 264 and latched in such withdrawn position by inserting a bolt through one of a series of openings 270 in the bar to lie adjacent the face 272 of the disc. Such adjustment of the drum 94 will pivot the plates 100 downwardly about the shaft 128, which adjustment will also shift the shaft 170 downwardly. However, the universal joints 174 and 182 will accommodate such shifting of the shaft 128 and the telescopic relation between the square end 176 and the shaft part 178 accommodates any lengthening or shortening of the driving connection.

It will thus be seen that I have provided a spreading unit which may be effectively associated with trucks of conventional design for

spreading road surfacing material in a uniform manner upon the face of the road. The unit is easily and quickly connected with the truck body and one of the rear wheels of the truck constitutes a source of power for the feed screw. Door **40** is adjustable to vary the amount of material delivered to the road surface. The door **40** cannot swing inwardly beyond the position of Figure 4 because of the abutting relation between the hinges **44** and the flange **274** extending along the lower edge of the wall **30**. However, the door **40** is free to swing outwardly.

I claim:

1. In a dump truck having a traction wheel, a hopper mounted on the dump truck and having an opening in its bottom, a rotary feed member lying in said opening, a first frame pivotally connected with said hopper, a second frame pivotally connected with said first frame, a rotary friction member carried by said second frame and engageable with one of said traction wheels to be rotated thereby, a third frame carried by said hopper, a telescopic shaft having universal joints rotatably carried by said second and third frames, a driving connection between said friction member and said telescopic shaft, and means for pivoting said first and second frames to respectively move said friction member into and out of engagement with said one of the traction wheels.

2. The invention described in claim 1 wherein there is provided a motion conversion means operatively connecting said telescopic shaft with said rotary feed member and actuated through reverse rotation of said telescopic shaft for rotating said rotary feed member in one direction only regardless of the direction of rotation of said telescopic shaft.

3. The invention described in claim 1 wherein tensioning means interconnect the dump truck with said second frame for yieldingly holding said friction member against said one traction wheel.

ERIC H. OLSEN.