Nov. 22, 1955 H. L. OSWALT 2,724,481

ENSILAGE LOADER

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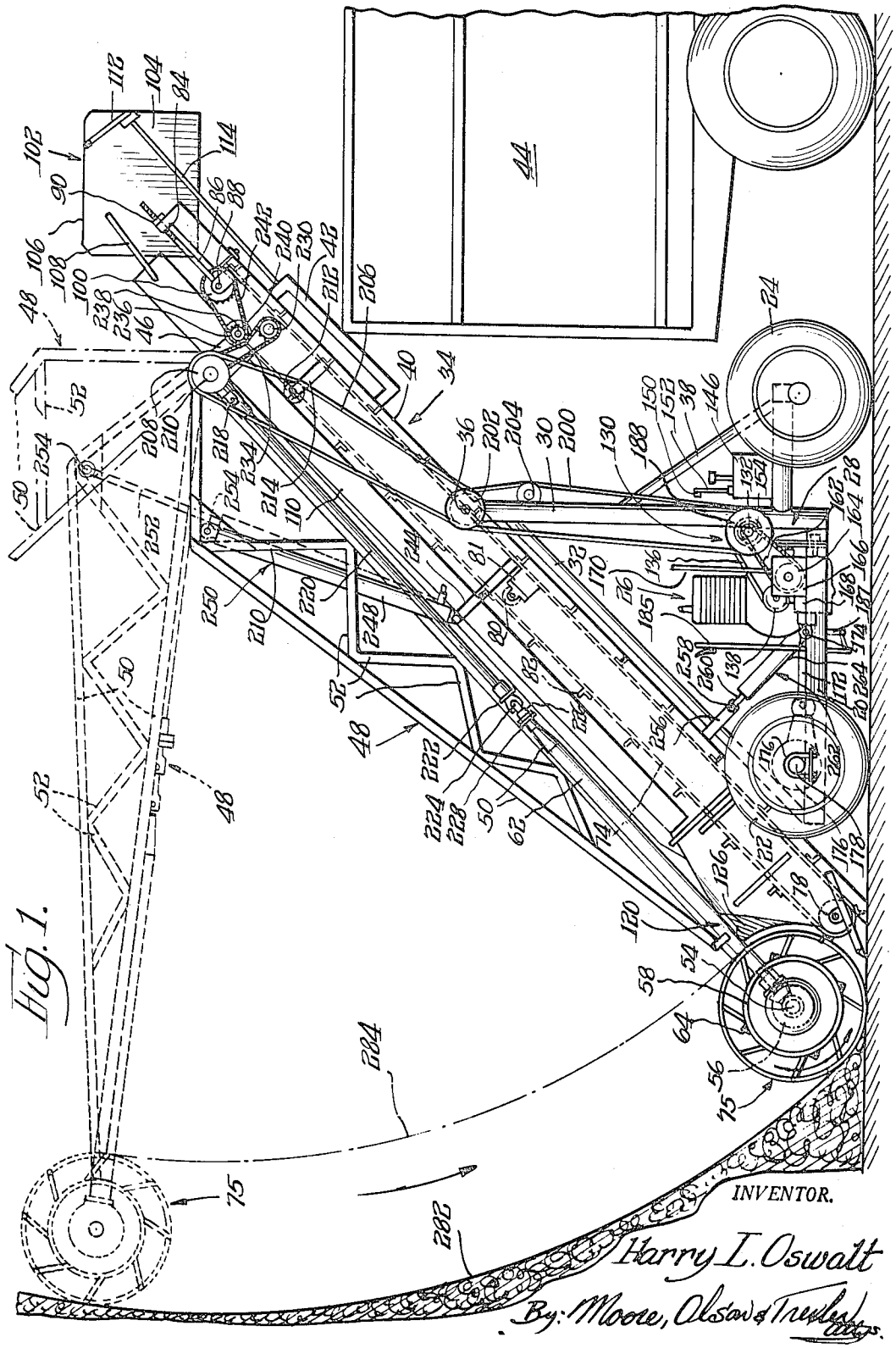


Fig. 1.

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Fig. 2.

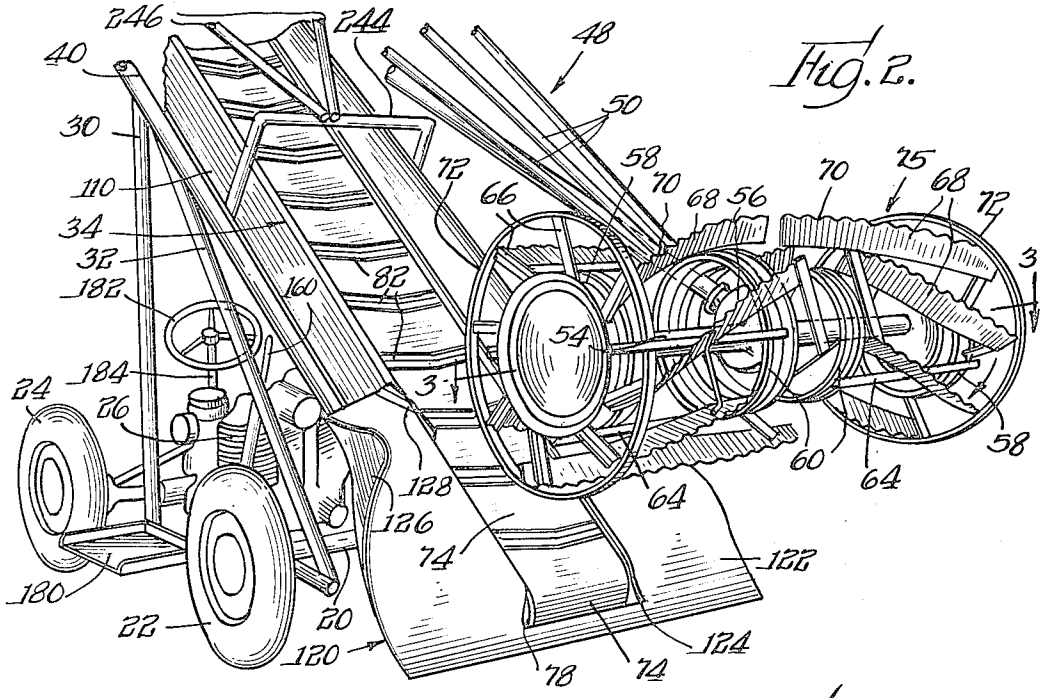


Fig. 3.

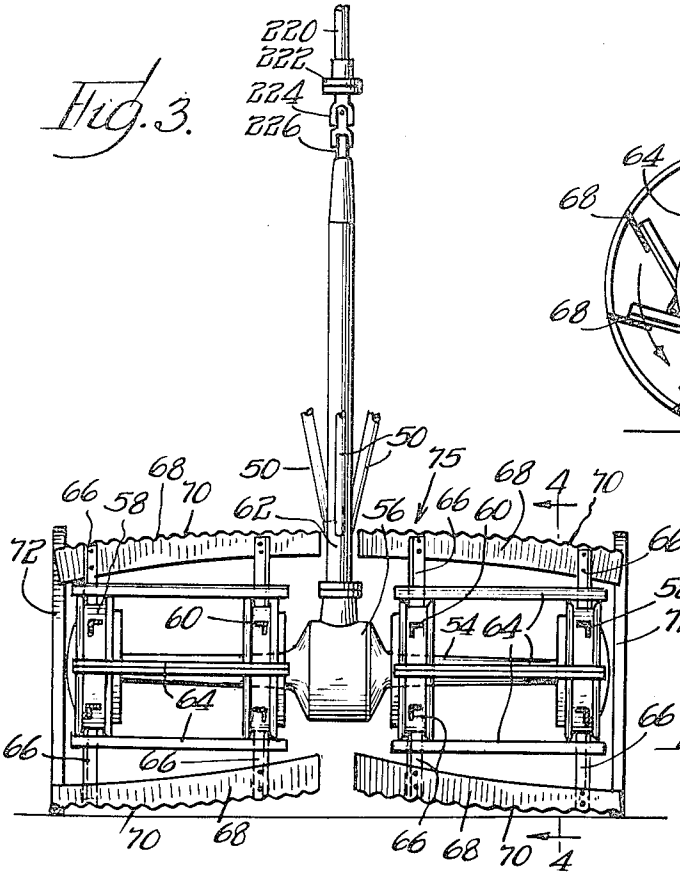
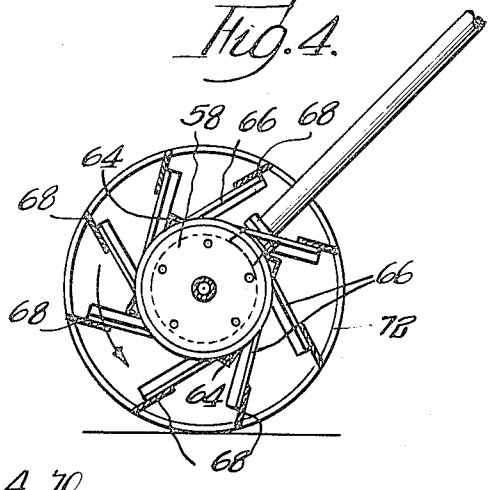


Fig. 4.



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Fig. 5.

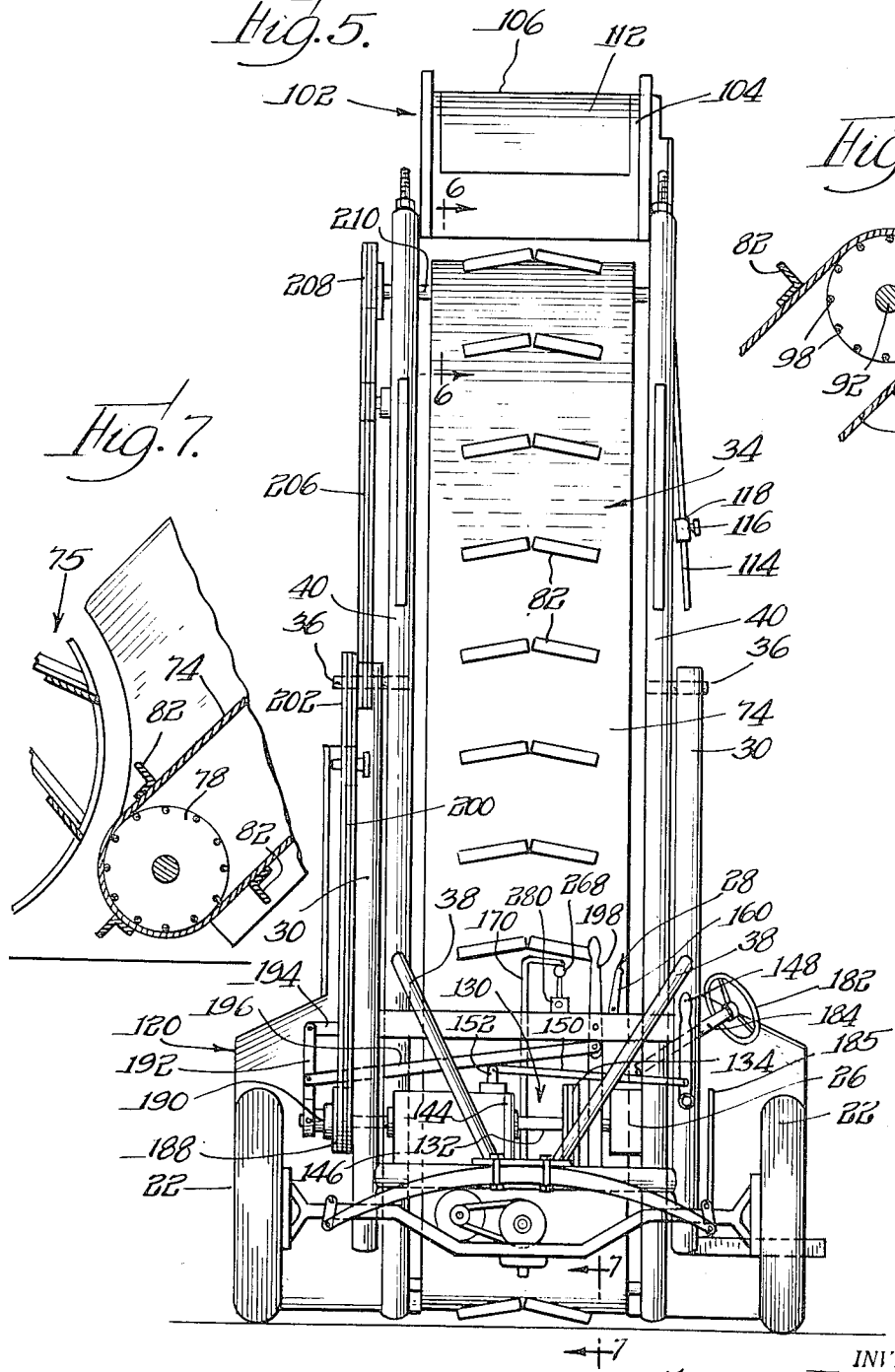


Fig. 6.

Fig. 7.

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Fig. 8.

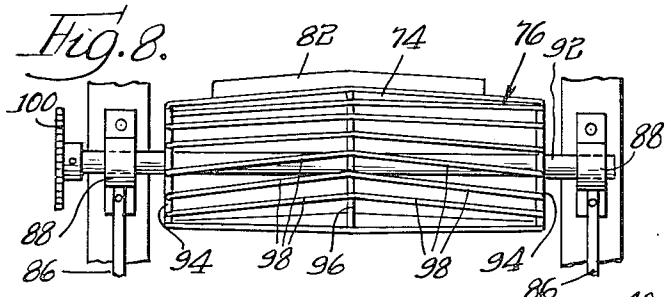


Fig. 9.

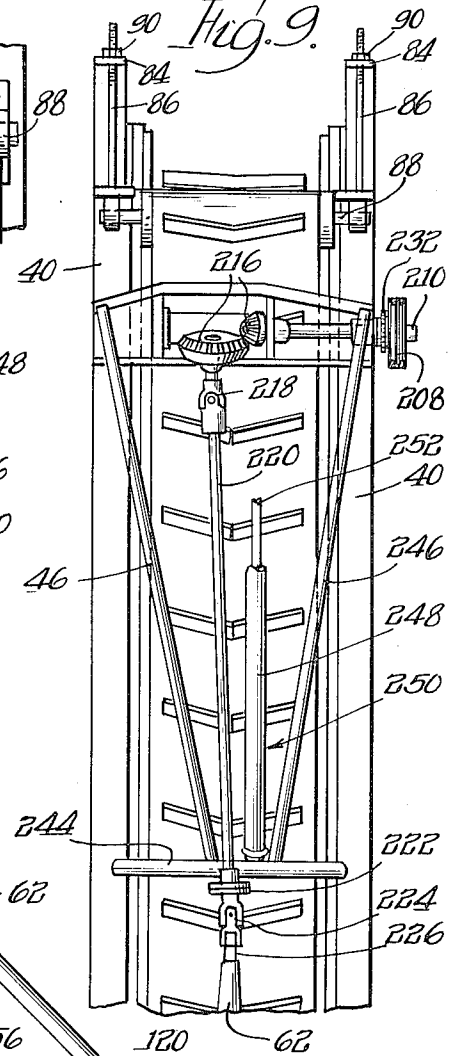


Fig. 10.

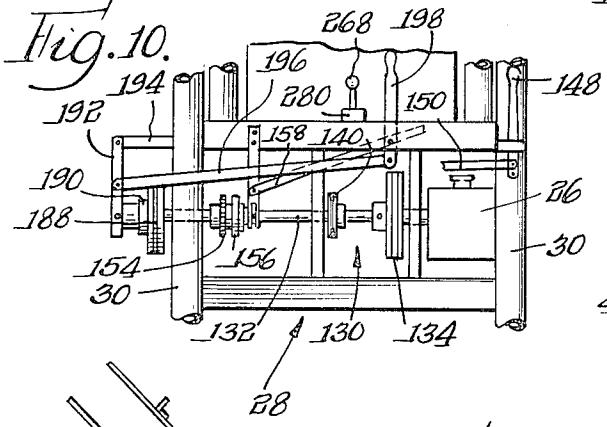
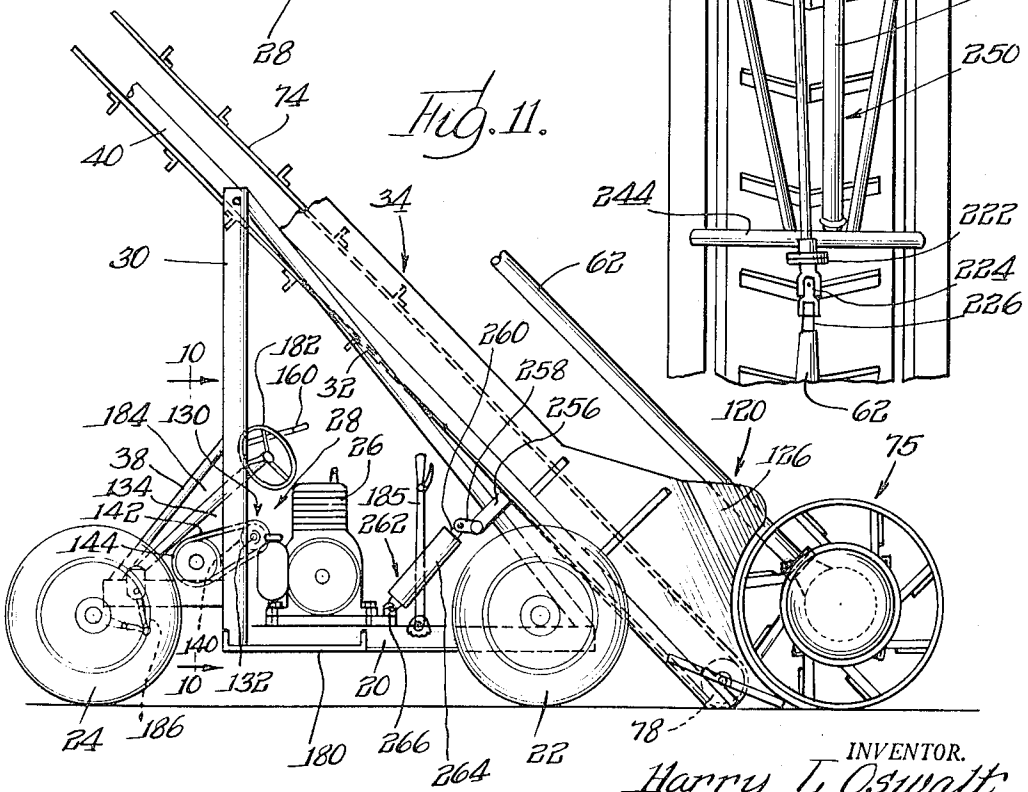


Fig. 11.



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2,724,481

ENSILAGE LOADER

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Application March 20, 1953, Serial No. 343,569

14 Claims. (Cl. 198—9)

This invention is concerned with a mechanical ensilage loader.

In many farming areas where large quantities of stock feed must be stored, it is more convenient and economically more feasible to utilize trench silos than to erect buildings for such storage. Large excavations or trenches are formed in the earth and crops such as corn, alfalfa, grass, sorghums and the like are chopped green and are packed in the trenches to ensile. Huge quantities of ensilage are stored in this manner and must be removed from the trenches from time to time for feeding purposes.

After storage for an extended period the ensilage is thoroughly matted and interlocked. Prior mechanical loaders have been constructed for mechanically loading ensilage from trench silos into trucks, wagons, or the like. Such loaders generally resemble mechanical forks mounted on a tractor or truck and dig into the face of the ensilage in a manner similar to hand forks. Such an action leaves a considerable amount of loosened ensilage to be exposed to the air, causing it to dry out and to mold. This reduces the nutritional value of the ensilage as feed, and in extreme cases will poison the animals eating it. The loaders often have included rotary devices designed to dig into the ensilage, and these rotary devices have tended to climb up the face of the pile without removing a satisfactory quantity of ensilage. In addition to the spoilage, the rough and loose edges on piles of ensilage left by prior loaders have made walking on top of the piles of ensilage extremely dangerous as such rough and loose edges are likely to collapse suddenly to drop a person to the bottom of the trench. For these and other reasons, prior mechanical ensilage loaders have been failures, and it has been generally necessary to load ensilage from a trench silo by hand. This is an extremely slow and tedious process and also results in frayed edges leading to spoilage of the ensilage and making walking on a pile of ensilage dangerous.

It is an object of this invention to provide a new or improved mechanical ensilage loader which forms straight walled cuts down a face of a pile of ensilage without disturbing the remainder of the ensilage and leaving smooth, tightly packed edges which prevent spoilage and makes it safe to walk upon the pile substantially up to the very edges thereof.

Another object of this invention is to provide an ensilage loader capable of loading ensilage at a much higher rate of speed than heretofore thought possible.

A further object of this invention is to provide a mechanical ensilage loader having a rotatable reel for removing ensilage from the face of a pile of ensilage with no tendency of the reel to climb the pile.

Yet another object of this invention is to provide a mechanical ensilage loader having a reel for cutting into a pile which pulls the ensilage in toward the center of an underlying conveyor for most efficient loading on to the conveyor.

A still further object of this invention is to provide a

mechanical ensilage loader having a conveyor or elevator in the form of a ramp the lower end of which is formed in a bulldozer design to scrape up loose ensilage from a floor of a trench for driving the same against a pile of ensilage to facilitate loading.

Yet another object of this invention is to provide a mechanical ensilage loader having an elevator or conveyor provided with "squirrel cage" conveyor belt rollers to prevent building up of ensilage deposits on the rollers and subsequent jamming or faulty operation of the conveyor.

Other and further objects and advantages of the present invention will be apparent from the ensuing description when taken in connection with the accompanying drawings wherein:

Fig. 1 is a side view of an ensilage loader constructed in accordance with the principles of my invention;

Fig. 2 is a perspective view of the machine particularly showing the reel and conveyor;

Fig. 3 is a longitudinal sectional view through the reel taken along the line 3—3 of Fig. 2;

Fig. 4 is a cross-sectional view of the reel taken along the line 4—4 of Fig. 3;

Fig. 5 is a front view of an ensilage loader;

Fig. 6 is a cross-sectional view taken along the line 6—6 of Fig. 5 and showing the squirrel cage roller at the top of the conveyor;

Fig. 7 is a cross-sectional view of the lower end of the conveyor taken along the line 7—7 of Fig. 5;

Fig. 8 is a detail view of one of the conveyor rollers;

Fig. 9 is a fragmentary top view of the loader showing some of the operating parts thereof;

Fig. 10 is a detail view taken along the line 10—10 of Fig. 11 showing the jack shaft assembly; and

Fig. 11 is a partial side view of the loader illustrating certain of the controls and drive connections.

An ensilage loader constructed in accordance with the principles of my invention in some respects resembles previous loaders of one sort or another in that it has an inclined elevator or conveyor for raising ensilage to drop it into a truck or the like, and a rotatable reel mounted on the end of a pivotally mounted boom for displacing ensilage from a pile thereof so that the ensilage will fall down on to a conveyor. Prior loaders have failed because the reels have been designed to dig into a pile of ensilage. This has required tremendous power, has tended to make the reels climb the piles, and has left ragged edges on the piles.

Failure of such prior machines to operate successfully has been due to the natural toughness, resiliency, and matted character of the ensilage. I have found that these very characteristics which heretofore have defeated successful operation of mechanical loaders can be utilized to advantage in loading ensilage. More specifically, I have invented a reel having blades thereon that lean backwardly relative to the direction of rotation of the reel from a radius thereof. These blades have no tendency to dig into the pile of ensilage and therefore impart no tendency to the reel to climb up the face of a pile of ensilage. It may appear at first blush that a reel thus constructed would be entirely inoperative, but I have found that the toughness, resiliency, and matted characteristics of the ensilage cooperate with such a reel for admirable loading characteristics.

Each backwardly leaning blade compresses the surface of the ensilage. As soon as the blade has passed, the compressed ensilage actually pops up into the air a slight distance where it is encountered by the succeeding blade and swept from the pile, that blade at the same time compressing additional ensilage which immediately thereafter pops into the air to be knocked from the pile by the next succeeding blade in a continuous sequence.

For an understanding of an ensilage loader incorporating my reel and other novel and desirable features, reference first should be had to Figs. 1 and 2. The ensilage loader comprises a frame **20** provided with a pair of rear drive wheels **22** of conventional pneumatic tire construction, and a pair of steerable front wheels **24**. The frame carries an internal combustion engine **26**. In actual practice I have found an eleven horsepower air cooled gasoline engine to be quite adequate for propelling the loader and to be quite adequate for operating it in loading operations. The motor acts through suitable drive connections **28** later to be described in detail to drive the rear wheels **22** for propelling the loader along the ground, and also to drive the reel and elevator shortly to be described.

The frame **20** is provided with an upstanding portion **30** which is braced in upright position by an upright brace **32**. An elevator or conveyor **34** is pivotally mounted by any suitable means on a cross bar or hinge bolt **36** at the top of the upstanding frame portion **30** and will be described in detail shortly.

The upstanding frame portion **30** is further braced from the main frame **20** by diagonally disposed front braces **38**. The elevator or conveyor **34** includes an elevator frame **40** which, like the previously described frame members, preferably is formed of steel tubing. The frame is provided with angle guards **42** to limit the position of the elevator or conveyor relative to a truck **44**.

A pair of support members **46** extends upwardly at right angles from the frame **40** near the upper end thereof and pivotally supports a boom **48**. The boom **48** is of welded tubular construction and is of substantially triangular cross section. The boom **48** includes longitudinal members **50** interconnected by diagonally disposed brace members **52**.

The outer end of the boom is provided with an automobile rear axle **54** (Figs. 1–4) including a locked differential **56**. A pair of automobile wheels **58** is mounted on the opposite ends of the axle to be driven thereby, and a pair of similar wheels **60** is rotatably mounted on the axle adjacent the differential **56** on opposite sides thereof and lying outside of the boom **48** which tapers to a narrow end on a drive shaft housing or sleeve **62** extending from the differential **56**. The wheels **58** and **60** are connected in adjacent pairs by angle irons **64** which have the flanges welded to the wheels with the apexes extending outwardly.

Each of the wheels **58**, **60** is provided with a plurality of outwardly extending angle members **66** which lean backwardly relative to the direction of rotation, the direction of rotation being counterclockwise in Figs. 1 and 4 and clockwise in Fig. 2. Curved blades **68** are mounted on the angle members **66** by means such as rivets. The blades **68** are positioned so that the outer ends thereof lead the inner ends as clearly may be seen in Fig. 2, and the blades preferably are provided with serrated outer edges **70**. This angular disposition of the blades causes them to tend to feed ensilage in toward the center so that substantially all of the ensilage drops on the elevator or conveyor **34** instead of dropping loosely past the edges thereof. A ring or hoop **72** encircles and is secured to the blades **68** at the outer ends thereof. These two rings or hoops serve as floats and serve to prevent the aforesaid structure mounted on the axle **54** and comprising a reel **75** from jerking or bumping up and down as each blade engages the ensilage.

In addition to the aforementioned elevator frame **40**, the conveyor or elevator **34** comprises an endless flexible belt **74** (Figs. 1, 2, 5–7, and 11) made of rubber or the like and stretched over upper and lower rollers **76** and **78** respectively. The upper roller **76** serves as a drive roller as will be apparent hereinafter, while the lower roller **78** serves as an idler. One or more idler rollers **80** (Fig. 1) also are supported by suitable brackets **81** on the elevator frame **40** intermediate the rollers **76** and **78** to support the upper reach of the belt **74**. The belt is provided

with a series of spaced apart, V-shaped cleats **82** on its surface. The cleats are formed of angle irons and are arranged so that the apexes of the cleats are downwardly directed on the upper reach of the belt **74** so as to tend to carry ensilage and the like inwardly from the edges of the belt without spilling any over the edges.

The upper end of the elevator frame **40** is provided with a pair of upstanding bosses **84** (Fig. 1) through which extend threaded bolts **86** attached to the brackets **88** mounting the upper roller **76**. The brackets **88** are slidably mounted on the frame **40** by any suitable means so that the belt **74** may be tightened by threading nuts **90** on the ends of the bolts **86** and abutting the bosses **84**.

Ensilage tends to be somewhat sticky at times, and this coupled with the static electrical charge that can build up on a conveyor belt, sometimes tends to cause ensilage to stick to the inner surface of a conveyor belt. The material is carried to the rollers and wedges against the rollers. With conventional solid rollers, the wedge of such material may actually stall the rollers and belt, or it may pass around the rollers causing a thump and stretching the belt undesirably. I have provided new and improved rollers to ameliorate this condition. The rollers **76** and **78** both are constructed the same and the roller **76** is shown in Fig. 8 by way of illustration. The roller **76** comprises a cross shaft **92** (see also Fig. 6) journaled in the bearings or brackets **88**. These bearings preferably are self-aligning pillow block ball bearings. Three discs comprising a pair of end discs **94** and a central disc **96** are mounted on the cross shaft **92**. The end discs **94** are of the same size, and the center disc **96** is ⅜ of an inch larger in diameter to form a crown. A plurality of rods **98** is welded on the plates at the peripheries thereof in herringbone pattern. The herringbone pattern and the crown at the center serve to feed any ensilage on the inner surface of the belt outwardly toward the outer edges of the belt where it will fall off on the ground. The spaces between the bars prevent any wedging of the material between the belt and rollers, and prevent thumping and stretching of the belt when ensilage on the inner surface thereof is carried around the rollers.

A sprocket **100** is secured on the end of the cross shaft **92** as may be seen in Figs. 1 and 8.

The upper or discharge end of the elevator or conveyor **34** is provided with a windshield **102** (Figs. 1 and 5). The windshield comprises a sheet metal enclosure having parallel side walls **104**, and a curved top **106**. The windshield **102** is mounted on the elevator frame and further is supported by brackets **108** at the upper end of side members **110** extending along the sides of the upper reach of the belt to maintain ensilage thereon. The side members **110** conveniently may take the form of one-inch wooden boards. The windshield further is provided with a regulating door **112** pivotally mounted at its upper edge and controlled by a longitudinally shiftable rod **114** extending down along the side of the conveyor **34** to a level where it can be conveniently reached by the hand. The rod **114** is lockable in place by means of a set screw **116** (Fig. 5) threaded into a sleeve **118** through which the rod **114** passes near its lower end. As will be understood, the set screw **116** is provided with a right angularly disposed portion or a hand wheel to facilitate ready hand operation.

The lower receiving or pick-up end of the elevator or conveyor **34** is provided with a bulldozer **120** (Figs. 1, 2, 5, and 11). The bulldozer is in the form of a relatively wide metal sheet **122** mounted on the elevator frame **40** and having a longitudinal central slot **124** for accommodating the belt **74**. The bulldozer **120** is curled upwardly at its upper outer edges as at **126** and is pitched slightly inwardly toward the conveyor belt **74** to urge ensilage in toward the belt. The lower ends of the side members **110** are attached to the upper edges of the

bulldozer in any convenient manner. The extreme upper edges of the bulldozer are turned over as at 128 adjacent the belt 74 so that ensilage cannot fall on to the inner surface of the belt.

The ensilage loader is provided with several drive mechanisms for driving the rear wheels 22, the reel 75, and the conveyor belt 74 from the engine 26. The engine 26 drives a jack shaft assembly 130 (Figs. 1, 5, 10, and 11). The jack shaft assembly 130 is displaced longitudinally of the loader from the engine 26 as readily may be seen in Figs. 1 and 11 and includes a jack shaft 132 journaled in suitable bearings on the upright frame members 30. A double pulley 134 is fixed on the jack shaft and is driven by belts 136 (Fig. 1) passed over the double pulley 134 and over a double pulley 138 on the output shaft of the engine.

The jack shaft 132 is provided in an intermediate position with a pulley 140 (Figs. 10 and 11) which is operative through a belt 142 to drive a pulley 144 on the input shaft of a hydraulic unit 146 (Figs. 1 and 5). A hydraulic pump control lever 148 (Figs. 5 and 10) is pivotally mounted on the upstanding frame 30 and is operative through a link 150 to operate a lever 152 (Figs. 1 and 5) on top of the hydraulic unit 146 to cause the pump in the hydraulic unit to apply pressure to the hydraulic system shortly to be set forth, or merely to bypass hydraulic fluid.

The jack shaft further is provided with a sprocket 154 (Figs. 1 and 10) rotatably mounted on the jack shaft and selectively coupled thereto by a clutch mechanism 156 of any conventional construction and operable by a link 158 suitably connected to a lever 160 (Figs. 2, 5, and 11). The sprocket 154 is connected by a chain 162 (Fig. 1) to a drive sprocket 164 on the input shaft of a right angle gear box 166.

The right angle gear box 166 drives a conventional automobile transmission 168 having an upwardly extending gear shifting lever 170. The transmission 168 drives a drive shaft 172 through a universal joint connection 174, and the drive shaft 172 drives a conventional automobile differential 176 which in turn drives the axle 178 on which the rear wheels 22 are mounted.

In addition to the drive connections just described driving the ensilage loader along the ground, I have provided an operator's platform 180 extending from the left side of the frame 20. A steering wheel 182 is angularly arranged next to the clutch lever 160 for ready accessibility from the operator's platform 180 and is mounted on a steering column 184. The steering column 184 is connected through conventional steering linkage 186 to steer the front wheels 24 for guiding the ensilage loader. A brake lever 185 (Figs. 1, 5, and 11) is positioned adjacent the operator's platform 180 and is connected to the operating member 187 of a conventional drive shaft brake for braking the loader in any desired position.

In addition to the pulleys and the sprocket heretofore set forth on the jack shaft 132, there is provided a double pulley 188 (Figs. 1, 5, and 10) which may be locked to the shaft for rotation therewith by means of a clutch 190 of any conventional construction. The clutch is operable by means of a lever 192 pivotally mounted on a bracket 194 and connected by means of a link 196 to a clutch actuating lever 198.

The double pulley 188 acts through a suitable belt 200 (Figs. 1 and 5) to drive a four groove idler pulley 202 rotatable about the axis 36 around which the conveyor pivots. A suitable idler pulley 204 is provided on the upstanding frame portion 30 to tension the belt 200.

The four groove idler pulley 202 acts through the intermediary of a belt 206 to drive a double V pulley 208 (Figs. 1, 5, and 9) on an upper cross shaft 210. A suitable idler pulley 212 is provided on a bracket 214 on the elevator frame 40 to maintain tension on the belt 206.

The cross shaft 210 acts through suitable bevel gears 216 and a universal joint 218 to drive a reel drive shaft 220. The outer extremity of the reel drive shaft 220 is connected through a slip clutch 222 (Figs. 1, 3, and 9) of any conventional construction and a universal joint 224 to an extension drive shaft 226 housed in the drive shaft housing or sleeve 62. The front end of the drive shaft housing or sleeve 62 is supported by a bracket 228 (Fig. 1) on the boom 48.

A sprocket wheel 230 (Fig. 1) is spaced from a sprocket wheel 232 (Fig. 9) on the upper cross shaft 210 and is drivingly connected thereto by a sprocket chain 234 (Fig. 1). A sprocket 236 on an idler shaft 238 meshes with one reach of the chain 234 and rotates the idler shaft and a sprocket 240 reversely of the upper cross shaft 210. A chain 242 drives the previously mentioned conveyor drive sprocket 100 from the sprocket wheel 240.

The elevator 34 is provided adjacent its mid section with a substantially U-shaped jack stand 244 (Figs. 1 and 9) extending between the elevator frame side members and above the conveyor belt 74. The jack stand 244 is braced by supports 246 extending from the bracket 46 mounting the upper cross shaft 210. The jack stand pivotally carries the lower end of the hydraulic jack cylinder 248 of an upper hydraulic jack 250. The upper hydraulic jack 250 also includes a piston (not shown) and a piston rod 252 the upper end of which is pivotally connected to the boom 48 at 254. Hydraulic pressure in the jack 250 is effective to raise the boom away from the ramp to positions such as those illustrated in dashed lines in Fig. 1.

A substantially U-shaped frame section 256 (Figs. 1 and 11) extends downwardly beneath the lower section of the elevator or conveyor 34 and is connected by means of a link 258 to the piston rod 260 of a hydraulic elevator jack 262. The elevator jack 262 further includes a jack cylinder 264 which is pivotally mounted at the lower end as at 266 to the frame 20.

A hydraulic control lever 268 (Figs. 5 and 10) extends from a hydraulic control valve 280 in a position where it readily can be operated manually by an operator standing on the operator's platform 180. The hydraulic valve 280 is a conventional two-way valve. When in one position it is connected by a hydraulic line (not shown) to the upper jack 250, and when in the other position it is connected by a hydraulic line (not shown) to the elevator jack 262. The hydraulic valve 280 is supplied with hydraulic fluid under pressure from the hydraulic unit 146 when the hydraulic pump control lever 148 is in the proper position. The conduit between the hydraulic unit and the valve has been omitted for clarity of illustration.

Operation

The ensilage loader may be driven to the site under the power of its own engine 26 operated through the various drive connections heretofore specifically set forth including jack shaft assembly 130, sprocket chain 162, gear box 164, transmission 168, drive shaft 172, differential 176, axle 178, and rear wheels 22. For such driving, the hydraulic lever 278 and the hydraulic pump control lever are actuated so as to raise the lower end of the elevator or conveyor from the ground, the reel 75 of course being raised with the conveyor.

On the site, the hydraulic pump control lever 148 is manipulated to allow the lower end of the elevator to drop to the ground as shown in Fig. 1. The hydraulic pump control lever 148 and valve lever 278 then are manipulated to raise the boom 48 to the position shown fragmentarily in dashed lines in Fig. 1. The gear shift lever 170 then is operated in conjunction with the clutch lever 160 to drive the ensilage loader in reverse to force the bulldozer 120 in engagement with the bottom of a pile of ensilage 282 (Fig. 1). The truck 44 is backed beneath the upper or discharge end of the elevator 34 as shown in Fig. 1, the angle guards 42 preventing damage to the conveyor belt by the truck. The pump control lever 148 then is manipulated to release pressure from the upper jack 250

and the weight of the boom and reel causes the boom and reel to descend through the dashed line position shown in Fig. 1 to the solid line position with the reel adjacent the lower end of the elevator. The reel cuts an arcuate swath through the ensilage as indicated at 234. The material cut from the pile drops on to the conveyor belt 74 generally centrally thereof due to the centralizing action of the spiral blades 68 of the reel. The conveyor belt raises the ensilage to the top of the elevator where it is discharged into the truck 44. The windshield 102 prevents the ensilage from being blown away from the truck while the baffle 112 helps to direct the ensilage into one part or another of the truck.

In an ensilage loader constructed in accordance with this disclosure, the reel 75 has an axial length of sixty-six inches, a diameter of thirty inches, and is driven at a rate of sixty-five to seventy-five revolutions per minute. The loader is continuously operable to load approximately 1,000 pounds of ensilage per minute and will load most trucks in less than five minutes.

As aforenoted, the backward tilt or inclination of the blades 68 of the reel 75 is of the utmost importance. Blades that are forwardly inclined tend to cut into a pile of ensilage. This leaves rough and loose edges so that a pile of ensilage or the like is likely to collapse if one walks on the top of it near the edge. Furthermore, the reactive force on forwardly tilted blades or on shredding tines or the like is considerable and tends to cause a rotary cutter to walk up the face of a pile of ensilage or the like unless considerable power is exerted to force the cutter down, and to force the machine away from the pile.

With the rearwardly leaning blades of my reel, there is no tendency for the blades to dig into the pile of ensilage or the like or to grab tufts therefrom. Each of the rearwardly tilted or leaning blades compresses the ensilage which it engages. After each blade has passed, the ensilage which it has compressed pops up into the air due to its natural resilience and is engaged in the air by the next succeeding blade which knocks it away from the pile down on to the elevator, the succeeding blade at the same time compressing additional ensilage which pops into the air for engagement by still another blade. This process continues indefinitely as long as the reel is running until the reel has cut a complete swath through the pile of ensilage. The absence of any tendency to pull tufts of material from the pile results in firm edges which do not collapse even when the pile of ensilage is walked upon up to the very edge. Furthermore, very little reactive force is imparted to the reel since it does not tend to dig into the pile, and the reel has no tendency to climb the pile, but rather drops readily through the pile under its own weight.

The serrations on the edges of the reel blades increase agitation and thereby facilitate the cutting action of the reel. Any loose ensilage which has not dropped directly on to the conveyor belt is readily loaded on to the belt with very little manual effort by virtue of the curved or substantially helical configuration of the reel blades. All that is necessary is to push the loose material against the end of the reel with the back of a hay fork, and the screw action of the reel blades pulls the loose ensilage in toward the center of the reel and on to the conveyor belt.

It will be understood that the ensilage loader may be driven back and forth to form parallel, slightly overlapping swaths. In forming a large number of such swaths, considerable loose ensilage may be deposited on a floor of a trench silo. It is a simple matter to clean this up simply by backing up the loader with the bulldozer 120 scraping along the floor to scoop up the loose ensilage, some of which moves directly on to the conveyor belt 74 by virtue of the shape of the bulldozer, and the remainder of which is pushed up against the pile of ensilage where it readily is fed in toward the conveyor belt 74 by the spiral reel blades 70.

It will be apparent that the inward funneling action of the bulldozer and the spiral reel blades tends to deposit all ensilage on top of the conveyor belt so that very little gathers on the inner surfaces of the belt. The ensilage that does so gather on the inner surfaces does not jam against the belt rollers to stall the conveyor, or to cause thumps and vibration and stretching of the belt in rounding the rollers. The spaces between the bars of the conveyor rollers permit passage of any ensilage on the inner surface of the belt without jamming or thumps, while the slight crown of the rollers and the herringbone pattern of the bars effects feeding of ensilage on the inner surface of the belt toward the outer edges thereof from where it will drop on the ground.

The particular embodiment of the invention herein shown and described is for illustrative purposes only. Various modifications are possible and form a part of my invention insofar as they fall within the spirit and scope of the appended claims.

I claim:

1. In an ensilage loader of the type having a wheeled frame, an elevator mechanism carried by asid frame and adapted to raise ensilage and the like for depositing the ensilage in a truck or the like, means for driving said elevator mechanism, a boom pivotally carried by said frame, and means for pivoting said boom, the combination comprising a rotary device rotatably mounted on said boom for displacing ensilage and the like from a pile thereof toward the lower end of said elevator mechanism, and means for rotating said rotary device in a predetermined direction, said rotary device including a plurality of blades each with the inner edge thereof leading the outer edge in the direction of rotation of said rotary device and disposed at an angle of not more than 90° to the corresponding radius of the rotary device so that the outer portions of the blades engage the ensilage and the like behind inner portions of the blades.

2. In an ensilage loader of the type having a wheeled frame, an elevator mechanism carried by said frame and adapted to raise ensilage and the like for depositing the ensilage in a truck or the like, means for driving said elevator mechanism, a boom pivotally carried by said frame, and means for pivoting said boom, the combination comprising a rotary device rotatably mounted on said boom for displacing ensilage and the like from a pile thereof toward the lower end of said elevator mechanism, and means for rotating said rotary device in a predetermined direction, said rotary device including a plurality of outwardly projecting and axially extending instrumentalities each with the inner edge thereof leading the outer edge in the direction of rotation of said rotary device and disposed at an angle of not more than 90° to the corresponding radius of the rotary device so that the outer portions of the instrumentalities engage the ensilage and the like behind inner portions of the instrumentalities.

3. In an ensilage loader of the type having a wheeled frame, an elevator mechanism carried by said frame and adapted to raise ensilage and the like for depositing the ensilage in a truck or the like, means for driving said elevator mechanism, a boom pivotally carried by said frame, and means for pivoting said boom, the combination comprising a rotary device rotatably mounted on said boom for displacing ensilage and the like from a pile thereof toward the lower end of said elevator mechanism, and means for rotating said rotary device in a predetermined direction, said rotary device including a plurality of spirally arranged blades leaning rearwardly relative to the direction of rotation of said rotary device so that the radially outermost portions of the blades engage the ensilage and the like behind inner portions of the blades.

4. In an ensilage loader of the type having a wheeled frame, an elevator mechanism carried by said frame and adapted to raise ensilage and the like for depositing the ensilage in a truck or the like, means for driving said elevator mechanism, a boom pivotally carried by said

frame, and means for pivoting said boom, the combination comprising a rotary device rotatably mounted on said boom for displacing ensilage and the like from a pile thereof toward the lower end of said elevator mechanism, and means for rotating said rotary device in a predetermined direction, said rotary device including a plurality of blade means leaning rearwardly relative to the direction of rotation of said rotary device so that the radially outermost portions of said blade means engage the ensilage and the like behind inner portions of the blade means, said blade means being spirally arranged with the opposite ends thereof disposed forwardly of the other portions of the blade means at the center of the rotary device relative to the direction of rotation for feeding ensilage and the like from the outer ends of the rotary device in toward the center thereof.

5. In an ensilage loader of the type having a wheeled frame, a boom pivotally supported from said frame, means for pivoting said boom, a rotary device rotatably mounted on said boom for displacing ensilage and the like from a pile thereof, and means for rotating said rotary device in a predetermined direction, the combination including a plurality of blades on said rotary device and each with the inner edge thereof leading the outer edge in the direction of rotation of said rotary device and disposed at an angle of not more than 90° to the corresponding radius of the rotary device, so that the radially outermost portions of the blades engage the ensilage and the like behind inner portions of the blades, a conveyor elevator mechanism carried by said frame for receiving ensilage displaced from a pile by said rotary device and for raising the same for delivery into a truck or the like, said elevator mechanism including an endless belt and a pair of spaced apart rollers over which said belt is passed, said rollers each being of squirrel cage configuration and having parallel, spaced apart bars defining the outer surface thereof, and means for rotating at least one of said rollers for driving said belt.

6. In an ensilage loader of the type having a wheeled frame, a boom pivotally supported from said frame, means for pivoting said boom, a rotary device rotatably mounted on said boom for displacing ensilage and the like from a pile thereof, and means for rotating said rotary device in a predetermined direction, said rotary device having a plurality of outwardly extending instrumentalities for engaging ensilage and the like, the combination comprising a conveyor elevator mechanism carried by said frame for receiving ensilage displaced from a pile by said rotary device and for raising the same for delivery into a truck or the like, said elevator mechanism including an endless belt and a pair of spaced apart rollers over which said belt is passed, said rollers each being of squirrel cage configuration and having parallel, spaced apart bars defining the outer surface thereof, and means for rotating at least one of said rollers for driving said belt.

7. In an ensilage loader of the type having a wheeled frame, a boom pivotally supported from said frame, means for pivoting said boom, a rotary device rotatably mounted on said boom for displacing ensilage and the like from a pile thereof, said rotary device including a plurality of outwardly projecting instrumentalities for engaging ensilage and the like, and means for rotating said rotary device, the combination comprising an elevator mechanism carried by said frame and adapted to raise ensilage displaced by said rotary device for depositing in a truck or the like, said elevator mechanism including an endless conveyor belt and a plurality of spaced apart squirrel cage rollers over which said belt is passed, each of said rollers having a larger diameter at the center than at the ends and having a plurality of bars arranged in a herringbone pattern about the circumference thereof, and means for rotating at least one of said rollers for driving said belt.

8. In an ensilage loader of the type having a wheeled frame, a boom pivotally supported from said frame, means for pivoting said boom, a rotary device rotatably mounted on said boom for displacing ensilage and the like from a pile thereof, and means for rotating said rotary device in a predetermined direction, said rotary device including a plurality of outwardly projecting instrumentalities for engaging ensilage and the like to displace the same from a pile thereof, the combination comprising an elevator mechanism including an endless belt for raising ensilage and the like displaced by said rotary device for loading into a truck or the like, means for driving said belt, and a windshield at the upper end of the belt for preventing ensilage and the like from being blown astray, said windshield having a discharge opening and a damper in said opening for controlling the flow of ensilage and the like therefrom.

9. A rotary device for use in ensilage loaders and the like and adapted for rotation in a given direction for displacing ensilage and the like from a pile thereof, comprising a plurality of blades, having relatively broad ensilage engaging surfaces and means for supporting said blades in arcuately spaced array with the surfaces of the blades each with the inner edge thereof leading the outer edge in the direction of rotation of said rotary device and disposed at an angle of not more than 90° to the corresponding radius of the rotary device so that the outer portions of the blades engage the ensilage and the like behind inner portions of the blades.

10. A rotary device as set forth in claim 9 wherein the outer edges of the blades are serrated.

11. A rotary device as set forth in claim 9 wherein the blades are spirally arranged with opposite axially spaced ends thereof in advance of the blades adjacent the mid section of said device for feeding material from the ends of the device in toward the center thereof.

12. A rotary device as set forth in claim 11 wherein the outer edges of the blades are serrated.

13. A rotary device for use in ensilage loaders and the like and adapted for rotation in a given direction for displacing ensilage and the like from a pile thereof, comprising a plurality of pressure applying means engageable with the ensilage pile for compressing the surface of said pile so that as said means disengages from the pile upon rotation of said rotary device the inherent resiliency of the ensilage causes the compressed ensilage to spring outwardly from said surface for engagement with a following pressure applying means for sweeping said outwardly sprung ensilage from the pile.

14. In an ensilage loader as claimed in claim 1, wherein ring members are secured to the blades at each end of the rotary device.

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