May 14, 1963 E. A. NATANSON 3,089,733

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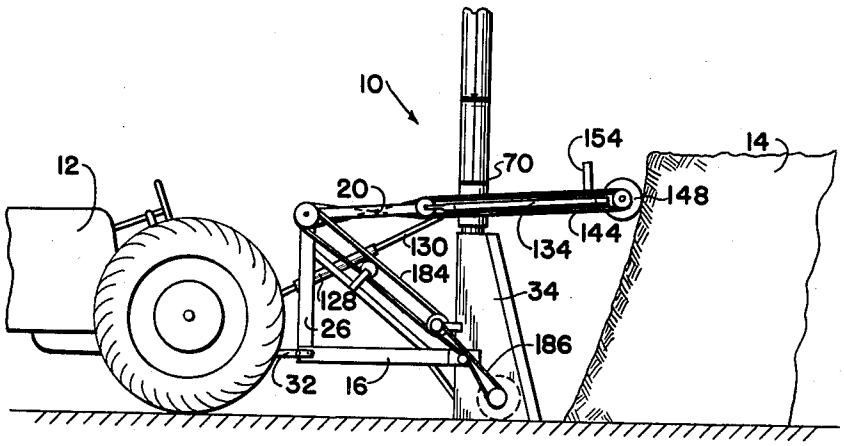


FIG. 1

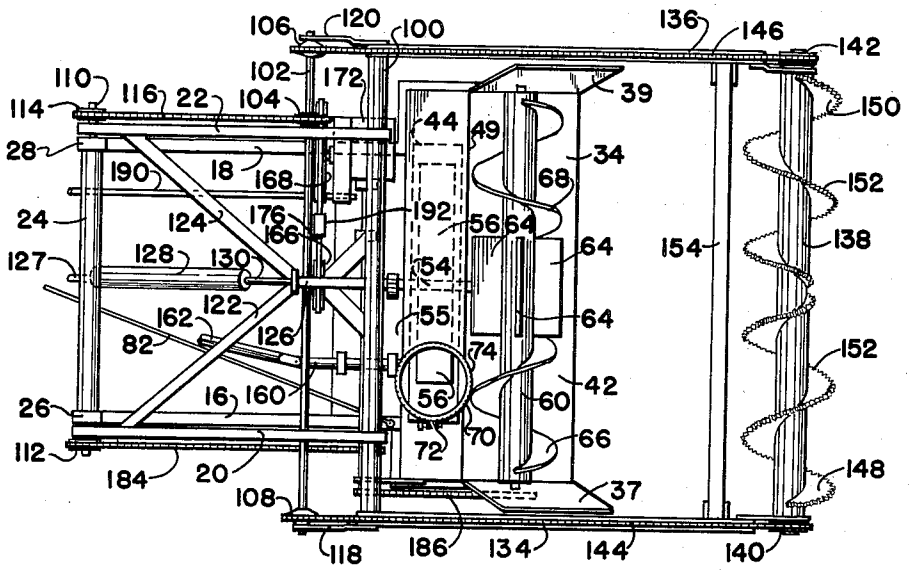


FIG. 2

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May 14, 1963 E. A. NATANSON 3,089,733

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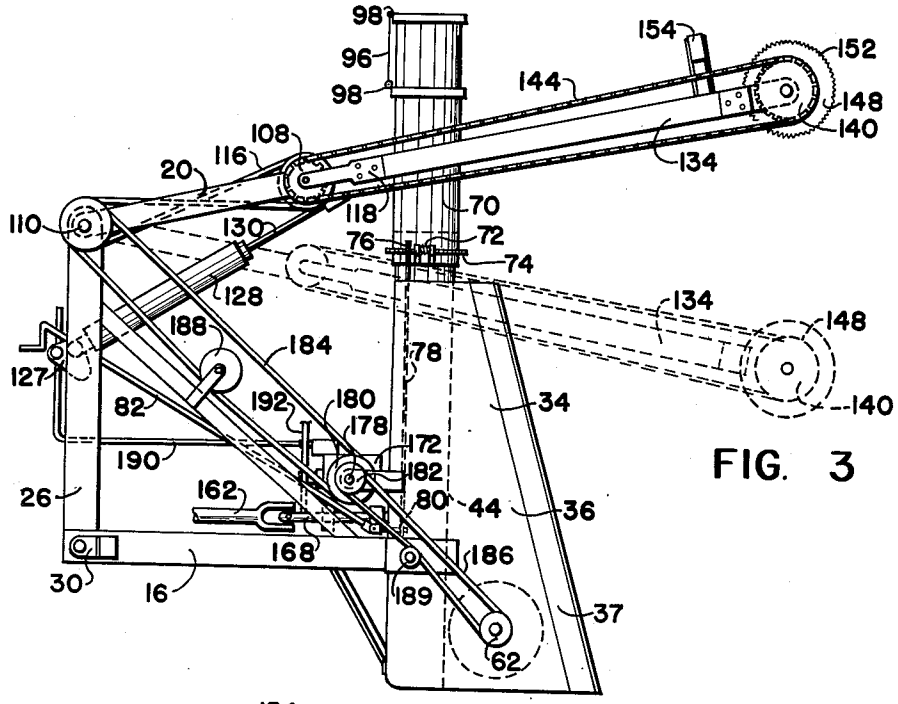


FIG. 3

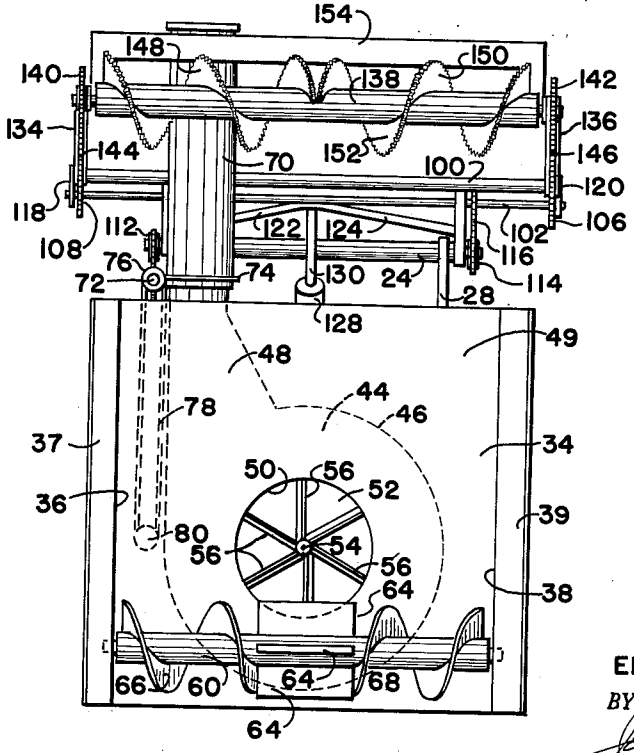


FIG. 4

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May 14, 1963 E. A. NATANSON 3,089,733

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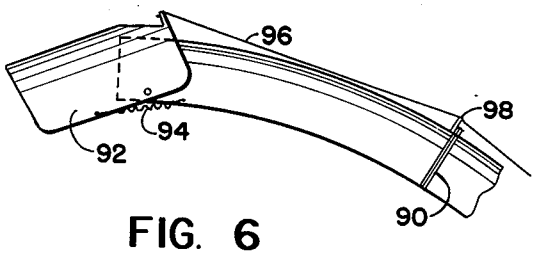


FIG. 6

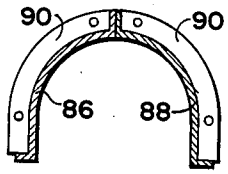


FIG. 7

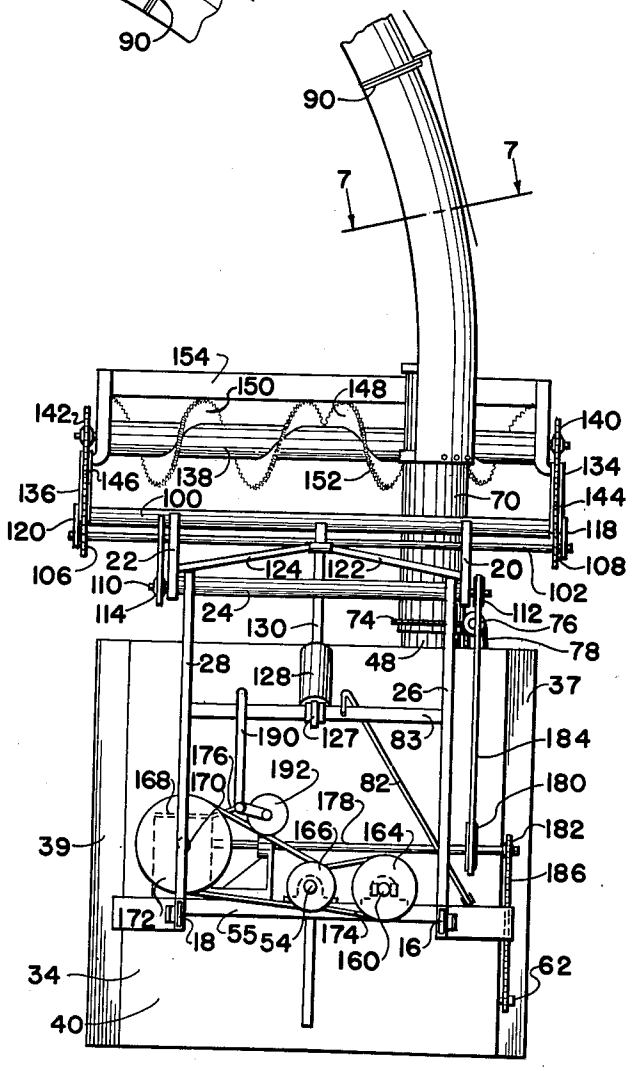


FIG. 5

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3,089,733

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Filed Nov. 15, 1960, Ser. No. 69,471
6 Claims. (Cl. 302—56)

This invention relates to conveying and/or loading means. More particularly, the invention relates to loading means for ensilage and the like. In a still more specific aspect, the invention relates to means for loosening and conveying ensilage and the like from silos, particularly trench silos, and for loading same onto a vehicle.

Many types of loading and/or conveying means are known to the prior art. The prior art devices are primarily designed for and utilized with materials which are readily easily accessible to the loading and/or conveying devices. These structures are not readily adaptable for use with specialized products or goods. Furthermore, many of the prior art devices do not include means for transferring the article or product from its stored location to the conveying devices. Also, some of the prior art structures require excessive manpower, making these structures economically unfeasible for use on small farms.

During recent years the use of trench silos to store agriculture products has increased substantially. These trench silos normally consist of a relatively deep and wide trench dug into the earth into which the farm product is placed for storage. These silos are particularly advantageous, since they are relatively easy to construct in comparison to the normal silo above the ground, and negligible losses result therefrom due to weather effect and the like. However, these trench silos have not been utilized to their fullest extent due to the problems encountered in removing products stored therein. Mechanical means for removing ensilage from these trench silos have been constructed, however they have generally proved unreliable in use and/or relatively expensive and therefore not generally acceptable to the average farmer.

In accordance with the present invention new means are provided to remove material from storage areas. In a preferred specific embodiment of the invention, a blower structure is provided to receive material and discharge same thereferom onto a transporting vehicle. Conveyor means are preferably used in connection with the blowing apparatus to convey the material from the storage area into the blowing structure. Preferably, two such conveying structures are utilized, one adjacent to the blowing structure and the other being movable so as to loosen and convey the material from the storage structure to the conveying apparatus which move the material to the blowing structure. Chute means are preferably provided to direct the discharged material in the desired direction, and preferably the chute means is made adjustable so as to change the direction and distance the material is conveyed from the storage area. Preferably, the loader is constructed and adapted to load farm products and to be carried by a tractor or the like and operated by power take-off means therefrom.

Accordingly, it is an object of the invention to provide new conveying means.

Another object of the invention is to provide new conveying and loading means particularly constructed and adapted for use with trench silos and the like.

A further object of the invention is to provide new loaders for ensilage and the like incorporating means to loosen ensilage.

Another object of the invention is to provide a new loader having means therewith to accurately control the direction and distance of the material conveyed.

A still further object of the invention is to provide a new loader particularly designed for use in trench silos having movable means therewith to loosen and convey material stored in the silo.

A further object of the invention is to provide new loading means which are relatively easy to operate and inexpensive to construct and use.

Another object of the invention is to provide a new loader operable with a minimum of manpower.

Various other objects, advantages and features of the invention will become apparent to those skilled in the art from the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a side elevation view of a preferred specific embodiment of the loader of the invention in operation.

FIG. 2 is an enlarged top plan view of such.

FIG. 3 is a side elevation view of same.

FIG. 4 is a front elevation view of such.

FIG. 5 is a rear elevation view.

FIG. 6 is a partial elevation view showing the upper or outer end portion of the chute preferably used with this loader.

FIG. 7 is an enlarged cross section view taken along the line 7—7 of FIG. 5.

The following is a discussion and description of a preferred specific embodiment of the new loader of the invention, such being made with reference to the drawings whereon the same reference numerals are used to indicate the same or similar parts and/or structure. It is to be understood that such discussion and description is not to unduly limit the scope of the invention.

Referring now to the drawings in detail, FIG. 1 shows a preferred specific embodiment of the loader of the invention indicated generally at 10 in operating position in a trench silo or the like. The loader 10 is connected to and supported by a tractor 12 of the usual construction or other suitable vehicle means. The ensilage or the like to be loaded is shown at 14 with the loader positioned so as to engage the ensilage and convey same from the silo onto a nearby vehicle, such as a truck or the like, not shown.

Frame means are provided to support the various elements of the structure. These include a lower generally U-shaped frame member having sides or arms 16 and 18 joined at the rear end portion by another frame member (not shown). A similar upper U-shaped frame member has sides or arm members 20 and 22 joined by frame member 24. The two U-shaped frame members have their base portions joined at the sides by upright support members 26 and 28.

Preferably, the lower of the U-shaped frame members is constructed and adapted to be engaged and supported by suitable structure on the tractor 12. Various means can be provided for this, such as the clevis shown at 30, FIG. 3 which receives suitable structure, shown at 32 in FIG. 1. Frame members 16 and 18 can be hollow to telescopically receive supporting structure from the tractor, if desired.

A generally box-like housing 34 is preferably provided an can be positioned between and secured to the outer end portion of side or arm members 16 and 18. Housing 34 preferably includes sides 36 and 38, a back 40 and a bottom 42. Housing 34 is preferably open at the front and the sides 36 and 38 are tapered from top to bottom as indicated in FIG. 3. The forward edges of sides 36 and 38 can be provided with members 37 and 39 which are preferably inclined outwardly to direct loosened ensilage into housing 34.

A blower housing 44 is provided and is preferably secured to the inside face of the back 40 of housing 34. The blower housing 44 includes a generally cylindrical portion 46 which is preferably centrally positioned on back 40 and the top of housing 44 is preferably tapered or shaped as indicated at 48, FIG. 4 to form a generally cylindrical outlet. The outlet 48 preferably extends beyond the top of the box-like housing 34 and one side of the outlet 48 is preferably tangential to the cylindrical por-

tion 46. A plate 49 can be positioned at the front end of housing 44 and is generally parallel to back 40 of housing 34.

The cylindrical portion 46 of the blower fan housing 44 has a central inlet or opening 50 which is preferably centrally located with respect to the cylindrical portion 46. A blower fan 52 is preferably coaxial with the opening 50 and is mounted within the body portion 46 of blower fan housing 44. The blower fan includes a drive shaft 54 which preferably extends through back 40 of housing 34 and is journaled on a shelf 55 which is positioned at the back 40 of the housing and extends between the arms 16 and 18. Fan drive shaft 54 has a plurality of blades 56 secured thereto which extend radially therefrom and longitudinally therealong across the body portion of the blower housing.

A conveyor shaft 60 is rotatably mounted on the sides 36 and 38 of box-like housing 34, preferably the lower and forward portion of the sides. A sprocket 62 is secured to one end portion of the conveyor shaft 60 to turn same in operation.

A plurality of paddles, preferably four in number as shown at 64, are provided and are secured to conveyor shaft 60 to turn therewith. The paddles 64 preferably extend longitudinally along the conveyor shaft 60 and are centrally positioned thereon and extend radially therefrom. The paddles are preferably equally spaced around the conveyor shaft 60 and positioned so as to be adjacent to the inlet or opening 50 in the blower housing 44.

Two coaxial spiral flights 66 and 68 are mounted on the conveyor shaft 60 with one end portion of each of the flights 66 and 68 terminating at one of the paddles 64. The flights 66 and 68 preferably extend in opposite directions around shaft 60 from the paddles 64 to the end portions of the conveyor shaft 60 and are secured to the shaft 60 in any suitable manner, such as by welding, so as to turn therewith. Flights 66 and 68 preferably have a like or common pitch. The paddles 64 and the augers formed by the flights 66 and 68 are preferably dimensioned so that the outer edge portions thereof are spaced slightly from the blower housing 44 and from the bottom 42 of the box-like housing 34. Thus, when ensilage or the like is engaged by the flights 66 and 68, it will be conveyed inwardly from each end of the conveyor shaft 60 to the paddles 64 and the paddles 64 will lift the ensilage or the like from the bottom 42 of the box-like housing 34 into the blower fan housing 44.

A chute 70 is mounted on the cylindrical portion 48 of the blower housing 44 in any suitable manner, such as by cylindrical portion 48 telescopically receiving chute 70. Preferably, chute 70 is rotatably mounted thereon so that ensilage being discharged from the blower housing through the cylindrical portion 48 can be directed as desired onto a receiving vehicle. A preferred manner of making the chute assembly 70 rotatable is illustrated in the drawings wherein a worm gear 72 is rotatably mounted on the upper end portion of the cylindrical portion 48 of the box-like housing 44 and is engageable with teeth 74 formed on a projecting rim on the lower edge portion of the chute 70. The shaft of worm gear 72 also receives a sprocket 76 which in turn receives a chain 78. Another sprocket 80, FIG. 4, is positioned at the side of the blower fan housing 44 and also receives chain 78. The shaft for sprocket 80 is rotatably received by the back 40 of the box-like housing 34. A control rod 82 is connected to the shaft for sprocket 80 by a common universal type connection and extends rearwardly to be held by frame member 83 and positioned within reach of the operator on the tractor 12 so that he may manually rotate the control rod 82 which turns sprocket 80 and sprocket 76. This rotates worm gear 72 which engages the teeth 74 to rotate the chute 70. While this means of rotating the chute 70 is preferred, other structures can be utilized, if desired.

At least the lower portion of chute 70 is preferably made cylindrical as indicated in the drawings. Since the material discharged by the blower fan 52 is normally traveling at a relatively high rate of speed, the upper portions of chute 70, which are normally bent or arcuate so as to direct the material from the blower onto a receiving vehicle, can be made semi-cylindrical in the cross section, the force of the fast moving material causing same to remain within the chute in these areas. This preferred construction of the upper portion of chute 70 is indicated in FIG. 7. This semi-cylindrical portion can be formed by a plurality of arcuate sections 86 and 88 which are secured together along longitudinal edge portions in any suitable manner and lip portions 90 can be provided in each instance to attach the semi-cylindrical portions formed thereby to adjacent ones of the semi-cylindrical portions. Preferably, the outer end portions of the chute is provided with a pivotally mounted ensilage deflector 92 as shown in FIG. 6. The deflector 92 can be spring biased by a helical spring 94 to continually urge the deflector downwardly. A rope, cable or other suitable means as shown at 96 can be attached to the upper portion of deflector 92 and received by guide members 98 on the chute and preferably leads from there to the tractor 12 to be easily reached by the operator thereon. Thus, by the use of rope 96, the position of the deflector can be easily altered to change the distance the ensilage or the like is thrown from the loader.

As will be seen from the foregoing description, a highly versatile discharge system has been provided whereby ensilage or the like received within the blower housing 44 will be moved by the blower fan 52 through the cylindrical portion 48 of the blower fan housing into the chute 70. The upper end portion of the chute is preferably arcuate as described and the deflector 92 thereon can be easily changed or adjusted by the operator on the tractor 12 so as to vary the distance that the ensilage or the like is thrown. Also, since the chute member 70 can be rotated by worm gear 72 acting on the teeth 74, the entire chute assembly can be rotated as desired to change the direction of the discharged ensilage so that as the ensilage loader moves further and further into the ensilage 14 in the trench silo it will not be necessary for the operator on the tractor 12 to stop the entire device and move the truck, trailer or the like receiving the ensilage.

A frame member 100 is provided and is secured to the outer end portions of the side or arm members 20 and 22. Preferably, frame member 100 is round and elongated and extends beyond the sides of arm members 20 and 22 as best seen in FIG. 2. An intermediate drive shaft 102 is preferably rotatably mounted in an intermediate portion of the arm members 20 and 22 and also preferably extends to each side thereof. Sprockets or pulleys 104, 106 and 108 are preferably mounted on drive shaft 102, preferably so that pulley or sprocket 104 is positioned adjacent to frame member 22 and pulley or sprockets 106 and 108 are secured to the outer end portions of the drive shaft 102. An idler shaft 110 is rotatably received by the tubular frame member 24 and has sprockets or pulleys 112 and 114 secured to the outer end portions thereof. Belt or chain drive means 116 connects pulley or sprocket 114 on shaft 110 with sprocket or pulley 104 on shaft 102 to drive shaft 102 in operation.

Arm members 118 and 120 can be provided to connect the end portions of frame member 100 and drive shaft 102 to provide the desired rigidity to the outer end portions of drive shaft 102.

Frame members 122 and 124 are preferably provided and are connected in one end portion to the frame members 20 and 22 respectively. Frame members 122 and 124 are secured in the other end portion to frame or brace structure 126 from frame member 100 and on drive shaft 102.

A servo motor 128 is provided and the operating rod 130 at the end thereof is received by suitable mounting means at the intersection of frame members 122, 124 and 126. The other end portion of servo motor 128 is secured to other mounting means 127 on frame member 83. Servo motor 128 can be either the single or double

acting type and is operated from the tractor in the conventional manner and acts on frame members **122**, **124** and **126** to raise and lower same.

Arms **134** and **136** are secured in one end portion to the outer end portions of tubular frame member **100** and receive in their other end portion a second conveyor shaft **138**. The conveyor shaft **138** is rotatably secured in its end portions to the arm members **134** and **136** and sprockets **140** and **142** are secured to the outer end portions of the conveyor shaft **138**. A chain **144** connects sprocket **140** with sprocket **108** on drive shaft **102**, and a similar chain **146** connects sprocket **142** with sprocket **106** on drive shaft **102**. A brace **154** can be provided between arm members **134** and **136** to make the outer end portions thereof relatively rigid.

Conveyor shaft **138** has two flight conveyors **148** and **150** coaxially mounted thereon and secured thereto in any suitable manner, such as by welding. Flights **148** and **150** preferably meet at the center of the conveyor shaft **138** and extend outwardly therefrom in opposite directions and with a like or common pitch to the end portions of the conveyor shafts **138**. Preferably, flights **148** and **150** have teeth **152** formed thereon to easily and quickly loosen ensilage and the like during use. Similar teeth can also be provided on flights **66** and **68**, if desired. Fiights **148** and **150** on conveyor shaft **138** form augers which loosen and convey ensilage and the like during operation.

A power shaft **160** is journaled on the shelf **55** and a linking member **162** is connected thereto by a common universal type joint and operatively connects the power shaft **160** to power take-off means on the tractor **12**. Shaft **160** has a pulley **164** (FIG. 5) rigidly secured thereto to turn therewith. Fan drive shaft **54** has a pulley **166** rigidly secured thereto and another pulley (not shown) is secured to shaft **54**. A pulley **168** is secured to input shaft **170** of a common gear box **172**. Belts **174** and **176** connect the pulleys on the various shafts to be driven in unison by power shaft **160**. An output shaft **178** from gear box **172** extends over shelf **55** and is generally parallel therewith. The output shaft **178** has pulleys or sprockets **180** or **182** secured to one end portion thereof. Chains or belts **184** and **186** connect pulley or sprocket **180** to the pulley or sprocket **112** and the pulley or sprocket **182** to the pulley or sprocket **62** on conveyor shaft **60**, respectively. Idler pulleys **188** and **189** can be provided as best seen in FIG. 3 to maintain the belts or chains **184** and **186** tight during operation.

An operating rod **190** is connected in one end portion to a wheel **192** and the other end portion thereof extends rearwardly to be positioned within reaching distance of the operator on the tractor **12**. Wheel **192** is designed to engage belt **176** so as to tighten same during operation and cause the pulley **168** on input shaft **170** of gear box **172** to be rotated. This structure permits the fan drive shaft **54** to be rotated by power input shaft **160** without the other structure being operated. Thus, should the fan **52** become overburdened or full, the fan alone can be driven until the ensilage or the like therein is discharged through chute **70**.

The operation of the loader is as follows: the entire device is placed in a trench silo or the like in the general relaion as indicated in FIG. 1 and power shaft **160** is rotated by linking member **162** from the power take-off means of the tractor **12**. This turns blower fan drive shaft **54** and, when wheel **192** tightens belt **176**, it also rotates pulley **168** and input shaft **170** of gear box **172**. The direction of rotation is changed by gear box **172** to rotate shaft **178** and turn pulleys or sprocket **180** and **182**. This rotation drives sprocket **62** and turns conveyor shaft **60** and the flight conveyor **66** and **68** and the paddles **64** thereon. The rotary motion of output shaft **178** is transferred through belt or chain means **184** to idler shaft **110** which in turn drives drive shaft **102** through the chain means **116**. As drive shaft **102** is rotated, the chain means **144** and **146** will rotate conveyor shaft **138** and turn the augers formed by flights **148** and **150**. The upper augers will engage the ensilage **14** and the teeth **152** on the augers will cause same to be shredded or loosened from the relatively high stack of ensilage in the trench. The loosened ensilage will fall downwardly and be received by the housing **34** as the loader is moved rearwardly by the tractor **12**. The upper auger can be moved in an arcuate direction as indicated in the dotted lines in FIG. 3 by operation of the servo motor **128** by the operator on the tractor. This is an important feature of the invention and permits the entire exposed face of the ensilage **14** to be worked on relatively easily to provide a continuous supply of ensilage to the lower augers. The loosened ensilage is received by the lower augers and will be conveyed inwardly to paddles **64** by the flight conveyors **66** and **68** on conveyor shart **60**. The paddles **64** will lift the loosened ensilage and discharge same through opening **50** to the blower fan **52**. As blower fan **52** is rotated the blades **56** will cause the ensilage received within the housing **44** to be discharged upwardly through the chute **70**. Chute **70** can be rotated as desired so as to direct the loosened ensilage onto a nearby vehicle and deflector **92** on the upper end of the chute is advantageous for positively directing loosened ensilage in the desired direction and for the desired distance.

As the loader continues to move rearwardly, the worm gear **172** can be operated from the tractor to rotate chute **70** so that the vehicle being loaded will not have to be moved except very infrequently.

As will be seen from the foregoing description, the ensilage loader is a self-contained unit which can be easily operated by a single individual from tractor **12** with a minimum of effort. This construction of a loader has proved to be very efficient in operation and satisfactory for general use in loading. The entire device is easily disconnectable from the tractor **12** during periods of nonuse.

While the invention has been described in connection with a preferred specific embodiment thereof, it will be understood that this description is intended to illustrate and not to limit the scope of the invention, which is defined by the appended claims.

I claim:

1. An ensilage loader for a tractor having a power take-off means, comprising, in combination, two vertically spaced and normally horizontally disposed U-shaped frame members, the base portion of said U-shaped frame members being joined by upright support members at the sides thereof, the base portion of the lower one of said U-shaped frame members being constructed and adapted to receive supporting structure of said tractor and to be carried thereby, a box-like housing secured to and positioned between the outer end portion of said lower one of said U-shaped frame members, said box-like housing being closed at the back, sides and bottom, being tapered from top to bottom at the front end portion thereof and open at the front, a shelf secured to the back sides of said housing and extending between said outer end portion of said lower one of said U-shaped frame members, a blower housing secured to the inside face of said back of said box-like housing, said blower housing having a generally cylindrical body portion centrally positioned on said back of said box like housing, said blower housing being shaped at the top portion thereof to form a cylindrical outlet extending upwardly beyond said top of said box-like housing, one side of said outlet being tangential to the side of said body portion of said blower housing and disposed vertically, a blower fan centrally mounted in said body portion of said blower housing with the drive shaft thereof extending through said back of said box-like housing and journaled on said shelf, said drive shaft of said blower fan having a plurality of blades extending radially therefrom and extending longitudinally along said drive shaft across said body portion of said blower housing, said

blower housing having a circular inlet opening at the front end thereof coaxial with said blower fan, a conveyor shaft rotatably secured in its end portions to the lower forward portion of said sides of said box-like housing, a sprocket operatively connected to one end portion of said shaft, four straight and longitudinally extending paddles centrally mounted on said shaft and extending radially therefrom, said paddles being equally spaced around said shaft and positioned adjacent said inlet opening in said blower housing, two coaxial spiral flights mounted on said shaft with one end portion of each adjacent one of said paddles, said flights extending in opposite directions from said paddles with a common pitch around said shaft to said end portions of said shaft and being secured to said shaft to turn therewith, the resulting augers and said paddles being dimensioned so that the outer edge portions thereof are spaced from said blower housing and said floor of said box-like housing, a chute rotatably mounted on the upper end portion of said cylindrical portion of said blower housing and extending upwardly therefrom in an arcuate manner, means carried by said cylindrical portion of said blower housing and cooperable with said chute to rotate said chute, an adjustable ensilage deflector pivotally mounted on the outer end portion of said chute, a round and elongated frame member secured to the outer end portion of the upper one of said U-shaped frame members and extending to each side thereof, a drive shaft journaled in an intermediate portion of said upper one of said U-shaped frame members and extending to each side thereof, three sprockets secured to said drive shaft to turn therewith, one of said last-named sprockets being mounted at each end portion of said drive shart and the other of said last-named sprockets being secured to said drive shaft adjacent one side of said upper one of said U-shaped frame members, other frame means connecting the sides of said upper one of said U-shaped frame members and the intermediate portion of said tubular frame member, mounting means positioned between and carried by said upright support members, a servo motor pivotally securable in one end portion to said mounting means, the other end portion of said servo motor being pivotally secured to said other frame means, arms secured in one end portion to opposite ends of said tubular frame member, a second conveyor shaft rotatably secured in its end portions to the other end portion of said arms, two spiral flights coaxially mounted on asid second conveyor shaft, said last-named flights meeting at the center of said second conveyor shaft and extending outwardly therefrom to said end portions of said second conveyor shaft in opposite directions and with a common pitch, said last-named flights having teeth formed on the radial outer edges thereof, sprockets mounted on the end portions of said conveyor shaft, chain means connecting said sprockets on the end portion of said second conveyor shaft with said sprockets on the end portions of said drive shaft, a power shaft journaled on said shelf and connectable to said power take-off means on said tractor, a gear box mounted on said shelf, said gear box having an input shaft and an output shaft, pulleys mounted on said power shaft, said blower fan shaft and said input shaft of said gear box, belts connecting said pulleys so that as said power shaft is turned said blower fan drive shaft will be rotated and said input shaft and said output shaft of said gear box will be turned, said output shaft of said gear box extending over said shelf and having a sprocket at the end thereof, chain means connecting said sprocket on said output shaft of said gear box with said drive shaft on said upper one of said U-shaped frame members to turn said drive shaft and rotate the augers of said second conveyor shaft, and other chain means connecting said output shaft of said gear box with said sprocket on said first-named shaft to rotate said augers and said paddles of said first-named shaft, said device being constructed and adapted so that said augers of said second conveyor shaft can be rotated, said augers and paddles of said first conveyor shaft can be rotated and said blower operated through said power take-off, and said second conveyor shaft moved in an arcuate direction by said servo motor acting on said other frame means, and so that said augers and said paddles of said first-named shaft will receive ensilage and the like loosened by said upper of said augers and deliver same to said blower housing and discharge same therefrom through said chute onto a nearby vehicle.

2. An ensilage loader for a tractor having power take-off means comprising, in combination, two vertically spaced U-shaped frame members, said frame members being joined by support members at the sides thereof, the lower one of said U-shaped frame members being constructed and adapted to receive supporting structure of said tractor and to be carried thereby, a box-like housing secured to the outer end portion of said lower one of said U-shaped frame members, said box-like housing being closed at the back, sides and bottom and open at the front end portion thereof, a shelf secured to the back side of said housing and extending between said lower one of said U-shaped frame members, a blower housing secured in said box-like housing, said blower housing having an inlet opening at the front thereof and being shaped at the top to form an outlet, a blower fan centrally mounted in said blower housing with the drive shaft thereof extending through said box-like housing and journaled on said shelf, a conveyor shaft rotatably secured in its end portions to the sides of said box-like housing, a plurality of longitudinally extending paddles centrally mounted on said shaft and extending radially therefrom, said paddles being equally spaced around said shaft, two coaxial spiral flights mounted on said shaft with one end portion to each adjacent one of said paddles, said flights, extending in opposite directions from said paddles with a common pitch around said shaft to said end portions of said shaft and being secured to said shaft to turn therewith, the resulting augers and said paddles being dimensioned so that outer edge portions thereof are adjacent to but spaced from said blower housing and said box-like housing, a chute adjustably mounted on said outlet of said blower housing and extending upwardly therefrom, other frame means positioned between the sides of said upper one of said U-shaped frame members, mounting means positioned between and carried by said support members, a servo motor pivotally secured at one end portion to said mounting means, the other end portion of said servo motor being pivotally secured to said other frame means, arms operatively connected in one end portion to the outer end portion of said upper one of said U-shaped frame members, a second conveyor shaft rotatably secured in its end portions to the other end portion of said arms, two spiral flights coaxially mounted on said second conveyor shaft, said last-named flights meeting at the center of said second conveyor shaft and extending outwardly therefrom to said end portions of said conveyor shaft in opposite directions and with a common pitch, said last-named flights having teeth formed on the radial outer edges thereof, a power shaft journaled on said shelf and connectable to said power take-off means on said tractor, a gear box mounted on said shelf, said gear box having an input shaft and an output shaft, means connecting said power shaft, said blower shaft and said input shaft of said gear box together for rotation when said power shaft is turned, and means connecting said output shaft with said flight conveyor shafts, said device being constructed and adapted so that when said power shaft is rotated said blower fan will be turned and said output shaft of said gear box will be rotated causing said conveyor shafts to be turned to rotate said augers to loosen and convey ensilage and the like to said blower housing to be discharged therefrom through said chute onto a nearby vehicle.

3. An ensilage loader for a tractor having a power take-off means comprising, in combination, two vertically spaced and normally horizontally disposed U-shaped frame members, said frame members being joined by

upright support members, the lower of said U-shaped frame members being receivable by supporting structure of said tractor to be carried thereby, a box-like housing secured to and positioned between the outer end portion of said lower one of said U-shaped frame members, a shelf secured to the back side of said housing, a blower housing secured to the inside of said housing, said blower housing having an inlet opening at the front thereof and an outlet opening at the top thereof, a blower fan mounted in said blower housing, a conveyor shaft rotatably mounted in said box-like housing, a plurality of paddles centrally mounted on said shaft and extending longitudinally along said shaft, two coaxial spiral flights mounted on said shaft with one end portion of each adjacent one of said paddles, said flights extending in opposite directions from said paddles around said shaft and being secured to said shaft to turn therewith, the resulting augers and said paddles being positioned adjacent to and spaced from said blower housing and said box-like housing, a sevro motor operatively connected to said upper one of said U-shaped frame members and operable to raise and lower same, arms operatively connected in one end portion to the outer end portion of said upper one of said U-shaped frame members, a second conveyor shaft rotatably secured in its end portions to the other end portion of said arms, two spiral flights coaxially mounted on said second conveyor shaft, said flights meeting at the center of said second conveyor shaft and extending outwardly therefrom and secured to said conveyor shaft to turn therewith, a power shaft journaled on said shelf to be turned by said power take-off means on said tractor, said power shaft being operatively connected to the shaft of said blower fan and to the input shaft of a gear box, and connecting means connecting the output shaft of said gear box to said conveyor shafts to turn same when said power shaft is rotated, said ensilage loader being constructed and adapted so that said augers and paddles can be rotated to loosen ensilage and convey same to said blower fan housing so that said blower fan can discharge same therefrom through said outlet in said blower housing and said upper one of said augers can be raised and lowered by said servo motor to loosen ensilage.

4. The ensilage loader as recited in claim 3 further comprising a chute adjustably mounted on said outlet of said blower housing, and means operatively connected to said chute to rotate same to direct ensilage from said blower onto a nearby vehicle.

5. An ensilage loader for use with a tractor or the like having power take-off means comprising, in combination, two spaced upper and lower frame members connected by support members, said lower of said frame members having means connectible to said tractor or the like to be carried thereby, a housing connected to said lower of said frame members, a blower fan mounted in said housing and having an inlet opening at the front thereof and an outlet opening at the top thereof, a shaft rotatably mounted on said housing having means to receive and mount a conveyor, a plurality of spaced paddles mounted on said shaft on an inner portion thereof and extending longitudinally along said shaft, two spiral flights coaxially mounted in mirror image relation on said shaft with the inner end portion of each adjacent said paddles, said flights extending in opposite directions from said paddles around said shaft and being secured to said shaft to turn therewith, the resulting augers and said paddles being positioned adjacent to and spaced from the lower portion of said housing, power means operatively connected to said upper of said frame members and operable to raise and lower same, a second shaft rotatably mounted on said upper of said frame members and having means to receive and mount a conveyor, two spiral flights coaxially mounted in mirror image relation on said second shaft, said flights extending from the center portion of said second shaft outwardly therefrom and secured to said second shaft to form augers, said second shaft being rotatable and when in contact with ensilage or the like to move same inwardly toward said center portion of said conveyor shaft, connecting means operatively connected to said shafts and connectible to a power take-off on a tractor to turn said shafts when said power take-off is operated, said loader being constructed and adapted so that said augers and paddles can be operated to loosen ensilage or the like and convey same to said blower fan so that said blower fan can discharge same therefrom through said outlet in said housing, and said upper ones of said augers can be raised and lowered by said power means to loosen ensilage and move same inwardly toward said center portion of said second shaft.

6. A loader for ensilage or the like comprising, in combination, spaced and interconnected upper and lower frame members, a housing connected to said lower of said frame members, a blower fan rotatably mounted in said housing and having an inlet and an outlet, a first shaft rotatably mounted on said housing, said shaft having at least one longitudinally extending paddle secured thereto for rotation therewith and positioned adjacent said inlet to said blower fan to move ensilage or the like into said inlet of said blower fan, spiral flights mounted on said shaft to turn therewith, said flights being constructed and positioned to in operation convey ensilage or the like to said paddle, a second shaft rotatably mounted on said upper of said frame members, spiral flights secured to said second shaft, said last-named flights being mounted in mirror image relation and extending from the center portion of said second shaft outwardly therefrom along said second shaft with said last-named flights and said second shaft being rotatable in operation when in contact with ensilage or the like to move same inwardly toward said center portion of said second shaft, said upper of said frame members and said second shaft being movable so that said second spiral flights can engage ensilage and the like, and drive means operatively connected to said blower fan and said shafts to turn same and loosen ensilage and the like and convey same to said blower fan to be discharged therefrom onto a nearby vehicle.

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