April 3, 1951 J. KUNZ 2,547,270

BARN CLEANER

Filed July 29, 1946 2 Sheets-Sheet 1

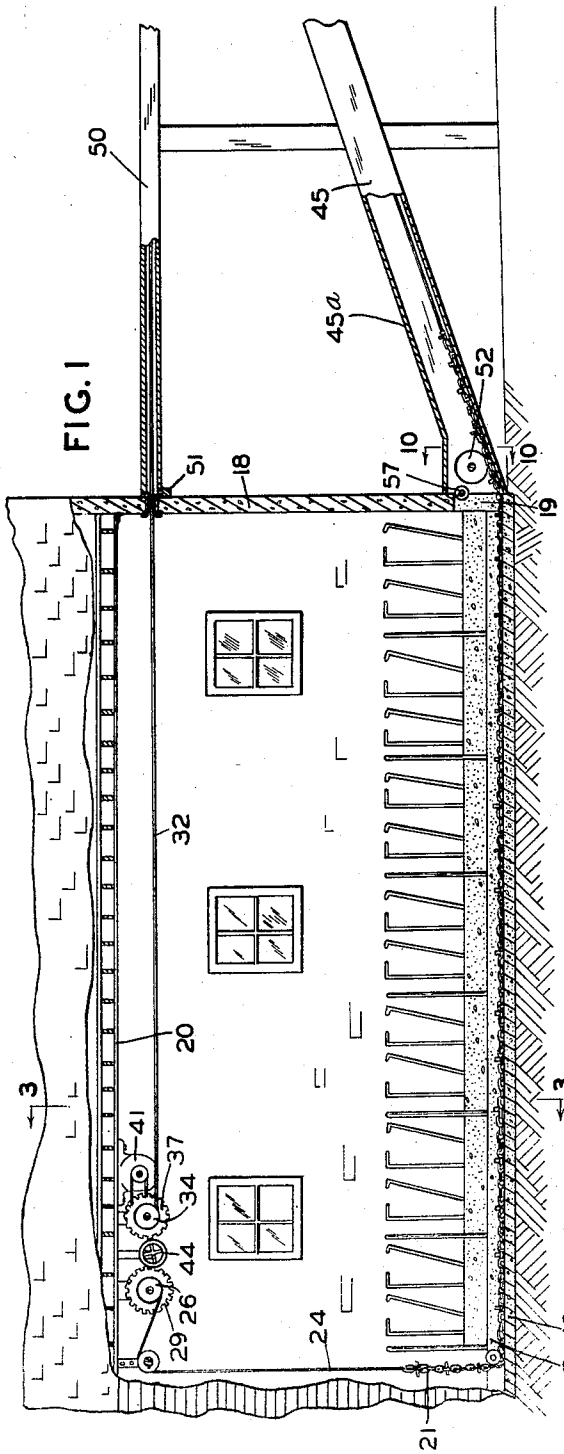


FIG. 1

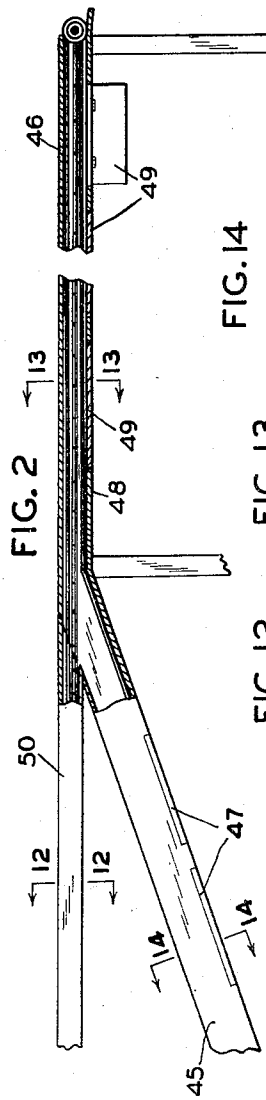


FIG. 2

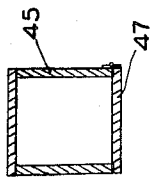


FIG. 14

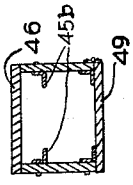


FIG. 13



FIG. 12

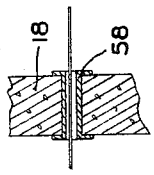


FIG. 15

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FIG. 3

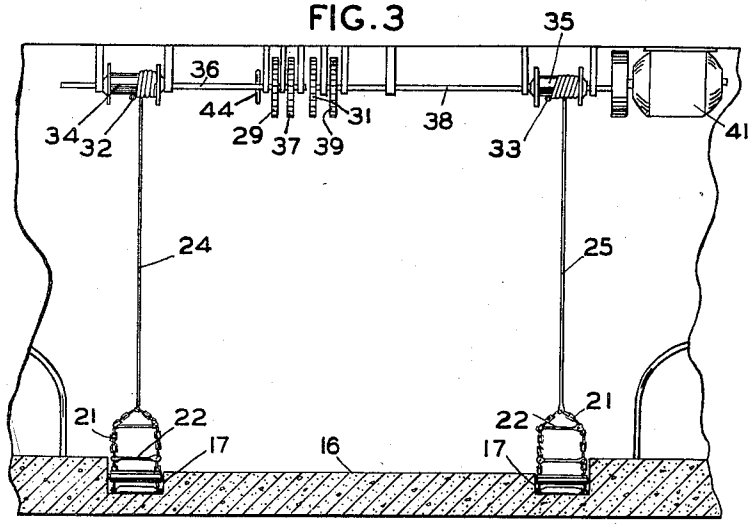


FIG. 4

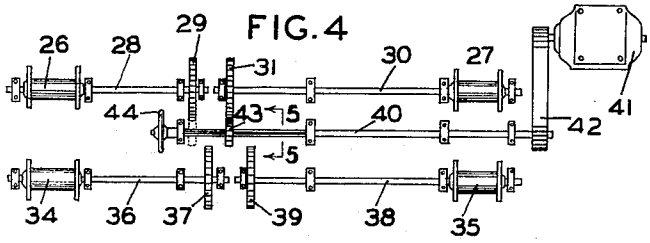


FIG. 5

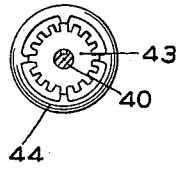


FIG. 7

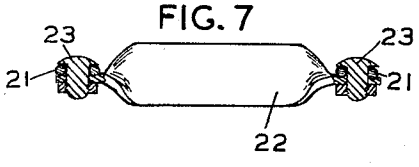


FIG. 6

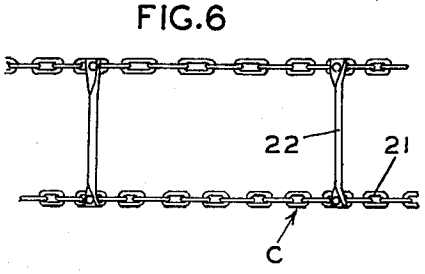


FIG. 8

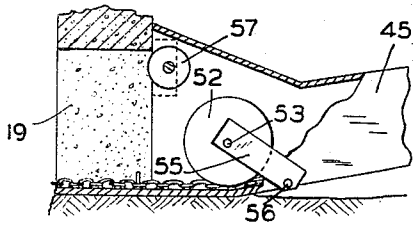


FIG. 9

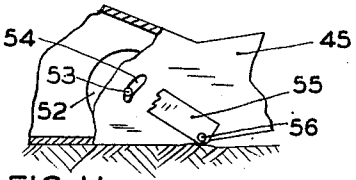
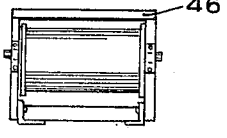


FIG. 11



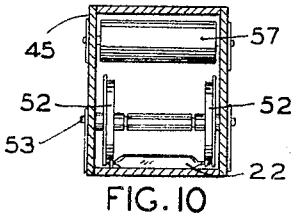


FIG. 10

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BARN CLEANER

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Application July 29, 1946, Serial No. 687,004

5 Claims. (Cl. 198—218)

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This invention relates to barn cleaners. It relates more particularly to that type of cleaner which includes a conveyor member which is movable longitudinally in a gutter in the barn to clean the gutter of droppings and other accumulations.

It is an object of the present invention to provide a barn cleaner of the flexible conveyor type wherein the conveyor is carried from the barn and the material moved thereby is elevated so that such material can be either dumped on a manure pile located outside of the barn or conveniently loaded in a manure spreader or other conveyance.

Another object of the invention is to provide means for selectively dumping manure at different points relative to the conveyor and its supporting trough.

Another object of the invention is to provide means for simply and easily operating the cleaner to move the conveyor outwardly from the end of the gutter and to return the same to a ready position preparatory to the next cleaning operation.

The above and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the views, and, in which:

Figure 1 is a view partially in side elevation and partially in section of a portion of a barn with part of my apparatus incorporated therewith;

Figure 2 is a view partially in section and partially in side elevation of the remainder of the cleaner structure;

Figure 3 is a section taken approximately on the line 3—3 of Figure 1;

Figure 4 is a plan view of the selective power transmission;

Figure 5 is an enlarged sectional view taken approximately on the line 5—5 of Figure 4;

Figure 6 is a plan view of a portion of the conveyor member;

Figure 7 is an enlarged transverse vertical sectional view through the conveyor member;

Figure 8 is an enlarged fragmentary detail with portions in section of the lower portion of the conveyor chute or trough;

Figure 9 is a view similar to Figure 8 showing the guide for the conveyor controlling rollers;

Figure 10 is an enlarged section taken approximately on the line 10—10 of Figure 1;

Figure 11 is an enlarged end view of the structure shown at the right hand side of Figure 2;

Figure 12 is an enlarged section taken on the line 12—12 of Figure 2;

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Figure 13 is an enlarged section taken on line 13—13 of Figure 2;

Figure 14 is an enlarged section taken on the line 14—14 of Figure 2; and

Figure 15 is an enlarged fragmentary sectional view of the barn wall cable guide.

In Figure 1 there is shown a barn having a floor 16 having a gutter 17 therein. This is one of a pair as indicated in Figure 3. The gutters 17 customarily extend along behind each row of stalls in a barn as is commonly understood. The barn is provided with an end wall 18 which has a pair of lower openings 19 therein to provide outlets for the gutters 17. A first floor ceiling 20 is also indicated as part of the barn construction.

A flexible conveyor C is shown in Figures 6 and 7 to be made up of a pair of spaced parallel chains 21 which are connected at spaced intervals by cross members 22, the latter being connected to the chains by means of nutted bolts 23. It should be noted in Figure 7 that the height of the cross members 22 intermediate their ends is greater than the overall height of the nutted bolts 23 and their connections with the chains 21 and the cross members 22. This permits the cross members 22 to drag along the bottom surfaces of the barn gutters. Connected at one end of each of the conveyors C are cables 24 and 25. These cables are connected respectively to winding drums 26 and 27. The drum 26 is mounted on a shaft 28 shown in Figure 4, and said shaft is provided with a gear 29. The drum 27 is mounted on a shaft 30 which carries a gear 31 on its left hand end as viewed in Figure 3 and adjacent and axially aligned with the gear 29.

The opposite ends of the conveyors C have cables 32 and 33 connected thereto, said cables also being connected to and wound upon winding drums 34 and 35. The drum 34 is mounted on a shaft 36 carrying a gear 37 and the drum 35 is mounted on the shaft 38 carrying a gear 39. It will be noted that the gears 29, 31, 37 and 39 are disposed in staggered relation. A power shaft 40 lies between the axis of shafts 28 and 30 and that of shafts 36 and 38. The shaft 40 is driven by suitable means such as an electric motor 41 which is connected to the shaft 40 by a belt 42. A gear 43 is splined on the shaft 40 and shiftable into and out of engagement with any one of the four gears 29, 31, 37 and 39. A small hand wheel 44 is mounted on the left hand end of the shaft 40 so that it can be rocked to assist in disengaging the gear 43 from any one of its complementary gears.

Extending outwardly and upwardly from the

openings 19 in the lower end wall portions of the barn are troughs 45 only one of which is shown, it being understood that one such trough is provided at the end of each gutter 17. Each trough 45 has a closed top 45a and its outer portion may be horizontal as indicated at 46. The bottom of the diagonal trough portion 45 is preferably provided with one or more doors 47 and the horizontal outward end portion 46 of the trough has a bottom 48 with doors 49 therein. There is a conveyor guide 50 which extends from the left hand end of the horizontal portion 46 of the conveyor trough inwardly toward the barn and over the trough portion 45. This conveyor guide 50 cooperates with guide flanges 45b mounted in the upper interior of the horizontal portion of the trough and extending throughout its length to direct the conveyor in its overhead travel from the outer end of the trough to the barn. The left hand end of the conveyor guide 50 is suitably connected to the outer side of the end wall 18 of the barn as at 51. A cable guide 58 shown in Figures 1 and 15 is preferably mounted through the end wall 18 of the barn.

When the gear 43 on the power shaft 40 is connected with one of the gears 37 or 39 to wind one of the cables 32 or 33 upon its respective drum 34 or 35, the corresponding conveyor C will be drawn outwardly through the barn wall gutter outlet opening 19 and diagonally upwardly in the trough 45 to the horizontal trough portion 46. In order to properly maintain the conveyor in the lower portion of the trough where it starts to move diagonally upwardly I provide a pair of flanged rollers 52 on a shaft 53. The shaft 53 lies in arcuate slots 54 formed in the lower side portions of the conveyor trough 45. Said shaft 53 is mounted for rotation in a pair of hangers 55 which are pivotally connected at 56 to the lower side portions of the lower end of the slanting trough 45. As a precaution against the conveyors striking the upper end of the opening when a strong pull is exerted thereon and should the conveyor slip from beneath the rollers 52 there is provided a small relatively fixed roller 57 shown in Figures 1 and 8.

As the conveyor is drawn upwardly through the trough 45 which is closed at its top the droppings are retained in the trough. If it is desired to dump the droppings on a manure pile in the yard one of the doors 49 can be opened leaving the other doors closed so that the particular point of discharge is accurately controlled. When desired of course all the doors can be closed and the droppings of manure can be discharged from the extreme right hand end of the structure shown in Figure 2. Furthermore, material can be dropped from either one of the doors 47 which preferably are high enough to accommodate a manure loader or other conveyance beneath it. By locating the doors at spaced points along the trough it is possible to maintain a manure pile as well as to keep a space free so that the manure can be loaded directly into the wagon. The upward and outward slope of the trough 45 permits the farmer to elevate the manure for loading on a pile or into a wagon with convenience.

Obviously when the transmission is shifted to wind the cables 24 and 25 on the drums 26 and 27 the conveyor will be returned to the position shown in Figure 1 so that it is in position to again clean out the trough when necessary.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What I claim is:

1. In a barn cleaner, an elongated conveyor member adapted to be received in a horizontal barn gutter having an outlet end, a takeup device, cables each connected to an end of said conveyor and to said takeup device, the takeup device being reversible to move said conveyor in either direction in said gutter, a trough having an inlet end adapted to be positioned at the outlet end of said barn gutter and extending diagonally outwardly and upwardly and having an elongated horizontal outer portion, said trough being of a size to accommodate said conveyor, and said horizontal outer portion of said trough having spaced doors in the underside thereof.

2. The structure in claim 1, and a vertically yieldable conveyor guide secured to said trough at its inlet end to rest upon said conveyor as the latter is drawn into and out of said trough.

3. In a barn cleaner, an elongated conveyor member adapted to be received in a barn gutter having an outlet end, a trough having an inlet end adapted to be positioned at the outlet end of said barn gutter to receive material therefrom, said trough extending outwardly and upwardly and having an elongated substantially horizontal outer portion and being of dimensions to accommodate said conveyor therein for relative movement thereto, said horizontal outer portion of said trough having at least one door in the underside thereof through which said material may be permitted to drop, conveyor member mounting and guiding means mounted adjacent the end of said trough in position to receive and engage said conveyor member and adapted to direct said conveyor member longitudinally of and within said trough, and conveyor propelling mechanism connected to said conveyor member and adapted to cause said member to move longitudinally of said trough and past said door.

4. In a barn cleaner, an elongated conveyor member adapted to be received in a horizontal barn gutter having an outlet end, a take-up device, cables each connected to an end of said conveyor and to said take-up device, the take-up device being reversible to move said conveyor in either direction in said gutter, a trough having an inlet end adapted to be positioned at the outlet end of said barn gutter and extending diagonally outwardly and upwardly and having an elongated horizontal outer portion, said trough being of a size to accommodate said conveyor, said horizontal outer portion of said trough having at least one door in the underside thereof, and conveyor guiding means adapted to receive and guide said conveyor member, said guiding means being connected with said trough and extending from a point adjacent said door toward said take-up device a distance approximating the length of said conveyor member.

5. In a barn cleaner, an elongated conveyor member adapted to be received in a horizontal barn gutter having an outlet end, a take-up device, cables each connected to an end of said conveyor and to said take-up device, the take-up device being reversible to move said conveyor in either direction in said gutter, a trough having an inlet end adapted to be positioned at the outlet end of said barn gutter and extending diagonally outwardly and upwardly and having an elongated horizontal outer portion, said trough being of a size to accommodate said conveyor, said hori-

zontal outer portion of said trough having at least one door in the underside thereof, and conveyor guiding means adapted to receive and guide said conveyor member, said guiding means being connected with said trough and extending toward said take-up device from a point adjacent said door and terminating approximately above said inlet end of said trough.

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