

Feb. 20, 1962

D. J. KRAHN
BARN FLOOR CLEANER

3,021,819

Filed June 10, 1959

2 Sheets-Sheet 1

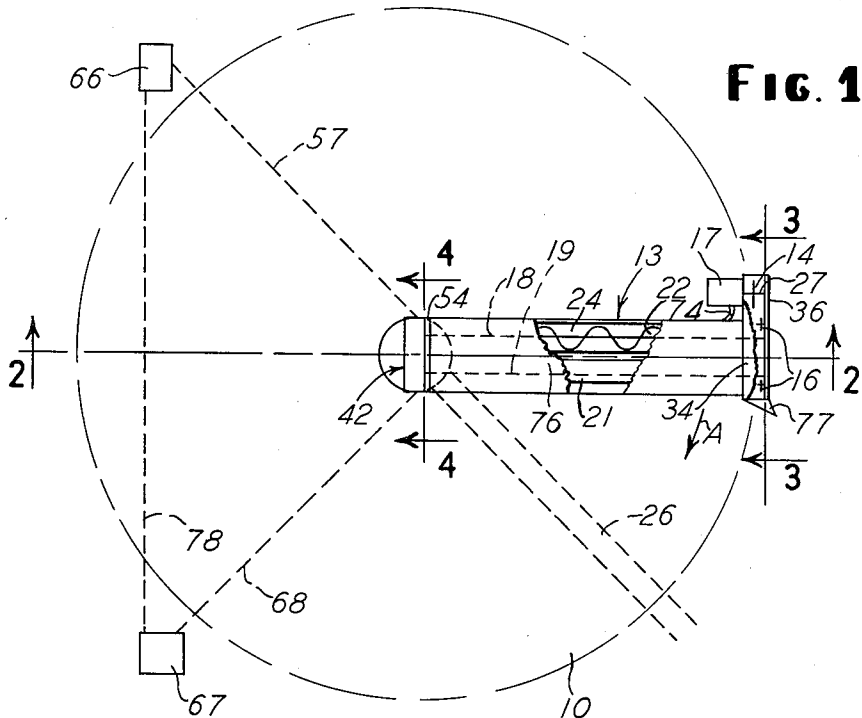


FIG. 1

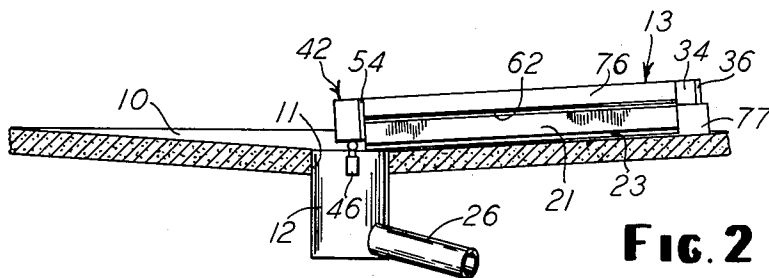


FIG. 2

INVENTOR:
DONALD J. KRAHN
BY: *Arthur J. Harmann*
ATTORNEY

Feb. 20, 1962

D. J. KRAHN
BARN FLOOR CLEANER

3,021,819

Filed June 10, 1959

2 Sheets-Sheet 2

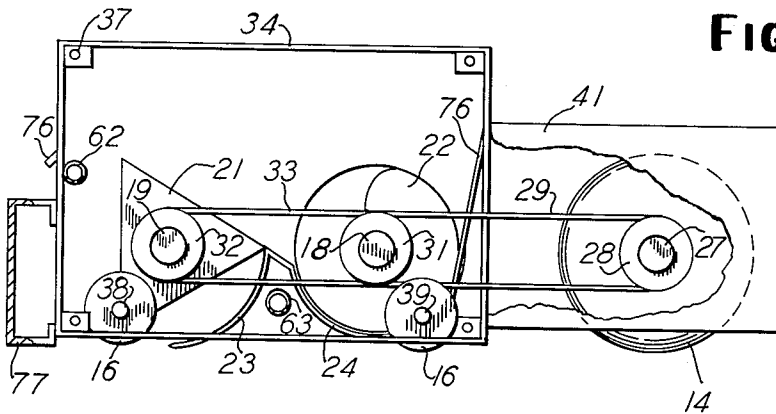


FIG. 3

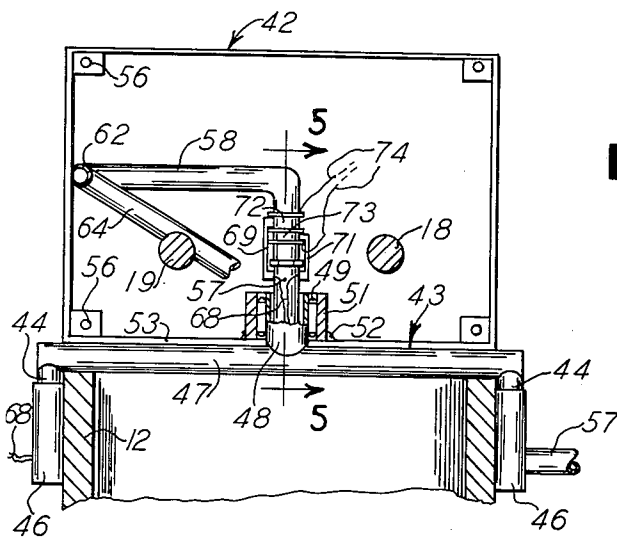


FIG. 4

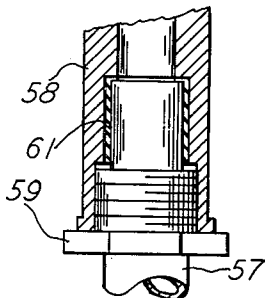


FIG. 5

INVENTOR:
DONALD J. KRAHN
BY: *Arthur J. Hausmann*
ATTORNEY

1

3,021,819

BARN FLOOR CLEANER

Donald J. Krahn, Box 675, Rte. 1, Salem, Wis.

Filed June 10, 1959, Ser. No. 819,338

5 Claims. (Cl. 119-22)

This invention relates to improvements in barn cleaners, and, more particularly, it relates to a barn cleaner wherein cattle can be loosely housed within the barn and the cleaner will remove the defecation of the cattle, as needed.

The primary object of this invention is to provide a barn cleaner which will permit cattle to be loosely housed in the barn, and yet the defecation, such as the manure and urine of the cattle, will be removed from the barn floor, so that the barn is in a clean condition at all times during occupancy by the cattle.

Another object of this invention is to provide a mechanical cleaner or manure disposer, which is automatic in operation, and which will conveniently and economically keep the floor clean, and which can be operated automatically at frequencies which will clean the barn floor almost as fast as the cattle excrete onto the floor.

Still another object of this invention is to provide a barn cleaner which can operate on the barn floor while the cattle are loosely housed in the barn and they will not be harmed, but will only be mildly inconvenienced during the time that the cleaner is in actual operation over the barn floor.

A further object is to provide a barn cleaner which will actually flush the floor to clean it to a highly sanitary condition.

Still a further object is to provide a barn cleaner which can be readily timed to operate to the degree necessary to keep the floor clean so that depending upon the number of cattle in the barn, the frequency of operation of the cleaner will be set accordingly.

This particular invention has specific application to barns for the loose housing of cows, and of course by that is meant that the cows are not shackled or restrained in any way within the housing, as they are free to roam about the barn. The result of such modern housing is, of course, healthier, more productive, and more contented cows, and modern farming has, of course now realized these advantages, and therefore, this invention is directed at permitting loose housing, and at the same time, providing the means for keeping the barn floor in a clean condition without disturbing the cows. It will thus be understood that the cleaner of this invention operates over virtually the entire barn floor, and thus the problem of cleaning the floor even where the cattle are restrained at stations in the barn, is overcome as the defecations and the like created between the barn door and the stations are also of concern in present day barns, as even these barns, of course must be especially cleaned, even though stations are employed in restraining the cattle.

Other objects and advantages will become apparent upon reading the following disclosure in conjunction with the accompanying drawings wherein:

FIG. 1 is a diagrammatic top plan view of a barn floor with a cleaner and the necessary water and electrical connections shown in relation thereto.

FIG. 2 is a view taken along the lines 2-2 of FIG. 1.

FIG. 3 is a sectional view taken along the line 3-3 of FIG. 1, and showing the parts thereof enlarged.

FIG. 4 is an enlarged sectional view taken along the line 4-4 of FIG. 1.

FIG. 5 is an enlarged sectional view taken along the line 5-5 of FIG. 4.

The same reference numerals refer to the same parts throughout the several views.

The drawings show a barn floor 10, which would preferably be made of concrete, and which is pitched toward

2

the center which has an opening 11 for receiving a container or the like 12. FIG. 1 shows the floor in a circular form, and this, of course, would indicate the area traversed by the mechanism of the cleaner or disposer generally designated 13. Continuing in general description, the disposer or cleaner 13 rotates about the center of the floor 10 as the inner end of the disposer 13 is rotatably mounted in a manner hereinafter described, while the outer end of the disposer 13 is shown to be provided with a drive wheel 14 and two support wheels 16. The manner of driving the cleaner 13 in the circular path indicated, is provided by a conventional electric motor 17 or other power means, of course, could be employed, and the motor 17 drives the wheel 14 which thus propels the cleaner over the floor, as desired. At this point, it will also be briefly mentioned that the cleaner 13 includes two shafts extending for the length of the cleaner as shown in FIG. 1, and designated 18 and 19, and these shafts are rotatably mounted at their opposite ends in a manner hereinafter mentioned. Also, it should now be understood that the shaft 19 contains a reel or pickup mechanism 21, and the shaft 18 supports a conventional auger type conveyor 22, such that upon rotation of the two shafts, the reel 21 will direct manure or the like into and over the trough 23 shown in FIG. 3, and from there the manure or the like will fall into the trough 24, where the auger conveyor 22 will transport it to the center container 12, and from this point, it can be further discharged through the piping or the like 26 to the exterior of the barn. Of course, there could also be powered or flushing means in the conduit 26 so that the material therein could be positively moved to the exterior of the barn, as desired.

Thus the mechanism 13 rotates in the direction of the arrow A in FIG. 1, and FIG. 3 shows that the drive wheel 14 has a shaft 27 on which is mounted a conventional pulley 28 receiving a belt 29. The latter extends to a pulley 31 mounted on the auger shaft 18, and thus the shaft and auger 22 are rotated as desired to convey the manure or the like along the trough 24 to the receptacle 12, as mentioned. Further, the shaft 19 has a pulley 32, which connects to the pulley 31 through a conventional belt 33, such that the reel 21 is also rotated in a forward direction to operate in the necessary manner of picking up the manure from the floor, and passing it to the trough 24 as mentioned. A rectangularly shaped housing 34 is provided around the end of the mechanism 13, and a cover plate 36 attaches to the housing 34 through the bolt openings 37, and the plate 36 thus provides the necessary journals or bearings for the rotating shafts 18 and 19, as well as providing support for the spindles or shafts 38 and 39 which support the floor engaging wheels 16. It will also be understood that a housing or support member 41 is attached to the frame 34 to suitably support the wheel 14 and its shaft 27, along with the motor or prime mover 17.

The inner end of the mechanism 13 is best shown in FIG. 4, where it will be noted that the box-like frame member 42 is rotatably mounted and supported on the receptacle 12 by means of a fixed support member 43. The latter consists of two legs 44, which are received in sockets or sleeves 46, stationarily attached to the receptacle 12 or otherwise stationarily disposed in any conventional manner. A cross bar 47 is connected to the legs 44 and therebetween to present and support an upright centerpiece 48, which has a conventional bearing such as needle bearing 49 disposed therearound. Thus the sleeve or bearing 51 of the frame 42 rotates over the standard 48 through the conventional bearing 49, as the sleeve 51 suitably connected by weldment 52 or the like to the base 53 of the frame 42. In this manner, the frame 42 and thus the inner part of the mechanism 13

is rotatably mounted on the fixed standard 48, and it will be understood that there will be necessary movement or play between the standard 48 and the sleeve 51 so that the mechanism can consume the necessary position parallel to the slight pitch in the floor 10. At this time it will also be noticed that the frame 42 supports a cover or bearing plate 54, which attaches to the frame by bolts passing through the frame bolt holes 56. The cover 54 thus provides the journals and rotatable bearings for the shafts 18 and 19 in the manner which the cover 36 supports the opposite outer ends of the shafts 18 and 19.

The drawings further show that a water pipe 57 extends to the socket 46 on one side of the receptacle 12, and the pipe extends through the cross member 47 and is shown to terminate thereabove on the center line of the receptacle 12 as shown in FIG. 4. FIGS. 4 and 5 show the upper end of the pipe 57 connected to a swivel or rotatable pipe 58, which thus receives the water from the pipe 57, which is, of course, in a stationary position, while the pipe 58 rotates therearound in the movement of the mechanism 13 around the barn floor, as mentioned. In making the connection between pipes 57 and 58, a conventional packing nut 59 is utilized to secure packing material 61 between the pipes 57 and 58 to make them fluid tight at their juncture, while still, of course, permitting rotation of the pipe 58, and such connection is of a conventional type.

Pipe 58 connects to a horizontal pipe 62 and a second horizontal pipe 63 with the latter connection being made through a pipe section 64 extending between the inner ends of pipes 62 and 63. Thus the pipes 62 and 63 are in the positions shown best in FIG. 3 and extend for the length of the mechanism 13, and it will be further understood that these two pipes have outlet openings in the circumferences thereof faced toward the floor, so that water in the pipes 62 and 63 will be discharged onto the floor for flushing the same. Of course, the discharge from the pipe 62 is in advance of the movement of the mechanism 13, and it is further preferred that a water control mechanism or valve 66, as shown in FIG. 1, be provided in the line 57 so that flow through the pipes 62 and 63 will be timed to be prior to the movement of the mechanism 13, that is, before the mechanism 13 begins its cycle of rotating over the barn floor, the water valve 66 will be opened by conventional timing mechanism, such as an electrically operated solenoid, and the water will flow from the pipes 62 and 63 before the mechanism 13 begins its movement, as mentioned, and this action will permit a flushing of the floor in advance of the operation of the mechanism 13.

FIG. 1 further shows an electric control box 67, from which conventional wires 68 extend to the socket 46 on receptacle 12, and these wires are further shown in FIG. 4 to extend to electrical contact arms 69 and 71, which are in brushing or rotating relation with circular, electrical contacts 72 and 73 respectively, on the rotating pipe 58. In this manner, which is a conventional electrical connection, the arms 69 and 71 are stationarily mounted on the stationary pipe 57, while the other ends or upper ends of the arms 69 and 71 are in brushing contact with the rotating pipe 58. Thus leadoff wires 74 extend from the contacts 72 and 73 to the motor 17 as shown in FIG. 1.

To summarize the operation described thus far, it should be now understood that the mechanism 13 is operated periodically as needed for cleaning the barn floor 10, and in this operation, the first action can be that the water is sprayed through pipes 62 and 63 onto the barn floor. Next, the electrical control 67 can be energized to run the motor 17, which in turn rotates the drive wheel 14, and thus rotates the entire mechanism 13 about the axis of the receptacle 12, and of course over the barn floor 10. In this action, the reel 21 is rotated to direct manure and other material into the trough 24, where the auger 22 is rotating to further direct the material to the

receptacle 12. In this operation, the cows or other cattle will be in the barn and free to move therearound while the disposer 13 is operating. With the spray of water 62 being directed in advance of the most forward projecting part of the mechanism 13, the cows or cattle will simply be warned of the approach of the disposer 13 and they will either walk away from it, or step over it as it approaches them. However, in no instance is it expected that the mechanism will in any way physically injure the cattle or cow or even frighten the animal. Further, to somewhat protect the animal from the moving mechanism, a housing or shroud 76 extends over the top of the mechanism 13 for the entire length thereof from a point adjacent the pipe 62 to a point along the frame 34 at the top thereof, as seen in FIG. 3 and this shield is actually a continuation of the trough 24. Also, it may be preferred that a scraper 77 be attached to the front of the frame 34 in line with the wheels 16 and 14 so that it clears the floor in the advance of the pass of the wheels, to direct the material into the reel 21, and of course, prevent it from interfering with the level ride of the wheels 16 and 14. Also, the electric box 67 can serve as a master control with an electric line 78 extending therefrom to the water control 66 so that the entire mechanism can be completely controlled in the frequency of operation by the action of the master control 67. Thus the electrical control can be of any conventional type, which is an electric time control. Also, in this construction, the trough 23 is disposed as shown to serve the function of a scoop in the forward or rotating motion of the mechanism 13.

While a specific embodiment of this invention has been shown and described, it will be understood that certain changes in the embodiment can be effected, and the invention, therefore, should be limited only by the scope of the appended claims.

What is claimed is:

1. A barn cleaner comprising an elongated conveyor mountable on the barn floor for revolving movement about a center point of said floor and having a discharge opening adjacent said center point, rotatable pickup means connected to said conveyor and disposed to the side thereof in advance of said conveyor and being rotatable about an axis parallel to the elongation axis of said conveyor for directing manure into said conveyor, power means connected to said conveyor for operating the latter to move the manure toward said center point, and a receptacle disposed aligned with said center point and in said floor and directly below said discharge opening for receiving the manure from said conveyor.

2. A barn cleaner for use on a floor pitched downwardly to a center point, comprising a trough mobility mountable on said floor for movement thereover around said center point, rotatable means included in said cleaner and disposed in advance of the movement of said trough and being rotatable with respect thereto for directing manure off said floor and into said trough, means operable in said trough for moving the manure to said center point, a receptacle mountable in said floor at said center point for receiving the manure, and a water conduit included in said cleaner and being rotatably connected thereto for moving with said trough and having outlets therein directed at said floor in advance of said trough for spraying said floor while said trough passes thereover.

3. A barn cleaner comprising a conveyor mounted on the barn floor for movement about a center point, rotatable means connected to said conveyor and disposed to the side thereof in advance of said conveyor and being rotatable with respect thereto for directing manure into said conveyor, an electrical motor connected to said conveyor for moving and operating the latter to move the manure toward said center point, a receptacle mountable in said floor at said center point and being disposed below said conveyor in direct manure-discharge communication therewith for receiving the manure from said conveyor, an electrical timer connected to said motor for automatically energizing the latter at selected intervals,

5

wheels rotatably connected to the end of said conveyor radially outward from said center point for mobility supporting said conveyor on said floor, a water conduit connected to said conveyor for movement therewith and having outlets for directing water onto said floor, and a rotatable water connector attached to said conduit and attachable to a water supply.

4. A manure disposer for use in a barn where cattle are loosely housed and where the barn floor is pitched downwardly to a center point, comprising a receptacle having an open top and mountable in said floor, a support stationarily mounted on said receptacle and extending thereabove, at said center point a first housing rotatably mounted on said support, a trough attached to said housing for rotation therewith and extending therefrom in a direction to be disposed along said floor, a second housing attached to the outer end of said trough, a drive wheel rotatably mounted on said second housing, a conveyor mounted between said housings and operable in said trough for moving manure toward said receptacle, an electric motor for driving said wheel and said conveyor, rotatable pick-up means disposed in advance of said trough and being rotatable with respect thereto for directing manure thereinto, a water supply pipe attached between said housings and having outlets directed downwardly for spraying water onto said floor to thereby flush same, a water supply swivel connection disposed in said support for conducting water therethrough and to said pipe while said housings and said trough are rotating over said floor, and an electrical timer mechanism for energizing said motor and controlling said water supply at selected intervals.

6

5. A manure disposer for use on a barn floor where cattle are loosely housed, comprising a receptacle having an open top, a support stationarily mounted on said receptacle and extending above said open top, a first housing rotatably mounted on said support, two troughs attached to said housing for rotation therewith and extending therefrom along said floor with one in a rotationally advanced position with respect to the other and with said one trough being open toward the direction of rotation for a scraping action on said floor, a pick-up means rotatably mounted on said housing and extending parallel to said one trough and thereabove for pushing manure off said floor and across said one trough and into said other trough, a second housing attached to the outer end of said troughs, a drive wheel rotatably mounted on said second housing, means operable in said other trough for moving manure toward said receptacle, an electric motor for driving said wheel, a water supply pipe attached between said housings for spraying water onto said floor to thereby flush same, and a water supply swivel connection disposed in said support for conducting water therethrough and to said pipe while said housings and said troughs are rotating over said floor.

References Cited in the file of this patent

UNITED STATES PATENTS

1,274,548	Holnagel et al.	Aug. 6, 1918
2,383,326	Lovell	Aug. 21, 1945
2,601,844	Lovell	July 1, 1952
2,735,400	Stubbs	Feb. 21, 1956