May 26, 1953 H. A. TONAGEL ET AL 2,639,803

STABLE CLEANING DEVICE

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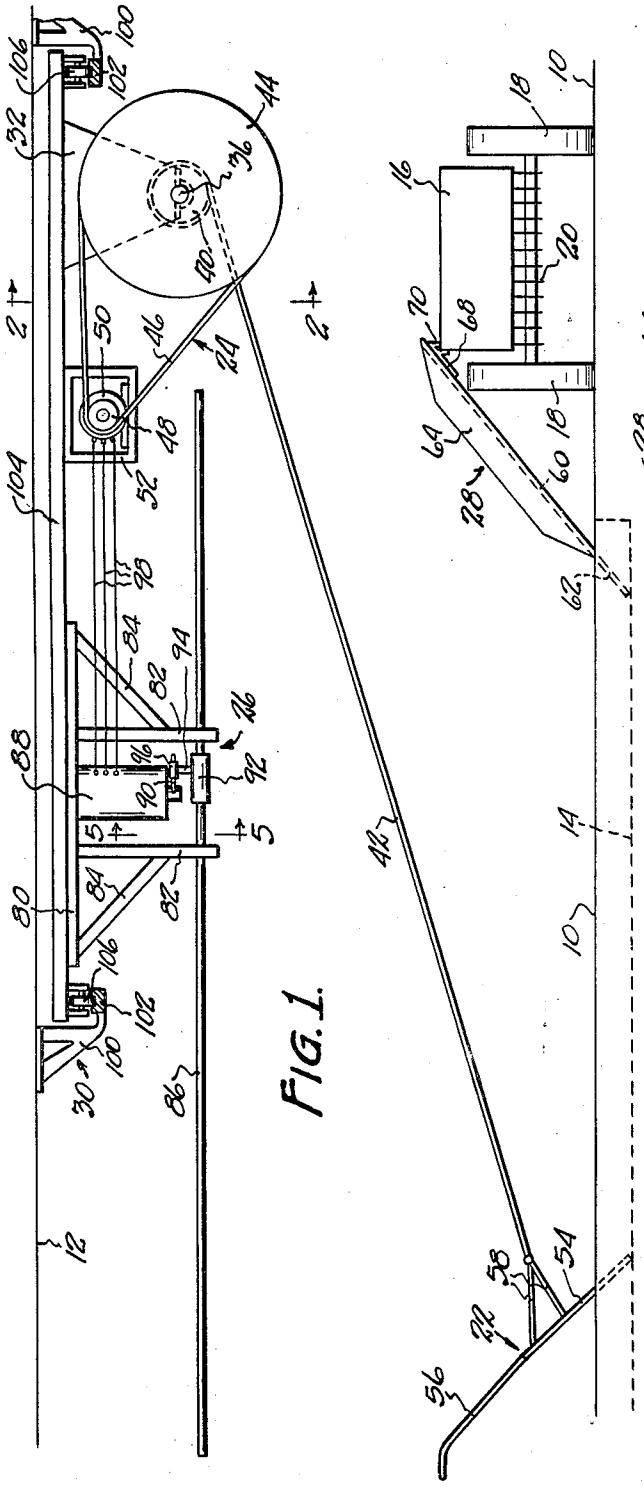


FIG. 1.

FIG. 3.

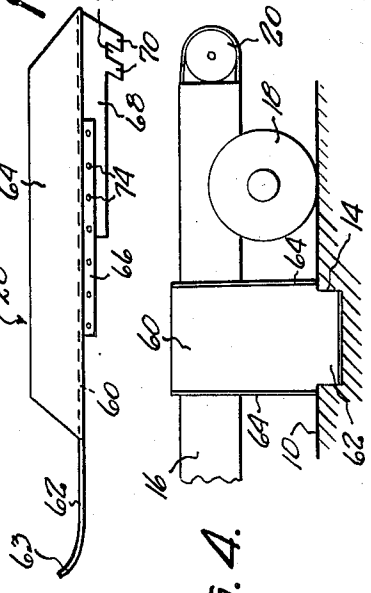


FIG. 4.

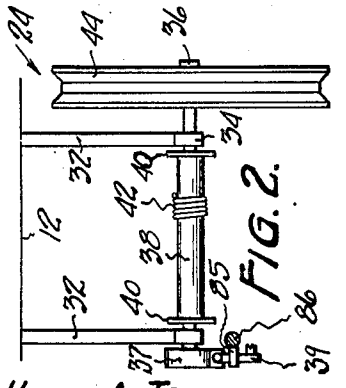


FIG. 2.

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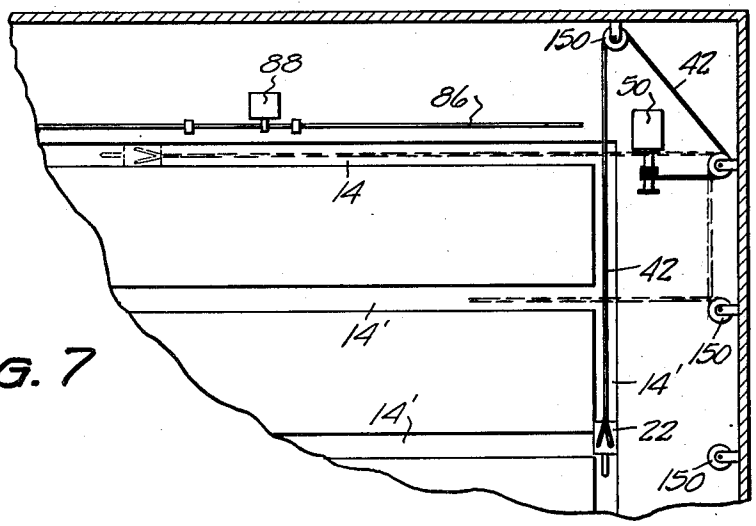


FIG. 7

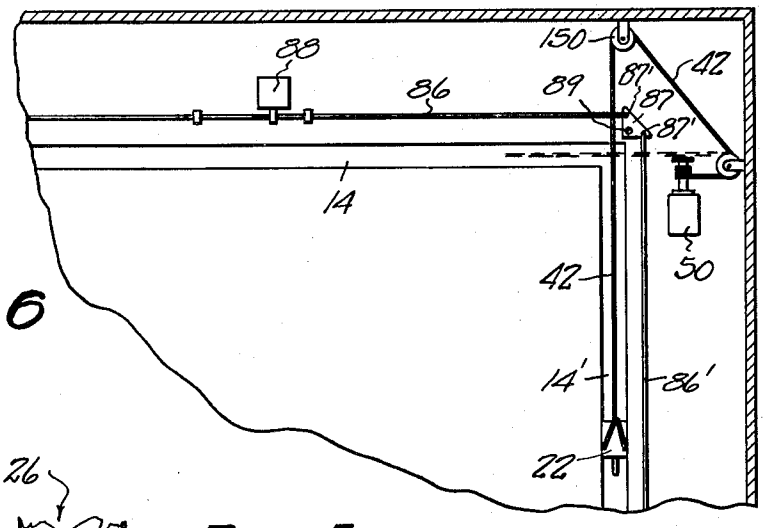


FIG. 6

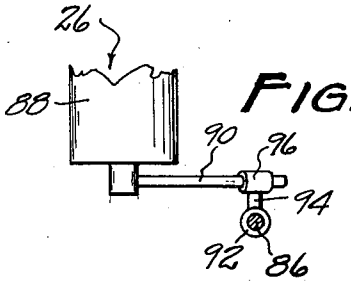


FIG. 5

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STABLE CLEANING DEVICE

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8 Claims. (Cl. 198—224)

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This invention relates to stable cleaning devices, and more particularly to a power-operated device by means of which the gutters of a dairy barn or stable may be cleaned.

The primary object of this invention is to provide a device of this character by means of which cleaning of stable gutters is accomplished rapidly and easily by power-actuated means under full control of the operator at all times.

A further object is to provide a device of this character which is power-actuated and which includes control means extending lengthwise of the gutter to be cleaned and accessible at all times by the operator, said control means permitting the user to manipulate the device as required for use under all conditions.

A further object is to provide a device of this character which is installed permanently in a building but which is adjustable or shiftable between different predetermined operative or working positions, in each of which positions full control is afforded at all positions along the working path of the device.

Other objects will be apparent from the following specifications.

In the drawing:

Fig. 1 is an elevational view of the device as positioned in use within a barn or stable.

Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged view in side elevation of a runway which is used with the device.

Fig. 4 is a side view, illustrating the runway in use in loading position.

Fig. 5 is an enlarged fragmentary sectional view taken on line 5—5 of Fig. 1.

Fig. 6 is a part schematic view illustrating a modified embodiment of the invention.

Fig. 7 is a part schematic view illustrating still another embodiment of the invention.

Referring to the drawings, and particularly to Figs. 1 to 5, which illustrate the preferred embodiment of the invention, the numeral 10 designates the floor of a building, such as a dairy barn or stable, and the numeral 12 indicates the ceiling line of the same building. The floor of the building is preferably provided with gutters or troughs formed therein, as shown in Fig. 4, adjacent the animal stalls (not shown) provided in the building. If desired, the building may have any selected number of gutters 14 preferably arranged parallel to each other and each juxtaposed to a row of animal stalls.

A runway area will be located along the end of each groove or gutter as is customary, and

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along which a wagon or other wheeled device, such as a manure spreader, may be positioned. Thus, as illustrated in Figs. 1 and 4, a manure spreader having a box or body portion 16, wheels 18 and suitable spreader mechanism 20, is preferably used in conjunction with the device.

In its simplest aspect our improved device, intended for the purpose of removing litter, debris, manure, etc., from the gutter or trough for deposit or discharge in the box 16 of a wagon or manure spreader, comprises a unit 22 adapted to be propelled by a power-driven unit 24 under selective manual control by a controller 26 so that it may traverse the length of the gutter, and also an inclined slide unit 28 extending between the gutter and the wagon. The drive unit 24 and the control unit 26 may be permanently or detachably mounted in the barn or stable and, if desired, can be constructed to be movable in the stable from place to place to clean different gutters, and, in the latter case, said units are mounted upon a carrier unit 30.

The driving unit 24 of the device comprises one or more hangers 32 adapted to be secured to an overhead support and depending downwardly from that support with their lower end portions mounting one or more bearings 34 in which is journaled a shaft 36. The shaft 36 has fixed thereon a drum or reel 38, including a cylindrical reel portion and enlarged end plates 40. The drum or reel is adapted to have wound thereon a cable, chain or other elongated flexible member 42 of substantial strength, one end of which is anchored to the drum and the other end of which is free and adapted to extend for connection to the scraper unit 22.

The shaft 36 mounts thereon a sheave, pulley or other drive transmission element 44. As here illustrated, the member 44 constitutes a pulley around which is trained a belt 46, also trained upon the drive sheave or pulley 48 mounted on the shaft of a reversible electric motor 50. The motor 50 is carried by any suitable structural support 52 adapted to be suspended from the ceiling of the building or from any overhead structure adjacent to the hanger 32 and associated parts. The motor will preferably have associated therewith speed reduction gearing (not shown) so that the speed at which the drive output shaft upon which the pulley 48 or other transmission member is mounted will operate at a selected low speed. Further speed reduction means are provided as illustrated by the ratio of sizes of the drive transmitting members, such as the small size of the pulley 48 and the comparatively large size of

the pulley 44. The parts are so arranged or correlated that the speed of linear travel of the cable or other member 42 will be substantially the normal walking speed of an individual. While one form of drive unit 24 has been illustrated, it will be understood that changes may be made therein as desired. Thus the shaft 36 may be directly driven from an actuating motor or other prime mover or may be driven through gearing or any other desired type of drive transmission interposed between the prime mover and the cable reel.

The scraper unit 22 comprises a blade 54, preferably of a width to fit slidably in the gutter 14 and to span the same, so that as it is propelled or pulled along, it will propel the debris in the gutter lengthwise thereof. The blade 54 has a handle portion projecting upwardly therefrom by means of which it may be guided and manipulated. The connection between the cable and the scraper unit preferably is made at 58 adjacent the upper portion of the blade and in transversely balanced relation so that the pull of the cable will propel the scraper and will maintain the same in a normal working attitude by the requirement of only slight manual exertion applied by gripping the handle 56.

The skid or inclined member 28 utilized to guide the movement of the scraper unit 22 and to elevate the same and the litter and debris propelled thereby for discharge into the wagonbox 16 may be of the construction illustrated in Fig. 3. The unit 22 thus preferably comprises a flat elongated sheet or panel 60 formed of metal, wood or other suitable material, and preferably of a width throughout its major portion slightly greater than the width of the gutter 14. The lower end portion 62 will preferably be somewhat narrower to fit snugly within the gutter. At its sides above the narrow portion 62 thereof, the panel 60 has side walls 64 serving as guides and being spaced apart a distance somewhat greater than the width of the blade 54 so that said blade 54 may pass freely over the length of the panel 60 and between the side walls 64. The panel 60 is preferably flat throughout at least the major portion of its extent, but, if desired, may have its lower end portion curved at 63, as shown in Fig. 3, instead of being flat throughout as illustrated in Fig. 1. The panel 60 may have one or more longitudinal elongated members 66 fixedly secured thereto. The member or members 66 serve as guides for adjustably positioning and securing a hook or positioning member, here shown as provided with an elongated shank portion 68 and a pair of laterally angularly projecting ears 70, spaced apart and defining a notch 72 therebetween so oriented that it may fit over the edge of a portion of the wagonbox 16. As illustrated the guide member 66 may have a plurality of longitudinally spaced apertures 74 formed therein, and the shank 68 of the hook of positioning member may have one or more openings therein, and suitable pins, bolts or other securing means may be employed to secure the shank 68 to the guide 66 in selected position longitudinally of the panel 60. It will be apparent that the longitudinal adjustment of the shank 68 of the positioning member will afford a measure of control of the angle of inclination of the panel 60. In particular it will afford adjustment to insure that a given angle found most effective can be maintained when the height of the top edge of the wagonbox 16 of successively loaded wagons differs. In other words, the skid unit illustrated is adjustable to compensate for differences in the heights of wagons or units to be loaded.

The control unit 26 includes a bracket having a base portion 80, two or more depending arms 82 and suitable reinforcing braces 84. The bracket is mounted upon any suitable overhead support, with the depending arms 82 located adjacent to and above the gutter 14 and with a plane therebetween substantially parallel to said gutter. The arms 82 are provided with bearings, guides or apertures adjacent their lower ends, within which an elongated rigid rod or bar 86 is slidably mounted and supported. The bar 86 may be of any length found suitable and preferably will be of a length substantially equal to the length of the gutter 14 to be cleaned and be positioned thereabove parallel thereto and within reach of an operator walking alongside a gutter to guide and manipulate the scraper 22. The members 82 constitute hangers and, while only two thereof have been shown, it will be understood that any greater number may be employed as desired.

An electric controller or switch 88, preferably of the type having a rotatable or swinging actuating arm 90, is mounted upon the bracket with its actuating arm 90 located adjacent to the rod 86. The rod 86 preferably mounts a sleeve 92 fixed thereon and from which projects a rod 94 rotatably mounting a sleeve 96 at its outer end, which sleeve is adapted to have a slide fit upon the controller rod 90. Thus it will be apparent that as the rod 86 is shifted longitudinally, such movement will be translated by the parts 92, 96 into actuating movement of the controller arm 90. The controller will preferably be of the character having two operative positions and a neutral inoperative position so that it will have in effect forward, reverse and stop positions. The controller will be connected to a suitable source of power and in turn is connected by the leads 98 with the motor 50 so as to control that motor which, as previously described, is a reversible motor.

It will be apparent that by means of this construction the operation of the device is rendered simple and is easily controlled.

Regardless of where the operator stands with respect to the length of the gutter 14 being cleaned, he can always operate the device quickly and with the assurance of positive response. There is no limitation as to the points at which the operator must be standing or located to effect this control. In normal operation of the device, therefore, it will be apparent, assuming that use of the device is to commence following spotting of the wagon 16, 18 and positioning of the slide 28, the bar 86 will first be actuated to set the controller for motor operation in cable release direction so that the operator may carry or pull the scraper 22 to the end of the gutter 14 remote from the vehicle 16, 18. When this starting position is reached, a small manipulation of the bar 86 will actuate the controller to stop the operation of the motor; whereupon the user can properly position the scraper blade within the gutter 14 and can prepare for working operation of the device which will commence upon further manipulation of the rod 86 in a manner to start the motor. In the normal operation of the device, assuming that no unforeseen difficulties have occurred, the operation of the motor will continue in forward or loading direction until the scraper 54 has traversed the length of the

gutter and also the length of the panel 60 of the transfer member 28 and discharged its contents into the vehicle body box 16, at which time the user can easily and quickly manipulate the rod 86 to stop the motor. The user, however, is not limited to manipulation and control of the device at the starting position and at the stopping or discharging position. Thus, if he should encounter any difficulty at any point intervening between those positions, he can instantaneously and conveniently stop the device by reaching up for the rod and, if desired, in using the device, he can walk with one hand held aloft alongside the rod 86 to reduce the time required for response to any emergency condition requiring stopping of the device.

The rod 86 may serve the additional function of actuating a brake 37, as best seen in Fig. 2, upon the shaft 36 of the cable drum 38, if desired. The brake 37 may be of any desired character having actuating means 39, and the rod 86 may be extended to a position adjacent the brake-actuating means 39 and may be provided with a part 85 engaging said brake-actuating means. In the preferred arrangement of the parts they will be so constructed and arranged that, when the rod 86 is in its neutral position, the brake 37 will be actuated to hold the drum 38 against rotation, but, when in either of its two operating positions, the part 85 will be disengaged from the brake actuator 37 to permit release of the brake.

While the device has been illustrated and described above as applicable to the cleaning of gutters which extend parallel to the control rods 86, its use is not so limited. Figs. 6 and 7 illustrate that, by the use of sheaves or pulleys 150, suitably placed in a building, the cable 42 may be so trained and guided that the scraper 22 may be used to clean gutters 14 and 14' extending in spaced relation to and at angles to the gutter adjacent to which the control rod 86 is located. In the form of Fig. 7, the device must be operated by two men, one of whom is stationed at the control rod 86, and the other of whom handles the scraper 22. Alternatively, where gutters extend at angles to each other, individual elongated controls 86 and 86', as shown in Fig. 6, may be provided therefor for each, in which event only one worker is required to operate the device. In the Fig. 6 embodiment, the two rods 86 and 86' are pivotally connected at 87' to a member 87 which is in turn pivoted to a support at 89. The parts are so arranged that whenever either of the members 86, 86' is shifted, the other is shifted similarly and equally.

Many barns or stables are of a size such that they have multiple gutters therein and quite commonly those gutters are substantially parallel to each other, or at least the major portions thereof are arranged in parallel. In such instances it is possible to construct the device to move from a position juxtaposed to one gutter to a position juxtaposed to any of the gutters parallel thereto. As shown in Fig. 1, brackets 100 may be fixedly secured in a stable or other building, as at the ceiling thereof, to mount elongated track elements 102 which extend transverse of the gutters 14 and may be of any length necessary to extend to all of a plurality of parallel gutters. A carriage 104 spans the tracks 102 and preferably journals rollers 106 which traverse said guides. The carriage may mount carriers 80, 82, 84 of the control unit 26, carrier 52 for supporting the motor 50, and hangers 32 for supporting the drum winding cable 38, 40. Such a construction is shown in Fig. 1 and it will be apparent that the rod 86 or any other parts of the device depending to a level within reach, although normally all in a position to provide head clearance for workers thereunder, may be contacted to shift or manually adjust the position of the carrier 104, the rod 86 and the cable drum with reference to any one of the selected gutters 14 extending transverse of the tracks 102.

While the preferred embodiments of the invention have been illustrated and described herein, it will be understood that changes may be made in the construction within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A device for cleaning stable gutters, comprising a scraper having a blade portion and a handle portion; an actuator unit including a reversible motor, a motor driven drum and a cable wound on said drum and connected to said scraper to propel said scraper along a selected path; and a control unit including a motor controller electrically connected with said motor and an actuator for said controller, said actuator constituting an elongated overhead member extending alongside said path and connected to said controller whereby it may be reached and manipulated by an operator grasping the handle of said scraper, while the scraper is traversing said path.

2. A device for cleaning stable gutters, comprising a scraper having a blade portion and a handle portion; an actuator unit including a reversible motor, a motor driven drum and a cable wound on said drum and connected to said scraper to impel said scraper in a selected path; and a control unit including a support, a motor controller electrically connected to said motor and an actuator connected to said controller, said actuator being elongated and shiftably mounted on said support in an overhead position substantially parallel to said path and within reach of a person handling said scraper.

3. In a device for cleaning stable gutters comprising a scraper, an actuator having a reversible motor, an elongated flexible pulling member connecting said scraper and actuator to move said scraper along a work path, a motor controller electrically connected with said motor, an overhead support mounting said controller and having a pair of guide openings, a rigid elongated substantially horizontal member shiftable in said guide openings and extending adjacent to said work path throughout at least the major portion of the length of said path, said member being connected to said motor controller.

4. In a device for cleaning stable gutters comprising a scraper, an actuator having a reversible motor, an elongated flexible pulling member connecting said scraper and actuator to move said scraper along a work path, a motor controller electrically connected with said motor and having a part shiftable on a vertical axis, an overhead support mounting said controller and including a plurality of guide portions, and an elongated substantially horizontal rigid member shiftably carried by said guide portions and connected to said shiftable controller part, said member being positioned adjacent and substantially parallel to said path and at a height within reach of a person walking alongside said path.

5. In a device for cleaning stable gutters comprising a scraper, an actuator having a reversible motor, an elongated flexible pulling member connecting said scraper and actuator to move said scraper along a work path, an overhead support

having depending guide portions, a motor controller electrically connected with said motor and carried by said support and having a projecting part swingable on a vertical axis between a plurality of angularly displaced operating positions, an elongated horizontal rigid rod shiftably carried by said guide portions adjacent to said projecting controller part and within reach of a person walking alongside said path, and a connector fixed on said rod and coupled with said projecting controller part.

6. A device for cleaning parallel gutters of a stable, comprising a gutter scraper, a cable connected to said scraper, a cable actuator, a reversible motor driving said actuator, a controller electrically connected with said motor and including an elongated horizontal handle portion positioned overhead and within reach of an individual operating said scraper, an overhead track adapted to extend transverse of said gutters, and a carriage mounted on said track and shiftable therealong, at least said cable actuator being mounted on said carriage.

7. A device for cleaning stable gutters, comprising a scraper having a blade portion and a handle portion, an actuator unit including a reversible motor, a motor driven drum, a drum brake and a cable wound on said drum, said cable being connected to said scraper, and a control unit including a motor controller electrically connected with said motor and an actuator for said controller, said controller actuator constituting an elongated overhead rigid member within reach of a person operating said scraper, said elongated member being coupled to said drum brake to actuate said brake.

8. A device for cleaning angularly disposed gutters of a stable, comprising a pair of angularly disposed elongated rigid substantially horizontal overhead members within reach of an operator, a bellcrank link pivotally connecting adjacent portions of said members, a power driven gutter scraper, a drive motor therefor, means connecting said motor and scraper, and a controller electrically connected with said motor and having a plurality of operative positions, and means connecting said controller and one of said first named members.

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