ABSTRACT OF THE DISCLOSURE

A retractable refuse receptacle assembly for subterranean location including a subterranean housing having a motor supporting plate mounted in the bottom thereof and a motor mounted on the under side of the supporting plate. A receptacle supporting platform is movably mounted in the housing above the motor supporting plate, and through cables or the like, the motor drives the platform in reciprocation in the housing. A receptacle frame is mounted on, and extends upwardly from, the supporting platform and functions to bias to an open position, two cooperating lid sections which are pivotally secured to the housing at opposite sides thereof. In one embodiment, a pair of resilient fingers are secured to the frame and are positioned for engaging the refuse receptacle carried on the supporting platform.

This invention relates to a retractable refuse receptacle assembly which can be positioned in a subterranean location and which can be easily elevated to provide access to the receptacle when it is desired to deposit refuse therein. More specifically, but not by way of limitation, the invention relates to an automatically elevated refuse receptacle which can be normally positioned below the surface of the earth in a vermin-proof enclosure where it is out of sight, and can be automatically elevated to ground level for access when it is desired to deposit refuse therein.

Many types of trash, garbage and refuse receptacles have been heretofore proposed which undertake, by their construction, to provide ready access to the interior of the receptacle, to prevent the infestation of the receptacle by vermin, such as flies, rats and the like, and which undertake to improve the aesthetic appearance of the receptacle. The present invention provides an improved refuse receptacle which is normally positioned below the surface of the earth in a vermin-proof housing and which can be automatically elevated to an accessible position at such time as it is desired to deposit refuse therein.

BROADLY described, the present invention comprises a subterranean housing having side walls and a bottom with motor support means mounted in the housing adjacent the bottom. A motor or suitable prime mover is supported on the support means and is used for driving a receptacle supporting platform which is moveably mounted in the housing above the motor supporting means. The motor drives the receptacle supporting platform in a vertical reciprocating movement by means of a flexible lifting means which is operatively connected to the motor and extends over sheaves which are secured to the sides of the housing above the receptacle supporting platform. The flexible lifting means is connected also to the receptacle supporting platform which is moveably mounted in the housing above the motor supporting means, and the lifting means draws the platform upwardly in the subterranean housing when the motor is energized. A receptacle frame is mounted on, and extends upwardly from, the receptacle supporting platform and includes horizontally extending bumper elements at the upper end thereof. A rigid lid which is pivotally connected to the top edge of the sides of the housing and is aligned with the bumper elements for contact thereby as the receptacle support-
includes side walls 14 and a bottom 16. The subterranean housing may be made of several types of rigid material, but in the illustrated embodiment, is shown as being constructed of concrete, and is illustrated as having a rectangular configuration. Spaced upwardly a short distance above the bottom 16 of the subterranean housing 10, and secured to the side walls 14 of the housing are a pair of horizontally extending rigid supporting members or rods 18 which are secured to the side walls 14 of the housing by any suitable means. The horizontally extending support rods 18 support a motor support plate 20 which extends horizontally across the housing 10 and rests at its edges upon the rods 18. The motor support plate 20 can be secured to the rods 18 by bolts or by any other means rendering the plate 20 quickly detachable from the support rods 18 in the event that the motor needs to be overhauled or repaired. A motor 22 which is susceptible to directional operation to cause its drive shafts 24 to be rotated in either direction is bolted or otherwise suitably mounted on the underside of the motor support plate 20. As best illustrated in FIGURES 1 and 4, the drive shafts 24 each carry at their outer ends, and horizontally spaced from the motor 22, a pair of winch drums 30 which are keyed to the shafts 24 for rotation therewith.

Spaced vertically from the motor support plate 20 and adapted to rest thereon in its lowestmost position is a receptacle supporting platform 30 which is dimensioned so that its outer edges are spaced inwardly from the side walls 14 of the subterranean housing 10. The receptacle supporting platform 30 is preferably a flat plate which is constructed of metal and is large enough that a large trash or refuse receptacle 32 can be rested thereon in the manner illustrated in dashed lines in the figures. A receptacle aligning frame designated generally by reference character 34 is secured to the receptacle supporting platform 30 at one side thereof, and includes a pair of upwardly extending stanchions 36 which are interconnected at their midsections by a brace 38 and across their upper ends by a rigid bumper element 40. The bumper element 40 is spaced vertically above the receptacle supporting platform 30 by a distance which permits it to normally be located at a height above the upper end of any receptacle which will be placed on the receptacle supporting platform. The receptacle frame 34 further may include a pair of outwardly extending resilient fingers 42 which are adapted to extend partially around a receptacle positioned on the platform 30 in the manner illustrated in FIGURE 3. The resilient fingers 42 are sufficiently flexible and resilient that a loaded refuse container or receptacle which is positioned therein can be slid out from between the fingers without permanently distorting the fingers, and yet the fingers have sufficient strength and rigidity to retain the empty or partially filled receptacle in its centralized position on the receptacle supporting platform 30 while the receptacle is in use.

Rotatably mounted at opposite sides of the receptacle supporting platform 30 are a pair of guiding elements, which, in the illustrated embodiment, are a pair of rollers 44. The rollers 44 each guide upon a pair of vertically extending guide rails 46 which are secured to and extend upwardly alongside the side walls 14 of the subterranean housing 10. On the opposite sides of the receptacle supporting platform 30 from the rollers 44, a pair of pad eyes 48 or other suitable securing means are secured to the upper surface of the supporting platform 30 and are used in connection with each of a pair of flexible lifting elements, such as the cables 50. The cables 50 extend upwardly from the pad eyes 48 and over a pair of sheaves 52 which are rotatably mounted on stub shafts or axles 54 secured to the side walls 14 of the housing 10 near the upper edges of the side walls. From the sheaves 52, the cables 50 extend downwardly through notches or recesses 58 cut inwardly into the side edges of the supporting platform 30, and then through holes or apertures 60 formed in the motor support plate 20 and are reeved around the winch drums 26.

Pivotedly secured to the upper edges of the side walls 14 of the subterranean housing 10 and a pair of cooperating lid elements 64 which, in the illustrated embodiment of the invention, are complementary in configuration and meet at the center of the housing to form a closure in which the two lid elements 64 are in monoplanar alignment. It will be noted in referring to FIGURES 1 and 4 that the rigid bumper element 40 provided on the frame 34 is positioned to bridge across the meeting line of the lid elements 64 so that, as the receptacle supporting platform 30 is elevated by means of the cables 50 as hereinabove explained, the bumper element will bear against the two lid elements and cause them to be forced upwardly and outwardly to permit the receptacle to be elevated above the ground.

Operation

In the operation of the refuse receptacle assembly of the invention, an empty refuse receptacle is placed on the receptacle supporting platform 30 in the manner illustrated in dashed lines in the figures and, in this position, it is retained in its central position on the platform by the resilient fingers 42. The lid may or may not be provided on the receptacle, as desired, but it should be pointed out that the construction of the assembly and, particularly, the way in which the lid elements 64 cooperate makes it unnecessary to cover the receptacle during its use. This is a considerable advantage in that there then does not exist any requirement for a lid for the receptacle which must be removed and replaced each time refuse is placed in the receptacle, and which may become dented or bent over extended periods of use so that it does not fit the receptacle.

After positioning the receptacle in the central receptacle supporting platform 30 and between the resilient fingers 42, and electrical circuit which is connected to the motor 22 and which includes a remote control switch (not shown) is closed so as to energize the motor in the proper direction for reeving the cables 50 upon their respective winch drums 26. As the cables are permitted to unwind from the winch drums 26, the receptacle supporting platform 30 is slowly lowered. With such lowering movement, the lid elements 64 are permitted to move downwardly and inwardly about their respective pivotal axes until they assume the monoplanar alignment in closed position as shown in FIGURES 1 and 4. At this time, the receptacle is completely contained within the subterranean housing 10 and the interior of this housing is completely closed by the lid elements so that there is no access to the receptacle by rats, flies, and other vermin. Moreover, it will be noted that the upper edge of the subterranean receptacle is substantially at ground level so that there is no unsightly appearance to the housing or to the refuse receptacle, both of these elements being substantially invisible from above the surface of the ground. At any time that it is desired to place refuse, garbage, or trash in the receptacle, the motor 22 is energized to reeve the cables 50 upon their respective winch drums 26 and thus to elevate the receptacle supporting platform 30. The bumper element 40 protects the upper rim of the receptacle from being bent or damaged by contact with the lid elements 64 and biases these elements outwardly and away from the upper part of the receptacle as the platform 30 moves vertically.

At such time as the refuse receptacle has become completely filled, the receptacle supporting platform 30 may be elevated and the receptacle supporting platform 30 lifted by means of the supporting platform by pulling it horizontally across the platform and away from the resilient fingers 42.

From the foregoing description of the invention, it is believed that it will have become apparent that the invention provides a compact, relatively economically constructed and highly sanitary system or assembly for utilizing and storing a refuse receptacle. Although a preferred embodiment of the invention has been illustrated in the
accompanying drawing, it is to be understood that various modifications and changes can be effected in the invention without departure from the basic principles upon which it is founded. All such changes and innovations which do not relinquish the use of such basic principles are therefore deemed to be circumscribed by the spirit and scope of the present invention except as the same may be necessarily limited by the appended claim or reasonable equivalents thereof.

What is claimed is:

A refuse receptacle assembly comprising:

a housing having side walls and a bottom, said side walls and bottom being interconnected to form an integrated housing which may be positioned in the earth;

a substantially horizontally extending motor support plate extending across said housing between the side walls thereof and terminating within said side walls, said motor support plate having apertures in two opposed side edges thereof;

a motor secured to the lower side of said motor support plate;

elongated, horizontally extending support rods secured to the walls of said housing and detachably supporting said support plate whereby said support plate and said motor may be easily removed from said housing for repair of said motor;

a supporting platform movably mounted in said housing above said motor support plate and extending substantially parallel to said motor support plate, said receptacle supporting platform having apertures in two opposed side edges thereof vertically aligned with the apertures in the two opposed side edges of the motor support plate;

a pair of vertically extending guide rails secured to two opposed facing sides of said housing;

guiding elements mounted on opposed facing edges of said receptacle supporting platform other than those two edges which are apertured, said guiding elements cooperating with said guide rails for guiding said receptacle supporting platform in the horizontal plane of said receptacle;

a winch drum on each of said shafts;

a pair of cable guiding elements each secured to opposing side walls of said housing and spaced horizontally around said housing from said vertically extending guide rails;

a pair of cables each receivied at one side of said winch drums, and each extended through one pair of said aligned apertures in said motor support plate and said receptacle supporting platform, extended over said one of said cable guiding elements, and secured at one end to said receptacle supporting platform for elevating said receptacle supporting platform in said housing when said motor is energized, said guiding elements, rails and cables cooperating to prevent horizontal movement and canting of said receptacle supporting platform during its vertical movement in said housing;

a pair of cooperating lids each pivotally secured to opposed side walls of said housing at the upper edge thereof and pivotally into substantially monoplanar alignment to close said housing, said cooperating lids having free edges meeting along a line extending transversely across the top of said housing when said lids are in monoplanar alignment and said housing is closed thereby;

a refuse receptacle supported on said receptacle supporting platform;

a receptacle frame mounted on, and extending upwardly from, said receptacle supporting platform and including a horizontally extending bumper element at the upper end of said receptacle frame, said receptacle frame and horizontally extending bumper element extending at least the width of said refuse receptacle and positioned on said receptacle supporting platform to extend across and substantially normal to, the adjacent free edges of each of said cooperating lids when said lids are in their closing, substantially monoplanar aligned positions, whereby said refuse receptacle is shielded from contact with said lids as said receptacle supporting platform is elevated, and whereby said lids are gradually pivoted upwardly to an open position by contact with said bumper element; and

a pair of resilient fingers extending substantially horizontally outwardly from said receptacle frame and dimensioned and positioned for resiliently gripping said receptacle.

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