

Dec. 26, 1939.

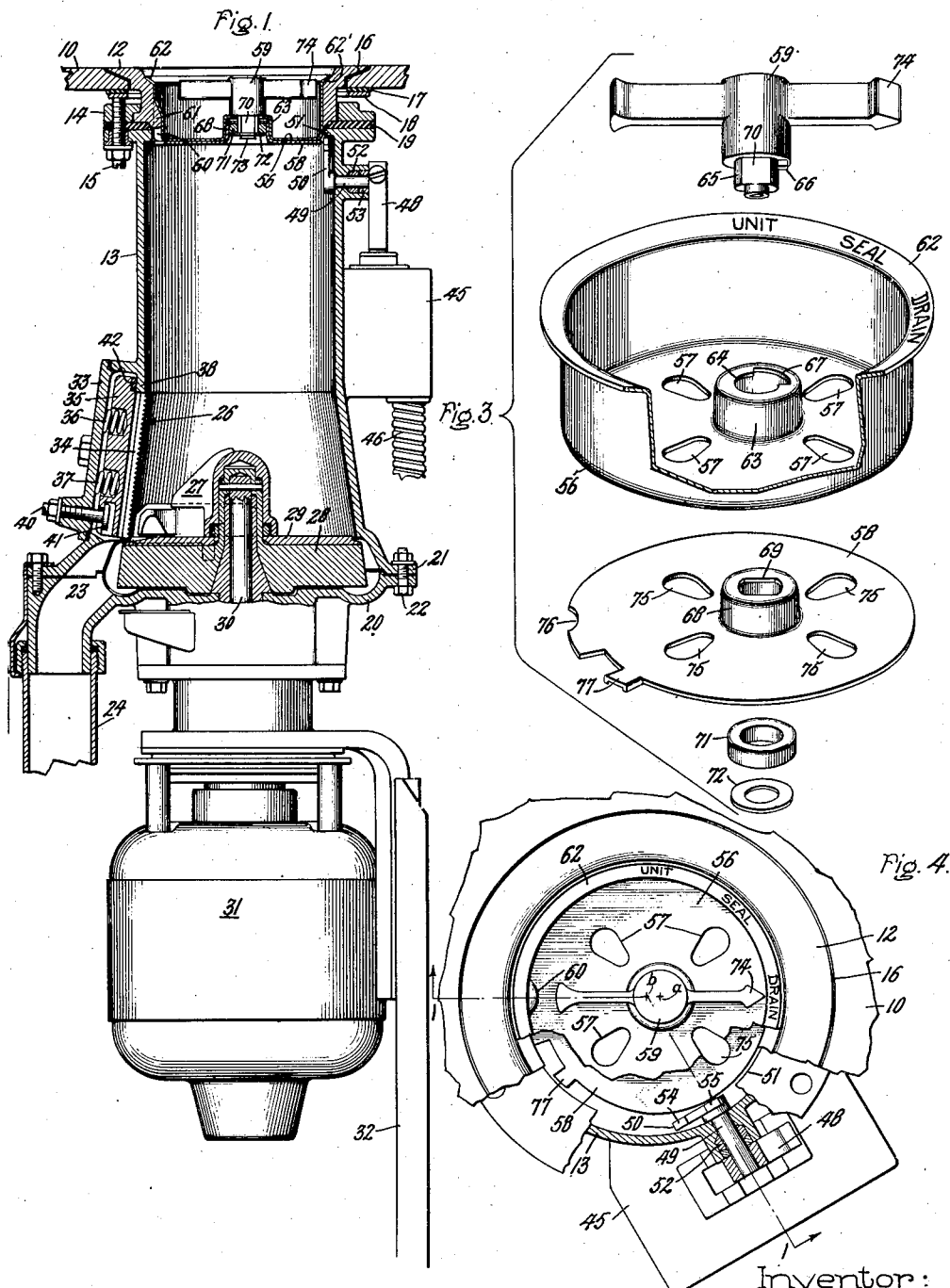
J. H. POWERS

2,185,037

WASTE DISPOSAL APPARATUS

Filed Nov. 12, 1936

3 Sheets-Sheet 1



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Fig. 5.

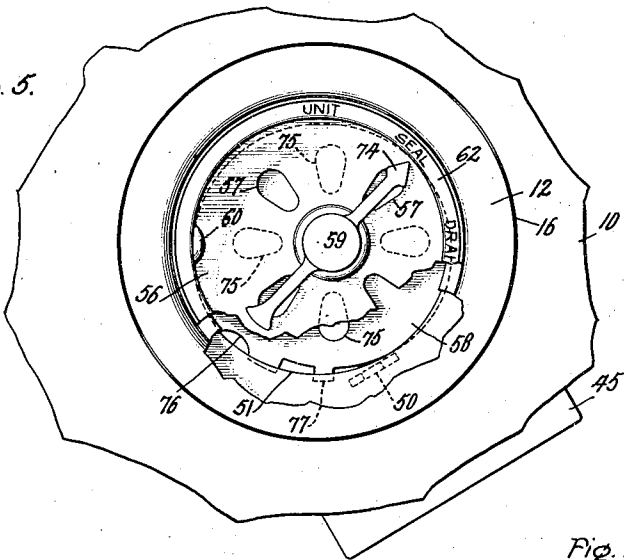


Fig. 6.

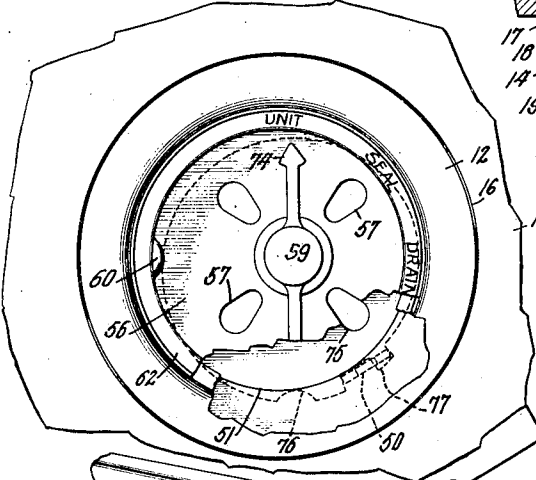


Fig. 2.

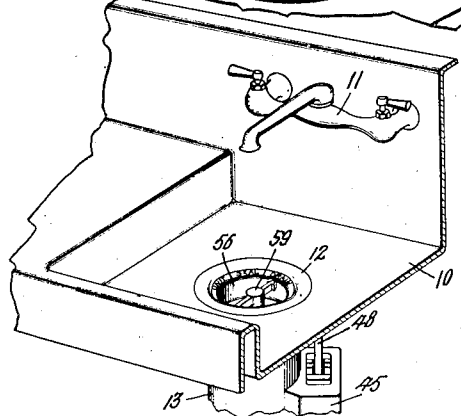
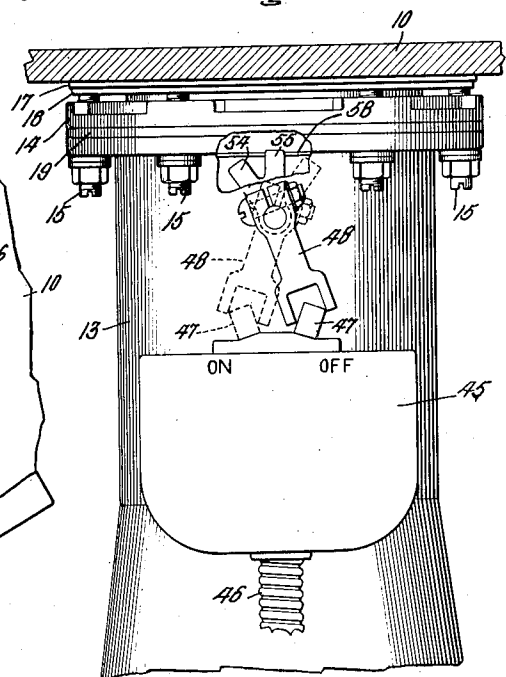


Fig. 7.



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Fig. 8

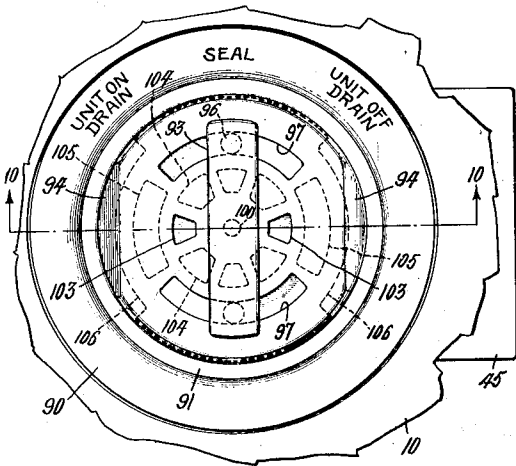


Fig. 9

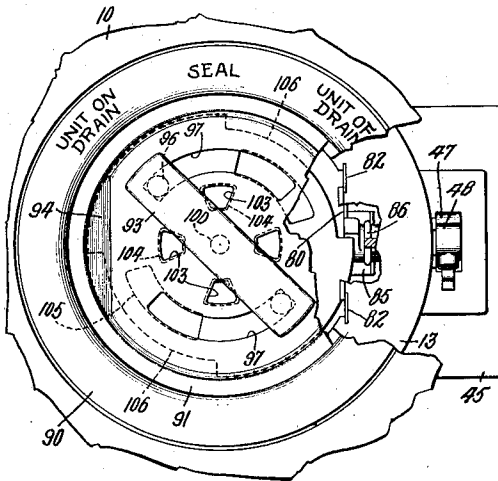


Fig. 10

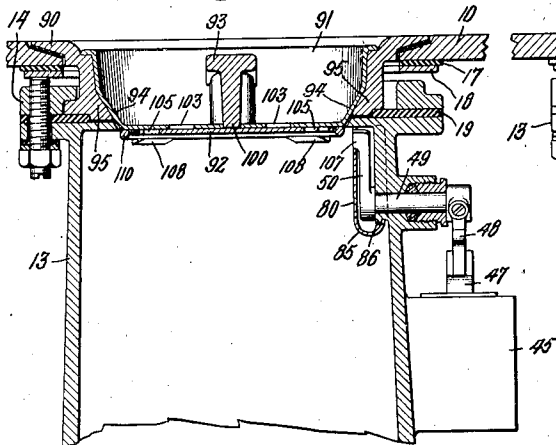


Fig. 11

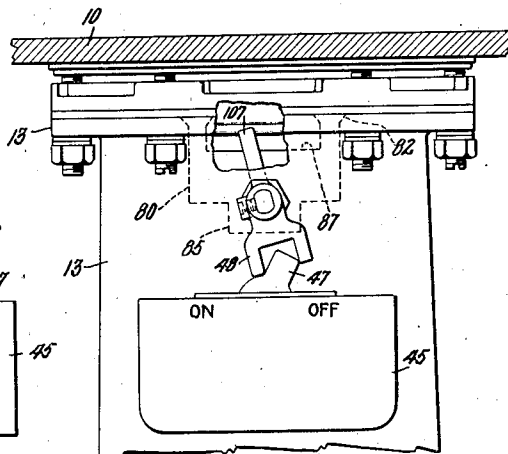
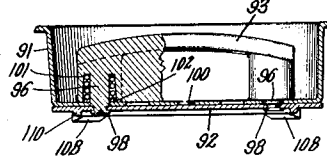


Fig. 12



UNITED STATES PATENT OFFICE

2,185,037

WASTE DISPOSAL APPARATUS

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New York

Application November 12, 1936, Serial No. 110,489

19 Claims. (Cl. 83—6)

The present invention relates to apparatus for disposing of waste material and has for a general object the provision of an improved apparatus for the comminution, by grinding, crushing or cutting, of garbage in the form of vegetable matter, meat, bones and the like and of other forms of waste material, and for the flushing of the comminuted material into a sewer system or the like with the aid of water supplied to the apparatus.

A more specific object of the invention is the provision of improved means for controlling the operation of a power driven waste disposal appliance or similar device.

Another object of the invention is the provision of improved closure or stopper means for a drain opening in a sink or like structure.

For an understanding of other objects of the invention and the details of the manner in which the invention is carried out, attention is directed to the following detailed description taken in conjunction with the accompanying drawings in which,

Fig. 1 is a side elevation partially in section, of an exemplary form of waste disposal apparatus embodying the present invention and incorporating an electric motor driven grinding machine connected with the drain opening of a kitchen sink for receiving therefrom water and material to the ground, and having also an improved stopper or closure device arranged for controlling the flow of water from the sink through the drain opening and for controlling the operation of the electric motor; Fig. 2 is a perspective view of a portion of the sink and the grinding machine showing the improved closure device seated in the drain opening of the sink; Fig. 3 is an exploded view showing the details of construction of one form of the improved stopper or closure device; Figs. 4, 5 and 6 are plan views, partially cut away, illustrating successive steps in the operation of the closure device; Fig. 7 is a rear quarter view of the grinding machine showing the control switch for the electric driving motor and the actuating mechanism for the switch; Figs. 8 and 9 are plan views of a modified form of the improved stopper or closure device and respectively show two different steps in the operation of the device; Fig. 10 is a sectional side elevation of a portion of the waste disposal apparatus incorporating the modified form of closure device and its cooperating control mechanism; Fig. 11 is a rear quarter view of the portion of the apparatus illustrated in Fig. 10 and showing the mounting of the control switch and the actuating

mechanism therefor; Fig. 12 is a sectional view of the modified form of closure device showing certain details of the construction thereof, and Fig. 13 is an exploded view illustrating a protective guard which is incorporated in the apparatus of Fig. 10.

Referring particularly to Figs. 1 and 2 of the drawings, 10 designates a portion of a kitchen sink or like structure of the basin type adapted to have water supplied thereto from a faucet 11 or other suitable water supply means and having a drain opening in which is seated an adapter ring 12. To this ring the casing or housing 13 of an electric motor driven appliance, or grinding machine, is connected, as best shown in Fig. 1, by means of a flanged ring 14, which engages a flange on the adapter ring, and screw bolts 15 which extend through a flange on the upper end of the casing 13 into screw threaded engagement with the flanged ring 14. A gasket 16 of resilient material is provided between the adapter ring and the rim of the sink drain opening and a similar gasket 17, held in place by means of metal ring 18, is provided between the screw bolts 15 and the sink, while a third gasket 19 of resilient material is inserted between the upper end of the casing and the adapter ring 12 and the flanged ring 14. These three gaskets serve not only for sealing purposes but also to prevent the transmission of vibration from the grinding machine to the sink structure.

Casing 13 is adapted to serve as a receptacle for the deposit of waste material to be ground and has a lower portion of frusto-conical form providing a grinding chamber while the upper portion of the casing is of cylindrical form to facilitate the feeding of material into the grinding chamber. The lower end of the casing is closed by means of a bottom plate 20 which is secured to a flange 21 on the lower end of the casing by means of bolts 22. Bottom plate 20 and flange 21 are so formed as to provide a drain or discharge conduit 23 which is adapted to be connected in any suitable manner, as by means of a pipe 24, to a sewer system or the like, thus providing for the flushing of water and comminuted material from the casing into the sewer system or the like.

In the bottom of the casing 13 are provided a rotatable cutter and crusher element, generally designated 27, and a stationary cutter element, generally designated 26, which are arranged for cooperation to grind, cut or crush material in the lower or grinding chamber portion of the casing. Rotatable cutter 27 is mounted upon a supporting

disk 28 and a strainer disk 29 and is connected by means of drive shaft 30 for rotation by electric motor 31 which may be supported in any suitable manner as by means of a pedestal 32 mounted on either a floor or wall structure. The details of the construction and mounting of the rotatable cutter and crusher element and the connections and mounting of the motor are not essential to an understanding of the present invention, but a full description thereof is to be found if desired in the copending application of Adalbert Alexay, Serial No. 71,156, filed March 27, 1936, which became Patent No. 2,156,075 on April 25, 1939, and is assigned to the assignee of the present invention. Stationary cutter element 26 in the illustrated embodiment is arranged in a lateral recess in the side wall of the lower portion of casing 13, the outer wall of the recess being formed by a removable cover plate 33. This cutter comprises a toothed cutting member or knife 34 secured in any suitable manner to a movable holder plate 35. A pair of compression springs 36 and 37, disposed in recesses in the back of the plate 35 and pressing against the cover plate 33, serve to force the toothed face of member 34 into cooperative relation with the rotatable cutter 27 in the grinding chamber. Forward movement of the cutter is limited at the top by the pressure of the upper end of plate 35 against a flange 38 formed on the wall of casing 13 and at the bottom by means of adjusting screw 40 which extends through the cover plate 33 and has a flanged head engaging a flanged recess in the back of the plate 35. Due to the cooperative action of the flange 38, adjusting screw 40 with its head 41, and springs 36 and 37, the toothed cutting face of member 34 is maintained substantially parallel with a generatrix of the inner surface of the frusto-conical grinding chamber portion of the casing in order to facilitate the grinding operation in the manner described in detail in the previously referred to Alexay patent. Springs 36 and 37 serve not only to maintain the cutting face in proper relation to rotatable cutter 27 but also to substantially absorb any vibration of the plate 35 during operation of the apparatus and thereby to minimize the transmission of such vibration to the casing. In order further to insure against transmission of vibration from plate 35 to the casing, the upper end of the plate is provided with one or more inserts 42 of resilient material which bear against the flange 38 and act as shock absorbers to minimize transmission of vibration at this point. Adjusting screw 40 provides for adjustment of the outward movement of the cutter element 26 if desired for any reason, as, for example, to compensate for wear on the teeth of member 34.

The comminution of material by the apparatus illustrated is accomplished in a manner substantially the same as that described in detail in connection with the apparatus forming the subject matter of the previously referred to patent of Adalbert Alexay and will not be reviewed herein except to point out that upon energization of motor 31 in a manner to be described hereinafter, the cutter element 27 is set in rotation through drive shaft 30 and cooperates with stationary cutter 26 to grind, cut and crush materials supplied thereto and to reduce the material to a fineness which will pass the strainer disk 29 and be suitable for discharge through the conduit 23 and pipe 24 to the sewer system or the like. The grinding, cutting and crushing operations and

the discharge of the comminuted material into the sewer system are greatly facilitated by water supplied to the grinding chamber.

Energization of motor 31 is controlled by means of a suitable switching mechanism, the details of which are not essential to an understanding of the present invention, accommodated in a box 45 mounted on the side of the casing 13. In Figs. 1 and 7, 46 designates a conduit for proper wiring connections to the motor and to a source of electric supply. The switching mechanism includes a switch arm 47 which upon movement into the position illustrated in solid lines in Fig. 7 and designated "Off" is effective to cause deenergization of motor 31 and which upon movement into the position illustrated in dotted lines in Fig. 7 and designated "On" is effective to cause the switching mechanism to energize motor 31. Arm 47 is arranged for actuation by a lever 48 which is connected through pivot shaft 49 for actuation by trip lever 50. Lever 50 is disposed on the inside of the cylindrical portion of casing 13 and is shielded from material fed through the sink opening by means of an inwardly projecting flange 51 formed on the upper end of casing 13. Pivot shaft 49 extends through the wall of the casing and is effectively sealed by means of suitable packing 52 and packing nut 53. At the upper end of lever 50 are provided two ears 54 and 55 for a purpose to be pointed out hereinafter. It will be evident from an inspection of Fig. 7 that movement of the upper end of trip lever 50 with its ears 54 and 55 to the right causes movement of the lower end of lever 48, and thereby of switch arm 47, to the left thus causing energization of motor 31 to rotate the cutter element 27.

In accordance with a feature of the present invention, an improved closure or stopper device is provided for the sink drain opening. As will be seen most clearly from Fig. 3, this device comprises a cylindrical cup-shaped plug member 56 having apertures 57 in the bottom thereof spaced approximately 90° from each other, a baffle plate 58 mounted on the bottom of the plug member, and an operating handle 59. Member 56 is adapted to seat removably in the opening provided by the adapter ring 12 and is provided with a guide recess 60 in one side thereof which is arranged to cooperate with a lug 61 formed on the inner surface of the adapter ring to insure the proper seating of the member 56 in the opening and to prevent rotation of the member when in the opening. Cup-shaped member 56 has also an outwardly slanting flange or rim 62 which is arranged to seat snugly upon a ledge 62' formed in the adapter ring 12. Adjacent the center of the cup-shaped member there is provided an upwardly projecting circular boss 63 for the support of the handle 59 and having a central opening 64 in the top thereof for the accommodation of the partially circular extension 65 projecting downwardly from the handle. The handle is adapted to rotate with respect to the cup-shaped member and the rotation thereof is limited by the engagement of pin 66, carried by the handle, with the slot 67 formed on one side of the opening 64 in the cup-shaped member.

Baffle plate 58 is arranged to be mounted on the bottom of cup-shaped member 56 and has an upwardly projecting boss 68 arranged to fit rotatably in the boss 63 of the cup-shaped member and provided with an opening 69 having two flat sides arranged to engage the flat sides 70 of the extension 65 of handle 59. Plate 58 is secured

rigidly to handle 59 by means of a ring 71 which fits over the lower end of extension 65 and snugly engages the interior of boss 68 and which is held tightly in place by means of a washer 72, which in turn is fastened in any suitable manner as by means of a screw or, as indicated at 73 in Fig. 1, by means of riveting or spinning over of the lower end of extension 65. Thus, the baffle plate is constrained to move with handle 59 and is rotatable with respect to the cup-shaped member 56. The rim 62 has marked thereon the legends "Drain", "Seal" and "Unit", respectively, spaced approximately 45° from each other, and handle 59 has a pointer 74 which, upon rotation of the handle and thereby the baffle plate 58, indicates the position of the baffle plate. This last mentioned plate is provided with apertures 75 spaced 90° from each other and arranged to register with the apertures 57 in the cup-shaped member 56 when pointer 74 indicates either "Drain" or "Unit", while the plate is arranged to close apertures 57 when the pointer indicates "Seal". Baffle plate 58 is provided also with a notch 76 arranged to be in alignment with the recess 60 in the cup-shaped member 56 only when pointer 74 indicates "Drain". By this means it is insured that the stopper device can be inserted into the opening in adapter ring 12 only when pointer 74 is turned to "Drain" since otherwise the rim of baffle plate 58 will engage the lug 61 and prevent seating of the cup-shaped member in the opening. Moreover, if while the cup-shaped member is seated in the opening, the handle is turned so that the pointer indicates either "Seal" or "Unit", a portion of the rim of the baffle plate engages the underneath surface of lug 61 and prevents removal of the stopper device from the opening. Also, as will be seen best from Fig. 4, the baffle plate is mounted eccentrically for rotation about a center *a* which is offset with respect to the true center *b* of the plate and the cylindrical cup-shaped member so that upon rotation of the handle and baffle plate in a counterclockwise direction, as viewed in Fig. 4, a portion of the rim of the baffle plate will swing outwardly into engagement with the underneath surface of the flange 51 on the upper end of casing 13 to thereby aid the lug 61 in effectively locking the stopper device in the opening in the adapter ring. Thus it is rendered impossible to remove the stopper device when the plate is in the positions illustrated in Figs. 5 and 6 wherein the pointer 74 indicates "Seal" and "Unit" respectively.

As will be seen from Figs. 1 and 4, when the cup-shaped drain plug 56 is properly seated in the opening in adapter ring 12 and pointer 74 indicates "Drain", the edge of baffle plate 58 is in close proximity to the upper end of lever 50 but does not engage the lever since the rim of the baffle plate, when the latter is in "Drain" position, does not project beyond the rim of the cup-shaped plug. A portion of the rim of the baffle plate, extending from a point substantially opposite lever 50 when the plate is in "Drain" position to a point approximately 90° therefrom in a clockwise direction, as viewed in Fig. 4, is cut back spirally with respect to the true center *b* of the plate or, in other words, is formed as an arc of a circle having the point *a* as its center. By reason of this cutting back, the rim of the plate is not brought into engagement with the lever 50 during rotation of the plate 90° in a counterclockwise direction from its "Drain" position, in spite of the eccentric mounting of the plate. However, the spirally cut-back portion

of the rim of the plate is provided with an arm 77 projecting outwardly therefrom and arranged to engage one or the other of the ears 54 and 55 of lever 50 after rotation of the plate approximately 90°. Normally ear 55 of the lever 50 extends vertically upward, as best shown in Fig. 7, so that lever 48 is in position to maintain switch arm 47 in "Off" position. Rotation of handle 59 from the position wherein pointer 74 indicates "Drain" through approximately 45° to the position wherein the pointer indicates "Seal", as illustrated in Fig. 5, does not bring any part of the baffle plate into engagement with the ear 55. However, rotation of the handle a further 45° until pointer 74 indicates "Unit", as illustrated in Fig. 6, causes projection 77 to engage ear 55 and move the upper end of lever 50 to the right to the position illustrated in dotted lines in Fig. 7, thus effecting movement of the lower end of lever 48 to the left, to its position also illustrated in dotted lines in Fig. 7, to thereby operate switch arm 47 into "On" position and cause energization of motor 31. Subsequent rotation of handle 59 in a clockwise direction as viewed in Fig. 4, causes the projection 77 to engage ear 54, which has been brought into vertical position by previous movement of ear 55 out of vertical position, to thereby effect movement of lever 50 to the left as viewed in Fig. 7, causing the lower end of lever 48 to move to the right and operate switch arm 47 into "Off" position to cause de-energization of motor 31. Hence, the motor 31 and rotatable cutter 27 are inoperative when pointer 74 indicates either "Drain" or "Seal" and are rendered operative upon movement of the pointer to indicate "Unit".

In the operation of the device for the disposal of garbage in the form of vegetables, meat, bones, and the like, papers or other waste material, the closure or stopper device is removed from the opening in adapter ring 12 and the material to be disposed of is deposited in the grinding chamber of the casing or receptacle 13. The stopper device is then replaced in the adapter ring opening, care being taken that the notch 76 in baffle plate 58 is in alignment with the recess 60 in the cup-shaped plug 56 so as to pass the lug 61 and permit proper seating of the stopper device. Water may then be supplied to the sink, as by means of faucet 11, and permitted to flow through the apertures 57 in the cup-shaped drain plug and through the apertures 75 in baffle plate 58 into the grinding chamber to wet the material therein, it being remembered from previous description that when notch 76 is in alignment with recess 60 the apertures 75 in the baffle plate are in alignment with the apertures 57 in the plug to permit flow of water therethrough. Then in order to start the operation of the apparatus, handle 59 is turned in a counterclockwise direction, as viewed in Fig. 4, from the position wherein pointer 74 indicates "Drain" to the position wherein the pointer indicates "Unit". By this means the projection 77 on baffle plate 58 is rotated into engagement with ear 55 on lever 50 and thereby effect operation of the levers 50 and 48 to actuate switch arm 47 into "On" position and cause energization of motor 31 to rotate the cutting element 27. As previously pointed out, when pointer 74 indicates "Unit" apertures 75 in plate 58 are again in registry with apertures 57 in the cup-shaped plug to permit the flow of water from the sink into the grinding chamber to aid the cutting elements 26 and 27 in comminuting the material in the grinding chamber

and also to aid in flushing the comminuted material out of the grinding chamber and into the sewer system through discharge conduit 23 and pipe 24. Also, as previously pointed out, the stopper device is securely locked in the adapter ring opening when the pointer is turned to the position designated "Unit" to effect operation of the cutting, grinding and crushing means since the rim of baffle plate 58 is then in engagement with lug 61 and flange 51, thereby insuring against removal of the stopper device from the opening and protecting the operator or anyone else from accidentally or carelessly reaching into the grinding chamber during rotation of the rotatable cutter 27.

If, during operation of the apparatus, handle 59 is turned so that its pointer 74 indicates "Seal" with the result that apertures 57 are closed by means of baffle plate 58 to prevent the flow of water into the grinding chamber, the motor 31 is immediately deenergized through the engagement of projection 77 with ear 54 to cause the levers 50 and 48 to actuate switch arm 47 into "Off" position. Thus it is insured that the elements 26 and 27 are rendered inoperative to perform their grinding, cutting and crushing functions when no water is being supplied thereto to facilitate these functions.

A further advantage of the "Seal" position of the baffle plate 58 is that by means thereof the drain opening of the sink may be effectively closed to prevent drainage of water therethrough and permit the filling of the sink with water for any desired purpose.

Turning of handle 59 to the position in which its pointer 74 indicates "Drain" permits the removal of the closure device from the adapter ring opening, if desired, or permits the use of the cup-shaped plug simply as a strainer plate to allow the flow of water from the sink to the sewer system while preventing the accidental passage of any articles or materials from the sink into the casing 13.

A further advantage of the apparatus hereinbefore described is that it is possible to render the motor operative without employing the improved closure device due to the accessibility of the lever 50 through the opening in the adapter ring 12. Under certain circumstances, such as servicing of the apparatus by a competent service man, this may prove to be highly advantageous. However, due to the positioning of the lever 50 there is little likelihood of its being operated carelessly or tampered with by children. On the other hand, if it is desired to render the lever 50 more inaccessible and to better protect it from material fed through the opening in housing or casing 10, this may be accomplished by means of a safety guard member such as that designated 80 in Fig. 13 and which is shown in Figs. 9, 10 and 11 as being applied to the modified form of the apparatus therein illustrated. In the exemplary form illustrated, the guard member is constructed of sheet metal and has two upwardly projecting arms 81 which have V-shaped portions 82 on the upper ends thereof arranged to be wedged into V-shaped slots 83 of recesses 84 provided in the inwardly projecting flange 51 at the top of casing 13. Thus provision is made for firmly holding the upper end of the guard member in place while the lower end of the guard member is provided with a hook-shaped portion 85 arranged to engage a flanged projection 86 on the inner wall of the housing below lever 50 to firmly hold the lower

end of the guard member in place. A space 87 is left between the arms 81 in order that the upper end of the lever may be engaged by the actuating mechanism of the improved stopper or closure device. It will be evident, therefore, from the drawings that the solid portions of the guard member in cooperation with the overhanging rim 51 renders manual access to the lever relatively difficult and also effectively shields the lever from material fed through the casing opening.

In Figs. 8 to 11 inclusive are illustrated certain modifications of the closure or stopper device and the control mechanism hereinbefore described. An adapter ring 90 is provided in the drain or like opening of the sink structure 10 for the attachment thereto of the casing 13 of the waste disposal apparatus in a manner similar to that described in connection with the adapter ring 12 of the first embodiment. Ring 90 is adapted to form a seat for the modified form of closure or stopper device which comprises essentially a cylindrical cup-shaped plug member 91, a circular plate member 92 and an actuating handle 93. Two opposite sides of the plug member are beveled inwardly at the bottom as shown at 94, these beveled portions have substantially plane surfaces arranged to engage inwardly slanting substantially plane surfaces of ledges 95 formed on two opposite sides of the inner wall of adapter ring 90. By reason of the cooperative engagement of the beveled portions 94 and the ledges 95, proper positioning of the plug member is insured and rotation of the plug member is prevented when it is seated in the adapter ring opening.

The circular flat baffle plate 92 is held in contact with the flat bottom wall of the plug member 91 by means of pins 96 which extend downwardly from handle 93 through arcuate slots 97 in the bottom wall of the plug member and which are suitably fastened to the plate as for example by riveting over of the ends of the pins as shown at 98. Handle 93 has a pivot pin 100 engaging an opening in the center of the bottom wall of the plug member, and the handle as well as the circular plate are arranged to rotate about the axis of the cup-shaped plug member and not eccentrically with respect thereto as in the previously described embodiment. Compression springs 101 are placed in depressions surrounding pins 96 and by their engagement with the seats of the depressions and with washers 102 which in turn bear against the bottom wall of the cup-shaped member, serve to maintain the plate member 92 in firm engagement with the bottom surface of the bottom wall of the plug member while at the same time providing for free rotation of the handle and plate without binding thereof against said bottom wall. Slots 97 extend over a sufficient arc to provide for rotation of the handle 45° in either a clockwise or a counterclockwise direction from its midposition, illustrated in Fig. 8, whereat the handle indicates "Seal". Movement of the handle beyond the 45° limit in each direction is prevented by engagement of the pins 96 with the respective ends of the slots 97. The bottom wall of the plug member has also four apertures 103 respectively arranged 90° apart upon a circle having a radius less than that of the slots 97 and two of the apertures 103 are disposed on two opposite sides of the center of the plug member and on a line which passes through this center and midpoints of the two slots 97. Plate

member 92 also has four similarly disposed apertures 104 which are arranged to be in non-alignment with the apertures 103 when the handle is in its midposition indicating "Seal", as shown in Fig. 8, and to be in alignment with the apertures 103 when the handle and plate member are turned 45° in either a clockwise or a counterclockwise direction, as for example, to the position wherein the handle indicates "Unit on—drain" as illustrated in Fig. 9. Plate member 92 has also two arcuate slots 105 respectively disposed at two opposite sides of the plate and substantially the same radial distance from the center of the plate as are the slots 97 in the plug member. Slots 105 are so arranged that when the handle and plate are in the midposition illustrated in Fig. 8, they are in non-alignment with the slot 97 while upon rotation of the handle and plate 45° in either a clockwise or a counterclockwise direction from this midposition, as for example to the "Unit on—drain" position illustrated in Fig. 9, portions of the slots 105 come into alignment with portions of the slots 97. Hence it will be seen that when the handle and plate are in their midposition illustrated in Fig. 8, solid portions of the plate are in alignment with apertures 103 and slots 97 to block or seal the same and thereby prevent drainage of water therethrough while upon rotation of the handle and plate to either the "Unit on—drain" or "Unit off—drain" positions the apertures 104 are brought into alignment with the apertures 103 and portions of the slots 105 are brought into alignment with portions of the slots 97 so as to permit drainage of water through the bottom of the cup-shaped drain plug from the sink or like structure into the casing of the waste disposal appliance.

In order that the operation of the driving motor of the appliance as well as the flow of water through the drain plug may be controlled by rotation of handle 93 and plate 92, arcuate recesses 106 are provided in the rim of the plate at two opposite sides thereof. These recesses are so arranged that when handle 93 is in its midposition, the midpoints of the recesses are in substantial alignment with the midpoints of the beveled portions 94 of drain plug 91 so that they will pass the ledges 95 on the inner surface of the adapter ring 90 and permit proper seating of the drain plug in the adapter ring opening. Also when the handle is in its midposition the midpoint of one of these recesses is substantially directly opposite lever 50 which in the presently described modified embodiment has only one prong or ear 107 rather than two prongs or ears as in the first described embodiment. At both ends of each of the recesses 106 there are provided downwardly projecting lugs 108. These lugs are so arranged that upon rotation of the handle and the plate 45° in a counterclockwise direction to the position designated "Unit on—drain", the portion of the plate at the right-hand end, as viewed in Fig. 9, of the recess 106 which is opposite lever 50, projects through the open space 87 in guard member 80 so that the lug 108 on this projecting portion of the plate engages the ear 107 of lever 50 to move it to the right, as viewed in Fig. 11, thereby causing movement of the lower end of lever 48 to the left to actuate switch arm 47 to its "On" position and effect energization of motor 31 to drive the grinding mechanism in casing 13. Under these circumstances the elements of the improved closure or stopper device are in their

positions illustrated in Fig. 9 wherein portions of the rim of plate 92 are shown as engaging the underneath surfaces of ledges 95 to lock the closure device in the adapter ring opening and apertures 104 and slots 105 of the plate are shown as being in alignment with apertures 103 and slots 97 respectively of the drain plug to thereby permit drainage of water from the sink or like structure into the casing 13 to facilitate the grinding operation.

In the presently described modified embodiment of the apparatus, provision is made for operation of the apparatus not only with handle 93 and plate 92 in the "Unit on—drain" position described in the preceding paragraph, wherein the closure device is locked in the drain opening, but also for operation of the apparatus with the handle turned back to the "Seal" position so that the closure device may be removed from the drain opening. This is accomplished in that when the handle is turned 45° in a clockwise direction as viewed in Fig. 8 to the "Seal" position, subsequently to its having been turned in the counterclockwise direction to the "Unit on—drain" position, no portion of plate 92 is brought into engagement with ear 107 of lever 50 to operate the lever to effect deenergization of motor 31. With the handle in the midposition the closure device may be removed from the adapter ring opening since, as previously pointed out the recesses 106 are then opposite the ledges 95 so that they do not lock the closure device in the adapter ring opening. Under these conditions waste material to be disposed of by the apparatus may be fed continuously into the casing 13 through the adapter ring or drain opening, care being taken not to overload the grinding mechanism, and water for aid in the comminuting and flushing of the material may then pass from the sink or like structure directly into the casing through the drain opening. It is to be understood that this latter may be accomplished only after the handle has first been turned in a counterclockwise direction to the "Unit on—drain" position and subsequently turned back to the "Seal" position. Such operation of the apparatus with continuous feeding of material to be ground thereto may under certain conditions prove highly advantageous but in such case care must be exercised by the operator that he does not reach into the casing 13 and come in contact with the grinding and cutting mechanism.

When the stopper or closure device is seated in the adapter ring opening and the apparatus is in operation, the driving motor 31 may be deenergized by rotation of handle 93 in a clockwise direction, either 90° from the "Unit on—drain" position illustrated in Fig. 9 or 45° from the "Seal" position illustrated in Fig. 8, to the "Unit off—drain" position. By this means the lug 108 at the left-hand end of the slot 106 which is opposite lever 50 as viewed in Fig. 9, is brought into engagement with the ear 107 of lever 50 to move the lever to the left to its position illustrated in Fig. 11, thereby effecting movement of switch arm 47 to its "Off" position to deenergize the motor. Also, with the handle in "Unit off—drain" position, the closure device may be used simply as a drain plate in the manner hereinbefore described. Then subsequent rotation of the handle back to "Seal" permits removal of the closure device or, if desired, permits the use of the device simply as a stopper for closing the drain opening in the sink or

like structure as pointed out in connection with the first embodiment described, since when the handle is in "Seal" position the drain apertures 103 and slots 97 in the drain plug are closed by solid portions of the baffle plate 92.

The modified form of the closure device has, in addition to the advantages previously pointed out, the advantage that due to the construction of the baffle plate 92 including a reinforcing rib 110 disposed around the bottom thereof and passing in proximity to the inner edges of the recesses 106 and including also the reinforced lugs 108 for engaging lever 50, and due to the manner of attaching the plate to the handle at two spaced apart points on opposite sides of the center of the plate, great rigidity is secured and the chances of buckling of the baffle plate so that it would not properly engage lever 50 are rendered negligible. The manner of attaching the plate to the handle has also the advantage that it insures good leverage and renders very easy the turning of the plate to actuate the lever 50. A further advantage of the modified form of the closure device is that, due to the symmetry of arrangement of its various parts, it may be installed in the adapter ring opening in either of two positions, displaced 180° apart with respect to each other, and the closure device will operate equally effectively in either of the two positions to perform the functions for which it is designed.

From the foregoing description it will be evident that the present invention provides an improved form of waste disposal apparatus having control means which is extremely flexible for accomplishing the desires of an operator and which effectively minimizes the chances of injury to an operator or anyone else due to careless or ignorant manipulation, and which at the same time is simple in construction and arrangement and most conveniently located for ease in controlling the operation of the apparatus. It will be evident also that the invention is not limited to the details of the exemplary embodiments illustrated and described herein but on the contrary is subject to modification to adapt the apparatus for various installation conditions which may be encountered, and that certain features of the invention lend themselves with advantage to other than kitchen or domestic applications with sinks or like structures. Hence, such other modifications or applications as do not depart from the true spirit and scope of the invention are intended to be covered by the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A waste disposal apparatus comprising a sink or like structure adapted to have water supplied thereto and having a drain opening, a receptacle connected to the sink and having a passage in communication with said opening for admitting water and waste material to the receptacle, power driven means operable for comminuting material in the receptacle, means for the discharge of comminuted material and water from the receptacle, control means for rendering said power driven means operative and inoperative, a removable stopper device for said opening operable selectively for closing the opening to prevent drainage of water therethrough from said sink and for affording a passage for said drainage of water, means carried by said stopper device and selectively operable, when the stopper device is in said opening, for effecting operation

of said control means to render said power driven means operative and inoperative, and means operative automatically to lock said stopper device against removal from said opening upon operation of said control means to render said power driven means operative.

2. In a waste disposal apparatus, a housing providing a receptacle for waste material and having a material admission opening adapted to be connected with a drain opening of a sink or like structure for admission of water to said receptacle from the sink or like structure, power driven means for comminuting waste material in said receptacle, control means operable selectively for rendering said power driven means operative and inoperative, a stopper device adapted to seat removably in said housing opening and having means selectively operable, when the stopper device is seated in the housing opening, for controlling the flow of water through the housing opening into said receptacle, and actuating means carried by said stopper device and operable, when the stopper device is seated in said housing opening, to a plurality of positions for effecting selective operation of said control means to render said power driven means operative and inoperative and for selectively operating said flow controlling means.

3. In combination, a housing providing a receptacle for material to be ground and having an opening providing access to the interior of said receptacle, power driven means operable for grinding material in said receptacle, a closure device adapted to be disposed removably in position to close said opening, control mechanism for said power driven means including a part disposed adjacent said opening, and a control actuating element carried by said closure device and cooperatively engageable with said part only when the closure device is in position to close said opening, said actuating element being movable to a plurality of different positions relative to the closure device for cooperation with said part, when the closure device is in position to close said opening, to effect selective operation of said control mechanism to render said power driven means operative and inoperative.

4. In combination, a housing providing a receptacle for material to be ground and having an opening providing access to the interior of said receptacle, power driven means operable for grinding material in said receptacle, a removable closure device for said opening, an actuating element carried by said closure device and movable relative thereto, and control mechanism for said power driven means including a control element disposed in said housing adjacent said opening for engagement by said actuating element when the closure device is in position to close said opening, said control element being operable to two different positions for rendering said power driven means operative and inoperative respectively, and said actuating element being movable, when said closure device is in position to close said opening, for selectively effecting operation of said control element to render the power driven means operative and inoperative.

5. In combination, a housing providing a receptacle for material to be ground and having a material admission opening providing access to the interior of said receptacle, power driven means operable for grinding material in said receptacle, a removable closure device for said opening, control mechanism for said power driven means including a control element dis-

posed in said housing adjacent said opening and operable selectively for rendering said power driven means operative and inoperative, an actuating element carried by said closure device engageable with said control element and operable, when the closure device is in position to close said opening, for effecting selective operation of the control element to render said power driven means operative and inoperative, and guard means positioned to shield said control element from accidental contact by an operator or material passing through said opening when said closure device is removed from the opening.

6. In a waste disposal apparatus, a casing having power driven means for grinding waste material therein, means providing an opening affording access to the interior of said casing for the feeding of material to be ground thereinto, a removable closure device for said opening, control means including an element of said closure device, which said element is selectively operable, when the closure device is in closing relation to said opening, for rendering said power driven means operative and inoperative, and means cooperative with said control means automatically to lock said closure device against removal from said opening upon operation of the control means to render said power driven means operative.

7. In combination, a casing having means operable for grinding material therein and having means providing an opening affording access to the interior of the casing, a removable closure device for said opening, control means for said grinding means including a control actuating element supported adjacent said opening and operable selectively for rendering the grinding means operative and inoperative, an element supported by said closure device for movement relative thereto and arranged to engage said control actuating element for operating the same when said closure device is in position to close said opening, and means arranged to cooperate with said second mentioned element automatically to lock said closure device in said opening when said control actuating element is operated by said second element to render the grinding means operative.

8. In combination, a sink or like structure having a drain opening, a power operated device having a chamber connected with said opening for receiving water from said sink or like structure through said opening, control means for said power operated device and a removable stopper device for said drain opening having means selectively operable, when said stopper device is in said opening, for effecting operation of said control means to render the power operated device operative and inoperative.

9. In combination a sink or like structure having a drain opening therein, a casing connected to said sink or like structure and having power driven means therein, means including said opening providing for access to the interior of said casing and for the admission of water from the sink or like structure to said power driven means, means carried by said casing operable for controlling the operation of said power driven means, a removable stopper device for said opening having means operable, when the stopper device is in said opening, for selectively effecting operation of said controlling means to render said power driven means operative and inoperative, and means operative automatically to lock said stopper device in said opening upon operation of said controlling means to render the power driven means operative.

tion of said controlling means to render the power driven means operative.

10. In combination, a housing defining a grinding chamber having an opening for affording access thereto; power driven means for grinding material in said chamber; control means operable to render said power driven means operative and inoperative; a removable closure device for said opening having means cooperative with said control means and selectively operable, when the closure device is in position to close said opening, to render said power driven means operative and inoperative; and locking means operative dependently upon operation of said selectively operable means, positively to lock said closure device and prevent removal thereof from closing position relative to said opening upon operation of said selectively operable means to render said power driven means operative; said locking means being operative to release said closure device dependently upon operation of said selectively operable means to render said power driven means inoperative.

11. In combination, a casing having power driven means therein and having an opening arranged to be connected in substantial registry with a drain opening in a sink or like structure for admitting water from the sink or like structure to said casing, control mechanism for said power driven means including a control actuating element disposed adjacent said casing opening, an apertured member arranged to seat removably in said casing opening, a baffle plate carried by said member and movable relative thereto into a plurality of positions including a position for closing the apertures in said member, means carried by said member for moving said baffle plate and means mounted for movement with said baffle plate and engageable with said control actuating element for operating the same upon movement of the baffle plate relative to said member into predetermined ones of its said positions.

12. In a waste disposal apparatus, the combination with a receptacle having an opening providing for access to the interior thereof, grinding means in the receptacle, a motor for driving the grinding means and control mechanism for the motor, of a movable element disposed adjacent said casing opening and connected for actuating said control mechanism, a closure member adapted to seat removably in said casing opening and having apertures therein, an apertured plate member carried by said closure member and movable relative thereto into a plurality of positions including at least one position wherein the plate member is operative to close the apertures in the closure member and at least one other position wherein the apertures in the plate member are in substantial registry with the apertures in the closure member, and means carried by said plate member engageable with said control actuating element for operating the same upon movement of said plate member relative to said closure member into predetermined ones of its said plurality of positions.

13. In a waste disposal apparatus, the combination of a sink or like structure adapted to have water supplied thereto and having a drain opening, means providing a receptacle for waste material and a passage communicating with said opening for conducting water and waste material from said structure to said receptacle, power driven means for comminuting waste material in said receptacle, an apertured strainer element

adapted to seat removably in said opening, control mechanism for said power driven means including a control element disposed in said passage adjacent said opening and operable selectively for rendering the power driven means operative and inoperative, and an actuating element carried by said strainer element engageable with said control element and operable, when the strainer element is seated in said opening, for actuating said control element.

14. A waste disposal apparatus including in combination a sink or like structure adapted to have water supplied thereto and having a drain opening, a receptacle connected with said drain opening for receiving water from said sink or like structure, power driven means for comminuting waste material in said receptacle, a closure device for said drain opening having means operable selectively into at least one position for preventing drainage of water through said opening from said sink or like structure and into at least two other positions for permitting such drainage of water, and control means for said power driven comminuting means cooperative with said selectively operable means for rendering the comminuting means operative when the selectively operable means is in one of its said flow permitting positions and for rendering the comminuting means inoperative when the selectively operable means is in another of its said flow permitting positions.

15. A waste disposal apparatus including in combination a sink or like structure adapted to have water supplied thereto and having a drain opening, a receptacle connected with said drain opening for receiving water from said sink or like structure, power driven means for comminuting waste material in said receptacle, control means for said power driven means, an apertured drain member in said drain opening, a baffle member cooperatively associated with said drain member for movement into a plurality of positions including at least one position for closing the apertures in the drain member and at least two other positions for opening the apertures in the drain member, and means movable with said baffle member for operating said control means to render said comminuting means operative upon movement of the baffle member into a predetermined one of its said aperture opening positions and for operating the control means to render the comminuting means inoperative upon movement of the baffle member into another predetermined one of its said plurality of positions.

16. The combination with a sink or like structure adapted to have water supplied thereto and having a drain opening, of a casing having a passage connected with said drain opening for conducting water from said sink or like structure to the interior of the casing, power driven means in said casing, closure means for said drain opening operable selectively for preventing drainage of water through the opening from said sink or like structure and for permitting said drainage of water, actuating means for said closure means movable into a plurality of positions including at least one position for operating the closure means to prevent drainage of water through said opening and at least two other positions for operating the closure means to permit drainage of water through said opening, and control means for said power driven means con-

nected for operation by said actuating means to render the power driven means operative when the actuating means is in one of its said other positions and to render the power driven means inoperative when the actuating means is in another of its said other positions.

17. In combination, a sink or like structure adapted to have water supplied thereto, means providing a passage for drainage of water from said structure, a waste disposal appliance including a chamber connected for receiving water through said passage from said structure and power driven means operable for comminuting waste material in said chamber, valve means in said passage including an element movable to two different positions in the passage, each of which positions permits drainage of water from said structure, and control means for the power driving means of said appliance operative to render said power driving means operative in response to movement of said element to one of its said two positions, said control means being inoperative to render said power driving means operative upon movement of said element to the other of its said two positions.

18. The combination with a sink or like structure adapted to have water supplied thereto and having a drain opening, and a power driven appliance connected for receiving water through said drain opening from said sink or like structure, of control mechanism for the power driving means of said appliance including a control element disposed adjacent said drain opening and operable for rendering said power driving means operative and inoperative, an apertured strainer element disposed in said drain opening, a baffle element supported for movement relative to said strainer element to a plurality of positions including positions for selectively controlling the flow of water through the apertures in said strainer element, and control actuating means operatively associated with said baffle element for movement therewith and engageable with said control element for effecting selective operation of the control element in response to movement of the baffle element to certain of its said plurality of positions.

19. A combined drain closure and control actuating device for use with a power operated appliance which is adapted to be connected with the drain opening of a sink or the like for receiving water therefrom and which appliance has control means including a control operating element arranged to be located adjacent such drain opening; said device comprising an apertured strainer member adapted to seat removably in a drain opening of a sink or the like, a handle disposed on the upper side of said member to be accessible from such sink or the like and having spaced apart projections respectively extending through substantially concentric arcuate slots in said member, a baffle plate disposed on the lower side of said member and attached to said projections, and means for maintaining said baffle plate in firm slidable engagement with the underneath surface of said member, said plate being rotatable by said handle selectively to operate the plate into and out of closing relation to the apertures in said member and having means engageable with said control operating element for selective actuation of said element.

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