Dec. 4, 1934. H. ROBINSON 1,983,401

SILVERWARE BURNISHING MACHINE

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Fig. 1.

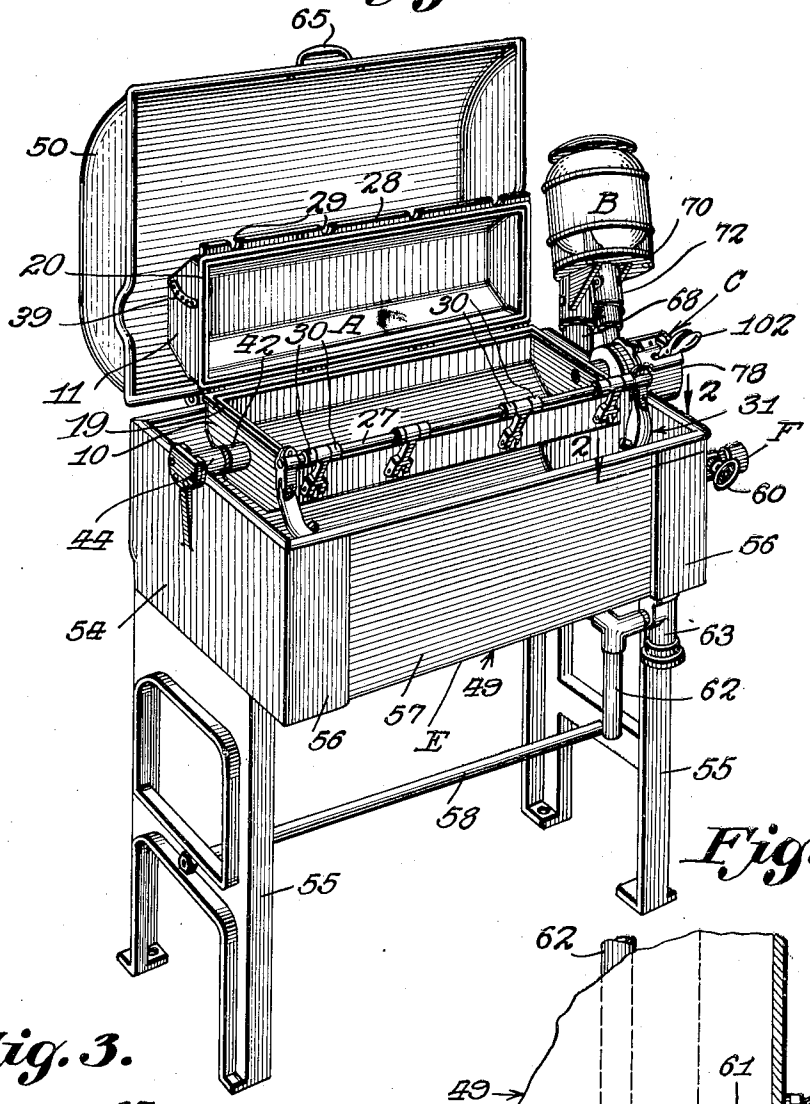


Fig. 2.

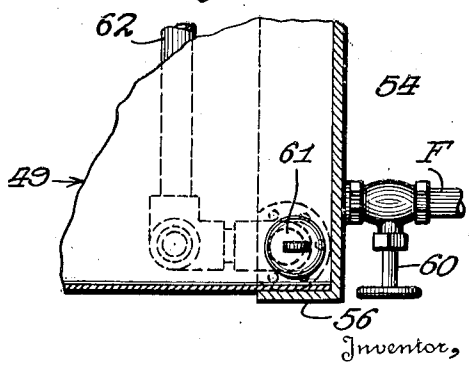
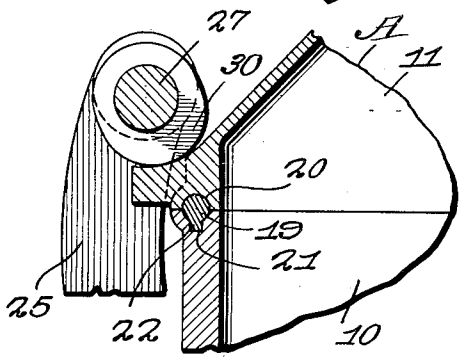


Fig. 3.



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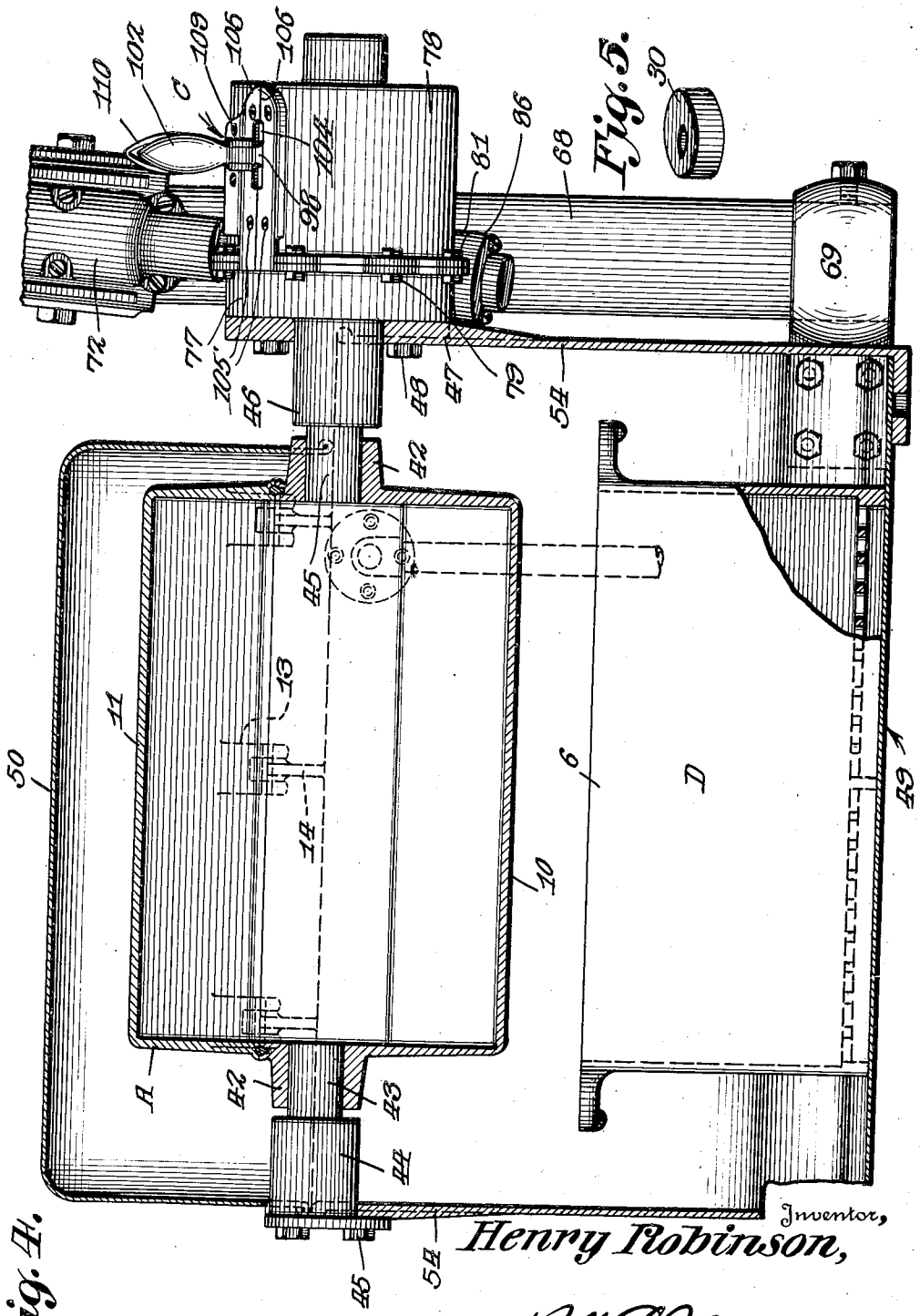
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SILVERWARE BURNISHING MACHINE

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SILVERWARE BURNISHING MACHINE

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Fig. 7.

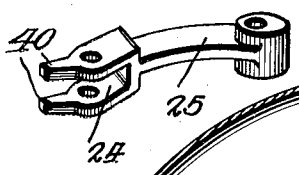


Fig. 6.

Fig. 9.

Fig. 8.

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SILVERWARE BURNISHING MACHINE

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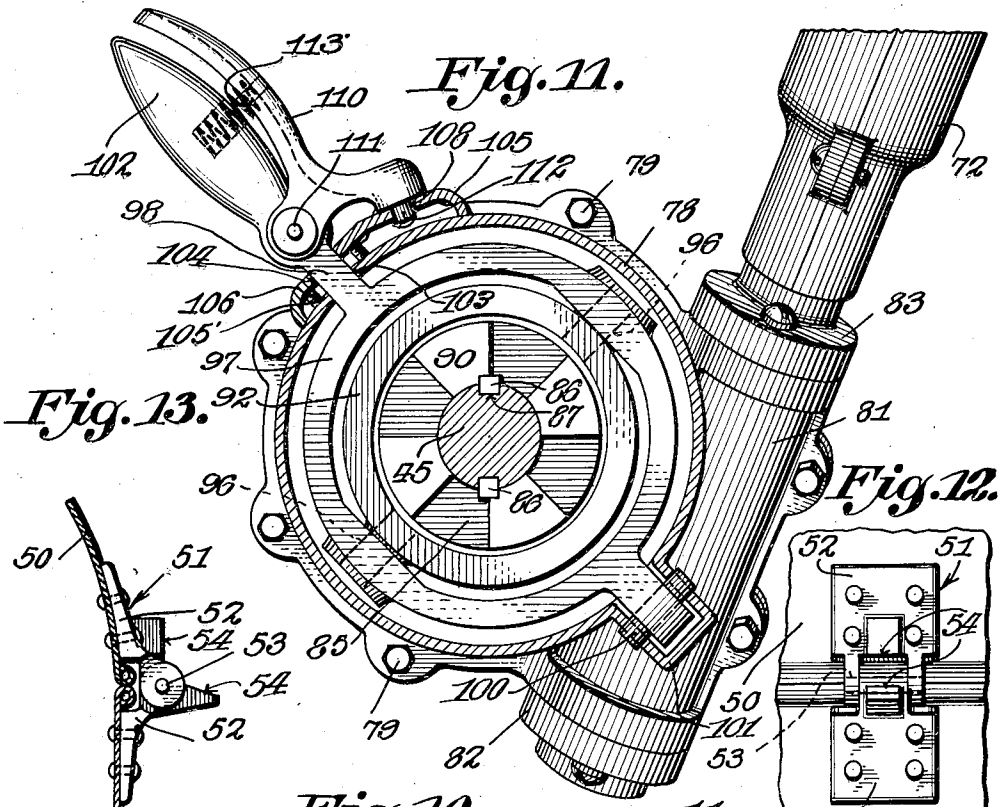


Fig. 11.

Fig. 12.

Fig. 13.

Fig. 10.

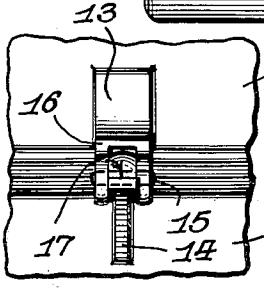


Fig. 14.

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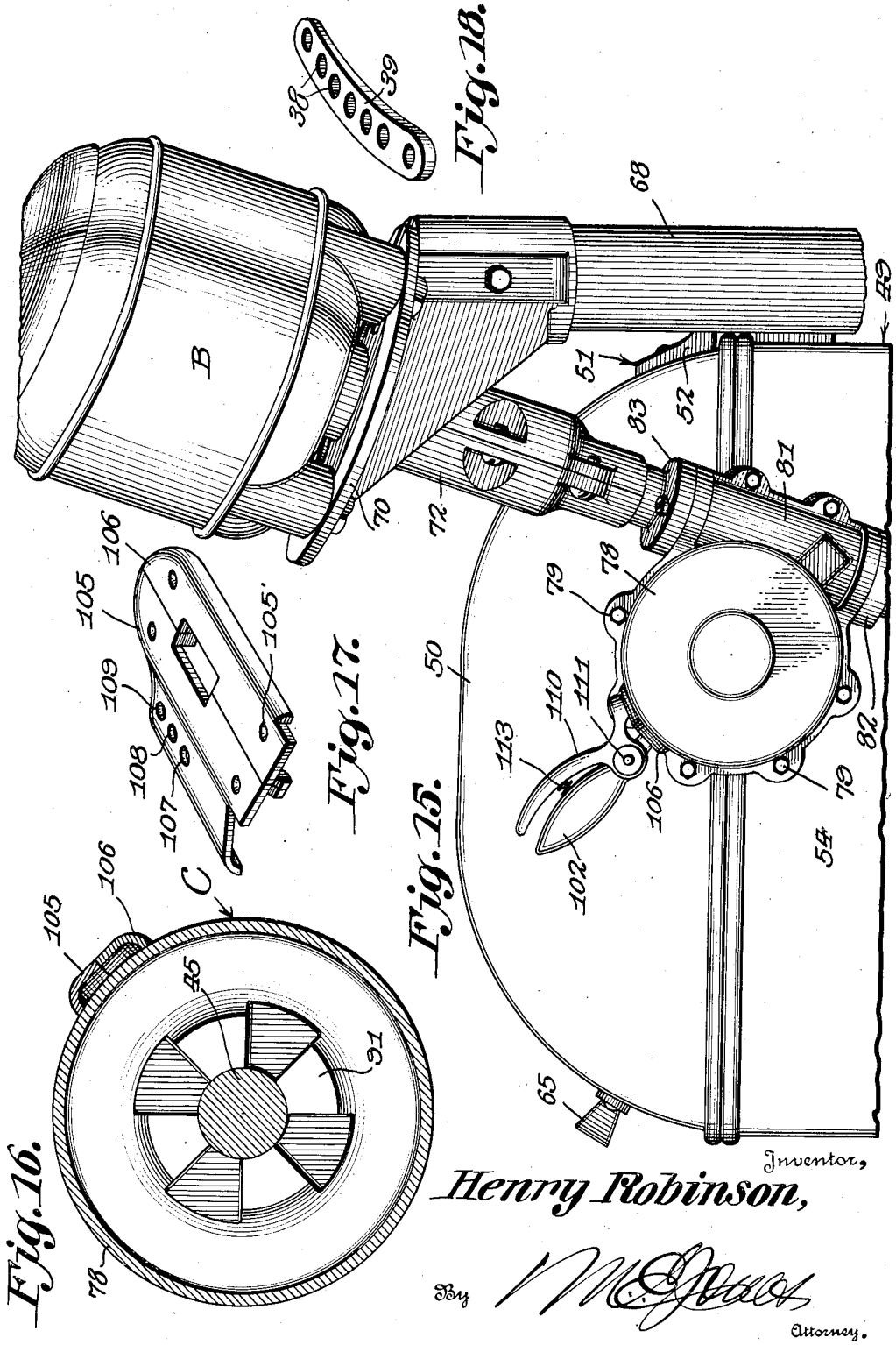
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SILVERWARE BURNISHING MACHINE

Filed July 29, 1933 6 Sheets-Sheet 5



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SILVERWARE BURNISHING MACHINE

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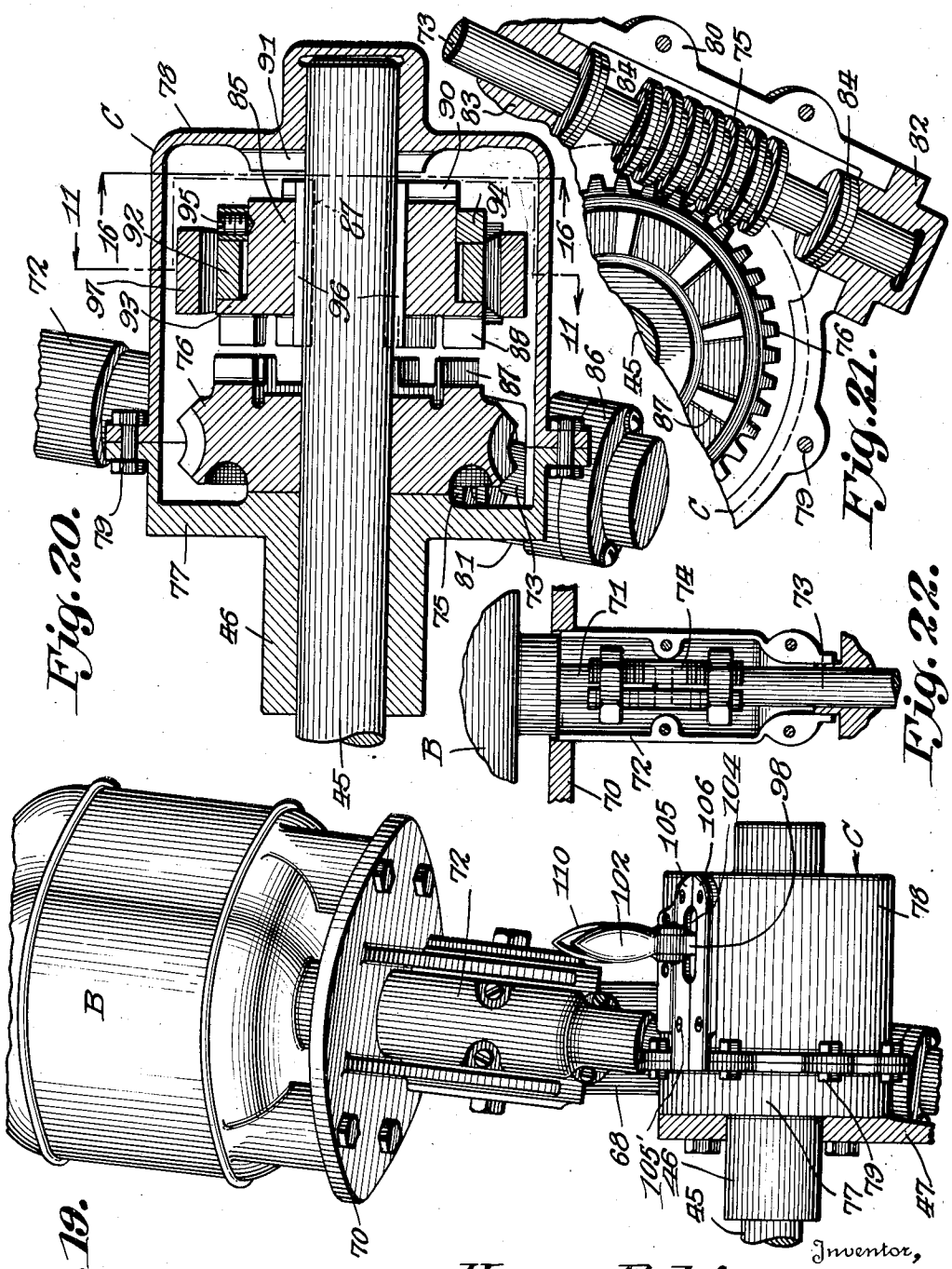


Fig. 19.

Fig. 20.

Fig. 21.

Fig. 22.

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Patented Dec. 4, 1934 1,983,401

UNITED STATES PATENT OFFICE

1,983,401

SILVERWARE BURNISHING MACHINE

Henry Robinson, Lindenhurst, N. Y.

Application July 29, 1933, Serial No. 682,856

14 Claims. (Cl. 51—164)

This invention relates to a machine for burnishing articles of silver tableware wherein the silverware with a liquid detergent and metallic balls are tumbled.

It is generally aimed to provide an exceedingly durable and compact construction capable of ready manufacture and efficiency in use.

In addition, such a machine is provided with maximum safety features against bodily injury, and escape of liquid from the tumbler and tank onto the operator and into the motor.

A very important object is to provide an extremely efficient closure means for the tumbler, enabling the required pressure to be applied with minimum effort to insure against the escape of liquid, and in which latching members constitute extensions and parts of the lever arms for operating such closure means, being movable into fastened positions with the same motion of applying the closure means and automatically therewith.

Another important feature resides in the mounted position of the motor to attain secure and rigid fastening thereof away from the zone of splashing water and permit free movement of the cover of the tank or casing and positioning and operation of clutch and drum shaft lock means.

Still another object is to produce a construction wherein the tumbler is eccentrically mounted within the tank to enable baskets to freely be placed into and removed from the tank between the tumbler and front inner side wall of the tank, such baskets being adapted to receive the silverware from the tumbler and washed and sterilized while in the tank, the tank having a portion of its bottom arranged for the baskets to rest thereon and another portion inclined to facilitate drainage.

The more specific objects and advantages will become apparent from a consideration of the description following, taken in connection with accompanying drawings illustrating an operative embodiment.

In said drawings:

Figure 1 is a perspective view of my improved burnishing machine, the casing cover being shown raised and the cover or closure of the tumbler also being shown raised or open;

Figure 2 is a detail horizontal section, taken on the line 2—2 of Figure 1;

Figure 3 is an enlarged detail vertical sectional view through the tumbler and its closure, taken on the line 3—3 of Figure 10;

Figure 4 is a substantially central longitudinal sectional view primarily through the casing;

Figure 5 is a detail perspective view of one of the cams used in the closure means for the tumbler;

Figure 6 is a substantially central transverse sectional view through the casing;

Figure 7 is a detail perspective view of one of the links used in the closure mechanism for the tumbler;

Figure 8 is a detail perspective view of one of the operating and latching lever means for the tumbler cover;

Figure 9 is a detail horizontal section, taken on the line 9—9 of Figure 8;

Figure 10 is a front elevation of the tumbler in closed condition;

Figure 11 is a cross section through the clutch and lock mechanism, taken substantially on the plane of line 11—11 of Figure 20;

Figure 12 is a detail in elevation, showing one of the hinges for the casing cover;

Figure 13 is a detail section through portions of the casing and showing the last mentioned hinge;

Figure 14 is a detail rear view of a portion of the tumbler, showing one of the hinges used thereon;

Figure 15 is an enlarged end elevation of the upper portion of the casing, clutch and lock, and drive;

Figure 16 is a detail section, taken on line 16—16 of Figure 20, showing the lock teeth which the clutch engages;

Figure 17 is a detail perspective view of the sectional guide and latch plate for the clutch-shifting lever;

Figure 18 is a detail perspective view of the keeper plate engaged by the latches of the tumbler closure mechanism;

Figure 19 is a view in front elevation primarily showing the clutch and lock mechanism and the drive, the connection to the casing being fragmentarily shown in section;

Figure 20 is a substantially central longitudinal sectional view through the clutch and lock mechanism;

Figure 21 is a detail view, partly in section and partly broken away, showing the worm and worm wheel drive for the tumbler; and,

Figure 22 is a detail sectional view, showing the motor shaft and drive shaft connection.

Referring specifically to the drawings, wherein like reference characters designate like or corresponding parts in the several views, the machine briefly is adapted to tumble table silveware, or other articles, in a tumbler drum A, which also contains small metallic balls and soapy water or other liquid detergent. Said tumbler drum A is adapted to be rotated from an electric motor B through the medium of suitable gearing under control of a clutch C, which also serves to lock the tumbler against accidental rotation, as a safety feature to the operator, when the tumbler is open and the cleaned silverware is removed.

Such silverware is deposited in one or more foraminous baskets D, as best shown in Figures 5 and 6, applicable to and removable from a casing E through the space between the tumbler and front wall of the casing. The silverware, while in the baskets D, is rinsed and sterilized by immersion in the hot water bath of the tank supplied from any suitable source through means F.

The tumbler and its closure means

Reverting to the tumbler A, the same is made of any suitable material, such as wood, or metal, or composite, and is, preferably but not necessarily, octagonal or otherwise polygonal in cross section to facilitate tumbling, the shape being well shown in Figures 1 and 6. Said tumbler has a main section 10 and a cover or closure section 11 joined together by hinges 12 (Figures 6 and 14). Said hinges 12 comprise leaves 13 secured to the section 11 and leaves 14 fastened to section 10. Said leaves are pivoted together by horizontal pintles 15 and respectively have abutment shoulders 16 and 17 adapted for engagement to limit movement of cover 11 to and sustain it in the open position of Figure 1, the center of gravity being slightly past the vertical. Section 10 may have a handle 10', if desired.

The meeting edges of both sections 10 and 11 are thickened or widened at 18 and grooved at 19, so as to be filled by an endless rubber or other gasket 20. Said gasket is generally round in cross section but has a flange 21 extending from one side thereof which fits tight in an extension 22 of one of the grooves 19. Either groove may have said extension 22. Said flange 21 is preferably wedge fitted in the extension 22, and, if desired, glued or bonded therein as well. The gasket is thus fixed to one of the sections, for instance, 10, as shown, while the other section is free to engage or disengage the same. It is particularly to be noted that such gasket crosses the junction line of the sections 10 and 11 in order to intercept any moisture to prevent escape from the tumbler. The gasket is subject also to compression to more effectively seal the closure or cover.

Integral with or otherwise provided on the front wall of the tumbler are spaced lugs 23 straddled by bifurcations 24 of links 25, horizontal pivot pins 26 passing therethrough. In the free ends of said links 25, a clamping rod 27 is journaled. The front edge portion of closure 11 is extended at 28 and has notches or slots 29. Said links 25 are adapted to be swung into the notches 29 whereby clamping rod 27 is located above the flange or extension 28. Cams 30 are fastened to clamping rod 27, one abutting each side of each link, whereby the clamping rod is mounted against displacement. Through turning of the clamping rod, said cams 30 depress the cover tightly over the gasket 20 to insure a seal against the escape of water. To this end, cranks or levers 31 are rigidly fastened to the clamping rod at opposite ends. Such levers are preferably split at 32, so they may be slipped over the rod and thereafter rigidly bolted in place, as at 33. Elements 34 are pivoted at 35 to the levers 31, their axes being at a right angle to the longitudinal axis of the clamping rod. Therefore, elements 34 function as extensions and parts of the levers. Such elements have a limited lateral movement on the pivots 35 due to the clearance at 36 and, hence, as the levers are depressed into closing position, lugs 37 on elements 34 register with one or more openings 38 on the sides of cover 11, and are slid into the same. Only one or a series of such openings or sockets 38 may be provided, as preferred, and they are preferably formed in plates 39, welded or otherwise secured to cover 10.

Particular attention is directed to the fact that the closure mechanism does not involve any detachable parts and is exceedingly simple, durable and efficient, giving the required leverage and clamping effect for the expenditure of minimum power. It is to be particularly borne in mind that the clamping and locking of the said mechanism is accomplished through substantially the same or continuous movement of the hand, in that the hand moves the lever 31 and element 34 simultaneously downwardly and inwardly so that the lug 37 automatically enters the desired socket upon registering therewith, through the said movement or pressure of the hand. Reverse movement of the levers 31 disengages the cams from the cover and swings the links 25 and clamping rod outwardly to the extent limited by lugs 40 on such links. Handles 41 may also be provided on the elements 34 to facilitate retraction of lugs 37 from the sockets.

The ends of section 10 have hubs 42, in one of which a stub shaft 43 is fixed and in turn journaled in a bearing or bracket 44, bolted or otherwise fastened to one end wall of casing D. In the other hub 42 a shaft 45 is fixed. Shaft 45 is journaled in a bearing 46 extending through a thickened part 47 of the adjacent end wall of the casing E and fastened thereto as, by bolting, at 48. Power is imparted to the shaft 45, as will later be specifically described, to rotate the tumbler.

The casing

The casing E consists of a main section or tank 49 and a cover or closure section 50 pivoted thereto by hinges 51 having leaves 52 pivoted at 53. Said leaves have surfaces 54 adapted to abut in open position, as shown in Figure 1, to support the cover slightly past the vertical (Figures 1, 6, 10 and 12).

Main casing section 49 may be constructed in one piece, or in any other way. As shown, the ends 54 thereof are parts of castings which also include supporting legs 55. Ends 54 have flanges 56 at the bottom and sides which are engaged water-tight by a body section 57, riveted, welded, or in any other way secured to said flanges. A brace rod 58 may connect said legs 55. This construction enables me to use the castings 54—55 with body sections 57 of varying lengths according to the size of the machine desired.

As well shown in Figure 6, the tumbler and its mounting are disposed eccentrically of the casing closer to the rear than the front, thereby providing a relatively large space 59, through which the previously mentioned foraminous baskets or trays D may be inserted and removed. After a tumbling operation and opening of the tumbler A, the silverware is transferred to the basket or baskets D positioned in the tank, as in Figures 4 and 6. The basket D and its contents are immersed in hot water in the tank, supplied from any desired source through the previously mentioned pipe line F. Said pipe line F has a control valve 60. The outlet from the tank is shown at 61 (Figure 9) to a drain pipe 62 leading to a sewer or other point of discharge, and which includes a removable trap 63. Such hot water rinses and sterilizes the silverware. The forward portion of the bottom wall of tank 49 is preferably flat at 64, to better support the basket or baskets D,

and the remainder of said bottom wall inclines toward it to insure complete drainage of the used water from tank, when required.

Said cover section 50 of the casing has a handle 65, and the end walls are notched at 66 and 67 to respectively fit the bearing 44 and hub 42. As best shown in Figure 4, said cover 50 is shorter than the main casing section, so as to terminate short of the transmission and clutch, permit the parts to be freely manipulated and the cover to be readily opened and closed. Such cover 50 acts as a guard over the revolving tumbler and prevents any water being thrown from the casing.

The drive

The previously mentioned motor B is electric, and while it may be positioned in the fully enclosed type, yet it need not be, as it is positioned out of the zone where splashing water can reach its parts or interfere with its operation, being mounted adjacent the top of the machine with its longitudinal axis inclined upwardly and rearwardly and also outwardly and upwardly. An upstanding vertical post 68, shown in Figure 4, is located at the right rear corner of the machine, supported and suitably clamped in a bracket 69 fastened to that corner of the tank 49. At its upper end, post 68 mounts an inclined shelf 70, which carries the said motor B, its drive shaft 71 depending at the angle mentioned through an opening in the shelf, a sectional protecting housing 72 of suitable construction surrounding the same. A shaft 73, aligned with shaft 71, is coupled thereto at 74 within said housing 72. Shaft 73 carries a worm gear 75 enmeshed with a worm wheel 76 loose on the tumbler shaft 45, such gears being enclosed in a casing with clutch and lock parts now to be described.

The clutch and tumbler lock

The previously mentioned bearing 46 is part of a section 77 of a casing for the clutch and tumbler lock mechanism C, the casing being completed by a main section 78 and detachably bolted at 79 to section 77. Said sections 77 and 78 include portions or enlargements 80 and 81, respectively, which house the gear worm 75 and mount bearings 82 and 83 for shaft 73, thrust collars 84 on the shaft abutting the latter bearings to position the shaft 75. Said worm wheel is enclosed by the main portions of the clutch casing 77—78, which also encloses a slidable clutch member 85. Said clutch 85 rotates with shaft 45 as well as slides axially thereof due to the engagement of splines or keys 86 on the shaft in slots 87 extending from the bore of the clutch member. Equidistantly spaced teeth 88 on said clutch member 85 are engageable with similar equidistantly spaced teeth 89 on the adjacent side of worm wheel 76 in order to rotate the tumbler. Teeth 90 are provided on the other end of clutch 85 and adapted for engagement with similar teeth 91 integral with the casing section 78 and thus rigid with the frame of the machine, resulting in latching or locking the shaft 45 and tumbler against accidental rotation. This is especially desirable in overcoming the accident hazard incident to removing silverware from the tumbler into the basket D.

In order to slide the clutch 85, a ring 92 loosely surrounds the clutch between a wall 93 thereof and a retainer ring 94 fastened at 95 thereto. Said ring 92 at diametrically opposite points is pivotally connected by pins 96 to a ring 97 of an operating lever 98 having an extension 99 pivoted at 100 in an extension 101 of housing section 78. The space within the ring 97 is relatively large to provide clearance for movement relatively to ring 92. A handle 102 on lever 98 extends exteriorly of the casing through a horiozntal slot 103 in section 78, and a similar slot 104 formed in a guide and latch plate 105, best shown in Figure 17. Plate 105 is preferably screwed in place at 105' and made in sections dividing along the line 106, one section having three notches 107, 108 and 109 therein. A latch 110 is pivoted at 111 to handle 102 having a lug 112 urged toward the said notches by a spring 113. The said clutch is movable to three positions, namely, driving (by engagement of teeth 87 and 88), neutral and tumbler-locking (by engagement of teeth 90 and 91). The clutch is locked in the said three positions in the order named through the engagement of lug 112 in the notches 107, 108 and 109, respectively.

The particular angles mentioned for the motor and its shaft not only enable a compact structure to be provided and the cover 50 used with freedom of swinging, but cause the motor shaft to coact with the post 68 in providing an inverted V support, thus rigidly mounting the motor substantially against vibration. The rigidity is enhanced by the connection of casing section 77 to the thickened wall portion 47.

Various changes may be resorted to, provided they fall within the spirit and scope of the invention.

I claim as my invention:

1. In combination with a tumbler or the like having separable sections, a rod, link means in which said rod is journaled, said link means being pivoted on one section, the other section having an extension provided with a notch, the link means being movable through the notch of the extension, clamping means on the rod engageable with the extension, a crank on the rod operable to turn it, an element pivoted to the crank on an axis at an angle to that of the rod and forming an extension of the crank, and interengaging means between said element and adjacent section of the tumbler.

2. In combination with a tumbler or the like having separable sections, a rod, link means transversely of said rod and in which said rod is journaled, said link means being pivoted on one section, the other section having an extension provided with a notch, the link means being movable through the notch of the extension, clamping means on the rod engageable with the extension, a crank on the rod operable to turn it, an element pivoted to the crank on an axis at an angle to that of the rod and forming an extension of the crank, and one of said sections having a socket entered by the element.

3. In combination with a tumbler or the like having separable sections, a rod, link means in which said rod is journaled, said link means being pivoted on one section, the other section having an extension provided with a notch, the link means being movable through the notch of the extension, clamping means on the rod engageable with the extension, a crank on the rod operable to turn it, an element pivoted to the crank on an axis at an angle to that of the rod and forming an extension of the crank, and means of interengagement between said element and one of the sections substantially automatically engageable through a single applying movement of the crank.

4. In combination with a section of a tumbler

or the like, a section movable relatively thereto and having an extension beyond the same provided with a notch, a link pivoted to the first section, and movable into and out of the notch, a rod journaled in the link, cams on said rod on opposite sides of the link, means operable to turn the rod so that said cams will engage said extension, a crank adjacent one end of said rod, and a latching element thereon engageable with the second section, said latching element forming an extension of the crank and being pivoted thereto at a right angle to its axis.

5. In combination with a section of a tumbler or the like, a section movable relative thereto having an extension beyond the same provided with notches, links pivoted on the first section and journaling the rod, said links being insertible into said notches, cams on the rod engaging the extension, cranks at opposite ends of the rod, extensions pivoted to the cranks on an axis at an angle to that of the rod, and means of interengagement between the extensions and second section.

6. Closure mechanism comprising a rotatable rod, cam means thereon, links in which said rod is journaled adapted for pivotal connection to a supporting means, means operable to turn the rod, including a crank on the rod, and a latching extension pivoted to the crank on an axis at an angle to that of the rod.

7. In a machine of the class described, a casing having a tank section, a tumbler journaled therein, drive means at one end of the tank section having a box on the exterior of the tank section and having a driving shaft extending upwardly, rearwardly and longitudinally away from the box, a motor at the top of said shaft, an upstanding post on said tank section, a support surmounting said post, said motor being disposed above the tank and being mounted on said support, sheathing about said shaft rigidly connected to the motor housing, support and box, and a cover for the casing disposed over the tumbler and terminating short of the driving end of the tank section so that it is capable of swinging to open and closed positions.

8. In combination with a side wall of a casing, a laterally disposed shaft journaled therein to drive mechanism in the casing, a box having a section on the exterior of said wall in which said shaft is journaled, an upstanding post on the exterior of said casing and adjacent the rear of said wall, a motor support inclined rearward and downward surmounting said post, a motor above said casing on said support, shaft means driven by the motor depending therefrom at a right angle to said support, said shaft means also extending upwardly and longitudinally away from the casing, gear and clutch means in said casing between said shaft and shaft means, said box having means therein engageable by the clutch to lock the shaft against rotation, and enclosing means for the shaft means rigid with said housing, said support and said box.

9. In combination with a tumbler or the like having separable sections, a rod, link means in which said rod is journaled, said link means being pivoted on one section below the rod, the other section having an extension below the rod in the closed condition of the tumbler and provided with a notch, the link means extending below its pivotal axis and being normally spaced from the adjacent section, the link means in said closed condition occupying the notch, said link means being movable away from the tumbler out of said notch and past a perpendicular line passing through the axis of movement of the link, the lower end portion of the link means during outward movement abutting the adjacent section to maintain the rod materially above the said pivotal axis of the link means, clamping means on the rod engageable with the extension, and operating means on the rod beyond one end of the tumbler, said operating means being depressible inwardly and away from the rod and downwardly toward the tumbler to apply the clamping means.

10. The combination of claim 9 wherein said operating means is adapted to hang from the rod when the sections are unfastened to maintain the rod and clamping means retracted from the path of movement of the movable section.

11. The combination of claim 9 wherein said operating means is an element pivoted to the rod and has a fastening element applicable to and removable from an end wall of the tumbler through movement in a plane at a right angle to said end wall.

12. In combination with a section of a tumbler or the like, a section movable relatively thereto and having an extension beyond the same provided with a notch, a link pivoted to the first section below the extension, and movable into and out of the notch, a rod disposed at substantially a right angle to and journaled in the link above the extension, cams on said rod on opposite sides of the link, and means operable to turn the rod in a direction inwardly and downwardly relative to the axis of movement of the tumbler so that said cams will engage said extension, said means also being movable upwardly and outwardly with respect to said axis to move the link out of said notch and then assume a depending position, the link means being adapted to contact with the section to limit its movement out of the notch to maintain the rod materially above the pivotal axis of the link means.

13. A machine of the class described having a casing, a box on the exterior of a side wall thereof, a tumbler in said casing having a shaft extending laterally through said side wall and into the box, an upstanding post carried by and exteriorly of the said casing, a motor above the casing surmounting the post, a depending shaft driven by the motor disposed in inverted V-relation to said post, said shaft also extending upwardly and longitudinally away from said side wall, sheathing about said shaft rigidly connected to the motor housing and box, and means housed by the box to drive the first mentioned shaft from the last mentioned shaft.

14. In combination with a side wall of a casing, an exterior box thereon, a laterally disposed shaft journaled in the casing to drive mechanism in the casing, said shaft extending into the box, an upstanding post on the exterior of said casing, a motor above the casing, an inclined support for the motor surmounting the post, a depending shaft driven by the motor disposed in inverted V-relation to said post, said shaft also extending upwardly and longitudinally away from said side wall, sheathing about said shaft rigidly connected to the inclined support and box, and means housed by the box to drive the first mentioned shaft from the last mentioned shaft.

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