Oct. 3, 1933. W. J. O'NEILL 1,928,950

TUMBLING BARREL OR THE LIKE

Filed June 17, 1932 3 Sheets-Sheet 1

Fig. 1

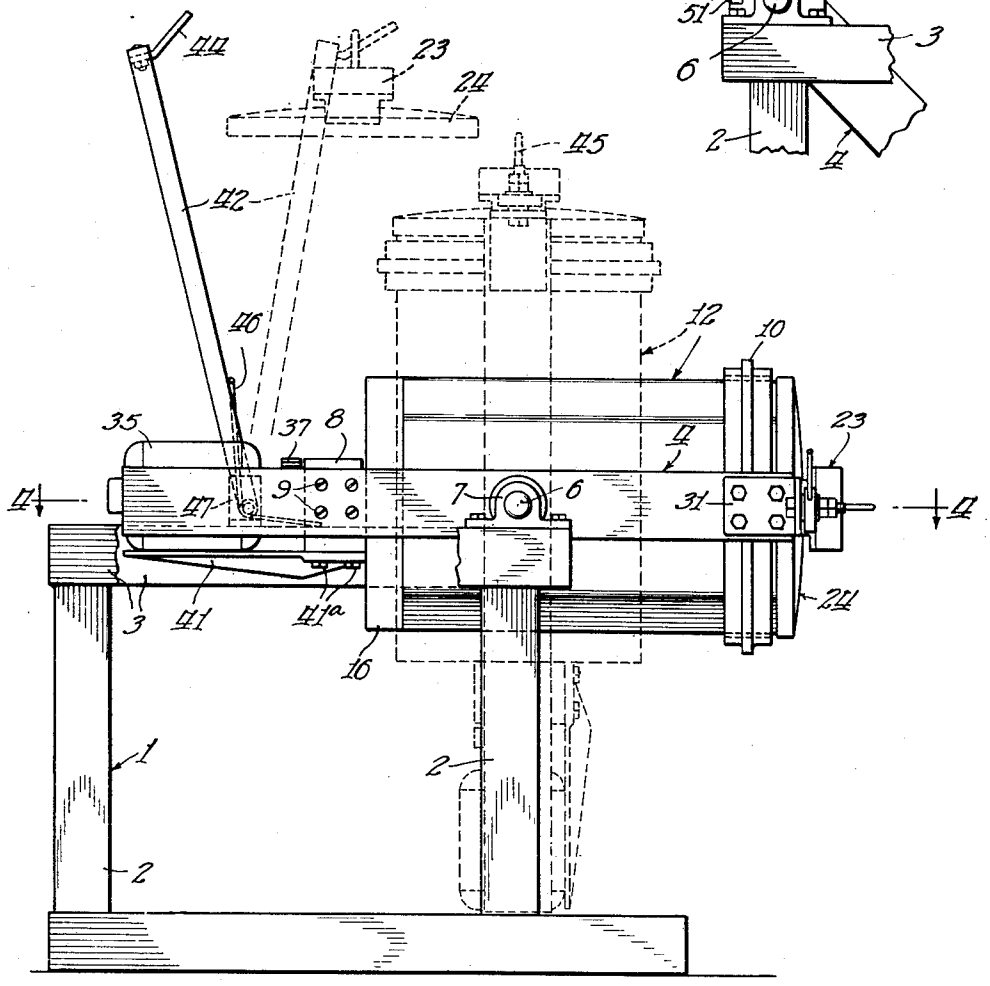
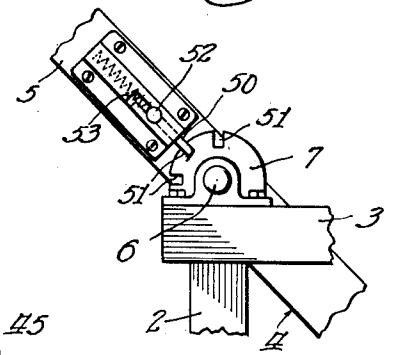


Fig. 5



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Fig. 2

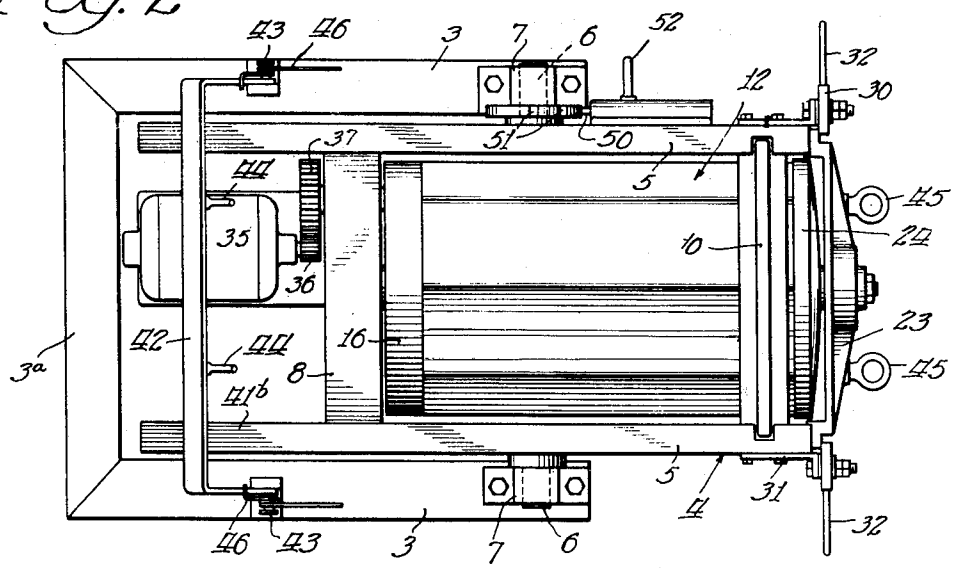
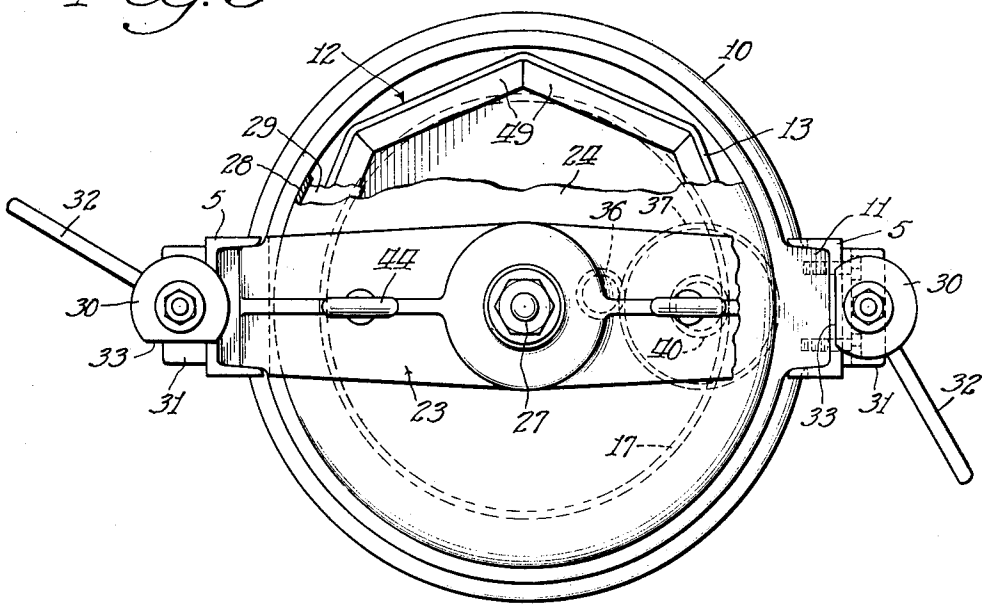


Fig. 3



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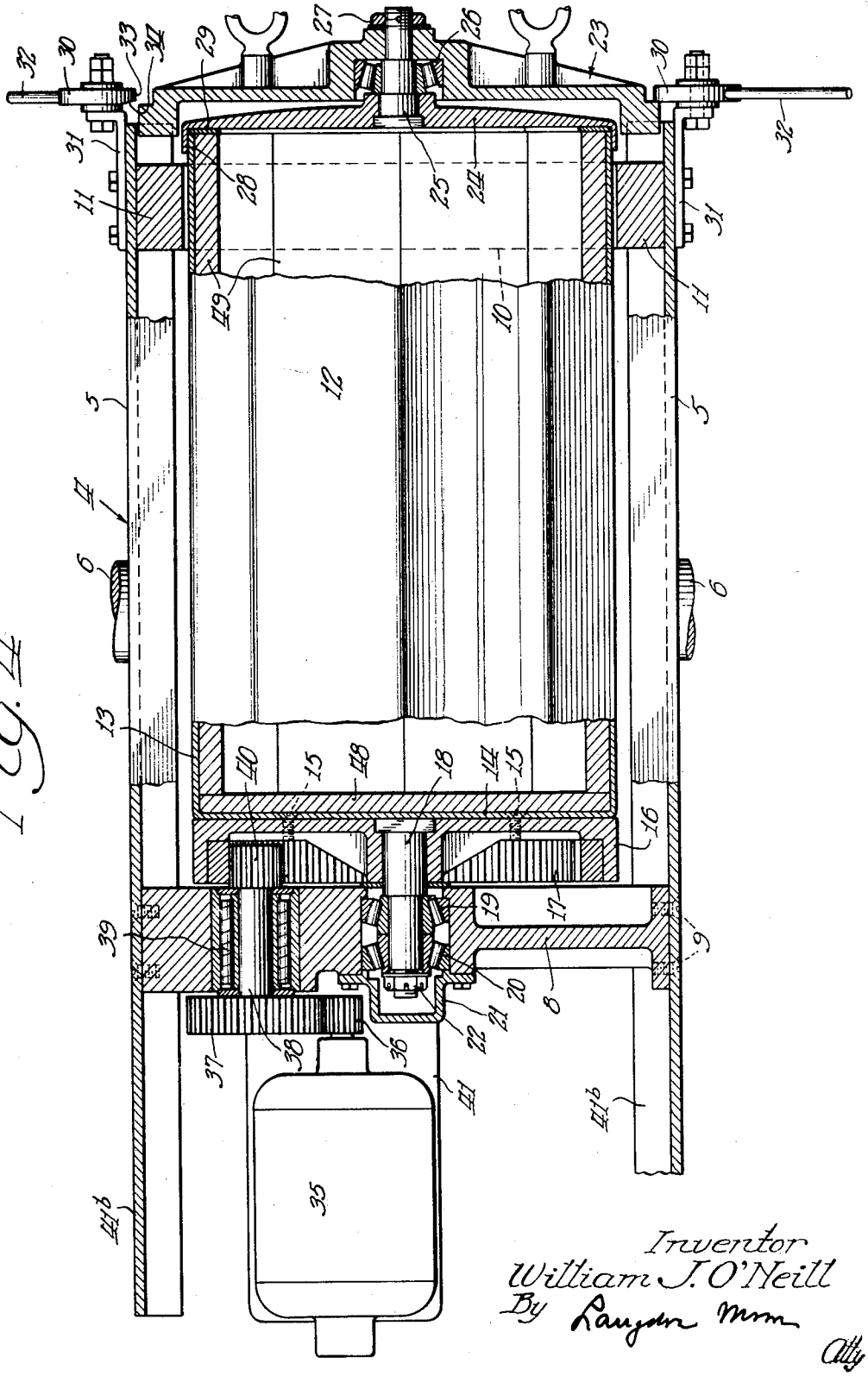


Fig. 1

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UNITED STATES PATENT OFFICE

1,928,950

TUMBLING BARREL OR THE LIKE

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Application June 17, 1932. Serial No. 617,817

17 Claims. (Cl. 51—164)

This invention relates to tumbling barrels or the like.

Among other objects, the invention aims to provide an improved barrel which occupies a minimum of space and which is at the same time sturdy and efficient.

Another object is to provide means for mounting the barrel and a motor therefor upon a frame within which the barrel rotates and which is swingable to place the barrel in selective charging, running or unloading positions, thus effecting great economy of time and effort.

Still another object is to provide a removable closure for the barrel, one of the stub shafts upon which the barrel rotates being carried by said closure, and simple and efficient means for removing and replacing the closure.

Other objects and advantages will be apparent from the following description of the illustrative embodiment of the invention shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a structure embodying the invention, showing one position of the parts in full lines and another position in dotted lines;

Figure 2 is a plan view of the structure shown in Figure 1;

Figure 3 is an end view of the structure shown in Figure 2, taken from the right hand side of the figure;

Figure 4 is a plan section of the frame and barrel taken on the line 4—4 of Figure 1, other parts being omitted; and

Figure 5 is a fragmentary side elevation of the structure of Figure 1 showing the latching means for the frame.

Referring in detail to the figures of the drawings, I have shown in general a base 1 which comprises four spaced apart pedestals 2 and spaced apart horizontal girders 3 together with transverse reinforcing member 3a therefor. The girders 3 may be supported on the pedestals 2, but at their ends opposite the member 3a the girders 3 are unconnected, so that between each pair of girder and pedestal may be received a frame 4. The longitudinal side members 5 of the frame 4 are desirably of channel iron formation and are provided medially of their ends with trunnions 6 which are received in trunnion sockets 7 attached to the outer ends of the girders 3. The side members 5 are maintained in separated relation at one end by a transverse end member represented by the bearing block 8 which is secured within the inwardly faced channels of the side members 5 by screw bolts 9. At its other end the side members 5 of the frame 4 are maintained in fixed spaced apart relationship by a collar 10 having lugs 11 suitably secured within the channels of the members 5 for a purpose presently pointed out. So constructed and arranged, the frame 4 is swingable in a vertical plane upon the base 1 on an axis passing transversely through the longitudinal side members 5.

Received between the side members 5 of the frame 4 is the tumbling barrel 12 which may comprise a metal cylinder 13 closed at one end by the integral end wall 14. Fixed to the end wall 14 of the barrel 12, by suitable screw bolts such as indicated at 15, I have shown a gear wheel 16 which, in this instance, is provided with the internal gear teeth 17. Carried centrally by the gear wheel 16 is a stub shaft 18 which may be pressed into the hub of the gear wheel and which is journaled in the bearing block 8 constituting one of the frame end members through the intermediation of axially aligned anti-friction bearings 19 and 20 carried by the bearing block 8. The outer end of the stub shaft 18 is advantageously covered by a guard plate 21 which protects the bearings from dirt, etc. When the stub shaft 18 is secured in the bearings 19 and 20 as for example by the holding nut 22, the barrel 12 is supported within the frame 4 and collar 10 to be rotated therein and also to be swingable with the frame 4 in a vertical plane. By reason of the aligned bearings the barrel 12 is supported free of the collar 10, but should some slight tilting of the barrel occur the collar 10 will unobjectionably support the outer end of the barrel.

At its end opposite the bearing block 8 the frame 4 has another transverse end member represented by the bearing block 23 which is separable from the frame 4, but is adapted to be received between the side members 5 and clamped thereto. The barrel 12 also has an end 24 which forms a closure for the barrel and which is removable, as here shown with the bearing block 23. The barrel end 24 carries centrally, as by a press fit, a stub shaft 25 which is journaled in the bearing block 23 through the intermediation of the anti-friction bearing 26 and the block 23 and barrel end 24 may be permanently secured together by the holding nut 27. The barrel end 24 has an annular flange 28 which fits snugly over the cylinder 13 and may also be provided with a gasket 29 which makes the barrel watertight. The bearing block 23 may be clamped within the channels of the side members 5 by clamping means such as the cam discs 30 fixed to rotate on brackets 31 carried by the

outer faces of the side members 5. By means of the levers 32 the cam discs 30, which have cutaway portions 33 and cam surfaces 34 may be rotated to have the cam surfaces 34 engage the bearing block 23 and press it into assembly with the frame 4, or may be rotated to have the cutaway portions 33 adjacent the bearing block 23, so that this block and with it the barrel end 24 may be removed. It will be understood that when the bearing block 23 is clamped in position as described, the barrel end 24 is also clamped upon the barrel cylinder 13 to form both a closure therefor and a carrier for one of the stub shafts upon which the barrel rotates. When the bearings 19, 20 and 26 are thus aligned, the axis of the barrel is fixed and the barrel rotates freely of the collar 10 and of all other parts of the frame 4.

The barrel is desirably rotated by a conventional electric motor 35 which has a driving pinion 36 meshing with a gear 37 fixed on a shaft 38 carried eccentrically by the bearing block 8 through the intermediation of an antifriction bearing 39, the shaft 38 at its end opposite gear 37 and upon the opposite side of the bearing block 8 also carrying a pinion 40 which meshes with the internal gear 17 of the gear wheel 16. The motor 35 is supported by a platform 41 carried by the frame 4 as by being suitably bolted to the bearing block 8 as indicated at 41*a* (Figure 1). Thus the motor and the barrel are both mounted on the frame 4 and are swingable as a unit with the frame. The side members 5 of the frame are desirably continued beyond the bearing block 8 as indicated at 41*b* to form a protection for the motor 35 when the frame is swung as described.

For a charging position of the barrel, the frame 4 may be swung into vertical position and the bearing block 23 and barrel end 24 removed, as shown in dotted lines in Figure 1. Since these parts are of considerable weight, I have provided a mechanical aid for lifting these parts from the frame, here represented by the jib 42 which is shown of inverted U-shape, spanning the base 1 and pivoted to the girders 3 at 43. Two hooks 44 may be suspended from the horizontal cross piece of the U-shape jib 42 and these hooks may engage in eye-bolts 45 suitably secured to the bearing block 23. The jib 42 is desirably moved toward the barrel 12 against the action of springs 46, so that the jib when released is normally retracted to be out of the way of the barrel. Stops 47 may limit the movement of the jib away from the barrel.

The trunnions 6 are desirably located on the frame 4 so as to place its center of gravity (including the weight of the barrel and motor) to the side of the trunnion 6 away from the closure end of the barrel, thus effecting a position of stable equilibrium for the frame when in the vertical position shown in dotted lines in Figure 6.

When the hooks 44 are engaged in the eyebolts 45, the bearing block 23 and barrel end 24 may be lifted away from the frame 4 and supported by the jib 42 in a position clear of the open end of the barrel, but ready to be easily and quickly reassembled therewith. With the parts in this position, the barrel 12 may have placed therein objects to be tumbled (not shown) together with conventional polishing or burnishing material such as steel shot and soap-and-water, as is well known in the art. To protect the end wall 14 of the barrel from scarification, I desirably insert a metal plate 48 adjacent the end wall 14 of the cylinder which may be replaced when worn. The barrel, in accordance with common practice, is also desirably lined with wood inserts 49 which may be swollen into place and which in turn retain the plate 48 in position.

When the barrel has been charged as indicated and the bearing block 23 and barrel end 24 again clamped in position as described, the frame 4 may be swung to horizontal position in its vertical plane of movement and the barrel rapidly rotated to bring into intimate contact the objects to be polished and the polishing media. In this position also, after the bearing block 23 and barrel end 24 have been removed the barrel may be emptied of its contents. To maintain the frame 4 in its selective positions, I provide latching means such as the spring pressed finger 50 (Figure 5) suitably carried by one of the side members 5 and engageable in notches 51 arcuately arranged upon one of the trunnion sockets 7. The finger 50 may be held out of engagement with the notches 51 by means of a handle 52 thereon which may be turned to be received in a laterally directed slot 53 when the finger is in retracted position.

Obviously, the invention is not limited to the details of construction shown herein for purposes of illustration. Furthermore, it is not indispensable that all features of the invention be employed conjointly since various combinations and sub-combinations may be advantageously used.

What I claim is:

1. In a structure of the class described, the combination of a base; a frame pivoted rotatably thereon; a tumbling barrel journaled in said frame; and a motor carried by the frame for rotating the barrel, the motor and barrel being at opposite ends of the frame and the frame being pivoted to the base so as to place the center of gravity upon the motor side of the pivot to maintain the frame in stable equilibrium with the barrel uppermost.

2. In a structure of the class described, the combination of a base; a frame pivoted medially thereon at one side of its center of gravity and swingable in a vertical plane on an axis passing transversely through the longitudinal sides of the frame; a tumbling barrel journaled in said frame and rotatable on an axis longitudinal of the frame; a motor carried by the frame for rotating the barrel, said motor being carried at the end of the frame containing the center of gravity whereby the frame tends to swing to vertical position with the barrel uppermost; and locking means for maintaining the frame in horizontal position.

3. In a structure of the class described, the combination of a base; a frame having longitudinal sides and a separable end portion transverse to its longitudinal sides pivoted medially on the base and swingable in a vertical plane on an axis passing transversely through one corner of the base and through the longitudinal sides of the frame, said frame extending beyond the vertical projection of the base at its end having the separable end portion in one position of the frame; a tumbling barrel in said frame and rotatable on an axis longitudinal of the frame; and a motor carried by the frame at its end opposite the separable end portion for rotating the barrel.

4. In a structure of the class described, the combination of a base; a frame having longi-

tudinal sides and a separable end portion transverse to its longitudinal sides pivoted medially thereon and swingable in a vertical plane; bearings carried by the frame and aligned transversely of the axis about which the frame swings, one of said bearings being in a separable end portion of the frame; a tumbling barrel journaled in said bearings longitudinally of the frame and barrel, said barrel having a closure separable therefrom with the separable end portion of the frame and permanently attached to said portion of the frame; a motor carried by the frame at its end opposite said separable end portion for rotating the barrel in said bearings; and a pivoted jib carried by the base for supporting the said end portion of the frame and barrel closure in separated position.

5. In a structure of the class described, the combination of a base; a frame pivoted medially thereon and swingable in a vertical plane; bearings carried by the frame; one of said bearings being separable from the frame; a barrel; journals carried by the ends of the barrel and received in said bearings, one of said ends providing a closure for the barrel and being separable therefrom with the bearing which is separable from the frame; and a motor carried by the frame for rotating the barrel in said bearings.

6. In a structure of the class described, the combination of a base; a frame carried pivotally thereon; a tumbling barrel journaled in the frame; a rotatable gear fixed to one end of said barrel; a rotatable spur pinion journaled in the frame and meshing with the gear; and a motor carried by the frame and having a rotatable shaft driving the pinion, all of said rotatable parts other than the frame having axes of rotation extending in the same direction.

7. In a structure of the class described, the combination of a base; a frame carried pivotally thereon; a tumbling barrel journaled in the frame; a rotatable internal gear fixed to one end of said barrel; a rotatable spur pinion journaled in the frame and meshing with the internal gear; and a motor carried by the frame and having a rotatable shaft driving the pinion, all of said rotatable parts other than the frame having axes of rotation extending in the same direction.

8. In a structure of the class described, the combination of a base; a frame pivoted medially thereon and swingable in a vertical plane; bearings carried by the frame; one of said bearings being separable from the frame; a barrel; journals carried by the ends of the barrel and received in said bearings, one of said ends providing a closure for the barrel and being separable therefrom with the bearings which is separable from the frame; a motor carried by the frame for rotating the barrel in said bearings; and a jib carried by the base and engageable with the cover to lift it from the barrel when the frame is swung vertically.

9. The structure of claim 8 wherein the jib is moved toward the barrel against spring pressure which retracts the jib when released.

10. In a structure of the class described, the combination of a base; a frame embodying longitudinal side members and transverse end members, one of said end members being separable from the frame, said frame being pivoted on the base medially of its end members to be swingable in a vertical plane on an axis passing transversely through the side members; bearings carried by the end members; a cylindrical barrel having ends, one of which is removable to provide a closure therefor; stub shafts carried by the barrel ends and journaled in the frame ends; clamping means for securing the separable end to the frame; and means for rotating the barrel in said bearings.

11. The structure of claim 10 wherein the separable frame end and the barrel cover are permanently connected and the base carries a jib engageable with the separable frame end to lift it and the cover from the barrel when the frame is swung vertically.

12. The structure of claim 10 wherein the separable frame end and the barrel cover are permanently connected and the base carries a jib engageable with the separable frame end to lift it and the cover from the barrel when the frame is swung vertically and wherein the jib is moved toward the frame against spring pressure which retracts the jib when released.

13. The structure of claim 10 wherein latching means are carried by the base and frame for fixing the frame in selective positions in said vertical plane.

14. In a structure of the class described, the combination of a base; a frame embodying longitudinal side members and transverse end members, one of said end members being separable from the frame, said frame being pivoted on the base medially of its end members to be swingable in a vertical plane on an axis passing transversely through the side members; bearings carried by the end members; a cylindrical barrel having ends, one of which is removable to provide a closure therefor; stub shafts carried by the barrel ends and journaled in the frame ends; clamping means for securing the separable end to the frame; a gear fixed to the end of the barrel which is not removable; a pinion journaled in the frame end which is not separable and meshing with the gear; and a motor carried by the frame and driving the pinion.

15. In a structure of the class described, the combination of a base; a frame embodying longitudinal side members and transverse end members, one of said end members being separable from the frame, said frame being pivoted on the base medially of its end members to be swingable in a vertical plane on an axis passing transversely through the side members; bearings carried by the end members; a cylindrical barrel having ends, one of which is removable to provide a closure therefor; stub shafts carried by the barrel ends and journaled in the frame ends; clamping means for securing the separable end to the frame; an internal gear fixed to the end of the barrel which is not removable; a pinion journaled in the frame end which is not separable and meshing with the internal gear; and a motor carried by the frame and driving the pinion.

16. In a structure of the class described, the combination of a base; a frame embodying longitudinal side members and transverse end members, one of said members being separable from the frame; trunnions on the side members medially of the ends of the frame; horizontally aligned sockets in the base receiving the trunnions; an anti-friction bearing carried by the separable frame end member; a cylindrical barrel end having a closed end and having one removable to provide a closure therefor; a stub shaft fixed centrally of the removable barrel end and journaled in the bearing carried by the separable frame end member; a plurality of longitudinally aligned anti-friction bearings carried by

the other frame end; a gear wheel fixed to the closed end of said barrel; a stub shaft carried centrally by the gear wheel and journaled in said aligned bearings; internal gear teeth on said gear wheel; a pinion journaled in the frame end adjacent the gear wheel and meshing with the gear; a motor carried by the frame and in driving relation with the pinion; and clamping means for securing the separable frame end to the frame.

17. In a structure of the class described, the combination of a tumbling barrel having a closed end and a removable end forming a closure therefor; journals carried by said ends upon which the barrel is rotatable; a frame having longitudinal side members and end members disposed transversely thereof, said end members carrying bearings for the journals, one of said end members being separable from the frame with the removable barrel end; aligned bearings in the other frame end for supporting the barrel when the separable frame end is removed; and a collar carried by the frame adjacent its separable end and encircling the barrel.

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