July 17, 1928. 1,677,290

D. PARKER

EGG CASE FILLING AND INVERTING APPARATUS

Filed May 18, 1927 3 Sheets-Sheet 1

Fig.1.

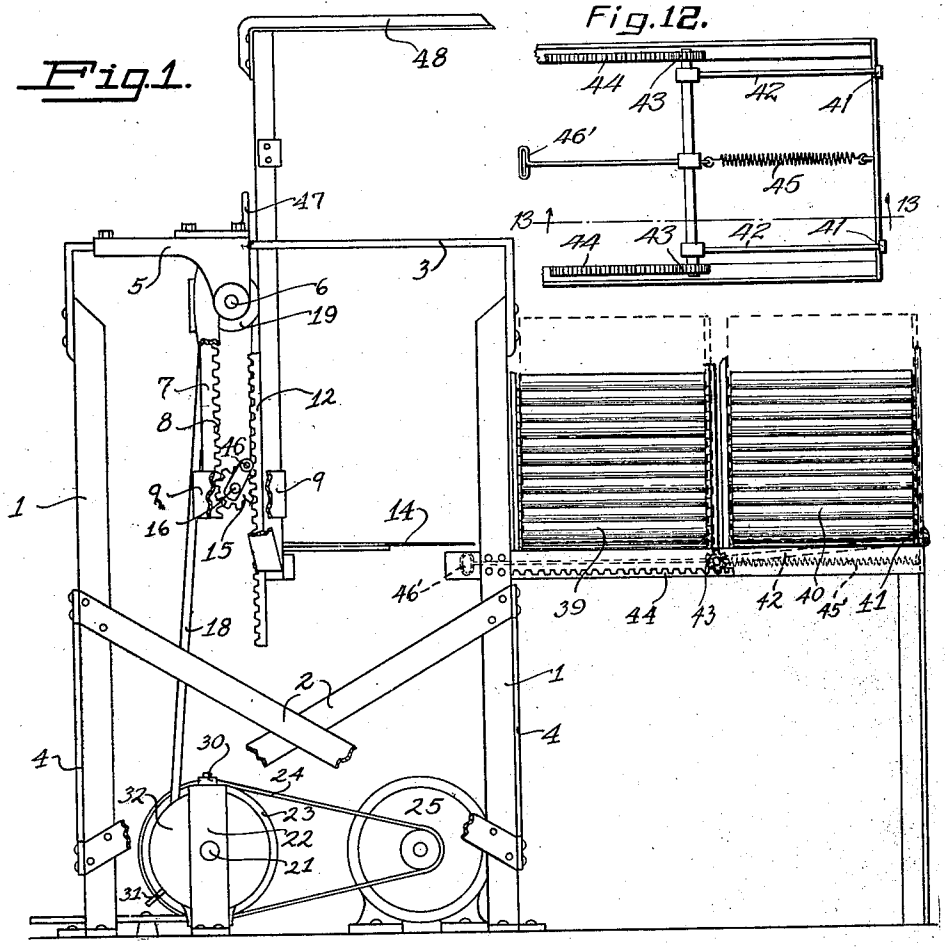


Fig.12.

Fig.9.

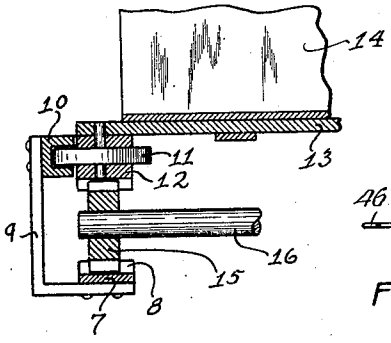


Fig.10.

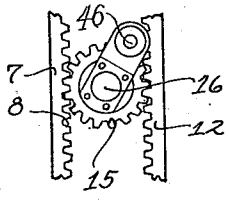
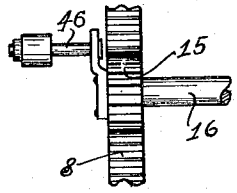


Fig.11.



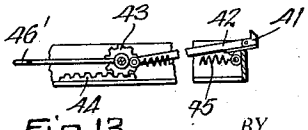


Fig.13.

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EGG CASE FILLING AND INVERTING APPARATUS

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Fig. 2.

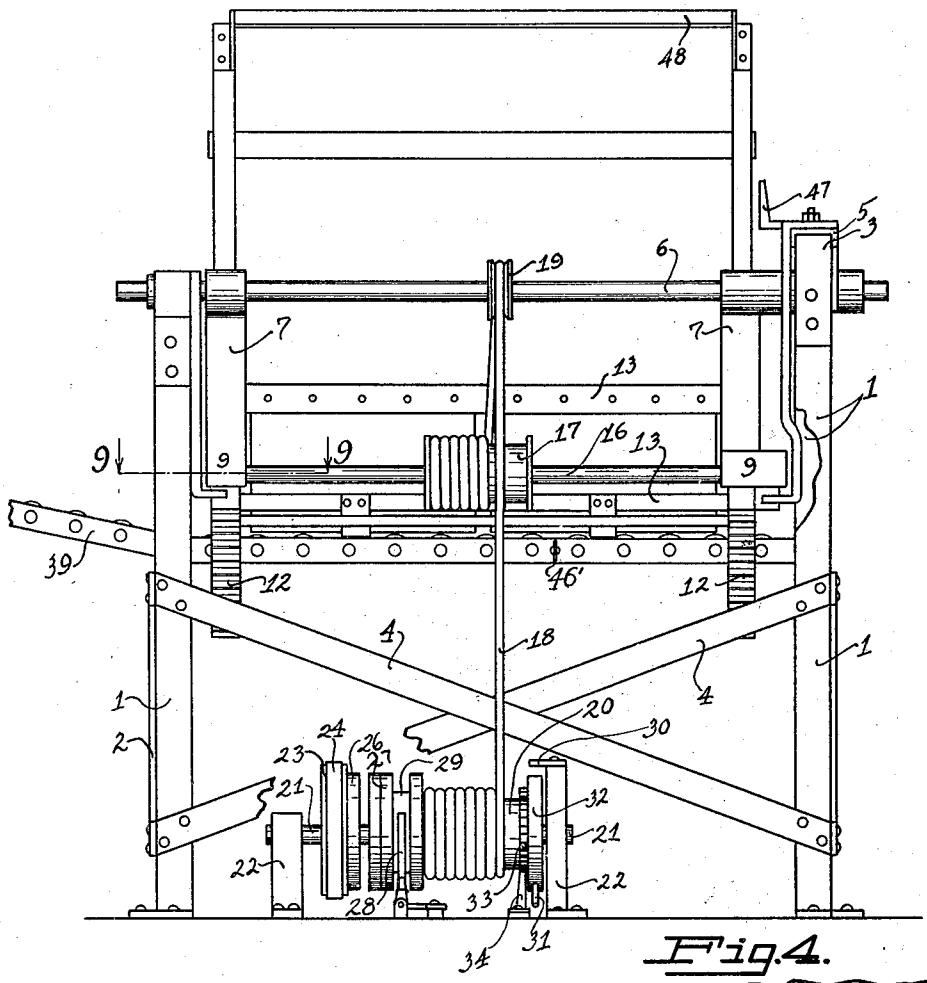


Fig. 3.

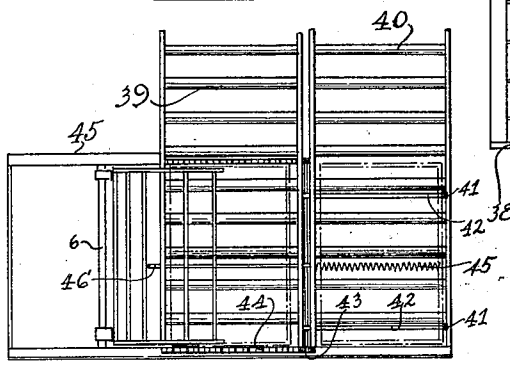
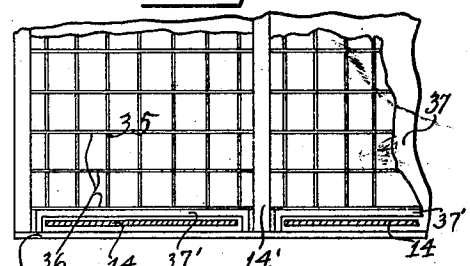


Fig. 4.



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EGG CASE FILLING AND INVERTING APPARATUS

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Fig.5.

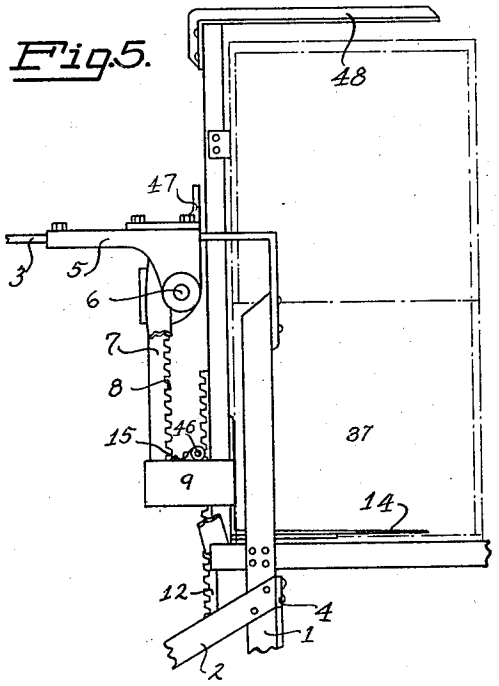


Fig.6.

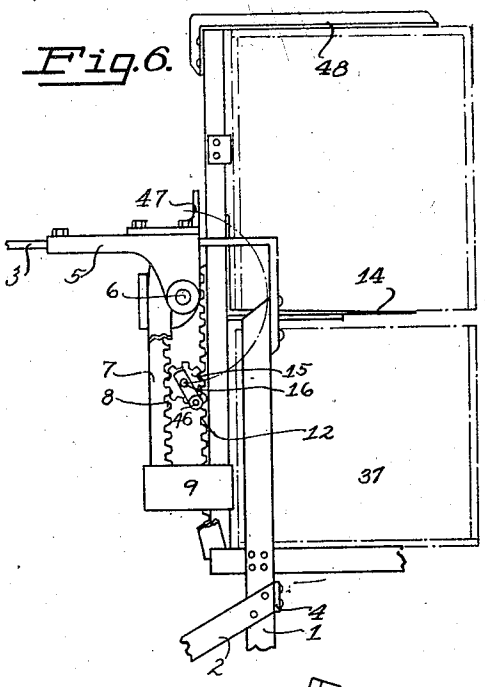


Fig.8.

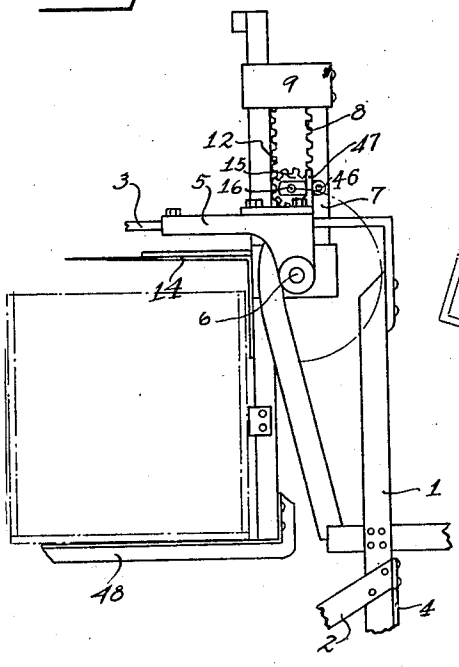
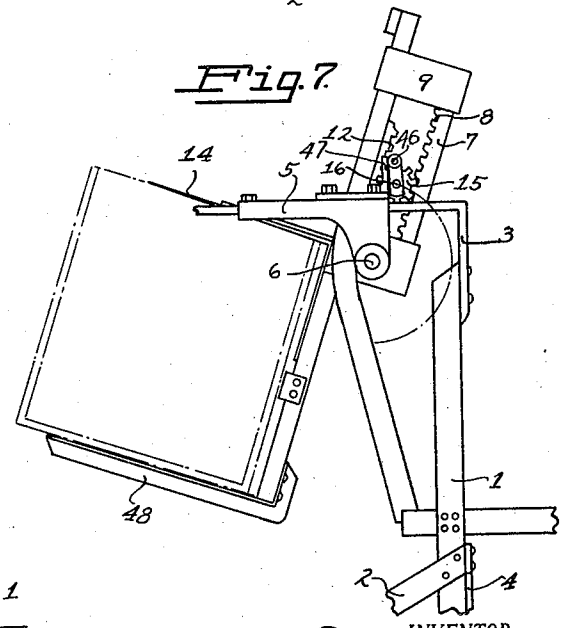


Fig.7.



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UNITED STATES PATENT OFFICE.

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EGG-CASE FILLING AND INVERTING APPARATUS.

Application filed May 18, 1927. Serial No. 192,465.

At present, it is the practise in filling egg cases to commence the filling operation with an egg case, the top and one side wall of which is removed. The cell forming members with the usual spacers or flats therebetween of the number necessary to fill a compartment and each cell containing an egg are assembled at a suitable point in the plant; are conveyed to the case and there, by an operator, are moved horizontally into one of the case compartments through the opening afforded by the removed side wall. When both compartments of the case are thus filled, the case is provided with its side wall, which is nailed thereto by an operator, and after inspection and padding, a cover is nailed to close the top of the case.

The operation of nailing one side and the top wall onto the egg case is quite expensive, as hand labor is required, no automatic machine having yet been provided to accomplish this double purpose.

The jar imparted to the eggs by these two distinct nailing operations, performed manually, occasions considerable loss in breakage.

The present invention relates to an improvement in the filling of egg cases or other receptacles wherein the commodity to be received within the case or receptacle is presented thereto in a preformed shape, is lifted or raised upwardly into the case or container through its filling opening, which is downwardly disposed, and with the commodity held therein by the raising or lifting mechanism the case or receptacle is inverted to a position to present its filling opening upwardly disposed.

This invention enables the utilization of a case or container with but its top or bottom wall or one side wall removed, enabling its being closed by an automatic machine at present on the market and known as a cover nailing machine.

By the closing of the case or container by the use of such machine, the nails are mechanically forced into the walls of the box by lineal pressure being applied thereto, rather than by the application of successive blows, which take place when they are manually applied. Thus the mechanical application of the cover eliminates the jar and consequent injury to the contents of the case or container, particularly when the same contains fragile and delicate articles, such as eggs.

Among its objects, the present invention is designed to facilitate and expedite the filling of egg cases and the closing thereof without undue jar or injury being imparted to the eggs contained in the cases, by the case closing operation. Another object of the invention is to provide an apparatus for accomplishing the above purpose, which delivers the eggs in a prearranged condition upwardly into the case and thereafter is operated to invert the case to present its filling opening upwardly disposed to receive its closing cover. Other objects will be presented, as the specification and description progresses.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

To more clearly comprehend the invention, reference is directed to the accompanying drawings, wherein—

Fig. 1 is a view in end elevation of the preferred embodiment of my invention, illustrating the apparatus arranged in connection with two lines of filler runways the latter being illustrated as rising or being upwardly inclined toward their rear ends.

Fig. 2 is a view in rear elevation.

Fig. 3 is a view in plan of the conveyor mechanism for delivering two lines of fillers to the apparatus.

Fig. 4 is a view in side elevation of one of the egg case filler forms, which corresponds to a conventional egg case with the exception that one side and top wall are

removed therefrom, and illustrating a filler elevating form in the bottom thereof.

Fig. 5 is a view in detail end elevation of the egg filler elevating mechanism in its normal position.

Fig. 6 is a view similar to Fig. 5, with the elevating mechanism in its raised position, having raised the filler from its filler form into the case and elevated the case into contact with its stop mechanism.

Fig. 7 is a view similar to Fig. 6, with the mechanism illustrated therein pivoted on a horizontal axis to invert the filled case and present its filling opening upwardly disposed.

Fig. 8 is a similar view illustrating the parts in position of completion of the inverting operation.

Fig. 9 is a transverse detail sectional view taken on line 9—9 of Fig. 2.

Fig. 10 is a view in fragmentary detail end elevation of the rack and pinion mechanism.

Fig. 11 is a view in elevation of the pinion and one of the racks.

Fig. 12 is a view in detail of the case feeding mechanism.

Fig. 13 is a view clearly illustrating the operating pinion between the respective racks.

Referring more particularly to the drawings, wherein like characters of reference designate corresponding parts,—1 indicates the vertical members of one end of a supporting frame, they being interconnected by the braces 2 and at their tops united by the horizontal connecting and guide members 3. The frame end members are connected in parallel spaced relation by the cross braces 4. Longitudinally slidable on the respective members 3 are the tubular brackets 5 connected by a shaft 6 forming a horizontal fulcrum, hereinafter described. Rotatably mounted on the shaft 6, at each end between the frame end members, are the hangers 7 formed on corresponding faces with racks 8. At each end each hanger carries a rectangular plate 9 extending forwardly therefrom. The plates 9 each carry a track or guide channel 10 disposed at right angles to the racks 8, and in said guides operate thrust rollers 11 carried by reciprocably mounted elevating racks 12, one opposing each of the rack faces 8 of the respective hangers 7. The racks 12 are united by transverse connecting members 13, the lowermost of which carry a pair of horizontally projected elevating members or plates 14, illustrated as tapering toward their free forward edges. The adjacent parallel side edges of the plates 14 are spaced a sufficient distance apart as to admit their projection beyond the division member 14′ of an egg case filler form, hereinafter described.

Intermeshing with the opposing racks of each pair is a toothed pinion 15, the pinions being carried by the opposite ends of a shaft 16 which mounts within its length a reel or spool 17. The shaft 16, pinions 15 and reel 17 are adapted for rotation as a unit. To the reel 17 is secured one end of a flexible operating connection 18, which passes over an idler sleeve 19, rotatably mounted on the horizontal fulcrum shaft 6, Fig. 2.

A suitable operating means is provided for actuating the operating connection 18, and the form illustrated consists of a winding drum 20, to which the opposite end of the operating connection 18 is secured. The drum is rotatable on a shaft 21 supported in bearings 22, and keyed to the shaft is a drive pulley 23 from which extends a drive belt 24, operated by a motor or other power source 25.

Clutch mechanism is provided for affording a releasable drive connection between the drum 20 and shaft 21, and the same consists of a friction clutch disk 26 rotatable with the shaft 21 and into contact with which is adapted to be moved the friction disk 27 on the end of the drum 20; the drum and disk 27 having slight movement lineally, on the shaft 21.

A clutch lever 28 extends into the circumferential clutch groove 29 in the end of drum 20, and its operation causes the engagement and disengagement of the friction clutch surfaces 26 and 27, controlling the raising and lowering of the elevating members 14.

The driving ratio between drum 20 and reel 17 is such that on one complete revolution of the drum 20, the shaft 16 is sufficiently rotated to operate the elevating members 14 a complete stroke in either direction, and to limit this rotative movement a stop 30 is provided on one of the members 22 and is adapted to be engaged on each complete revolution of the drum 20 by a stop pin 31 carried on the drum flange 32.

To hold the elevating members 14 in their raised position until such time as it is desired to release the same, the drum is provided with a plurality of ratchet serrations 33, cooperating with which is a spring pawl 34, the pawl serving merely as a brake to retard the rotation of the drum in either direction.

The packers in preparing the eggs, arrange the same in horizontal superimposed layers in the conventional fillers 35, each layer being separated by a flat 36. This arrangement takes place in the respective compartments of an egg case filler form 37, which corresponds in all respects to a conventional egg case with the exception that each form has its top and one side wall removed, and in the base of each filler form is positioned a frame 37′ on which rests the

lowermost flat 36, raising the lowermost layer of eggs slightly above the bottom wall 38 of the filler form 37, this being illustrated in Fig. 4. The raising of the lowermost layer of eggs in each compartment in the filler form, from the bottom wall 38, admits of the elevating members being projected beneath the lowermost layer of eggs in each compartment when it is desired to elevate or lift the same from the upper open top of the form.

In advance of the front of the rectangular frame and in alignment with the elevating members 14, the egg case filler forms, the compartments of which are filled with eggs ready for packing in the case, are supplied to the elevating and inverting apparatus on parallel conveyers 39 and 40 of any well known construction, they being disposed in a plane parallel with the elevating members 14 when the latter are in their lowermost position, as illustrated in Fig. 1. Plural conveyers 39 or 40 are provided to ensure the continuous supplying of filler forms to a position in front of members 14, with two conveyers it being unlikely that the portions thereof opposite the member 14 will both be vacant at the same time. The filled filler forms delivered by conveyer 39 are removed directly therefrom on to the elevating members 14, while the filler forms from conveyer 40 are moved laterally therefrom transversely across conveyer 39 on to members 14, this being possible when a vacancy occurs in the latter conveyer in front of members 14.

To facilitate the movement of the filler form associated with conveyer 40 laterally thereof to overlie the conveyer 39 in cooperative relation with the elevating members 14, there is provided a filler form wall engaging member 41 pivoted to the free end of the frame rods 42, the latter at their forward end carrying pinion gears 43 operating on toothed rails 44, carried by the horizontal frame members 45. An operating handle 46′ connects with the frame members 42 and is adapted to be engaged by the operator to impart movement to the frame 42 transversely of its runway 40 when it is desired to laterally slide a filler form from the runway 40 to runway 39. A spring 45′ maintains the frame 42 in its normal position or returns it to its normal position on the operator releasing the handle 46′.

To slightly separate the elevating members 14 from the top of the egg case at the time the case has been inverted, a lateral arm extension 46 is provided on the end of shaft 16 and as the operator causes an axial rotation of the hanger 7 on shaft 6, the arm extension 46 contacts with a stop 47 on one of the members 5, which imparts a one-quarter turn to the shaft 16 in a direction reverse to its direction of elevating movement of the members 14. This back-up or reversal movement raises the elevating members 14 from the open top of the inverted case and permits the same to be withdrawn laterally from the stop arms or members 48 which project laterally from the upper ends of members 10, in parallel relation to the elevating members 14.

With the various parts and elements arranged in the position as in the drawings and with a line of egg case filler forms packed as illustrated in Fig. 4, and moving longitudinally of the conveyers 39 and 40, the operator to transfer the contents of an egg case filler form to an egg case through its filling opening and inverting the egg case to present its filling opening upwardly disposed, operates the mechanism in the following manner: The operator grasps the hanger 7 and slides the same forwardly on the guide members 3, projecting the elevating members 14 beneath the respective members 37 in the compartments of the egg case filler form in advance thereof. The motor 25 operating, enables the operator of the apparatus to throw the clutch lever 28, so that the clutch faces 26 and 27 are in engagement. This causes a winding movement to be imparted to drum 20 which winds the flexible member 18 about the same, the member in its winding movement rotating the shaft 16, causing pinions 15 to act on racks 8 and 12 to elevate the members 14. Prior to this, an egg case with its top removed has been inverted over the upper open top of the filler form and the elevating movement of the members 14 raises the eggs in their fillers upwardly in the filler form compartments and delivers them into the compartments of the egg case. Continued upward movement of the members 14, after the eggs have been delivered into the compartments of the egg case, causes members 44 to engage with the downwardly disposed edges of the case and elevate the same until it contacts with the stop 48. At this time the drum 20 has completed its revolution and pin 31 is in contact with stop 30.

The above described movements are clearly illustrated in Figs. 5 and 6, and with the elevating members in position as in Fig. 6, the operator grasps the portion of the rails 10 projecting above the guides 3 and pivots the hangers 7 with the parts carried thereby on the shaft 6, the pivotal movement being illustrated in Fig. 7.

This movement inverts the filled case and positions the filling opening thereof, which is preferably the top of the case, upwardly disposed.

To enable the inverted case to be readily slid from the stop arms 48 on which the inverted case now rests, the elevating members 14 are moved slightly away from the stop members 48. This is accomplished by

the arm 46 contacting with the stop 47 on the pivoted movement of the hangers 7 from the position Fig. 7 to that in Fig. 8.

After the case is manually removed from the stop members 48, the operator manually swings the hanger members 7 backwardly from their position Fig. 8 to that in Fig. 6, slides the brackets 5 longitudinally on the members 3 from the position Fig. 6 to that in Fig. 1, and in any manner desired lowers the elevating members 14 by unwinding the member 18 from drum 20.

I claim:

1. An apparatus for filling containers positioned with their filling opening downwardly disposed and thereafter inverting the filled container, comprising a support for the material to be filled into the container and over which the container is positioned with its filling opening downwardly disposed overlying the material, material elevating means, means overlying the container to be filled and providing a stop to limit the elevation of the container and to support the same when inverted, means for operating the elevating means to elevate the material into the container, and move the container into contact with its stop means, and a fixed axis about which said material elevating means and the container stop means revolve as a unit with the container held therebetween to invert the same.

2. An apparatus for filling containers positioned with their filling opening downwardly disposed and thereafter inverting the filled container, comprising a support for the material to be filled into the container and over which the container is positioned with its filling opening downwardly disposed overlying the material, material elevating means, means overlying the container to be filled and providing a stop to limit the elevation of the container and to support the same when inverted, means for operating the elevating means to elevate the material into the container, and move the container into contact with its stop means, a fixed axis about which said material elevating means and the container stop means revolve as a unit with the container held therebetween to invert the same, and means whereby the container elevating means, the stop means, and the fixed axis of rotation are movable as a unit horizontally to and from said support.

3. An apparatus for filling containers positioned with their filling opening downwardly disposed and thereafter inverting the filled container, comprising a support for the material to be filled into the container and over which the container is positioned with its filling opening downwardly disposed overlying the material, material elevating means, means overlying the container to be filled and providing a stop to limit the elevation of the container and to support the same when inverted, means for operating the elevating means to elevate the material into the container, and move the container into contact with its stop means, a fixed axis about which said material elevating means and container stop means revolve as a unit with the filled container held therebetween to invert the same, and means for separating the elevating and stop means on the inverting of the container to admit of the same being removed therefrom.

4. An apparatus for filling containers positioned with their filling opening downwardly disposed and inverting the filled container, comprising a support on which rests a filler form provided with an open side and top walls, its interior containing the material to be filled into the container, and the container resting thereon with its filling opening in register with the interior of the filler form, a material elevating means movable laterally beneath the material in the filler form, means overlying the container to be filled and providing a stop to limit the elevation of the container and to support the same when inverted, means for operating the elevating means to elevate and remove the material from the filler form and convey the same into the container and move the filled container into contact with said stop means, and a fixed axis about which said material elevating means and container stop means revolve as a unit with the filled container held therebetween to invert the same.

5. An apparatus for filling containers positioned with their filling opening downwardly disposed and inverting the filled container, comprising a support on which rests a filler form provided with an open side and top walls, its interior containing the material to be filled into the container, and the container resting thereon with its filling opening in register with the interior of the filler form, a material elevating means movable laterally beneath the material in the filler form, means overlying the container to be filled and providing a container stop and a support for the same when inverted, means for operating the elevating means to elevate and remove the material from the filler form and convey the same into the container, and a fixed axis about which said material elevating means and container stop means revolve as a unit with the filled container held therebetween to invert the same.

6. An apparatus for filling containers positioned with their filling opening downwardly disposed and thereafter inverting the filled container, comprising a support for the material to be filled into the container and over which the container is positioned with its filling opening downwardly

disposed overlying the material, means for elevating the material, a container stop means overlying the material elevating means and affording a support for the container when inverted, rack and pinion mechanism for operating said material elevating means to move to and from said stop, an axis about which the material elevating means and the container stop means revolve as a unit, and a horizontal support longitudinally of which said container stop means, material elevating means, and axis are movable as a unit to and from the material support.

In testimony whereof I have signed my name to this specification.

DONALD PARKER.