F. J. DRYSDALE.

MEANS FOR RAISING AND LOWERING GOODS.

APPLICATION FILED APR. 14, 1920.

1,434,880. Patented Nov. 7, 1922.

3 SHEETS—SHEET 1.

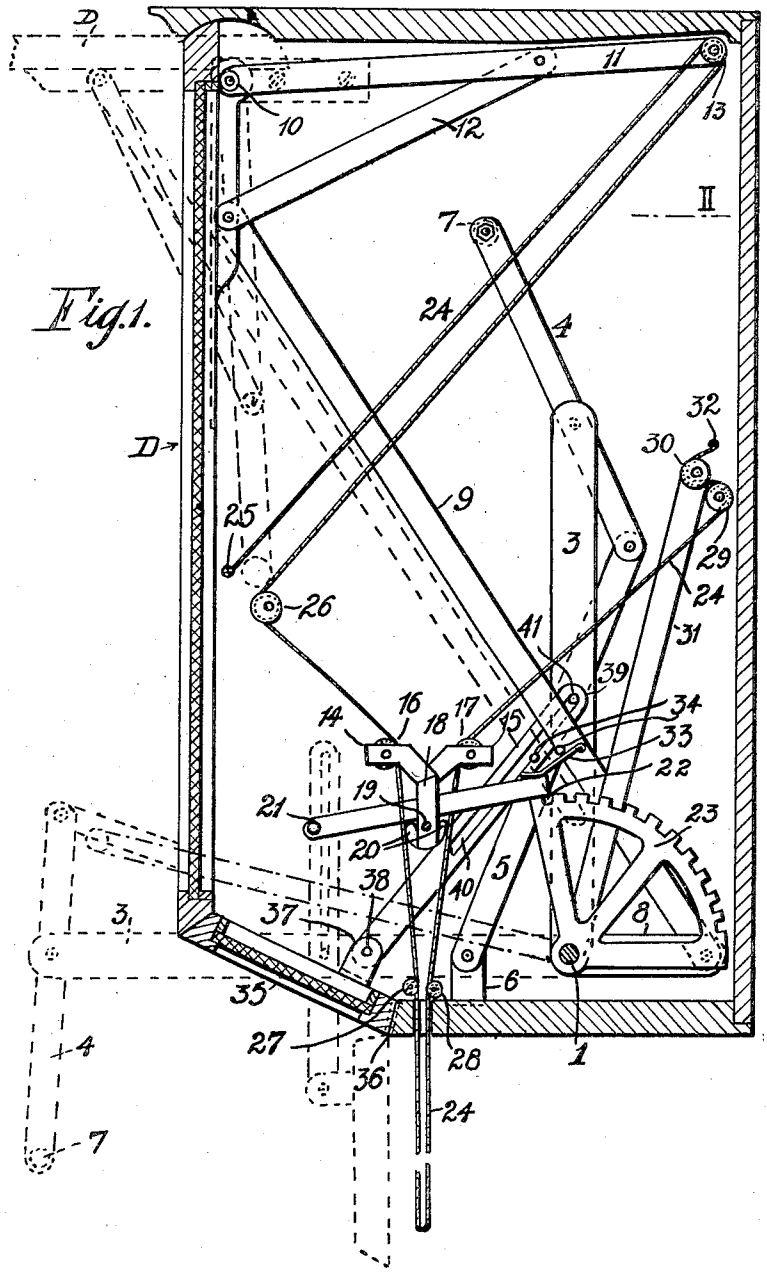


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 3.

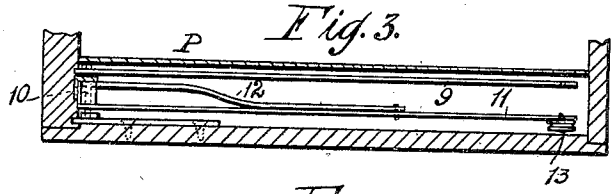


Fig. 2.

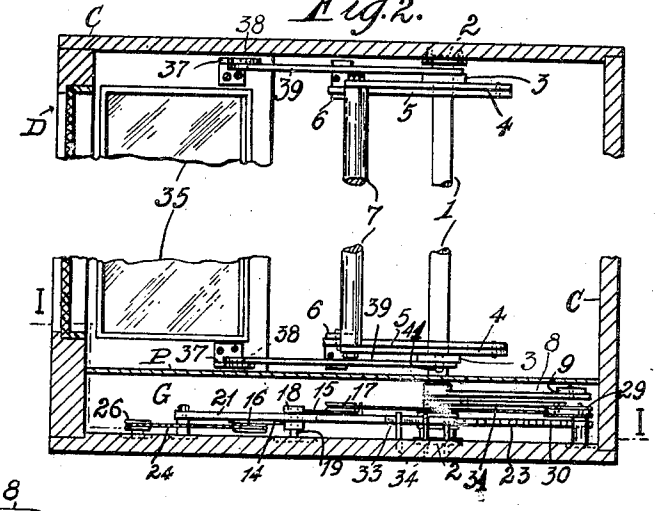
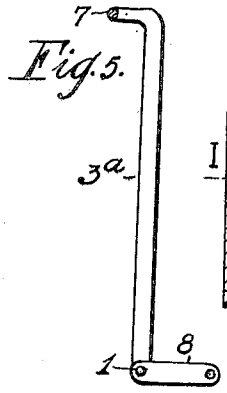


Fig. 5.



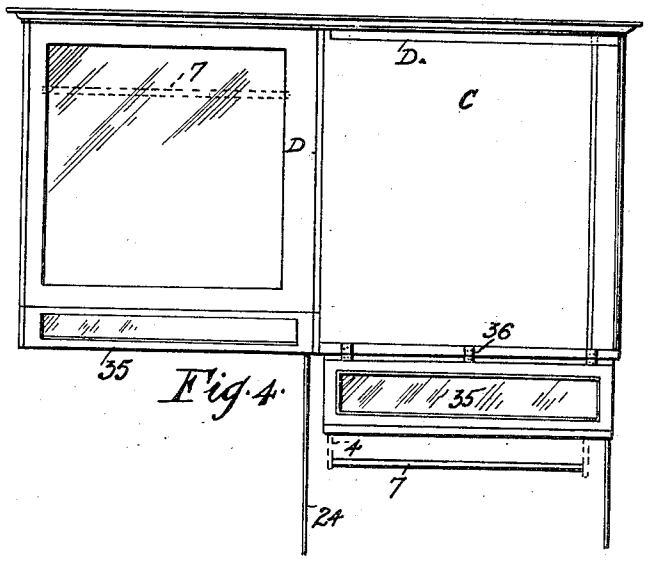


Fig. 4.

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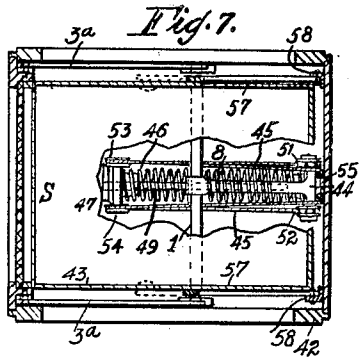
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3 SHEETS—SHEET 3.

Fig. 7.



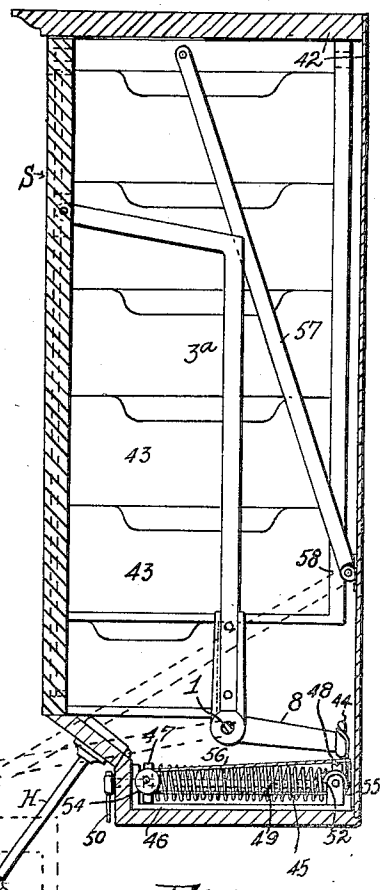


Fig. 6.

Fig. 9.

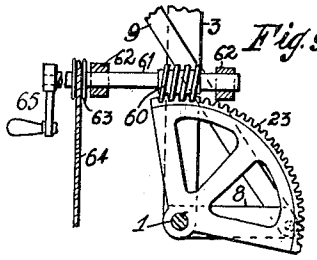
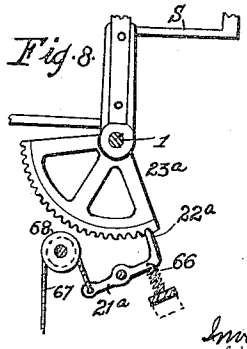


Fig. 8.



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UNITED STATES PATENT OFFICE.

FREDERICK J. DRYSDALE, OF MIDDLE BRIGHTON, VICTORIA, AUSTRALIA.

MEANS FOR RAISING AND LOWERING GOODS.

Application filed April 14, 1920. Serial No. 373,848.

To all whom it may concern:

Be it known that I, FREDERICK JOHN DRYSDALE, a subject of the King of Great Britain, of "Coniston," Kinane Street, Middle Brighton, in the State of Victoria, Commonwealth of Australia, designer, have invented certain new and useful Improvements in Means for Raising and Lowering Goods, of which the following is a specification.

The present invention has been devised to provide means whereby goods in shop and show room fixtures stored or located at a height not readily accessible without the aid of a ladder may be readily lowered, as for display to a customer, and subsequently returned.

Briefly stated the invention resides in one or more supporting arms for the goods and means for imparting radial movement thereto in opposite directions, and means counterbalancing the weight of said arms and the goods carried thereby.

Where a plurality of said arms are employed, which is the preferred arrangement, they are more or less vertically disposed when in the raised position and are mounted on a common axis preferably a rocker shaft to which same are keyed or otherwise secured.

The partial rotation of the shaft may be effected by hand actuating means located at a convenient point or by power, and where a spring counterbalancing element is employed as a substitute for an equivalent weight its tension may be adjusted to compensate for goods of variable weight.

In one practical embodiment of the invention each goods container or carrier is provided with a pair of vertical supporting arms connected by a cross bar and mounted on a rock shaft provided with a crank, the end of which is connected to a rod crossing over and extending upwardly to a point ahead of the vertical arms, when the latter is in its raised and normal position, the outer ends of said cross rod being connected to a counterbalancing element which may conveniently be the hinged door of the casing containing the goods. The door is hinged at its top horizontal edge and, as the vertical arm moves radially outwardly, the door lifts radially until it assumes a horizontal or approximately horizontal position the travel of the arm and door being such that the latter is clear to admit the former to pass. To secure greater clearance for the goods between the door and the bottom of the casing, portion of the latter may be hinged and arranged to swing downwardly during the final raising movement of the door. When the door is lowered it operates the crank and reverses the rock shaft thus returning the arms supporting the goods within the casing. If it is desired to lower the goods closely to the face line of the casing, the supporting arms are formed of suitably jointed members as hereinafter explained.

If preferred the crank may be connected to a spring controlled slidable element in such a manner that the lowering of the goods or casing containing same puts the spring in compression, the power of which is utilized to return the goods or casing to storage position thereby rendering the operation of raising the goods easy of manipulation.

The construction illustrated in the accompanying drawings constitutes a practical form of the invention.

Fig. 1 is a vertical section illustrating one form of construction the view being taken on line 1—1 of Fig. 2, with the partition forming the gear compartment in the casing omitted.

Fig. 2 is a horizontal section approximately on line 11 of Fig. 1 with parts broken.

Fig. 3 is a horizontal section through the upper portion of the gear compartment.

Fig. 4 is an outline elevation of two of such casings (with the gear omitted) showing in one instance the goods in lowered position.

Fig. 5 is a fragmentary detail illustrating a modification of the supporting arms.

Fig. 6 is a vertical section and

Fig. 7 a horizontal section partly broken illustrating another form of the invention in which the casing is bodily lowered.

Fig. 8 is a detail of a locking device used in conjunction with the construction shown in Figs. 6 and 7.

Fig. 9 is a detail of an alternative simplified means of operating and locking the rock shaft as illustrated in Fig. 1.

Referring now particularly to Figs. 1 to 5, C designates a casing fixed at a suitable height and near the bottom of same is a

horizontal rock shaft 1, the ends of which are journalled in bearings 2, 2 in the sides of the casing.

Fixed to said shaft are vertical arms 3 to each of which is pivoted a lever 4 pivoted at its lower end to a link 5 the lower end of which is pivotally mounted on lug 6 fixed to the floor of the casing. The upper ends of the levers 4 are joined by a transverse horizontal bar 7 which is used to either afford direct support for the goods or containers for same.

Projecting from the shaft 1 at one end is a crank or offset arm 8 connected by a cross over rod 9 with the upper portion of the door D hinged at the upper end as at 10 to the casing. Thus, when the rock shaft 1 is partially rotated by any suitable means, the door opens and the supporting bar 7 descends out of the casing to the position close to the face of the casing as shown by broken lines in Fig. 1 and in full lines Fig. 4.

The weight of goods and the supporting bar 7 is approximately counterbalanced by the gravity action of the hinged door in descending so that reverse rotation of the shaft 1 is easy of manipulation.

If it is desired to lower the goods to a position some distance in front of the casing, as for instance above a shop counter, the levers 4 and links 5 are dispensed with and supporting arms such as 3^a in Fig. 5 are employed.

One practical means for operating the shaft 1 and locking same in desired position is depicted in Figs. 1, 2, and 3 of the drawings. Therein the upper end of the door is provided with an arm 11 inwardly projecting approximately at right angles from about the hinge 10, said arm being supported by a brace 12 and having at its end a pulley 13. These parts are enclosed within the gear compartment G formed at one side of the casing by a partition P. At a suitable position within said compartment is a tilting bracket 18 mounted on a pivot 19 fixed on the casing wall and provided with two upwardly extending projections 20 bearing against the underside of a pivoted locking bar 21 controlled by a spring 33 and stops 34 and having a tooth 22 at its end adapted to engage with one of a series of teeth formed on a quadrant 23 keyed to the shaft 1. Said bracket 18 has also two oppositely extending arms 14 and 15 supporting pulleys 16 and 17.

A cord 24 is fixed at one end 25 to the casing and passes up over pulley 13 and around a pulley 26 fixed to the casing near said end 25, said cord then passing around the inner side of pulley 16 at the side of a guide pulley 27 and out through an aperture formed in the bottom of the casing. The cord then loops back past guide pulley 28, around pulley 17 and upwardly over a fixed pulley 29 and under another pulley 30 mounted on an arm 31 extending upwardly from the rock shaft 1, the end 32 of said cord being fixed to the casing near the pulley 29.

It will be understood that by grasping the lower hanging portion of the cord 24 shown nearer the front of the casing and pulling in a downward direction the bracket 18 is tilted and one of the projections 20 lifts the locking bar 21 and consequently its tooth 22 out of engagement with the teeth of the quadrant 23 which is thus released.

The pulling operation of the cord 24 draws down arm 11 and opens the door D whereby rod 9 connected to the crank 8 rocks the shaft 1 and lowers the bar 7 and the goods supported thereby.

As shaft 1 rotates forwardly arm 31 swings over and draws up the cord over pulley 29 and similarly arm 11 performs the same function on the rearward rotation of the shaft which is similarly effected by pulling on the other portion of the cord.

In lieu of the cords 24, arms 11 and 31, brace 12, locking bar 21, and bracket 18, a worm 60 (Fig. 9) may gear with the toothed quadrant 23, the shaft 61 of said worm being mounted in bearings 62 projecting from the side of the casing and it is provided with a pulley 63 operated by a cord 64 or said shaft may extend through the front of the casing and be provided with a crank handle 65.

The forward portion of the bottom of the case may be in the form of a flap 35 hinged at its inner end at 36 and provided with lugs 37 each having a pivot 38 on which is mounted an arm 39 formed with a longitudinal slot 40 engaged by a pin 41 on the vertical arm 3. Thus, when said arm operates the pin 41 slides in the slot till it reaches the lower end thereof when it causes the flap to swing down as illustrated in Fig. 1. Similarly on the the return of the goods to the case, the flap is operated during the final movement of the door D to close at its outer end against the lower end of said door, said ends being bevelled to ensure a good dust proof junction. It will be evident, however, that in lieu of this construction the flap 35 might be integral with the door in which case the mechanism just described would be unnecessary.

According to the form of the invention shown in Figs. 6 and 7 the container S is mounted on the supporting arms 3^a to swing bodily out of a fixed frame 42 and it is provided with drawers 43 to contain the goods, said drawers being drawn out from the side of the container when in lowered position as indicated in broken lines Fig. 6.

The crank 8 is centrally arranged on the shaft 1 and is provided with a cross head 44 formed with lugs to each of which is fixed

one end of a cord 45. Beneath the crank is a base plate 46 having thereon a slide block 47 and a slide nut 48 with a spring 56 between same, said nut 48 being in screwed engagement with the threaded end of a screw 49 the shank of which passes freely through the block 47 and through a lug on the base and is provided with a handle 50 for rotation of said screw. Mounted upon lugs formed on the base are pulleys 51, 52 and similar pulleys 53, 54 are provided on the block 47. One cord 45 passes down under pulley 51 and up over pulley 53 and then back to an end lug 55 to which its end is attached. Similarly the duplicate cord passes around pulleys 52, 54 and is fixed to lug 55. Thus, when crank 8 rises by rotation of rock shaft 1, slide block 47 travels along the base 46 and compresses the spring 56 as the container S is being lowered to position shown in broken lines in Fig. 6 and the stored power of the spring is used to lift the container back to its normal position in the frame 42.

By rotating the handle 50 the tension of the spring 56 can be adjusted to nicely counterbalance the weight of the container so that ease of manipulation is assured.

In the form illustrated the container is provided with a handle H for raising and lowering and locking same and the case is supported from the top upon bars 57 pivoted at their lower ends to lugs 58 on the frame, said bars having parallel action with the supporting arms 3^a to ensure the show case maintaining its vertical disposition while being raised or lowered.

Means for locking the shaft may be employed, if desired, in connection with the form of the invention just described. A practical construction is shown in Fig. 8 and consists of a toothed quadrant 23^a mounted on the rock shaft 1 between its centre and one end and a pivoted locking bar 21^a having a tooth 22^a engaging the quadrant, said bar being controlled by a spring 66 and connected at one end with a cord 67 passed over a pulley 68. By pulling the cord the locking bar is released from a tooth of the quadrant which permits the rock shaft 1 to be rotated and the container S to be lowered or raised.

It is to be understood that the apparatus described is applicable for lowering goods, either suspended from the supporting bar by means for instance, as fixed and swivel hangers or stored in containers, shelves, cases, baskets, and the like supported thereon, and it is also applicable for bodily lowering an entire show case with or without drawers or the like.

Moreover, in the constructions illustrated two vertically disposed supporting arms are shown for each case, but it will be evident that a single arm might be employed with a cross bar for supporting the goods, also that a crank might be formed integral with an arm and the whole keyed to the rock shaft or the arm crank and quadrant might be formed integral and swing on a fixed shaft.

Furthermore, it will be evident that where a number of show cases are arranged one beside the other a rock shaft might be extended through a series of cases and the goods therein simultaneously raised and lowered by a single manually or power operated device controlling the rotation of the rock shaft.

It will be evident that the rock shaft may be rotated by other means than those illustrated and that the goods on the supporting element as depicted in Figs. 1–4 may be lowered and raised by opening and closing the door of the casing.

Furthermore, either of the arms 11 or 31 may be cord operated for raising and lowering the goods and the goods may be raised by closing the door.

If the case is not fitted with a door a counterbalancing weight may be suspended from the outer end of the crank or a projection on the supporting arm and the rock shaft rotated by any suitable manual or power operated means.

I claim:—

1. Means for raising and lowering goods, comprising a vertically disposed axially supported swinging arm having a bell crank extension at the base to which is applied a weight counterbalancing element.

2. Means for raising and lowering goods, comprising one or a plurality of vertically disposed arms each projecting from a rock shaft and pivoted to a weight supporting lever pivoted to one end of a link mounted at the other end on a fixed pivot.

3. Means for raising and lowering goods, comprising a case having a hanging hinged door and one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door.

4. Means for raising and lowering goods, comprising a case having a hanging hinged door and one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door and a hinged flap in the bottom of said case operated through the medium of said arms.

5. Means for raising and lowering goods, comprising a case having a hanging hinged door and one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door and a hinged flap in the bottom of said case

having levers pivoted thereto, each formed with a longitudinal slot engaged by a pin on said arm.

6. Means for raising and lowering goods, comprising a case having a hanging hinged door, one or a plurality of vertically disposed arms in said case each projecting from a rock shaft provided with a crank connected by a cross over bar with said door and means for rocking said shaft.

7. Means for raising and lowering goods, comprising a case having a hanging hinged door, one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door, and an inwardly projecting arm adapted to be cord operated.

8. Means for raising and lowering goods, comprising a case having a hanging hinged door one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door, an upwardly projecting arm on said rock shaft and inwardly projecting arm on said door operated alternately by a cord passed around suitably arranged pulleys.

9. Means for raising and lowering goods, comprising a case having a hanging hinged door one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door and an upwardly projecting arm on the rock shaft adapted to be cord operated.

10. Means for raising and lowering goods, comprising a case having a hanging hinged door one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door, means to rock said shaft and locking means to retain same.

11. Means for raising and lowering goods, comprising a case having a hanging hinged door one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door, an inwardly projecting arm on said door and an upwardly projecting arm on said rock shaft adapted to be operated by a cord and means to lock said rock shaft.

12. Means for raising and lowering goods, comprising a case having a hanging hinged door one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door, an upwardly projecting arm on said rock shaft and inwardly projecting arm on said door operated alternately by a cord passed around suitably arranged pulleys, a toothed quadrant on said rock shaft engaged by a pivoted toothed locking bar and means operated by the cord for raising said locking bar.

13. Means for raising and lowering goods, comprising a case having a hanging hinged door one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar, with said door, an upwardly projecting arm on said rock shaft and inwardly projecting arm on said door operated alternately by a cord passed around suitably arranged pulleys, a toothed quadrant on said rock shaft engaged by a pivoted toothed locking bar, a pivoted bracket formed with upwardly extending lugs located beneath said bar and tilted by the operation of said cord.

14. Means for raising and lowering goods, comprising a case having a hanging hinged door one or a plurality of vertically disposed arms in said case, each projecting from a rock shaft provided with a crank connected by a cross over bar with said door, an upwardly projecting arm on said rock shaft and inwardly projecting arm on said door operated alternately by a cord fixed at each end and passed over pulleys on said arms and other pulleys and through pulleys on oppositely extending projections on a pivoted bracket adapted when tilted to lift a spring controlled pivoted locking bar from engagement with a toothed quadrant fixed on the rock shaft.

Dated this 18th day of February A. D. 1920.

FRED. J. DRYSDALE.