Sept. 13, 1932. H. D. LATHROP ET AL 1,877,334

CONVEYER

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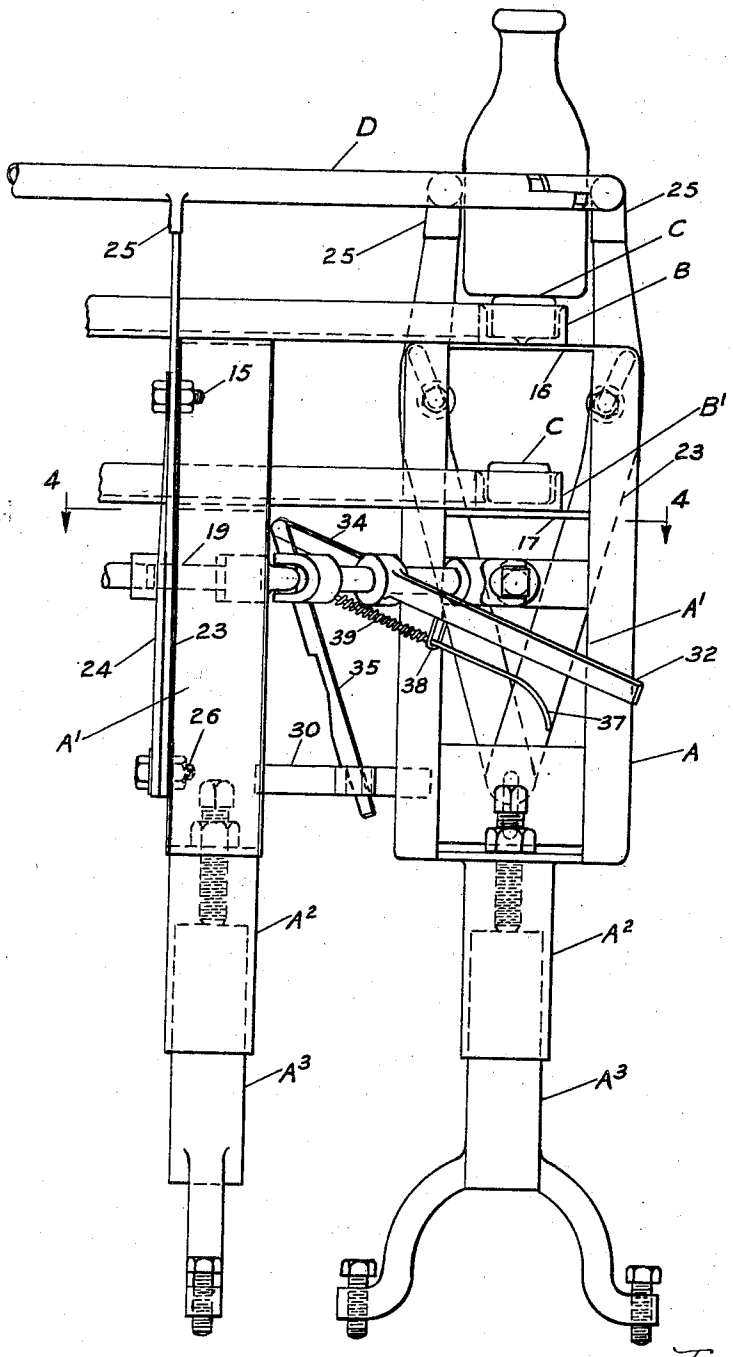


FIG. 1

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FIG. 4

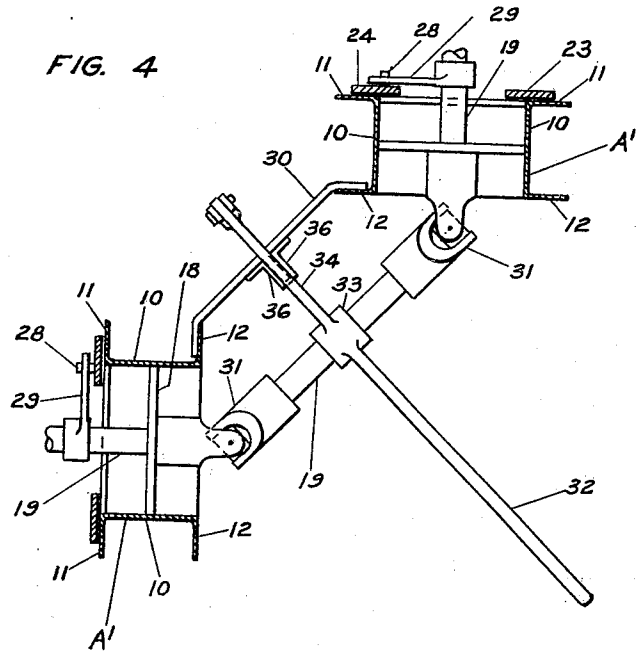


FIG. 2

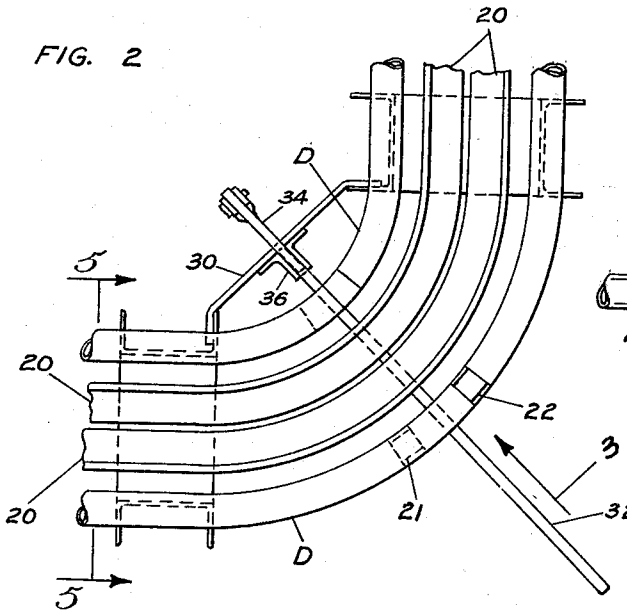
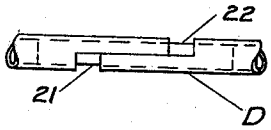


FIG. 3



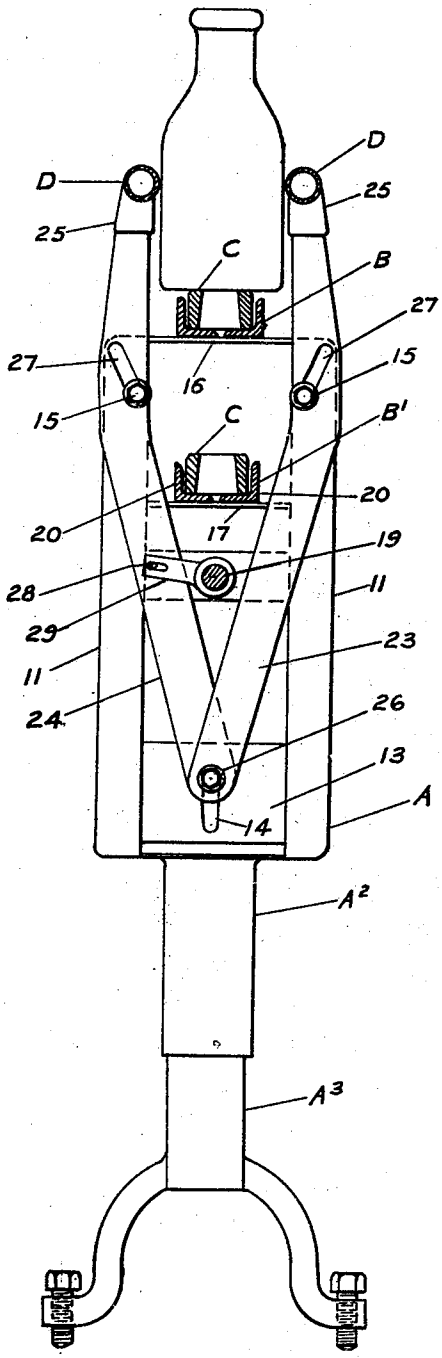
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CONVEYER

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FIG. 5



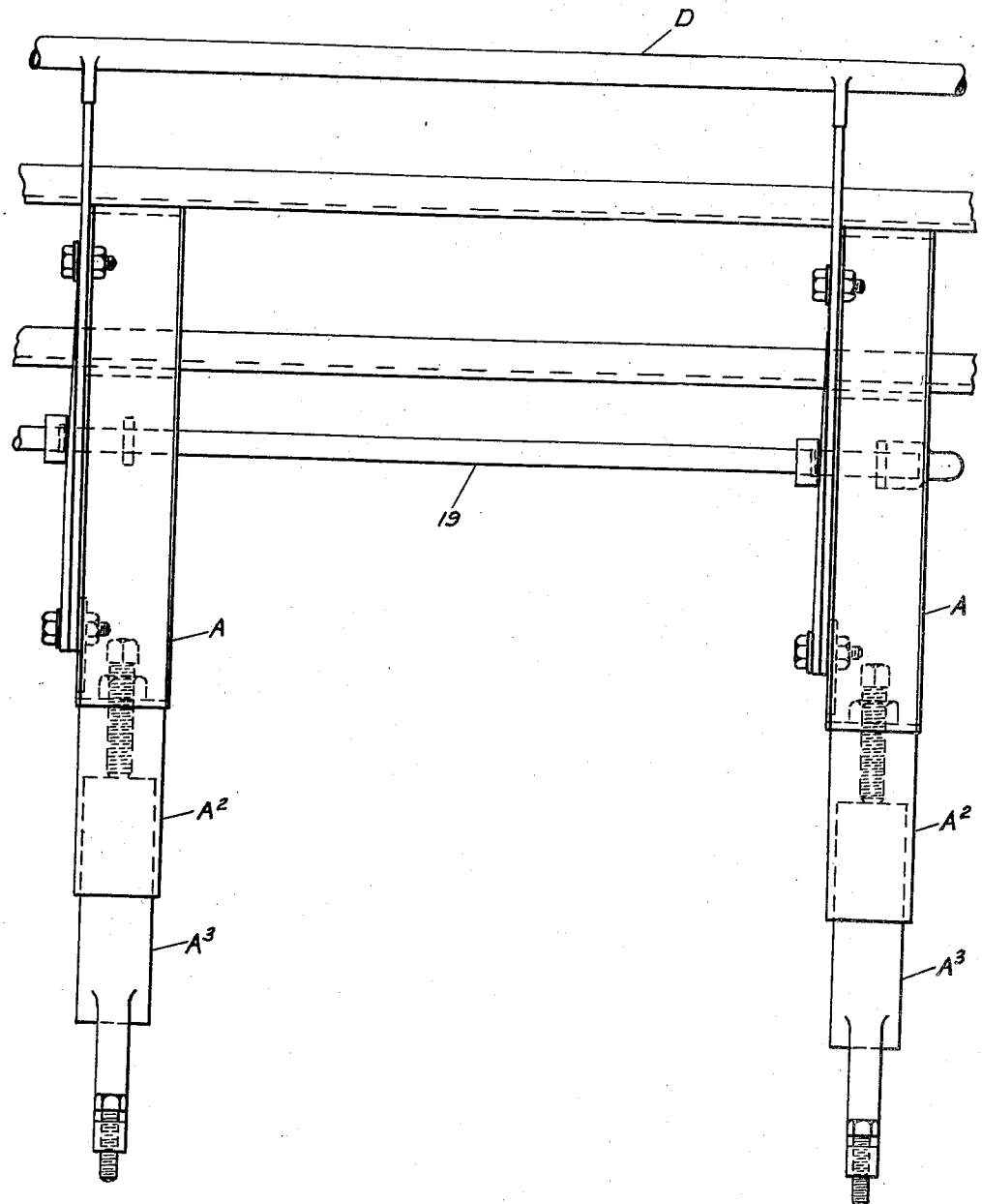
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FIG. 6



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Patented Sept. 13, 1932 1,877,334

UNITED STATES PATENT OFFICE

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CONVEYER

Application filed April 20, 1932. Serial No. 606,497.

This invention relates to conveyer apparatus and more particularly to apparatus adapted to convey bottles and other articles of varying dimensions.

One of the objects of the invention is to provide conveyer apparatus of simple and staunch construction which may be readily adjusted to handle bottles and other articles having varying heights and thicknesses. A further object is to provide adjustment mechanism for accommodating the guide rails of the apparatus to different sizes of bottles, packages and other articles, the adjustment for an extensive and curved track system being controlled at a single point. Other objects and advantages will appear as the specification proceeds.

The invention, in the preferred embodiment, is illustrated in the accompanying drawings, in which—

Figure 1 is a broken front view in elevation of apparatus embodying our invention; Fig. 2, a broken plan view; Fig. 3, a front detail view, the view being taken, as indicated, along line 3 of Fig. 2; Fig. 4, a plan sectional view, the section being taken as indicated at line 4 of Fig. 1; Fig. 5, a vertical sectional view, the section being taken as indicated at line 5 of Fig. 2; and Fig. 6, a side view in elevation of a straight section of the conveyer apparatus.

In the illustration given, A represents a supporting member; B and B′, superposed tracks carried by the support A; C, a conveyer chain in tracks B and B′; and D, guide rails at the sides of the upper conveyer track B.

The support A may be of any suitable construction. In the illustration given, a large number of supports A are employed to support tracks B and B′ and the supports are identical in construction. Each comprises an upper frame member A′ carried by a tubular base A^2 which in turn telescopically receives a standard A^3. Adjustment screw mechanism of well known construction may be employed to raise or lower the frame A′ upon the base standard A^3.

The frame A′, as shown more clearly in Figs. 4 and 5, includes a pair of spaced U beams 10 which have flanges 11 and 12. The flanges 11 are joined at their base by base plate 13 which is provided centrally with a vertical slot 14. As seen more clearly in Figs. 1 and 5, the vertical flanges 11 are equipped at their upper portions with guide studs or bolts 15. A cross beam 16 which extends between the tops of vertical flanges 11 supports the upper track B and a similar cross beam 17, which is spaced below cross beam 16, supports the lower track B′. As shown more clearly in Figs. 4 and 5, the frame A′ is provided centrally with a web or cross beam 18 which is apertured to receive and support a rock shaft 19.

The tracks B and B′ may be of any suitable construction. As illustrated, each track comprises a pair of angle members 20 which have their horzontal flanges in alignment and their vertical flanges spaced apart to provide guide rails for the chain conveyer C.

The chain C may also be of any suitable form and may be driven by any suitable means. It is preferred to employ a continuous chain composed of pivotally connected units which permit the chain to pass around curves, corners, etc.

The guide rails D are illustrated as tubular members which are supported, as will be hereinafter described, above and on the sides of the upper track B. The rails may be curved, as shown in Figs. 2 and 3, to conform to the curved tracks B. In order to permit lateral movement of the guide rails D, as will be later described, the rails are severed along the curves or bends and provided with slip joints. As shown in detail in Fig. 3, the end portion of one segment of the rail is cut away along its lower side at 21, while the adjacent end portion of the other segment is cut away along its top side at 22. The two segments have sufficient space between their ends to permit slipping of the rails as the rail is directed away from the track or drawn inwardly toward the track. The inner rail is also provided with a slip joint similar to that illustrated in Fig. 3.

In order to support the guide rails D at an elevation above the upper track B, we prefer to employ, in combination with each support

A, toggle arms or link members 23 and 24. The arms, as illustrated in Figs. 1 and 5, are preferably spaced apart at their upper portions in substantial alignment with the vertical flanges 11 and the upper ends of the links releasably engage hollow sleeves 25 with which the guide rails D are provided. The lower portions of the link arms 23 and 24 are inclined inwardly and overlap at their ends where they are pivotally connected by stud 26. The stud 26 preferably extends through the slot 14 with which the base plate 13 is provided and is retained within the slot by a nut. The link arms 23 and 24 are provided at their waist portion with outwardly inclined slots 27 which are engaged by the guide studs 15 carried by flanges 11. As shown more clearly in Figs. 4 and 5, the link arm 24 is equipped at its lower side with a pin 28 which is engaged by the slotted finger 29 keyed to the rock shaft 19.

When the rock shaft 19 is rotated so as to bring the finger 29 up against the pin 28, the link arms 23 and 24 are raised, the guide slots 27 directing the lateral movement of the upper ends of the link arms, as will be later described. Any suitable means for turning the rock shaft 19 may be employed. For example, a lever arm may be secured to the shaft at any point. It is preferred, however, to secure the lever arm as illustrated in Figs. 1, 2 and 4. At a corner of the track, a pair of supports A are brought into the position illustrated in Fig. 4 and the flanges 12 are connected by a metal strap 30. A short length of the rock shaft 19 is connected to the two angularly disposed adjacent ends of the rock shafts which extend through the two supports A, by universal joints 31. A lever bar 32 is provided with a collar 33 which is keyed to the short length of shaft 19 and is provided with an integral extension 34. A latch bar 35, equipped with any suitable number of notches, is pivotally connected to the end of the extension 34. The latch bar 35 engages the metal strap 30 and slides between the guide flanges 36 with which the strap 30 is provided. As shown more clearly in Fig. 1, a release bar 37 is secured to latch bar 35 and supported in close relation with the lever 32 by a metal loop 38. A spring 39 is confined between the loop 38 and the latch bar 35 and urges the latch bar into contact with the metal strap 30.

In the operation of the apparatus, when it is desired to convey a small package or bottle and of relatively small thickness or diameter, the guide rails D are lowered and drawn inwardly so as to brace the sides of the small package or bottle. This is accomplished by turning the rock shaft so as to depress the slotted finger 29 which engages pin 28 on the link arm 24, thus lowering the link arms and guide rails. At the same time, the inclined slots 27, in engagement with studs 15, guide inwardly the upper ends of the link arms and the rails carried thereby. In order to turn the rock shaft 19, the latch bar must be withdrawn from engagement with the metal strap 30 and this is brought about by drawing the bar 37 upwardly toward the handle or lever 32. The latch bar 35 may have any desired number of notches so that the guide rails may be stopped at any desired elevation. In order to raise and spread the link arms and guide rails so as to receive and brace a larger package or bottle, the lever or handle 32 is depressed so as to rock the shaft 19 and bring the actuating finger 29 against the pin 28. The link arms are thus raised and the guide slots 27 cause the upper ends of the link arms and the guide rails D to expand as they are elevated. At the same time, the latch bar ratchets over the metal strap 30. After the desired elevation is reached, the bar 32 may be released, the latch bar 35 serving to maintain the rails at that height.

By the use of universal joints between straight lengths of rock shafts, the actuation of the link arms may be accomplished along an extensive stretch of straight and curved conveyer tracks. While it is not necessary that the lever arm be placed at a bend or curve in the track, it has been found advantageous because of the unitary structure afforded by the adjacent pair of supports and because of the direct actuation of the two long lengths of rock shaft.

The apparatus may be modified in many respects. For example, the inclination of the guide slots may be varied and the contour of the slots changed to adjust the guide rails to the shape and form of the articles which are to be conveyed; in other words, by specifying the types of articles to be handled, the guide slots may be fashioned so as to bring the guide rails into juxtaposition with the sides of each of the articles handled and at the proper elevation therefor.

While the conveying element has been described as a chain, it will be understood that any other suitable conveying mechanism may be employed, and where in the accompanying claims the word "chain" is employed, we desire to cover belts and other conveying strips.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

We claim:

1. In a device of the character set forth, a conveyer chain, means for supporting the chain, a guide rail supported above and at one side of said chain, means for raising and lowering the rail, and guide means for directing the rail away from the chain as the rail

is raised and toward the chain as the rail is lowered.

2. In a device of the character set forth, a conveyer chain, means for supporting the chain, guide rails supported above and at the sides of said chain, means for simultaneously raising and lowering the rails, and guide means associated with said last-mentioned means for directing the rails away from the chain as they are raised and toward the chain as they are lowered.

3. In a device of the character set forth, a conveyer chain, means for supporting the chain, guide rails supported above and at the sides of said chain, means for simultaneously raising and lowering the rails, guide means for directing the rails away from the chain as they are raised and toward the chain as they are lowered, and latch means for releasably locking said rails in one or more elevated positions.

4. In a device of the character set forth, a conveyer chain, means for supporting the chain, guide rails supported above and at the sides of said chain, means for simultaneously raising and lowering the rails, said means including a plurality of rock shafts connected at their ends by universal joints, and guide means for directing the rails away from the chain as they are raised and toward the chain as they are lowered.

5. In a device of the character set forth, a support, a conveyer chain carried thereby, guide rails, arms supporting said rails above and at one side of said chain, means for raising and lowering said arms, and guide means associated with said support and said arms for expanding said arms during the raising operation and contracting them during the lowering operation.

6. In a device of the character set forth, a support, a conveyer chain carried thereby, guide rails, link arms pivotally connected at one end and supporting said guide rails above and at the sides of said chain, means for raising and lowering said arms, and guide means carried by said support and said arms for expanding said rails during the raising operation and contracting them during the lowering operation.

7. In a device of the character set forth, support, a conveyer chain carried thereby, guide rails, link arms pivotally connected at one end and supporting said guide rails above and at the sides of said chain, means for raising and lowering said arms, and guide means on said support and said arms for expanding said rails during the raising operation and contracting them during the lowering operation, said means comprising cooperating guide studs and inclined guide slots.

8. In combination with conveyer apparatus equipped with a conveyer chain and guide rails thereabove, a support having vertical flanges equipped with guide studs, a pair of link arms engaging said guide rails and having their lower ends pivotally connected, said link arms having inclined guide slots engaging said guide studs, and means for raising said arms.

9. In combination with conveyer apparatus having a conveyer chain and guide rails thereabove, a support equipped with guide studs and a vertical slot, toggle arms engaging said guide rails, a pivot stud connecting the lower ends of said arms and engaging the vertical slot of said support, inclined guide slots in said arms and receiving the guide studs of said support, and means for raising said arms.

10. In combination with conveyer apparatus equipped with a conveyer chain and guide rails thereabove, a support, link arms engaging said guide rails, cooperating guide means on said link arms and said support, a rock shaft carried by said support, cooperating means carried by said rock shaft and said link arms for raising said link arms as said shaft is rotated, and means for rotating said shaft.

11. In combination with conveyer apparatus equipped with a conveyer chain and guide rails thereabove, a support, link arms engaging said guide rails, cooperating guide means on said link arms and said support, a rock shaft carried by said support, cooperating means carried by said rock shaft and said link arms for raising said link arms as said shaft is rotated, said means comprising a pin carried by one of said link arms, and an actuating finger carried by said rock shaft.

12. In combination with conveyer apparatus having a curved track and a conveyer chain and having also curved guide rails above said track, a pair of supports on each side of the curved track, rock shafts supported therein, a connecting shaft secured to the ends of said first-mentioned shaft by universal joints, a lever arm secured to said connecting shaft, link arms slidably connected to said supports and carrying said guide rails, and cooperating means carried by said rock shafts and said arms for raising said arms.

13. In a device of the character set forth, a curved conveyer track, supports on each side of the curved portion of said track, rock shafts rotatably mounted in said supports, a chain in said track, curved guide rails over the curved portion of the track, said guide rails being equipped with slip joints, a connecter shaft joined to said rock shafts by universal joints, a lever secured to said connector shaft, link arms engaging said guide rails and slidably connected to said supports, and means carried by said arms and said rock shafts for elevating said arms upon rotation of said connector shaft.

14. In a device of the character set forth,

a curved conveyer track, supports on each side of the curved portion of said track, rock shafts rotatably mounted in said supports, a chain in said track, curved guide rails over the curved portion of the track, said guide rails being equipped with slip joints, a connector shaft joined to said rock shafts by universal joints, a lever secured to said connector shaft, link arms engaging said guide rails and having inclined guide connections with said supports, means carried by said arms and said rock shafts for elevating said arms upon rotation of said shaft, and releasable latching means associated with said lever for supporting said arms in elevated position.

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