J. A. BURNS.

SHOW CASE.

APPLICATION FILED MAR. 29, 1912.

1,078,249. Patented Nov. 11, 1913.

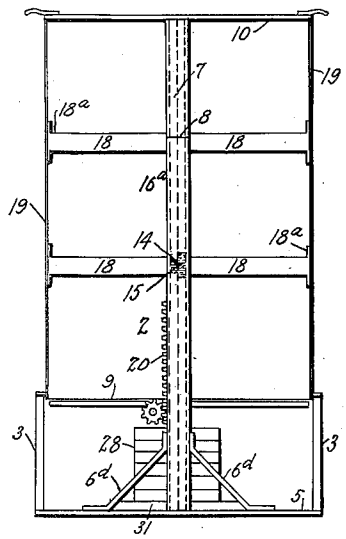


Fig. 3

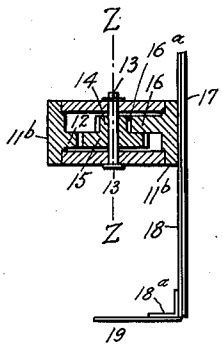


Fig. 4

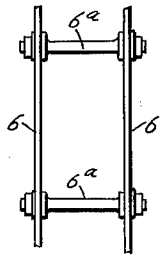


Fig 5

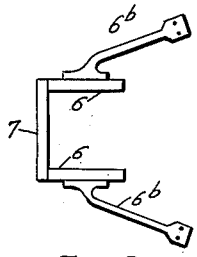


Fig 6

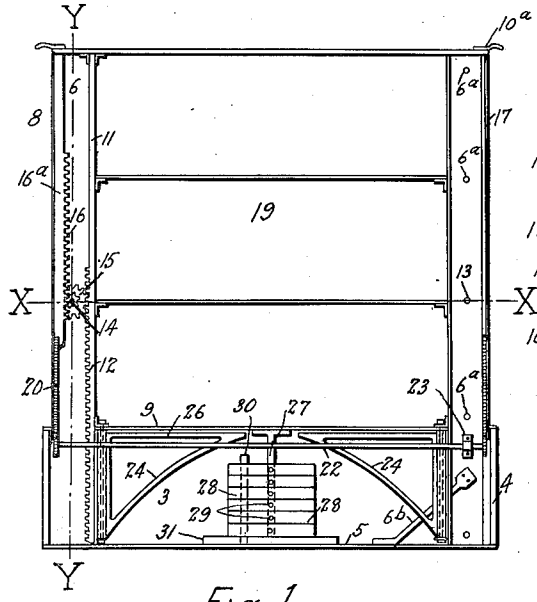


Fig. 1

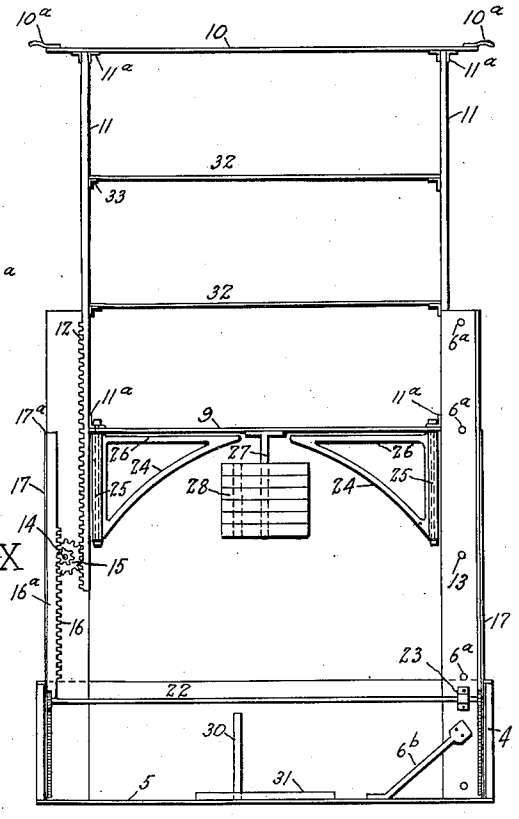


Fig. 2

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SHOW-CASE.

1,078,249. Specification of Letters Patent. Patented Nov. 11, 1913.

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To all whom it may concern:

Be it known that I, JOHN ALEXANDER BURNS, a subject of the King of England, residing at the city of Mexico, Mexico, have invented certain new and useful Improvements in Show-Cases, of which the following is a specification.

This invention relates to show cases of the extensible or open out type.

It aims to provide a case for the exhibition of merchandise or for other purposes, adapted to be shut together into a compact package of relatively small compass and to be extended or opened out upwardly to a position and condition in which the contents may most advantageously be exhibited and may be readily reached from without.

Another object of the invention is to so arrange the construction that a maximum exposure of the contents or interior of the show case will be obtained by a minimum movement of the part actuated by hand, and that the several members may be counterpoised so as to require a very small effort for the operations of opening and closing the case.

Finally the invention aims to afford means for readily increasing the surface upon which merchandise may be displayed when the case is in the opened out position, and for infolding said means within the structure when closed.

These objects are attained by the construction and arrangement fully described hereinafter and illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation of the box in its closed position, the front board of the base and of the left hand trunk being removed to show the interior; Fig. 2, a similar view of the box in its extended position, or opened out, exposing the contents to free access; Fig. 3, an end view of the box closed, the end board of the base being removed to expose the interior; Fig. 4, an enlarged horizontal section of the right hand end of Fig. 1 on line X—X; Fig. 5, a vertical transverse section through a portion of one of the trunks, as on line Y—Y, Fig. 1; and Fig. 6 is a top plan view showing one of the means for bracing the sides of the trunks.

In the drawings the case has been shown provided with glass sides and ends, which, upon extending the case, partly descend into the base, and are partly left by the ascending show case, leaving the sides and ends of the latter entirely open. It is to be noted that it is entirely within the purview of this invention to have the glass sides and ends go down and the top and bottom of the case move up the top and bottom moving at twice the speed of the sides and ends, after the fashion of the movable glass sides and ends here shown and described by way of illustration. Should the movable wooden or metal sides and ends be used the case will when extended not give access to its contents all around, but keep these inclosed by glass, but in such a way that they may readily be seen. To gain access to the interior one of the sides or ends must be made slidable vertically, or have a door or opening provided in it. Such a construction affords the advantages of closing up to a minimum bulk, and of being capable of extension as in the general case.

In the present illustrative case the receptacle is represented as a parallelepiped of oblong horizontal section, which is the form most commonly used. It may also have a square section, and the same division of parts and operative mechanism shown for the parallelepiped would also answer for cylindrical show cases, such as are especially adapted for displaying jewelry and the like.

Referring to the drawing, the show case proper 2 is seen to rest in its closed position with its bottom on the upper edges of a hollow base having side- and end-walls 3 and 4, of wood paneling or of suitable sheet metal, put together after the fashion of a box, and resting on and secured to a bottom 5, the principal office of which is to afford means for fastening the feet of the trunk stays and braces. In the present instance the height of the base is made equal to one quarter the total height of the case. Close inside of each end of the box but separated therefrom by a space just sufficient to give the end glasses of the case clearance for moving down and up, is a pair of vertical, parallel strips 6, 6, or planks of wood, spaced apart the width of the differential gear to be described farther on, partly inclosing a trunk-like space open throughout its height on the inner side, and closed by a cross plank 7 on the outer side near the top, above the point 8, which marks the limit of upward extension of the end-glass-rack bar. Strictly speaking the two planks

6, 6, do not by themselves form a trunk, but rather two sides of a trunk, the ends of which are closed by the elevating and the lowering operative member, respectively, as will appear more fully farther on. For the purposes of this description, however, the space between these two planks will here be known as the trunk. As this trunk must carry the entire weight of the case proper when opened out, and the weight of its sides and ends at all times the planks are well tied to one another by body bolts 6^a, with internal shoulders, against which the trunk sides are set by bolts bearing on washers pressing against the outer surface of each respective plank, as shown in Fig. 5. These stay bolts are run across the trunk space where they may clear the two rack bars. In addition, the forward edge of each trunk side is braced near the foot by a palm stay 6^b, running inwardly and downwardly, its foot being fastened to the bottom planking 5 of the base. Finally the trunk sides are braced laterally by angular palm struts 6^d (Fig. 3), running to the bottom planking to which their feet are fastened by wood screws or other suitable means.

The floor or bottom 9 and the cover or top 10 of the show case proper, preferably made of wood or sheet metal are rigidly tied to one another by a bar 11 at each end, secured to the bottom and top by angle brackets 11^a, rigidly united to the parts they connect by screws or the like. The inner side of each bar 11 is fashioned into a shoe or T head 11^b, which slides along the inner edges of the sides 6 of its respective trunk, completely closing that side of the trunk when the show case is shut up. A rack bar 12 extends outwardly from the shoe, after the manner of the web of a girder or beam, from the bottom of bar 11 upwardly to a height a little more than one half the total height of the case with base over all, the teeth being on the outer side of the bar. In each trunk a horizontal axle 13 is rotatably mounted in bearings fitted in each trunk side at a point slightly above mid height of the entire structure when closed. A differential gear is keyed to this axle, consisting of a small pinion 14 and a larger pinion 15, fitted so as to rotate together in the same direction. The two pinions may be cut in one integral piece or made separately and keyed to axle 13 so as to operate as one piece. In the present instance used by way of illustration the larger pinion has twice as many teeth as the small pinion, the teeth being of the same pitch, root and flank and adapted to engage the teeth of the respective rack bars. The combined width of face of the differential gear is just sufficient to clear the inside of the trunk, in which it is mounted. That is to say, the width of the trunk is adapted to said combined width of face. Rack bar 12, carrying the top and bottom of the show case proper is at all times held in engagement with the larger pinion of the differential gear, on the inner side of the latter, and travels up and down in the trunk. The smaller pinion 14 is engaged on the outer side of the differential by the teeth of a rack bar 16, traveling up and down in said trunk, and extending, when the show case is closed, upwardly from the center of the axle 13 of its pinion a distance slightly greater than one quarter the total height of the structure when closed. The outer side of rack bar 16 is formed into a T head or bearing shoe 16^a to which is fastened by any known suitable means the end glass 17, on the corresponding end of the show case. At suitable points along the height of the shoe 16^a horizontal arms 18 secured to the edges of the bar project forwardly and backward therefrom, carrying at their outer ends angle brackets 18^a, one arm of each of which is fastened by rivets and the like to the corresponding front or rear side glass 19 of the case proper. This insures that the side and end glasses are all bound together into one shell of rectangular horizontal section and move together and with the rack bars 16, each carrying its shoe 16^a. The latter moves along the outer edges of the trunk sides, closing all that side of the trunk space. If now, the top 10 be pulled upward, as by lifting on handles 10^a, its two rack bars 12 will cause their respective pinions 15 to so revolve on axle 13 that the top of the gear is moving outwardly and downwardly, which will cause pinions 14, partaking of the same movement, to push rack bars 16 downwardly, or in a direction opposite to the travel of rack bars 12, engaging on the opposite side of the differential. By virtue of the differential size of the two pinions the side and end glasses will travel downward one half as fast and as far as the case proper travels upward. Hence when the case has risen by one half the total height of the structure, the side and end glasses descending into the base by an amount equal to $\frac{1}{4}$ the total height of the structure, will have become stripped entirely clear of the sides and ends of the case proper, leaving them wholly open. If we call h the total height of the structure, $\frac{3h}{4}$ will be the height of the case proper, the base being $\frac{h}{4}$. When the case has risen by $\frac{h}{2}$ it would leave covered by the end glasses, if they remained stationary $\frac{(3h}{4} - \frac{2h)}{4} = \frac{h}{4}$ of its height. As we know that the side and end glasses are constrained to descend by a distance of $\frac{h}{4}$, the

tops of the side and end glasses will have been brought level with the floor or bottom 9 of the case proper. To insure that the two ends will rise and descend together a side rack 20 is provided on the side of each of the outer rack bars 16, extending from the foot of the bar upward to a short distance above ¼ the total height of the structure. Pinions 21 mounted on each end of a shaft 22, rotatably supported in bearings 23, secured to the side of each trunk engage the side racks 20, constraining the rack bars 16 at the two ends of the case to move together uniformly. When the case has thus been extended, giving free access to its contents, brackets 24, hung from the bottom 9 of the case proper by pivot- or hinge-bolts 25 (shown in dotted lines in Fig. 2), may be swung out, affording support to a tray or leaf 26, which when pulled out offers additional surface for the display of merchandise or of selected parts of the contents of the show case. The mechanical details of construction of these trays are not of the essence of this invention as they may obviously be arranged in a great many different ways.

It will be seen that if the side and end glasses are not allowed to reach to the very bottom, they may, by suitable adjustment of the respective weights, be held in a floating equipoise with the show case proper, the weight of both being sustained by the differential gears, each acting as fulcrum to the scale beam, and by them transmitted to the corresponding trunks. As the relation between the weights of the two parts to be counterpoised will vary with the weight of the contents of the case proper, a depending vertical rod 27 is secured to the underside of the floor 9, and adapted to support one, two or more of the weights 28, which are arranged to fasten to or be detached from the weight above by spring clips 29, after the manner of the well known weights of health lifts in gymnasiums. The weights 28 are perforated in one place to enable them when not hung on rod 27 to be threaded on a pin or peg 30, rising from the weight-bed 31. By suitably putting on or taking off weights from the case proper, it may be held in almost perfect balance with the side and end glasses, so that the least push or pull will cause the case to close to or open out. Obviously a variable adjustment of weights may also be applied to the side and end glasses by using the upper end of rack bar 16 as point of application.

If it be desired trays may be fitted inside the show case proper, resting on ledges or brackets secured to the inner sides of the bars 11. In Fig. 2 two such trays 32 are shown resting on brackets 33.

The particular dimensions or rather proportions of the parts, as well as the particular ratio between the pitch circle diameters of the differential gear such as are used in the present illustrative example, are arbitrarily chosen, and are not to be considered in any sense as limiting the scope of the invention. Any other suitable proportion of the height of the base to that of the case proper may be adopted, provided the ratio between the diameters of the two pinions 14 and 15 be correspondingly varied. It is also to be noted that the floor 9 of the case proper may be extended outwardly beyond the trunks at both ends after sufficient clearance has been cut out to allow the floor to freely pass up and down along the trunk walls.

Having thus described my invention and set forth the manner of putting it into practice, what I claim as new and desire to have protected by Letters Patent is the following:

1. In a show case, a top and a bottom rigidly interconnected, sides and ends normally inclosing the space between said top and bottom, said sides and ends not being connected with said top and bottom, means for moving said sides and ends away from said top, leaving a portion of said space uninclosed and means for moving said top and bottom in a direction opposite to the direction of motion of said sides and ends, so as to increase the uninclosed portion of said space.

2. In a show case, a top and a bottom rigidly interconnected, sides and ends normally inclosing the space between said top and bottom, said sides and ends not being connected with said top and bottom, means for moving said sides and ends away from said top, leaving a portion of said space uninclosed and means for moving said top and bottom in a direction opposite to the direction of motion of said sides and ends, simultaneously with said movement of said sides, so as to increase the uninclosed portion of said space.

3. In a show case, a top and a bottom rigidly interconnected, sides and ends normally inclosing the space between said top and bottom, said sides and ends not being connected with said top and bottom, means for moving said sides and ends away from said top, leaving a portion of said space uninclosed, and means for moving said top and bottom in a direction opposite to the direction of motion of said sides and ends, and sufficiently far to entirely clear said space from said sides, permitting free access to the contents of said show case laterally.

4. In a show case, a top and a bottom rigidly interconnected, sides and ends normally inclosing the space between said top and bottom, said sides and ends not being connected with said top and bottom, means

for moving said sides and ends away from said top, leaving a portion of said space uninclosed, and means for moving said top and bottom in a direction opposite to the direction of motion of said sides and ends, simultaneously with said movement of said sides, and sufficiently far to entirely clear said space from said sides, permitting free access to the contents of said show case laterally.

5. In a show case, a top and a bottom rigidly interconnected, sides and ends normally inclosing the space between said top and bottom, said sides and ends not being connected with said top and bottom, means for simultaneously moving said top and bottom and said sides in opposite directions sufficiently to leave said space entirely uninclosed laterally.

6. In a show case, a top and a bottom rigidly interconnected, sides and ends normally inclosing the space between said top and bottom, said sides and ends not being connected with said top and bottom, means for simultaneously moving said top and bottom and said sides in opposite directions sufficiently to leave said space entirely uninclosed laterally, and means for counterbalancing the weight of said top and bottom with its contents against the weight of said sides and ends.

7. In a show case, a top and a bottom rigidly interconnected, sides and ends normally inclosing the space between said top and bottom, said sides and ends not being connected with said top and bottom, but connected between each other so as to move as a unit, means for simultaneously moving said top and bottom and said sides in opposite directions sufficiently to leave said space entirely uninclosed laterally, and means for counterbalancing the weight of said top and bottom with its contents against the weight of said sides and ends.

8. In a show case, a top and bottom rigidly interconnected, sides and ends rigidly interconnected but not connected with said top and bottom, and inclosing the space between said top and bottom when said show case is in its closed up-position, a base supporting said bottom in said closed up-position, the sides of said base being sufficiently spaced outwardly from the edges of said bottom to allow said sides and ends to be lowered into it, means for simultaneously lowering said sides and ends as a shell into said base, and for raising said bottom from said base and lifting it and said top together sufficiently to entirely clear the top edges of said sides and ends, and adjustable means for counterbalancing the weight of said top and bottom with the contents against the weight of said sides and ends.

9. In a show case, a top and bottom rigidly interconnected, sides and ends rigidly interconnected but not connected with said top and bottom, and inclosing the space between said top and bottom when said show case is in its closed up position, a base supporting said bottom in said closed up position, the sides of said base being sufficiently spaced outwardly from the edges of said bottom to allow said sides and ends to be lowered into it, means for simultaneously lowering said sides and ends as a shell into said base and for raising said bottom from said base and lifting it and said top together sufficiently to entirely clear the top edges of said sides and ends, adjustable means for counterbalancing the weight of said top and bottom with its contents against the weight of said sides and ends, and means for insuring that the two ends rise and sink together.

10. In a show case, a top and bottom rigidly interconnected, but not connected with said top and bottom, and inclosing the space between said top and bottom when said show case is in its closed up position, a base supporting said bottom in said closed-up position, the sides of said base being sufficiently spaced outwardly from the edges of said bottom to allow said sides and ends to be lowered into it, means for simultaneously lowering said sides and ends as a shell into said base and for raising said bottom from said base and lifting it and said top together sufficiently to entirely clear the top edges of said sides and ends, adjustable means for counterbalancing the weight of said top and bottom with its contents against the weight of said sides and ends, means for insuring that the two ends rise and sink together, and trays underneath said bottom adapted to be pulled out when said show case is in the opened out position and to be pushed back into place when said show case is in the closed-up position.

11. In a show case, a top and bottom rigidly interconnected, sides and ends rigidly interconnected but not connected with said top and bottom and inclosing the space between said top and bottom when said show case is in its closed up position, horizontal shelves between said top and said bottom, a base supporting said bottom in said closed up position the sides of said base being sufficiently spaced outwardly from the edges of said bottom to allow said sides and ends to be lowered into it, means for simultaneously lowering said sides and ends as a shell into said base, and for raising said bottom from said base and lifting it and said top together sufficiently to entirely clear the top edges of said sides and ends, adjustable means for counterbalancing the weight of said sides and ends, means for insuring that the two ends rise and sink together, and trays underneath said bottom adapted to be

pulled out when said show case is in the opened out position and to be pushed back into place when said show case is in the closed up position.

12. In a show case, a base open at the top and closed at the sides, ends and bottom; a vertical hollow trunk member inside each end at the middle thereof, secured to the respective end and to the bottom of the said base, a top and a bottom of the show case proper rigidly interconnected at each end by a rack bar moving in said hollow trunk, sides and ends rigidly interconnected but not connected with said top and bottom, and inclosing the space between said top and said bottom when said show case is in its closed up position; a space between the outer edges of said bottom of the case proper and the sides and ends of said base, sufficiently wide to allow said sides and ends of the case proper to be lowered thereinto, a rack bar rigidly affixed to the face of each end of said case proper and moving in its respective hollow trunk; a differential gear journaled in each trunk, having a large pinion meshing with the rack bar of said top and bottom, and a small pinion integral with said large pinion and meshing with said rack bar of said end member of said show case proper, said rack bars meshing on diametrically opposite sides of said differential gear.

13. In a show case, a base open at the top and closed at the sides, ends and bottom; a vertical hollow trunk member inside each end at the middle thereof, secured to the respective end and to the bottom of said base, a top and a bottom of the show case proper rigidly interconnected at each end by a rack bar moving in said hollow trunk, sides and ends rigidly interconnected but not connected with said top and bottom, and inclosing the space between said top and said bottom when said show case is in its closed-up position; a space between the outer edges of said bottom of the case proper and the sides and ends of said base, sufficiently wide to allow said sides and ends of the case proper to be lowered thereinto, a rack bar rigidly affixed to the face of each end of said case proper and moving in its respective hollow trunk; a differential gear journaled in each trunk, having a large pinion meshing with the rack bar of said top and bottom, and a small pinion integral with said large pinion and meshing with said rack bar of said end member of said show case proper, said rack bars meshing on diametrically opposite sides of said differential gear, a side rack on each rack bar of said ends of the case proper, meshing with a pinion keyed on each end of a shaft extending horizontally and laterally.

14. In a show case, a base open at the top and closed at the sides, ends and bottom, a vertical hollow trunk member inside each end at the middle thereof, secured to the respective end and to the bottom of said base, a top and a bottom of the show case proper rigidly interconnected at each end by a rack bar moving in said hollow trunk, sides and ends rigidly interconnected but not connected with said top and bottom and inclosing the space between said top and said bottom when said show case is in its closed-up position; a space between the outer edges of said bottom of the case proper and the sides and ends of the said base sufficiently wide to allow said sides and ends of the case proper to be lowered thereinto, a rack bar rigidly affixed to the face of each end of said case proper and moving in its respective hollow trunk; a differential gear journaled in each trunk, having a large pinion meshing with the rack bar of said top and bottom, and a small pinion integral with said large pinion and meshing with said rack bar of said end member of said show case proper, said rack bars meshing on diametrically opposite sides of said differential gear, a side rack on each rack bar of said ends of the case proper, meshing with a pinion keyed on each end of a shaft extending horizontally and laterally, a differential gear journaled in each trunk, having a large pinion meshing with the rack bar of said top and bottom, and a small pinion integral with said large pinion and meshing with said rack bar of said end member of said show case proper, said rack bars meshing on diametrically opposite sides of said differential gear, a side rack on each rack bar of said ends of the case proper, meshing with a pinion keyed on each end of a shaft extending horizontally and laterally, means attached to said bottom of said case proper for varying the weight of said case proper.

15. In a show case, a base open at the top and closed at the sides, ends and bottom; a vertical hollow trunk member inside each end at the middle thereof, secured to the respective end and to the bottom of said base, a top and a bottom of the show case proper rigidly interconnected at each end by a rack bar moving in said hollow trunk, sides and ends rigidly interconnected but not connected with said top and bottom and inclosing the space between said top and said bottom when said show case is in its closed-up position; a space between the outer edges of said bottom of the case proper and the sides and ends of the case proper sufficiently wide to allow said sides and ends of the case proper to be lowered thereinto, a rack bar rigidly affixed to the face of each end of said case proper and moving in its respective hollow trunk; a differential gear journaled in each trunk, having a large pinion meshing with the rack bar of said top and bottom, and a small pinion integral with said large pinion and meshing with said rack bar of end member of said show case proper, said rack bars meshing on diametrically opposite sides of said differential gear, a side rack on each rack bar of said ends of the case proper meshing with a pinion keyed on each end of a shaft extending horizontally and laterally, means attached

to said bottom of said case proper for varying the weight of said case proper, and a tray fitted under said bottom of said case proper adapted to be pulled out and supported when said case is in its exhibiting position and to be pushed in when said case is closed.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN ALEXANDER BURNS.

Witnesses:
EDWARDO ROMERO,
WILLIAM R. MARSHALL.