May 21, 1935. T. F. BYRON 2,002,171

WINDOW CURTAIN

Filed Feb. 26, 1934 2 Sheets-Sheet 1

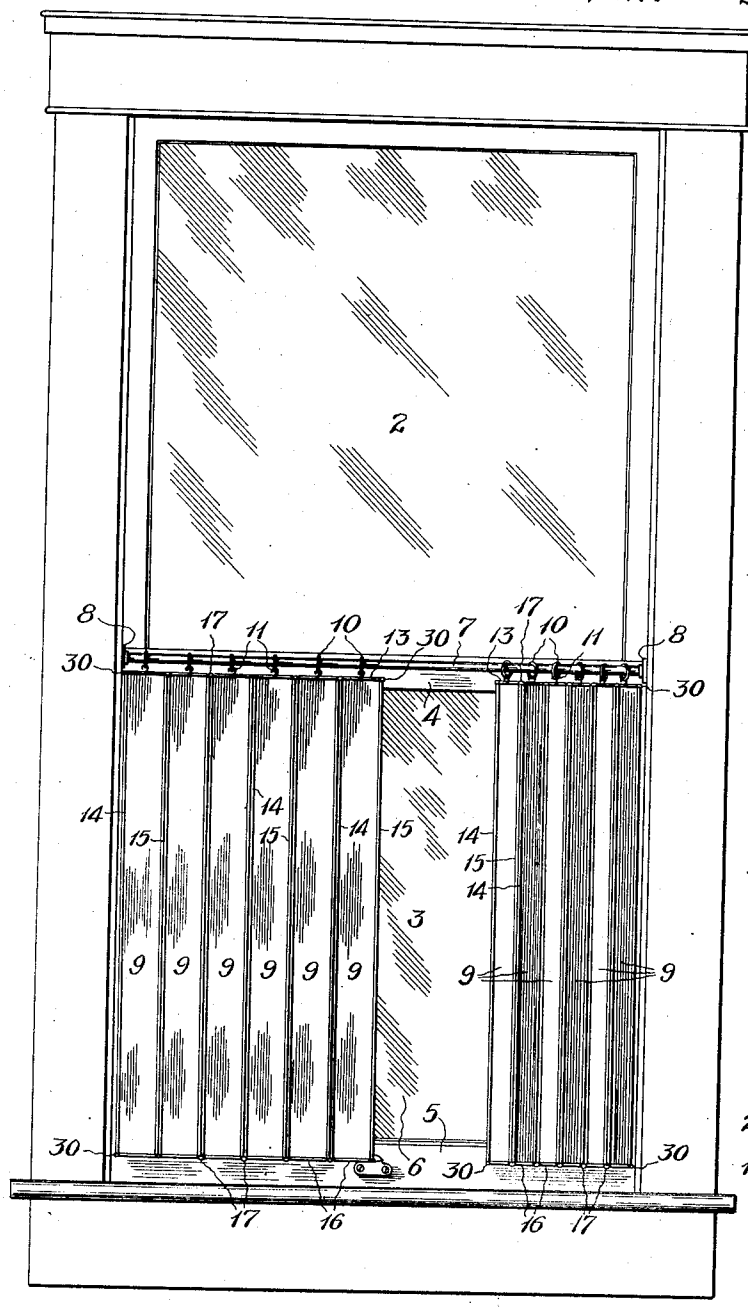


FIG. 1.

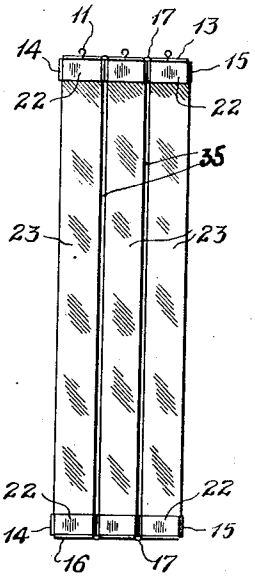


FIG. 2.

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Filed Feb. 26, 1934 2 Sheets-Sheet 2

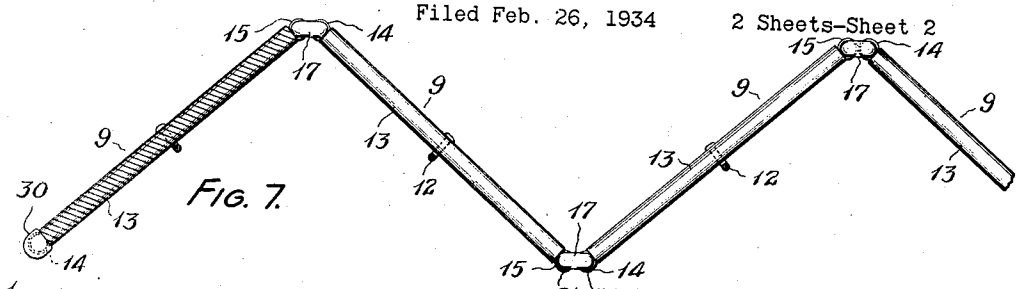


FIG. 7.

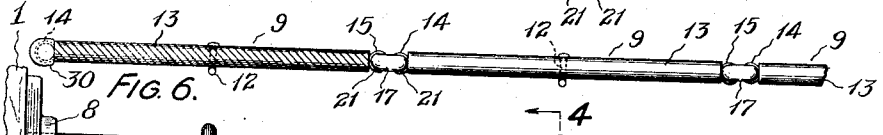


FIG. 6.

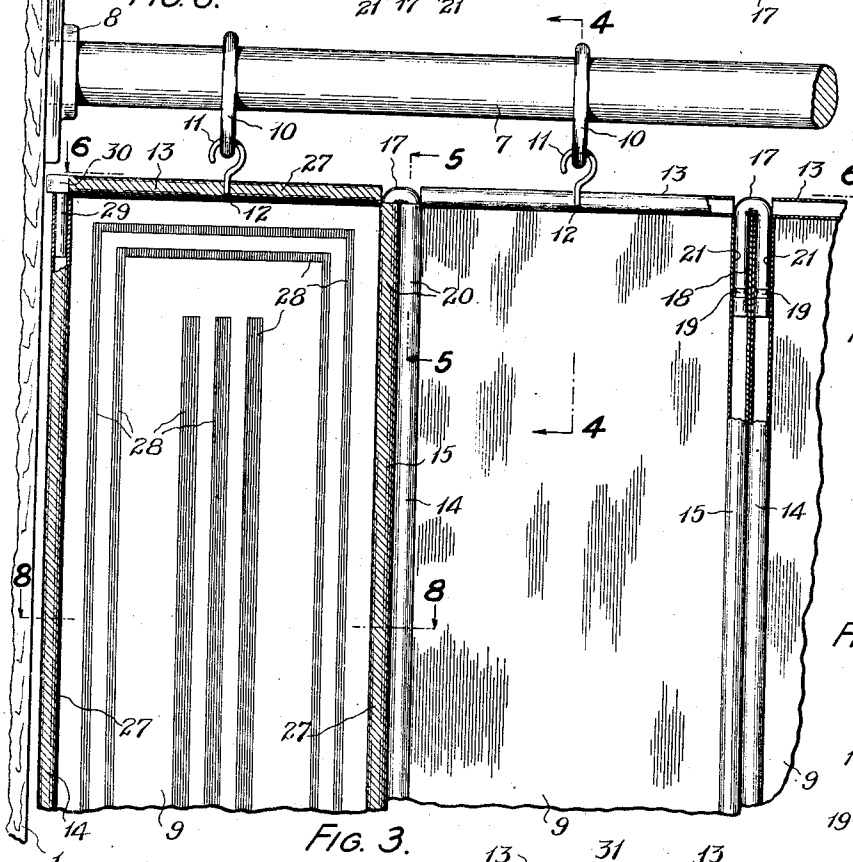


FIG. 3.

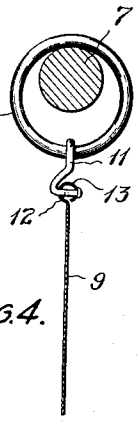


FIG. 4.

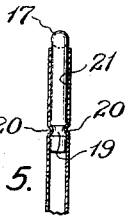


FIG. 5.

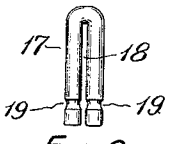


FIG. 9.

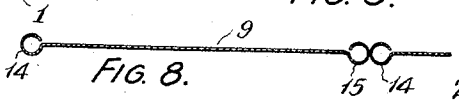


FIG. 8.

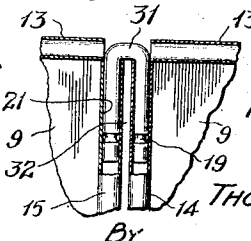


FIG. 11.

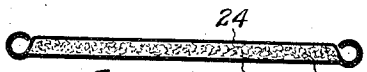


FIG. 10.

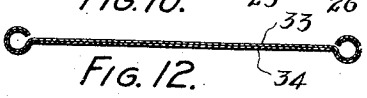


FIG. 12.

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UNITED STATES PATENT OFFICE

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WINDOW CURTAIN

Thomas F. Byron, Cleveland, Ohio

Application February 26, 1934, Serial No. 712,926

20 Claims. (Cl. 156—16)

My invention particularly relates to window curtains made of a plurality of depending relatively hinged stiff panels. I illustrate my invention by metal and glass panels but materials other than metal and glass, such as wood, rubber, etc. of suitable stiffness and rigidity may be used. I have devised a novel curtain of this character which can be economically manufactured, easily kept clean, and conveniently manipulated, and which is of pleasing appearance. The manipulation consists in folding up the relatively hinged panels crosswise so as to provide a clear opening throughout the height of the window or window sash, of any desired width from a minimum to a maximum of substantially the full width of the window. My improved curtain construction also makes possible the economical obtaining of any desired ornamental effects; as also, different color effects for the outside and the inside of the curtain to harmonize with the outside and inside environments.

The annexed drawings and the following description set forth in detail certain means embodying my invention, such disclosed means constituting, however, only a few of the various forms in which the principle of the invention may be embodied.

In said annexed drawings:

Figure 1 is an elevational view showing the inside of a window having upper and lower sashes, adjacent to the lower sash of which is applied a pair of my improved curtains each comprising a plurality of relatively hinged metal panels, one curtain being shown expanded to its full width covering one-half of the sash, and the other shown partially folded to provide a clear opening through the window throughout the height of the sash and for a portion of the width thereof;

Figure 2 is a fragmentary elevational view of a modified form of curtain having glass, celluloid, or other transparent or translucent material comprising the body thereof, the several panels of which are secured at their ends in relatively hinged metal holders;

Figure 3 is a fragmentary view, upon an enlarged scale, of a portion of the fully-expanded curtain shown in Figure 1, certain parts being shown in vertical section;

Figure 4 is a fragmentary vertical section, taken in the plane indicated by the line 4—4, Figure 3;

Figure 5 is a fragmentary vertical section, taken in the plane indicated by the line 5—5, Figure 3;

Figure 6 is a plan section, taken from the plane indicated by the line 6—6, Figure 3;

Figure 7 is a plan section of a portion of the curtain suggested in Figure 6, but showing the curtain portion in partially folded position;

Figure 8 is a horizontal section, taken in the plane indicated by the line 8—8, Figure 3;

Figure 9 is an elevation of a staple adapted to form the bearing or pintle portions of a hinge serving to pivotally connect the adjacent ends of adjacent curtain panels, the latter having peripheral beads adapted to be journalled or pivotally mounted at the top and bottom upon staples such as shown in this Figure 9;

Figure 10 is a view similar to Figure 8 but showing a modified form of curtain panel comprised of a pair of spaced metal body members with heat-insulating and/or sound-deadening material filling the space between the two body members;

Figure 11 is a view similar to a portion of Figure 3, showing a form of perforate curtain designed to furnish more ventilation than the substantially imperforate curtain shown in Figure 3; and

Figure 12 is a view similar to Figure 8 of a curtain comprised of panels made from two-ply material.

Referring to the annexed drawings in which the same parts are indicated by the same respective numbers in the several views, I show in Figure 1 a window 1 having an upper sash 2 and a lower sash 3, adjacent the latter of which one of my improved multiple-panel metal curtains is applied. The curtain which is comprised of a plurality of relatively hinged vertical panels 9 is shown for purposes of illustration as projecting slightly above the bottom of the upper rail 4 of the sash 3 and slightly below the top of the bottom rail 5 and extends, when fully expanded, across one-half of the lower sash 3, so as completely to cover one-half of the window glass 6. If desired, of course, the entire sash 3 or any portion thereof, or, in fact, the entire window 1 can be served by a single curtain. The several curtain panels 9 are dependingly supported by a transverse rod 7 rigidly mounted in the opposed side members of the window frame 1 by any suitable means such as the fixtures 8 secured to said side members of the window frame adjacently below the top of the upper rail 4.

Inasmuch as the several panels 9 are designed to be relatively hinged together in order to provide for the folding of the curtain to any desired extent up to the complete collapsing of the curtain so as to cause the panels to lie face to face flat against the side of the window frame, I support the several panels 9 from the supporting rod 7 by loosely fitting means such as enlarged rings 10, Figures 3 and 4, through which the rod 7 passes, these rings defining a circle materially greater in cross-section than the cross-sectional area of the rod 7. The rings 10 can adjust themselves angularly relatively to the rod 7, according to the amount which the curtain is folded, as illustrated by the right-hand curtain, Figure 1, which is shown in partly folded condition.

The panels 9 are suspended from the rings 10 by means of depending hooks whose eyes 11 are engaged by the rings 10 and whose stems 12 are bent at substantially right angles and secured in upwardly-extended beads 13 into which the upper edges of the respective panels 9 are formed, as clearly shown in Figure 4. The lower edges of the panels 9 are formed into downwardly-extended beads, designated "16".

In order to connect together the adjacent lateral edges of the panels 9 and yet provide for the easy relative pivotal movement of the adjacent panels for the purpose of folding the curtain, I provide the panels with laterally-extended side beads 14 and 15, respectively, the upper and lower parts of which serve as hinge elements 21 that freely turn upon the respective legs of a staple or U-shaped hinge-element 17, these legs serving as bearings or pintles and respectively fitting within the upper ends of the adjacent beads 14 and 15 and being separated by an opening 18, Figure 9, of a width twice the thickness of the panel material, Figure 3, so that the two panel thicknesses substantially fill the opening 18 between the legs of the hinge member 17, whereby to provide a substantially imperforate curtain. In order firmly to hold the staple hinge member 17 within the upper and lower ends of the beads 14 and 15, I form the exterior surfaces of the legs of the staples 17 with small grooved sections 19 within which I crimp corresponding parts 20 of the beads 14 and 15, as clearly shown in Figures 5 and 9. The beads 13, 14, 15 and 16 are tubular, in the form of curtain shown, and are preferably rolled out of the panel material.

The pivotal action between the various panels 9, when folding the curtain, is illustrated in Figure 7 wherein a part of a curtain is shown substantially half folded, and it will be noted that the journalled parts 21 of the beads 14 and 15 have turned upon the bearing legs of the hinge element 17, the latter having maintained substantially its original position, and this action can be continued, if it is so desired, until the curtain is disposed flat against the window frame with the adjacent panels face to face and spaced a distance apart substantially equal to the diameter of one of the beads 14 and 15 and slightly greater than the thickness of one of the legs of the staple 17. The hinge connection at the bottom between adjacent panels 9 is of the same construction as that described for the top connection. Within the top and bottom of the end beads 14 and 15 of a curtain I fit stoppers 29 having rubber tips 30 which lie between the window frame and the adjacent end of the top bead 13.

In Figure 10 I show a modified panel construction comprised of two superposed spaced sheet metal plates 24 and 25, having beads similar to those herein described for the panels 9, the bead of one sheet being folded within the bead of the other sheet, and the space between the sheets 24 and 25 being filled with heat-insulating and/or sound-deadening material 26, as clearly shown in Figure 10.

In Figure 2 I have shown a modified form of curtain comprised of panels whose body portions 23 are made of glass, celluloid, or other transparent or translucent material, and which are cemented or otherwise suitably secured at their ends in metallic end pieces 22. These end pieces 22 are identical in construction with the ends of the structure shown in Figure 10, except that each end piece 22 is of a depth sufficient only to securely hold an end of the glass body 23, which glass body end fills the space in the end piece, instead of filling material such as shown in Figure 10. The curtain construction of Figure 2 is not provided with side beads except on the end pieces 22, so there are formed vertical air circulation openings 35 between adjacent panel bodies 23 even when the curtain is fully expanded. The curtain construction shown in Figure 2 serves to furnish subdued mellow light and some air circulation at all times, and can be collapsed or folded, as desired, in the same manner as can be done with the form of curtain shown in Figure 1, to provide additional light, air and ventilation.

In Figure 11 I show a form of curtain in which the opening 32 between the legs of the staple hinge 31 is materially wider than the thickness of the material of the two beads 14 and 15, so as to provide vertical air-circulation openings between adjacent panels 9 even when the curtain is fully expanded.

In Figure 12 the panels 9 of the curtain are made of two metal sheets 33 and 34 disposed closely together face to face and each having extended marginal beads, the beads of one sheet being rolled within the beads of the other sheet.

In addition to the economy with which my improved curtain can be made, and in addition to its permanency and ease of operation, and to the easy manner by which it can be dusted or washed in situ, I direct particular attention to the pleasing ornamental effects which can be obtained. For instance, the respective inside and outside of the curtain may be finished in different colors to conform in the one case with the decoration inside the room and in the other case to conform with the outside finish of the house. Also it is possible and of easy accomplishment to color the entire beads 13, 14, 15, and 16 the same as that of the outside of the curtain thus to provide an inside trim 27 of a color differing from that of the color of the main inside body of the curtain, as clearly shown in Figure 3. Also, as is well known to those versed in the sheet metal art, the metal sheets from which the panels 9 are formed can readily and economically be provided by lithographic processes with designs of any desired character. I stamp the separate panels from such lithographed sheets, thus making available a great variety of ornamental effects for my improved multi-panel metal curtain, such as illustrated by one such design 28 upon the left-hand panel shown in Figure 3.

What I claim is:

1. A hinge for relatively pivoted curtain panels comprising laterally-opposed tubular members, and a U-shaped bearing whose respective legs are disposed within said members with a turning fit.

2. A hinge for relatively pivoted curtain panels comprising laterally-opposed tubular members, and a U-shaped bearing whose respective legs are disposed within said members with a turning fit, and means for preventing relative axial movement between said members and said bearing.

3. A hinge for relatively pivoted curtain panels comprising laterally-opposed tubular members having their adjacent outer surfaces in contact, and a U-shaped bearing whose respective legs are disposed within said members with a turning fit.

4. A window curtain comprising a plurality of rigid panels adapted to depend from a fixed sup-

porting rod in opposed edgewise alignment, each panel being angularly adjustable relatively to the rod, adjacent panel edges having opposed extended tubular beads, hinge elements near the tops and bottoms of adjacent panel edges having bearing portions upon which the panel beads are pivoted, the outer edges of the end panels also having extended tubular beads, and stoppers in the last-named beads having extended resilient enlarged heads.

5. A panel member for multi-panel collapsible curtains comprising a rigid sheet having rolled edges forming tubular beads serving as pintle receiving members of hinges by which the panel may be turned upon its edges as axes.

6. A panel member for multi-panel collapsible curtains comprising a pair of superposed sheets having edges rolled one within the other to form tubular peripheral beads serving as elements of hinges by which the panel may be turned upon its edges as axes.

7. A panel member for multi-panel collapsible curtains comprising a pair of superposed spaced sheets having edges rolled one within the other to form tubular peripheral beads serving as elements of hinges by which the panel may be turned upon its edges as axes, and insulating material filling the space between said sheets.

8. A panel member for multi-panel collapsible curtains comprising a glass sheet, end members within which the respective ends of said sheet are contained, said end members comprising superposed spaced plates each having a lateral edge rolled one within the other so as to form beads adapted to serve as pintle-receiving elements by which the panel may be turned upon its edges as axes.

9. A hinge for relatively pivoted curtain panels comprising laterally-opposed tubular members having their adjacent outer surfaces spaced from each other, and a U-shaped bearing whose respective legs are disposed within said tubular members with a turning fit.

10. A collapsible curtain comprising a plurality of pivotally connected panels, each panel including a rigid sheet having rolled edges forming tubular beads, and bearing members having pintle portions disposed in adjacent beads of adjacent panels with a turning fit.

11. A curtain according to claim 10 and in which the adjacent beads of adjacent panels are in contact.

12. A curtain according to claim 10 and in which the adjacent beads of adjacent panels are spaced apart.

13. A collapsible curtain comprising a plurality of hingedly connected panels, each panel including parallel pintle-receiving hinge elements formed integrally with the panel at two sides thereof, and at least some of the panels having means between their parallel hinge elements for supporting the curtain.

14. A collapsible curtain comprising a plurality of panels, each panel having a plurality of parallel hinge elements and the panels being formed and arranged so that adjacent panels have adjacent parallel hinge elements, and U-shaped hinge elements pivotally connected with the adjacent parallel hinge elements of adjacent panels, whereby the panels are hingedly connected together.

15. A panel member for multi-panel collapsible curtains comprising a sheet having integrally formed pintle-receiving hinge elements at two of its edges and provided at a third edge with panel supporting means adapted to permit angular movement of the panel relative to a support for a curtain.

16. A window curtain comprising a plurality of panels adapted to be carried dependingly from a support and means for swingably connecting the panels together so as to provide such angular adjustment of the panels relative to each other and relative to said support that the curtain is collapsible to a folded position of the panels and is expansible to an extended aligned position of the panels, said means including readily connectible elements adapted to permit ready connection of the panels while the curtain is carried by the support.

17. A window curtain comprising a plurality of panels adapted to be carried dependingly from a support and hinges connecting the panels together so as to provide such angular adjustment of the panels relative to each other and relative to said support that the curtain is collapsible to a folded position of the panels and is expansible to an extended aligned position of the panels, adjacent panel edges being formed with hinge elements, and said hinges including other hinge elements readily connectible to the first-mentioned hinge elements while the curtain is carried by the support.

18. A window curtain comprising a plurality of panels adapted to be supported dependingly from a support and hinges connecting the panels together so as to provide such angular adjustment of the panels relative to each other and relative to said support that the curtain is collapsible to a folded position of the panels and is expansible to an extended aligned position of the panels, adjacent panel edges having extended beads which constitute elements of said hinges, and said beads of adjacent panel edges extending substantially the full length of the edges and being substantially in contact to form a substantially imperforate curtain structure of the plurality of panels.

19. In a window curtain adapted to be supported by rings loosely mounted upon a rod, a plurality of panels having beads at their lateral edges, and bearing members upon which said beads are journalled so as to provide such angular adjustment of the panels relative to each other that the curtain is collapsible to a folded position of the panels and is expansible to an extended aligned position of the panels, the several panels being provided with hooks adapted to be supported by the several rings.

20. In a window curtain adapted to be carried on a support, a plurality of panels, means providing such angular adjustment of the panels relative to one another that the curtain is collapsible to a folded position of the panels and is expansible to an extended substantially aligned position of the panels, said means being adapted to provide for ready connection of the panels while the curtain is carried by the support, and means for supporting the panels for ready movement along said support.

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