Aug. 29, 1939. J. CARRERAS ET AL 2,170,938

VENETIAN BLIND

Filed May 3, 1938

Fig. 1.

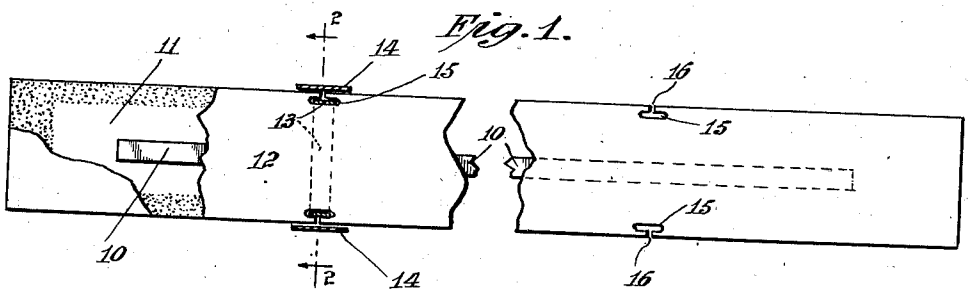


Fig. 2.

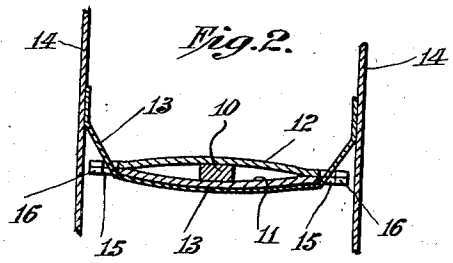


Fig. 3.

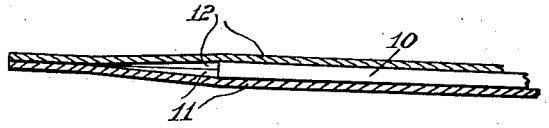


Fig. 4.

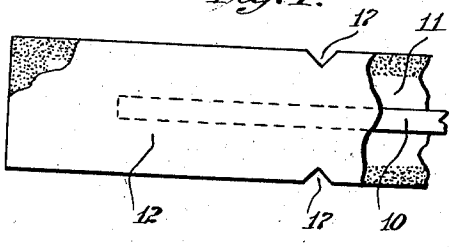


Fig. 5.

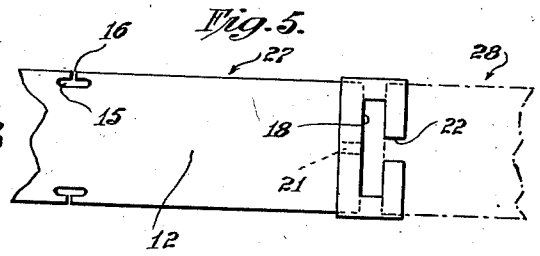


Fig. 6.

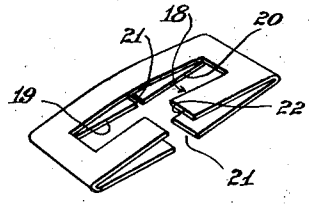
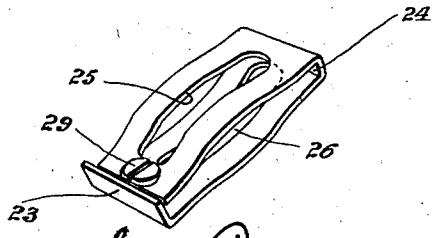


Fig. 7.



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UNITED STATES PATENT OFFICE

2,170,938

VENETIAN BLIND

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Application May 3, 1938, Serial No. 205,668

4 Claims. (Cl. 156—17)

The invention relates to Venetian blinds, and more particularly to the construction of louvers especially adapted for use in the type of Venetian blinds disclosed in our Letters Patent No. 2,116,356, granted May 3, 1938, of which this application is a continuation in part.

While the louvers for Venetian blinds have been made of various materials and of different constructions, those most commonly used are made of wooden slats having, toward the opposite ends thereof, transversely extending elongated slots for the passage of the cords for raising and lowering the blinds. Such louvers are materially weakened at the point of the location of such slots, and while, when using other materials, various devices have been used to reinforce the material of the louvers adjacent the slots, the presence of such slots is necessary.

A louver embodying the invention is such as to permit not only the inexpensive production of a blind, but to enable the louvers to be produced with a wide range of decorative effects and color schemes. In the louver, we use lightweight, waterproof material which may be readily decorated by printing or other methods, if desired.

These louvers are made of two strips of inherently flexible material, provided with a longitudinally extending reinforcing strip extending from adjacent one end of the louver to adjacent the other end thereof, this strip being of a thickness to impart a transverse curvature to the louver from the longitudinal center thereof to the opposite edges, thus not only securing an arched or convex surface to each side of the louver, but securing the effect of a partially flattened tube, so that the material of the facing strips will be so formed as to supplement the reinforcing spacing strip in imparting the desired rigidity to the entire louver structure. The opposite edges of the facing strips, and the opposite ends thereof beyond the longitudinally extending reinforcing strip, are permanently bonded together.

In a louver embodying the invention, there are no transversely extending slots for the passage of the lifting cords, the use of such slots being prohibited by reason of the presence of the longitudinally extending reinforcing strip.

In a louver embodying the invention, the possibility of bending of the louvers, either longitudinally or transversely thereof, is reduced to a minimum, and the structure throughout is extremely light, is composed of inexpensive materials, and may be rapidly produced by means of automatic or semi-automatic machinery assembling the three parts entering into the louver.

In a louver for use with the type of blind shown in the aforesaid application, notches are formed in opposite edges of the louver for the reception of the stays of the ladder tapes used for tilting the louvers or for raising and lowering them, these notches being formed in the edge portion of the louvers in which the opposite facing strips are firmly bonded together. These notches may take a variety of different forms, two such forms being shown in the accompanying drawing.

While louvers may be made of standard lengths, it is desirable to provide means whereby a plurality of shorter sections of louvers may be combined to adapt the louvers for use with unusually wide windows, or windows not conforming to the standard range of widths.

The invention consists primarily in a Venetian blind embodying a louver composed of a reinforcing central slat having inherent rigidity, and facing strips of flexible material upon opposite sides, and extending beyond the ends, of said slat, the edges of said facing strips, upon opposite sides and at the ends of said slat, being cemented together, whereby said facing strips may be decorated before their assembly with said reinforcing slat; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawing,

Fig. 1 is a plan view of a louver embodying the invention, partly broken away, a ladder tape and its cross stay being shown toward one side of this view;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary portion of a longitudinal section at one end of a louver;

Fig. 4 is a plan view of a louver adjacent one end thereof and partly broken away, showing the use of edge slots instead of T-slots as shown in Fig. 1;

Fig. 5 is a view showing the manner of coupling two adjacent louver sections together for the purpose of producing a louver of odd length;

Fig. 6 is a perspective view of the coupling mechanism used in Fig. 5; and

Fig. 7 is a view of a modified form of coupling mechanism.

Like numerals refer to like parts throughout the several views.

There is available on the open market at the

present time, tough, light cardboard or heavy paper having one surface thereof coated with a water resistant material. This paper is produced in various colors, and the finished surface thereof may have various designs impressed thereon, either by typographical or lithographic printing. This cardboard or paper lacks the inherent thickness or rigidity to make it suitable for use in producing louvers for the blind of the invention. It cannot be readily applied to thicker stock without leaving unsightly edges on the louver. Its use in the production of louvers, however, is highly desirable because its use affords an unlimited range of color schemes and decorative designs which may be incorporated in the louver.

In order to utilize this material in the production of louvers, we construct the louvers with a reinforcing core **10** consisting of a wooden slat having elongated strips of paper **11** and **12** upon opposite sides thereof, the portions of the paper along opposite edges and at both ends of the louver being brought together and cemented to each other. The thickness of the slat **10** provides a central bulge lengthwise of the louver, as shown more particularly in Fig. 2 of the drawing, so as to get the arched effect above referred to, and at the same time makes the louver sufficiently rigid to ensure its proper retention by the stays **13** connecting the tapes of a ladder tape **14** and permit a tilting action by means of the tapes and said stays without possibility of deformation of the louvers. The wooden slat **10** extends longitudinally of the louver, substantially centrally of the width thereof, and is shorter in length than the louvers, as shown in Figs. 1 and 3, so that the side edges and the end portions of the paper strips may be brought together and cemented at the ends, as described.

In the opposite edges of the paper strips, in the portions thereof which are cemented together, are openings for engaging the stays of a ladder tape. These openings are located toward opposite ends of the louvers where the ladder tapes will be located, and transversely opposite openings are provided to engage the same stay adjacent the opposite tapes of the ladder. By making these openings in the form of a T-slot having a wide head **15** and a narrow stem **16** opening outwardly of the edge of the louver, the ladder stays **13** will not only be confined to avoid possible displacement thereof longitudinally of the louvers, but the stays, in their entirety, whether in the form of a plurality of lengths of yarn or a short strip of woven yarn, may pass from the tapes downwardly through both edge openings and beneath the louver, thus forming a strong support for the louver, while, at the same time, permitting the opposite edges thereof to be moved in opposite directions when the ladder tape is actuated. If desired, these openings may be formed, as shown in Fig. 4, as simple V-notches **17** in the opposite edges of the louver, but when such notches are used, the ladder stays must be in the form of strands of yarn, some of which will pass over, and others of which will pass under, the louver.

It is desirable, from a manufacturing standpoint, to make louvers of certain standard lengths, so that blinds embodying same may be made to conform to standard widths of windows.

The louvers embodying the invention may be made from twenty-six to thirty-six inches in length, or slightly longer, without sacrificing the rigidity of the louver structure. Standard lengths, varying two inches in width from each other within the range stated, will permit the production of blinds for a high percentage of ordinary windows. It is impossible with a louver embodying the invention, to reduce its length by cutting off its ends and re-touching the finish.

To adapt the louver of the invention to extra large windows or windows of odd dimensions, we provide a coupling member consisting of a sheet metal fitting, shown in Figs. 5 and 6, formed of strip metal having a central slot **18** and end slots **19** and **20**. The opposite ends of this strip are folded inwardly in the form of a flattened tube, the top and the bottom of the fitting being transversely arched. The adjacent ends of the inwardly turned end portions are spaced apart as shown at **21**, and the material of the strip, opposite one slot **21**, is slotted as at **22** so as to permit a lift cord to be positioned within the slot **18**, if it be desired to use lift cords passing through the louver instead of ladder tapes for raising and lowering the blind.

In Fig. 7, a coupling fitting of different construction, but used for the same purpose, is shown. This fitting is formed of strip metal having one end **23** turned at substantially right angles to the plane of the strip. The strip is folded upon itself, as shown at **24**. The top and the bottom of the fitting is arched as shown, the curvature substantially conforming to that of the top and the bottom of the louver. Alined openings, for the passage of a lift cord into the openings **18**, are provided in the top and the bottom reaches of the fitting, as shown at **25** and **26**.

While the form of coupling shown in Fig. 6 is secured to the end of a louver section by merely pressing the material of the fitting against the adjacent louver portion by forcibly closing the fitting by hand or by means of a hand tool, the coupling shown in Fig. 7 is provided with a clamp screw **29** screw-threaded in the top or the bottom of the fitting and having an enlarged head engaging the bottom or the top of said fitting. This clamp screw is positioned adjacent the free ends of the folded strip.

In both forms of coupling shown, the fitting is clamped upon the ends of adjacent louver sections, with the ends of the sections spaced apart to provide clearance for the run of a lift cord through the openings in the fitting.

The lift cord, with the form of fitting shown in Fig. 6, may be positioned in the slot **18** by passing it through the edge openings **21**. In Fig. 6 the end of the lift cord must be passed vertically through the transverse openings **25** and **26**.

The fitting shown in Fig. 6 is of thin metal stock, adapting it for use with louvers of short lengths, while the fitting shown in Fig. 7 is made of heavier metal stock, adapting it for use with longer louvers.

When using couplings in the production of louvers made up of a plurality of short sections, it is merely necessary to cut both ends from one louver constructed as shown in Fig. 1, to form a middle section **27** of the louver, and cut another louver to form two end sections **28** of lengths, which with the middle section and two couplings, will form a single louver of the desired length. In this manner, the coupling will engage each louver section at its thickest part, and the reinforcing strip extending longitudinally and centrally of each louver section will co-act with the fitting in securing a finer connection between the sections. Furthermore, the contour of the built-up louver will be, except for

the presence of the fittings, the same throughout as a louver made in a single section.

The finish of the fitting must be such as to avoid rusting and unsightliness.

In the manufacture of louvers embodying the invention, the central, longitudinally extending reinforcing strip 10 is laid upon a strip of facing material 11 of the necessary greater length to provide the cemented end portions of the louver. The opposite edges and ends of the strip 11 have a cement coating, but the arching of the opposite facing strips 11 and 12 in the completed louver prevents displacement of the reinforcing strip 10 without bonding this strip to ether facing strip. The upper facing strip is then laid upon the reinforcing strip 10 and the facing strip 11, and the side edges and ends of the two facing strips are brought together in alinement, one with the other. This alining of the side and end edges, with two facing strips of the same dimensions, imparts the desired lateral and end arching effect in the louver.

While we have referred to a reinforcing strip of wood and to paper facing strips, it is obvious that other materials having the desired rigidity, as to the former, and flexibility as to the latter, may be used. When paper is used in the facing strips, the reinforcing strip 10 should extend across the grain of the paper, so that in arching the material and while the louver is in use, there will be no tendency towards the formation of cracks in the facing strips. The presence of the strip 10 and the cemented two ply edges and ends of the facing prevents the formation of transverse cracks during the assembly of the parts of the louver.

In actual practice, we have had very satisfactory results, in louvers about thirty inches long and two inches wide, with a reinforcing strip 10 of wood, square in cross section and having a dimension of from one-eighth to three-sixteenths of an inch, and with paper of from one-sixty-fourth to one-thirty-second of an inch in thickness. With this construction, the maximum thickness of the louver, along its longitudinal center, is less than one-quarter of an inch, and the opposite edges and ends have a maximum thickness of one-sixteenth of an inch.

By using light cardboard or heavy paper reinforced by a slat 10, it is possible to produce the opposite faces of each louver of different colors if desired, or to impress upon sheets of paper, complete or partial designs, making the louvers attractive when in the fully closed position, and if desired, permit the building up of a complete design, different parts of which are carried by different louvers. The absence of any openings through the louvers for the passage of the lift cords makes the use of a louver of the type above referred to possible.

Aside from the locating of the slat 10 and the cementing of the edges of the facing strips, no finishing work is required upon the louvers, such as painting or enamelling, commonly resorted to in other types of Venetian blinds. To protect the exposed edges of the facing strips and make them moistureproof, a thin coating of shellac or other similar material may be applied thereto as the final step in their production.

It is not our intention to limit the invention to a louver having the particular dimensions, or formed of the particular materials, herein specified, since it is obvious that such may be varied without departing from the spirit and scope of the invention. The essential characteristics of such louvers are the opposite facing strips of inherently flexible material which are transversely arched and stiffened by a narrow reinforcing strip extending along the longitudinal center of, and confined between, said strips, and of a thickness to secure a transversely arched or flattened tube-like form in the louver when the opposite edges of the facing strips are cemented together, as described.

Having described the invention, what we claim as new and desire to have protected by Letters Patent, is:

1. In a Venetian blind, a louver composed of a reinforcing central slat having inherent rigidity, and facing strips of flexible material upon opposite sides, and extending beyond the ends, of said slat, the edges of said facing strips, upon opposite sides and at the ends of said slat, being cemented together, whereby said facing strips may be decorated before their assembly with said reinforcing slat.

2. In a Venetian blind, a louver composed of a reinforcing central wooden slat, and facing strips of decorated paper stock upon opposite sides of, and extending beyond, said slat, the edges of said facing strips being cemented upon opposite sides of, and at the opposite ends of said slat, said slat being of materially less width than said strips, whereby said louver bulges outwardly centrally thereof and has narrow edges entirely about same.

3. In a Venetian blind, a louver composed of a reinforcing central wooden slat, and facing strips of decorated paper stock upon opposite sides of, and extending beyond, said slat, the edges of said facing strips being cemented upon opposite sides, and at the opposite ends, of said slat, said slat being of materially less width than said strips, whereby said louver bulges outwardly centrally thereof and has narrow edges entirely about same, said facing strips at the opposite edges and adjacent the opposite ends of the louver having oppositely disposed openings therein by means of which longitudinal shifting of the louver in relation to ladder tapes is prevented.

4. In a Venetian blind, a louver composed of a reinforcing central slat having inherent rigidity, and facing strips of flexible material upon opposite sides, and extending beyond the ends, of said slat, the edges of said facing strips, upon opposite sides and at the ends of said slat, being cemented together, whereby said facing strips may be decorated before their assembly with said reinforcing slat, said slat being of less width than said facing strips, and of a thickness to cause said strips to be transversely arched, and said facing strips having a plurality of oppositely disposed openings in the form of T-slots having a wide head and a narrow stem opening outwardly of the edge of the louver for receiving and retaining the stays of ladder tapes.

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