Feb. 11, 1941. B. H. HEPWORTH 2,231,447

VENETIAN BLIND

Filed Nov. 13, 1939

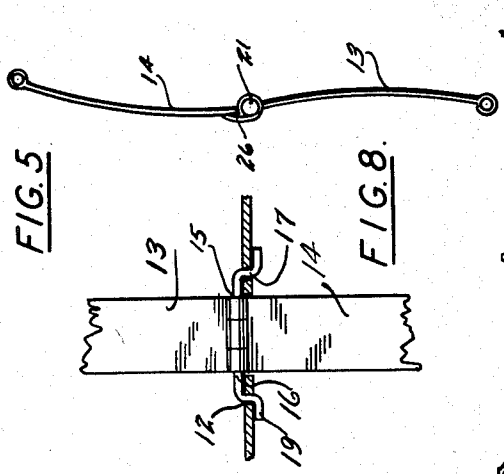


FIG. 5

FIG. 8.

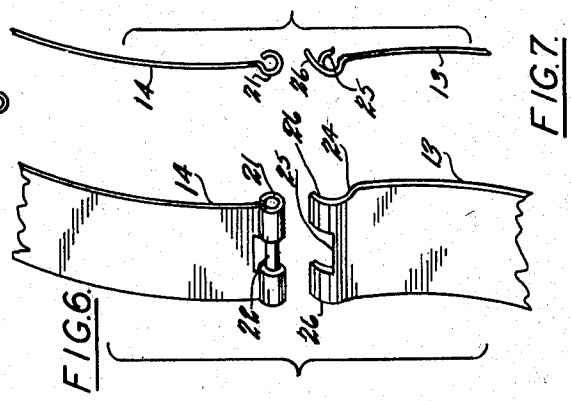


FIG. 6

FIG. 7.

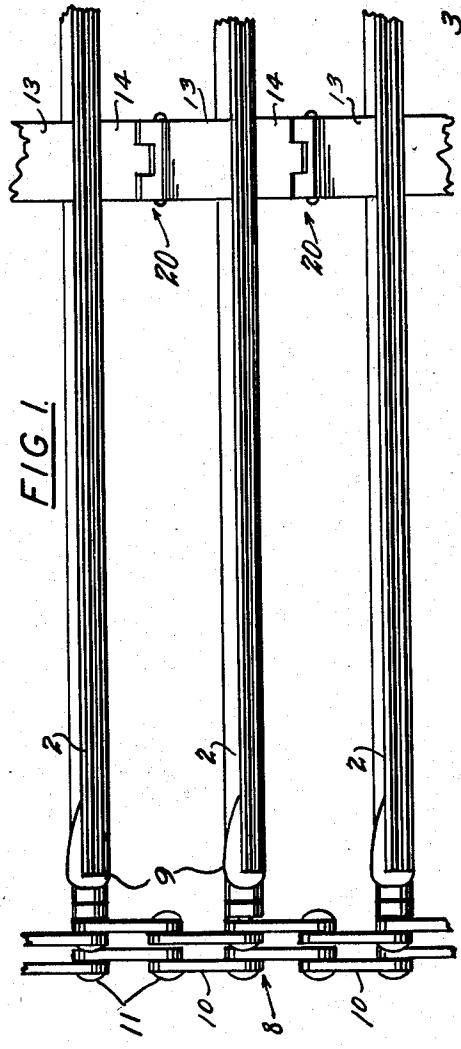


FIG. 1.

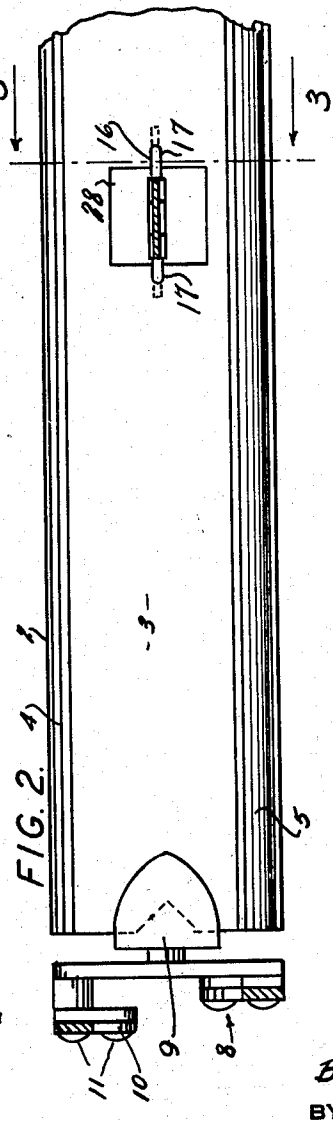


FIG. 2.

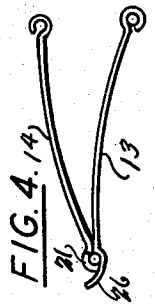


FIG. 4.

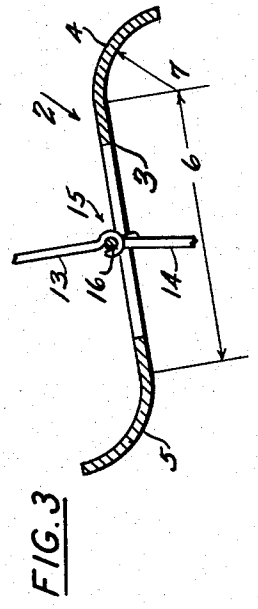


FIG. 3

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2,231,447

VENETIAN BLIND

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Application November 13, 1939, Serial No. 304,181

4 Claims. (Cl. 156—17)

This application relates generally to Venetian blinds composed of slats made of metal or composition suspended and controlled by metal linkage.

The invention has for its objects:

First, to provide a Venetian blind composed of slats, as above described, with intermediate end linkage so that the weight of the blind is not entirely supported at the ends;

Second, to provide a Venetian blind, as above described, provided with intermediate linkage; said linkage being attached to the blind slats and constructed so that it will permit all movements, heretofore desired of Venetian blind slats, such as variation of an angle and variation of spacing, said linkage being adapted to be made entirely of metal; and

A third object is to provide an intermediate linkage that may be readily attached to metallic or composition Venetian blind slats that will act as a suspension when the blinds are fully extended independently of the end supporting and turning devices.

I attain the foregoing objects by means of the devices and construction illustrated in the accompanying drawing, in which—

Figure 1 is an elevational view of several slats of a portion of Venetian blind including my improvements; a portion of one end linkage being shown together with the intermediately positioned linkage;

Figure 2 is a plan view of the same;

Figure 3 is a section of one of the slats taken substantially on line 3—3, Figure 2, and drawn on an enlarged scale;

Figure 4 is an end view of one of the intermediate links shown in closed position and drawn on a somewhat enlarged scale;

Figure 5 is a similar view of one of said links in fully extended position;

Figure 6 is a perspective view, of the detachable hinge coupling of one of said intermediate links showing the opening stops;

Figure 7, an elevational end view thereof;

Figure 8 is a front elevational view of the hinge joint of a pair of intermediate links showing a fragment of a slat in section and means for attachment of the hinge to the slat.

Similar numerals refer to similar parts in all of the views.

The slats 2 are moulded, formed, drawn, or otherwise shaped of comparatively thin material. As shown in Figure 3, the slat is formed with a flat central portion 3, a downwardly curved right hand edge 4, and an upwardly curved left hand edge 5. The width of the flat area, as indicated by numeral 6, is variable and is governed by the stiffness of the material and generally by the size of the entire blind, while the radius 7 of the curved bends is sufficient, considering the width of the flat portion and the nature and thickness of the slat material to give the required longitudinal stiffness to the slats.

To form a blind, a desired number of these slats 2 (Figure 1) are suspended at each end by linkage 8, Clips 9, moulded of pot metal, or the like, are slipped onto each end of each slat. These are provided with a straight slot to receive the slat and are sized to extend only the width of the flat central portion. Centering and lateral positioning is provided by a B notch cut in the ends of the slats. Links 10 are made of metal stampings, stops being provided to prevent dead centering, and shouldered rivets 11 constitute bearings and pintles.

However, to attain the maximum benefit of this type of slat construction, particularly in a long span in conjunction with windows having a wide opening, I have found that end linkage, while it is sufficient for all ordinary purposes to lift and regulate the spacing between slats, and to turn them to adjust their angle relative to the window opening, is nevertheless not sufficient to prevent a slight central sag where there are long spans, and wide openings to be covered by the blind. In order to make it unnecessary to use slats of greater thickness of material, I provide a mechanical support intermediate the end linkage.

This intermediate support consists of a system of linkage composed entirely of metal and consisting of pairs of links 20 joined by bearings, the pintles of which form a means of attachment to the body of each slat at any intermediate position desired.

These links are composed of an upper part 13, a lower part 14, joined together by a hinge joint 15, and held by a pintle 16, in the manner of an ordinary hinge. These pintles are made of steel wire and have a downward bend at each end beyond the bearing portion. These downward bends 17 extend through holes 12 on each side of a rectangular opening 18, cut in each of the slats 2. Just beyond this downward bend, this wire is again bent outwardly to form a lock 19 to hold the pintle in place. The axis of each pintle is aligned with the axes of the supporting clips of each slat.

The lower link 14 of each of these pairs of links terminates in a portion of a hinge joint, having the bearings 21 closed around a pintle 22. The

central portion between each end bearing is left open to receive the upper end 24 of the next lowermost pair of links. This joint portion consists of a three-quarters closed bearing 25, opened sufficiently so that it may be hooked upon the central portion of pintle 22. On either side of this bearing are two fingers 26 forming spring stops adapted to engage that part of the adjoining link 14 just above the bearing 21. These stops prevent the links from opening beyond dead center, as shown particularly in Figure 5. It is not intended that there be a dead or fixed stop, but as shown in this figure, when fully extended the link bearings may be substantially aligned, but the resilience of these fingers forces the joint off dead center as soon as the weight of the slat is lessened, as when the blind is drawn up. Each link is somewhat arched to conform comparatively to that portion of the section of the slat to which it may be adjacent when in folded position.

When in folded position the lower half of one set of links and the upper half of the next succeeding set may be folded as shown in Figure 4. In this position, the semi-closed bearing 25 may be unhooked from pintle 22, as will be understood by reference to Figure 7. When fully extended, as shown in Figure 5, the links constitute a definite support for such mid portions of slats 2 as those upon which they may be affixed.

These intermediate links 20 are thus joined to form a continuous chain or linkage between the slats 2. The holes 28, cut in each slat, are sized to permit free turning of the link ends without binding or restriction. When the slats are turned to form a closure, the link, themselves, close these openings in the slats.

When installed, movement of the slats is in no way restricted. Since the pintles 16 of the link hinges are aligned with the axes of the end supports, all desired turning movement of the slats is permitted. When the slats are in intermediate, angular and drawn positions, these links do not afford vertical support, but, in such positions none is needed. When, however, the slats are turned to a position approximating the horizontal and the blind is in extended or open position, they afford all the support needed to keep long slats from sagging. Obviously, where extremely long slats are used, any number of chains of these intermediate links may be installed.

Having now fully described my invention and explained its uses, I realize that to those familiar with the art, several alternative structures and modifications may readily suggest themselves. All of these, however, might well remain within the spirit of the invention and, therefore, I wish to be limited only by the following claims.

I claim:

1. In a Venetian blind, intermediate supporting linkage comprising pairs of links set into openings in each of the blind slats supported on pintles axially aligned with the longitudinal turning axis of each blind slat, said links having detachable hook joints for connecting the lower link of one pair with the upper link of the pair next below it to form a continuous linkage extending from the topmost supporting bar to the lowermost slat.

2. In a Venetian blind, having a plurality of slats intermediate supporting linkage composed of pairs of links, hingedly supported within openings in said slats on pintles aligned with the longitudinal turning axis of each of said slats, said links being provided with detachable hinge joints at their outer ends to connect with similar pairs of links similarly positioned in adjacent slats.

3. In a Venetian blind, having a plurality of slats intermediate supporting linkage composed of pairs of links, hingedly supported within openings in said slats on pintles aligned with the longitudinal turning axis of each of said slats, said links being provided with detachable hinge joints at their outer ends to connect with similar pairs of links similarly positioned in adjacent slats, and resilient fingers on one of said links cooperative with said detachable hinge joint forming a resilient stop to prevent said joint opening beyond a predetermined degree.

4. In a Venetian blind, an intermediate supporting link chain composed of hinged links, one hinged joint being aligned with the turning axis of the blind slat and mounted thereon, the other joint opening between the adjacent blinds.

BERT H. HEPWORTH.