Aug. 29, 1950 F. W. BOPP ET AL 2,520,272

VERTICAL BLIND

Filed Feb. 12, 1945 2 Sheets-Sheet 1

Fig. 1

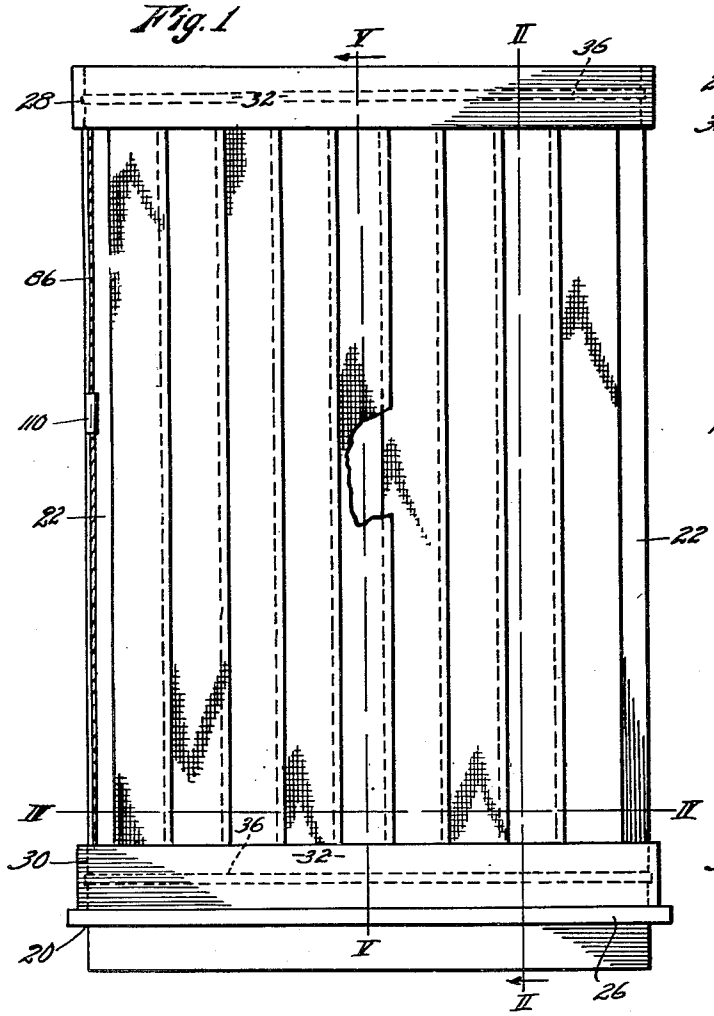
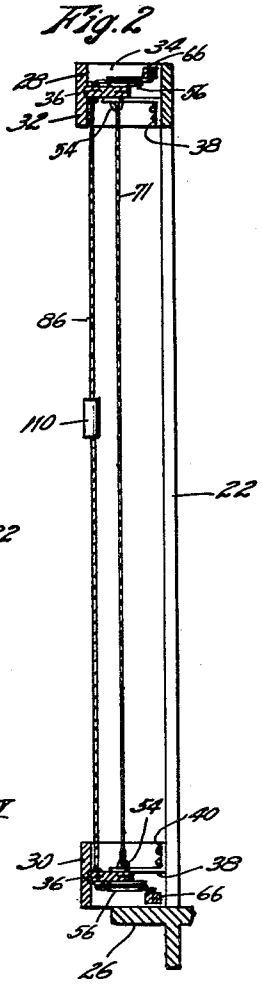


Fig. 2



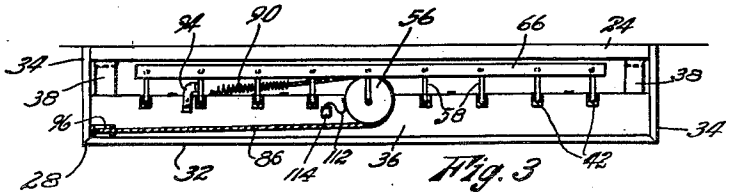


Fig. 3

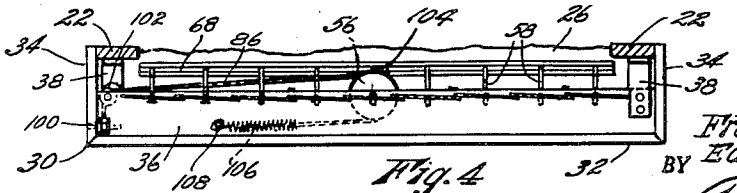


Fig. 4

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Fig. 5

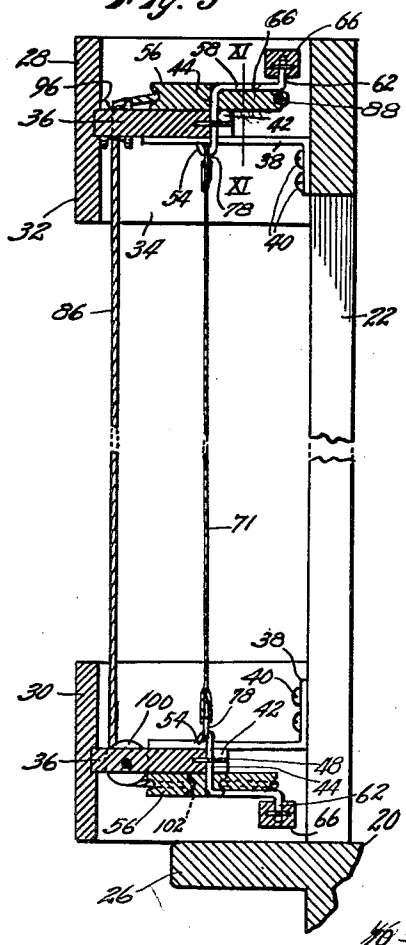


Fig. 6

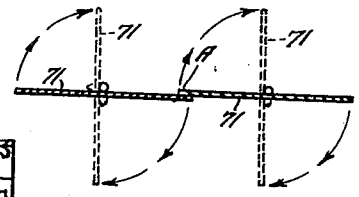


Fig. 13

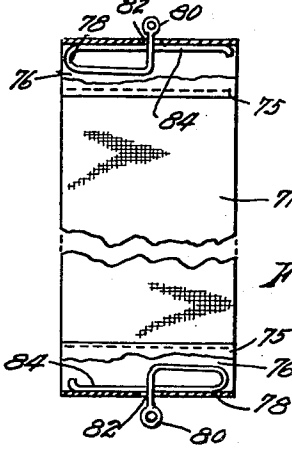


Fig. 7

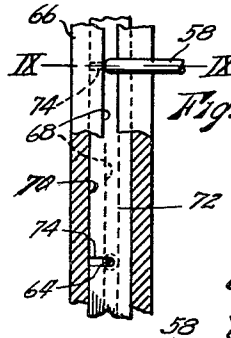


Fig. 8

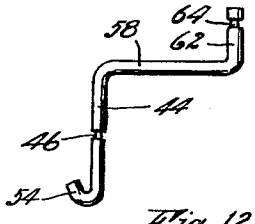


Fig. 12

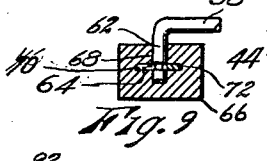


Fig. 9

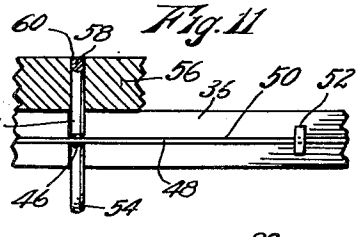


Fig. 11

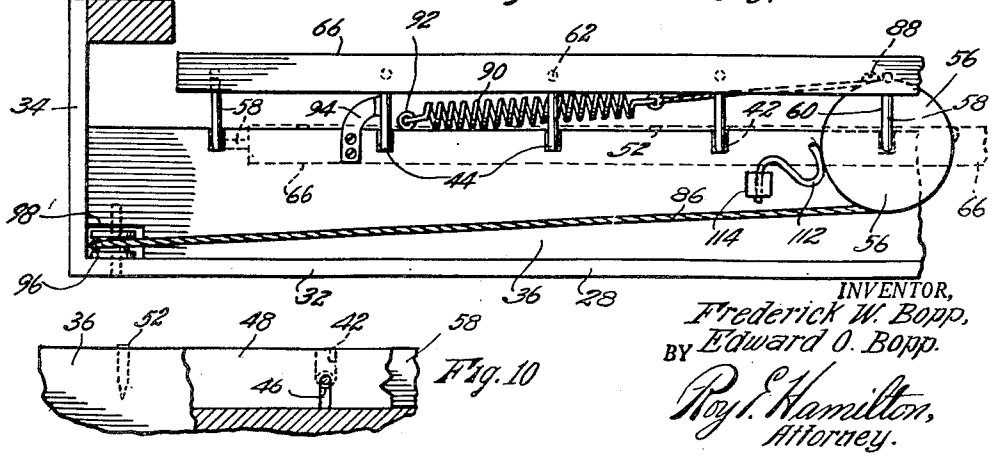


Fig. 10

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2,520,272

VERTICAL BLIND

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Application Feb. 12, 1945, Serial No. 577,359½

4 Claims. (Cl. 160—166)

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This invention relates to improvements in blinds and has particular reference to blinds having horizontally disposed operating bars with a plurality of vertically disposed strips or bars carried thereby.

The principal object of the present invention is the provision of a blind having a series of overlapping vertically disposed strips provided with operating means whereby said strips may be caused to operate on their respective longitudinal axis through an arc of substantially 180°.

Another object of this invention is the provision of a vertically disposed blind having a top operating bar and a bottom operating bar horizontally disposed and operable by means of a single cord to adjust the blind throughout its length to control the air and light to the room.

Other objects are simplicity and economy of construction, ease and efficiency of operation and adaptability for use wherever a blind for controlling light and air is needed.

With these objects in view, as well as other objects which will appear during the course of the specification, reference will now be had to the drawings wherein:

Figure 1 is an elevational view of a blind mounted on the inside of a window frame partly broken away and embodying this invention.

Fig. 2 is a vertical section taken on line II—II of Fig. 1.

Fig. 3 is a top plan view of the blind.

Fig. 4 is a horizontal sectional view taken on line IV—IV of Fig. 1.

Fig. 5 is an enlarged fragmentary sectional view taken on line V—V of Fig. 1.

Fig. 6 is an enlarged view of a portion of the parts shown in Fig. 3 with the operating bars shown in dotted lines in the adjusted position to set the blind strips to admit a maximum of light through the blind.

Fig. 7 is an enlarged fore-shortened elevational view of one of the strips partly broken away to disclose the resilient connectors.

Fig. 8 is an enlarged fragmentary view of a portion of one of the operating bars with parts broken away.

Fig. 9 is a sectional view taken on line IX—IX of Fig. 8.

Fig. 10 is a fragmentary planar view of the ledge and its associated parts partly broken away.

Fig. 11 is an enlarged sectional view taken on line XI—XI of Fig. 5.

Fig. 12 is a detached elevational view of the operating shaft.

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Fig. 13 is a diagrammatic cross sectional view of two of the strips or slats showing their relative position and movement.

Throughout the several views like reference characters refer to similar parts and the numeral 20 designates a window frame having inside vertical facing members 22, header 24, and window ledge 26. The blind is secured to the window frame within the room by means including a top bracket 28 and a bottom bracket 30 which extend horizontally across the window frame as clearly shown. Each of these frames are substantially channel-shaped having a longitudinal cross plate 32 and end plates 34. These end plates are perpendicular to the cross plates 32 and extend inwardly to engage the edges of the face plates 22. Bracket 28 is provided adjacent its vertical central portion with a ledge or shelf 36 disposed in a horizontal plane to receive the blind operating means. An angled bracket 38 is securely attached to the underside of ledge 36 for releasable attachment to the window casing by means of screws 40.

Ledge 36 is vertically slotted at 42 at spaced apart points to receive the operating shaft 44. Referring to Figs. 10 and 12, it will be noted that this shaft is provided with an annular groove 46, thus presenting a reduced section of the shaft suitable for being inserted into the slot 46 of the shaft securing bar 48. This bar 48 is relatively thin so as to snugly fit into the groove 50 formed in the edge face of the ledge 36 to extend beyond the slots 42 so that when the notched securing bar 48 is positioned to engage the annular grooved portion of the various operating shafts 44 they will be secured in position in the ledge. In order to prevent accidental displacement of the securing bar 48, staples 52 are driven into the edge of ledge 36 so as to straddle said bar. The lower end of operating shaft 44 extends below the lower surface of ledge 36 and is rebent to form a hook 54. The upper portion of shaft 44 extends through the axis of a pulley 56 which is positioned to rest on the face of ledge 36. Shaft 44 is offset to form a radial crank arm 58 which rests in a radial groove 60 formed in the upper face of pulley wheel 56 thereby securing the crank arm and pulley together for oscillatory movement. At the periphery of the pulley wheel 56 the operating shaft is bent upwardly at right angles to the radial crank arm 58 to form a vertical stem 62 which is provided with an annular groove 64. The stems 62 are secured in fixed spaced apart relation in the operating bar 66. This operating bar is substantially rectangular in

cross section and is slotted longitudinally at 68 to a width suitable for receiving stem 62 and is provided with a blind slot 70 which intersects slot 68 and is adapted to contain the securing bar 72 having transverse slots 74 suitable for engaging in annular grooves 64 of the operating shaft 44. In mounting this operating bar 66, the notched bar 72 is first fitted on to the various stems of the operating shafts as described and then 66 is slid thereon from one end of securing bar 72.

Since the lower bracket 30 contains like parts slightly altered in position, with the operating bar 66 positioned below the ledge 36, the corresponding parts thereof are given like designating numerals as applied to the parts just described. The shutters or blinds 71 may be made of fabric, plastic, wood or any other suitable material; however, they are here shown as strips of fabric looped and hemmed at their opposite ends at 75 to form boots 76 of sufficient width to receive a resilient connector or adaptor 78, the eye 80 of which extends through the hole 82 at the edge of the hem. This resilient connector or adaptor is preferably made of spring wire having a body 84 adapted to rest in the boot in such a manner as to cause the straightening of the strip when pressure is exerted on the eye 80 as hereinafter set forth. The eye at the upper end of the strip 71 is positioned on hook 54 while the eye at the opposite end of the strip is attached to the lower hook 54. It is the purpose of this structure to mount these strips under tension with the resilient member 78 partially compressed. This tensioning means will always maintain the strips in a taut position regardless of the expansion or contraction of the strip.

The operating cable 86 is secured by screw 88 to the periphery of the upper pulley 56 at such a position as to permit of a full half revolution of the pulley whereby the strips 72 may be moved through 180°. One end of cable 86 extending from screw 88 is attached to one end of a tension spring 90 which in turn is secured at its other end by screw eye 92 to the edge of ledge 36. This spring serves to urge the arm 58 against a stop 94 which is secured to ledge 36 to limit the oscillation of the blind in one direction. Cable 86 which extends about half way around pulley 96 passes over a sheave wheel carried by bracket 38 and passes through a slot 98 formed through ledge 36. This cable then passes downwardly over a sheave wheel 100 carried by the lower bracket 30 to a point below ledge 36, thence around sheave wheel 102 mounted on the underside of ledge 36 thence around lower pulley 56 to which it is securely attached by a screw 104. The attached end of the cable continues around pulley 56 and is attached to one end of the tension spring 106 the other end of which is attached to a pin 108 carried by ledge 38. A hand grip 110 is mounted on cable 86 at a position convenient for moving the strips through the desired angle.

Referring to the diagrammatic view 13 wherein two of the strips are shown in their relative relation as disclosed in the different views of the drawing, it will be noted that they overlap slightly at A and that they rotate in the same direction as indicated by the arrows so that the overlapped portions move away from each other. When the strips are rotated through 90°, they will be in substantially right angled relation to their closed position so as to admit a maximum amount of light therebetween. By continuing

the rotation of the strips through another 90° angle, the strips will contact each other from opposite directions and the inside surface of the strips will then be exposed to the outside view. It is contemplated to make the inside and outside surface of each of the strips of different general appearance so as to produce desirable contrasting effects.

For the purpose of securing the blind in any desired adjusted position against displacement, a brake spring 112, secured in block 114 attached to ledge 36, is positioned to rest against the periphery of pulley 56 with sufficient force to overcome the pull of the springs 90 and 106 which are always under tension. By means of the hand grip 110, the operator may adjust the strips 71 to any desired angle and all the strips will take the same relative angle due to the pull of springs 90 and 106, and the brake spring 112 will maintain them in the set position until the operator again manually adjusts the blind.

While the drawings embody one form of the invention, yet it is apparent that many minor changes might be made in the shape and arrangement of the parts without departing from the spirit of the invention.

Having thus described our invention, what we claim as new and desire to be secured by Letters Patent is:

1. A blind comprising a pair of vertically spaced apart, horizontally disposed brackets; a pair of like series of vertically disposed shafts mounted respectively for oscillation in said brackets, said shafts each being formed to present a bell-crank lever; a rigid bar connecting the bell-crank levers of all of the shafts in each of said series of shafts; a pulley fixed to one shaft of each of said series of shafts; a flexible cable passing about both of said pulleys, whereby operation of said cable will cause simultaneous oscillation of all of said shafts; frictional means to secure said pulleys against accidental movement; and a series of strips of material, each strip being connected under longitudinal tension at its opposite ends to corresponding shafts of the two series of shafts whereby as said shafts are oscillated, said strips will be oscillated on their longitudinal axis to vary the light spaces therebetween.

2. A blind comprising a pair of vertically spaced apart, horizontally disposed brackets; a pair of like series of vertically disposed offset shafts mounted respectively for oscillation in said brackets; means manually operable to simultaneously move all of said shafts in like manner; a series of strips of material, each strip being connected under longitudinal tension at its opposite ends to corresponding shafts of the two series of shafts whereby as said shafts are oscillated, said strips will be oscillated on their longitudinal axis to vary the light spaces therebetween; spring members connected with said series of shafts to normally urge them to their central position of oscillation; and frictional means to secure said shafts in any desired degree of oscillation against the urge of said spring members.

3. A blind comprising a pair of vertically spaced apart, horizontally disposed brackets adapted to be secured respectively to the top and bottom portions of a window frame; two like series of vertically disposed, rotatably mounted shafts carried respectively by said brackets, each shaft having a bell crank lever at its one end; an operating bar associated with

each of said series of shafts to engage each bell crank lever thereof; means manually operable to simultaneously oscillate all of said shafts in like direction and through the same arc; a series of strips of material, each strip being connected, under longitudinal tension, at its opposite ends to corresponding shafts of the two series whereby said strips may be adjusted through substantially a half revolution on their longitudinal axis to vary the space between adjacent strips and to reverse the sides of the blind; and resilient braking means to normally secure said shafts against accidental movement regardless of their degree of oscillation.

4. A blind comprising a pair of vertically spaced apart, horizontally disposed brackets; a series of vertically disposed shafts carried by each of said brackets, each of said shafts having a peripheral groove formed therein engaged by said bracket whereby said shafts may rotate but not move axially, and corresponding shafts of said two series of shafts forming cooperating pairs, the inner ends of each of said pairs of shafts being formed to present hooks and the outer ends being formed to present crank levers; a tension spring secured to each of said hooks; a flexible slat secured at its ends to the springs of one of said pairs of shafts; a rigid

bar pivotally joined to all of the cranks of the shafts of each of said series of shafts; and means for simultaneously oscillating one shaft of each series of shafts, whereby all of said shafts will be oscillated.

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