Jan. 27, 1942. F. W. SWORMSTEDT 2,270,978

LIGHT-TIGHT SHADE CONSTRUCTION

Filed April 5, 1939

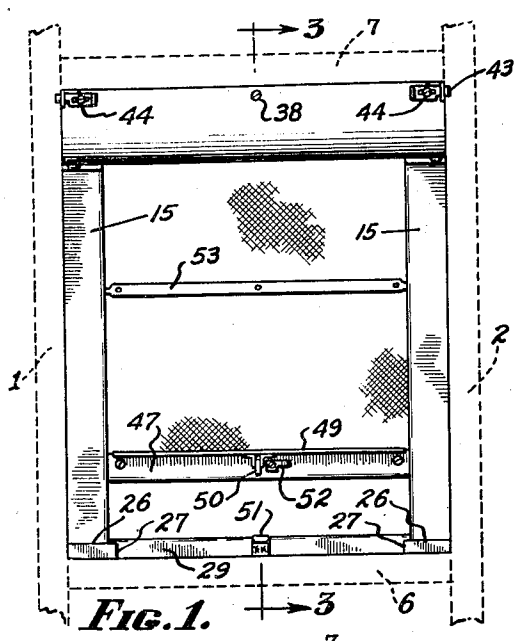


FIG. 1.

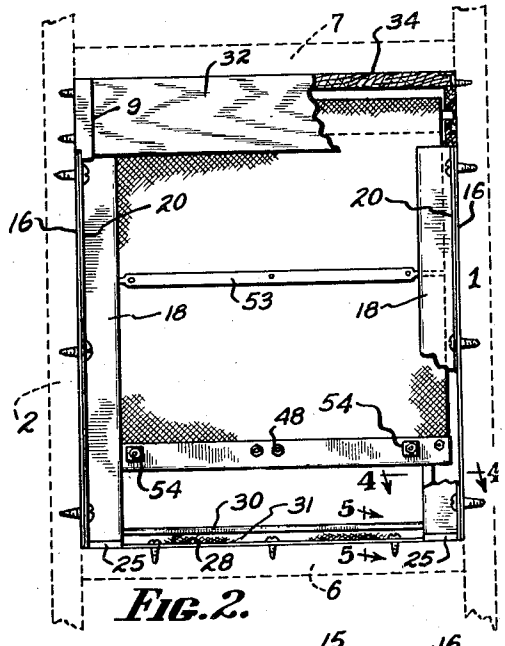


FIG. 2.

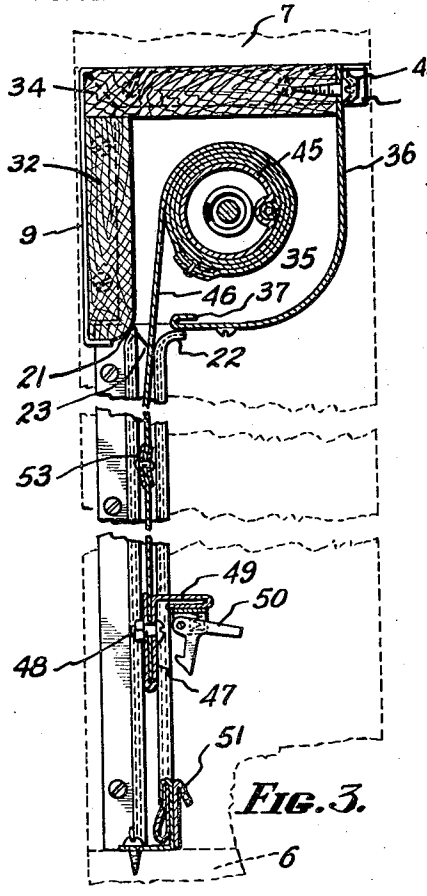


FIG. 3.

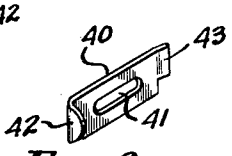


FIG. 6.

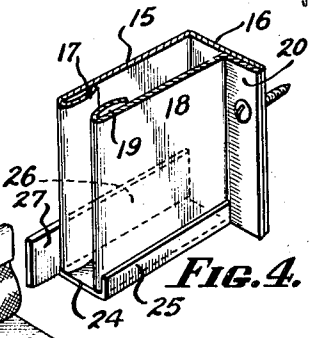


FIG. 4.

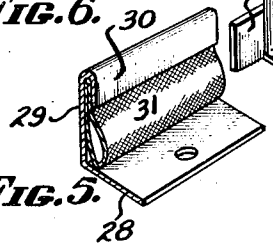


FIG. 5.

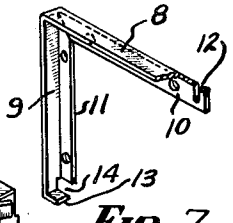


FIG. 7.

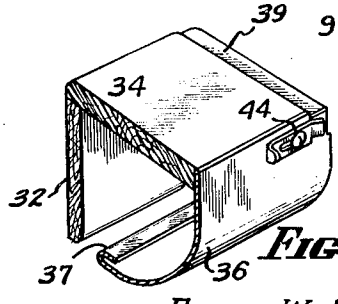


FIG. 8.

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LIGHT-TIGHT SHADE CONSTRUCTION

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Application April 5, 1939, Serial No. 266,156

8 Claims. (Cl. 156—10)

My invention relates to light-tight shade constructions for use in hospitals, clinics, lecture rooms, laboratories, dark rooms and elsewhere, where it is desired on occasion to close off the room or hall from light passing through the windows or other openings. Light-tight closures of the rolling type, having a roller housing, a flexible curtain-like closure member retractible into the housing, side guides, and a bottom rail have been proposed; but such constructions have been both complicated and expensive, as well as difficult to install, and rigid and inflexible in assembly.

It is an object of my invention to simplify the construction of light-tight shades, and achieve consequent great economies in cost.

It is an object of my invention to simplify the installation and to provide elementary units of the assembly in standardized form, which may be adapted without costly changes to openings of different dimensions.

It is an object of my invention to simplify the mode of interconnection of the several elementary units to effect light tightness, whereby none of the units require permanent interconnection, and the several units are capable both of assembly and of disassembly in the opening itself, and whereby the units are capable of adapting themselves, in some degree at least, to minor variations in dimensional requirements.

It is an object of my invention to provide a structure in which the roller housing may be bodily removed from the opening without disturbing the relationship of the other units, for replacement, adjustment or repair, quickly and easily.

These and other objects of my invention, will be set forth hereinafter, or will be apparent to one skilled in the art upon reading this specification, I accomplish by that certain construction and arrangement of parts of which I shall now describe an exemplary embodiment. Reference is made to the drawing, wherein:

Figure 1 is an elevational view of my structure in an opening, and viewed from inside the room.

Fig. 2 is an elevational view of the structure taken from the other side, certain parts being shown in section.

Fig. 3 is a vertical sectional view taken along the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the lower part of a guide member, showing also a bottom fitting, taken along the line 4—4 of Fig. 2.

Fig. 5 is a perspective view of a bottom rail member, taken along the line 5—5 of Fig. 2.

Fig. 6 is a perspective view of one form of locking member for the roller housing which I may use.

Fig. 7 is a perspective view of a bracket for holding the roller housing.

Fig. 8 is a perspective view of one end of the roller housing.

I shall describe the various elementary units of my invention in connection with the manner in which they are installed in an opening. In Figures 1 and 2 are represented the side frame members of an opening, for example, a window, and 6 and 7 represent respectively the bottom and top frame members of the opening. The first operation is to fasten in position in the upper right and left hand corners respectively of the frame opening, brackets such as are shown in Fig. 7. These brackets are formed of angularly bent strip metal, cut as indicated to form a top portion 8 and a portion 9 which, when installed will lie toward the outer part of the building, as clearly indicated in Fig. 3. Integral with the parts 8 and 9, and laterally disposed as shown are side flanges 10 and 11 which in the particular installation lie along the inner face of the frame member 2 of the opening. The portions 10 and 11 are provided with suitable counter-sunk perforations so that the bracket may be installed in a wooden frame by ordinary wood screws or in a metal frame by drilling and tapping for machine screws. The free end of the portion 10 may be provided with a slot 12 the purpose of which will hereinafter be described. The lower end of the portion 9 may be turned over to form a step 13 to support the rearward end of the roller housing as will also hereinafter be described. Also the member 11 and a portion of the part 9—13 may be cut away as at 14 to accept the end of a side guide member.

The brackets just described are, of course, made in rights and lefts, the one illustrated in Fig. 7 being a bracket to go at the right hand top portion of the frame of the window or other opening as shown in Fig. 3. The bracket on the other side of the top portion of the frame or other opening will be a mirror image of the device shown in Fig. 7.

I employ side guides for my light-tight closure, the construction of which is most clearly shown in Fig. 4. This construction may be considerably varied as will be understood by one skilled in the art. The particular side guide consists of a pair of plates, one of which forms a guide portion 15 and an attachment flange 16, the edge of the guide portion being turned inwardly

as at 17. The other plate forms a guide portion 18 having an inturned edge 19 and a flange 20. The flange on the member 18 is narrower than the flange on the member 15 so that when the parts are assembled in the manner shown in Fig. 4, the two portions 15 and 18 will be interspaced to form the guide within which the rolled curtain or closure, together with the end of the draw bar and such stiffening ribs as are employed in connection with the closure, slide. The width of the portions 15 and 18 of the side guides is such that the edge of the rolling curtain may extend sufficiently into them to cut off light both by direct transmission and by reflection. It is convenient to assemble the guide members as units, spot welding the flange portions 16 and 20 together or otherwise attaching them so that each side guide may be handled as a unit. The side guides will be cut to such a length as to extend from the bottom of the roller housing to the bottom of the frame of the window or other opening. This may be done on the job. At the top of the side guide, the inturned edge portion 19 may be pinched as at 21 in Fig. 3. The end of the other portion of the guide is preferably rolled inwardly as shown at 22 in the same figure. This makes it easy to insert the rolling curtain and the ends of the draw bar into the guide during installation and also prevents the rolling curtain and its appurtenances from catching on the end of the guide during operation. In order to roll the end of the guide it is necessary to free it from the flange portion 16—20 by a suitable cut; and I prefer to bevel the top portion of the flange 16 as shown at 23 in Fig. 3. The guide is preferably so installed that the flange portion 16—20 extends towards the outer part of the window or other opening. This gives a finished appearance within the room. The end of the flange 16—20 extends upwardly into the space left by cutting away the lower end of the bracket member as at 14 in Fig. 7.

I seat the guide at its lower end in a member shown in Fig. 4 as being of channel shape and comprising a bottom part 24, an upturned flange 25 toward the outside of the window opening and a somewhat wider upturned flange 26 toward the inside of the window opening. The flange 26 has an extension 27 projecting beyond the side edges of the guide. The bottom member illustrated in Fig. 4 may, if desired, be attached to the frame of the window opening; but this is not necessary, since being of channel shape it will be held against movement in two directions by the side guide and against movement in the third by the bottom rail next to be described.

The construction of the bottom rail is shown in Fig. 5 as comprising a piece of sheet metal bent to form a bottom flange 28, an upturned portion or flange 29 and a reversely bent narrow flange 30. In order to effect a light-tight closure between this bottom rail and the draw bar of the rolling curtain, I double a piece of suitable fabric as shown at 31 in Fig. 5, and catch the juxtaposed ends of this piece of fabric between the flange portion 30 and the part 29 of the bottom rail, where the ends are frictionally held. I am not limited in my choice of fabric for the part 31. I have found that I may conveniently employ a piece of the same material as I use for the rolling curtain itself, which is a relatively heavy coated fabric. The purpose of the element 31 is to form resilient means for pressing against the draw bar on the end of the rolling curtain so as to effect a light seal. A more elaborate construction may be adopted, if desired, and the use of soft rubber tubing or pre-formed rubber members is within the scope of my invention, but is not ordinarily necessary. The construction I have shown in Fig. 5 is simple and inexpensive. Moreover, it is easily cut to length and may be cut to length on the job. When it is installed, the bottom flange 28 comes against the end of the bottom fitting 24 on the side guide; but the projection 27 of the bottom member overlaps the upwardly extending portion 29 of the bottom rail so as to prevent the passage of light between the bottom rail and the side guide members.

The installation in the window or other opening of the two brackets illustrated in Fig. 7, of the side guides with their bottom members as in Fig. 4 and of the bottom rail as in Fig. 5 completes the installation of all parts which are directly fastened to the frame of the opening. It will be seen that the installation problem is, therefore, very much simplified; and that the parts are of simple and inexpensive character. Depending upon the degree of light tightness desired, various precautions may be taken in the installation of the various parts. For example, before the attachment of the brackets, and the flanges of the side guides and bottom rails pieces of felt may be placed in position so as to prevent light passing through the openings made by surface non-conformity of the frame of the opening and various parts so installed; or after the installation of the several parts they may be calked. Such precautions are ordinarily required with light-tight closures where a perfect light tightness is required as in photographic dark rooms. But in lecture halls and the like where the problem is merely to darken the room sufficiently for the showing of slides by projection, such exact precautions may not be required.

In accordance with my invention, I provide a roller housing which is wholly demountable per se, but which when in use is held by the brackets aforesaid in such relationship to the side guides as will make a light-tight juncture. While I have shown my roller housing as constructed partly of wood it will be understood that this is not a limitation upon my invention and that the housing may be constructed entirely of metal or of other materials as may be found most convenient. The roller housing in the form shown is made of the back piece 32, a top piece 34 and end pieces 35. These end pieces are rounded at their free corners as will be apparent in Fig. 3; and the housing may be completed, therefore, by a single piece of sheet metal 36 which extends from the top member 34 around the periphery of the free portions of the end parts 35, approaching the back member 32 so as to leave a slot for the passage of the rolling curtain. For stiffness as well as for protection to the curtain the lower end of the sheet metal member 36 may be turned over inwardly as at 37. The upper edge of the member may be held to the top 34 of the housing by one or more screws 38 (Fig. 1) which, where the housing is made of wood, may be wood screws. A cheap and inexpensive housing structure is thus formed; and for different window openings it will usually be necessary to vary the housing only as to length. This is because the housing may be made large enough in transverse dimensions to accommodate a spring roller and the thickness of the longest length of curtain material likely to be employed in any closure. The ends of the top portion 34 of the

housing are relieved as at 39 (Fig. 8) to accommodate the portion 8 of the brackets, so that the surface 34 of the top portion may lie in close proximity to the inner surface of the top frame member 7 of the window opening. In use the brackets hold the roller housing which thus is completely and readily demountable. The lower corners of the back portion 32 of the housing rest upon the step portions 13 of the brackets as will be clear in Fig. 3. Thereby, the inner face of the ends of the back portion 32 are brought tightly against the end of the portion 18 of the side guides as will be clear from the same figure. I have shown the member 32 as rounded at its lower inner edge; but it may be otherwise shaped, if desired, to accept the end of the guide portion 18. To hold the roller housing to the brackets, I provide a locking member. I am not limited to the type of locking member which I may employ, any means for holding the housing to the brackets being suitable. I have, however, illustrated in Fig. 6 a simple and convenient locking means comprising a body 40 slotted as at 41. At one end the body is turned over as at 42 to provide an abutment which may be engaged by the fingers. At the other end the body is provided with a tongue 43 of such size as will enter the slot 12 in the inner end of the bracket. The device of 40 may be held to the front plate 36 of the housing by a wood screw 44 passing through the slot and through a suitable perforation in the plate. When this screw is considerably loosened the locking member of Fig. 6 may be tilted so that the tongue 43 can be inserted in the slot 12 by longitudinal movement of the locking member. Then upon tightening the screw the locking member acts as a lever (the tongue 43 being bent slightly upwardly) to pry the housing into tight engagement with the bracket members. The housing may, however, readily be released by reversing these operations. When the housing is released it is tilted forwardly using the step 14 on the brackets as a fulcrum. Thus, the housing is freed from the brackets. If the rolling curtain has been withdrawn into the housing and the draw bar is up against the housing, the housing may be further rotated in a clockwise direction in Fig. 3 and completely withdrawn, carrying the draw bar with it.

In my housing I employ a suitable spring roller. Although this does not form a limitation upon my present invention, I prefer to employ the spring roller described in the patent to Clifford Traut, No. 1,938,729 issued December 12, 1933. A roller is indicated at 45, at its ends it will be supported in suitable members on the end pieces 35 of the roller housing. A rolling curtain 46 is attached at one of its ends to the roller. At its other end it is attached to a draw bar, the body of which is formed of sheet metal bent upon itself in a U shaped construction as shown at 47. The shade fabric is caught between the parallel parts of the body of the draw bar; and these parts may be fastened together at intervals as by bolts or rivets 48. The body of the draw bar is as long as the shade material is wide. Hence, the ends of the draw bar extend within the side guides as will be clear from Fig. 2. In the portion of the draw bar intermediate the side guides the metal is bent over (and then reversely bent for stiffening) to form a ledge 49. The draw bar is also provided with a spring latch, an exemplary form of which is shown at 50 in Fig. 3. The latch may coact with a metal catch 51 fastened to the bottom rail. When the draw bar is drawn down and latched, the body of it coacts with the light sealing element 31 of the bottom rail. The ledge 49 is a finger ledge to make it easy to draw the draw bar downwardly; but where the window openings are very large or are located in the building so high that the draw bar may at times be out of reach, it is within the scope of my invention to provide the draw bar with a fitting 52 whereby a chain or cord may be attached to it for its operation.

With large light-tight closures it is necessary to provide some stiffening means for the rolling shade since otherwise deflection of the shade might draw the edges of it out of the side guides. I may employ various types of stiffening means; but a simple and effective one is shown in the various figures as consisting of a pair of metal strips 53, one of which is located on each side of the rolling shade, the two strips being riveted or otherwise attached to the shade and to each other. At the end portion of the strips where they extend into the side guides, they are made narrower. In their main portions the strips are curved laterally as shown clearly in Fig. 3 so that they will conform more closely to the spring roller 45. When the shade is rolled thereon it will be understood that, depending upon the size of the rolling shade, one or a number of these constructions are employed at suitable intervals. On the side of the draw bar opposite the finger ledge, I prefer to provide guide blocks 54 (Fig. 2). These blocks keep the draw bar in a generally centered position between the side guides. I prefer to make them of a relatively hard fibrous material such as, for example, so called vulcanized fabric. This provides an excellent non-rattling structure which is silent in operation.

For replacement and repair, it is only necessary to remove from my structure the roller housing which will carry with it the light closure curtain and the draw bar. This is a significant simplification as respects former structures wherein it is necessary to remove the entire structure from the window opening. Also since my roller housing is readily removable it is much simpler in form because I do not have to provide means accessible from the front, or from bottom portions of the roller housing for the adjustment of spring tension. The roller housing is merely removed from the brackets sufficiently to disclose the roller rod mounting devices at the ends of the housing. For this reason, in addition to others which have been given, my structure is very much cheaper and less complicated then the structures which have had to be provided in the past.

Modifications may be made in my invention without departing from the spirit thereof.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In a device of the character described side guides for attachment to a window frame at the sides thereof, bracket means for attaching to said window frame at the top thereof and a roller housing demountably attachable to and supportable by safe brackets, and when in position therein forming a substantially light-tight engagement with said side guides, which engagement can be released by the removal of said housing from said brackets.

2. In a rolling closure a pair of side guides, brackets surmounting said side guides and a roller housing demountably held in and supported by said brackets independently of said side guides

but in substantially light-tight engagement therewith whereby without demounting said brackets and said side guides said roller housing may be removed therefrom for adjustment and the like.

3. In a device of the character described side guides and independent bracket means surmounting said side guides, said bracket means adapted to accept and retain demountably a roller housing, and a roller housing having portions for engagement in said brackets and portions for engagement with said side guides, said brackets comprising angularly shaped, angularly related elements having supporting means for a portion of said roller housing, means for locating said housing with reference to said side guides and interlocking means for detachably fastening said housing in located position.

4. In a device of the character described side guides, independently mounted brackets surmounting said side guides, said brackets having portions extending in the direction of said side guides and portions transverse thereto, and a roller housing demountably retainable in said brackets, said brackets having fixed means for supporting and locating one portion of said roller housing, and releasably interlocking means for retaining said housing in located position, said housing as so located having a portion coacting with portions of said side guides to form a light-tight engagement therewith.

5. In a device of the character described side guides, independently mounted brackets surmounting said side guides, said brackets having portions extending in the direction of said side guides and portions transverse thereto, and a roller housing demountably retainable in said brackets, said brackets having fixed means for supporting and locating one portion of said roller housing and interlocking means for retaining said housing in fully located position, said housing as so located having a portion coacting with portions of said side guides to form a light-tight engagement therewith, said interlocking means comprising means for forcing a tight engagement of said housing in said brackets, said housing comprising top, rear and end portions and a front and bottom portion approaching said rear portion so as to leave a slot for the passage of a rolling closure, said parts being so proportioned that said slot is in alignment with said side guides, and said side guides being flared adjacent said housing.

6. In a bottom rail for a structure for the class described, a flange portion and a portion upstanding therefrom said last mentioned portion having its free edge turned over, and resilient closure member caught between the upstanding portion and said turned over portion.

7. In a bottom rail for a structure for the class described, a flange portion and a portion upstanding therefrom said last mentioned portion having its free edge turned over, and resilient closure member caught between the upstanding portion and said turned over portion, said resilient closure member comprising a fabric folded upon itself to form a loop and having juxtaposed edges, said juxtaposed edges being caught between said upstanding portion and said turned over portion.

8. In a device of the character described, the combination of a spring roller housing and independently mountable brackets for removably retaining said spring roller housing independently in a window opening, said housing having a body with top and rear faces, and said brackets each comprising angularly shaped members angularly related to each other for engagement with said faces, one of said members having at its bottom means for supporting the lower rear edge of the said housing and the other of said members having at its forward end an interlocking means for engagement with means on said housing whereby to enforce conformation of said housing to said brackets, whereby said brackets act fully to locate said housing in said window opening independently of other structural features.

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