June 23, 1931. C. N. BOEHM 1,810,899

WINDOW SHADE

Filed March 25, 1929 2 Sheets-Sheet 1

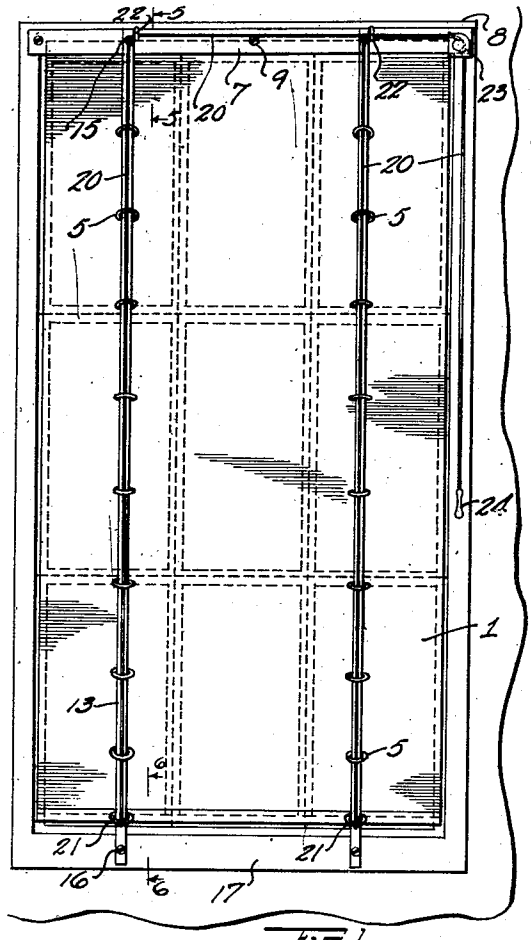


FIG. 1.

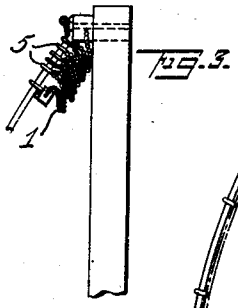


FIG. 3.

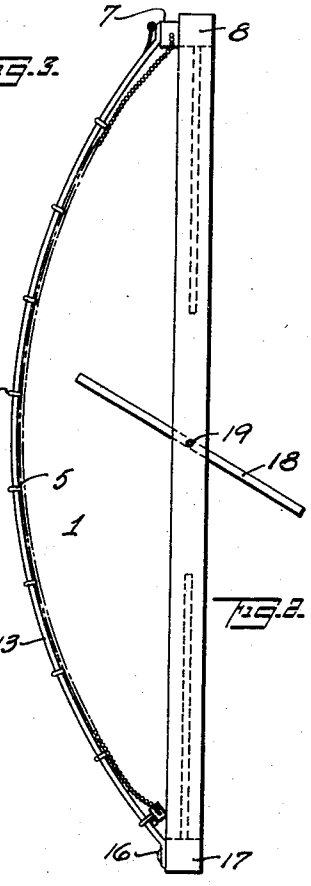


FIG. 2.

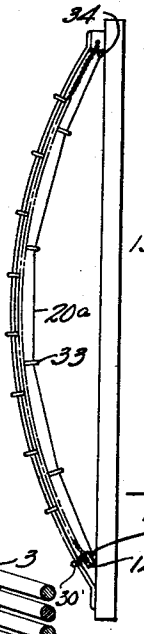


FIG. 15.

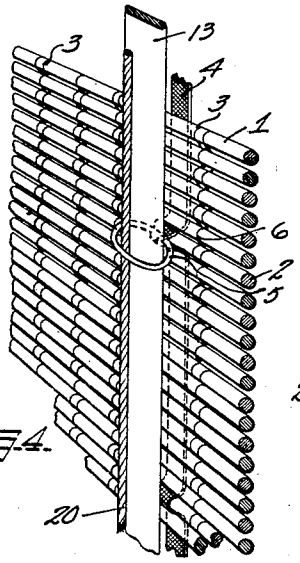


FIG. 4.

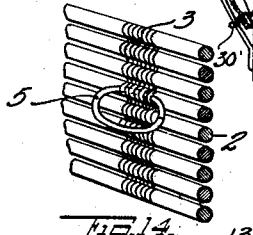


FIG. 14.

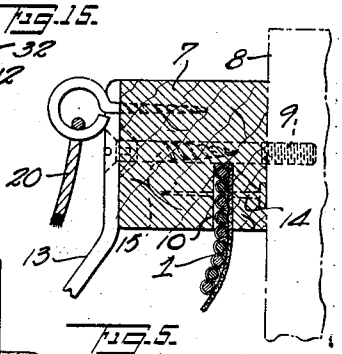


FIG. 5.

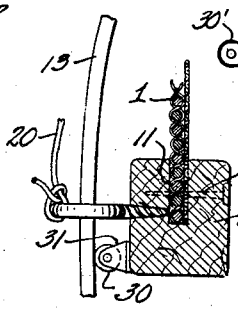


FIG. 6.

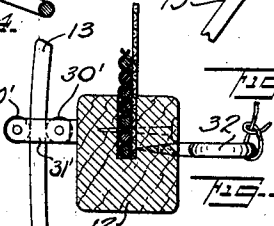


FIG. 17.

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WINDOW SHADE

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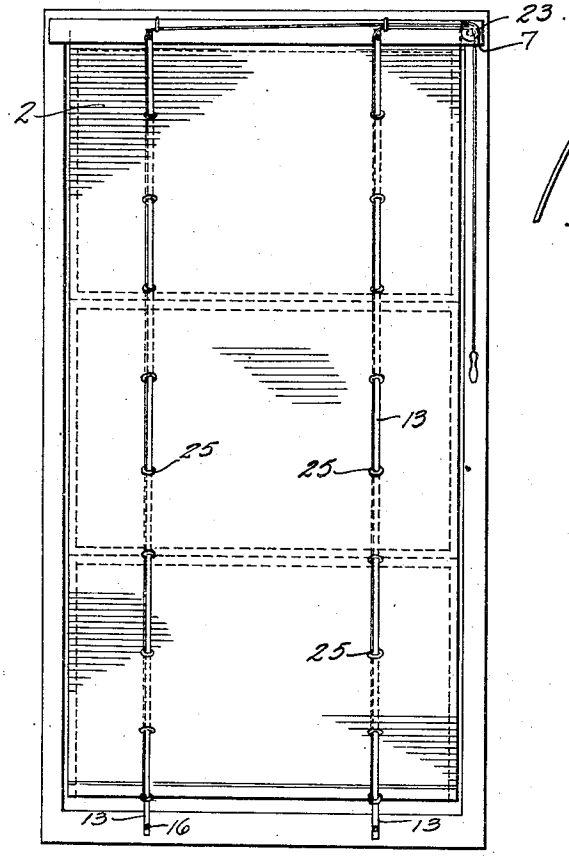


Fig. 7.

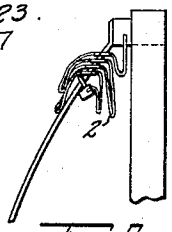


Fig. 9.

Fig. 8.

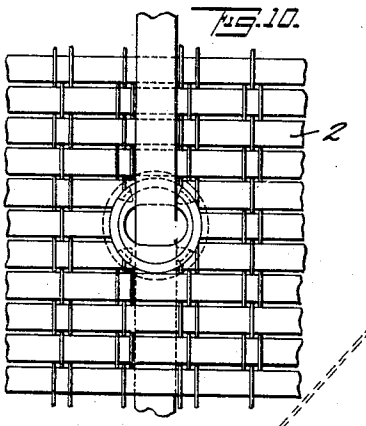


Fig. 10.

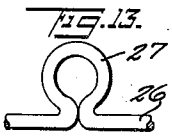


Fig. 13.

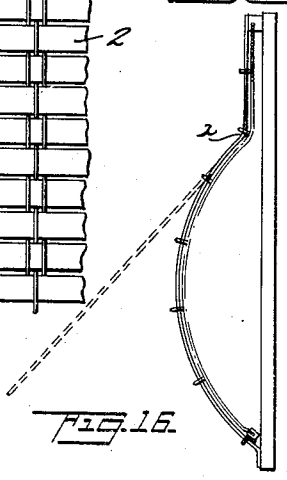


Fig. 16.

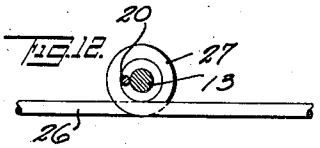


Fig. 12.

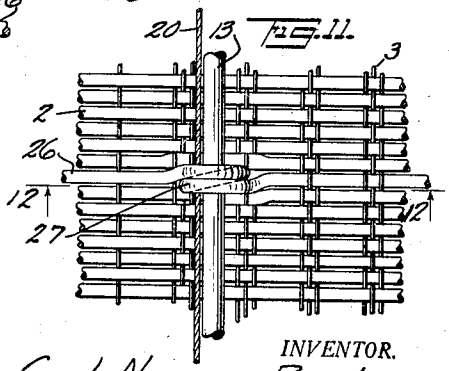


Fig. 11.

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Patented June 23, 1931 1,810,899

UNITED STATES PATENT OFFICE

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WINDOW SHADE

Application filed March 25, 1929. Serial No. 349,584.

My invention relates to window shades, and has for its object the production of an improved shade, adapted more particularly for indoor use, although capable of use as an outdoor screen.

It is quite common in the construction of factories and other buildings for business use to pivot a window sash on a central horizontal axis, so that when it is opened, it extends for a considerable distance into the room. My improved shade may be applied to a window having a pivotal sash as described, in such manner that the sash may be opened or closed without contacting with the shade, and the latter may be raised or lowered without contacting with the sash even though the same is in its fully open position.

I am aware that devices have been heretofore designed for such use, but such devices have made use of shade members which roll up from the bottom and complicated and unsightly guides composed of front and rear members spaced apart to receive the end portions of the shade.

One of the principal objects of my invention is to do away with roll-up shades and guides adapted to receive portions thereof, to use a shade of the folding type, and to support the same by a guide without spaced members and of very simple construction in such manner that the shade is securely held against displacement and may be raised and lowered with very little frictional resistance.

Various other details of construction are also included within the scope of the invention as hereinafter set forth and claimed.

Reference is hereby made to the accompanying drawings of which

Fig. 1 is a front elevation of a shade and shade support constructed in accordance with my invention, and applied to a window frame;

Fig. 2 is a side elevation of the same;

Fig. 3 is a portion of Fig. 2 showing the shade in folded position;

Fig. 4 is an enlarged detail view in perspective of a portion of the shade fabric, with guide ring secured thereto;

Figs. 5 and 6 are enlarged sections on lines 5—5 and 6—6 respectively of Fig. 1;

Fig. 7 is a front elevation of a modified form of shade applied to the same form of guides as shown in Fig. 1;

Fig. 8 is a side elevation of the same;

Fig. 9 is a portion of Fig. 8 showing the shade in folded position;

Fig. 10 is an enlarged front elevation of a portion of the shade of Fig. 7;

Fig. 11 is a similar view of a second modification in which the guide engaging member is in the form of a looped rod or wire;

Fig. 12 is a section on line 12—12 of Fig. 11;

Fig. 13 is a similar view of a third modification;

Fig. 14 is an enlarged perspective view of a fourth modification;

Fig. 15 is a side elevation of a fifth modification;

Fig. 16 is a side elevation showing the shade of Fig. 2 applied to a window in which the pivotal sash is below the center of the window; and

Fig. 17 is an enlarged section of the lower portion of the shade of Fig. 15.

Referring to Figs. 1 to 6, the shade is a flexible and foldable structure composed of a multiplicity of transverse rods or staves 2 of any suitable material and of any desired form as to cross section. These staves are united at suitable intervals by cords or fabrics 3 interwoven therewith in well known manner. There are also two or more woven tapes or ribbons 4 for supporting a series of spaced guide engaging rings 5, the tapes being arranged in the rear of the shade and being looped at intervals to partly surround one of the staves 2 as shown at 6, Fig. 4, whereby the tapes are firmly united to the shade. Each of the guide rings 5 encloses and is held by one of the loops 6.

The shade 1 is supported by a transverse bar 7 which is preferably of wood and may be secured to the upper frame member 8 of the window-frame by any suitable means, for example, screws 9. A downwardly opening recess or slot 10 is formed in the bar

7 into which the upper end of the shade 1 is inserted and secured by nails 14.

The lower end of the shade is inserted into an upwardly opening recess or slot 11 formed in a bar 12, preferably of wood and secured therein by nails 14.

The means for guiding the shade and supporting the same against lateral as well as in and out movement comprises two or more metal guide rods 13, which are threaded through each of the aligned rings 5. The ends of the rods are secured respectively by screws 15 and 16 to bar 7 and lower frame member 17 of the window-frame.

The window shown comprises a movable sash or section 18 pivoted on a horizontal axis 19 which is substantially equidistant from frame members 8 and 17. Whenever the sash 18 is fully opened, one end thereof extends into the room for a considerable distance, and in order that such sash and the shade may be moved into any position without contacting with one another, the guide rods 13 are bent into arcuate form as shown. While the guide rods 13 may have any desired form of cross section, I prefer to make use of flat rods as shown in Fig. 4. Such rods of soft steel and in straight lengths are carried in stock by hardware dealers and can readily be shaped to fit any window. In case the pivotal sash is central of the window, as in Fig. 2, it is necessary merely to cut from stock a rod of suitable length and fasten the upper end thereof to the bar 7. The lower end is then raised into proper position and secured to the lower frame member 17. The rod 13 assumes the arcuate form shown as its lower end is raised into position.

In case it is desired to form an arcuate section which begins at a substantial distance from one end of the rod, as for example where the pivoted sash is below the center of the window, as shown in Fig. 16, it is necessary merely to form a sharp bend in the rod as at *a*, whereupon, by securing its upper and lower ends as above described, the rod assumes and retains the form shown in full lines. By reason of its flattened cross section, the rod 13 has great resistance to lateral bending stresses.

The position normally occupied by the shade under the action of gravity is that shown in Figs. 1 and 2, and in order to elevate the shade to the position of Fig. 3 or any intermediate position, I provide a pair of tension members such as cords 20. One end of each cord is secured to a screw eye 21 which is threaded in the bar 12. The cords pass thence upwardly through the aligned rings 5, thence through screw eyes 22 to fixed guide 23, thence downwardly to a position where the handle 24 may be readily grasped. It should be noted that as the shade is elevated by the cords 20, it is held against being rolled up and the compacting of the rings 5 causes the shade to form a series of folds as shown in Fig. 3. In order to reduce the frictional resistance of the shade against such upward movement, rollers 30 are rotatably mounted in brackets 31 secured to the bar 12 in such position as to bear against the rear or inner surfaces of the guide rods 13, see Fig. 6.

Another means for reducing such frictional resistance is shown in Figs. 15 and 17 and consists in providing the bar 12 with inwardly extending eyes 32 to which the cords 20 are secured. These cords are interior to the shade and are guided by aligned rings 33 secured thereto in any suitable manner and extending inwardly therefrom as shown. Upper screw eyes 34 are provided for enabling the cords 20 to be brought out horizontally from behind the shade, thence downwardly as in Fig. 1. This type of shade with cords 20 interior thereto offers less frictional resistance to upward movement than the type in which the cord is exterior to the shade, for example, Figs. 1 to 4, and such resistance may be further reduced by providing the bar 12 with rollers 30′ rotatably mounted in brackets 31′ carried by said bar. These rollers bear respectively against outer and inner surfaces of the guide rods 13. If desired, the inner roller 30′ may be omitted.

The structure of Figs. 7 to 10 differs from that of Figs. 1 to 6 merely as regards the means by which the shade is supported by the guide rods 13. In the structure of Figs. 7 to 10, the shade 1 is provided with two or more rows of small bushings 25 which in spaced relation to each other are secured to the staves 2. The guide rods 13 and cords 20 are threaded through the apertures of said bushings, whereby the shade 13 is divided into sections which are alternately in front of and in rear of the guide rods.

In the structure of Figs. 11 and 12 the shade is provided at suitable intervals with metal rods 26, preferably of the same diameter as the staves 2 and woven into the shade so as to form a part thereof by the cords 3. Each of the rods 26 is bent to form loops 27 to receive the guide rods 13 and cords 20, the loops of the various rods being in vertical alignment.

In Fig. 13 I have shown a fragment of a metal rod 26′ which is mounted in the shade in exactly the same manner as the rod 26 and differs therefrom only in the manner in which it is bent to form a loop for receiving the rod 13 and cord 20. In the device of Fig. 13 the loop 27′ is formed as shown and the rod 26′ and loop 27′ lie in a single plane as distinguished from the loop 27 which is of helical form.

In Fig. 14 I have shown a desirable construction in which the guide engaging rings

5 are secured to the shade by the threads or cords 3 which are interwoven with the staves 2 to form the shade fabric. In this construction the rings are opened sufficiently to receive a group of threads 3 as shown and are then closed. The rings thereupon lie flat upon the staves and do not in any way interfere with the weaving operation.

Among the advantages of the structures herein disclosed are the fact that the shades fold instead of rolling up, whereby single rods may be used as guides instead of front and rear members spaced apart, and furthermore, by reason of the threading of the guide rods through the small apertures of the guide engaging members, the shade is securely held against lateral movement and against flapping back and forth against spaced guides and the production of unpleasant rattling noises is thereby avoided.

Having now described my invention, what I claim is:

1. In a device of the class described, a shade support having inner and outer plane surfaces and a downwardly opening slot, a shade composed of flexibly united transverse members, the upper end of said shade being secured within said slot, and guide rods having flat end portions secured to the outer surface of said support.

2. A shade comprising horizontal staves, flexible cords interwoven therewith, and one or more series of guide engaging members secured by said cords in alignment with each other.

3. A shade comprising horizontal staves, flexible cords interwoven therewith, and a series of rings in alignment with each other, each of said rings enclosing said cords.

4. In a device of the class described, guide rods supported at top and bottom and arcuate therebetween, a foldable shade having aligned guide engaging means through which said rods are threaded, and flexible tension means threaded through said guide engaging means for folding said shade.

5. In a device of the class described, guide rods supported at top and bottom and arcuate therebetween, a foldable shade having aligned guide engaging means through which said rods are threaded, and the lower edge of said shade having anti-friction rollers engaging said rods.

6. In a device of the class described, a plurality of guide rods secured at their upper and lower ends and having arcuate portions extending therebetween, a shade comprising transverse, flexibly united members and guide engaging members secured to certain of said transverse members, adjacent guide engaging members being separated from each other by more than two transverse members, said guide engaging members having openings through which said guide rods are threaded, whereby the shade is restrained against lateral movement, the width of said openings being slightly in excess of that of said rods.

7. In a device of the class described, a window having upper and lower transverse frame members and a horizontally pivoted section disposed substantially equi-distant therefrom, arcuate guides secured at their ends to said frame members and having sufficient curvature to permit pivotal movement of said pivoted section, a folding shade comprising transverse, flexibly united members and apertured guide engaging members through which said arcuate guides are threaded, adjacent guide engaging members being separated from each other by more than two transverse members, and shade lifting means co-operating with the lower end of said shade and with said upper frame member.

8. In a device of the class described, a window having upper and lower transverse frame members and a horizontally pivoted section disposed substantially equi-distant therefrom, arcuate guides secured at their ends to said frame members and having sufficient curvature to permit pivotal movement of said pivoted section, a folding shade comprising transverse, flexibly united members and apertured guide engaging members through which said arcuate guides are threaded, adjacent guide engaging members being separated from each other by more than two transverse members, and shade lifting means passing through said apertures and co-operating with the lower end of said shade and with said upper frame member.

9. In a device of the class described, a plurality of thin, flat, guide rods secured at their upper and lower ends and having arcuate portions extending therebetween, a shade comprising transverse, flexibly united members and guide engaging members secured to certain of said transverse members, adjacent guide engaging members being separated from each other by more than two transverse members, said guide engaging members having openings through which said guide rods are threaded, whereby the shade is restrained against lateral movement, the width of said openings being slightly in excess of that of said rods.

In testimony whereof, I have signed my name hereto.

CARL NORMAN BOEHM.