Sept. 29, 1936. J. B. FRIEDMAN 2,055,862

FOLDING SCREEN

Filed Dec. 14, 1934 2 Sheets-Sheet 1

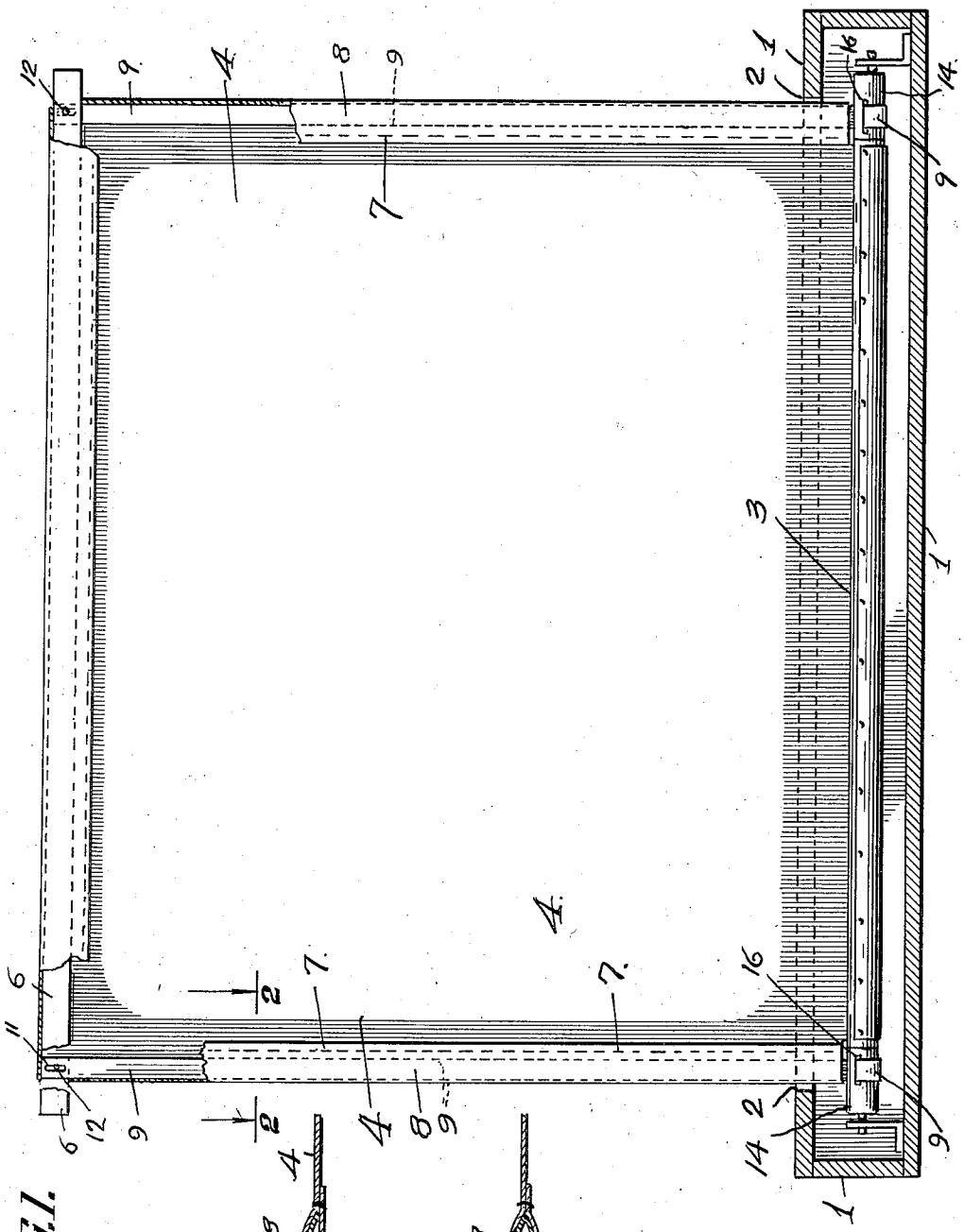


Fig. 1.

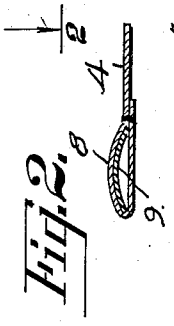


Fig. 2.



Fig. 3.

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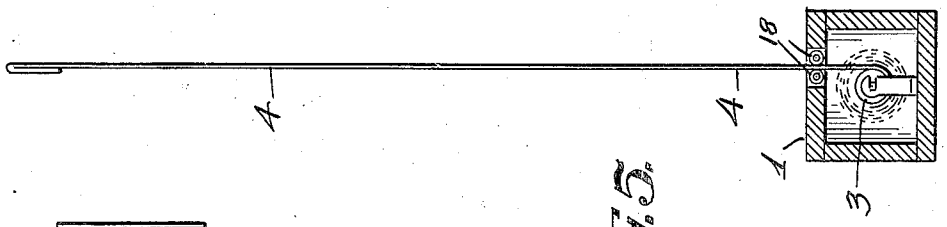


Fig. 5.

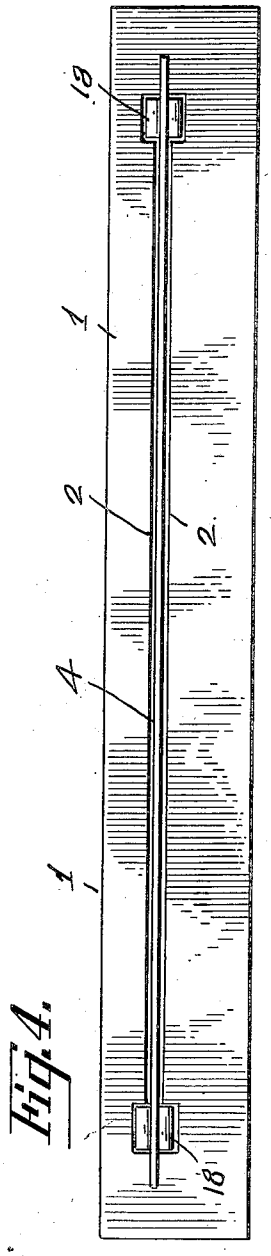


Fig. 4.

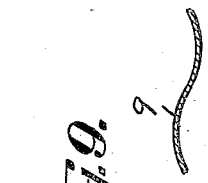


Fig. 9.

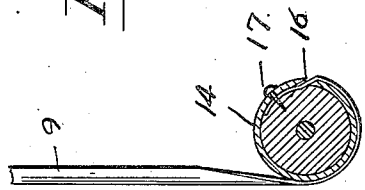


Fig. 7.

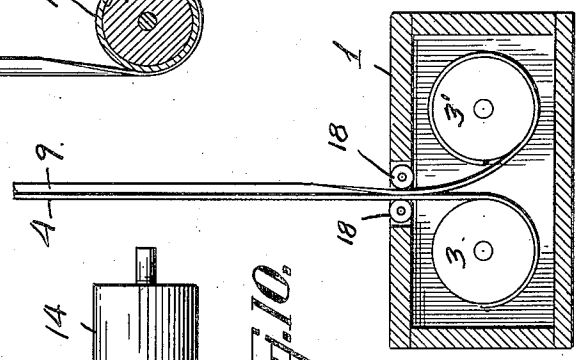


Fig. 10.

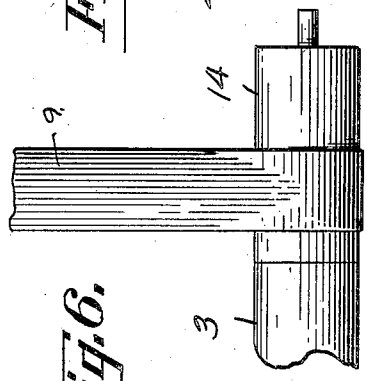


Fig. 6.

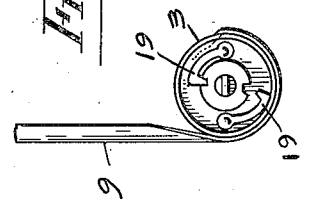


Fig. 8.

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Patented Sept. 29, 1936

2,055,862

UNITED STATES PATENT OFFICE

2,055,862

FOLDING SCREEN

Joseph B. Friedman, San Francisco, Calif.

Application December 14, 1934, Serial No. 757,498

8 Claims. (Cl. 88—24)

My invention relates to improvements in portable folding screens for motion pictures, stereopticon, and similar projection purposes, wherein a rollable screen of suitable fabric is provided on opposite edges thereof with thin flexible steel strips normally arcuate or channel-shaped in cross section, which cross section, operating in conjunction with the flexibility of the steel, has a normal tendency to longitudinally extend said strips and impart rigidity thereto, whereby said screen may be normally extended and held within a flat plane to receive projections from motion pictures, stereopticons, and the like, said extension strips, by reason of their flexibility, being readily flattened and rollable with said screen whereby the whole may be conveniently reduced to a compact form for storage and/or transportation purposes.

The primary object of my invention is to provide a new and improved portable folding screen for use in picture projection.

Another object is to provide a new and improved device of the character set forth having improved and simplified means for normally holding a sheet or screen extended in a flat plane and which improved means may be readily rolled with said screen.

A further object is to provide a screen of the type described having fewer parts and therefore lighter in weight, more economical in construction, and more readily operable than the present type.

A still further object of the present invention is to provide new and improved means for normally extending a sheet or screen into a flat plane to receive picture projections or for other purposes and which may be operated from an enclosing base, which operates as a stand, by the simple expedient of pulling the screen from said base, or permitting the screen to be wound upon a spring-shade roller, within said base, whereby expensive and complicated folding mechanism in the form of hinged and pivoted members may be eliminated.

I accomplish these and other objects by means of the invention of which one form is disclosed in the drawings forming a part of the present application, in which—

Fig. 1 is a partly broken and partly sectional front elevation of my improved folding screen, extended for use;

Fig. 2 is an enlarged transverse sectional view taken on line 2—2 of Fig. 1 in the direction indicated;

Fig. 3 is a similar view showing a modified form of Fig. 2;

Fig. 4 is a plan view of the device;

Fig. 5 is an end elevation, partly in section;

Figs. 6 and 7 are enlarged broken detailed views;

Fig. 8 is a slightly enlarged end view of the spring shade-roller employed;

Fig. 9 is a sectional view showing a modified cross sectional view of one of the extending strips; and

Fig. 10 is a cross sectional view disclosing a further modification of the device.

Referring to the drawings:

The numeral 1 is used to designate a comparatively long housing having a longitudinally disposed slot 2 in the upper surface thereof. An ordinary spring shade-roller 3 is rotatably mounted within said housing 1, the construction and operation of which is so thoroughly understood in the art that further description or illustration of the same is not required.

A sheet or screen 4 has one end secured to the roller 3 and the other end is projected through the slot 2 of the housing 1 and has a thin rigid member 6 secured to the other end thereof.

The side edges of the screen or sheet 4 are turned upon themselves and stitched as at 7 to provide envelopes 8 and within each envelope 8 is mounted a thin flexible metallic strip 9 arcuate or channel-shaped in cross section, as disclosed in Fig. 2 of the drawings. This thin metallic flexible strip or member 9 is similar in construction and operation to the well known flexible rule whose arcuate cross section has a tendency to normally project the said strip 9 and maintain the same in extended position while at the same time being rollable into a circular casing or housing. The arcuate cross section of the strip 9 provides a channel which in turn imparts a greater degree of rigidity than a flat metal strip.

One end of each strip is loosely connected to the adjacent end of the rigid member 6 preferably by means of a slot 11 engaging a suitable pin 12, the purpose of which will hereinafter be more fully set forth. The other end of each strip 9 is fastened to the rollers 3 within the housing 1. I prefer the method of fastening which I have shown and which consists in placing a metallic collar 14 upon each end of the roller 3 in any manner which will not interfere with the usual pawl and ratchet arrangement common to standard spring shade rollers. The end of the strip 9 passes through a longitudinally disposed slot 16 in said collar 14 and extends for a short

distance between the end of the collar or thimble 14 and the roller 3 where it is secured by a tack 17 or other suitable securing device, as disclosed in Fig. 7 of the drawings.

Rollers 18 are mounted upon opposite sides of the slot 2 of the housing 1 and at each end thereof to serve as a guide for the sheet or screen 4 and for the metallic flexible strips or members 9 secured to the edges of said sheet.

In operation

The sheet or screen 4, being rolled upon the roller 3 within the housing 1, when required for use, is projected into a flat, self-sustaining, operative position by pulling the same from said housing and against the tension of the spring shade-roller 3 until the required amount of sheet or screen 4 is projected beyond the housing 1, said housing resting upon any suitable supporting surface, not shown, and operating as a base for the said screen when thus extended.

When the screen or sheet 4 is thus extended, the arcuate or channel cross section of the flexible metallic strips 9 will provide sufficient rigidity to support the rigid member 6 and the sheet 4 and maintain the same in a flat plane, as disclosed in Figs. 1 and 5 of the drawings. In this position it should be observed that while the sheet extends upwardly from the base or housing 1, the positions may be reversed with the sheet depending in which case it may be used as a map mounting or window shade, or other similar purpose, the rigidity of the strips 9 maintaining, by reason of their normally arcuate or channel-shaped cross section, the sheet or screen 4 within a flat plane throughout substantially the entire surface thereof, thereby eliminating the "curl" which is generally found at the edges of maps, charts, and window shades.

While in such extended position, the rollers 18 and slot 2 which are preferably arranged in a line tangent to the roller 3, serve as a support to maintain the extended screen 4 perpendicularly to the base or housing 1.

To fold or roll the screen into a compact form for storage and/or transportation purposes, the said screen 4 is first released, as in releasing ordinary window shades, by pulling on said sheet or screen a sufficient amount to release the dogs or pawls 19 shown in Fig. 8 of the drawings, and then permitting the tension of the spring shade roller 3 to wind up said sheet or screen 4.

As the said screen or sheet 4 is being wound upon the said roller the thin metallic flexible strips 9 will assume, as in present use as a rule, a flat instead of an arcuate cross section, which will readily permit said strips 9 to coil upon the roller 3 with the screen 4.

In Fig. 3 of the drawings I have disclosed a modification wherein a pair of flexible strips 9 are inserted within each envelope 8, said arcuate strips being preferably placed with their concaved sides or surfaces abutting so that the combined strips will assume a substantially elliptical or more compact shape which may be conveniently inserted within said envelope 8 without distorting the same. When thus enclosed the tendency of the strips 9 to collapse is greatly decreased for the obvious reason that one arcuate cross section opposes collapse of the other. The rigidity in this case is still further increased, where larger screens are required, by reason of the fact that said strips with their abutting arcuate surfaces are held against lateral movement and in such abutting relation by the said envelope 8 while permitting relative longitudinal movement of the strips to compensate for the differential when the two separate strips are wound together upon the roller 3. To further permit such longitudinal movement, the slots 11 are provided in the outer ends of the strips 9, as disclosed in Fig. 1 of the drawings. At the same time it should be remembered that this differential between the two strips of the pair, when being wound, is exceedingly slight owing to the excessive thinness of the strips 9.

In Fig. 9 I have disclosed a further modification wherein the strips 9 are arcuate in cross section with a reverse or ogee curve. By means of this arrangement, a thinner, flat section may be obtained when the single strip 9 is wound upon the roller 3, and at the same time the advantage of increased rigidity, when the strip is extended, is obtained by reason of the opposing curves opposing collapse or bending of the said strip under pressure of a heavy or large screen.

In Fig. 10 I have illustrated a still further modification wherein the strip 9 is wound upon a separate roller 3', and thus wound separately from the screen 4, excepting at the top end, as shown in Fig. 1 of the drawings. In this case the strips, by their inherent rigidity, merely extend upwardly and support the rigid member 6 at the top end of the screen or sheet 4 and when said screen or sheet 4 is rolled upon its roller 3 the strip 9 is rolled upon the roller 3', it being understood that both rollers 3 and 3' are spring tensioned, but only one of them being provided with controlling dogs or pawls 19.

By means of the novel arrangement and construction herein set forth it is obvious that all folding and pivoted or hingedly connected supporting frames may be eliminated, thereby reducing the weight, cost of construction, and time saved in setting up and folding the screen to storage or inoperative position.

Having described my invention, I claim—

1. A folding screen comprising a rollable sheet; a rigid member secured to each end of said sheet; and resilient members, normally arcuate in cross section to normally extend said members and thereby provide rigidity when extended, connecting the ends of said rigid members whereby said sheet may be normally extended between said rigid and resilient members and in a common plane, said resilient members being rollable with said sheet whereby the whole may be rolled for storage or transportation purposes.

2. A folding screen comprising a housing having a slot in the upper end thereof; a roller rotatably mounted within said housing; a rollable sheet having one end secured to said roller and wound thereon and the other end thereof extending through said slot and exteriorly of said housing; a rigid member secured to said other end; and a pair of resilient members, normally channel-shaped in cross section to normally extend said members and thereby provide rigidity when extended, connecting the ends of the rigid member to the roller whereby said sheet may be held within a flat plane by said resilient and rigid members, said resilient members being rollable upon said roller with said sheet, whereby the entire device may be rolled into a compact form for transportation or storage.

3. A folding screen comprising a roller; a rollable sheet having one end secured to said roller; a rigid member secured to the opposite end of said roller; and a resilient member mounted upon

each opposite side of said sheet and connecting the ends of the rigid member with the roller, said resilient members being normally arcuate in cross section to normally hold said members in longitudinally extended position and to impart rigidity to said members when extended, said resilient members being also rollable upon said roller with said sheet, whereby the whole may be rolled into a compact form for transportation or storage purposes.

4. A folding screen comprising a roller; a rollable sheet having one end secured to said roller and having longitudinally disposed envelopes formed upon each side thereof; a rigid member secured to the opposite end of said sheet; and a resilient strip mounted within each envelope and having one end connected to said rigid member and the other end to said roller, each resilient strip being normally channel-shaped in cross section to normally extend said strip longitudinally and thereby impart rigidity to said strip whereby said sheet may be held in extended position, said resilient strips each being rollable upon said roller with said sheet.

5. A folding screen comprising a roller; a rollable sheet having one end secured to said roller and having longitudinally disposed envelopes formed upon each side thereof; a rigid strip secured to the opposite end of said sheet; and a pair of resilient strips mounted within each envelope with their concaved faces abutting and having their ends connected to the rigid strip and to the roller, each of said resilient strips being normally arcuate in cross section to normally extend and impart rigidity, when extended, to said members, whereby said sheet normally may be held in extended position, said resilient strips being readily rollable upon said roller with said sheet.

6. A folding screen comprising a supporting base; a roller rotatably mounted upon said base; a rollable sheet having one end secured to said roller; a rigid member secured to the opposite end of said sheet; and resilient strips, normally channel-shaped in cross section to normally extend said strips and impart rigidity thereto when extended, connecting the ends of said rigid member and roller and holding the same in spaced relation to normally extend said sheet into a plane, said resilient strips being rollable upon the roller with said sheet whereby the whole may be rolled for storage or transportation purposes.

7. A folding screen comprising a hollow base; a spring roller rotatably mounted within said base; a rollable sheet wound upon said roller and having one end connected thereto; a rigid member connected to the other end of said sheet; and supporting members comprising resilient strips connecting the ends of the rigid member and spring roller, said strips being normally arcuate in cross section to normally extend said strips and impart rigidity thereto when extended, to hold said sheet extended in a plane, said resilient supports being rollable with said sheet upon said spring roller whereby the whole may be rolled for storage or transportation.

8. A folding screen comprising a housing having a slot in the upper surface thereof; a spring roller rotatably mounted within said housing; a rollable sheet having one end secured to said roller and wound thereon and the other end extending through said slot in said housing, said sheet having longitudinally disposed envelopes formed upon each side edge thereof; a rigid member secured to the other end of said sheet; and a resilient strip mounted within each envelope and having one end connected to the rigid member and the other end connected to said roller, each resilient strip being normally channel-shaped in cross section to normally extend said strip and impart rigidity thereto when extended, to normally hold the rigid member in spaced relation with the spring roller and to extend said sheet into a plane, said resilient strips being readily rollable with said sheet upon said roller.

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