United States Patent [19]

Zinn

[11] **3,841,594**

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[54] **COLLAPSIBLE PROJECTION SCREEN**

[75] Inventor: **Robert W. Zinn,** Addison, Ill.

[73] Assignee: **Knox Manufacturing Company,** Wood Dale, Ill.

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[52] **U.S. Cl.** **248/169,** 160/24, 160/351

[51] **Int. Cl.** **G03b 21/56**

[58] **Field of Search** 248/169, 171, 409; 160/24, 160/351

[56] **References Cited**

UNITED STATES PATENTS

1,700,637	1/1929	Lamb	160/24 UX
2,335,884	12/1943	Raven	160/24
2,355,799	8/1944	Heck	160/24
2,361,119	10/1944	Owens	160/24
3,164,349	1/1965	Armstrong	160/351 UX
3,182,714	5/1965	Petrick	160/24
3,629,910	12/1971	Kirberg	160/24 X

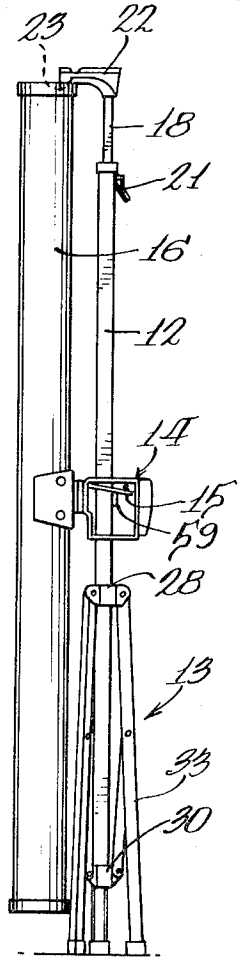
Primary Examiner—J. Franklin Foss

Attorney, Agent, or Firm—Hofgren, Wegner, Allen, Stellman & McCord

[57] **ABSTRACT**

A collapsible projection screen structure comprising an elongate standard, a screen support adjustable along the standard, a screen casing pivotally mounted on the support for movement between upright and horizontal positions, a rolled screen in the casing, an extensible rod on the upper end of the standard for holding the upper end of the screen extended and for holding the upper end of the casing in storage, a stop lug on the standard for limiting downward movement of the support, detent means on the support engageable with the stop lug for defining a storage position of the support on the standard, and means mounting the detent means on the support for bypassing the stop lug to selectively lower the screen for viewing.

9 Claims, 9 Drawing Figures



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SHEET 1 OF 2

Fig. 1.

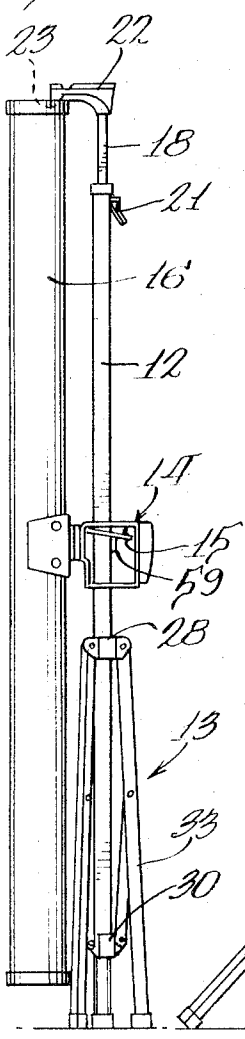


Fig. 2.

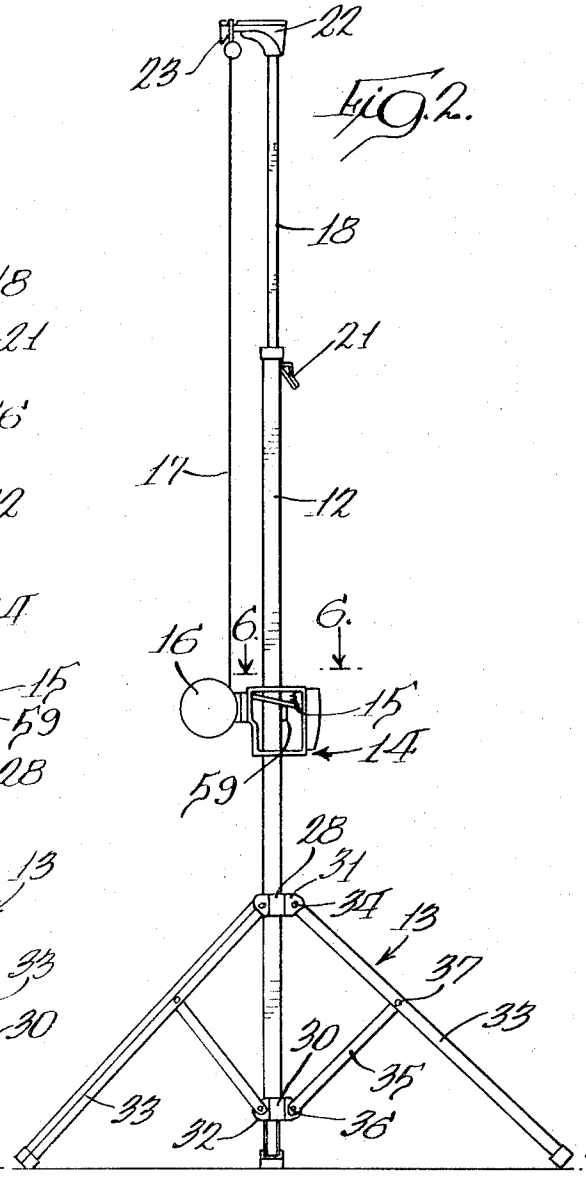


Fig. 3.

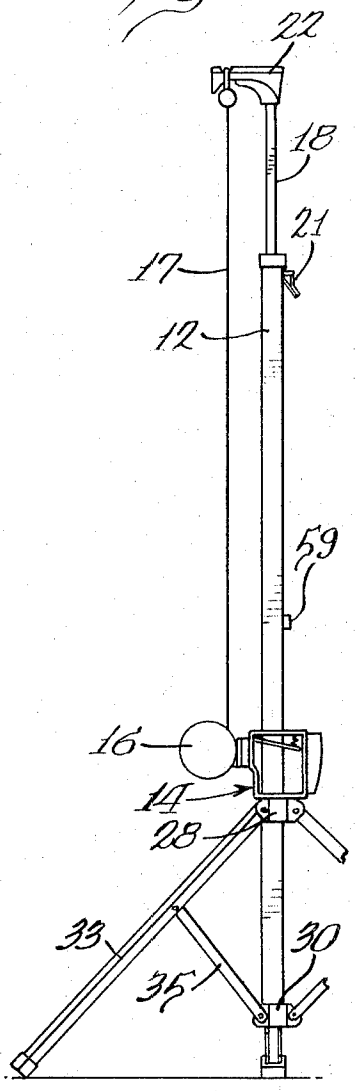


Fig. 4.

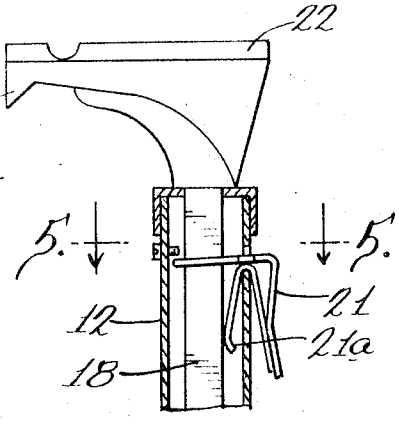


Fig. 5.

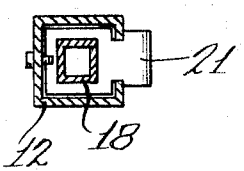


Fig. 6.

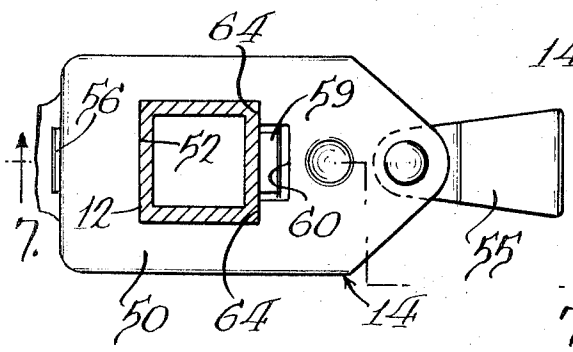


Fig. 7.

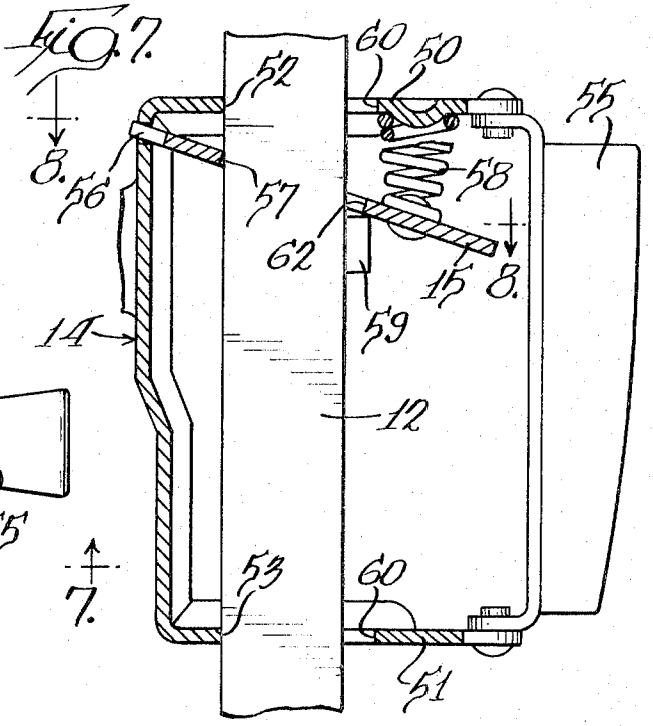


Fig. 8.

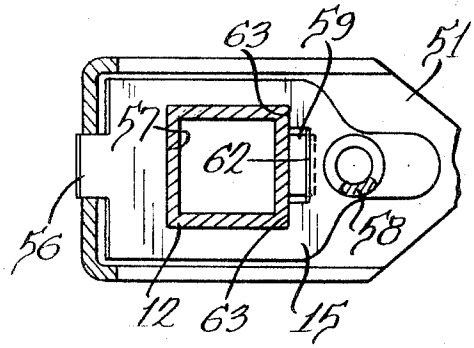
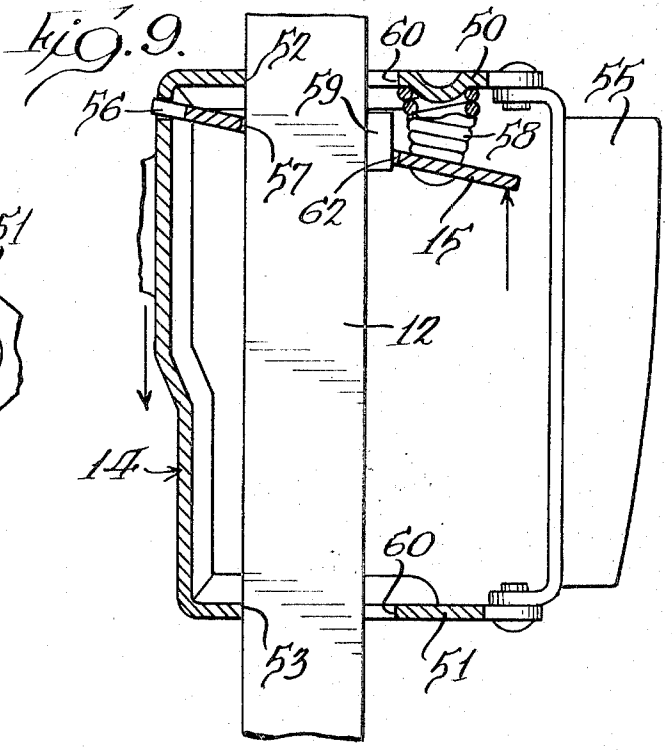


Fig. 9.



COLLAPSIBLE PROJECTION SCREEN

BACKGROUND OF THE INVENTION

The invention relates to a collapsible projection screen structure including an elongate standard carrying an adjustable screen support with a screen casing pivotally mounted thereon for movement between an upright storage position parallel to the standard and a horizontal position transverse to the standard where a rolled screen may be extended to a viewing position in an upright plane.

In collapsible screen structures of the type described, it is desirable to provide for vertical adjustment of the screen support on the upright standard and for retention of the support in adjusted positions on the standard. Prior art efforts have been devoted to provision of such features as shown, for example, in prior U.S. Pat. Nos. 1,700,637; 2,335,884; 2,361,119 and 3,182,714. Generally speaking, the constructions in the aforementioned patents provide for vertical adjustment of a screen support over a wide range of the length of the standard.

Other prior art constructions have included a centering stop on the standard engageable with the screen support for limiting downward movement of the support on the standard at a position where the screen casing will be properly located in vertical position parallel to the standard for storage, as shown in prior U.S. Pat. Nos. 2,832,405 and 3,164,348, for example. While it is desirable to provide a centering stop on the standard for locating the screen support in proper position for collapse and storage of the structure, it is sometimes desirable to permit adjustment of the screen support below the level of the centering stop for purposes of lowering the screen to a viewing position compatible with projection equipment utilized therewith.

SUMMARY OF THE INVENTION

It is a general object of the present invention to provide a new and improved collapsible projection screen structure including an upright standard, a screen support vertically adjustable on the standard, a centering stop on the standard normally effective for limiting downward movement of the screen support at a storage position, detent means on the support engageable with the stop, together with means mounting the detent means on the standard to be manipulated past the centering stop for lowering the screen to an appropriate viewing position.

A more specific object is to provide a new and improved projection screen structure of the type described, including an elongate standard, a screen support adjustable along the standard, a screen casing mounted on the screen support, a rolled screen in the casing, detent means for holding the support in adjusted positions on the standard, stop means on the standard engageable with the detent means for limiting downward movement of the support, and means mounting the dtent means on the support for manipulation past the stop means to selectively lower the support below the stop means.

Preferably, the detent means for holding the screen support in adjusted positions on the standard comprises a plate having one end pivotally mounted on the support, an intermediate portion having an oversize aperture receiving the standard, a manually accessible end, spring means resiliently urging the plate against the standard.

In a preferred construction illustrated herein, the screen support comprises a U-shaped bracket having spaced upper and lower apertured flanges slidably mounted on the standad, the stop means on the standard comprises a lug engageable with the detent plate, and the aperture in the detent plate is elongated in a front-to-rear direction to permit the plate to be manipulated past the stop lug.

As illustrated herein, both apertures in the screen support bracket have a cross-sectional area to fit the standard, and the bracket normally assumes an adjusted position on the standard with the flanges of the bracket biting the standard. Both apertures include a recess to pass the stop lug.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an elevational view of a collapsible projection screen structure embodying the principles of the present invention, with the leg assembly in closed position and the screen casing in storage position parallel to the standard;

FIG. **2** is an elevational view of the screen structure with the leg assembly in supporting position, with the screen casing in horizontal position, and with the screen in extended viewing position;

FIG. **3** is a view like FIG. **2** with the screen support lowered past the centering stop to a lowermost position;

FIG. **4** is an enlarged fragmentary elevational view of the upper end of the standard, partly in section, illustrating the means for retaining the extensible rod in adjusted positions in the standard;

FIG. **5** is a transverse sectional view taken at about the line **5—5** of FIG. **4**;

FIG. **6** is an enlarged fragmentary transverse sectional view taken at about the line **6—6** of FIG. **2**;

FIG. **7** is a fragmentary vertical sectional view taken at about the line **7—7** of FIG. **6** illustrating the screen support in contact with the centering stop on the upright standard;

FIG. **8** is a transverse sectional view taken at about the line **8—8** of FIG. **7**; and

FIG. **9** is a view similar to FIG. **7**, but with the screen support manipulated in a manner to move downwardly past the centering stop on the standard.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

In the embodiment illustrated, and referring particularly to FIGS. **1** and **2**, a standard **12** is adapted for support in upright position by a collapsible tripod leg assembly, generally designated **13**. The standard carries a screen support member generally designated **14** which is slidably mounted on the standard **12** and provided with a latching member **15** for holding the screen support member **14** in vertically adjusted positions on the standard **12**.

The forward face of the screen support member **14** affords a mounting surface to which a conventional screen casing **16** is pivotally mounted. The casing **16** is preferably mounted so that when released from its carrying position parallel to the standard (FIG. **1**), it may be pivoted 90° to its operative position perpendicular to the standard, as shown in FIG. **2**, where a rolled

screen 17 may be extended to a viewing position in an upright plane.

The standard 12 is a tubular member having a telescoping rod 18 slidably received and appropriately guided therein. The telescoping rod 18 is vertically adjustable and held in adjusted positions by a conventional clamping member 21 located near the upper end of the standard 12. The clamping member is preferably biased by a spring member 21*a* so that it is normally held in clamping position and must be manually released to permit adjustment of the telescoping rod 18. The upper end of the rod 18 carries a bail support 22 from which the free upper end of the projection screen may be hung in a conventional manner. The bail support 22 is provided with a depending lug 23 of a size to fit within a well in the end of the casing 16 to hold the casing 16 in its carrying position parallel to the standard, as shown in FIG. 1.

The leg assembly 13 is provided with an upper collar 28 which slidably embraces the lower end portion of the tubular standard 12 and with a lower collar 30 which is fixedly secured adjacent the lower end of the tubular standard 12. The upper collar 28 is provided with three pairs of angularly spaced ears 31, and the lower collar 30 is likewise provided with three pairs of ears 32 angularly spaced about the lower collar 30 in a manner similar to the spacing of ears 31 on the upper collar 28.

A channel-shaped leg member 33 is swingably secured to each pair of ears 31 by a rivet 34. A channel-shaped bracing link 35 is similarly pivotally secured at one end to each pair of ears 32 on the lower collar 30 by rivet 36. The opposite end of each of the bracing links 35 is pivotally secured to an intermediate portion of its associated leg member 33 by a rivet 37.

When the leg assembly 13 is swung toward closed position adjacent the standard 12, the slidable upper collar 28 moves upwardly on the standard 12 (FIG. 1), and the leg members 33 and bracing links 35 swing inwardly about the pivot connections afforded by the rivets 34, 36 and 37. In reverse fashion, when the leg assembly 13 is moved to extended supporting position, the upper collar 28 slides downwardly upon the standard 12 (FIGS. 2 and 5) and the leg members 33 and bracing links 35 pivot outwardly.

The details of the leg assembly form no part of the present invention and need not be described completely. If desired, the leg assembly may be similar to that in the aforementioned U.S. Pat. No. 3,164,348, for example, wherein spring means associated with the leg assembly 13 causes the leg assembly to be yieldably held in closed position adjacent the standard (FIG. 1), and yieldably held in the outwardly spread supporting position (FIG. 2).

As best illustrated in FIGS. 6–9, the screen support member 14 comprises a U-shaped bracket including spaced upper and lower horizontally directed flanges 50 and 51 which are provided respectively with aligned apertures 52 and 53 receving the tubular standard 12 so that the screen support bracket 14 is vertically slidable adjustable on the standard. As illustrated, the standard 12 is substantially square in cross-sectional configuration, and the apertures 52 and 53 in the screen support bracket 14 are generally square and closely fit the standard so that the bracket 14 may slide relative to the standard 12. The free ends of the bracket flanges 50 and 51 are connected by a handle member 55 having upper and lower ends respectively connected to the flanges 50 and 51.

The latching member 15 is in the form of a plate which has one end pivotally mounted at 56 on the front of the screen support bracket 14. The plate 15 includes an intermediate portion which has an aperture 57 which is enlarged relative to the standard 12 through which the standard 12 passes. The opposite end of the plate 15 is biased downwardly by a coiled compression spring 58 acting between the flange 50 and the plate 15 to urge the latter against the standard 12 so that the edges of the plate adjacent the aperture bite into the standard.

In operation, the weight of the screen casing 16 and the screen 17 on the front of the screen support bracket 14 tend to tilt the upper portion of the bracket forwardly and the lower portion of the bracket rearwardly, as shown in FIG. 9, so that the lower flange 51 bites into the front of the standard 12 and the upper flange 50 bites into the rear of the standard 12. Together with such action, the latching plate 15 is biased by spring 58 toward the inclined position illustrated in FIG. 9 where the plate bites into the front and rear surfaces of the standard 12. As a result, the screen support 14 will be held in selected vertically adjusted positions for purposes of locating the lower portion of the screen appropriately for viewing. The support 14 may be vertically adjusted on the standard 12 by grasping the handle 55 in a manner to pivot the latch 15 in a direction to compress the spring 58 such that the latch is released from the standard 12. Under these circumstances, the screen support 14 may be raised or lowered on the standard 12.

As seen in FIGS. 7 and 9, the standard 12 includs a stop lug 59 on the rear thereof engageable with the detent plate 15 at a position suitable for centering the screen support 14 on the standard at a position where the casing 16 will be appropriately located for storage when disposed parallel to the standard as illustrated in FIG. 1. In such position, the screen casing is positioned so that the upper end may be held by the projection 23 against pivotal movement relative to the standard. At the same time, the lower end of the casing is slightly elevated above the floor so that the legs 33 support the entire structure. The centering stop 59 is convenient for expediting collapse of the structure, in that it normally functions to define a lower limit to which the screen support 14 should be moved for storage.

It sometimes becomes desirable to lower the screen support 14 below the level of the centering stop 59, so that the lower portion of the screen in extended operative position may be disposed low enough to accommodate a picture projected from a particular projection apparatus which might not conveniently permit elevation of the image. According to the present invention, the latch plate 15 is mounted in a manner to be manipulated past the centering stop 59 so that the bracket may be lowered as desired. In order to facilitate such manipulation, the support flanges 50 and 51 are recessed as at 60 adjacent the rear of apertures 52 and 53 sufficient to permit each of the flanges 51 and 50 to be moved past stop 59. As illustrated in FIG. 10, the plate 15 is also recessed at 62 adjacent the rear of plate aperture 57, in a manner to allow the plate 15 to pass the stop 59, when the plate is compressed toward the portion illustrated in FIG. 11. The width of the recess 62 in the latch plate 15 is less than the width of recess 57,

so that laterally extending edges as at **63** are engageable with the standard for retaining the support in adjusted positions. Similarly, the width of recess **60** in flange **50** is less than the width of apertures **52** so that edges **64** are engageable with the standard.

The construction described, with stop **59,** facilitates collapse of the structure expeditiously by movement of latch plate **15** against stop **59,** while also permitting adjustment of the screen below the stop if that becomes desirable in situations where the image cannot be elevated for projection to the screen when positioned above stop **59.**

I claim:

1. A projection screen structure, comprising,
a. an elongate standard,
b. a screen support adjustable along an intermediate portion of the standard,
c. a screen casing mounted on the screen support,
d. a rolled screen in the casing,
e. a hanger on the upper end of the standard,
f. a latch on the screen support for holding the support in adjusted positions on the standard,
g. a stop lug on the standard normally engageable with the latch for limiting downward movement of the support at a position defining a storage position of the support on the standard,
h. means mounting the support on the standard for bypassing the stop lug, and
i. means mounting the latch on the support for selectively bypassing the stop lug to lower the support past the stop lug.

2. A projection screen structure as defined in claim **1,** wherein the screen support comprises a bracket having spaced upper and lower apertured flanges slidably mounted on the standard.

3. A projection screen structure as defined in claim **2,** wherein the standard is rectangular in cross section and the screen support bracket flanges have rectangular apertures slidably receiving the standard and recesses for clearing the stop lug.

4. A collapsible projection screen structure as defined in claim **2,** wherein the latch for holding the screen support bracket in adjusted positions on the standard comprises a plate having one end pivotally mounted on the bracket, an intermediate portion having an oversize aperture receiving the standard, a manually accessible opposite end, and spring means resiliently urging the plate against the standard.

5. A projection screen structure as defined in claim **4,** wherein the pivoted plate has a recess for clearing the stop lug.

6. A collapsible projection screen structure, comprising,
a. an elongate standard,
b. a screen support bracket having spaced flanges with apertures slidably receiving an intermediate portion of the standard for adjustment of the bracket along the standard,
c. a releasable latch on the bracket engageable with the standard for holding the bracket in canted position biting the standard,
d. a tubular screen casing mounted on the screen support for movement between an upright storage position parallel to the standard and a horizontal position transverse to the standard,
e. a rolled screen in the casing extensible from the casing in an upright plane when the casing is horizontally disposed,
f. an extensible rod on the upper end of the standard for holding the upper end of the screen in extended position and for holding the upper end of the casing in storage position,
g. releasable clamp means on the standard for holding the rod in adjusted positions,
h. a stop lug on the rear of the standard normally engageable with the latch on downward movement of the bracket to limit downward movement of the bracket at a position defining a storage position of the bracket,
i. the apertures in said bracket flanges being shaped to pass the stop lug for movement of the screen to a lower position for viewing, and
j. the latch being shaped with a recess for selectively bypassing the stop lug.

7. A collapsible projection screen structure as defined in claim **6,** wherein the releasable latch on the bracket for holding the bracket on the standard comprises a plate having one end pivotally mounted on the front of the bracket, an intermediate portion having an oversize aperture receiving the standard, and an opposite end manually accessible adjacent the handle for manipulation, and spring means resiliently acting between the upper bracket flange and said opposite end of the plate to bias such end downwardly to engage the plate with the standard.

8. A collapsible projection screen structure as defined in claim **7,** wherein the latch plate is recessed at the rear of the oversize aperture to pass the stop lug.

9. A collapsible projection screen structure, comprising,
a. an elongate standard,
b. a collapsible leg structure on the lower end of the standard for supporting the standard in upright position,
c. a screen support bracket having spaced flanges with apertures slidably receiving an intermediate portion of the standard for adjustment of the bracket along the standard,
d. a handle on the screen support bracket,
e. a releasable latch on the bracket engageable with the standard for holding the bracket in canted position biting the standard,
f. a tubular screen casing pivotally mounted on the screen support for swinging movement between an upright storage position parallel to the standard and a horizontal position transverse to the standard,
g. a rolled screen in the casing extensible from the casing in an upright plane when the casing is horizontally disposed,
h. an extensible rod on the upper end of the standard for holding the upper end of the screen in extended position and for holding the upper end of the casing in storage position,
i. releasable clamp means on the standard for holding the rod in adjusted positions,
j. a stop lug on the rear of the standard normally engageable with the latch on downward movement of the bracket to limit downward movement of the bracket at a position defining a storage position of the bracket,
k. said bracket flanges being recessed at the rear of the apertures therein to pass the stop lug for movement of the screen to a lower position for viewing, and
l. the latch being apertured to selectively bypass the stop lug.

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