Aug. 14, 1945. A. L. RAVEN 2,382,025

PROJECTION SCREEN STAND

Filed May 29, 1943 2 Sheets-Sheet 1

Fig. 1,

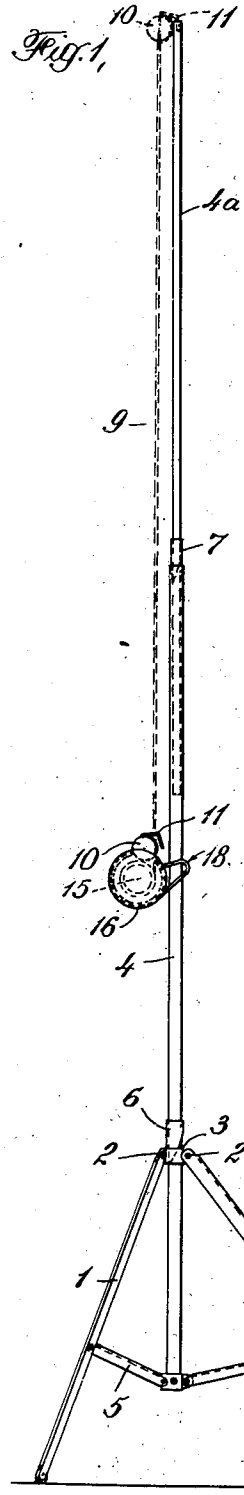


Fig. 2,

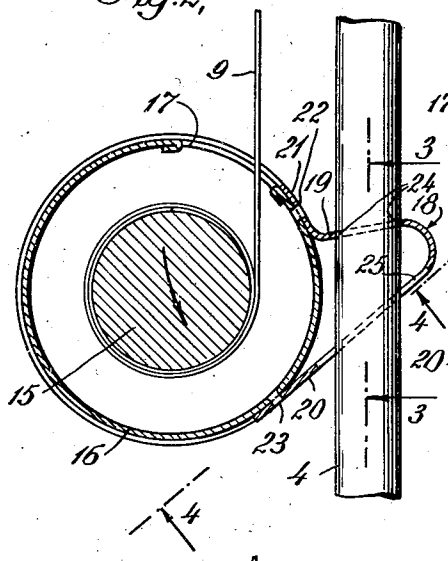


Fig. 3,

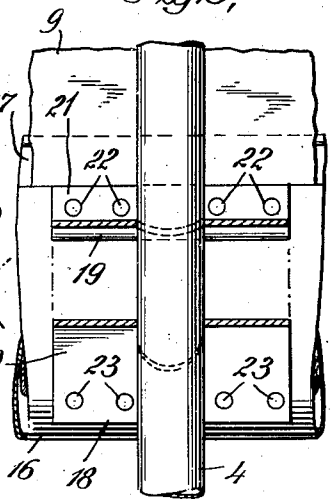


Fig. 4,

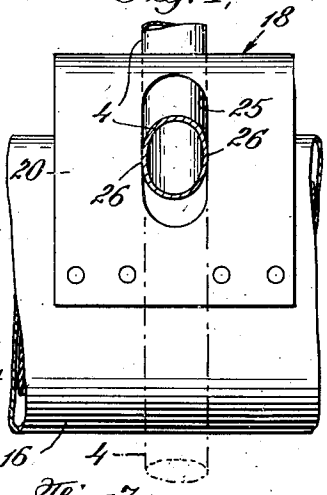


Fig. 5,

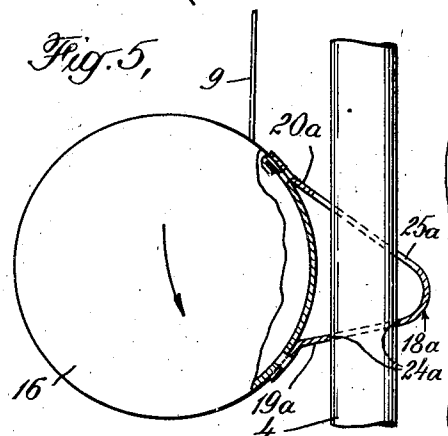


Fig. 6,

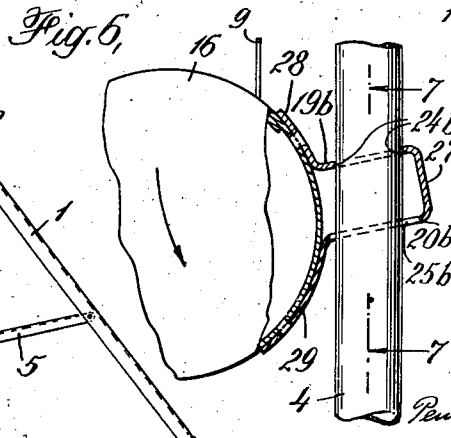
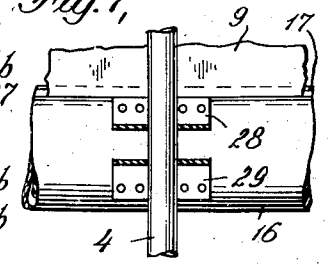


Fig. 7,



INVENTOR
ALBERT L. RAVEN
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

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Fig. 8,

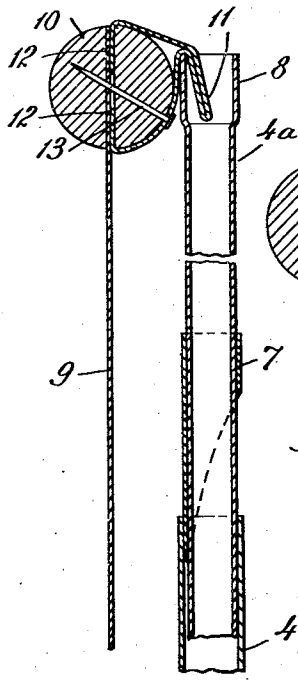


Fig. 10,

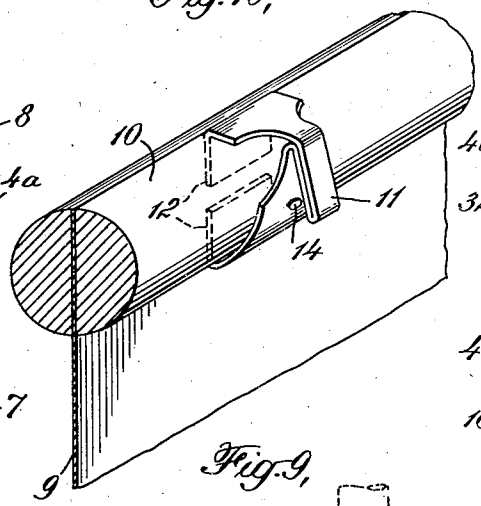


Fig. 12,

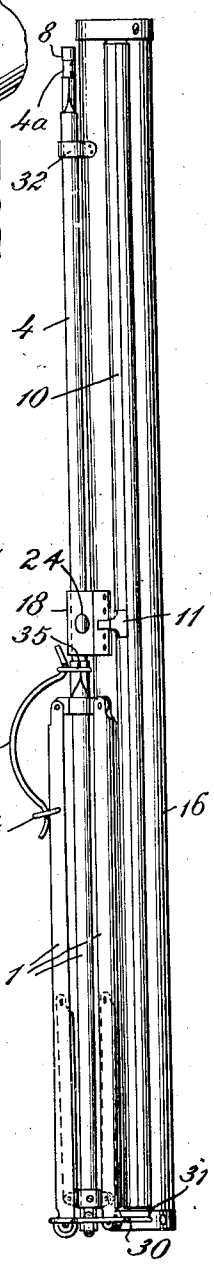


Fig. 9,

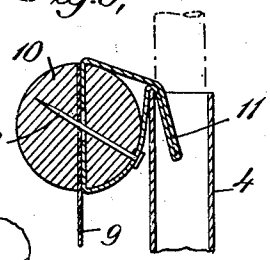
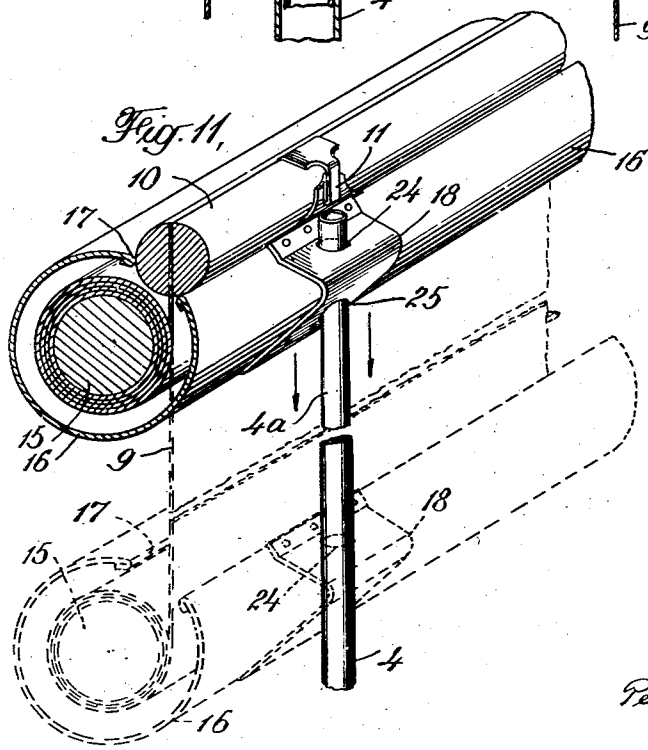


Fig. 11,



INVENTOR
ALBERT L. RAVEN
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

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UNITED STATES PATENT OFFICE

2,382,025

PROJECTION SCREEN STAND

Albert L. Raven, Mount Vernon, N. Y.

Application May 29, 1943, Serial No. 488,952

8 Claims. (Cl. 160—24)

This invention relates to improvements in adjustable display stands for rolled screens and the like, the general object of the invention being to provide an improved adjustable stand of this kind intended to support an elongated tubular casing such as is used to house a spring roller upon which may be wound a projection screen, map, drawing, or the like.

An important consideration in connection with such stands is the desirability of providing for the assembly of the support, or display stand part of the device, and the tubular casing into a compact package for carrying from place to place and for storage. It is also important to be able to quickly set up the device for use. This requires a construction which permits the casing to be released from its association with the stand in the carrying package and the casing mounted on the mast of the display stand, the screen being unrolled and the supporting strip or batten for the upper edge of the screen attached to the upper end of the mast and the casing adjusted to the proper position on the mast to unroll the desired amount of screen.

In my copending application, Ser. No. 413,943, filed October 7, 1941, patented Dec. 7, 1943, No. 2,335,884, of which the present application is in part a continuation, there is disclosed and claimed an arrangement of the tubular casing and the display stand by which they are connected together in such a way that they constitute a single unit; that is to say, on setting up the stand it is only necessary to release the two ends of the casing from the stand and then swing the casing into position at right angles to the mast. In the stand of the present invention the casing and the stand are not constructed as a single unit and when the casing is released from the stand the two parts are entirely separate from one another, an object of the present invention being to provide a device for supporting the casing on the mast which will permit the ready assembly and adjustment of the casing and mast at right angles to one another in position to support the unrolled screen.

The attachment of the upper edge of the screen to the upper end of the mast tends to hold the casing at right angles to the mast so long as the screen is in display position, but when it has been re-rolled and retracted into the casing, as occurs in taking down the screen to reassemble it with the mast into the compact package, there is a tendency for the casing to depart from its position at right angles to the mast to such an extent that the display stand becomes awkward and unattractive in appearance. It is another object of the present invention to provide a device for supporting the casing in position on the mast which, itself, maintains the casing at substantially right angles to the mast.

Another object of the invention is to provide a device for supporting the casing in adjustable position on the mast which renders the screen roll casing conveniently adjustable as to its position and supports the casing at substantially right angles to the mast, but also which is of rugged construction so that it will stand up under hard usage but at the same time is inexpensive to manufacture, using economical material and requiring few manufacturing operations, all of which are simple in character.

Another object of the present invention is to provide a device for supporting the upper edge of the screen at the top of the mast which is so constructed and so related to the device for supporting the casing on the mast that the connection of the top edge of the screen with the top of the mast may be made automatically as the casing is assembled in position on the mast.

The invention will be understood by reference to the accompanying drawings which illustrate several embodiments thereof. It is to be understood, however, that the invention is not limited to the constructions shown in these drawings as exemplifying the invention, but that the scope of the invention is set forth in the appended claims. In these drawings:

Fig. 1 is a view in elevation of the stand set up and supporting a motion picture screen in exhibiting position, the screen being illustrated in edge view;

Fig. 2 is a vertical transverse section taken at the center of the screen roll casing drawn to an enlarged scale and showing the support by which the casing is adjustably positioned upon the mast of the display stand;

Fig. 3 is a fragmentary vertical section taken on line 3—3 of Fig. 2 drawn to the same scale as Fig. 2;

Fig. 4 is a fragmentary section taken on line 4—4 of Fig. 2;

Fig. 5 is a view somewhat similar to Fig. 2 showing a modification;

Fig. 6 is another view somewhat similar to Fig. 2 showing a further modification.

Fig. 7 is a vertical section taken on line 7—7 of Fig. 6 and drawn to a somewhat smaller scale;

Fig. 8 is a vertical central section through the

upper portion of the mast and screen showing the device for supporting the upper edge of the screen;

Fig. 9 is a fragmentary section similar to Fig. 8 showing the screen supporting device engaged with the lower section of the mast;

Fig. 10 is an isometric view of the central part of the upper edge of the screen showing further details of the supporting device;

Fig. 11 is an isometric view illustrating the manner of automatically engaging the screen edge supporting device with the top of the mast in the same movement by which the casing is placed on the mast; and

Fig. 12 is a side view of the screen roll casing and display stand assembled into a compact package for carrying and for storage.

Referring now to the accompanying drawings, the display stand is of the tripod type having three equal length legs 1 each pivoted at 2 to a crown member 3 which has a central opening to receive a mast 4. The lower end of the mast has pivoted to it three operating arms 5 which are jointed at their outer ends to the three legs 1. Collar 3 slides upwardly on mast 4 to cause legs 1 to collapse into parallel position with one another and with mast 4, when it is desired to fold the display stand to enable it to be assembled into a compact package for storage or for carrying about, as shown in Fig. 12.

Crown 3 is slid downwardly on mast 4 so as to spread legs 1, when the stand is set up in display position as shown in Fig. 1, all as described in my former application above referred to. Also as set forth and claimed in that application, mast 4 is adjustably secured or locked in its set up position by means of an axially slidable sleeve-like wedge member 6 which operates in the clearance space between the outside of the mast and the opening in crown 3.

Mast 4 is usually constructed with two or more telescoping sections, the mast shown in Fig. 1 having two sections, the upper of which is indicated by numeral 4*a*. This upper mast section 4*a*, instead of being made of a solid rod as is customary in screen stands, is made of a light metal tube which not only saves metal but also makes the stand lighter in weight and permits additional mast sections to be used if desired. This also facilitates the support of the upper edge of the screen, as will be apparent from Figs. 8–11 to be described presently. Upper section 4*a* is secured or locked in any desired position with respect to the main mast section 4 by means of a second sleeve-like wedge member 7, a clearance space also being provided between the outer surface of mast section 4*a* and the interior of mast section 4 to receive the tongue of wedge member 7. The upper end of mast section 4*a* is expanded as shown at 8 in order to retain sleeve wedge 7 on the mast when the device is folded into a compact package, as shown in Fig. 12.

The projection screen is indicated by numeral 9 and it is reinforced along its upper edge by means of a rigid strip or batten 10, preferably made in two semicircular halves placed respectively on opposite sides of the screen and secured together by nailing or in any other suitable manner. The device for securing the batten 10 to the upper end of the mast comprises a downwardly pointed hook member secured to batten 10 midway between its ends, that is, at the center of the upper edge of screen 9.

Hook 11 may conveniently be made of a piece of sheet metal punched to an appropriate form and folded upon itself, as shown in Figs. 8 and 10, the central portion of the folded strip forming the hook portion and the end portions 12 being suitably bent so as to be received between the two halves of batten 10. Ends 12 are held in place by friction and also by means of a nail 13 which passes through an aperture 14 in the lower portion of the metal strip and is then driven between the edges of the ends 12 which are spaced apart for this purpose. This nail serves as one of the several nails which hold the two halves of batten 10 together.

Referring now to Figs. 2 and 3 of the drawings, screen 9 is wound upon a roller 15 which is an ordinary spring roller such as is used for window shades and this roller is mounted for rotation in supports adjacent the opposite ends of a tubular casing 16. The casing is provided with a slot-like opening 17 through which the screen is withdrawn, and this opening is closed by batten 10 when the screen is withdrawn into the casing by winding upon roller 15.

Casing 16 may be supported on either the upper section 4*a* or the lower section 4 of the mast, but as it is usually desired to expose the entire surface of the screen, it is usually positioned on the lower section 4, as shown in Fig. 1. In order to adjustably support casing 16 on the mast, the casing is provided with a supporting device 18. Supporting device 18, as shown in Figs. 2 and 3 is a V-shaped plate member bent to form a rounded apex and upper and lower leg portions 19 and 20, respectively. The width of supporting member 18 indicated in Fig. 3 is somewhat greater than the thickness of the mast and appropriate to give the member the required stiffness.

Supporting member 18 is permanently attached to casing 16 by its legs 19 and 20, the upper leg 19 being mounted in a nearly radial position on casing 16 and having its marginal edge bent upwardly as indicated at 21, so as to facilitate attachment to the casing by spot welding or riveting indicated by numeral 22. Lower leg 20 is straight and mounted tangent to the lower side of casing 16, being also attached by any suitable means such as spot welding or riveting indicated by numeral 23.

The upper leg portion 19 is provided with an aperture 24, preferably, though not necessarily, circular but which is only slightly larger than the mast. Lower leg portion 20 is provided with an elongated or slot-like opening 25 extending in a direction generally at right angles to the axis of casing 16 and long enough to permit the tilting of the upper leg member 19 under the influence of the weight of the roller 15 and casing 16 so as to cause the edges of aperture 24 to serve as a clutch to grip the mast and hold the casing in any position to which it may be adjusted thereon.

Although it is necessary to permit the upper leg member 19 freedom to tilt about an axis parallel with the axis of casing 16, it is desirable to prevent it from tilting about an axis at right angles thereto, and plate clutches of this sort have a tendency to tilt in any direction. In order to overcome this tendency and to permit the upper leg or plate member 19 to tilt only about a horizontal axis parallel with the axis of the casing, the elongated or slot-like aperture 25 is arranged to have a width which is substantially the same as that of mast 4, as shown in Fig. 4, so that the sides 26 of this opening engage the surface of the mast at all times.

These side portions **26** of slot **25** being spaced vertically along the mast from the clutch opening **24** of upper leg **19** therefore serve as a guide which cooperates with aperture **24** to maintain supporting member **18**, and consequently casing **16**, at right angles to mast **4** when viewed from either the front or the rear of the screen; that is to say, tilting of the supporting device **18** and casing **16** about a horizontal axis at right angles to the axis of the casing is prevented. By this means the casing **16**, when viewed either from the front or the rear, even though the screen is not unrolled and attached to the top of the mast, is at all times maintained in a position at right angles to the mast.

In the modification shown in Fig. 5 the supporting device **18***a* is substantially like the supporting device **18** previously described except that it has been turned upside down, the clutch plate leg **19***a* being on the bottom and the leg **20***a* with the guiding slot **25***a* in it on top.

In Fig. 6 a modification is shown in which the supporting device, instead of being constructed of a V-shaped plate member, is made with a U-shaped plate member, this device being indicated as well by numeral **27**. The upper leg **19***b* and the lower leg **20***b* are parallel with one another and they have respective flange portions **28** and **29** which are bent to the curvature of the casing **16** and secured thereto by welding or any other suitable means. Upper plate member **19***b* is provided with a clutching aperture **24***b* and the lower plate member **20***b* with a slot **25***b*. This slot serves as a guide cooperating with aperture **24***b* to maintain the casing at right angles to the mast when viewed from the front or the rear, as shown, for example, in Fig. 7.

It is desirable to be able to set up projection screens of this kind quickly and easily and with as little annoyance as possible in adjusting the mechanism. With screen display stands as usually constructed it is customary to go through a series of different steps before the screen is in proper position for the exhibition of a picture upon it. First of all the display stand is set up with the top of the mast at the proper height at which it is desired to support the upper edge of the screen. Then it is necessary to mount and secure the screen roll casing with the screen still rolled in it on the mast but whether the casing is properly positioned is wholly a matter of chance and usually the screen is secured in position by turning a clamping screw. With the casing thus fixed to the mast the screen is then unwound and its upper edge is attached to the top of the mast by whatever means may be provided. After this has been done it is usually necessary to again adjust the casing to a different position, or to raise or lower the upper section of the mast in order to expose the entire screen surface.

The present screen display stand is so constructed that this operation is considerably simplified and instead of requiring a number of steps, the entire application of the screen to the mast, the connection of the upper edge of the screen to the top of the mast and the positioning of the casing at the proper position on the mast can be done all in one step and all in one continuous movement. This is illustrated in Fig. 11 where the screen roll casing **16**, as shown in full line position is being placed upon the upper end of the upper mast section **4***a*. As the upper end of this mast section is threaded through the slot **25** and the clutching aperture **24**, hook or tongue **11** is close to and in accurate axial alinement with the open upper end of mast section **4***a*. Consequently the hook is automatically engaged with the top of the mast substantially as the mast is passed through opening **24**. Then as the downward movement of the casing continues the screen is unwound and the casing is merely moved downwardly on the mast until all of the screen surface has been exposed. At this position (shown in dotted lines) the casing is released, clutch opening **24** grips the mast and the operation of adjusting the screen has been completed.

This is brought about by the fact that tongue **11** is positioned at the center between the ends of batten **10** or the side edges of the screen and that supporting device **18** is similarly positioned on casing **16**; also by the fact that batten **11** is pulled against its seat in aperture **17** by the roller spring (not shown) and consequently always rests in the same position so that tongue **11** always points in the direction of clutch opening **24**, that is to say, is substantially alined with the axis of this opening and consequently with the axis of the mast.

Referring to Fig. 12, and also to Figs. 2, 5 and 6, the opening between the sides or leg portions **19** and **20** of supporting devices **18**, **18***a* and **18***b* is in the form of a loop (see Figs. 2, 5 and 6) such that when the display stand has been folded, as previously described, and it is desired to assemble it into a carrying or storage package, the mast can be inserted in such opening or aperture of supporting member **18**, as shown in Fig. 12, and this effectively unites the screen roll casing and the folded stand in compact relation. In order to secure the parts in this relation, a bail member **30** is provided which is pivoted to the casing at **31** and which frictionally surrounds and engages the lower ends of one of the legs **1**, as described more in detail in my co-pending application hereinabove mentioned. It is desirable also to provide some sort of tie between the upper end of the mast section **4** (into which the section **4***a* has been telescoped) to the casing. This can be done, for example, by means of a metal strap **32** riveted or welded to the casing and forming a second loop member to receive the upper end of mast **4**. It will be understood that the second loop member or strap **32** may be omitted if desired.

A handle for carrying purposes is provided in the form of a leather or fabric strap **33**, the lower end of which is secured to one of the folding legs **1** of the stand by means of a wire loop **34**, or other suitable means, which prevents the handle from longitudinal movement away from the center of gravity of the package. The opposite end of handle **33** is conveniently secured in place by means of a wire loop **35** which surrounds but is slidable upon mast **4**.

By means of the present invention, there has been provided a screen display stand which not only forms a compact package for carrying or storage but which can be readily set up for use. It will be understood that changes may be made in the details of the construction illustrated without departing from the spirit of the appended claims.

I claim:

1. In a display stand for rolled screens having a base portion, a mast and an elongated screen roll casing, a device for supporting the casing in adjusted position on the mast comprising a pair of plates projecting from the surface of the casing substantially parallel with the axis thereof, said plates having alined apertures therein to receive the mast, one of said apertures constituting

a gripping aperture and the other a guiding aperture, the gripping aperture being only slightly larger than the mast so that its edges grip the mast when the device is tilted and the guiding aperture being elongated sufficiently to prevent its ends from touching the mast when the device is tilted into gripping engagement therewith, and the sides of said aperture being in guiding engagement with the mast to maintain the casing axially at substantially right angles thereto.

2. In a display stand for rolled screens having a base portion, a mast and an elongated screen roll casing, a device for supporting the casing in adjusted position on the mast comprising a V-shaped plate member having its legs secured to the casing and its apex spaced therefrom, the surfaces of said legs being substantially parallel with the axis of the casing, said surfaces having alined apertures therein to receive the mast, one of said apertures constituting a gripping aperture and the other a guiding aperture, the gripping aperture being only slightly larger than the mast so that its edges grip the mast when the device is tilted and the guiding aperture being elongated sufficiently to prevent its ends from touching the mast when the device is tilted into gripping engagement therewith and the sides of said aperture being in guiding engagement with the mast to maintain the casing axially at substantially right angles thereto.

3. In a display stand for rolled screens having a base portion, a mast and an elongated screen roll casing, a device for supporting the casing in adjusted position on the mast comprising a U-shaped plate member having its legs secured to the casing and the bottom of the U spaced therefrom, the surfaces of said legs being substantially parallel with the axis of the casing, said surfaces having alined apertures therein to receive the mast, one of said apertures constituting a gripping aperture and the other a guiding aperture, the gripping aperture being only slightly larger than the mast so that its edges grip the mast when the device is tilted and the guiding aperture being elongated sufficiently to prevent its ends from touching the mast when the device is tilted into gripping engagement therewith, and the sides of said aperture being in guiding engagement with the mast to maintain the casing axially at substantially right angles thereto.

4. In a display stand for rolled screens having a base portion, a mast and an elongated screen roll casing supported at right angles to the mast, means for releasably attaching the upper edge of the screen to the mast comprising a hook mounted on the upper edge of the screen and a longitudinally disposed aperture at the top of the mast to receive the hook.

5. In a display stand for rolled screens having a base portion, a mast and an elongated screen roll casing, a clutch device for supporting the casing in adjusted position on the mast including a plate projecting from the surface of the casing substantially parallel with the axis thereof and having an aperture therein to receive and engage the mast, a hook member adapted to engage a longitudinally disposed aperture at the top of the mast to support the upper edge of the screen and a mounting for said hook member secured to the edge of the screen and adapted when the screen is rolled into the casing to position said hook member substantially in alinement with the aperture in the clutch device so that when the mast is threaded through said aperture in setting up the screen, the hook is automatically engaged with the upper end of the mast.

6. In a display stand for rolled screens having a screen roll casing, a supporting stand therefor including a mast and legs foldable into parallel relationship to form a compact package, a loop member mounted on said casing adapted to have the mast passed through it in positioning the supporting stand with the casing to form said compact package, and a bail member pivoted to the casing and adapted to be swung about the pivot into coaction with one of said legs to place the bail in connecting engagement with the stand.

7. In a display stand for rolled screens having a screen roll casing, a supporting stand therefor including a mast and legs foldable into parallel relation with one another, a supporting device fixed to the casing having two apertures therethrough, the axis of one being at right angles to the axis of the casing and adapted to receive the mast to hold the casing in display position at right angles to the mast, the axis of the other being parallel with the casing axis and adapted to receive the mast when the stand is positioned parallel with the casing to form a compact package, and a bail member pivoted to the casing and adapted to be swung about the pivot into coaction with one of said legs to place the bail in connecting engagement with the stand.

8. In a display stand for rolled screens having a screen roll casing, a supporting stand therefor including a mast and legs foldable into parallel relationship with one another, a supporting device fixed to the center of the casing having two apertures, the axis of one being at right angles to the axis of the casing and adapted to receive the mast to hold the casing in display position at right angles to the mast, the axis of the other aperture being parallel with the casing axis and adapted to receive the mast when the stand is positioned parallel with the casing to form a compact package, a loop member mounted adjacent one end of said casing to receive the end portion of the mast, and a bail member pivoted to the casing at the opposite end thereof and adapted to be swung about the pivot into coaction with one of the legs of said stand to place the bail in connecting engagement with the stand.

ALBERT L. RAVEN.