Nov. 1, 1966 H. J. BIESCHKE 3,282,545

HANDLE ACTUATED TRIPOD STRUCTURE

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FIG. 1

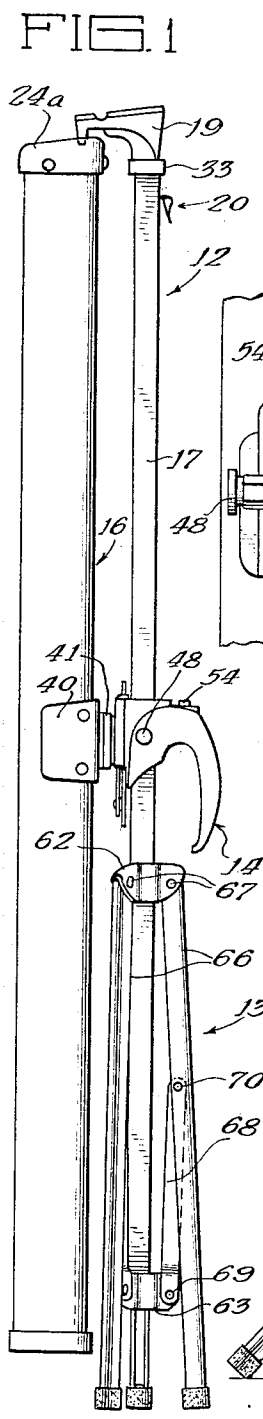


FIG. 2

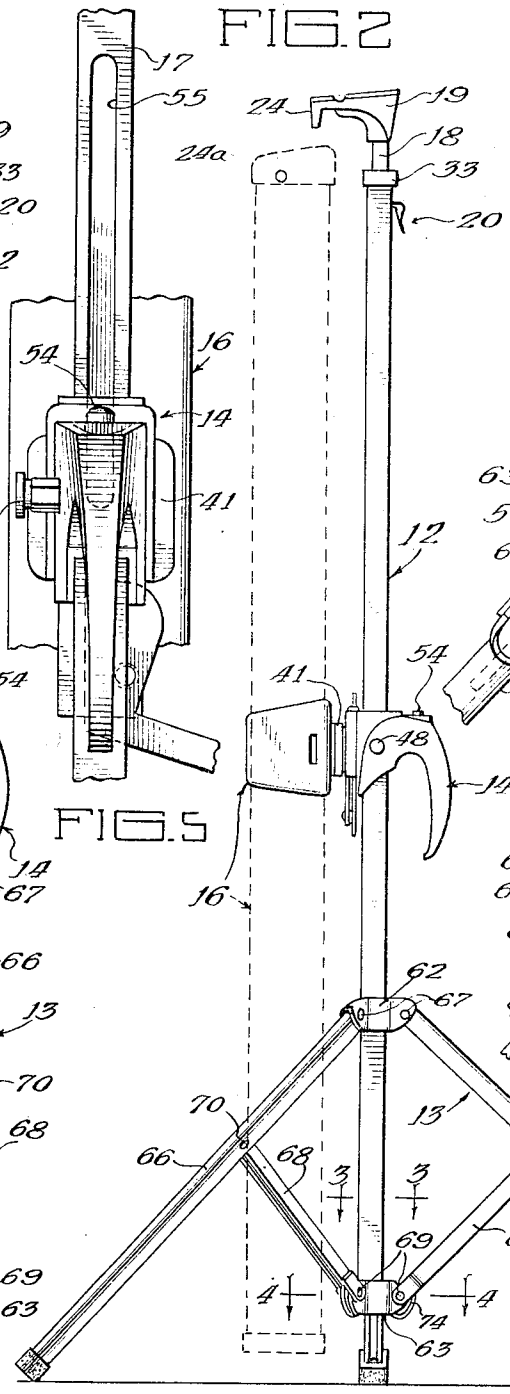
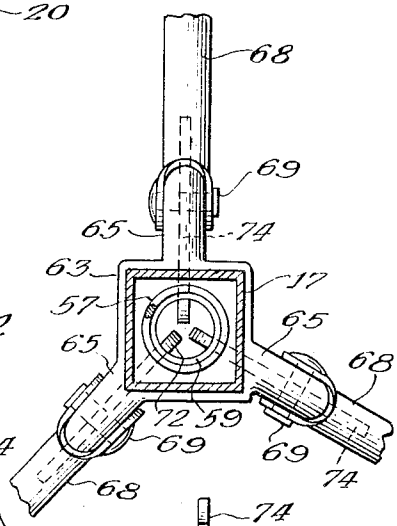


FIG. 5

FIG. 3



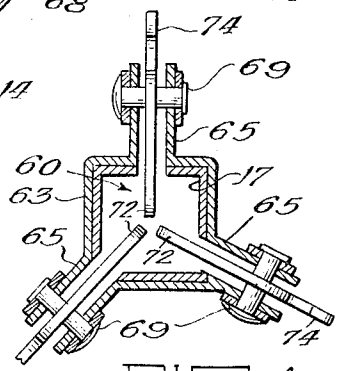


FIG. 4

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HANDLE ACTUATED TRIPOD STRUCTURE

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FIG. 6

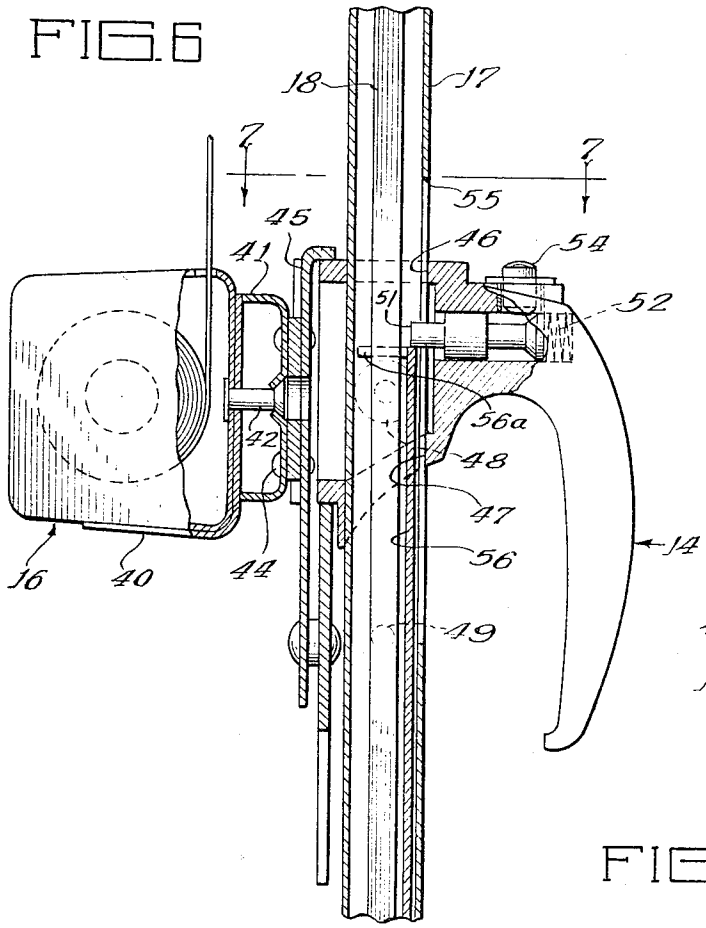


FIG. 7

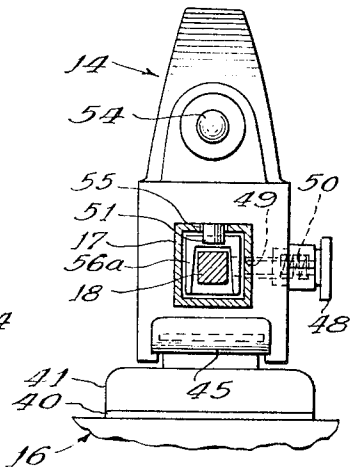
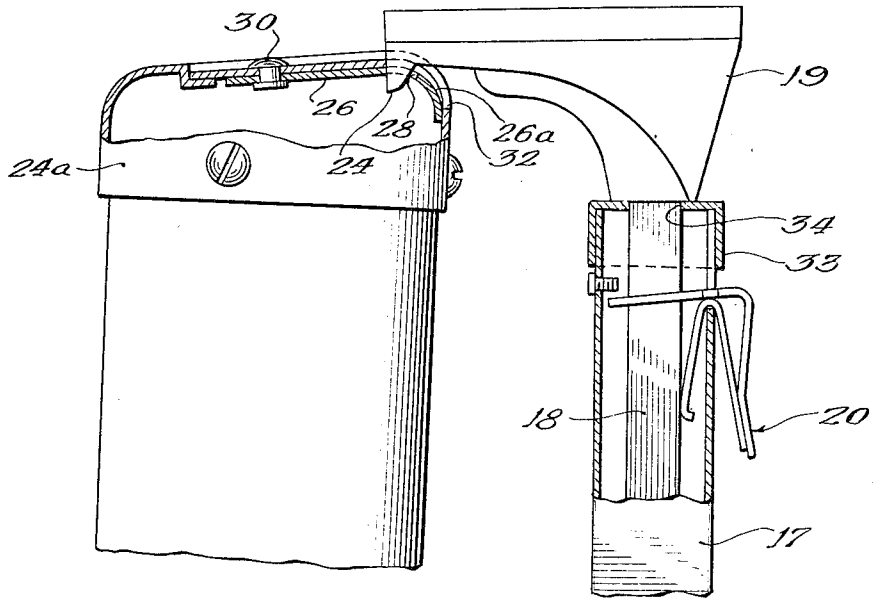


FIG. 8



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FIG. 9

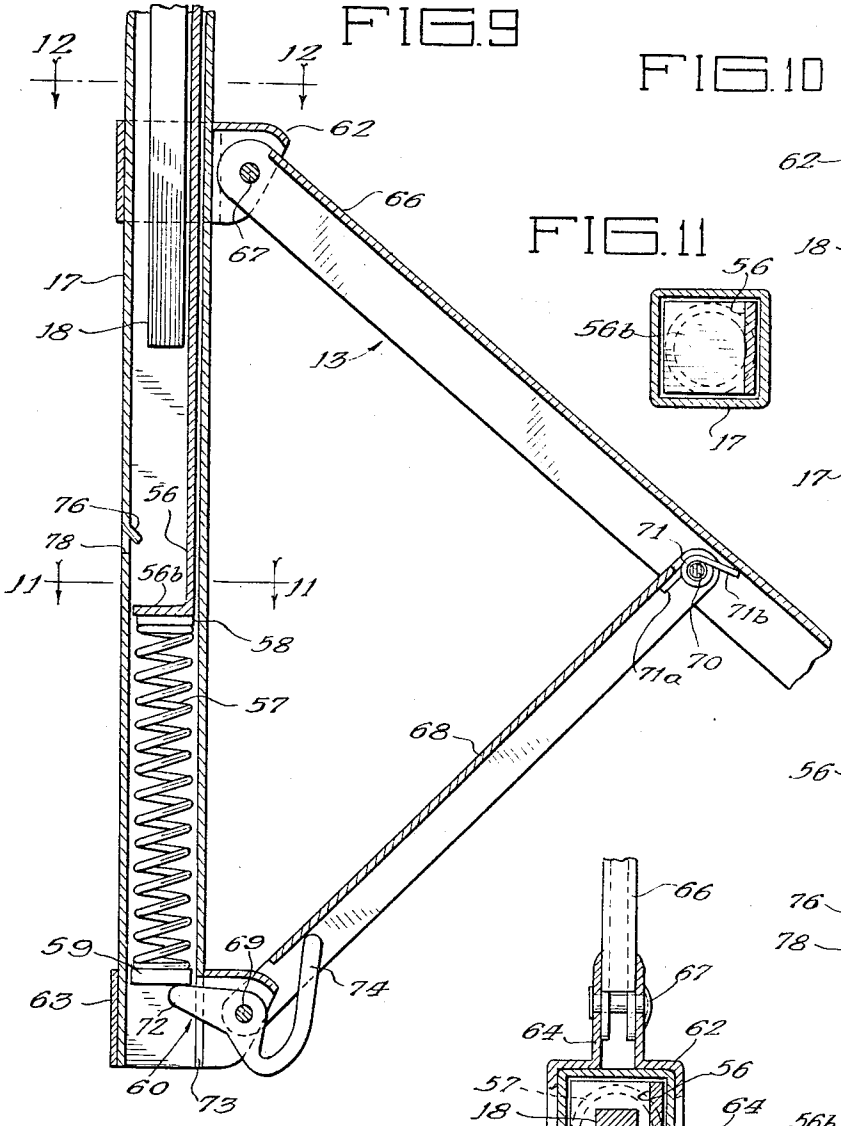


FIG. 10

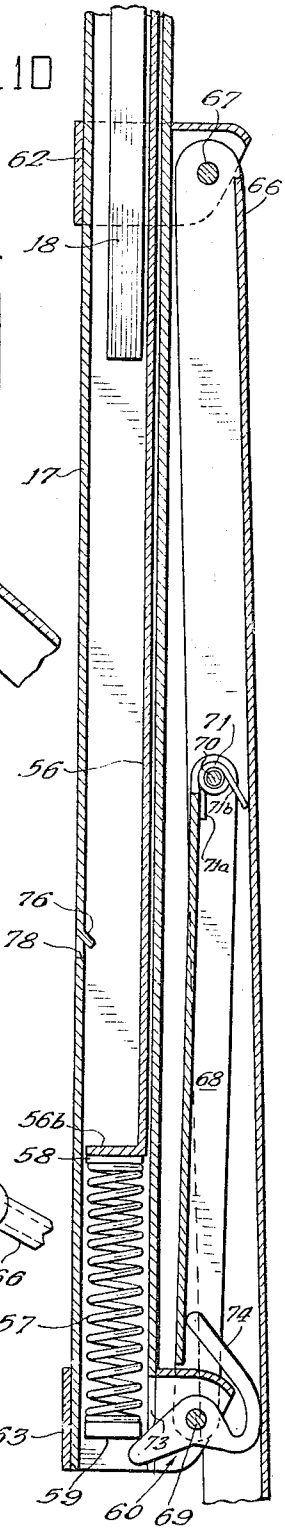


FIG. 11

FIG. 12

United States Patent Office

3,282,545

Patented Nov. 1, 1966

3,282,545

HANDLE ACTUATED TRIPOD STRUCTURE

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Filed Apr. 9, 1965, Ser. No. 446,904
8 Claims. (Cl. 248—171)

This invention relates to portable movie screen devices and more particularly to an improvement in the structure for actuating the leg unit so that the leg unit of the stand is automatically urged from the supporting position to closed position when the stand is lifted from its supporting surface.

The primary object of the present invention is to provide a new and improved support for a portable movie screen.

Another object of this invention is to provide an improved means for preconditioning the leg unit of a stand so that when the stand is lifted from the supporting surface, the leg unit will move automatically to a closed position.

A further object of this invention is to provide in a movie screen stand having a leg unit and a spring means within the standard which cooperates with pivoted lever means to urge the leg unit towards closed position, a means intermediate the ends of the standard in a readily accessible position for stressing the spring means to precondition the leg unit for movement towards the closed position when the leg unit is lifted from the supporting surface.

Still another object is to provide, in a movie screen stand having a leg unit with spring means within the standard cooperating with a pivoted lever means for urging the leg unit toward a closed position, means associated with the movie screen stand handle for biasing the spring means to a position in which it urges the leg unit towards the closed position so that when the stand is lifted from its supporting surface, the leg unit is automatically urged to the closed position.

Other objects, features and advantages of the present invention will be apparent from the following description of the preferred embodiments illustrated in the accompanying drawings, in which:

FIGURE 1 is a side elevational view of the movie screen stand of this invention with the leg assembly or leg unit in the closed position and the screen casing also held in closed position parallel to the standard;

FIGURE 2 is a side elevational view of the movie screen stand with the leg unit in supporting position, the leg unit having been released for outward movement to such supporting position by releasable means operative between the handle member and the leg unit and the telescoping member having been released to permit upward projection thereof to permit the casing to swing from the dotted line position 90 degrees to the full outline position perpendicular to the standard as shown;

FIGURE 3 is an enlarged fragmentary sectional view taken along the line 3—3 of FIGURE 2;

FIGURE 4 is an enlarged sectional view taken along the line 4—4 of FIGURE 2;

FIGURE 5 is a fragmentary front elevational view of a portion of the stand of this invention showing the handle, a portion of the standard and the casing when the device is in the position shown in FIGURE 1;

FIGURE 6 is an enlarged fragmentary side elevational view, partially in section, showing the position of the handle, the standard, and the screen casing when the movie screen stand is in the position shown in FIGURE 2;

FIGURE 7 is a fragmentary sectional view taken along the line 7—7 of FIGURE 6;

FIGURE 8 is an enlarged fragmentary view partially in section showing the bail support of the telescoping standard latched to the end cap of the movie screen device when the movie screen is in the position shown in FIGURE 1 with the screen casing held in closed position parallel to the standard;

FIGURE 9 is an enlarged fragmentary sectional view of the lower end of the standard showing one leg of the leg unit in supporting position and illustrating the spring means in released position whereby torsion springs acting between each of the braces and legs urge the leg unit towards supporting position;

FIGURE 10 is an enlarged fragmentary sectional view of the lower end of the standard showing the position of one of the legs of the leg unit in closed position and illustrating the cooperative relation between spring means in the standard and the pivoted lever means which urge the leg unit toward closed position;

FIGURE 11 is a sectional view taken along the line 11—11 of FIGURE 9; and

FIGURE 12 is a sectional view taken along the line 12—12 of FIGURE 9.

The structure of the present invention is an improvement in the device shown in the patent to Armstrong, No. 3,164,348, issued January 5, 1965, and assigned to the assignee of this invention. In such movie screen devices, the leg unit is preconditioned for movement to the closed position when the stand is lifted from the supporting surface by compressing a spring which is biased against pivoted lever means. When the stand is in the spread apart supporting position on a supporting surface, the weight of the stand prevents the tripod-like leg unit from collapsing. However, when the stand is lifted from the supporting surface, the spring force against the pivoted levers causes the levers to urge the leg units towards the collapsed closed position adjacent the standard. The coil spring which is biased against the pivoted levers is relatively strong and is compressed by depressing the telescoping extension rod against the coil spring and locking the rod in the depressed position.

Considerable force is needed to depress the extension rod against the action of the coil spring, and it may be somewhat difficult to depress the rod when it is in its extended position, even for persons of average height. This difficulty becomes accentuated when working with movie screen stands which are upwards of 6 or 7 feet in length. In such cases, one must stand on an auxiliary supporting surface, such as a stool, and reach a full arm's distance in an attempt to press the telescoping rod downwardly against the action of the coil spring. It is the purpose of this invention to provide an improved means for stressing a spring to precondition the tripod unit for movement to the collapsed position adjacent the standard when the stand is lifted from its supporting surface.

Referring initially to FIGURES 1 and 2, a standard, generally designated 12, is adapted for support in an upright position preferably by a tripod-type leg unit, generally designated 13. The standard carries a handle member, generally designated 14, which is slidably mounted on the standard 12 and is provided with means for adjustably positioning the handle 14 vertically of the standard 12.

The forward face of the handle member **14** is provided with means for pivotally mounting a conventional screen casing, generally designated **16**, so that screen casing **16** when released from its carrying position parallel to the standard (as shown in FIGURE 1), may pivot 90 degrees to its operative position perpendicular to the standard, as shown in FIGURE 2. The specific means by which the casing is mounted to the handle will be described in detail later.

The standard **12** is comprised of a main tubular member **17** and a telescoping rod **18** which is slidably received in the tubular member **17**. A bail support **19** is mounted on the free end of the telescoping rod. The rod may be held in varying positions of extended adjustment relative to the tubular standard by means of a conventional clamping member generally designated **20**, located near the upper end of the tubular member **17**. The clamping member is preferably spring biased so that it is normally held in clamping position and must be manually released to permit adjustment of the telescoping rod **18**. The bail support is provided with a depending stud or lug **24** at the free end thereof which is of a size to cooperatively fit within the latching means **26** in the screen casing end cap **24***a* for holding the casing in its carrying position parallel to the standard, as shown in FIGURE 1.

The latching means includes a spring metal clip **25***a* having an opening **28** and is secured to the interior of the end cap by means of a rivet **30**. The end cap is similarly provided with an opening **32** which overlies the opening **28** as well as a portion of the free end **26***a* of the spring clip to permit passage of the stud **24** therethrough for cooperative latching engagement with the latching means. The cap **33** positioned on the top end of the standard is provided with an opening **34** affording close tolerance with the telescoping rod **18** to serve as a guide and bearing surface therefor. The cap also cooperates with the bail support to limit the insertion of the rod into the tube and thus positively position the bail support for latching engagement with the end cap of the screen casing. The pivotal mounting of the screen casing to the handle permits a sufficient amount of play so that the casing may be moved toward and away from the standard slightly when in the upright position as shown in FIGURE 1 and as shown in dotted outline in FIGURE 2.

To latch the casing to the bail support, the telescoping rod is first depressed fully inwardly of the standard as shown in FIGURES 1 and 8 and the screen casing is then swung to a position substantially parallel with the standard with the end cap opening substantially aligned with the stud of the bail support. Slight relative lateral movement between the screen casing and the standard permits the stud to engage the free end portion **26***a* of the spring as the stud passes through the opening **32** of the end cap to depress the spring until the stud becomes impaled by the opening **28** in the spring, thereby securing the screen casing to the bail support in the storage position adjacent the standard as shown in FIGURES 1 and 8.

For pivotally mounting the screen casing to the forward face of the handle **14**, the screen casing **16** is provided with an L-shaped bracket **40**. The L-shaped bracket **40** is pivoted with respect to the cup-shaped support **41** held to the forward face of the handle about a pivot pin **42** which projects through the rear wall of the casing **16**, one arm of the bracket **40** and the bottom of the cup-shaped support **41**. The forward face of the side walls of the cup-shaped member **41** affords a peripheral bearing surface **43** to stabilize the casing **16** during its pivotal movement between an inoperative position parallel to the standard **12** as shown in FIGURE 1, and an operative position perpendicular to the standard, as shown in FIGURE 2.

The bottom of the cup-shaped member **41** is secured by rivets **44** to a member **45** which forms part of a tensioning assembly which is secured to the handle **14** in a manner described in detail in Petrick application, S.N. 275,388, filed April 24, 1963, and assigned to the assignee of this invention.

The handle **14** is provided with upper and lower bearing portions **46** and **47** which slidably embrace the tubular member **17**. The handle member can be held in the position shown in FIGURES 1 and 2, hereinafter called the "normal" or "first" position, by means of a spring urged bolt **48** which is normally urged to its projected position within an aperture **49** formed on the side of the tubular member **17**. The bolt **48** may be withdrawn from the aperture **49** to permit the handle to be moved along the length of the standard, by pulling outwardly on the bolt relative to the handle and the aperture against the spring **50** which normally biases the bolt towards the projected position.

The handle **14** is further provided with a second or tripod-actuating bolt **51** which is normally urged to a projected position by the spring **52** biased behind the bolt. The bolt **51** is provided with an inclined cam surface **53** near the inner end so that the transversely positioned actuating button **54** may retract the bolt against the action of the spring **52** when the button **54** is pressed inwardly of the handle. The bolt **51** normally projects to the interior of the tubular standard **17** through an elongate opening **55** which is formed in the front face of the standard so as to be positioned for engagement with the spring actuating plunger **56** for selectively inducing stress in the coil spring **57** in the lower end of the standard to precondition the tripod for movement to a collapsed position adjacent the standard when the stand is lifted from its supporting position.

The plunger **56** is bifurcated at its upper end **56***a* to permit the projection of the extension rod **18** interiorly of the standard when the rod is depressed and serves to stabilize the lower end of the rod relative to the standard. Plunger **56** is provided with a leg **56***b* at its lower end which is substantially coextensive in size with the interior cross-sectional dimension of the tubular standard **17**. The leg **56***b* bears against the upper end of the coil spring **57** so that as the bracket **56** is moved axially of the standard, compression of the spring **57** may be effected.

The spring **57** is provided with a washer **58** at its upper end which bears against the leg **56***b* of the plunger **56** and a washer **59** at its lower end which bears against the lever **60** of the leg unit. The washers **58** and **59** also serve to afford guiding and bearing surfaces to the coil spring. The function of the coil spring is to cooperate with portions of the leg unit and with the plunger **56** to precondition the leg unit so that the leg unit can be held adjacent the standard in closed position when desired, as shown in FIGURES 1 and 10, and so that the leg unit can be permitted, when desired, to move outwardly to supporting position, as illustrated in FIGURES 2 and 9. The preconditioning of the leg unit is accomplished through movement of the plunger **56** by means of the handle to impart stress to the spring **57** which, in turn, imparts thrust to the levers **60**.

For accomplishing these functions, the leg unit **13** is provided with an upper collar **62** which slidably embraces the lower end portion of the tubular member **17** and a lower collar **63** which is fixedly secured adjacent lower end of the tubular member. The upper collar **62** may be provided with three pairs of spaced ears **64**, and the lower collar **63** may be likewise provided with three pairs of spaced ears **65** peripherally spaced about the lower collar in a similar fashion to the ears on the upper collar. As shown in FIGURES 2, 9 and 10, a channel-shaped leg member **66** is swingably secured to each pair of ears **64** by a rivet **67**. A channel-shaped bracing link **68** is similarly pivotly secured at one end to each pair of ears **65** on the lower collar by rivet **69**. Rivet **69** also pivotly secures the lever member **60** to the ears **65** of the collar **63**. The opposite end of each bracing link **68** is pivotally

secured to a medial portion of the corresponding leg member **66** by a rivet **70**. Torsion springs **71** are preferably provided encircling each of the rivets **70** of the leg members **66**. The free ends **71***a* and **71***b*, respectively, of the torsion spring **71** bear in opposite directions against the medial web of each of the bracing links and leg members, to provide a means for causing the leg unit to be swung automatically to an outwardly spread supporting position.

The lever **60** and the remaining components of the leg unit as well as the coil spring **57**, the plunger **56** and components of the handle **14** form a means for causing the leg unit to be automatically swung to, and held in, a closed position adjacent the standard when the standard and leg unit are lifted from the floor or other supporting surfaces.

For affording this action, each lever **60**, pivotally mounted between each pair of spaced ears **65**, includes an inwardly extending arm **72** projecting into the lower end of the main tubular member **17** through a slot **73** in the tubular member, and an arcuate arm **74** extending outwardly and having a free end for engaging the web of the adjacent bracing link **68** as shown in FIGURES 9 and 10. FIGURES 9 and 10, for clearness of illustration, show only one of the three leg members, lever means and associated parts.

When sufficient downward force is caused to be exerted upon the three arms **72** extending into the tubular member **17** and the leg unit **13** is lifted from its supporting surface, each arcuate arm **74** is caused to be pivoted counterclockwise (FIGURE 9) with sufficient force to overcome the forces exerted by the torsion springs **71** (which tend to swing the legs outwardly) so that each bracing link **68** and attached leg member **66** is normally urged inwardly towards closed position adjacent the standard.

The force against the arms **72** of the lever **60** is provided by the relatively strong compression spring **57**. In FIGURE 9, the compression spring **57** has not yet been compressed. However, as soon as the plunger **56** is pushed downwardly to the position substantially shown in FIGURE 10, the coil spring **57** is then compressed between the leg **56***b* of the bracket and the ends of the arms **72** of the lever. When the spring **57** is held fully compressed as shown in FIGURE 10, the leg unit will still remain in outwardly spread supporting position because the weight of the standard and the casing is sufficient to prevent the compressed coil spring from forcing counterclockwise rotation upon the lever means **60**. However, as soon as the leg unit is lifted from its supporting surface, gravity or the weight of the portable screen is no longer acting upon the leg unit **13**. Accordingly, the lower end of the compressed spring **57** immediately moves downwardly and forces the three lever means **60** to rotate counterclockwise so that the arcuate arms **74** force the bracing links **68** and the leg members **66** into closed position adjacent the standard as shown in FIGURE 10.

The spring **57** is compressed or "cocked" in a novel manner which makes for easier manipulation of the movie screen. Previous means of cocking the spring utilized the telescoping rod **18**. The lower end of the rod was adjacent the coil spring **57** and when the rod was depressed inwardly of the standard, this also compressed the coil spring **57**. Typical movie screen stands may be of four to five feet in height, and the rod **18** may extend two or three feet beyond that. When depressing the rod inwardly of the standard, persons of even average height would have to raise their arm above their shoulder and, while the arm is raised in this fashion, attempt to force the telescoping rod inwardly against the strong opposing force of the coil spring **57**, a difficult task. Frequently standards may be in the order of six or seven feet in height, and it can be readily seen that the difficulty of depressing the rod inwardly against the coil spring was accentuated in such larger standards. This invention provides a means associated with the handle **14** for compressing the spring so that the spring is in a position, or "cocked," for acting upon the lever **60** to swing the legs inwardly towards the standard in collapsed position as shown in FIGURES 1 and 10 when the standard is lifted from its supporting surface.

Included in this novel means for cocking the spring is plunger **56**, having a first portion **56***a* which is normally positioned in the vicinity of the opening **55** in the tubular member **17** and a leg **56***b* which bears against the tube of the coil spring **57**. The handle **14** is held in its normal or first position by the plunger **48**. When so held, the handle is positioned for normal carrying of the movie screen device, for properly positioning the casing for latching engagement between the bail support and the end cap of the casing as shown in FIGURE 1, and for holding the spring **57** in the properly compressed position as shown in FIGURE 10 for urging and holding the tripod structure adjacent the standard. To this end, when the coil spring **57** is in the relaxed or uncocked position as shown in FIGURE 9, the top of the plunger **56** extends to a point intermediate the opening **55**. Retraction of the button **48** permits the handle **14** to be slid axially of the tubular member **17** to a point where the plunger **51** may project inwardly through the opening in abutment with the top **56***a* of the plunger **56**. When so engaged, the plunger **56** is, in effect, an interconnecting portion between the handle **14** and the spring **56**. The handle **14** then may be moved axially downward relative to the standard to a point where the spring urged plunger **48** may automatically engage in the opening **49**, to position the handle member in the normal or first position with the plunger **56** now compressing the spring as shown in FIGURE 10. The spring is thereby "cocked" for urging the tripod inwardly toward the standard as soon as the stand is lifted from its supporting surface. As long as the plunger **51** is in engagement with the top of the plunger **56** and the handle is held in the first position, the tripod structure will be held close to the standard as shown in FIGURES 1 and 10. The tripod may be released to the outwardly spread supporting position shown in FIGURE 2 by depressing the button **54**. This retracts the plunger **51**, permitting the coil spring to push the plunger **56** axially of the standard, thereby releasing the force of the coil spring **57** upon the levers **60** so that the torsion springs **71** may urge the leg members outwardly of the standard to a spread supporting position. The face of the plunger **56** substantially occupies the slot **55** and holds the plunger **51** in the relatively retracted position.

To again cock the spring **57**, the plunger **48** may be released and the handle **14** moved upwardly of the standard to a point where the plunger **51** may override the plunger **56** to engage the top **56***a* thereof. The handle is then moved outwardly to the first position where the plunger **48** again projects through the opening **49**.

Means are provided in the standard for limiting the upward movement of the plunger **56** responsive to the expansion of the compressed coil spring **57** after the button **54** has been depressed to retract the bolt **51**. As illustrated in FIGURES 9 and 10, this means includes a lip **76** struck inwardly from the wall of the standard **17** leaving an opening **78** in the standard. Thus after the spring is released from the compressed position as shown in FIGURE 10, by the retraction of the bolt **51**, the upward movement of the plunger **56** will be limited by the obstruction afforded by the lip **76** which is in a position to contact the surface **56***b* of the plunger. On these occasions when the plunger does move upwardly and strike the lip **76**, it will then settle on top of the washer **58**, resting on the top of the spring **57**, and remain in the position shown in FIGURE 9. This insures that the top **56***a* of the plunger **56** will never occupy a position which is above the top of the opening **55** wherein it would be inaccessible to the bolt **51**.

This invention provides a new and improved means for

preconditioning the tripod unit of a movie screen stand for movement towards the collapsed position of the standard. This means is located in a readily accessible position thereby reducing the effeort required to precondition the leg unit by stressing or cooking the associated spring. While in the preferred embodiment this means is shown as a function of the handle, it is to be understood that a separate lever, handle, or suitable mechanism can be provided for carrying out the same function. The significant improvement afforded by the actuation means of this invention involves relatively simple structure and does not necessitate a great amount of change in the structure of presently known stands.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as some modifications may be obvious to those skilled in the art.

I claim:

1. A stand adapted to be maintained in an upright position upon a supporting surface, comprising: an elongated standard; a plurality of leg members swingably mounted on the lower end portion of the standard for movement together between a closed position adjacent the standard and a spread supporting position in which the standard is maintained uprightly; a bracing link extending between one of the leg members and the lower end portion of the standard having one end pivotally secured to said lower end portion of the standard and the other end pivotally secured to said one leg member; spring means positioned at the lower end portion of the standard; lever means extending inwardly of the pivot at the one end of said bracing link so as to be positioned to receive thrust exerted from the spring means and to transmit that thrust to the bracing link in a direction tending to swing said bracing link toward the standard and thereby fold the leg members and the bracing link adjacent to the standard; means intermediate the ends of the standard for imparting stress to the spring means when the legs are in supporting position so as to provide thrust upon the lever means, said means having a connecting portion operatively engaging the spring means, said stress imparting means being movable on the standard to move the connecting portion so as to deform and impart stress to the spring means; and locking means for holding the stress imparting means in position upon the standard in opposition to the stress in the spring means so as to maintain the thrust against the lever means when the leg members are in supporting position, whereby when the stand is removed from the supporting surface the lever means and said bracing link will be rotated by the thrust of the spring means to pivot the bracing link and leg members inwardly to closed position adjacent the standard.

2. A stand adapted to be maintained in an upright position upon a supporting surface, comprising: an elongated standard; a plurality of leg members swingably mounted on the lower end portion of the standard for movement together between a closed position adjacent the standard and a spread supporting position in which the standard is maintained uprightly; a bracing link extending between one of the leg members and the lower end portion of the standard having one end pivotally secured to said lower end portion of the standard and the other end pivotally secured to said one leg member; spring means positioned at the lower end portion of the standard; lever means extending inwardly of the pivot at the one end of said bracing link so as to be positioned to receive thrust exerted from the spring means and to transmit that thrust to the bracing link in a direction tending to swing said bracing link toward the standard and thereby fold the leg members and the bracing link adjacent to the standard; means for imparting stress to the spring means when the legs are in supporting position so as to provide thrust upon the lever means, said means including a handle member mounted on the standard and having a connecting portion operatively engaging the spring means, the handle member being longitudinally slidable on the standard to move the connecting portion so as to deform and impart stress to the spring means; and locking means for holding the handle in position upon the standard in opposition to the stress in the spring means so as to maintain the thrust against the lever means when the leg members are in supporting position, whereby when the stand is removed from the supporting surface the lever means and said bracing link will be rotated by the thrust of the spring means to pivot the bracing link and the leg members inwardly to close position adjacent the standard.

3. A stand as specified in claim **2** including a bracing link extending between each of the leg members and the lower end of the standard, each bracing link having one end pivoted to the lower end portion of the standard and the other end pivoted to its respective leg member, and further including lever means on the lower end portion of the standard extending inwardly of the pivot at the one end of each of said bracing links.

4. A stand as specified in claim **2** wherein said spring means is a compression spring which rests upon said lever means.

5. A stand adapted to be maintained in an upright position upon a supporting surface, comprising: an elongate standard, said standard having a slot in the medial portion thereof; a handle slidably mounted on said standard for movement between a first position, a plunger engaging position, and a spring cocked position, said handle having a retractable bolt normally urged inwardly of said slot, said handle further having a locking bolt for locking said handle in said position; a plurality of leg members swingably mounted on the lower end portion of the standard for movement together between a closed position adjacent the standard and a spread supporting position in which the standard is maintained uprightly; a plurality of bracing links extending between the leg members and the lower end portion of the standard, each of said bracing links having one end pivotally secured to said lower end portion of the standard and the other end pivotally secured to a leg member; a compression spring positioned at the lower end portion of the standard; lever means extending inwardly of the pivot at the one end of said bracing link so as to be positioned to receive thrust exerted from the spring means and to transmit that thrust to the bracing link in a direction tending to swing said bracing links toward the standard and thereby fold the leg member and the bracing link adjacent to the standard; a plunger in said standard having a lower portion in abutment with said spring and an upper portion adjacent said slot, said plunger normally positioned with the free end of the upper portion intermediate the ends of the slot in a position for engagement with said retractable bolt, when said handle is moved from said first position along said slot to said plunger engaging position wherein the bolt overrides the top of the plunger, further movement of said handle to said spring cocking position causing said plunger to deform and impart stress to the spring; means for locking the handle in said spring cocking position on the standard in opposition to the stress in the spring so as to maintain the thrust against the lever when the leg members are in supporting position, whereby when the stand is removed from the supporting surface, the lever and bracing links will be rotated by the thrust of the spring to pivot the bracing links and leg members inwardly to closed position adjacent the standard.

6. A stand as specified in claim **5** wherein said spring cocking position and said first position of said handle on the standard are the same.

7. A stand as specified in claim **6** wherein the first position of the handle is below the plunger engaging position so that after the handle has been moved from the first position upwardly of the standard to a position ad-

jacent the free end of the plunger, the retractable bolt will override the plunger and engage the free end thereof so that the spring may be compressed by pulling the handle downwardly and held in the spring cocked position by locking the handle in the first position.

8. The stand as specified in claim 5 wherein means are provided on the handle for releasing the bolt to remove the stress in the spring means and permit the legs to swing outwardly to the spread supporting position.

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