June 16, 1953 R. G. BODE 2,642,247

COLLAPSIBLE STAND

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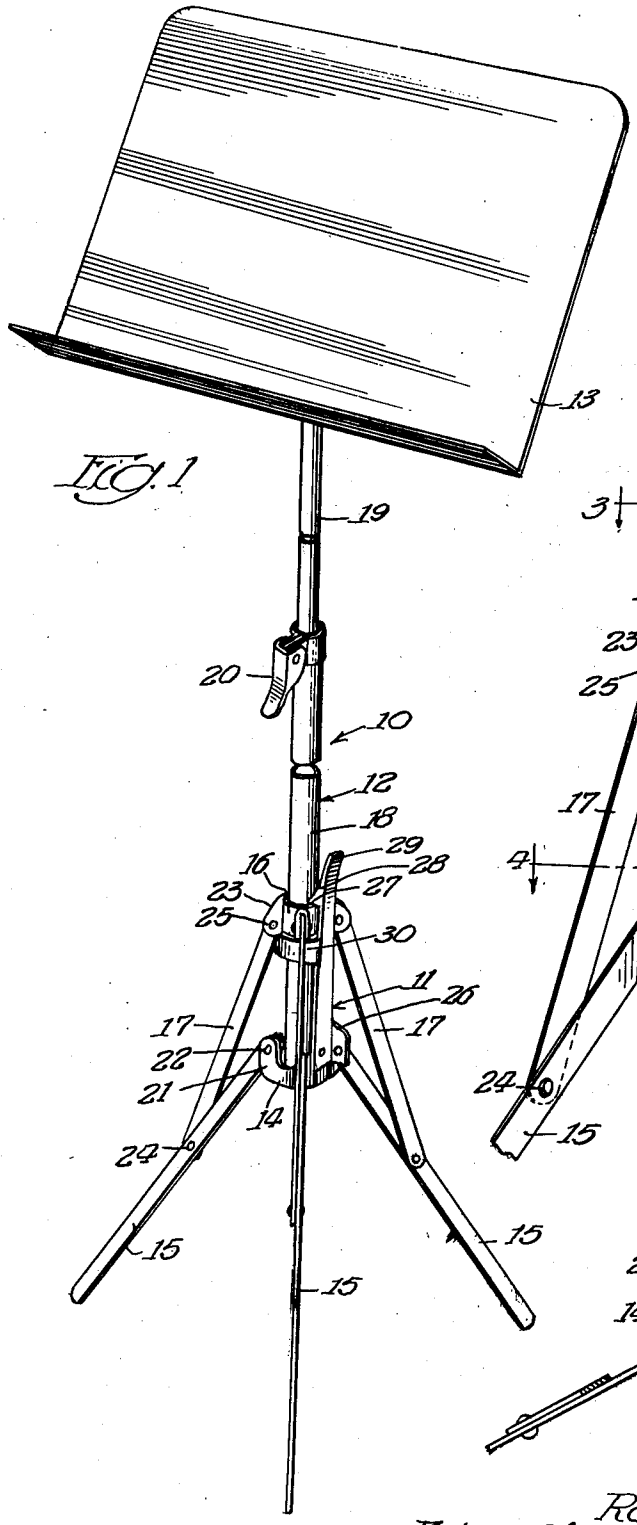


FIG. 1

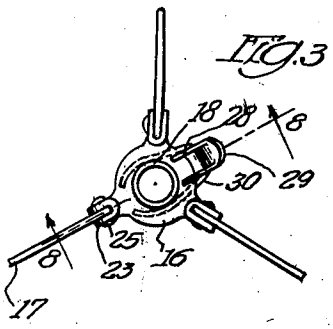


FIG. 3

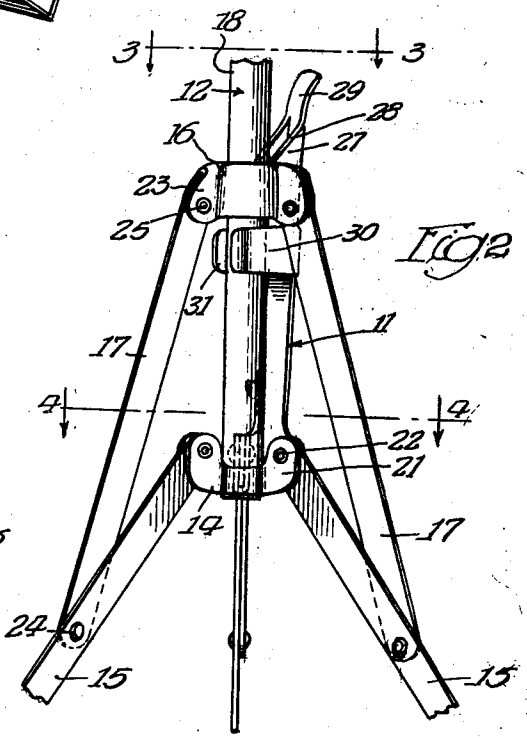


FIG. 2

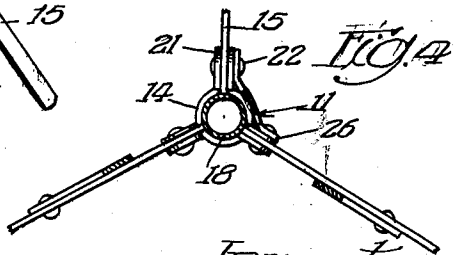


FIG. 4

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Fig. 5

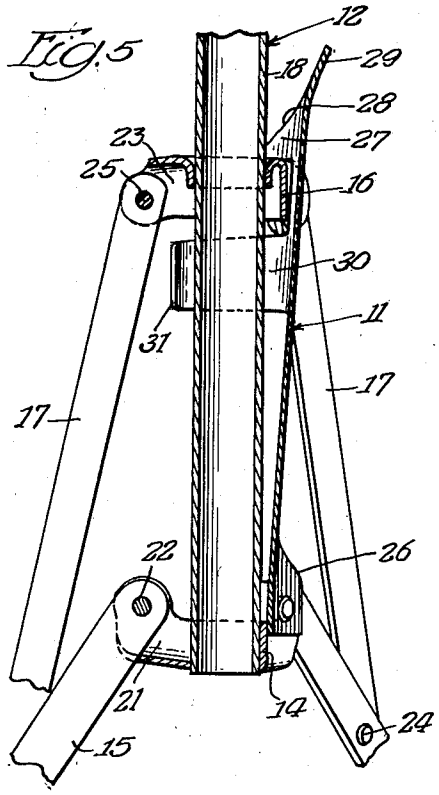


Fig. 6

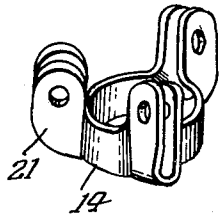


Fig. 7

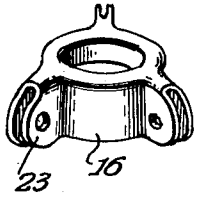
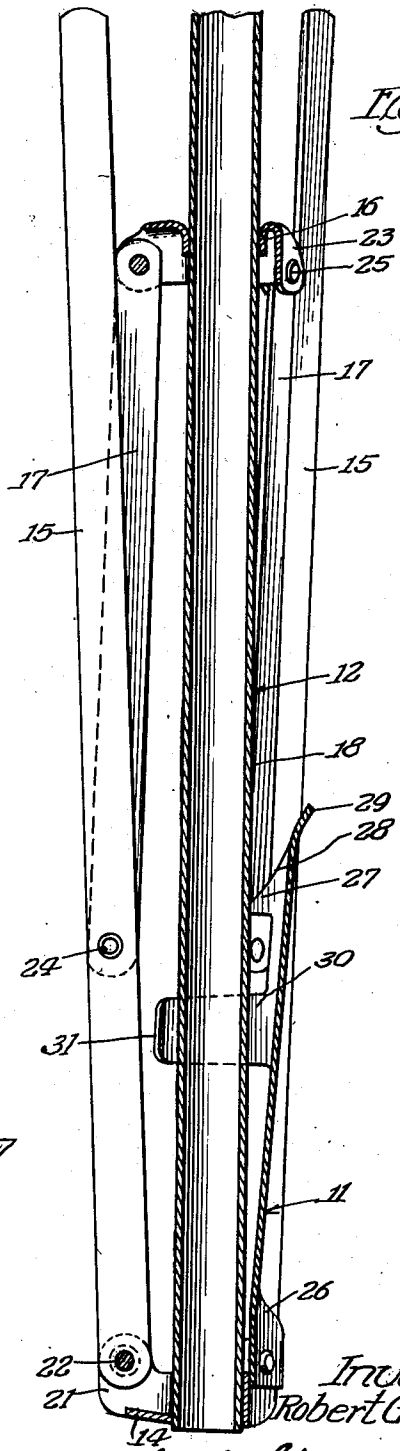


Fig. 8



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UNITED STATES PATENT OFFICE

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COLLAPSIBLE STAND

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2 Claims. (Cl. 248—171)

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The present invention relates generally to stands. More particularly the invention relates to that type of stand which is primarily designed for use in supporting sheet music and the like in an elevated position with respect to the floor and as its principal components or parts comprises: (1) an extensible standard which carries at its upper end a tiltable or angularly adjustable rack and has at its lower end a fixedly mounted bracket with three equidistantly spaced pairs of outwardly extending lugs; (2) three straight legs which have certain ends thereof pivotally connected to the pairs of lugs on the bracket in order that they are capable of swinging upwards and downwards; (3) a sleeve which is slidably mounted on the lower end of the standard above the bracket and has three equidistantly spaced pairs of outwardly extending lugs; and (4) three upwardly extending links which have the lower ends thereof pivotally connected to the central portions of the legs and their upper ends pivotally connected to the pairs of lugs on the sleeve and are adapted when the sleeve is slid downwards towards the bracket to swing the legs downwards into a position wherein they extend downwards and outwards and form a tripod support for the standard and when the sleeve is slid upwards away from the bracket to cause the legs to swing upwards and inwards into collapsed position wherein they extend in substantially parallel relation with the standard.

It has heretofore been proposed in connection with a music stand of the aforementioned type to provide the slidably mounted sleeve with a transversely extending set screw for securing it in place after downward or upward sliding movement thereof with respect to the standard. In practice it has been found that the use of a set screw for releasably securing the sleeve in place is subject to certain objections. In the first place, if the set screw is not tightly screwed into engagement with the standard after downward sliding movement of the sleeve to effect swinging of the legs into their operative tripod forming position any appreciable downward force on the standard is likely to cause the standard to slide with respect to the sleeve and thereby result in collapse of the legs. Secondly, if, in connection with sliding of the sleeve with respect to the standard, the set screw is not loosened completely the inner end of the set screw so abrades or roughens the standard as to preclude ready sliding movement of the sleeve.

One object of the invention is to provide in connection with a music stand of the type under consideration a latch which is simple in design and

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construction and is adapted when the sleeve is slid downwards in order to swing the legs into their operative tripod forming position to assume a latched position wherein it serves until released positively to hold the sleeve against upward sliding movement with respect to the bracket on the lower end of the standard and thus prevents accidental collapse of the legs.

Another object of the invention is to provide a latch of the aforementioned character which is in the form of a vertically elongated sheet metal stamping, has the lower end thereof riveted to certain of the outwardly extending lugs on the bracket at the lower end of the standard of the stand, embodies at its upper end an upper pair of spaced apart inwardly extending fingers, and is adapted to have its upper end flex outwards into an unlatched position and inwards into a latched position wherein its upper fingers are arranged in overlying or hooked relation with the upper end of the sleeve after downward sliding of the sleeve toward the bracket in order to swing the legs into their operative tripod forming position.

Another object of the invention is the provision of a latch of the type and character under consideration in which the upper ends of the inwardly extending upper fingers are inwardly and downwardly inclined to provide cam surfaces which, when the sleeve is slid downwards almost to its fullest extent, are engaged by the lower end of the sleeve and coact therewith to flex the upper end of the latch outwards into its unlatched position to the end that the upper end of the latch will automatically and with a snap action flex into its latched position after the sleeve is slid downwards to its fullest extent wherein it is disposed beneath the upper inwardly extending fingers.

A further object of the invention is to provide a latch of the aforementioned character which embodies at a small distance beneath the upper inwardly extending fingers a pair of lower inwardly extending fingers which are arranged in straddled relation with the lower end of the standard, serve to limit outward flexing of the upper end of the latch into its unlatched position and are adapted when the latch is in its latched position after full downward sliding of the sleeve towards the bracket to underlie the lower end of the sleeve and prevent further downward sliding of the sleeve with respect to the stand.

A still further object of the invention is to provide in connection with a music stand of the type under consideration a leg locking latch which effectively and efficiently fulfills its intended pur-

pose and is capable of being produced at an extremely low cost.

Other objects of the invention and the various advantages and characteristics of the present music stand leg locking latch will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawings which accompany and form a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a perspective view showing a music stand having a latch embodying the invention applied thereto;

Figure 2 is an enlarged fragmentary side elevation showing the latch in its operative or latched position wherein it serves to hold the sleeve against upward or downward sliding movement with respect to the standard after it has been slid downwards towards the bracket in order to swing the legs of the stand into their operative tripod forming position;

Figure 3 is a horizontal section taken on the line 3—3 of Figure 2 and illustrating in detail the construction and design of the slidably mounted sleeve on the lower end of the standard;

Figure 4 is a horizontal section taken on the line 4—4 of Figure 2 showing the construction and design of the lug equipped bracket on the lower end of the standard;

Figure 5 is an enlarged vertical section showing the latch in its operative or latched position;

Figure 6 is a perspective of the lug equipped bracket of the stand;

Figure 7 is a perspective of the slidably mounted sleeve of the stand; and

Figure 8 is an enlarged vertical section showing the lower end of the standard of the stand after the sleeve has been slid upwards so as to effect through the medium of the three links upward folding and collapsing of the legs of the stand.

The music stand which is shown in the drawings is equipped with a latch which constitutes the preferred form or embodiment of the invention. It is of conventional or standard design except for the latch and is designated generally in the drawings by the reference numeral 10. The latch is designated by the reference numeral 11.

The stand 10 comprises an extensible standard 12, a rack 13 at the upper end of the standard, a bracket 14 at the lower end of the standard, three legs 15 for supporting the standard in an upright position, a slidably mounted sleeve 16 on the lower end of the standard, and three links 17. The standard 12 consists of a tubular lower member 18 and a rod-like upper member 19. These two members are telescopically connected together as the result of the lower end of the upper member fitting slidably within the upper end of the lower member. The upper end of the lower member 18 of the standard is provided with a clamp type bracket 20 for releasably securing the upper member 19 in the various positions into which it is slid relatively to the lower member. The rack 13 is adapted to support sheet music and the like and extends upwards and rearwards and is suitably connected to the upper end of the upper member 19 of the standard in order that it may be tilted forwards or rearwards into different angular positions. The bracket 14 of the stand is in the form of a one-piece sheet metal stamping and extends around and is fixedly secured to the lower end of the lower member 18 of the standard. It is provided with three equidistantly spaced pairs of outwardly and upwardly extending lugs 21. As best shown in Figure 6, the two lugs of each pair are spaced laterally apart a small distance. The three legs 15 of the stand are straight and rigid. Certain of the ends of the legs fit within the pairs of lugs 21 and are pivotally connected to the lugs by horizontal rivets 22 in order that the legs are capable of being swung upwards and downwards. The rivets 22 extend through aligned holes in the lugs and said certain ends of the legs 15 and have heads at their ends whereby they are held against axial displacement with respect to the lugs 21. The sleeve 16 extends around the lower end of the lower member 18 of the standard and is located above, and slidable towards and away from, the lug equipped bracket 14. It is in the form of a one-piece sheet metal stamping and is provided with three equidistantly spaced pairs of outwardly extending lugs 23. The latter are substantially in vertical alignment with the outwardly and upwardly extending lugs 21 on the fixedly mounted bracket 14. As shown in Figure 7, the two lugs of each pair of lugs 23 on the sleeve 16 are spaced a small distance apart. The three links 17 are associated with the legs 15 respectively. They extend upwards and are straight and rigid. The lower ends of the links 13 are pivotally connected to the central portions of the legs 15 by horizontally extending rivets 24 and the upper ends of the links fit within, and are the pairs of lugs 23 on, the sleeve 16 and are pivotally connected thereto by way of horizontal rivets 25 which extend through aligned holes in the lugs 23 and the upper ends of the links and have enlarged heads at their ends for holding them against longitudinal or axial displacement. When the sleeve 16 is slid toward the bracket 14 on the lower end of the lower member 18 of the standard 12 the links 17 move downwards and operate to swing the legs 15 downwards into an operative position wherein they extend downwards and outwards and form a tripod support for the standard (see Figures 1, 2 and 5). When the sleeve 16 is slid upwards away from the bracket 14 the links 17 move upwards and cause the legs 15 to swing upwards and inwards into a collapsed position wherein they extend in substantially parallel relation with the standard as shown in Figure 8 and well understood in the art.

The latch 11, as heretofore indicated, serves releasably to lock the legs 15 in place after they have been swung downwards into their operative tripod forming position as the result of downward sliding of the sleeve 16 in the direction of the lug equipped bracket 14. It is designed or adapted to coact with the sleeve and is in the form of a vertically elongated one-piece stamping of spring metal stock. As shown in Figures 1, 2, 5 and 8, the latch 11 is located adjacent and extends lengthwise of the lower end of the lower member 18 of the extensible standard 12. The lower end of the latch is shaped to form two outwardly extending laterally spaced attaching ears 26. The latter extend at an obtuse angle with respect to one another, fit against the nearer lugs of two of the

pairs of lugs on the bracket 14 that are secured in place by the rivets which extend through the two pairs of lugs. The intermediate and upper end portions of the latch are free to flex laterally with respect to the lower end of the lower member 18 of the extensible standard. The upper end of the latch is shaped to form a pair of spaced apart parallel inwardly extending upper fingers 27. The latter, as shown in Figures 1, 2 and 5, are adapted, upon inward flexing of the intermediate and upper end portions of the latch after the legs 15 have been swung downwards into their operative tripod forming position, to overlie the upper end of the sleeve 16 and coact therewith in such manner as to lock the sleeve against upward sliding movement relatively to the lower end of the lower member of the standard. When the upper fingers 27 are in overlying or hooked relation with the upper end of the sleeve the legs 15 are secured in place and will not collapse or swing upwards due to a heavy downward force on the standard. The upper ends of the fingers 27 are inwardly and downwardly inclined to provide cam surfaces 28 for automatically causing the latch to flex outwards into its unlatched position when the sleeve 16 is slid downwards in connection with shift of the legs 15 into their operative tripod forming position. When the sleeve 16 is slid downwards so that the lower end thereof engages the cam surface 28 further downward sliding movement of the sleeve results in camming the latch outwards into its unlatched position so that the sleeve is free to slide past the upper fingers 27. As soon as the sleeve slides downwards past the fingers the latch, due to its inherent resiliency, flexes inwards with a spring action into its latched position wherein, as previously pointed out, the fingers 27 overlie the upper end of the sleeve and hence prevent upward sliding of the sleeve with respect to the standard and resultant collapsing of the legs 15. The upper extremity of the latch is shaped to form an outwardly extending handle 29 which may be grasped when it is desired manually to flex the latch outwards into its unlatched position so as to release the sleeve 16 so that it may be slid upwards away from the bracket 14 to effect collapsing of the legs 15. At a point a small distance beneath the upper fingers 27 the upper end of the latch 11 is shaped to form a pair of spaced apart lower fingers 30. These lower fingers are spaced beneath the upper fingers 27 a distance slightly in excess of the length of the sleeve 16 and are arranged in straddled relation with the lower end of the lower member 18 of the standard. They have a two-fold purpose in that they serve to limit outward flexing of the latch into its unlatched position and also prevent downward sliding of the sleeve 16 towards the bracket 14 after the sleeve has been slid past the upper fingers in connection with swinging of the legs 15 into their operative tripod forming position. The outer or free ends of the lower fingers 30 are bent inwards to form stops 31 which, when the latch is flexed outwards to a predetermined extent, engage the lower end of the lower member of the standard and thus prevent further outer flexing of the intermediate and upper end portions of the latch. When the latch is in its latched position while the sleeve is directly beneath the upper fingers 27 the lower fingers 30 underlie the lower end of the sleeve 16 and thus lock the sleeve against further downward sliding movement toward the bracket 14. The upper and lower inwardly extending fingers of the latch straddle the sleeve 16 when the legs 15 are in their proper operative position and hence lock the legs against swinging movement.

When it is desired to use the music stand the sleeve 16 is slid downwards so that the links 17, as hereinbefore described, swing downwards the legs 15. As soon as the lower end of the sleeve is brought into engagement with the cam surfaces 28 further downward sliding movement of the sleeve results in automatic outward flexing of the latch into its unlatched position. As soon as the sleeve, in connection with further downward sliding movement thereof, passes the upper fingers 27 the latch automatically flexes inwards into its latched position wherein the upper and lower fingers straddle the sleeve and thus prevent either upward or downward displacement or sliding movement of the sleeve relatively to the lower end of the lower member of the standard. When, after use of the stand, it is desired to collapse the legs 15 the handle 29 on the upper end of the latch is swung outwards so as to flex the latch into its unlatched position. While the latch is in such position the sleeve 16 is slid upwards away from the bracket 14 so as to cause, through the medium of the links 17, the legs 15 to swing upwards and inwards into their collapsed position wherein they extend substantially parallel to the lower end of the standard.

The herein described latch is essentially simple in design and construction and hence may be produced at a low cost. It effectively and efficiently fulfills its intended purpose insofar as it serves when in latched relation with the sleeve to prevent collapse of the legs 15 of the stand.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. In combination with a music stand of the type that comprises a standard, a bracket mounted fixedly on the lower end of the standard and provided with equidistantly spaced outwardly extending lugs, a plurality of legs having certain ends thereof pivotally connected to the lugs on the bracket so that they are capable of swinging upwards and downwards relatively to the standard, a sleeve mounted on the standard above the bracket to slide to and from the latter, and a plurality of upwardly extending links corresponding in number to, and associated respectively with, the legs, having the lower ends thereof pivotally connected to the central portions of the legs and their upper ends pivotally connected to the sleeve, and adapted when the sleeve is slid downwards towards the bracket to swing the legs downwards into an operative position and when the sleeve is slid upwards away from the bracket to swing the legs upwards into a collapsed position wherein they extend alongside the lower end of the standard, a vertically extending latch in the form of a one-piece stamping of spring metal, operative releasably to hold the legs in their operative position, having the lower end thereof provided with a pair of integral laterally spaced outwardly extending ears in connected relation with certain of the lugs on the bracket, arranged so that its intermediate and upper end portions are free to flex toward the standard into

a latched position and away from the standard into an unlatched position, and provided at its upper end with integral vertically spaced inwardly extending upper and lower pairs of fingers adapted when the legs are in their operative position and said portions of the latch are in their latched position to straddle the sleeve in such manner as positively to prevent upward and downward sliding movement of said sleeve, the upper ends of the upper fingers being inclined downwards and inwards in the direction of the standard to provide cam surfaces which are adapted, when the sleeve in connection with downward swinging of the legs approaches the end of its downward sliding movement, to be engaged by the lower end of the sleeve and to coact therewith to cam said intermediate and upper end portions of the latch into their unlatched position in order to permit the sleeve to slide downwards past said upper fingers, said portions of the latch being adapted immediately after the sleeve is slid downwards past the upper fingers to flex inwards with a snap action into their latched position and thus cause the upper and lower fingers to be brought into straddled relation with the sleeve, the lower fingers being arranged in lapped relation with opposite side portions of the lower end of the standard and having the free ends thereof bent inwards to form steps for limiting outward flexure of said intermediate and upper end portions of the latch into their unlatched position.

2. In combination with a music stand of the type that comprises a standard, a bracket mounted fixedly on the lower end of the standard and provided with equidistantly spaced outwardly extending lugs, a plurality of legs having certain ends thereof pivotally connected to the lugs on the bracket so that they are capable of swinging upwards and downwards relatively to the standard, a sleeve mounted on the standard above the bracket to slide to and from the latter, and a plurality of upwardly extending links corresponding in number to, and associated respectively with, the legs, having the lower ends thereof pivotally connected to the central portions of the legs and their upper ends pivotally connected to the sleeve, and adapted when the sleeve is slid downwards towards the bracket to swing the legs downwards into an operative position and when the sleeve is slid upwards away from the bracket to swing the legs upwards into a collapsed position wherein they extend alongside the lower end of the standard, a vertically extending latch in the form of a one-piece stamping of spring

metal, operative releasably to hold the legs in their operative position, having the lower end thereof provided with a pair of integral laterally spaced outwardly extending ears in connected relation with certain of the lugs on the bracket, arranged so that its intermediate and upper end portions are free to flex toward the standard into a latched position and away from the standard into an unlatched position, and provided at its upper end with integral vertically spaced inwardly extending upper and lower pairs of fingers adapted when the legs are in their operative position and said portions of the latch are in their latched position to straddle the sleeve in such manner as positively to prevent upward and downward sliding movement of said sleeve, the upper ends of the upper fingers being inclined downwards and inwards in the direction of the standard to provide cam surfaces which are adapted, when the sleeve in connection with downward swinging of the legs approaches the end of its downward sliding movement, to be engaged by the lower end of the sleeve and to coact therewith to cam said intermediate and upper end portions of the latch into their unlatched position in order to permit the sleeve to slide downwards past said upper fingers, said portions of the latch being adapted immediately after the sleeve is slid downwards past the upper fingers to flex inwards with a snap action into their latched position and thus cause the upper and lower fingers to be brought into straddled relation with the sleeve, the lower fingers being arranged in lapped relation with opposite side portions of the lower end of the standard and having the free ends thereof bent inwards to form steps for limiting outward flexure of said intermediate and upper end portions of the latch into their unlatched position, the upper extremity of the latch being bent outwards and shaped to form an integral handle whereby the latch may be grasped in connection with flexing of the intermediate and upper end portions thereof into their unlatched position.

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