Feb. 10, 1942. H. J. WAECHTER 2,272,490

TRIPOD

Filed May 14, 1940

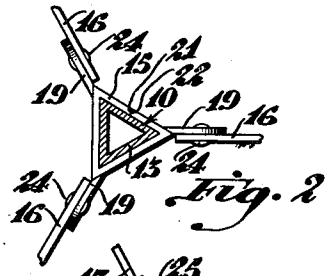


Fig. 2

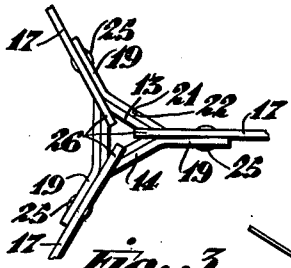


Fig. 3

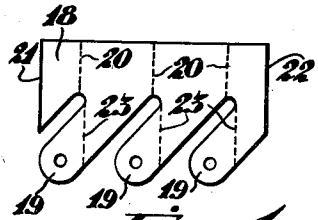


Fig. 4

Fig. 1

Fig. 6

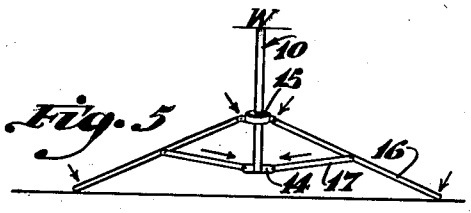


Fig. 5

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5 Claims. (Cl. 248—171)

This invention relates generally to foldable tripods of the type utilized for music stands, telescope rests, camera rests and the like. More particularly, it is concerned with the combination and relationship of the legs, their links and, the lower section of the standard.

It is naturally desirable in foldable stands to have the leg structures lock against collapse under weight while in any degree of spread. The types now in use are provided with manually operated locking means such as thumb screws or split rings which lock under the influence of cams.

The present invention provides a stand which requires no locking means to sustain its legs in position when unfolded and set up. Consequently, no manipulation of thumb screws or other detent means is necessary to change the position of its legs. Furthermore, the invention incorporates a simple means for limiting the spread of the legs beyond their effective self-sustaining extreme.

It has, therefore, been an object of this inventor to provide a stand of simple structure which is self-sustaining against collapse, that is, without the use of detents, at any point in the effective spread of its legs.

Another object of the inventor has been to provide a stand which utilizes a minimum of parts without losing any structural strength because of its simplification.

Furthermore, it has been another object of the inventor to utilize a post formed of triangular tubing and to arrange the lugs of the runner or the base element so that they project radially from the points of the triangular tubing. Thus the supporting thrusts or pressures exerted by the legs or links are directed against portions of the post which are braced. In other words, a post of this cross-section, with the lugs arranged as described, is much less apt to collapse than the conventional round tubing. Also, there is absolutely no possibility of the post sections rotating one within the other, and no chance of the runner rotating on the post, which rotating action in the case of the runner would permit twisting of the tripod structure.

Other objects and advantages of the invention will be apparent from the following description of the drawing in which:

Fig. 1 is a side view of a music stand embodying the invention.

Figure 2 is a cross sectional view taken on line 2—2 of Figure 1.

Figure 3 is a view looking up toward the bottom of the standard illustrating the manner in which the inner ends of the links are utilized as stops to limit the extension of the legs of the stand.

Figure 4 is a view of the blank which forms the runner or base piece.

Figure 5 is a diagrammatic view of a stand illustrating the self-sustaining action of the parts.

Figure 6 illustrates the legs of the music stand as they appear when folded.

The standard, indicated generally at 10, consists of several tubular sections which telescope to provide adjustment of its height. A music rack 11 carries a post 12 which slides into the upper section of the standard. The standard shown in the drawing is made of tubing which is triangular in cross section. Cylindrical tubing may be utilized without departing from the spirit of the invention except wherein the invention pertains to the self-supporting arrangement of the legs and links.

The supporting base, to which the invention is particularly directed, consists of the lower section 13 of the standard 10, a foot piece 14, a runner 15, legs 16, and links 17. The foot piece and runner may be made identical to simplify their fabrication. Both the runner and foot piece comprise a body portion 18 and three arms 19 which extend radially from the body portion. The blank from which either the foot piece or runner may be made is shown in Figure 4 of the drawing.

To form these ports so that they fit around the triangular standard, three folds, along the dotted lines 20, are made in the body portion 18 of each blank to bring side edges 21 and 22 together. The arms 19 are folded along the lines 23 to extend downwardly and radially from the three corners of the triangle as shown in Figures 2 and 3. The foot piece is secured near the bottom of the standard by spot welding or some similar method, while the runner is placed around the standard above the foot piece so that it is free to slide up and down.

Each leg 16 is pivotally attached to its corresponding arm 19 of the slidable runner by a pin 24. Each link 17 is similarly attached to an arm of the stationary foot piece by a pin 25. A short end section 26 of each link extends inwardly beyond the pivot point 25. The other end of each link is pivotally attached to its corresponding leg by a pin 27.

The essence of the invention resides in the

relationship of the axes of the pins **24**, **25**, and **27**, and the end sections **26** of the links, to the lower section of the standard. In the preferred embodiment of the invention, the length of each link between the centers of pins **25** and **27** is approximately .95 or a little less than the distance between the centers of pins **24** and **27** on the legs. Preferably, the distance between the centers of pins **24** and **27** is substantially less than one-half the total length of each leg. In Figure 1, the bracket *a* defines the travel of the runner through the effective distance of the self-sustaining action of the leg structure.

The diagram in Figure 5 illustrates the manner in which the parts cooperate. It can be seen from this diagram that the standard is free to move relative to the runner. The links take the direct thrust of any weight that is placed on the stand and transmit the weight to the legs so that the runners take the thrust of the upper end of the legs, and the surface upon which the stand is resting takes the thrust of the lower ends of the legs.

If the runner were permitted to be moved downwardly far enough to bring the links to a position where they are at 90 degrees to the axis of the standard, the distortion in the metal of the parts and the looseness of the joints would permit the links to sag or fold slightly if weight were placed on the stand. Since the above described sag would occur only when the links are near the horizontal, i. e. 90 degrees to the axis of the post, a limit to the spread of the legs is provided to prevent the links from moving to positions in which they are at 90 degrees to the axis of the post. Therefore, the stand is positively set against movement at any point in the possible spread of the legs.

This limit is constituted by the sections **26** of the links. In Figures 1 and 3, it can be seen that the sections **26** extend inwardly to contact the bottom of the standard when the effective limit of the spread of the legs is reached. In the stand illustrated, this effective limit is reached when the links are disposed approximately at 80–85 degrees to the axis of the post. The self-sustaining action of this structure is positive in any degree of spread of the legs and the runner will not slip under any weight; the only limiting factor to the weight that the stand will support being the structural strength of the parts utilized.

Having described my invention, I claim:

1. Tripod means for supporting a post, comprising; a runner slidably mounted on the post, a base element of the same form as the runner but fixed to the bottom of the post, said runner and base element respectively including radially extended ears, legs pivotally connected to the respective ears of the runner, links pivotally connecting the ears of the base element to intermediate portions of the legs, said links including portions extending inwardly beyond their pivotal connections to the base element, said extensions adapted to engage the lower end of the post and constituting stop means effective for stopping downward swinging movement of the links before they reach horizontal position, the distance between the pivotal points of the links being slightly less than the distance between the pivotal points of the legs and the connection of the links thereto.

2. Tripod means for supporting a post, comprising; a runner slidably mounted on the post, a base element of the same form as the runner but fixed to the bottom of the post, said runner and base element respectively including radially extended ears, legs pivotally connected to the respective ears of the runner, links pivotally connecting the ears of the base element to intermediate portions of the legs, said links including portions extending inwardly beyond their pivotal connections to the base element, said extensions adapted to engage the lower end of the post and constituting stop means effective for stopping downward swinging movement of the links before they reach horizontal position.

3. Tripod means for supporting a post, comprising; a runner slidably mounted on the post, a base element fixed to the bottom of the post, legs pivotally connected to and extending radially from the runner, links pivotally connecting the base element to intermediate portions of the legs, said links including portions extending inwardly beyond their pivotal connections to the base element, said extensions adapted to engage the lower end of the post and constituting stop means effective for stopping downward swinging movement of the links before the links reach horizontal position, the distance between the pivotal points of the links being approximately .05 less than the distance between the pivotal points of the legs and the connection of the links thereto.

4. Tripod means for supporting a post, comprising; a runner slidably mounted on the post, a base element fixed to the bottom of the post, legs pivotally connected to and extending radially from the runner, links pivotally connecting the base element to intermediate portions of the legs, said links including portions extending inwardly beyond their pivotal connections to the base element, said extensions adapted to engage the lower end of the post and constituting stop means effective for stopping downward swinging movement of the links before they reach horizontal position.

5. A post supporting tripod including a post of triangular cross-section, a runner of triangular cross-section freely slidably mounted on the post, ears fixed to and extending radially from the lower end of the post, said triangular runner including ears extending from its corners, said last-named ears disposed along lines exactly intersecting the angles formed by the sides of the post, legs pivotally connected to and extending from said last-named ears in parallelism therewith and links pivotally connecting intermediate points of the legs with said first-named ears.

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