April 21, 1931. C. W. FREDERICK 1,801,913

TENT FRAME

Filed March 1, 1930

Fig. 1.

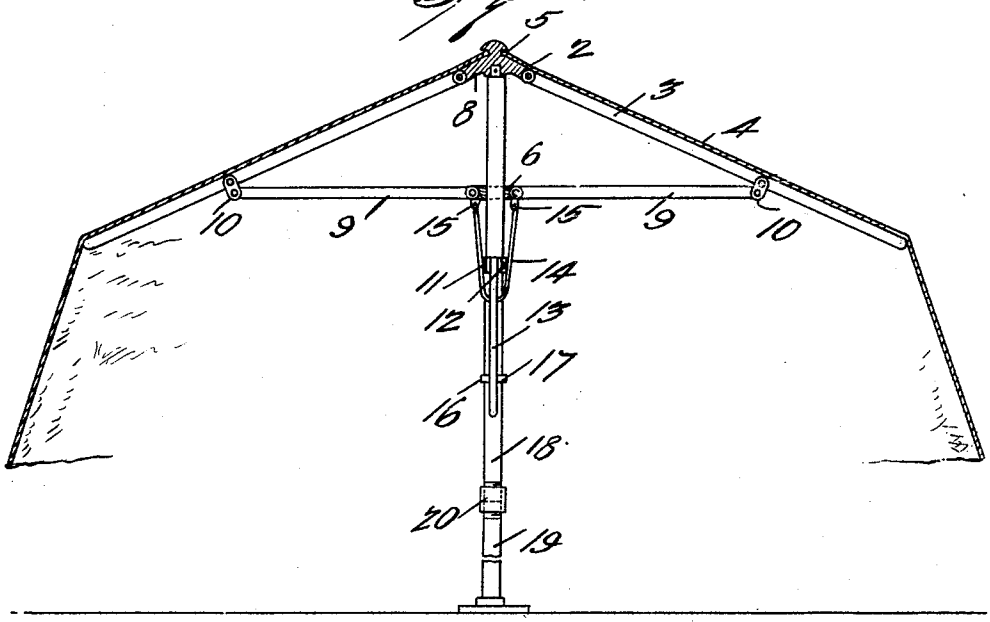


Fig. 2.

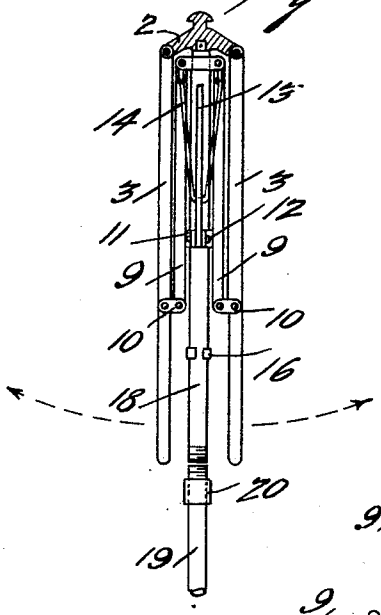


Fig. 3

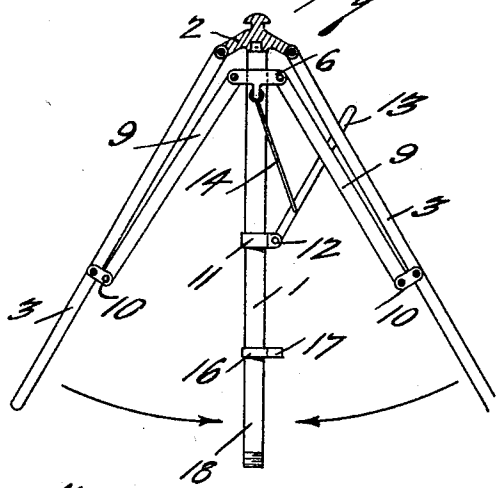
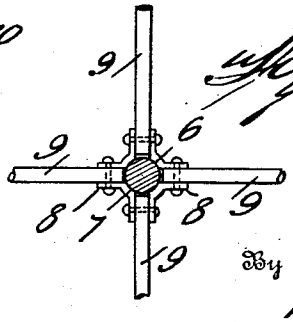


Fig. 4.



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UNITED STATES PATENT OFFICE

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TENT FRAME

Application filed March 1, 1930. Serial No. 432,430.

This invention is directed to an improvement in portable housings in the nature of tents and is more particularly concerned with a collapsible tent frame which may be readily extended for use to support a tent or collapsed for folding into small compass when not desired for use.

The primary object of the present invention is the provision of a tent frame involving a center pole, to the upper end of which the canopy supporting ribs or bars are pivotally connected, these supporting bars having a truss frame connection with the center pole, which is so constructed that when in operative position the truss members are at right angles to the center pole. This provides for maximum resistance and at the same time insures an even head room within the tent.

A further object of the invention is the provision of means involving a single lever by which the truss frame may be moved longitudinally of the center pole to extend or collapse the frame as the result of a single movement of the lever.

A further object of the invention is the provision of a frame in which the supporting bars are connected by truss bars, with the inner ends of the latter mounted for sliding relation to a center pole to elevate or lower the supporting bars; the construction providing for a collapsing of the frame in the upward movement of the inner ends of the truss bars on the center pole and the extension of the same by the downward movement of such truss bars. This permits a spreading operation by a downward pull of the operator and a collapsing operation by an upward push of the operator, therefore permitting the tent frame as a whole to be set or collapsed by a single operator without the necessity of help.

A further object of the invention is the provision of a center pole in sections, with the main section on which the bars are mounted of substantially the length of that of the supporting bars, this length of pole section being permitted by reason of the fact that when collapsed the pole connected ends of the truss bars is moved upwardly to thus avoid the length of center pole that would be necessary if in such collapse the inner ends of the truss bars were moved downwardly.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a view in elevation of the improved tent frame, the parts being shown elevated or in tent forming positions.

Figure 2 is a similar view of the frame with the parts shown collapsed.

Figure 3 is a view in elevation showing the tent frame partly collapsed to illustrate the operation of the lever.

Figure 4 is a sectional view through the center pole, showing the casting for supporting the truss frame members.

The improved tent frame comprises a center pole 1 having a removable head 2 to which are pivotally connected ribs or supporting bars 3. The supporting bars 3 are preferably four in number to provide a square tent, and the canopy or tent material, indicated at 4, is preferably secured more or less permanently to these bars, the head 2 having a non-leaking connection at 5 with the canopy material, as illustrated in Figure 1. Of course, the head 2 and the means of connecting the canopy material with the head and with the supporting bars are not important so far as the present invention is concerned and any conventional means may be employed for this result.

The four-way slide 6 is mounted for sliding movement on the center pole 1, this slide being in the form of a casting centrally formed with an opening 7 to receive the center pole and provided with radially disposed pairs of spaced ears 8 between which the brace or truss bars 9 are pivotally secured at their inner ends. The outer or free ends of the truss bars are pivotally connected through brackets 10 with the ribs or supporting bars 3. A bracket 11 is fixed on the center pole 1 and in ears 12 extending radially from the bracket is pivotally mounted an operating lever 13. The lever at a point intermediate its ends is connected by a U-shaped strap 14 with the slide 6, the strap having its lower cross bar passed

through the lever and its upper terminals 15 pivotally mounted in ears depending from the slide 6. Obviously, as the lever is raised and lowered, the slide 6 and therefore the inner ends of the truss bars 9 are correspondingly raised and lowered.

The relation of the parts is such that when the lever is in its extreme lowered position, that is with its free end turned downwardly into substantial contact with the center pole 1, as shown in Figure 1, the truss bars 9 will be in a relatively horizontal position and the supporting bars 3 inclined from the head 2 so as to support that portion of the canopy covering 4 connected with the bars 3 in a position to provide the top of the tent or housing. Of course, the tent material extends beyond the free ends of the bars 3 to provide the vertical walls of the tent when the bars are extended, as indicated in Figure 1.

In the reverse or upward movement of the free end of the lever 13, the slide 6 and connected ends of the truss bars 9 are moved upwardly until the ribs or supporting bars 3 are substantially parallel with and in close relation to the center pole 1, as indicated in Figure 2 of the drawings. In this position the parts are collapsed and the superfluous or loose tent material may be wrapped around the package as a whole to present the entire structure in a comparatively small, readily portable compass.

If preferred and as desired, a keeper 16 is secured upon the center pole 1, the keeper being formed with radial spaced extensions 17 between which the free end of the lever is housed when the latter is in operative position.

It is to be particularly noted that the truss bars 9, when the frame is extended, occupy a position at right angles to the center pole 1 and are substantially horizontal. This affords a maximum resistance to strain incident to pressure on the supporting bars 3, and furthermore provides the maximum head room within the tent, as distinguished from similar types of tent frame structures in which the truss bars are at an angle other than a right angle to the center pole. In the latter case the strain resistance is less effective than in the present arrangement of truss bars, and furthermore the angular relation of the truss bars of previous structures restrict the head room in the tent at certain points, as will be apparent.

Furthermore, in the particular construction described, the lever 13 is, when the parts are elevated, substantially parallel to the center pole 1 and as the parts between the lever and slide 6 of the truss bars are in substantially vertical alignment, it is quite apparent that the construction is substantially locked against accidental disturbance without the necessity of a locking means for the purpose. Furthermore, this lever and its connecting parts are entirely out of the way, being very closely adjacent to the center pole 1, and they present absolutely no obstruction in the interior of the tent.

The center pole 1 is preferably constructed in sections, indicated at 18 and 19, designed to be removably connected in pole-forming relation by a ferrule 20. The upper section 18 of the pole on which the slide 6 operates is substantially equal in length to the length of the supporting bars 3, as clearly shown in Figure 2. This comparatively restricted length of the section 18 of the pole is permitted by reason of the fact that the slide 6 moves upwardly in the collapse of the frame and downwardly for a comparatively short distance in extending the frame. Thus the pole length 18 need only be that necessary to accommodate the keeper 16 and at least need not be of any greater length than the length of the supporting bars 3. This provides for a comparatively short length package when the frame is collapsed and provides for very much more convenient storage and transportation than if the pole was of greater length. Furthermore, by reason of the head 2, the supporting bars 3, when in collapsed position as indicated in Figure 2, will lie substantially parallel with the pole section 18 and provide means between the pole section and such bars 3 for the reception of the slide 6 and truss bars 9. Thus the package formed is of substantially uniform diameter throughout its length to facilitate transportation and storing.

An important feature of the invention resides in the fact that the slide 6, that is the inner ends of the truss bars 9, move downwardly to extend the supporting bars 3 and upwardly to collapse said bars. Thus when setting the tent, after connecting the pole sections 18 and 19, a downward pull on the lever 13 is sufficient to spread the supporting bars to the desired positions. This operation being merely a downward pull on the lever, with the subsequent movement assisted by the weight of the parts, it is quite apparent that the setting of the frame into tent-forming relation may be readily accomplished by a single operator without requiring any assistance. Furthermore, when the lever has been turned downwardly to its final position, there is provided, as will be apparent from the foregoing description, a positive lock for the parts which will tend to prevent their casual displacement under substantially any usual disturbance to which the tent might be subjected.

The important feature in this connection, however, is the simplicity of operation incident to the mere up-and-down movement of

a single lever to secure the frame parts in collapsed or extended relation. The setting of the parts in operative position is incident to a mere downward pull on the free end of the lever and when this free end of the lever is brought into contact with the center pole, the upward pull necessary to a collapse of the structure is in direct line with or, as a matter of fact, outwardly beyond the fulcrums of the lever and of the strap 14, so that the greater the strain tending to collapse the structure, the more secure the holding position of the lever.

What is claimed to be new is:

1. A tent frame structure including a center pole, tent supporting bars pivotally connected to the upper end of the pole, a slide on the pole, truss bars pivotally connected to said slide and said supporting bars, and means for moving the slide in either direction to position the truss bars in operative or inoperative relation to the pole and supporting bars.

2. A tent frame structure including a center pole, tent supporting bars pivotally connected to the upper end of the pole, a slide on the pole, truss bars pivotally connected to said slide and said supporting bars, and a lever for moving the slide in either direction to position the truss bars in operative or inoperative relation to the pole and supporting bars, the limit movement of the lever in one direction arranging the truss bars at right angles to the center pole.

3. A tent frame structure including a center pole, tent supporting bars pivotally connected to the upper end of the pole, a slide on the pole, truss bars pivotally connected to said slide and said supporting bars, a lever pivotally mounted on the pole, and a strap intermediate said lever and slide, said lever, when turned downwardly into contact with the pole, serving to move the slide downwardly to position the truss bars at right angles to the center pole.

4. A tent frame structure including a center pole, tent supporting bars pivotally connected to the upper end of the pole, a slide on the pole, truss bars pivotally connected to said slide and said supporting bars, a lever pivotally mounted on the pole, and a strap intermediate said lever and slide, said lever, when turned downwardly into contact with the pole, serving to move the slide downwardly to position the truss bars at right angles to the center pole, said lever and strap presenting a locking joint when the lever is in operative position to prevent casual displacement of the lever.

In testimony whereof I affix my signature.

CLIFFORD W. FREDERICK. [L. S.]