May 28, 1957 P. A. LEFEBVRE 2,793,646

FOLDING CAMP TENT

Filed Sept. 10, 1954 3 Sheets-Sheet 1

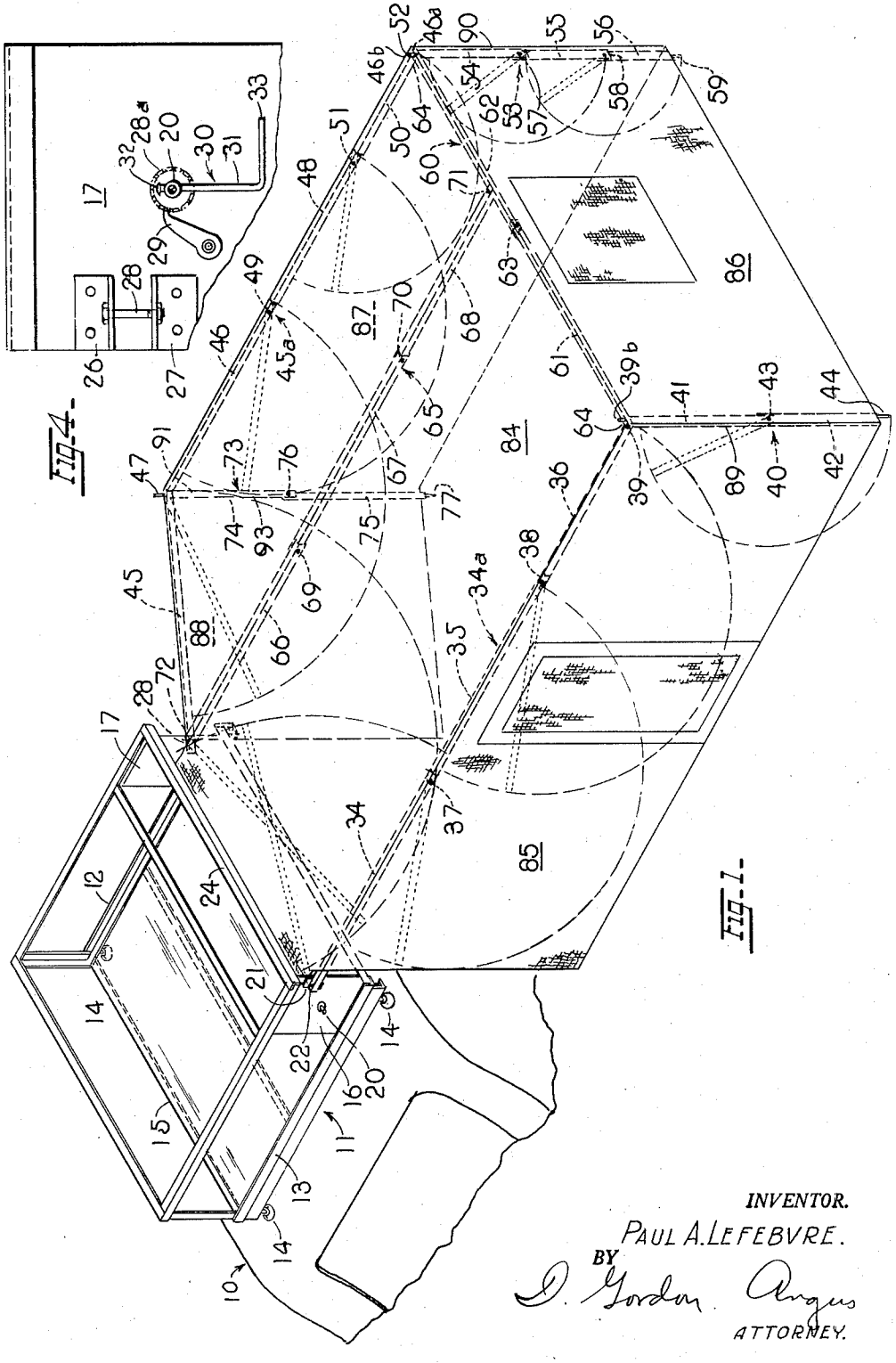


FIG. 1.

FIG. 4.

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FOLDING CAMP TENT

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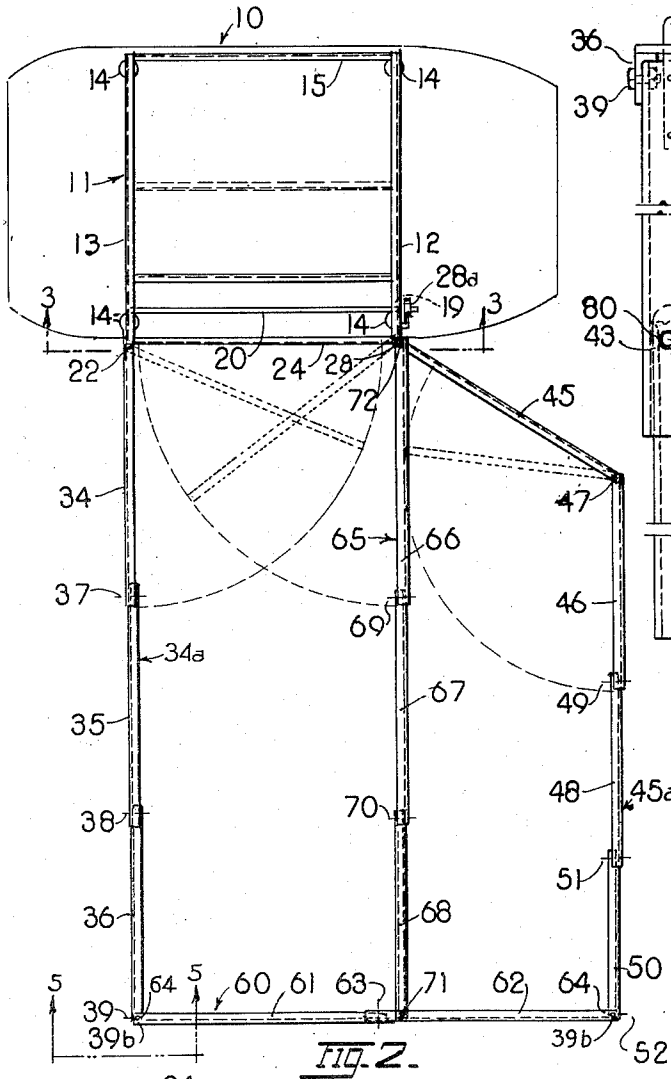


Fig. 2.

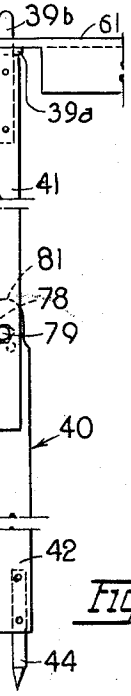


Fig. 5.

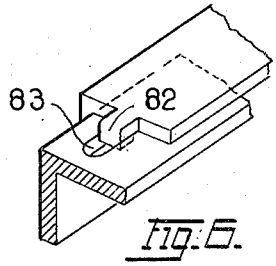


Fig. 6.

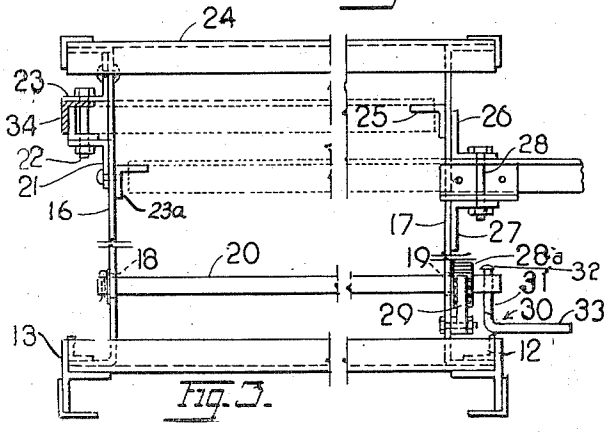


Fig. 3.

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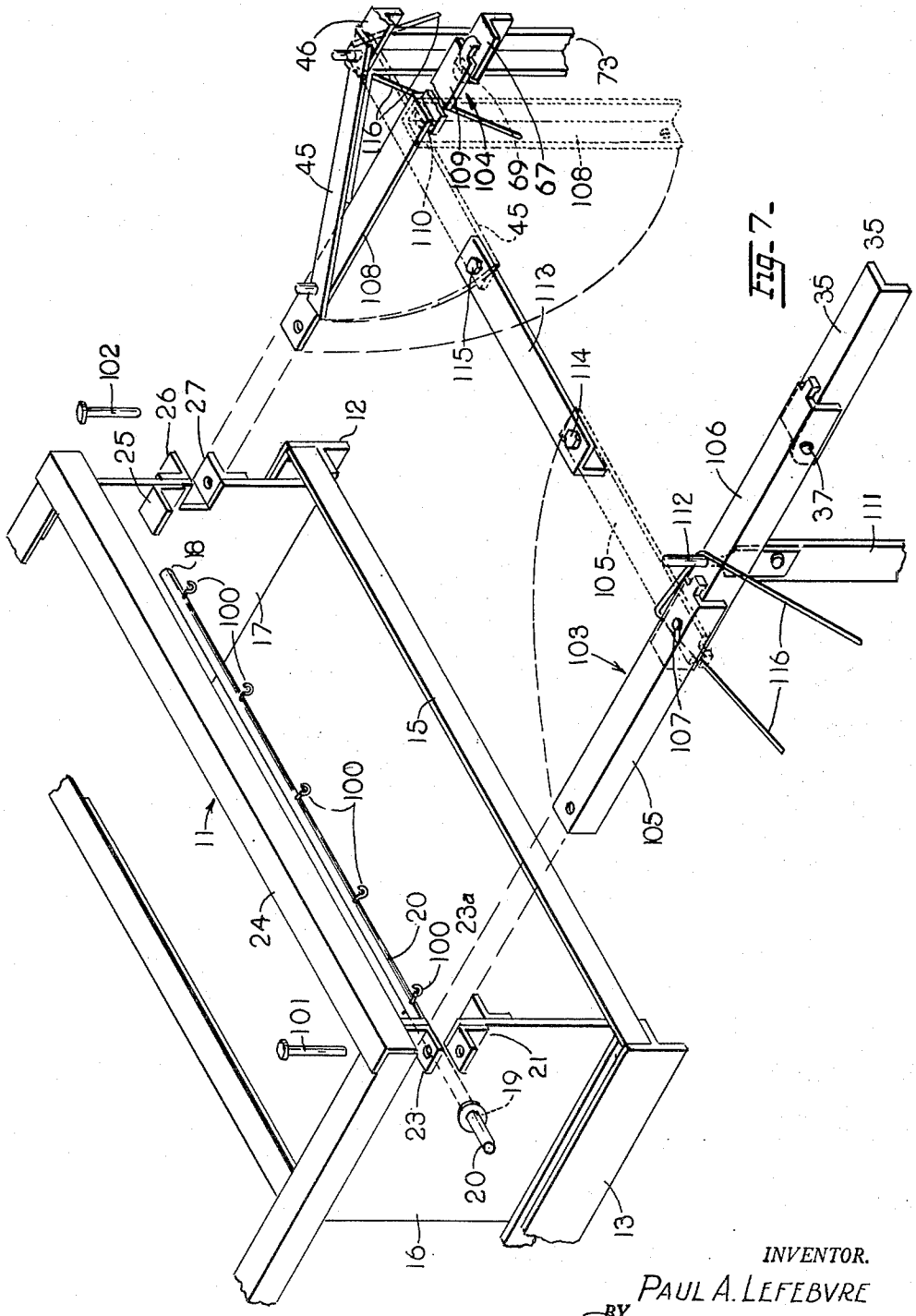


Fig. 7.

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2,793,646

FOLDING CAMP TENT

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Application September 10, 1954, Serial No. 455,140

1 Claim. (Cl. 135—1)

This invention relates to a folding camp tent, and in particular to a tent which can be partially supported by an automobile when set up, and stowed in a carrier atop the automobile when struck, and is a continuation-in-part of my copending patent application Serial Number 423,793, filed April 16, 1954, and entitled "Folding Camp Tent," now abandoned.

In the event of forced evacuation of metropolitan areas, the provision of housing for the displaced population will become a serious problem. There are insufficient buildings in dispersal areas to house even a small fraction of the people who will be sent to such areas. City dwellers are generally unfamiliar with the more complex conventional camping tents, and in addition, such tents are bulky and hard to store in the small storage space available in a family car. The inability of these people to provide for their own shelter will place an unbearable load upon the authorities in the time of an emergency.

It is therefore an object of this invention to provide a folding camp tent which can be stowed in a carrier of relatively small compass compared to ordinary tent stowage requirements, and which can be set up to provide a commodious shelter. A related object is to provide the tent structure and stowage means in a simple mechanical form whereby even a person largely lacking in mechanical skill and camping experience will be able to set up or store the tent in a minimum time. In fact, it has been found that this tent may be either set up or struck in as little as three minutes.

An optional object is to provide such a tent which can be detached from the automobile, thus providing shelter, but still permitting the separate use of the automobile.

The invention is carried out by providing a carrier at the side of the top of a car which accommodates a reel upon which a flexible covering for the tent structure can be wound. A feature resides in segmented tent frame members which are pivotally mounted to this carrier so as to be integral therewith, and these frame members may be swung out to provide a structure. If desired, additional stiffening members may be furnished. The segments of these members are joined by pivots so that the carrier need have a long dimension less than any edge dimension of the erected tent, thereby reducing stowage requirements. The length of the carrier thus ceases to be defined by the length of the longest edge of the tent, and the longest edge of the tent ceases to be limited by the length of the carrier. With this invention a tent can be stored in a carrier adapted to fit on a passenger car which formerly could only be fitted in a carrier of such a length that a station wagon or other long-bodied vehicle was needed to transport it. When the framework is set up, then the flexible covering can be unreeled to cover

the framework, and then, after fixing the covering to the framework, the reel can be tightened to give structural integrity to the tent.

The above and other features of this invention will be fully understood from the following detailed description and the accompanying drawings, in which:

Fig. 1 is an isometric view showing a tent according to the invention erected alongside an automobile;

Fig. 2 is a plan view of the tent of Fig. 1;

Fig. 3 is an elevation taken at line 3—3 of Fig. 2;

Fig. 4 is an end view of the carrier of Fig. 1 particularly showing a means for turning the reel;

Fig. 5 is a detailed view of a post for use in the tent of Fig. 1;

Fig. 6 is an isometric detailed view of a stiffening means between two adjacent structural segments; and

Fig. 7 is a fragmentary exploded view in perspective of another form of tent according to the invention adaptable to be set up separately of an automobile.

The tent of this invention is designed to be erected adjacent to an automobile **10** and is conveniently affixed to the roof thereof by means of a carrier **11** which preferably comprises a pair of T-section transverse members **12** and **13** which can be attached to the roof of the automobile by means of suction cups **14**. These suction cups are best disposed at both ends of said transverse members. The transverse members are spaced from each other by means of a cross-bar **15** and thereby form a base for the rest of the carrier (see Fig. 3).

This carrier conveniently has two side plates **16, 17** having flanges which are affixed to flanges of the transverse members **12** and **13**. A metal floor for a storage compartment can be laid atop the flanges of transverse members **12** and **13**. The side plates have aligned bearing holes **18, 19** for accommodating the shaft **20** of a reel assembly. Above the shaft an L-shaped hinge member **21** provides a lower hinge block for a hinge bolt **22** which passes vertically therethrough. At the same point of attachment to the side members **16** there is provided an L-shaped rest **23***a* for the purpose later to be described. Spaced from the hinge member **21** is another hinge member **23** in which there is provided a hinge hole for the same hinge pin **22** to pass through. This upper hinge support is also attached to side member **16**. At the top of the carrier there is a cross-bar **24** which extends between the side members **16** and **17** and is affixed to a flange on each of these side members. It will be observed that side members **16** and **17** are disposed at the side of the car leaving a floored storage area across the rest of the car top.

Below the cross-bar **24**, on side member **17**, there is disposed an L-shaped rest **25**. Below that rest and on the opposite side of side member **17**, is a pair of spaced hinge members **26, 27** having holes therein to pass a hinge pin **28**.

The reel shaft **20** protrudes from side member **17** and has a protruding end with a gear member **28***a* (see Fig. 4) mounted thereto. A dog **29** is pivotally mounted to the side member **17** and has a projecting tooth which can drop into a space between adjacent teeth on the gear **28**. At the extreme end of the shaft there is a crank **30** comprising an L-shaped bar with one arm **31** passing transversely through the end of the shaft. This arm has an upset end **32** to hold it in the shaft. The handle **33** of the crank may therefore be rotated about this arm so

the handle can be pushed to an out-of-the-way position.

The canvas covering for this tent may be fixed to the reel by means such as screws (not shown), or by any other appropriate method.

A first segmented tent frame member 34*a* is swivelly mounted to the hinge pin 22 associated with the side member 16. This tent frame member comprises five pivotally joined segments, one of which is pivoted to the vertical hinge pin 22 and therefore swings in a horizontal plane. It will be appreciated that the number of segments may be more or less than five, depending on the size and complexity of the tent to be erected, the number being shown in this example representing a preferred embodiment of the invention. Segment 34 is directly pivoted to the hinge pin 22, one end of segment 35 is pivoted to the free end of segment 34 by pivot 37 and one end of segment 36 is pivoted to the free end of segment 35 by pivot 38. A pivot 39 is provided at the free end of segment 36 for joining that segment to a leg 40 which has two segments 41, 42 with a pivot 43 between them. It will be noted that 34, 35 and 36 make up a roof edge.

Pivots 37, 38, 39 and 43 are generally parallel to each other, that is, they are substantially horizontal. They are therefore perpendicular to pivot 22. A spike 44 is provided at the foot of leg 40. A notch 39*a* is provided in segment 36 to receive a pin 39*b* on segment 41.

At the other hinge pin 28, there is provided another segment tent frame member 45*a*, comprising a segment 45 pivoted to vertical hinge pin or pivot 28, a segment 46 with a vertical pivot 47 joining it to the free end of segment 45, a segment 48 pivoted at 49 to the free end of segment 46, and a segment 50 pivoted at 51 to the free end of segment 48. A substantially horizontal pivot 52 joins segment 51 to a leg 53 which comprises three segments 54, 55, 56, a pivot 57 joining segments 54 and 55 and a pivot 58 joining segments 55 and 56. A spike 59 may be provided at the bottom of leg 53. A slot 46*a* is formed at the end of segment 50 to accommodate a post 46*b* on segment 54. It will be observed that segments 45, 46 and 48 make up a roof-edge.

Hinge 28 and pivot 47 are vertical and parallel, while pivots 49, 51, 52, 57 and 58 are substantially horizontal, parallel to each other and perpendicular to hinge 28 and pivot 47.

The segments 34, 35, 36, 41 and 42 are progressively shorter in that order, segment 34 being the longest and also being shorter than the distance between side members 16 and 17. Segments 45, 46, 48, 50, 54, 55 and 56 are relatively shorter than each other in that order, segment 45 being the longest and also being shorter than the distance between side members 16 and 17. Referring to the largest length, largest width, and the height of the tent as its edge dimensions, none of the segments, nor the width of the reel, is as large as any edge dimension.

A strengthening member 60 comprises two members 61, 62 which are pivoted to each other at 63 and have holes 64 at their free ends to accommodate a post such as 39*b* therethrough in order that they may be fixed at an end of segments 36 and 50 respectively. This strengthening member 60 comprises a roof-edge. Another strengthening member 65 comprises three segments 66, 67 and 68 which are joined by pivots 69, 70. The free end of segment 68 has a hole 71, and the free end of segment 66 has a hole 72, for joinder to posts on member 60 and segment 45 respectively. These pivots are preferably horizontal when the tent is erected. All of these segments are preferably shorter than the reel so that they can be stowed in the carrier.

A leg 73 comprising two segments 74, 75 (see Fig. 1) joined by a pivot 76 is provided with a post at its upper end for joinder with segment 45. This leg has a spike 77 on the bottom end thereof.

A tent with a floor area approximately 7½ x 10½ ft. may be conveniently constructed by providing segments of the following dimensions:

Table

Segment number	Pivot to pivot distance
34	42½
35	41¾
36	39
41	38½
42	36½
45	48
46	36½
48	33¾
50	30¾
54	28¼
55	22¾
56	20¼
74	42¾
75	30¾
66	42½
67	41¾
68	39
61	45½
62	45½

It will be later observed that all of these members may be conveniently folded into the carrier which will have a distance between side members of only 48½ inches. The complete unit, including all structure, the carrier and a flexible canvas covering weighs less than eighty pounds. Aluminum is the preferred substance for this tent, because of its low specific gravity.

The details of a preferred pivot such as pivots 37, 38, 49 and 51 between adjacent segments will be seen by particular reference to Figs. 5 and 6. A slot 78 is formed in one flange of the L-shaped segments, so that it slants away from the other flange, while a stud 79 is fixed to a flange of the adjacent segment so it projects through the slot. A nut or some upset means 80 is provided on the end of the stud to hold it in the slot. The end of the innermost flange is conveniently rounded off at 81 to simplify the pivoting action. When the segments are generally parallel and shoved together, there can be no further rotation. When pulled apart, the segments can be rotated relative to each other.

As will be appreciated by reference to Fig. 6, a further means for providing rigidity of structure and freedom from side sway comprises a finger 82 on the end of one of the segments, and a slot 83 in the other into which this finger may project when the segments are extended so as to be substantially parallel to each other. This provides a certain amount of rigidity in respect to sway-motion of the tent structure. This finger will be found on the upper side of the tent frame members, and is shown with particular reference to the joint between frame members 46 and 48. This stiffening means may be provided at all joints.

A fabric covering for the structure is shown erected in Fig. 1 which comprises a pentagonal roof sheet 84 and substantially rectangular side sheets 85, 86, 87 and 88. Side sheet 88 is disposed so as to form a wall dropping over segment 45 while sidesheets 85, 87 and 86 drop from segmented frame members 34*a* and 45*a* and from member 60, respectively. Zipper means are provided at joints 89, 90 and 91 so that pairs of side members comprising 85, 86; 86, 87; and 87, 88 respectively may have the shape of separate flaps which can be joined after the framework is set up. Doors and windows may be provided as suitable for the user in the various side sheets or even in the top.

It will be appreciated that for storage purposes, the side sheet 88 may first be thrown atop the roof sheet 84. After that, the sidesheet 87 and whatever other sheets extend on each side of the midpoint of sheet 84 may be folded by carrying the bottom end of sheet 87 over until

it coincides with the bottom end of sheet **85**. Then the bottom end of sheets **85** and **87** may be folded back on the top so as to create a folded fabric pile no wider than the reel **20**.

In Fig. 7 there is shown a modification of the tent of Fig. 1 which permits the tent to be set up and then detached from the automobile so that the automobile may be driven away after the tent is erected. The same carrier is used, and the components common to the embodiment of Fig. 1 bear the same reference numerals. The same fabric covering is utilized, and, when the tent is not detached from the car, its erected configuration has the same outer contour. For clarity of exposition, only the frame structure is shown in Fig. 7, it being understood that the fabric covering shown in Fig. 1 can conveniently be utilized. For this detachable tent, it may be desired to provide an additional fabric sheet as wide as the reel and as long as the tent is tall to cover the gap which formerly was filled by the automobile.

Hooks **100** are provided on the reel **20** by means of which the fabric covering may be detachably fixed to the reel.

In order to make the tent frame structure conveniently detachable, headed drop pins **101**, **102** are provided in place of the threaded hinge pins **22**, **28** shown in Fig. 3.

The principal structural differences between this detachable tent and the non-detachable tent resides in the substitution of a jointed, two-piece member **103** in place of segment **34**, which is attached to segment **35** by pivot **37**, and of another jointed two-piece segment **104** in place of segment **66**, which is attached to segment **67** by pivot **69**. The members **103**, **104** and segment **45** are shown in solid line in the position they have when the tent is erected and fastened to the car, and in dashed line in the position they have when the tent is erected and separated from the car.

The overall extended length of members **103** and **104** is the same as that of segments **34** and **66**, respectively. Member **103** is divided into two segment **105**, **106**, which are joined by a vertical pivot **107**, and member **104** is divided into two segments **108**, **109** which are joined by a horizontal pivot **110**.

A leg **111** is provided which has a pin **112**, long enough to project above the frame structure when inserted in a hole in the top of segment **106**. This leg **111** is the same in all details as leg **73**.

A patch segment **113** is provided, along with two sets of fasteners **114**, **115** for joining together segments **105** and **45**. This patch segment preferably is also L shaped in cross-section so as to make a rigid patch with segments **105** and **45**. The term "structural frame," or "frame" as used herein means the member comprised of a plurality of segments which supports the flexible covering at an edge, the edge being defined as the intersection of two tent surfaces, such as the roof and a side, or two sides.

The technique of setting up and of striking the tent of Fig. 1 will be evident from the drawings, and particularly from Fig. 2, wherein there is shown in solid line the erected tent structure, and in phantom line there is shown some of the technique of folding and unfolding the segments.

When the tent is to be set up the automobile is parked in appropriate position, and the segmented tent frame member **34***a* which is attached to pivot member **22** is swung outwards and segments **34**, **35**, **36** are unfolded to make a straight horizontally extending tent frame member, and segments **41** and **42** drop downward to form a leg **40**, the spike **44** of which may be pushed into the ground.

When the pivoting action is completed, the adjacent segments are pushed against each other so that further pivoting is prevented by their abutment. The movement at pivot **39** is restricted by the posts fitting into the slot **46***a*. The fingers **82** drop into the slots **83** to reduce side-sway between the tent frame members.

The segmented tent frame member **45***a* attached to pivot **27** is swung out so that segment **45** makes an acute angle with the forward direction of the automobile, and segments **46**, **48** and **50** are extended in a line generally perpendicular to said forward direction of the automobile. Leg **53** drops, and its segments **54**, **55**, **56** form a straight vertical leg with an end spike **59** which may be shoved into the ground. The same locking and sway preventing means are provided for this frame member as for the other. Then the cross member **60** is placed between pivot points **39** and **52** of the two horizontally extending structures.

The posts **39***b* and **46***b* hold the legs at right angles to the adjacent segments, and fingers **82** fit into slots **83** for stiffness. The leg **73** is next placed under segment **45**.

The canvas is unreeled until it mostly rests on the ground between the two segmented tent frame members. The side sheets are unfolded and lifted over the side members. Their weight draping over the frame pulls the top sheet **84** taut. Now the member **65** may be placed between the segment **45** and segment **62**.

The covering fabric is provided at the various corners with grommets through which the spikes at the bottom of the legs may or may not be inserted. Also, if a fabric floor is to be used, to keep out the humidity of the ground, it will be attached to the legs at this time. The Zippers **89**, **90** and **91** are closed so as to join the various side-sheets.

To tighten the covering fabric and give the tent complete structural integrity, the crank handle **33** is swung out so as to be substantially perpendicular to the side member **17**; the dog **29** is lifted, and the crank is turned until the sheets are drawn tightly against the supporting structure. Tightening the fabric puts all of the supporting members of the tent in compression, and also provides side support against buckling. Thus, the term "structural integrity" refers to a strengthening which substantially resists collapse of the tent structure. Then the dog is dropped into a space between adjacent teeth on the gear **38**. The handle **33** is swung out of the way, and the tent is assembled and ready for use. It will be appreciated that much structural integrity will be given to the tent simply by tightening the canvas by turning the reel, even if the spikes at the bottom of the legs are not inserted in grommets in the side sheets.

When the tent is to be stored the reverse procedure is followed and it will be appreciated that the entire structure including all of the folding members may be fitted conveniently within the carrier.

The flexible covering is unfastened from the frame and the Zippers are opened. The covering is then folded to a size no wider than the reel leaving cross-member **65** in place, and the covering is wound thereon. Then cross member **65** and strengthening member **60** are removed, folded, and stored, and then the legs and the segmented tent frame members are folded up. Most of the structure is pivotally jointed so that when folded, there are two pieces which can be pivoted into the carrier to rest on the supports **23***a* and **25**. There will be three separate assemblies, that is, two cross members and one leg which must be separately stowed in this embodiment. These separate members are also preferably of shorter length than the carrier so that they may fit therein. When the segments are folded, they fit one within the other, and form a bundle no longer than the longest of the segments.

The erection and striking of the tent of Fig. 7 is the same as has just been described in connection with the tent of Fig. 1. In fact, when segments **103** and **104** are fully extended and segment **45** is attached to the carrier, the resulting tent configuration is exactly the same.

When the erected tent is to be freed from the automobile, leg **111** is placed under segment **106**. Then guy ropes are fastened in pairs to all four corners to elimi-

nate side-sway. Pins **101** and **102** are next pulled out of the hinge members, and segment **105** is swung horizontally underneath segment **104** to point at pivot **107**. Strengthening member **65** then rests atop segment **45**, and segment **108** is swung vertically so as to dangle freely.

Then patch member **113** is bolted to segments **45** and **105**, creating a rigid roof frame member or roof-edge. The tent fabric may then be released from hooks **100**, and dropped to cover the area under this member, and a four-sided tent results which is free of the automobile. The automobile may now be driven away.

When the tent is to be struck, the member **103** and segment **45** are again connected to the carrier. The fabric covering is reconnected to the reel, and the storage of the tent is carried out as described.

By this invention there is provided a tent which can be conveniently stored within a carrier of small compass and which may be expanded to dimensions significantly larger than any of the dimensions of the carrier. Such a tent will be found very useful for persons interested in camping and camping activities and will also find a convenient and widespread use as an evacuation housing means, since in its small storage requirements there is provided a commodious living facility.

This car camp is also very practical for use as housing while fishing in the mountains or at the beach as well as for camping in the desert or while as on any trip when in locations where suitable hotels and motels cannot be found (such as certain areas of Mexico). It could also be used for saving hotel and motel expenses while traveling since it requires only 3 minutes to set up.

It will also be observed that this tent and its carrier require storage space only at one side of the automobile, and a substantially shorter length than the length of the automobile, and thereby leaves a large space toward the center of the car, within which luggage and dunnage such as tables and chairs, stoves and sleeping bags may be stored as desired. This leaves the trunk and the interior of the car free for use of the passengers.

The embodiment of Fig. 7 furnishes further advantage that the tent may be released from the automobile, so that it is unnecessary to strike the tent whenever it is desired to drive the car. By the provision of the extra jointing in the tent frame members all the advantages of a tent which remains fixed to the car can be retained, and the further advantages of a detachable tent are obtained.

This invention is not to be limited by the embodiments shown in the drawings or described in the description, which are given by way of example and not of limitation, but only in accordance with the scope of the appended claim.

I claim:

In combination: a carrier adapted to be mounted atop an automobile which carrier comprises two substantially upright side members, a reel rotatably mounted between the two side members, means for turning the reel, means for holding the reel in a selected rotational position, and a pivot on each of said side members; a tent having a stored configuration and an erected configuration, which tent in its erected configuration provides structural frames for forming portions of the perimeter of a roof and sides of a tent, said roof and sides intersecting to form edges of the tent structure in the erected configuration, said structural frames comprising a pair of segmented tent frame members, one of said segmented tent frame members being releasably and pivotally attached to each of said pivots, each of said segmented tent frame members comprising at least four segments, whereby the structural frame for a plurality of edges can be formed by each segmented tent frame member, the frame for each edge comprising a plurality of segments, pivots joining adjacent segments of the segmented tent frame members together, each of said segments being no longer than the spacing between the side members, each of the segments being shorter than any edge of the erected configuration, each of the segmented tent frame members providing a frame for at least one edge of the roof perimeter: said tent also including a flexible covering for the tent structure comprising a roof sheet and side sheets attached to said roof sheet, said flexible covering being foldable to a width no wider than the reel, and being detachably secured to said reel, whereby the flexible covering can be wound on the reel, said flexible covering also being attached to the structural frame, whereby tightening of the reel gives structural integrity to the erected tent, and a pair of legs for supporting corners of the tent in the erected configuration when said tent is erected separately from the automobile, whereby, with the tent in its erected configuration, the segmented tent frame members and the flexible covering can be detached from the side members and reels, respectively, the said segmented side members can be joined, and the said legs placed under the segmented tent frame members to support the same, whereby the tent is thereby erected separately from the automobile.

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