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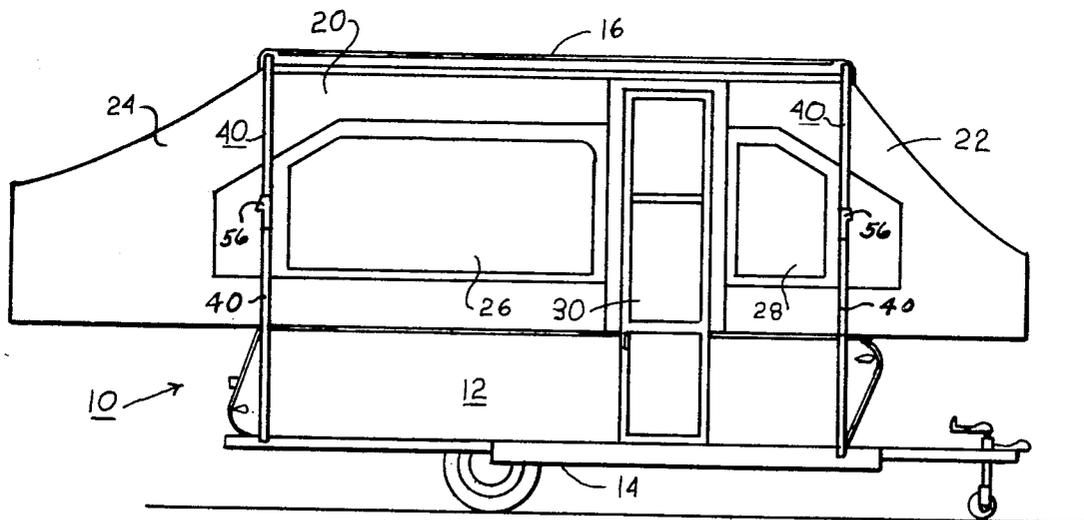
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[54] **SPRING LOADED ARM FOR CAMPING TRAILER AND THE LIKE**
 9 Claims, 6 Drawing Figs.

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 [51] Int. Cl. **P60p 3/32**
 [50] Field of Search 296/23, 26,
 27; 52/66; 287/14, 86, 99

ABSTRACT: A foldable arm for supporting the top of camping trailers, including two sections pivoted together, a spring in one section and a linkage connecting the spring to the adjacent end of the other section. The pivot point of the linkage and the pivot between the two sections are offset generally laterally from one another and the linkage is substantially enclosed in the structure of the two sections.



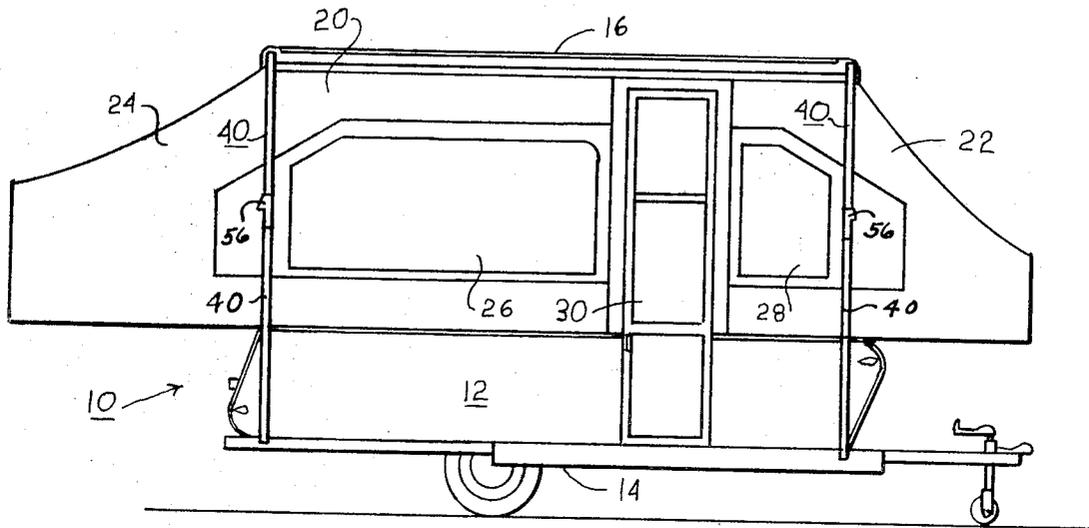


FIG. 1

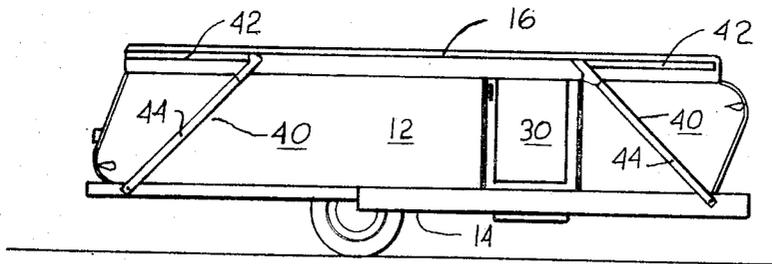
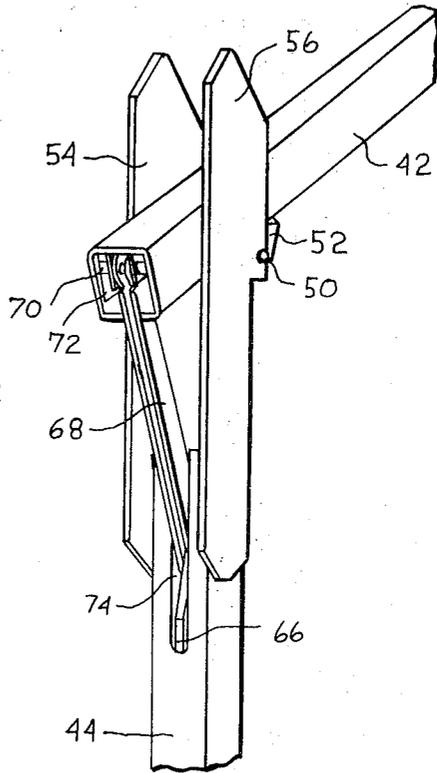
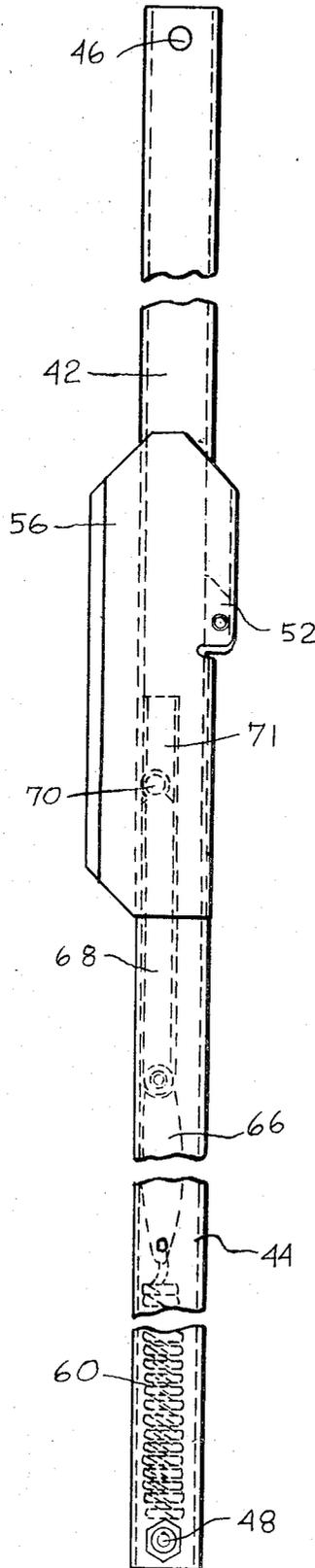


FIG. 2

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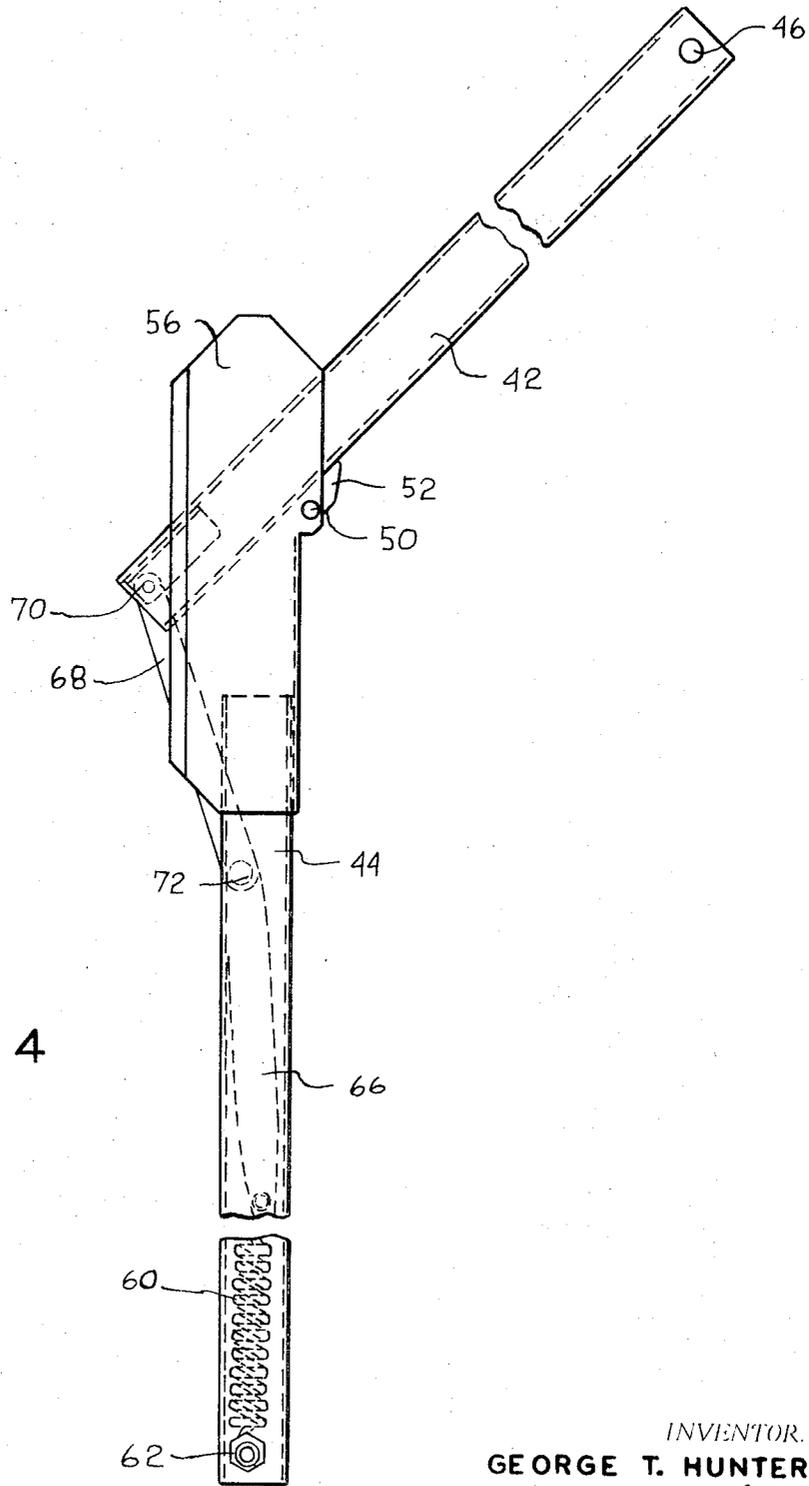


FIG. 4

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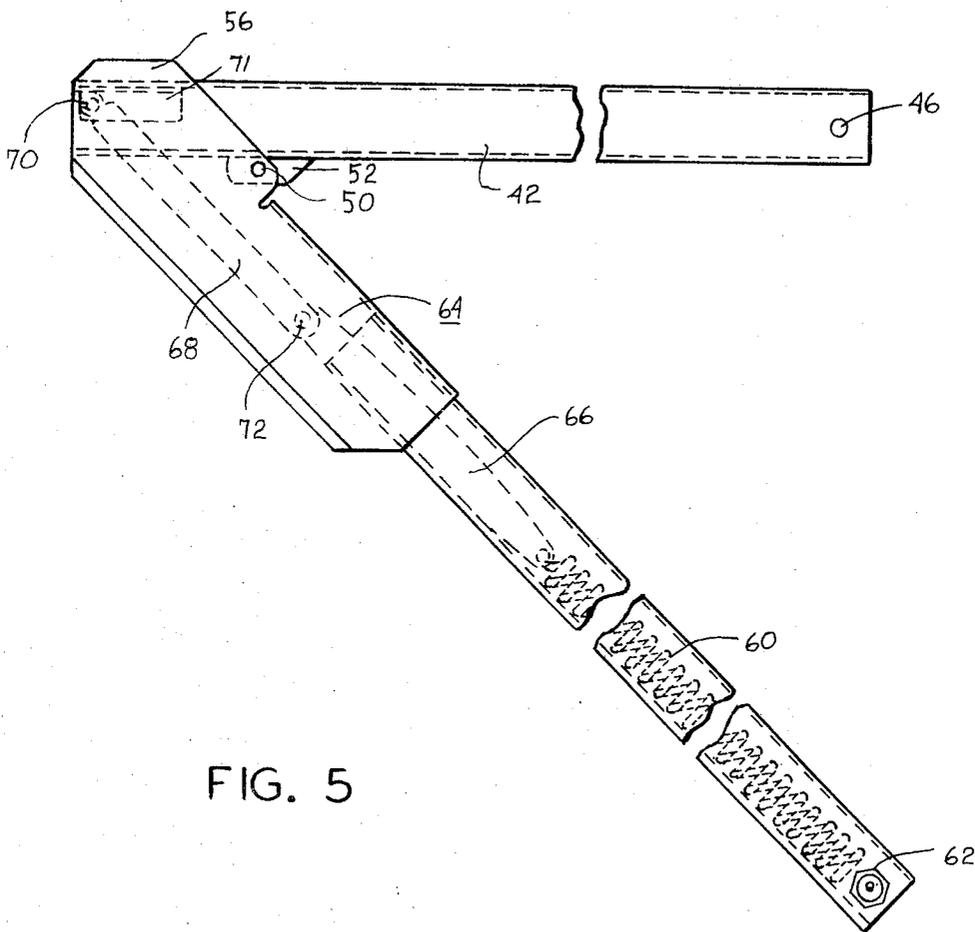


FIG. 5

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SPRING LOADED ARM FOR CAMPING TRAILER AND THE LIKE

The conventional camping trailer consists generally of a body supported on an undercarriage a top which is raised from and lower to a position on the body, folding arms positioned adjacent the four corners of the body and top. The arm generally consist of an upper section pivoted to the top and a lower section pivoted to the body and a pivot means connecting the two sections. In the past the arms have either been retained in their extended position by a positive acting clamp or fixture or by a spring operated lever which yieldably retains the two arm sections in a substantially straight line when the top is raised and which permits the sections to pivot toward one another when the top is lowered. The spring operated type has the advantage over the positive lock type of providing a counter force to the weight of the top for assisting in the raising operation and retaining the arms in their extended position without the use of any additional fastening means. In order for these spring operated types to function effectively, in the past, an exposed angularly positioned lever connecting the spring in one section with the other section, has been used to obtain good mechanical advantage between the spring and the other section. The exposed angularly positioned lever on the prior arms has created a hazard to the one raising and lowering the trailer top, in that as the sections of the arm were extended and folded, the lever closed inwardly onto one section, forming an effective scissor action which could cause serious injury to a hand or arm caught between the lever and the arm section. Further, this lever was always exposed, and in addition to creating the aforementioned hazard, was also unsightly and easily impaired in operation by foreign objects contacting it during movement of the trailer. It is therefore one of the principal objects of the present invention to provide an arm for camping trailers and the like which contains an effective operating spring for assisting in raising the top and holding the top in its raised position, but which is essentially enclosed within the arm structure in all positions of the two sections of the arm.

Another object of the invention is to provide a compact and rugged, jointed arm for camping trailers which is pleasing in appearance and easily maintained in optimum operating condition, and which can readily be installed on most camping trailers without modifying the design or construction thereof.

Still another object of the invention is to provide a camping trailer arm of the aforesaid type in which the operating parts are essentially enclosed in the bodies of the two pivoted sections, and do not pass through any exposed motion likely to cause injury to the operator, and which give reliable support to the top when the arm is in its extended position.

Further objects and advantages of the invention will become apparent from the following description and accompanying drawings, wherein:

FIG. 1. is a side elevational view of a camping trailer, showing the top of the trailer in its elevated position and the arms holding the top in their extended position;

FIG. 2. is a side elevational view of the camping trailer shown in FIG. 1 with the top in its lowered position and the arms in their folded position;

FIG. 3. is a side elevational and partial vertical cross-sectional view of one of the top-supporting arms, showing the arm in its extended position;

FIG. 4 is a side elevational and partial vertical cross-sectional view of one of the top-supporting arms showing the arm in its partially folded position;

FIG. 5 is a side elevational and partial vertical cross-sectional view of one of the top-supporting arms showing in its fully folded position; and

FIG. 6 is a fragmentary perspective view of one of the arms shown in the preceding FIGS. illustrating more fully the construction of the operative mechanism.

Referring more specifically to the drawings and to FIGS. 1 and 2 in particular, numeral 10 designates generally a camping trailer on which the present top-supporting arms are used. Nu-

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meral 12 indicates the body of the camping trailer, 14 the undercarriage on which the body is mounted, and 16 a top movable from the lowered position shown in FIG. 2 on the top of body 12 to the elevated position shown in FIG. 1. The space between the top of body 12 and the underside of top 16 is shown enclosed by a flexible structure 20 of a suitable material such as cloth or a plastic sheet. In the camping trailer illustrated in the two drawings, the ends are provided with extensions 22 and 24 and the sidewalls are provided with windows 26 and 28, and one side is provided with a door 30. The various details of the body and enclosure structure 20 do not form a direct part of the present invention, which is embodied in the four arms generally indicated by numeral 40 disposed at the four corners of the trailer. The construction and design of the trailer may be varied from one model to another and the arms 40 may be used satisfactorily on a variety of different types of camping trailers having an elevatable top of the type illustrated in the drawings.

The four arms used in the trailer structure illustrated herein are identical to one another, and hence only one will be described in detail. The arm consists of an upper section 42 and a lower section 44, the upper section being connected to top 16 by a pin, screw or bolt extending through hole 46 in the upper section 42, and the lower end of section 44 being connected to body 12 or a member of the undercarriage 14 by a pin, screw or bolt extending through a hole 48 in the lower end of section 44. The two sections are preferably formed of cross sectionally square tubular material, either with or without a longitudinal seam, and may be constructed of steel, aluminum or any other suitable structural material. The adjacent ends of sections 42 and 44 are connected to one another by a pin 50 extending through projecting member 52 on the side of section 42 and through the margin of members 54 and 56 joined rigidly to the upper end of section 44 on opposite sides thereof. The pin supported in the foregoing manner permits section 42 to fold downwardly with respect to section 44, as illustrated in FIGS. 3, 4 and 5, with members 54 and 56 forming merely an extension of sections 44 and a support for section 42. Member 42 pivots freely on pin 50 between the members 54 and 56.

A spring 60 is utilized to assist in raising the top 16 from its lowered position, shown in FIG. 2, to its raised position, shown in FIG. 1, and for retaining each arm in its extended position so that the arms will hold the top in the raised position without any additional locking or latching means being required on the arms. Spring 60 is disposed in the hollow interior of section 44 and is anchored to a sleeve or bolt 62 extending through the lower end of section 44 and is connected to the lower end of section 42 by a linkage 64 consisting of a lever 66 connected at one end to the upper end of spring 60 and to a lever 68, which in turn is connected to the lower end of section 42 by a pin 70 mounted in a bracket 71 in the lower end of section 42 and extending through a hole in the end of lever 68. The two levers 66 and 68 are pivotally connected to one another and to section 42 by pin 70, which forms an upper anchor point of linkage 64 spaced laterally from pivot pin 50, and hence the force of spring 60 tends to pull the inner end of section 42 downwardly and thus urges the two sections into alignment with one another.

As illustrated in FIG. 4, the inner end of section 42 swings outwardly from the axis of section 44 as the sections are moved between their folded and unfolded positions. With the present linkage, consisting of the two interconnected levers 66 and 68, the inner edge of the linkage is not at any time exposed in a manner which would permit the levers to form an effective scissor action in conjunction with the side of one of the sections, as is permitted by the conventional type of support arm. Lever 66 remains enclosed in section 44 and only lever 68 swings outwardly as the arm is folded, and this lever is substantially enclosed throughout the folding operation, by members 54 and 56 which form, in effect, a shroud along the sides of lever 68, thus eliminating any potential hazard which might otherwise result from the operation of the linkage dur-

ing the folding and unfolding of the arm. In order to balance the operation of levers 66 and 68, lever 66 consists of a single member, whereas lever 68 consists of two parallel members secured on either side of member 66. Lever 68 extends through a slot 74 in the upper end of section 44, and, when the arm is in folded or partially folded position, the lever extends through the open top of section 44. When the arm is in its extended position, the two sections are in alignment with one another. Since pivot pin 50 connecting the two sections of the arm is offset from the center line of the spring, the spring constantly urges the two levers into full alignment and tends to hold the two sections in the alignment after the top has been raised. The downward force of the top on the arm tends to hold the arm in its extended position, thus resulting in a firm, dependable support for the top until it is intentionally lowered.

In the operation of the arm installed on the trailer as illustrated in FIGS. 1 and 2, the top 16 is lifted, usually by raising one end at a time. As the top is raised, the two arm sections pivot away from one another and the pivoting action is assisted by the force of spring 60 acting through linkage 64 on the inner end of section 42. The springs are preferably of such strength that the weight of the top which must be lifted manually is relatively light. As soon as one end of top 16 is fully raised and the corresponding arms on opposite sides of the trailer are fully extended, the other end of the top is raised, thus permitting the respective arm to become fully extended. With the top raised and the four arms fully extended, the top is retained firmly in its elevated position by the action of springs 60 in each of the arms. In view of the offset position of pivot pin 50 connecting the two sections 42 and 44, a toggle action is in effect created between the two sections so that the weight of the top does not tend to collapse the arms. The alignment of the two sections is also firmly maintained by the action of spring 60 urging section 42 in a counterclockwise direction in all positions, including the fully aligned position illustrated in FIG. 3. When top 16 is to be lowered, the arms are merely pressed out of alignment, thus permitting the weight of the top to fold the arms downwardly to the fully lowered position of top 16. The lowering of the top may likewise be accomplished by first lowering one end and folding two of the arms while the other two arms remain in their fully extended position.

In embodiment of the present spring loaded arm, the tubular sections are shown as being cross-sectionally square. However, round tubular members may be used in place of those shown, and members 54 and 56, which are shown welded or otherwise secured as independent members to the sides of section 44, may be formed integrally with the section from the same piece of stock. While various shapes may be used for members 54 and 56, they perform the function of as a shroud to substantially embrace lever 68 when the arm is being folded to prevent the operator's hand or fingers from becoming inserted between the lever and one of the sections, thus preventing accidental injury to the operator. These shroud members

may be made sufficiently large to fully embrace the outer ends of the levers adjacent pin 70. Further, the arms may be installed between two panels forming sides of the vehicle, or may be folded into covers or shrouds on the sides of the vehicle body when the top is lowered.

Further changes and modifications may be made in the arm structure without departing from the scope of the present invention.

I claim:

1. A foldable arm for camping trailers and the like having a body and a top movable from a position on the body to a position spaced thereabove, said arm comprising an upper and lower section, a pivot means connecting said sections along one side near the adjacent ends for angular movement of the sections from a parallel position to a position with an included angle therebetween of less than 90°, a spring in one of said sections with one end supported therein, a linkage connecting the other end of said spring with said other section at a pivot point within said other section near the adjacent end thereof, a means forming a lateral enclosure for said linkage in substantially all positions thereof during the folding and unfolding operations of the arm.
2. A foldable arm as defined in claim 1 in which one end of said spring is anchored near the end of the respective arm p opposite said linkage.
3. A foldable arm as defined in claim 1 in which said linkage includes two levers pivotally connected together near the middle of said linkage, and one end of one lever is connected to the spring and the other end of the other lever is connected to the other section adjacent the side of said other section opposite the side on which the said pivot means is located.
4. A foldable arm as defined in claim 2 in which said linkage includes two levers pivotally connected together near the middle of said linkage and one end of one lever is connected to the spring and an end of the other lever is connected to the other section adjacent the side of said other section opposite the side on which the said pivot means is located.
5. A foldable arm as defined in claim 1 in which said means forming an enclosure consists of two members mounted on the section containing said spring and overlapping the adjacent end of said other section.
6. A foldable arm as defined in claim 4 in which said means forming an enclosure consists of two members mounted on the section containing said spring and overlapping the adjacent end of said other section.
7. A foldable arm as defined in claim 4 in which one of said levers of the linkage is a single barlike member and the other of said levers is a pair of barlike members positioned on opposite sides of said first lever adjacent the connection therebetween.
8. A foldable arm as defined in claim 1 in which said sections are of a square tubular cross-sectional construction.
9. A foldable arm as defined in claim 4 in which said sections are of a square tubular cross-sectional construction.

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