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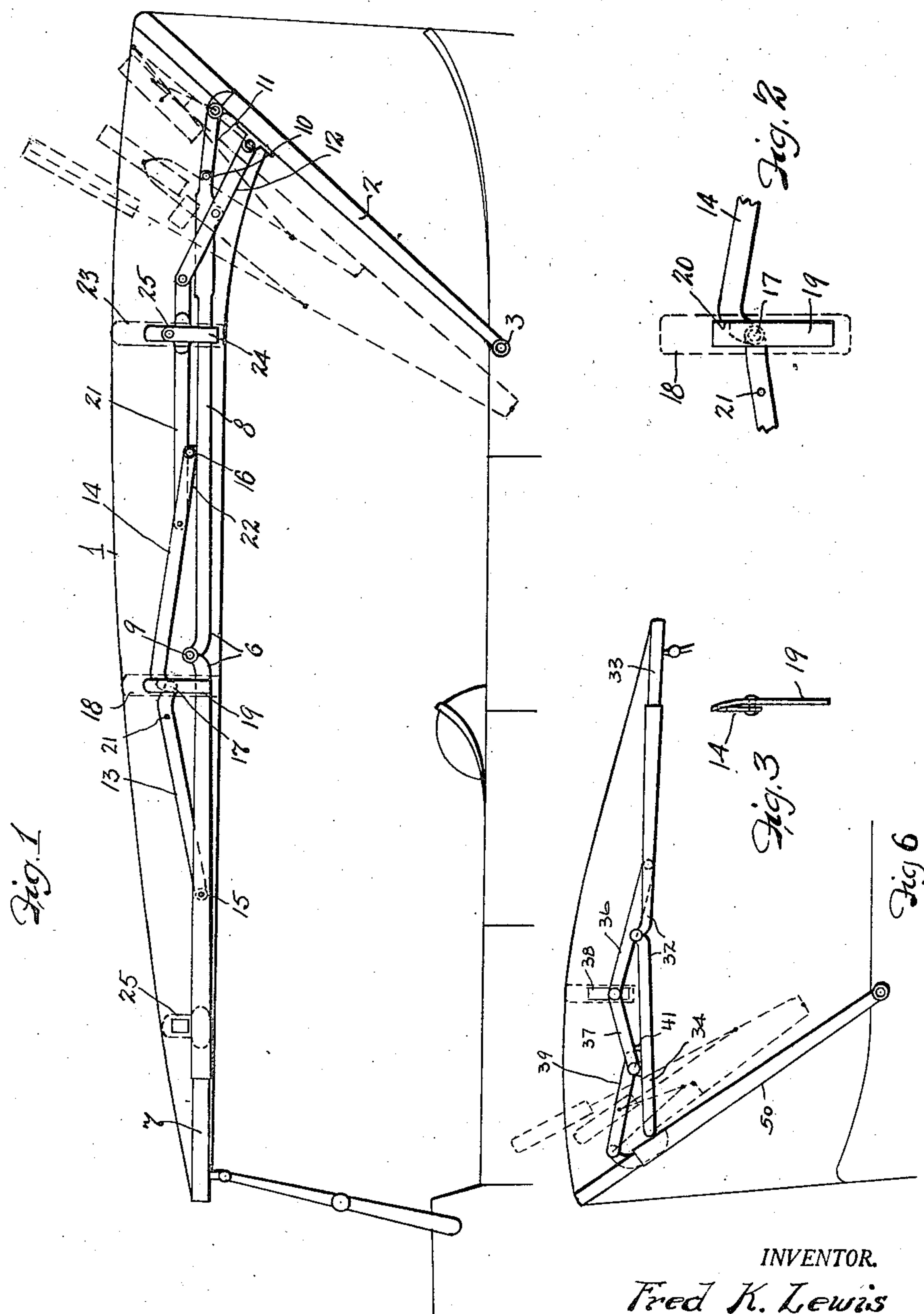
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F. K. LEWIS

TOP FOR VEHICLES AND THE LIKE

Filed Oct. 29, 1921

2 Sheets-Sheet 1



INVENTOR.

Fred K. Lewis

BY

Day, Oberlin & Day
ATTORNEYS

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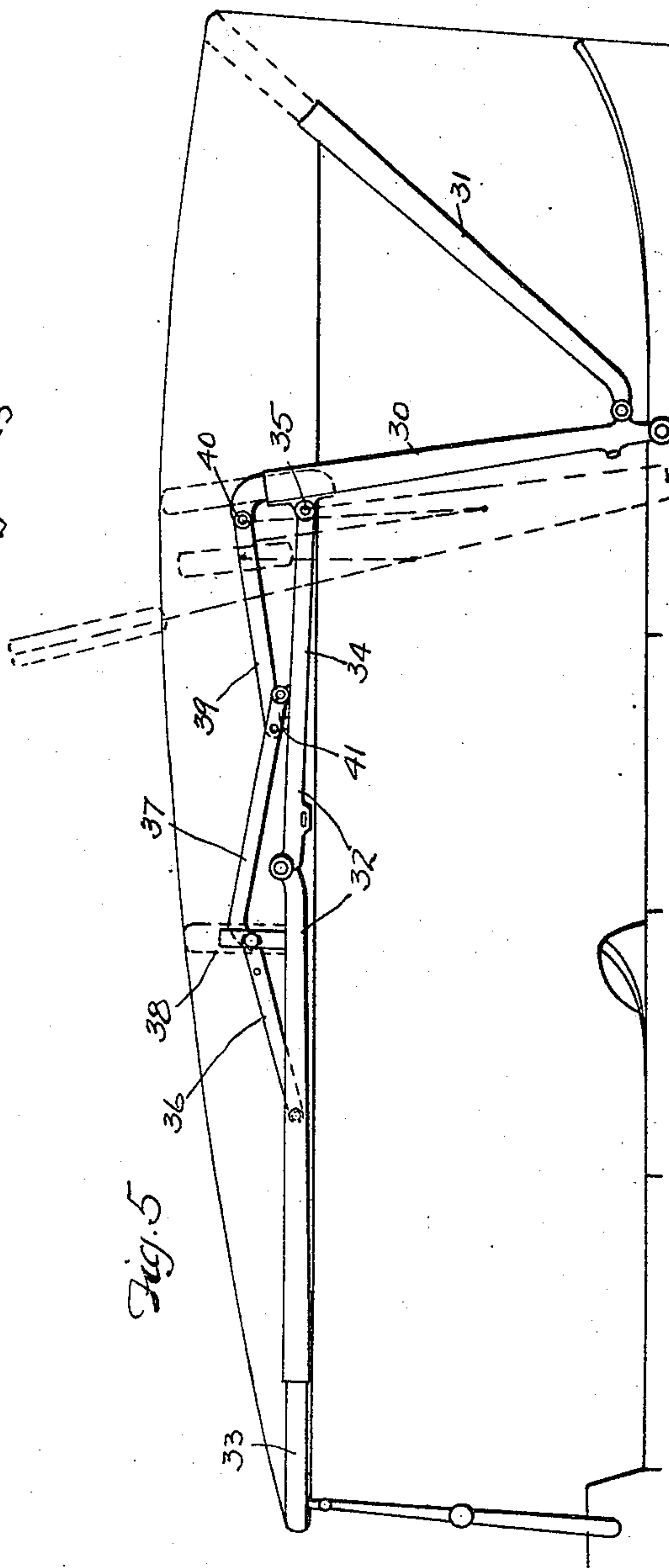
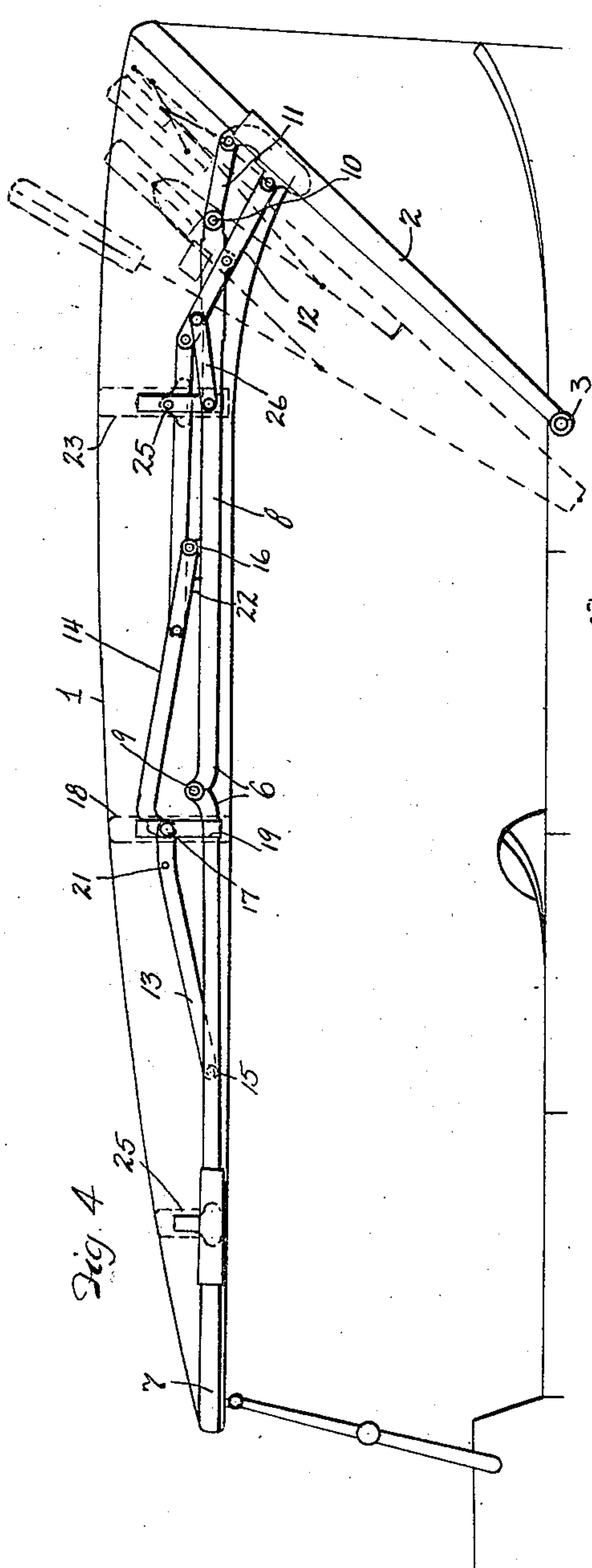
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INVENTOR.

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UNITED STATES PATENT OFFICE.

FRED K. LEWIS, OF ASHTABULA, OHIO.

TOP FOR VEHICLES AND THE LIKE.

Application filed October 29, 1921. Serial No. 511,304.

To all whom it may concern:

Be it known that I, FRED K. LEWIS, a citizen of the United States, and a resident of Ashtabula, county of Ashtabula, and State of Ohio, have invented a new and useful Improvement in Tops for Vehicles and the like, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present improvements, relate, as indicated, to vehicle tops, and particularly to the construction of the foldable outrigger or forwardly extending portion of so-called "one man" tops, which is the type at present largely in use on automobiles. In practically all these one man tops the outrigger bow, which extends horizontally in the open position of the top, is articulated, i. e., is connected, by means of swing arms, to the main bow or standard from which it is supported. In addition, such articulated outrigger bow usually carries one or more supplemental bows in order to support the top cover intermediate of the outrigger bow proper and such main bow or the back bow where the outrigger structure is supported from a standard that does not rise clear to the top.

The object of the present invention is to provide an outrigger structure of the character thus generally described, in which such supplemental bows are supported in a novel and more efficient manner, that will tend, not only to increase the rigidity of the structure in the extended or open condition of the top, but at the same time will permit the parts, including such supplemental bows, to fold up into a compact "stack." To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawings and the following description setting forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—

Fig. 1 is a side elevation of a top supporting structure or frame embodying the present improvements, shown as adapted

for, and mounted on, an automobile body or tonneau; Fig. 2 is a broken side elevation on a somewhat larger scale of a portion of the linkage whereby one of the supplemental bows is supported as aforesaid; Fig. 3 is a front elevation of the parts shown in Fig. 2; Fig. 4 is a view similar to Fig. 1, but showing a modification in construction, in that a folding link is provided in connection with one of the supplemental bows mounted or carried as aforesaid; and Figs. 5 and 6 are likewise views similar to Fig. 1, but showing the incorporation of the invention in somewhat simpler forms of outrigger structure.

While I have thus shown, and shall describe my improved top as applied to an automobile body, it will be understood that it is equally adapted for use on motor boats or other vehicles, and that the number of main bows in addition to the one utilized to support the outrigger structure, as well as the number of supplemental bows carried by the latter, will depend upon the longitudinal extent of the vehicle body which is to be covered by the top. It will also be understood that the term "bow" is used here inclusively to designate, not merely the bow proper, whether of wood or metal, but also the metallic sockets or equivalent members that carry the same, these parts, when regarded in side elevation, constituting the equivalent of the so-called "sticks" in the all-wooden bow type of construction. It will accordingly be a matter of convenience to refer to the parts in the singular, as though the structure lay in a single vertical plane, since the parts of interest do actually lie in substantially such a plane.

In the embodiment of the invention shown in Fig. 1, as well, for that matter, in the slightly modified construction shown in Fig. 4, the top covering 1 is preferably entirely supported through the outrigger structure from a single main bow or standard 2. The latter, which is of substantial construction in view of the weight it is thus designed to sustain, is pivotally attached to the body of the vehicle at the point 3 in the usual manner, so that it may be laid down and supported in a substantially horizontal plane when the top is not in use. Normally, in the extended or open condition of the top said main bow 2 in-

clines rearwardly at an angle approximately 45 degrees to the horizontal, being held from rising further by the top covering, or by special straps, (not shown), or extensions of the longitudinal strainer, which, as is well known, are used to connect the bows together, and provide supporting means for the top covering intermediately between said bows. For the purpose in hand such straps or strainers do not require to be distinguished from, but may be regarded as a part of, the covering material.

In each of the two embodiments just referred to, (Figs. 1 and 4), the outrigger structure will be seen to comprise a main articulated auxiliary bow, or, as it is sometimes called, outrigger bow 6, the latter term referring more particularly to the outer portion or bow 7 proper which is secured to the main bow by means of an arm 8, (one on each side of course), pivotally attached to said main bow and to the rear end of said outrigger bow, and so constituting the inner portion of said articulated auxiliary bow 6. The point of attachment of this arm to the main bow is preferably in line with, or just above, the side edge of the top covering 1, so as to be hidden by the latter, and the joint 9 between said arm and the outrigger bow is a rule joint, disposed so as to prevent upward bending of the arm in question when extended in horizontal fashion, as in the open condition of the top illustrated in the several figures. The outrigger bow 7 supports the extreme forward portion of the top covering in such position, such bow being suitably attached to the front part of the body through the windshield frame, or other means as found most convenient.

The arm 8 whereby the outrigger bow 7 is swingably supported from the main bow 2, is itself articulated, being formed with a joint 10, the distance of which from the main bow is such that when the link 11, that constitutes the rear extremity of said arm, is folded alongside said main bow, the remaining portion of said swing arm will similarly lie substantially parallel with the main bow, as shown more or less diagrammatically in dotted outline in Figs. 1 and 4.

Pivotally extended to swing arm 8, forwardly of such joint 10 therein, is a second arm or brace 12, that in the open condition of the top is designed to extend forwardly at an angle with respect to said arm and to a point a short distance above the same. The lower end of said brace 12 is directly pivotally attached to the main bow 2 at a point below the point of pivotal attachment of the rear extremity 11 of said swing arm to said main bow.

As previously indicated, a system of linkage is employed to sustain the supplemental bows, which may be one or more in number,

whereby the top covering 1 is supported intermediately of the main bow 2 and outrigger bow 7. The principal elements of such system are two links 13 and 14 that, in the extended condition of the top, lie above the articulated auxiliary bow 6, being attached at their respective outer ends to outrigger bow 7 at point 15, and to swing arm 8 at point 16, while their inner ends are pivotally interconnected at point 17, lying somewhat forwardly of the joint 9 in said auxiliary bow. Pivotally attached to said links 13 and 14, about the same pivot point 17 whereby they are thus connected, is a supplemental bow 18 that, save for such connection, is a floating element in the outrigger structure. However, when the top is extended the lower ends of said bow 18, each of which consists of a plate 19, as shown in Figs. 2 and 3, are designed to rest upon, and interlock with, outrigger bow 7 forwardly of the joint 9, whereby such bow is connected with swing arm 8. In order to assist in maintaining said supplemental bow 18 in proper vertical position when thus brought into engagement with outrigger bow 7, the forward end of link 14 is formed with a shoulder 20 that abuts against the rear edge of said plate; while to insure that said bow is carried rearwardly in proper position to fold compactly along with the other parts of the outrigger structure against main bow 2 when the top is collapsed, a pin 21 is provided on link 13 a short distance forwardly of the joint 17, being so positioned as to strike against the bow, or rather plate, 19, to which the ends of said bow are attached, and turn the same about said pivot 17.

In order to sustain the links 13 and 14 in their extended position a third link 21 is employed, being connected at its rear end to the upper end of arm or brace 12, and at its forward end to said link 14 at a point forwardly of the pivot 16, by which the latter is attached to swing arm 8. In addition a stop 22 on said swing arm is disposed to contact with the under side of said link 14 just forwardly of pivot 16. Where the extent of the outrigger structure is such as to make it desirable to additionally support the top covering 1 between main bow 2 and supplemental bow 18, a second supplemental bow 23 is provided, being carried by the link 21 just described. In its main features said second supplemental bow corresponds exactly with the first one, the bow proper having its ends attached to plates 24, one of which is pivotally attached at the point 25 to the link 21 on each side of the frame. In the open or extended condition of the top this plate 24 engages with the swing arm 8 in the same fashion as the plate 19, that forms part of the supplemental bow 18, engages with the side of outrigger bow 7.

In order to properly conform the forward

portion of the top covering, i. e., to prevent it from sagging between the forward edge of outrigger bow 7 and supplemental bow 18, still another supplemental bow 25 may be utilized, such bow being relatively shallow and having its ends fixedly attached to the corresponding sides of said outrigger bow.

The construction shown in Fig. 4 is substantially identical with that shown in Fig. 1 and the parts are correspondingly designated so as not to require further description than to point out the provision of an additional folding link 26, as it may be termed, between the lower end of the second supplemental bow 23 and the adjacent upwardly extending portion or arm or brace 12. The effect of said link 26 will evidently be to cause said supplemental bow to turn about its pivotal axis 25 on link 21 where it is not desired to place reliance on the top covering to produce such turning movement.

The manner in which the several bows and system of linkage operate in the folding of the top is clearly indicated by the position of the parts as shown in dotted outline in Figs. 1 and 4, and such operation is accordingly thought to require no further explanation. It will be understood of course that after the outrigger structure has been folded up against the main bow 2, or incidental to such folding, said main bow will be allowed to drop into a substantially horizontal position, as previously mentioned.

In the construction shown in Fig. 5 the main bow 30, corresponding with main bow 2, stands approximately upright in the open condition of the top, inclining just a trifle forward from the vertical, and the rear portion of the top cover is sustained by a back bow 31, which is not directly connected with the outrigger structure of present interest. The latter, as before, comprises an articulated outrigger bow 32 of slightly different form from that shown in Figs. 1 and 4, both the outrigger bow 33 proper and the swing arm 34 being shorter in view of the different location of main bow 30. Moreover, said swing arm 34 is directly pivotally attached to said main bow at the point 35 instead of through the medium of a link as in the previously described constructions. Corresponding with links 13 and 14, two similar links 36 and 37 are utilized, being connected in exactly the same fashion as before to the respective parts of the auxiliary bow 32 and carrying, likewise in the same fashion, a supplemental bow 38. In order then to support the outrigger structure, as well as to provide an operative connection between the main bow 30 and said links 36 and 37, a third link 39 is utilized, being directly connected at its rear end to the main bow 30 at a point 40 located above the pivot 35, by means of which arm 34 is attached to said main bow,

and being pivotally connected at its forward end to link 37 in the same fashion as link 21 in the previously described constructions is attached to link 14. A stop 41 on swing arm 34 also co-operates with said link 37 to retain the latter in proper position when the top is extended.

As before, the manner in which the bows 33 and 38 fold up against the main bow 30 is indicated in dotted outline, it being understood of course that said main bow 30 in turn pulls against back bow 31 and the whole stack is then lowered into horizontal position.

The top illustrated in Fig. 6 is of still simpler design, being intended for use on a roadster-type body. In effect, the parts are the same as in the preceding Fig. 5, except that the main bow 50 from which the outrigger structure is supported inclines rearwardly and no separate "back bow" is employed. The same reference letters have accordingly been employed to designate the remaining parts of the top as in said Fig. 5, and the mode of operation, it will be understood, is substantially identical.

The construction thus shown and described in several divergent forms, whereby one or more intermediate or supplemental bows are supported, not directly but in a floating fashion, on the articulated auxiliary bow that forms the base of the outrigger structure renders such structure unusually rigid when extended. In particular, the two links 13 and 14, in conjunction with supplemental bow 18, in the one case, or the corresponding links 36 and 37, in conjunction with supplemental bows 38, in the other, constitute a true truss, by means of which the entire longitudinal extent of the top is adequately bridged. This is quite independent of the particular means whereby the articulated auxiliary bow is attached to the main bow, as well as independent of the use of a second supplemental bow, as is desirable where said main bow inclines rearwardly and is the only one employed, as in Figs. 1 and 4. Despite the rigidity of the frame in the open condition of the top, the outrigger structure is very easily collapsed and caused to fold against the main bow upon breaking downwardly the joint therein, and the supplemental bows carried by the linkage system are carried back in proper position to form a neat and compact stack.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In a top for vehicles and the like, the

combination of a support pivotally attached to the body of the vehicle; a rigid brace pivotally attached to said support and inclining forwardly therefrom in the open position of the top; a forwardly extending articulated auxiliary bow pivotally attached to said brace and extending to the rear of the same; a link connecting such bow extension with said support; and two links lying above said auxiliary bow, said links being pivotally connected together at their inner ends and pivotally connected at their outer ends to the parts of said bow on either side of the joint therein, said links being operatively connected with said brace.

2. In a top for vehicles and the like, the combination of a support pivotally attached to the body of the vehicle; a rigid brace pivotally attached to said support and inclining forwardly therefrom in the open position of the top; a forwardly extending articulated auxiliary bow pivotally attached to said brace and extending to the rear of the same; a link connecting such bow-extension with said support; two links lying above said auxiliary bow, said links being pivotally connected together at their inner ends and pivotally connected at their outer ends to the parts of said bow on either side of the joint therein; and a third link connecting the rearmost of the aforesaid two links with the upper end of said brace.

3. In a top for vehicles and the like, the combination of a support pivotally attached to the body of the vehicle; a rigid brace pivotally attached to said support and inclining forwardly therefrom in the open position of the top; a forwardly extending articulated auxiliary bow pivotally attached to said brace and extending to the rear of the same; a link connecting such bow-extension with said support; two links lying above said auxiliary bow, said links being pivotally connected together at their inner ends and pivotally connected together at their outer ends to the parts of said bow on either side of the joint therein; stop means limiting the relative movement of said links in the open position of the top; and a third link connecting the rearmost of the aforesaid two links with the upper end of said brace.

4. In a top for vehicles and the like, the combination of a support pivotally attached to the body of the vehicle; a rigid brace pivotally attached to said support and inclining forwardly therefrom in the open position of the top; a forwardly extending articulated auxiliary bow pivotally attached to said brace and extending to the rear of the same; a link connecting such bow-extension with said support; two links lying above said auxiliary bow, said links being pivotally connected together at their inner ends and pivotally connected together at their outer ends to the parts of said bow on either side of the joint therein; stop means limiting the relative movement of said links in the open position of the top; a supplemental bow carried by said links; a third link connecting the rearmost of the aforesaid two links with the upper end of said brace; and a second supplemental bow carried by said third link.

5. In a top for vehicles and the like, the combination of a support pivotally attached to the body of the vehicle; a rigid brace pivotally attached to said support and inclining forwardly therefrom in the open position of the top; a forwardly extending articulated auxiliary bow pivotally attached to said brace and extending to the rear of the same; a link connecting said bow-extension with said support; two links lying above said auxiliary bow, said links being pivotally connected together at their inner ends and pivotally connected together at their outer ends to the parts of said bow on either side of the joint therein; stop means limiting the relative movement of said links in the open position of the top; a supplemental bow carried by said links, said supplemental bow being pivotal about the point of interconnection between said links; a third link connecting the rearmost of the aforesaid two links with the upper end of said brace; a second supplemental bow pivotally attached to said third link; and means for positioning said two supplemental bows about their respective pivotal axes.

Signed by me, this 28 day of October, 1921.

FRED K. LEWIS.