No. 777,037. PATENTED DEC. 6, 1904.

J. LIEBAU.

SUPPORTING FRAME.

APPLICATION FILED NOV. 4, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

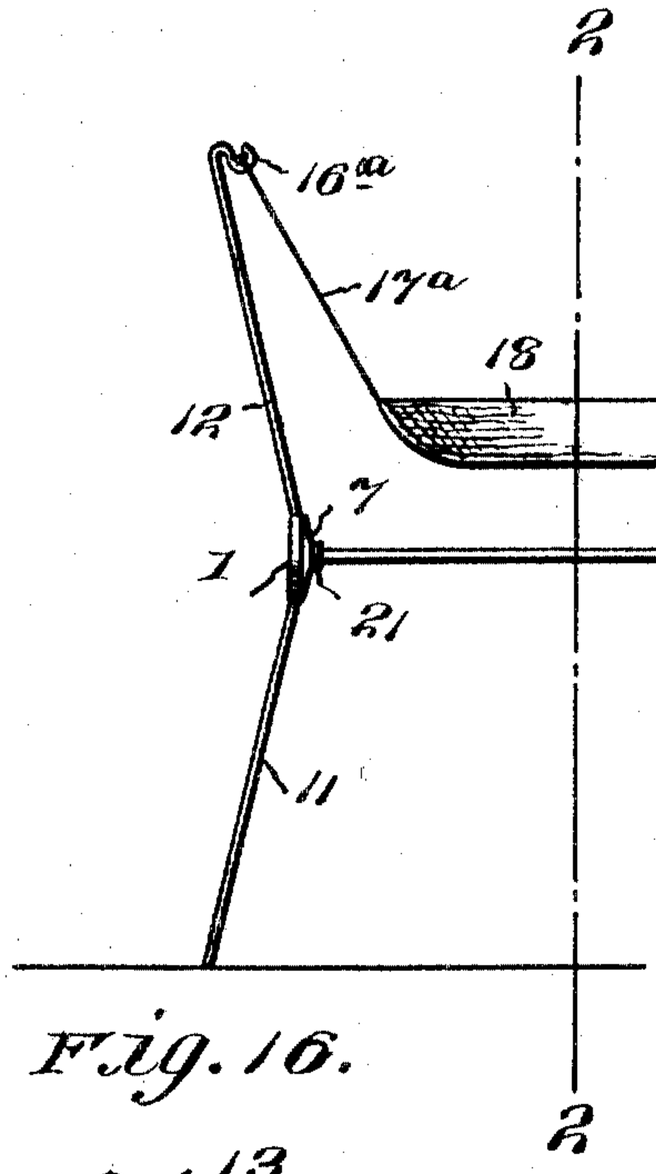


Fig. 16.

Fig. 2.

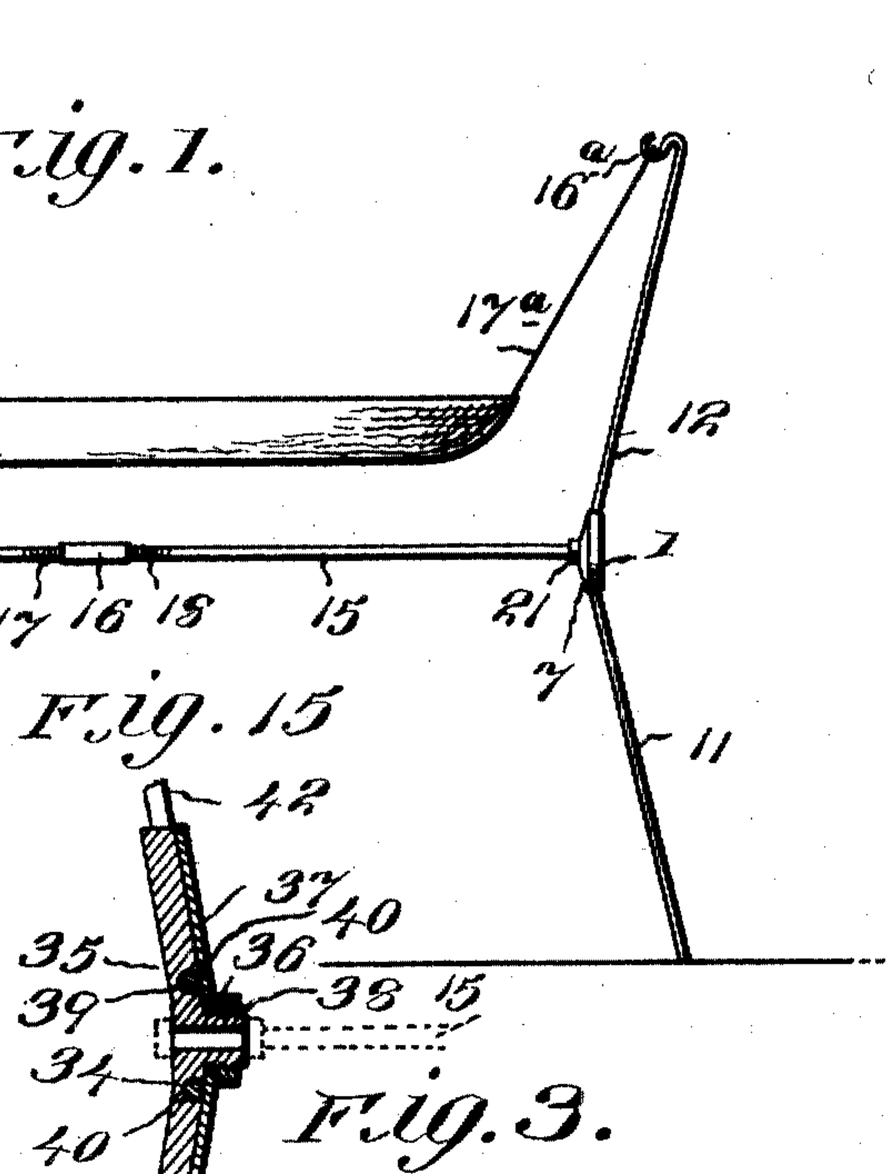


Fig. 15

Fig. 3.

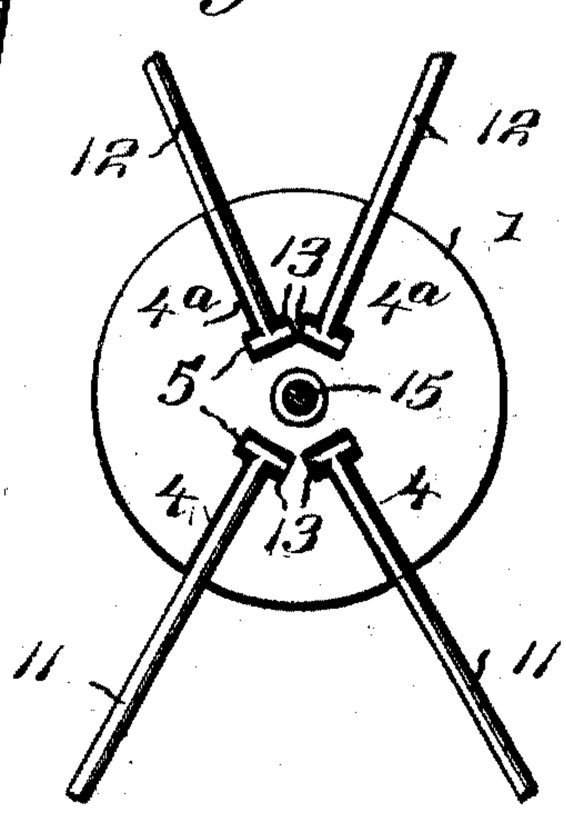
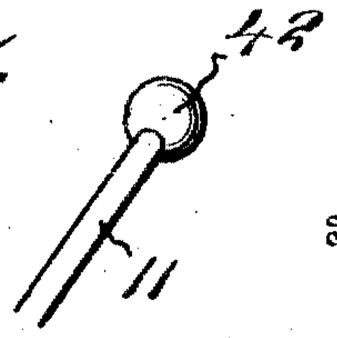


Fig. 17.



Witnesses
J. W. Peyton
Edw. E. Elliott

Inventor
John Liebau.

By Victor J. Evans
Attorney

No. 777,037. PATENTED DEC. 6, 1904.

J. LIEBAU.

SUPPORTING FRAME.

APPLICATION FILED NOV. 4, 1903.

NO MODEL. 3 SHEETS—SHEET 2.

Fig. 4.

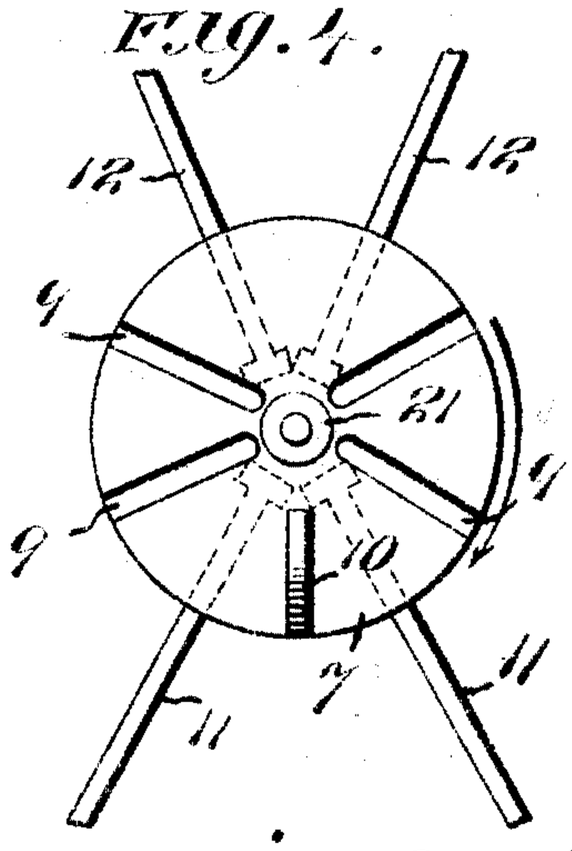


Fig. 6.

Fig. 8

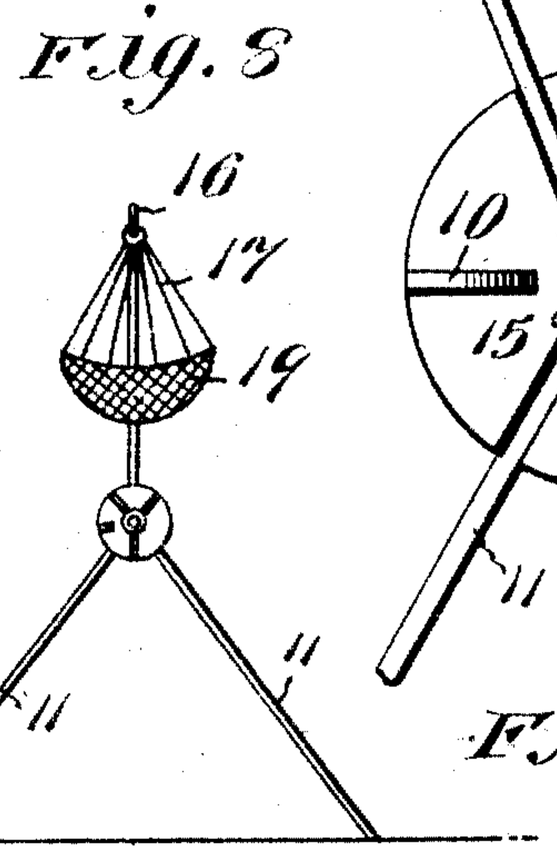


Fig. 5.

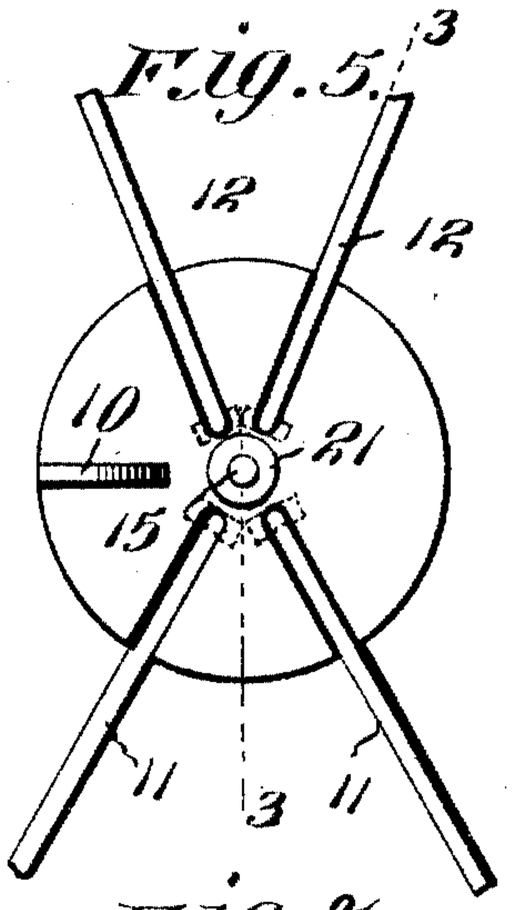


Fig. 7.

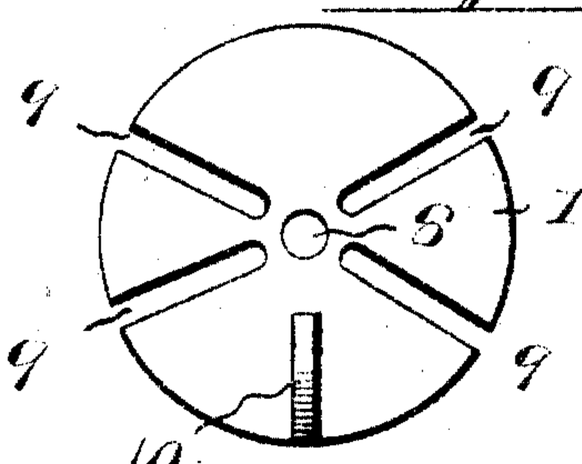
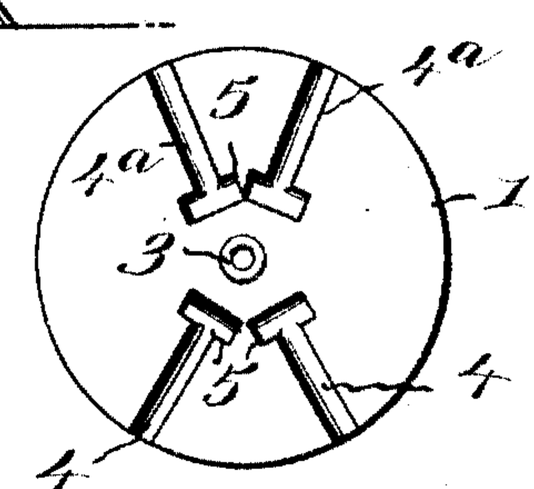
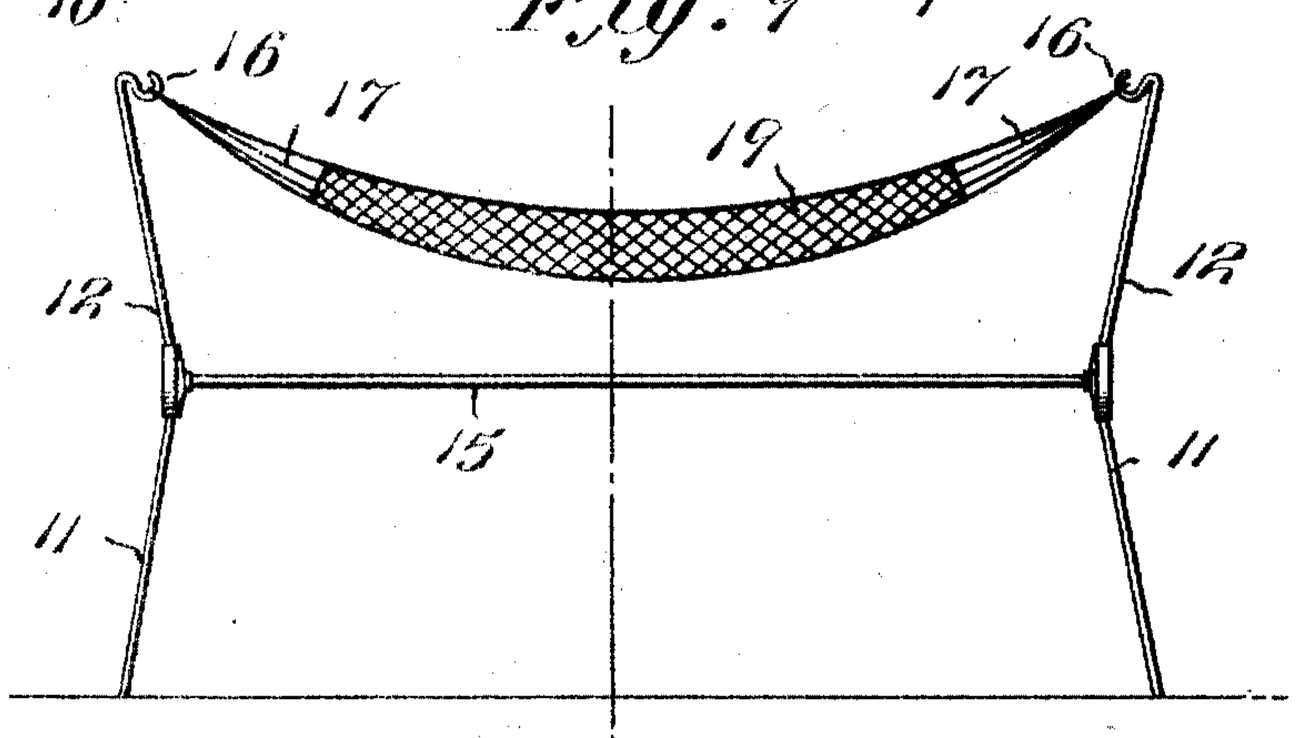


Fig. 9





Witnesses
G. W. Tiley.
Edw. E. Ellis

Inventor
John Liebau.

By Victor J. Evans
Attorney

No. 777,037. PATENTED DEC. 6, 1904.

J. LIEBAU.

SUPPORTING FRAME.

APPLICATION FILED NOV. 4, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 10.

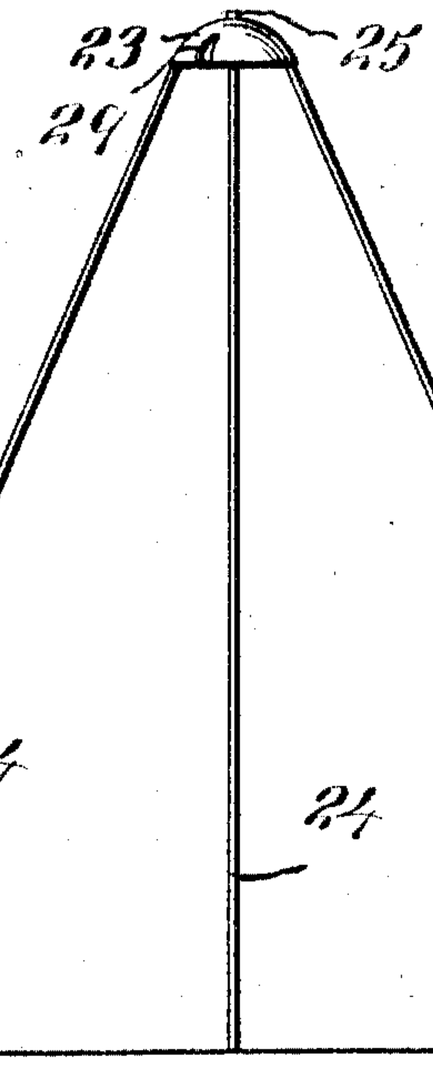


Fig. 12.

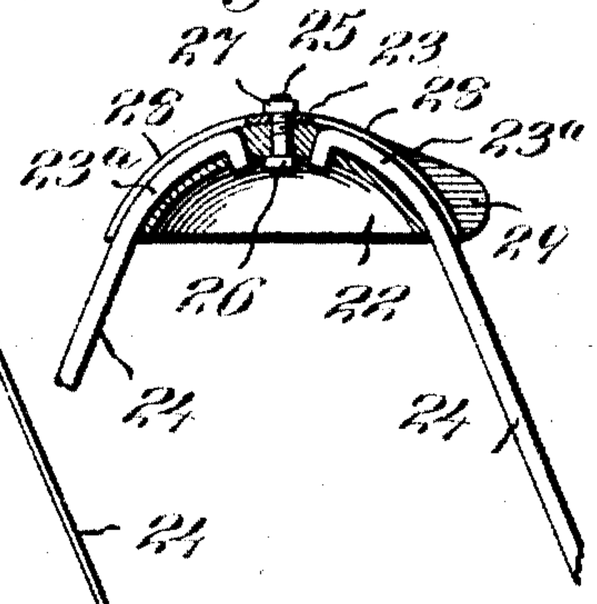


Fig. 13.

Fig. 11.

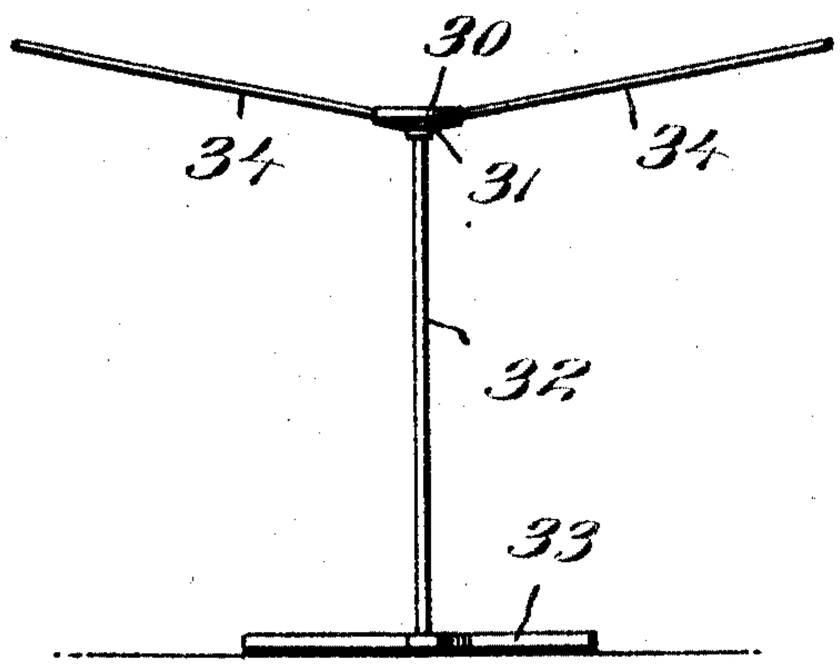


Fig. 14.

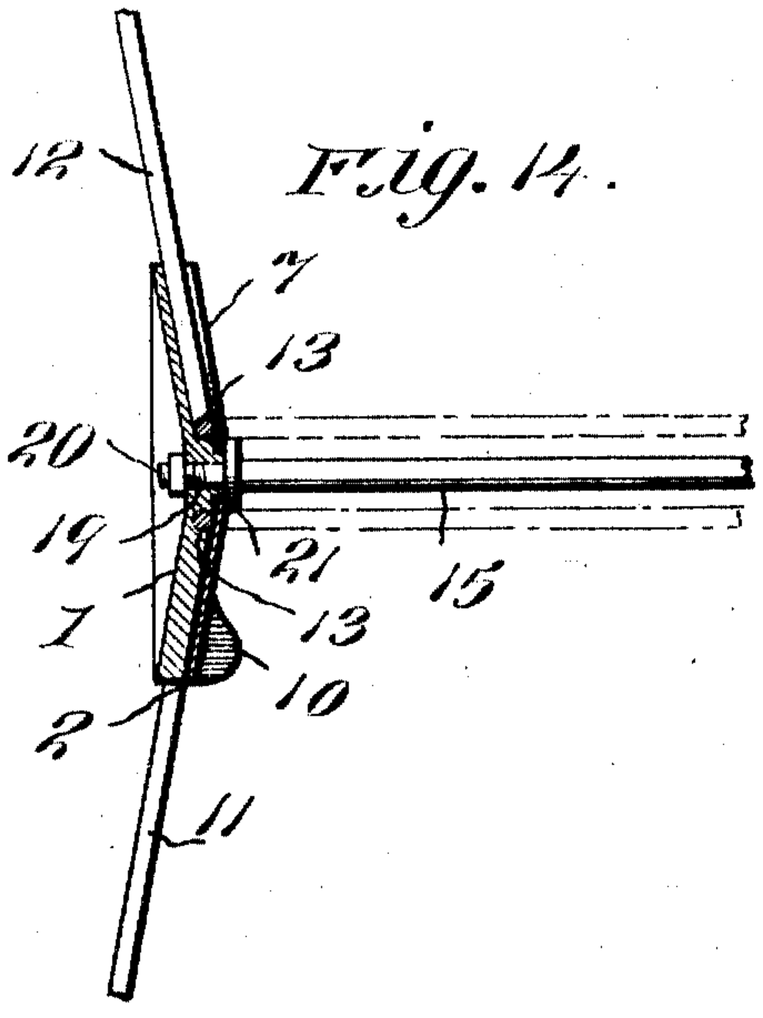


Fig. 18.

Witnesses
J. W. Riley.
Edw. E. Elles

Inventor
John Liebau.

By Victor J. Evans
Attorney

No. 777,037. Patented December 6, 1904.

UNITED STATES PATENT OFFICE.

JOHN LIEBAU, OF DURGY, NORTH CAROLINA.

SUPPORTING-FRAME.

SPECIFICATION forming part of Letters Patent No. 777,037, dated December 6, 1904.

Application filed Novembe 4, 1903. Serial No. 179,828. (No model.)

To all whom it may concern:

Be it known that I, JOHN LIEBAU, a citizen of the United States, residing at Durgy, in the county of Person and State of North Carolina, have invented new and useful Improvements in Supporting-Frames, of which the following is a specification.

This invention relates to supporting-frames; and it consists substantially in the improvements hereinafter particularly described and claimed.

One of the principal objects of the invention is to provide a supporting-frame which is collapsible or foldable to small compass and compact form by which to enable the same to be readily carried in the hand and also to provide a frame of this kind which is both strong and durable and light in weight, besides possessing the capacity for long and repeated service.

A further object of the invention is to provide a supporting-frame of the character referred to which is simple in construction and organization, as well as comparatively inexpensive to manufacture, and which also comprises but few elements capable of being easily taken apart and again put together.

The above and additional objects are attained by means substantially such as are illustrated in the accompanying drawings, in which—

Figure 1 is a side view illustrating one of the uses to which my improved supporting-frame may be applied. Fig. 2 is a transverse sectional view thereof on the broken line 2 2. Fig. 3 is a view looking at the inner face of one of the disks or plates employed in the construction of the frame and representing one manner in which both the leg members and supporting members proper are applied or fitted to said disk. Fig. 4 is a similar view looking at the outer face of another disk or plate employed, together with portions of the leg members and supporting members proper, said disk being shown in the position to which the same is turned to lock or secure portions of each of said members between the two disks. Fig. 5 is a similar view to Fig. 4, representing the disk in said latter figure as turned to position for enabling the leg members and supporting members proper to be brought together or collapsed. Fig. 6 is a face view of the disk or plate of Figs. 4 and 5 minus the portions of leg members and supporting members proper shown in the last-named figures. Fig. 7 is a similar view to Fig. 6 of the disk or plate shown in Fig. 3. Fig. 8 is an end view representing another adaptation of my improved supporting-frame. Fig. 9 is a side view thereof. Figs. 10 and 11 are views representing further adaptations of the frame. Fig. 12 is a view of an embodiment of the frame such as is preferably employed in said Fig. 10, this view (12) showing the two disks or plates in transverse section. Fig. 13 is a view in perspective of a portion of one of the rods shown in Figs. 10 and 12. Fig. 14 is a sectional view of Fig. 5, taken on the line 3 3 thereof. Fig. 15 is also a sectional view representing a modification. Fig. 16 is a perspective view in detail, showing the construction of one of the leg members employed in Fig. 3. Figs. 17 and 18 are similar views showing variations of construction for the inner end of each of the leg members and supporting members proper.

Before proceeding with a more detailed description it may be stated that in the forms of my improvements herein shown I employ two disks of special construction for the reception of end portions of leg members and supporting members proper of the frame, one of said disks being rotatable with reference to the other by which to enable both the said leg members and supporting members proper to be either locked in operative relation or collapsed or folded together in the manner hereinafter specifically set forth. The several elements or parts of the frame are capable of quick and ready assemblage, and said frame is admirably adapted as a support for folding beds, cradles, hammocks, and the like, besides being readily convertible into a clothes-rack, tent-frame, and similar structures, and while I have herein represented certain preferred forms of my improvements it will be understood, of course, that I am not limited to the precise details thereof in practice, since immaterial changes therein may be made coming within the scope of my invention.

Reference being had more especially to Figs.

1 to 9, inclusive, and Fig. 14 of the drawings, 1 represents, preferably, a circular disk or plate, which may be either flat or convex on the inner face 2 thereof, (the latter construction being preferred,) and which is formed with a central opening 3. As shown in the figures referred to, this disk is formed on the said inner face thereof, at opposite sides of said opening 3, with duplicate sets of radial or outwardly-divergent grooves 4 4ª, extending to the edge of the disk, and the inner end or terminal of each of which is crossed by a short groove 5, as shown. Another disk or plate is indicated at 7, the same being dished or concaved on its inner face, so as to snugly fit the convexed face of disk 1, this second disk having a central opening 8 coinciding with opening 3 and being formed or constructed with radial or outwardly-divergent slots 9, corresponding to the grooves 4 4ª in said disk 1. The disk 7 is formed or provided on its outer face with a projection 10 for enabling the same to be readily turned upon the disk 1, as and for the purpose about to be explained.

In the use of my improved frame as a support for beds, cradles, hammocks, and the like, as shown in Figs. 1, 2, and 9, for instance, I employ two sets of the disks or plates referred to, and in connection with each set thereof I also employ a pair of leg members 11 and a pair of supporting members proper, (indicated at 12,) each consisting of outwardly-divergent rods, formed or provided at their inner ends with T-heads 13, as shown. To secure the two sets of disks in proper relationship to each other for the purpose mentioned, I employ a rod 13, which may be in separable sections joined together at the inner end portions thereof in any suitable manner, as by means of a sleeve 16 receiving right and left hand screw-threads 17 and 18, formed on said portions, each outer end portion of said rod being also screw-threaded at 19 for the reception of a nut 20, while formed or provided on the rod a suitable distance from each of its outer ends is a collar 21. To assemble the parts or elements of the frame thus employed, a pair of leg members 11 are fitted in the grooves 4 of each of the disks 1, with the T-heads 13 thereof fitting in the corresponding grooves 5 therefor, and in like manner a pair of supporting members proper are fitted within the grooves 4ª of each of said disks 1, with the corresponding T-heads of said members fitting the other set of said T-grooves 13. The disk 7 is now placed close against the disk 1, this being accomplished by bringing the slots 9 of said disk 7 into registry with the grooves 4 4ª in disk 1, whereupon by turning the disk 7 so as to carry the intervening solid portions of the same before the said grooves 4 4ª it is apparent that both the said leg members and supporting members proper will be securely and rigidly held in the desired position for use. One of the ends of connecting-rod 15 is now inserted through the coinciding openings 3 and 8 of each pair of disks 1 and 7, with the collars 21 on said rod closely abutting adjacent surface portions of the outer face of the disks 7, after which the nuts 20 are applied to the ends of the rod and screwed up tightly against the outer surface portions of disks 1, surrounding said openings 3 therein. The upper ends of the supporting members proper are formed with hooks 16ª, to which may be fastened the ends of the suspensory cords 17ª of a bed or cradle 18, Fig. 1, or a hammock 19, Figs. 8 and 9, or the like, and thus will be seen some of the advantages of my improved frame. Whenever it is desired to fold or collapse the structure, the bed, cradle, or other device is removed, and then by partially unscrewing the nuts 21 and turning each of the disks 7, so as to bring the radial slots 9 thereof into registry with the grooves in disk 1, both the leg members and supporting members of each pair of disks may be turned hinge like in the T-grooves 5 of said disk 1 and carried through said radial slots 9, so as to be brought together in the manner shown in dotted lines at Fig. 14. The separation of the inner ends of rod 15 may be effected either before or after performing the above-described operation, and thus it will be seen that the entire structure may be so folded or collapsed as to be easily carried in the hand.

In Figs. 10 and 12 my improvements are shown in the form of a frame for a tent or the like and wherein I employ but one set of disks 22 and 23 as a cap-piece for securing together, either in a separable or collapsible manner, the upper bent convergent ends of rods or leg members 24, around which the canvas or other covering (not shown) for the tent may be applied in any suitable manner. In this instance the two disks are also preferably correspondingly concaved and convexed on their adjacent faces, as shown, and said disks are also provided, as before, with coinciding central openings, through which passes a threaded pin or bolt 25, having a head 26 and provided with a nut 27, by the tightening of which the two disks are secured together rigidly and by the loosening of which the disk 23 may be turned on disk 22 to enable the rods 24 to be separated from the disks by lifting the ends thereof upwardly through the radial slots 28 in said disk 23, it being seen that the upper bent portions 23ª of said rods lie in grooves in disk 22, with which the said slots 28 may be made to register similarly, as has been explained with the form of my invention previously referred to. Said disk 23 is also provided with a projection 29 to facilitate turning of the same, and it is thought this embodiment of my invention will be understood without further explanation.

To adapt the form of my invention shown in Fig. 14 to a similar tent structure, it is simply necessary to reverse the construction of disks 1 and 7, so as to enable both the leg members and supporting members proper to be collapsed or folded together in the direction opposite to that shown in said figure, as is apparent.

In Fig. 11 I have shown my improvements in the form of a rack, this structure being obtained by simply taking one pair of disks 30 and 31—such as shown in Figs. 1 and 4, for instance—together with a rod 32, (corresponding to one section of rod 15,) to the lower end of which is secured a suitable base 33. In this form of the invention the members 34, (corresponding to the leg members and supporting members proper hereinbefore referred to,) constitute supporting-arms on which clothing or the like may be hung.

In Fig. 15 the construction is substantially the same as that first herein described, the only difference residing in the employment of the convex face of the disk 35 (corresponding to disk 1) of a boss 36, having an opening or bore coinciding with the central opening in said disk, the said boss passing through an enlarged central opening therefor in disk 37 (corresponding to disk 7) and having its outer surface screw-threaded to receive a nut 38 for securing the two disks together. Surrounding this boss is a groove 39 for receiving the inner end portions 40 of the pairs of leg members 41 and supporting members proper, 42, similarly as the corresponding portions 13 in Fig. 3 are received in the grooves 5 of disk 1. With this last embodiment some auxiliary device, such as a ring, may be employed in groove 39 to aid in maintaining the leg members and supporting members proper in place, but this is not essential, and the same has therefore not been shown in the drawings.

As shown in Fig. 17, I may construct the inner end of each of the leg members and supporting members proper with substantially a spherical head 42 to fit a correspondingly-shaped recess (not shown) therefor in disk 1; and, as shown in Fig. 18, I may make the T-heads 43 separable from said leg members and supporting members proper by forming the inner ends of all the members with eyes 44, in which said heads 43 are removably driven or inserted.

Having thus fully described the invention, what is claimed as new is—

1. A supporting-frame having a disk formed with grooves communicating at their terminals with cross-grooves, another disk rotatably applied to the first-named disk and formed with slots corresponding to said first-named grooves, members adapted to have portions thereof fitting in the first-named grooves, said members having heads fitting in the cross-grooves between the disks, whereby said members are pivotally and removably mounted on the disks, and means for locking the two disks together.

2. A supporting-frame having a disk formed with a convex face provided with grooves communicating at their terminals with cross-grooves, a convex-concavo disk rotatably applied to the first-named disk and formed with slots corresponding to the first-named grooves, members adapted to have portions thereof fitting in the first-named grooves, said members having heads fitting in the cross-grooves between the disks, whereby said members are pivotally and removably mounted on the disks, and means for locking the two disks together.

3. In a device of the class set forth, a disk having a convex face provided with grooves communicating at their inner terminals with cross-grooves, a bolt carried by said disk, a convex-concavo disk revolubly mounted on said bolt and provided with slots corresponding with the first-named grooves, a nut mounted upon said bolt to secure the disks together, leg members having portions thereof fitting in the first-named grooves, said leg members having bent portions adapted to fit within the cross-grooves, and a projection carried by the last-named disk, whereby it may be turned.

4. A supporting-frame, having a disk formed in one of its faces with outwardly-diverging sunken grooves, and another sunken groove crossing the inner terminal of each of said diverging grooves, diverging members with portions thereof fitting in the diverging grooves, another disk rotatably applied to said first-named disk and formed with slots corresponding to the diverging grooves aforesaid, and means for locking the two disks together, said members each having at its inner end a head fitting flushly in one of the said cross-grooves.

5. A supporting-frame, having a disk formed in one of its faces with duplicate pairs of outwardly-diverging sunken grooves, and with another sunken groove crossing the inner terminal of each of the diverging grooves, duplicate pairs of diverging members with portions of the same fitting in the said pairs of diverging grooves, another disk rotatably applied to said first-named disk, and formed with duplicate pairs of slots corresponding to the pairs of diverging grooves aforesaid, and means for locking the two disks together, each of said diverging members having at its inner end a head portion fitting in one of the said cross-grooves, also flushly with the said mentioned face of the first-named disk.

6. A supporting-frame having a rod, screw-threaded at the ends, a disk applied to each end of the rod and provided with a threaded boss and an opening extending through the boss and disk and through which the ends of said rod project, said disk being also provided with grooves, and another groove crossing each of said first-named grooves, members with portions thereof fitting in the first-named

grooves, said members having heads fitting in the cross-grooves, another disk provided with an opening adapted to receive said boss and formed with slots corresponding to the first-named grooves, a nut mounted upon the boss to lock the disks together, and a nut secured upon each end of the rod for securing the disks in applied position.

7. A supporting-frame, having a rod constructed of separable sections and provided at each end thereof with a detachable disk, the latter being formed with duplicate pairs of outwardly-diverging sunken grooves, and with another sunken groove crossing each of the inner terminals of said diverging grooves, leg members with portions thereof fitting in one pair of the diverging grooves flushly with said face, and supporting members with portions thereof fitting in the other pair, also flushly with said face, another detachable disk rotatably applied to each of the disks first named, formed with duplicate pairs of slots corresponding to said pairs of diverging grooves, and means for securing the sets of disks upon the rod and for locking together the disks of each set, the said leg members and supporting members each having at its inner end a holding portion fitting in one of said cross-grooves, also flushly with the face of the disk first named.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN LIEBAU.

Witnesses:
JOHN L. FLETCHER,
EDWARD ELLIS.