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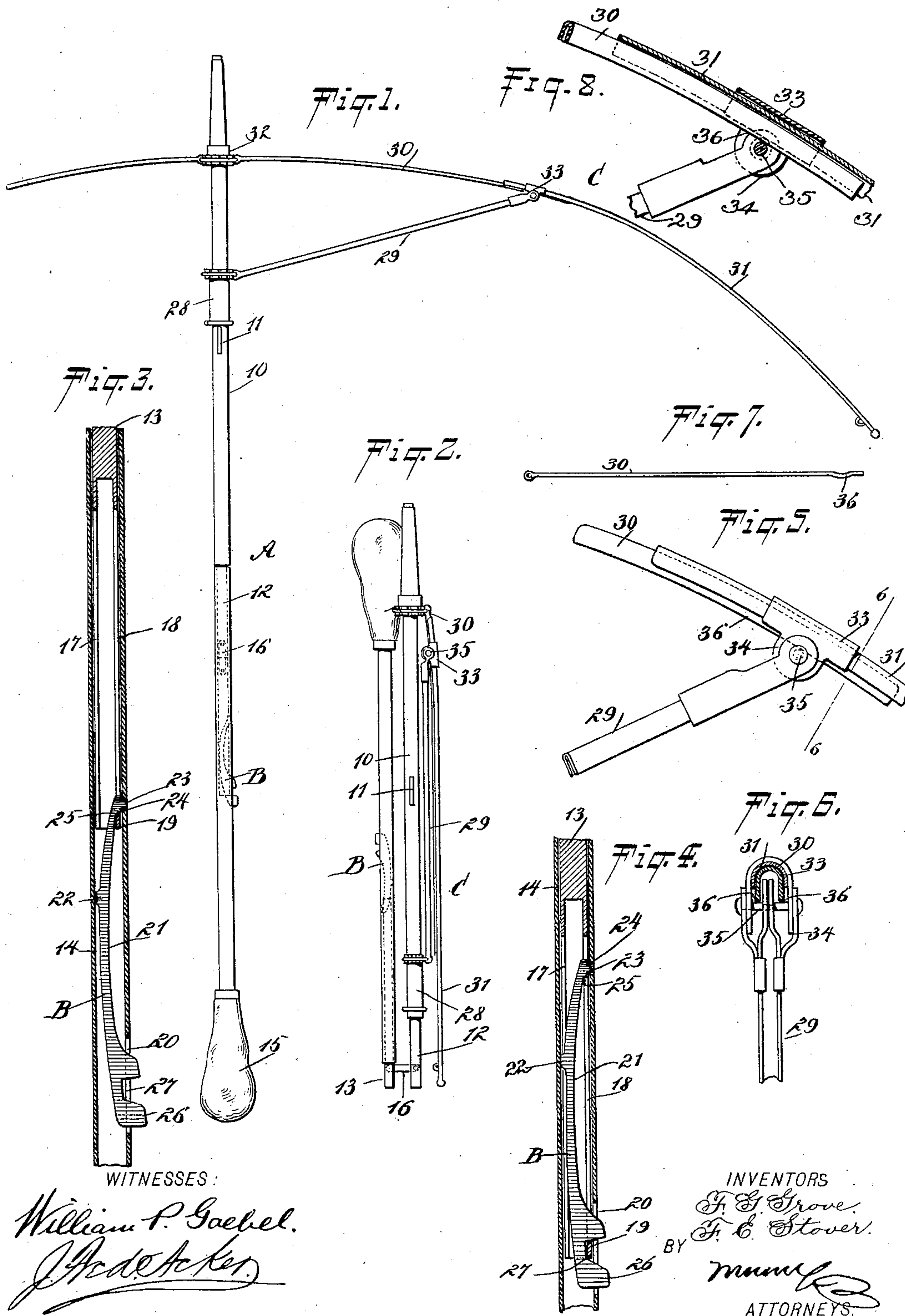
Patented Aug. 2, 1898.

F. G. GROVE & F. E. STOVER.

FOLDING UMBRELLA.

(Application filed Dec. 14, 1897.)

(No Model.)



UNITED STATES PATENT OFFICE.

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FOLDING UMBRELLA.

SPECIFICATION forming part of Letters Patent No. 608,453, dated August 2, 1898.

Application filed December 14, 1897. Serial No. 661,836. (No model.)

To all whom it may concern:

Be it known that we, FRANK G. GROVE and FRANK E. STOVER, of Luray, in the county of Page and State of Virginia, have invented a new and useful Improvement in Folding Umbrellas, of which the following is a full, clear, and exact description.

The object of our invention is to simplify the construction of the framework of folding umbrellas, and particularly to so construct telescopic ribs for such umbrellas that when the ribs have been drawn out to their full length and the runner is carried upward on the stick the action of the contracting portions of the two ribs will be such as to hold the ribs immovable and render the telescopic or sectional ribs as strong in every particular as a rib made in one piece.

Another object of the invention is to provide for a simple, durable, and economic construction of a folding stick, and, furthermore, to provide a spring for the lower section of the stick adapted to hold the runner when the umbrella is closed, which spring is readily removable from the stick and may be conveniently placed therein, the said spring furthermore serving to limit the movement of the lower section of the stick and lock the said lower section of the stick either when drawn from the upper section of the stick or when carried to an engagement with said section.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a portion of an umbrella-frame constructed in accordance with our invention, the frame being opened and the sections of the stick continuous. Fig. 2 is a side elevation of the frame shown in Fig. 1, but shown folded. Fig. 3 is an enlarged sectional view through the lower section of the stick and a portion of the intermediate section, illustrating the lower section as having been drawn downward from the upper section to admit of the folding of the stick. Fig. 4 is a view similar to Fig. 3, showing the

relative positions of the intermediate stick-section and the lower or handle section of the stick when said handle-section of the stick is carried up to an engagement with the upper section of the stick to render the handle continuous. Fig. 5 is an enlarged side elevation of the overlapping ends of the members of a rib and a portion of a stretcher connected with the rib. Fig. 6 is a transverse section taken on the line 6 6 of Fig. 5. Fig. 7 is a side elevation of the upper rib-section, drawn upon a small scale; and Fig. 8 is a side elevation, partly in section, of the overlapping ends of the members of a rib and a portion of a stretcher, the rib being extended and showing the cam of the inner section thereof in engagement with the pivot of the stretcher.

A represents the stick of the umbrella. This stick is made in sections, the upper section 10 whereof is provided with the usual spring 11 for holding a runner near the ferrule end of the stick, and the said upper section 10 is provided with a reduced portion 12 at its lower end, as shown in dotted lines in Fig. 1 and in positive lines in Fig. 2. The intermediate section 13 is of the same diameter as the reduced diameter 12 of the upper section 10. The upper portion of the intermediate section 13 is preferably made solid and the lower portion 14 of the stick is tubular throughout and is held to slide upon the intermediate section and upon the reduced portion of the upper section to an engagement with the shoulder of the upper section formed by said reduction, as shown in Fig. 1. The lower section 14 of the stick is secured in a handle 15 of any desired shape. A link 16 is pivotally connected with the upper end of the intermediate section 13 and the reduced portion 12 of the upper section 10, the link 16 being made to enter slots in both of said sections, as shown in Fig. 2.

In the lower or tubular portion of the intermediate section 13 two opposing longitudinal slots 17 and 18 are made, as shown in Figs. 3 and 4. The slot 17 extends through to the lower end of the intermediate section, while the slot 18 does not extend quite to the lower end, whereby a cross-bar 19 is formed. At a suitable point in the lower portion of the

lower section 14 of the stick an opening 20 is made, through which the lower end of a spring B is adapted to extend, this projecting portion of the spring B being adapted to enter the usual slot in the runner 28 when the said runner is carried down the stick in closing the umbrella. The spring B is of peculiar construction, the body 21 being curved. In fact, the spring is curved from end to end, and between the center and upper end of the spring, at what may be termed its "back" or "concaved" edge, a bearing 22 is formed, which enables the spring when introduced into the lower end of the stick to be fulcrumed upon the inner wall of said section.

A spur 23 is formed at the upper end of the spring at its concaved edge, and the said spur is passed through the slot 18 in the intermediate section above and across the cross-bar 19 and is made to enter an opening 24, produced in the lower or handle section of the stick. This spur, together with the fulcrum, serves to hold the spring in place, and below the spur a shoulder 25 is formed on the spring, adapted for engagement with the cross-bar 19 when the handle-section of the stick has been drawn entirely from engagement with the upper section 10 and slightly beyond the upper end of the intermediate section 13 of the stick. Thus the shoulder 25 serves to limit the downward movement of the handle-section.

The upper end of the spring, or that containing the spur and the shoulder, may be termed the "head" of the spring, and the tail or bottom portion of the spring is enlarged, as shown at 26, being at this point of greater width than at any other point, and the tail portion of the spring normally extends out through the opening 20 in the handle-section of the stick. In the enlarged or tail portion of the spring B a recess 27 is made, and the outer edge of the enlarged portion 26 of the spring above the recess 27 is beveled inwardly and upwardly. When the handle-section of the stick is carried upward over the reduced portion 12 of the upper section and engages with the shoulder on the said upper section, as shown in Fig. 1, the cross-bar 19 of the intermediate section will ride over the inclined portion of the tail of the spring and enter the recess 27, as shown in Fig. 4, and in this manner the handle-section of the stick is locked to the upper section, and the stick will be as rigid as if made in one piece.

The runner 28 is of the ordinary construction and likewise the stretchers 29, connected with the runner. The main feature of the invention relates to the construction of the ribs C. These ribs are made in two telescopic sections 30 and 31, the section 30 being the upper section and is connected in the usual way with the crown 32 of the stick. The section 31 of the rib is the outer or lower section and is held to slide upon the upper or inner section, both sections being paragon. The stretcher 29 for a rib is connected with the outer section of the rib preferably by means of the

usual lap 33, which is rigidly attached to the said lower portion of the rib at a point removed from its ends, providing for a back bearing of the lower or outer section against the upper section of a rib, as shown in Figs. 5 and 6. The lap is provided with ears 34, through which ears the pivot-pin 35 of a stretcher is passed, the pin being close to the under side edges of the upper section 30 of a rib.

The extreme outer or lower end of the upper section of a rib is in the same plane with the body of the rib; but near the outer or lower end portion of the upper section of the rib the said rib is concaved upon its upper face and convexed at its lower edges, providing lower cam-surfaces 36. Thus it will be observed that after the lap 33 of the lower section of the rib has passed the curved or cam portion of the lower section of the upper member of the rib the lower section or member of the rib will move freely on the upper section or member, enabling the upper end of a lower section or member of a rib to be carried quite close to the crown 32; but when the lower section is drawn downward so as to impart to the rib its full length the curved or cam portion of the upper section of the rib will be straightened out by reason of the convexed or cam edges bearing upon the pivot-pin 35, and the two sections of the rib will have practically four firm points of contact, one point of contact being between the upper end of the lower rib-section and the upper surface of the upper rib-section, another point of contact being between the lower end of the upper rib-section and the under face of the lower rib-section, while the two other points of contact occur one between the pivot-pin and the convexed or cam edges of the upper rib-section and the other between the opposing surfaces of the two rib-sections immediately within the lap 33.

It is evident that when contacts are made between the rib-sections, such as has just been described, the sectional rib for all practical purposes is as strong as when made in one piece, and a sectional rib may be raised and lowered fully as well as the ordinary rib. When the umbrella is to be folded, the outer ends of the lower sections of the ribs are slightly tapped, so as to carry the lap beyond the cam edges of the upper rib-sections, after which, as heretofore stated, the lower rib-sections may be readily slid on the upper rib-sections in direction of the crown. After the ribs have been reduced in length, as stated, the tail of the spring B is pressed inward, releasing the spring from engagement with the cross-bar 19 of the intermediate stick-section, whereupon the handle-section of the stick may be drawn downward, uncovering the link 16 connecting the upper and intermediate sections of the stick, and the handle-section of such stick may then be folded parallel with the upper section, as shown in Fig. 2, reducing the length of the umbrella about one-half and enabling it to be carried in a traveling-case, if desired.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a folding umbrella, a rib constructed in telescopic sections, the end portion of one section being provided with a concaved upper surface and convexed lower surface, the convexed lower surface constituting cam-surfaces with which the pivots of the braces engage, for the purpose specified.

2. In a folding umbrella, a rib constructed in telescopic sections, the lower section being mounted to slide upon the upper section, the lower end portion of the upper section being upwardly curved, producing cam-surfaces at the under edges of the said upper section, a lap attached to the lower section of the rib near its upper end and extending downwardly below the under edges of the upper section, and a pivot-pin adapted to receive a stretcher located in the said lap and adapted for engagement with the under cam edges of the upper section of the rib, for the purpose set forth.

3. In folding umbrellas, the combination, with a paragon rib constructed in telescopic sections, the lower section being mounted to slide upon the upper section, the upper section near its lower end being provided with a concaved upper surface and convexed under edges, the extreme end of said upper section being in a plane with the body back of its curved portion, of a lap secured to the upper portion of the lower rib-section, extending downward at the sides of the upper rib-section and below the under edges thereof, and a pivot-pin mounted in the said lap below the under edges of the upper rib-section and arranged for engagement with said edges, the pivot-pin being adapted to support an end of a stretcher, for the purpose set forth.

4. In folding umbrellas, a rib constructed in telescopic sections, one mounted to slide over the other, the inner section being provided with an under cam-surface near its outer end, and a pin carried by the outer section, arranged for engagement with the cam portion of the under section, the said pin acting to force the two sections together when brought in engagement with the cam portion of the said under portion, as specified.

5. In a folding umbrella, the combination of telescoping ribs, the inner section being provided on its under face near its outer end with a cam-surface, and the outer section provided at its inner end with ears, and a brace pivoted to the ears of the outer section, the pivot of the brace being adapted to engage the cam-surface of the inner section, substantially as and for the purpose set forth.

6. In a telescopic rib, the combination, with an upper section provided with under cam-surfaces, of a lower section, a lap fixed to the

lower section at a point forward of its upper end, and a pin carried by the lap, arranged for engagement with the said cam-surface, whereby the two sections of the rib may be held firmly together and a back bearing is obtained for the lower rib-section against the upper rib-section, as specified.

7. In a folding umbrella, a stick comprising an upper section having a reduced lower end, an intermediate section of the same diameter as the reduced portion of the upper section and having a link connection therewith, the lower portion of the intermediate section being tubular and provided with opposing slots, one of which extends through to the bottom of the intermediate section, the other terminating near the bottom, forming a cross-bar, and a tubular handle-section held to slide over the intermediate section and the reduced portion of the upper section of the stick, and a spring fulcrumed in the handle-section of the stick, one end of the said spring passing over the cross-bar in the intermediate section into a socket in the handle-section, the outwardly-extending end of the spring being provided with a recess adapted to receive the cross-bar of the intermediate section, for the purpose set forth.

8. In an umbrella, the combination, with a folding stick, the said stick consisting of an upper section having a reduced lower end, an intermediate section of the same diameter as the reduced portion of the upper section and having a link connection therewith, the lower end of the intermediate section being tubular and provided with opposing slots, the lower end of one slot being crossed by the bar, and a handle-section held to slide in the intermediate section and the reduced portion of the upper section of the stick, of a curved spring located mainly within the handle-section and having a bearing against the wall of the said handle-section, the upper portion of the spring being attached to the handle-section at a point opposite its bearing, the upper portion of the spring likewise extending over the lower bar of the intermediate section, the tail end of the said spring being loosely passed out through an opening in the handle-section, the said tail end of the spring being provided with a recess to receive the said bar on the intermediate section, as and for the purpose specified.

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