

May 9, 1933.

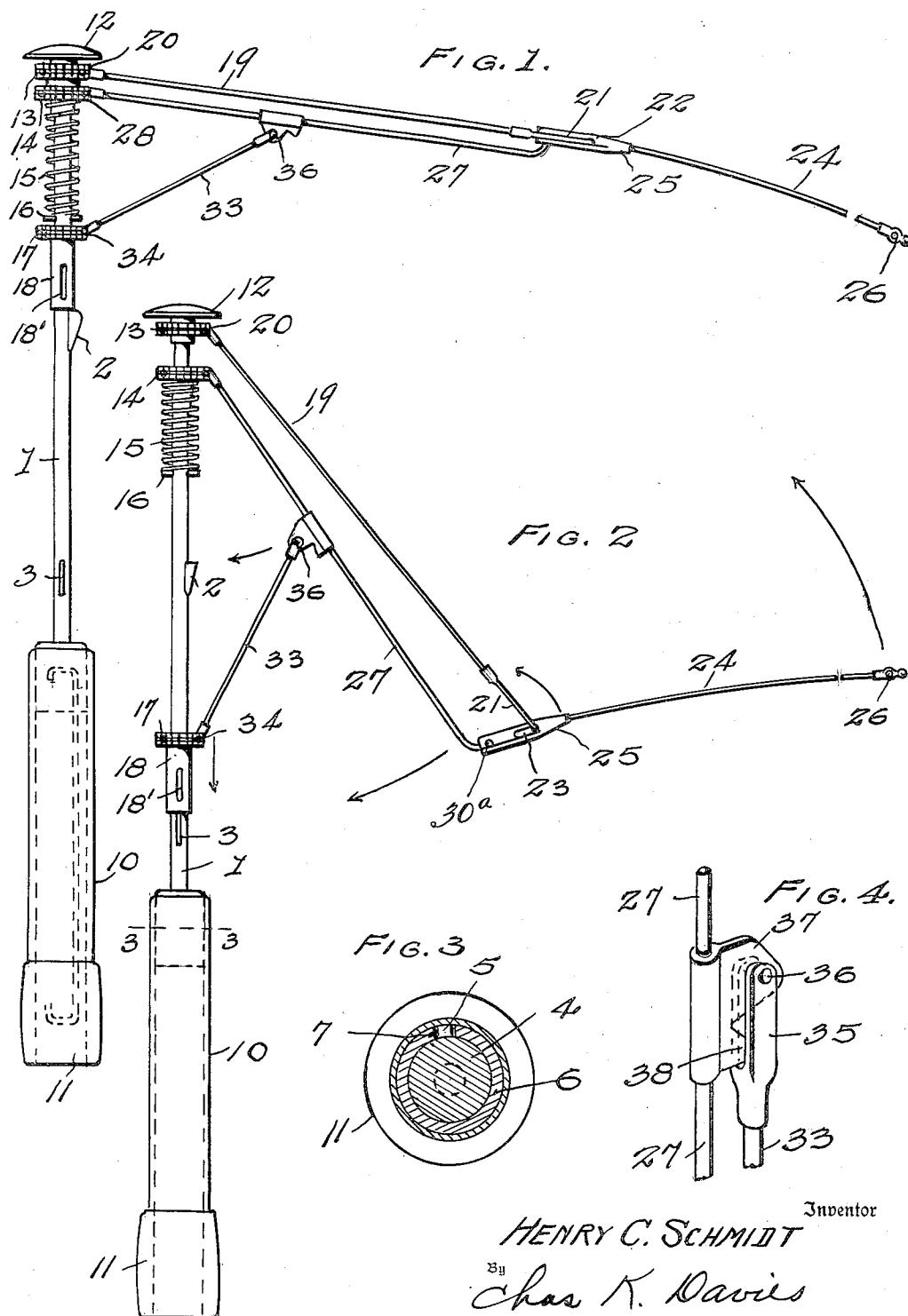
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1,908,453

UMBRELLA

Filed Jan. 14, 1932

2 Sheets-Sheet 1



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FIG. 5.

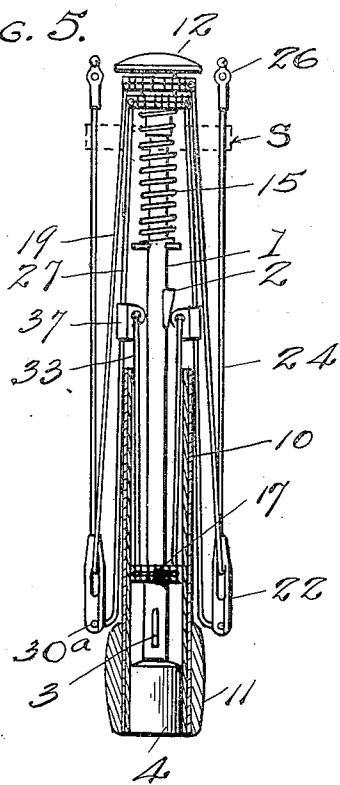


FIG. 7.

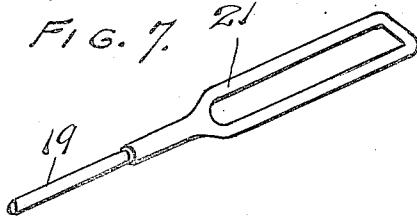


FIG. 8.

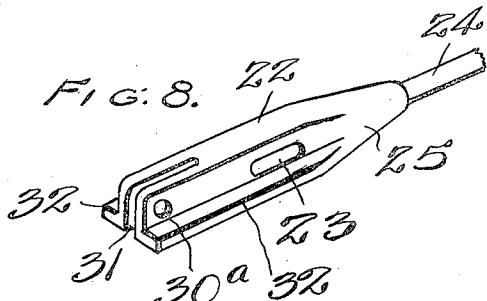


FIG. 6.

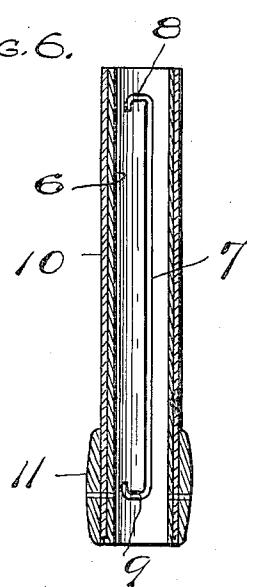


FIG. 9.

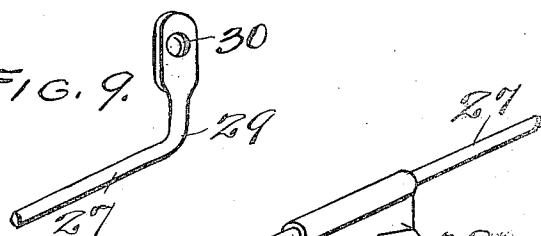
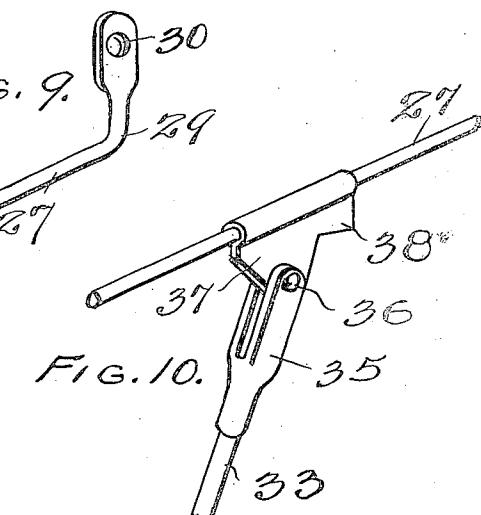


FIG. 10.



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## UNITED STATES PATENT OFFICE

HENRY CONRAD SCHMIDT, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-THIRD TO FRANK MAIER, OF CINCINNATI, OHIO, AND ONE-THIRD TO FRED G. FORTHUBER, OF CINCINNATI, OHIO

## UMBRELLA

Application filed January 14, 1932. Serial No. 536,632.

My present invention relates to improvements in umbrellas of the type which is collapsible, with folding and telescoping parts, in order that the umbrella may readily be compacted to small dimensions, when closed, and thereby adapted for carrying in a suitcase, over-night bag, or other traveling equipment, and the closed umbrella is of such small size that it may be carried in a pocket of the wearing apparel.

In carrying out my invention I employ a suitable number of foldable ribs, and I provide each rib with a foldable, reinforcing strut, which strut is employed as a lever arm in the opening and closing operations of the umbrella. I also employ a folding rib-brace for each rib, which rib-brace is utilized as a lever in connection with the lever-arm, and the rib-brace is operated by means of the usual slide ferrule and pivot-head adapted to be reciprocated on the stick or staff of the umbrella.

A hollow handle, in which the stick or staff is adapted to telescope, in addition to the performance of its usual functions, is utilized to slide over and retain the slide ferrule and pivot head or collar, for the purpose of holding the rib-braces and the ribs and other folded parts, when the umbrella is closed to insure a compactly arranged package.

The invention consists essentially in certain novel combinations and arrangements of parts, as above briefly outlined, and as will be more fully set forth and claimed. In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to one mode I have thus far devised for the practical application of the principles of my invention, but it will be understood that various changes and alterations are contemplated, and may be made in the exemplified structure, within the scope of my appended claims, without departing from the principles of my invention.

Figure 1 is a detail view in elevation of a portion of the umbrella of my invention with parts of the umbrella in open position for

use, and with the cover omitted for convenience of illustration.

Figure 2 is a view similar to Figure 1, showing the parts being closed as indicated by the arrows, and nearing their closed positions.

Figure 3 is an enlarged, transverse sectional view at line 3—3 of Figure 2, showing part of the bayonet-lock for the handle when the umbrella is open or raised.

Figure 4 is a detail perspective view showing the connection between a rib-strut and a rib-brace, in position when the umbrella is closed.

Figure 5 is a detail view in elevation, with parts in section, of the closed umbrella.

Figure 6 is a detail longitudinal sectional view of the hollow, slideable, umbrella handle.

Figure 7 is a perspective detail view of the looped-end of the inner section of one of the sectional, foldable, ribs.

Figure 8 is a perspective view at the inner end of an outer section of one of the sectional, foldable, ribs.

Figure 9 is a detail perspective view at the outer end of one of the reinforcing struts.

Figure 10 is a detail perspective view showing the pivotal connection between a strut and a folding rib-brace, in a position different from that of Figure 4.

In the preferred form of my invention, as illustrated in the drawings, the stick or staff 1, is of metal, either hollow, or solid, and it is provided with the usual catch 2 for use when the umbrella is opened or raised, and the lower catch 3, for use when the umbrella is lowered or closed.

At the lower end of the staff is secured or fixed a cylindrical head 4, which is provided with a radially projecting pin 5 for use with the hollow or tubular, slideable, cylindrical handle of the umbrella. The tubular handle, which is preferably cylindrical is composed of an inner tube 6 that is fashioned with a longitudinally extending slot 7, and at the upper end of the slot an L-shaped slot or extension 8 is fashioned, while at the lower end of the main slot a second L-shaped slot 9 is formed. The tubular handle slides over the head 4 and the walls of the slot 7 co-

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acting with the pin prevent relative rotary movement of the handle and head. The two L-shaped slots or extensions at the ends of the main slot permit the handle to be twisted or partly turned on the head for locking the handle in open position of Figures 1 and 2, or in closed position of Figure 5. After the handle is twisted or turned slightly, a slight pull, or push, on the handle, causes the short legs of an L-slot to engage the pin, and the handle is thus held against turning. The head is of sufficient size to provide a wide bearing for the handle and the head fits within the handle with a close frictional contact to prevent wobbling of the handle on the head.

An outer tubular cylinder 10 covers the inner slotted tube, and at their lower ends both tubes are rigidly joined with the knob 11, the tube 10 being a shield or cover for the pin and slot construction and the knob being employed for insuring a good hand grip on the handle. The cover 10 and the knob 11 may of course be ornamented in suitable manner, and may be fashioned of appropriate material for the purpose, and of course the umbrella cover, which is omitted for convenience of illustration, may be fashioned of suitable material and of varigated sizes, and colors.

At the upper end of the stick or staff, a crown or cap 12 is fixed, and of course is located outside of the umbrella cover or fabric. Under the crown 12, and under the umbrella cover, a pivot head 13 is also fixed on the stick, and provided with the usual notches, perforations, and wires in its central groove for the pivotal connection of the ribs of the umbrella.

Below the fixed pivot-head 13 is located an adjustable, spring-pressed, slideable, pivot-head 14, similar to the head 13, and adapted to slide down on the stick or staff against the action of a spring 15 which rests at its lower end on the pin 16 fixed in the staff. The spring bears against the lower or under side of the adjustable pivot-head or collar 14, and normally holds it against the under-side of the fixed pivot-head 13, but when the umbrella is being closed, and while closed, the spring is held under compression, in order that it may assist in the folding and unfolding operations of the foldable parts.

A third pivot-head or runner 17, similar to the heads 13 and 14, but provided with a rigid or integral slide sleeve or ferrule 18 is located on the staff, and is adapted to be slid up and down on the staff in usual manner, and the ferrule is provided with the usual slot 18' for co-action with the catch 3 of the staff, when the umbrella is closed. When the umbrella is open, the ferrule is above the catch 2, as indicated in Figure 1, for holding the umbrella open.

As indicated in the drawings, each rib is

made up of two foldable sections, of which the inner rib section 19 is pivoted at 20 on the fixed pivot head 13, and the outer end of each rib section 19 is fashioned with a looped, longitudinal extension 21 that is pivotally connected to a joint member 22 having a transverse slot 23 in which the looped end is pivoted. The outer section 24 of the rib is secured in the tapered end 25 of the joint member, and the outer, free end 26 of the outer rib-section is provided with the usual eye for attachment of the umbrella cover.

Each of the ribs is provided with a strut 27, which is pivoted at 28 to the pivot head 14, and extends, substantially parallel with the inner section 19 of the rib, out to the joint member 22. The outer end of the strut is bent at an angle as at 29, and is provided with a flattened, perforated, pivot head 30 that fits into the slot 31 of the joint member, and is pivoted thereto at 30a.

As best seen in Figure 8, the joint member 22 is fashioned with a pair of parallel edge flanges or ledges 32 on which the looped portion 21 of section 19 rests when the umbrella is open and these flanges hold the sectional rib against outward flexing beyond the proper raised or unfolded position of the ribs.

The looped end of the inner section of the rib fits snugly over the body of the joint member, to prevent lateral play of the loop on the member, and the slot 23 provides for a slight sliding movement of the looped end in the slotted joint member when the sectional ribs are being folded or unfolded.

The strut 27 is joined to the slide or runner 17 by means of a brace 33 pivoted at 34 to the slide, and the forked end 35 of the brace is pivoted at 36 to a gear 37 fixed on the strut, and fashioned with a detent or lug 38.

In raising and lowering, or opening and closing, the umbrella, the brace 33, as it is swung by movement of the slide 17, performs the functions of a lever, and the strut 27 to which the brace is pivoted, performs the functions of a lever arm for swinging the sectional rib of the umbrella. Thus, in Figure 2, where the umbrella is being lowered or closed, the slide has been pulled nearly to its catch 3, and the brace has swung the strut on its pivot 28. The pull of the brace and the swinging movement of the strut also slides the collar 14 against the compression of the spring 15, thus separating the strut, slightly, from the inner section 19 of the rib. This separation of the strut from the rib-section causes the joint member 22 to swing with its pivot end 30a downwardly, and the outer free end of the outer rib section 24 swings upwardly on the loop 21 as a pivot, thus folding the two rib sections. The continued downward sliding movement of the slide, and the consequent relative movement of the strut 27 and section 19 as they swing in toward the staff, cause the outer section of

the rib to fold inwardly against the inner rib-section.

After the ribs have been folded against the staff, and with the folded umbrella 5 grasped by the left hand at the upper end, as in Figure 5, the right hand is used to give a slight pull on the tubular handle to free the pin 5 from the short leg of bayonet slot 8, then the handle is given a slight twist 10 or turn to the right to bring the pin in line with the slot 7. By a push on the handle, the latter is now slid on the head 4, and the open end of the handle is slipped over the runner 17, and also over the infolded braces 15 33, which lie in position approximately parallel with the staff, for the purpose of retaining the braces in position against the staff. The open end of the handle passes between the enclosed braces 33 and the struts 20 27, and the struts lie snugly against the exterior of the handle. As best seen in Figure 4 the detents or lugs 38 of the gears 37 fit into complementary grooves or slots of the forked end 35 of the brace 33, to prevent wab- 25 bling of the folded parts.

After the slide has reached the end of its movement and is caught by the catch 3, and due to substantial alining of the brace with the strut of each rib, the spring 15 is per- 30 mitted to project the collar 14 to position of Figure 1, and the spring assists in holding the folded parts in proper position, and against loose movement.

For raising or opening the closed umbrella, 35 the latter is grasped at the upper end of Figure 5 by the left hand, the knob 11 is given a slight push to free the pin 5 from the short leg of the bayonet slot 9, then the handle is given a slight twist to the right 40 bringing slot 7 in line with the pin, and the handle is then pulled or slid, downwardly on the head 4 to position of Figures 1 and 2.

The slide or ferrule is now clasped in the left hand and the thumb releases the catch 3 45 from the ferrule, whereupon the umbrella is opened in usual manner, the slide and ferrule being slid along on the staff until the ferrule passes over the catch 2 and is then caught thereby.

As shown in Figure 5 where the umbrella is closed, the braces are almost parallel with the staff, for the reason that they have been forced inwardly by the advancing open end of the tubular handle. The ribs, struts, and 50 braces, are fashioned of resilient wire, and the resiliency of the wire permits these parts to be thus held under tension. As soon as the tubular handle is withdrawn from the braces, their upper ends naturally spring 55 outwardly to force the struts and folded ribs also to spring outwardly and swing on the pivots 20 and 28, preparatory to the raising or opening movement of the umbrella. The gears 37 by the engagement of their lugs 38 60 with the forked end of the braces, also act

as pivots or points of flexing of the struts so that their outer ends (which become the lower ends when the umbrella is closed) are bent inwardly toward the staff and placed under tension when the closed umbrella is tied with a strap (not shown). As soon as the strap is released, these ends, due to resiliency of the wire struts, also spring outwardly. Thus the folded parts are "sprung" into position, before the slide or ferrule is moved, so that when the ferrule is moved, the folded parts will readily unfold, and the ribs are swung to their proper unfolded and extended positions.

For convenience of illustration I have omitted the usual fabric cover for the umbrella, but it will be understood that the cover is folded with the sectional ribs to which it is attached at its edges, to the joint members 22, and to the crown portion of the umbrella, and the tie strap S indicated by dotted lines in Figure 5 is employed to hold the parts in wrapped position. The tubular handle retains the folded parts in compact arrangement, and the whole umbrella is thus com- 80 pacted into small compass in order that it may occupy a small space either in the traveling equipment, or in the pocket of the owner.

The number of ribs employed may be varied to suit differences in sizes of umbrellas, and for other purposes, but it will be understood that the rib structures are all of similar construction and operate in the same manner while being folded or unfolded.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an umbrella, the combination with a staff, a fixed pivot-head, a slidable pivot-head and an intermediate spring-pressed pivot head, of a sectional foldable rib, a slotted joint-member pivoted at the outer end of the inner section of the foldable rib pivotally supported from the fixed head, a strut pivotally connecting the intermediate head and the joint member, and a brace pivotally connecting the strut and said slidable head.

2. In an umbrella, the combination with a sectional folding rib having a pivoted end and an intermediate pivotal joint member, and means on said member for co-action with one of the sections to hold the rib in alinement, of a strut pivoted at one end to said joint member and an adjustable spring-pressed support for the other end of said strut, a brace pivoted at one end to the strut, and a sliding, pivotal support at the other end of the brace.

3. The combination with a rib section having a rigid, slotted joint member, of a second rib section having a stationary pivot-support at one end and a loop at its other end engaged in the slotted joint member, means on the joint member co-acting with the loop to hold the sections in alinement, a pivoted strut having

a pivotal connection to said joint member, and a brace pivoted to said strut.

4. The combination with a rib section having a rigid, slotted joint member, and lateral flanges on said member, of a rib section having a looped end in the slotted member and adapted to lie on said flanges, a strut having an angular end pivoted to said member, and a brace pivotally connected to said strut intermediate its ends.

5. The combination with a foldable, sectional rib having an intermediate joint member rigid with one section and pivoted to the other section, of a lever arm pivoted to said member and having a movable support, and a brace pivoted to said arm and having a slideable support.

In testimony whereof, I affix my signature.  
HENRY CONRAD SCHMIDT.

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