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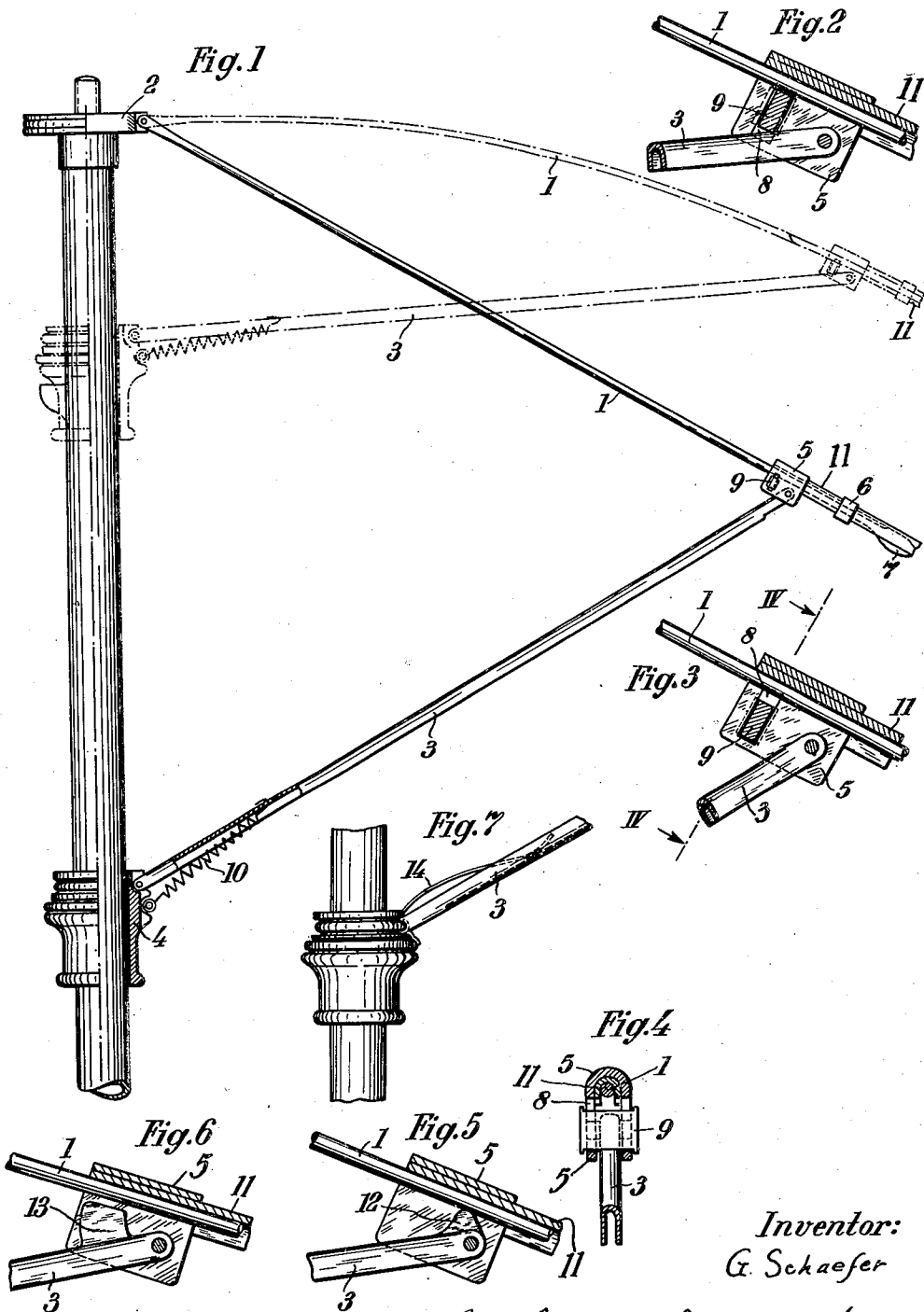
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2,160,231

UMBRELLA FRAME

Filed Aug. 4, 1936

2 Sheets-Sheet 1



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Fig. 8

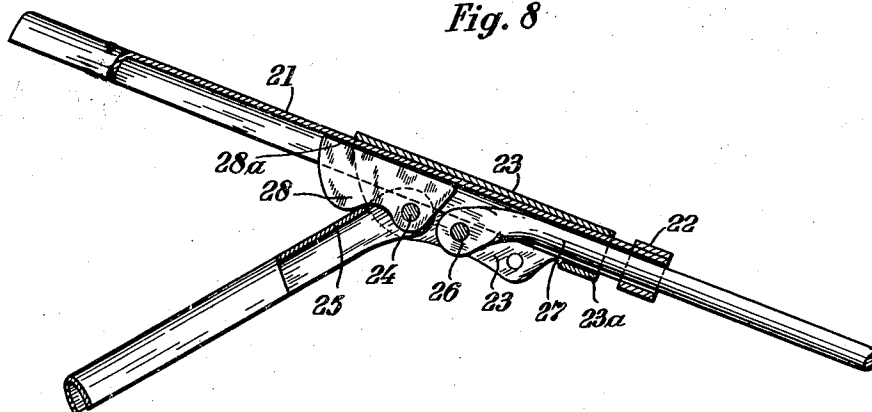
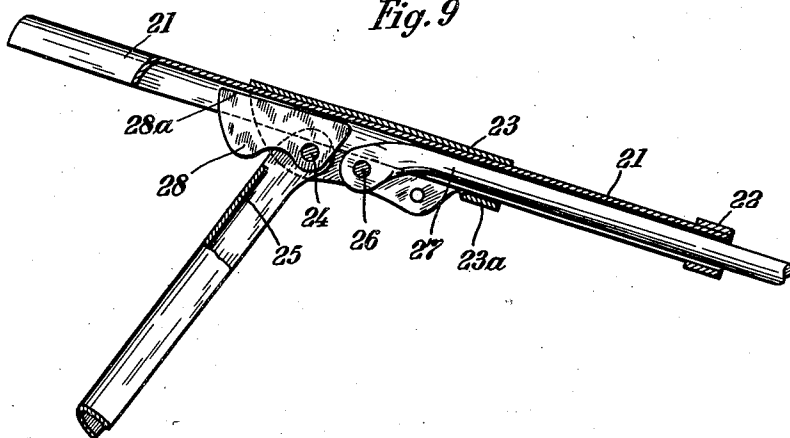


Fig. 9



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UNITED STATES PATENT OFFICE

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UMBRELLA FRAME

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In Great Britain November 8, 1935

7 Claims. (Cl. 135—26)

The present invention concerns an umbrella frame composed of a telescopic stick and telescopic ribs.

In such umbrellas it is essential that the extended ribs be secured in their position against the tendency of the cover to telescope them again before the umbrella is opened to its fullest extent.

Several arrangements have been suggested in the past for securing the ribs in such an extended position. For example, it has been proposed to secure the ribs in an extended position by means of spring members pressing one rib against the other. Another scheme has been to provide supports or projections which engage the end of the inner ribs when the ribs have been extended, and prevent the ribs from being telescoped together.

However, these known securing devices are complicated and unreliable and have not been considered practical. Attempts have been made to avoid the use of such securing means by providing auxiliary supports which secure the position of the main supports during the opening of the umbrella and which, at the same time, hold one part of the ribs against another part. This solution in construction of folding umbrellas is also rather complicated. The frame is more cumbersome and is heavier than most known frames.

Through the present invention, a practical and effective means of securing the ribs in the desired position is achieved by making use of a clamping or locking arrangement by means of which the outer portion of the rib is pressed against the inner rib and held there, when the umbrella is opened, by friction without making use of a notch or depression in the inner rib surface. The locking elements are thus effective upon the overlapping parts of the rib, which have smooth or unbroken contacting surfaces so as to be freely slidable one upon another in all positions of adjustment. By such means, the two parts of the ribs are secured one against the other in a most simple manner. A further advantage is obtained by the provision of such a locking device, in that the joint between the rib and the support is by no means weakened. Thus firmness of these parts is achieved throughout the frame.

Preferably, each joint between the supports and the ribs is provided with a locking device. In one embodiment of the invention a vertical slot is provided in the yoke of each support, positioned in such a manner as to extend over the inner rib and in which slot a rib engaging device is loosely guided. In a modification of the invention, the slot may be extended in a direction oblique to

the inner rib. These embodiments of the invention are particularly advantageous, as they are simple and particularly effective.

In another embodiment of the invention a rib engaging element is provided, loosely arranged on the support in such a manner, that it does not partake in a movement tending to force it out of the joint.

In a still further embodiment the locking is obtained by providing a projection or cam on each support, which projection or cam presses the inner rib against the outer rib during the opening of the umbrella. The projection may be provided close to the pivot of the joint or it may be provided beneath the joint, and arranged in such a position that while the umbrella is being opened it enters the yoke and forces the ribs into engagement with each other.

In folding umbrellas, the cover of the umbrella has a tendency to telescope or move together the already extended ribs. Therefore, it is necessary to provide means to counteract this tendency, and the locking means should become effective to clamp the ribs in the extended position. Otherwise, it may happen that some of the ribs are clamped in a position different from the position of the remaining ribs. The ribs would then protrude through the cover of the umbrella. To prevent this, according to another feature of this invention, springs are provided which have a tendency to swing the supports downwardly about their pivots on the slider. Preferably a leaf spring or a wire spring may be used, one end of which presses against each support from above and the other end of which is attached to the slider. A spring arranged in this way has an advantage in that it is almost hidden by parts of the frame. However, it is also possible to employ a coil spring, and to attach one end of the coil spring to the underside of the support and the opposite end to the slider. Instead of springs, rubber bands, rubber strips or other elastic means may be employed. In carrying out the invention it is not necessary to construct the ribs in such a manner that the inner parts attached to the crown of the umbrella are moved within the outer parts. On the other hand, it is possible to employ a reverse arrangement. In this case, the arrangement of the clamping means would be altered accordingly.

Various embodiments of this invention are illustrated by way of example in the accompanying drawings.

Fig. 1 shows an umbrella frame embodying the invention in two positions.

Fig. 2 is a sectional view of the details of the locking means which clamps the ribs in an extended position.

Fig. 3 is a sectional view illustrating the position of the clamping means when the umbrella is half open.

Fig. 4 is a sectional view taken on the line IV—IV of Fig. 3.

Fig. 5 is a view illustrating partly in section a modified clamping arrangement.

Fig. 6 is a view partly in section and partly in elevation of a further modified clamping arrangement.

Fig. 7 shows a part of still another umbrella frame constructed in accordance with the invention, in which view the springs influencing the supports have been altered.

Fig. 8 shows still another constructional form of the clamping means illustrating the position of clamping parts when the umbrella is completely opened.

Fig. 9 is a view similar to Figure 8 showing the position of the clamping means in a half-closed position.

The umbrella frame is provided with a stick adapted to be extended or collapsed in the manner of a telescope. The stick is provided with ribs comprising two parts I and II, which ribs are adapted to be extended into the open position or to be telescoped together into the closed position of the umbrella. The ribs are attached to the crown 2 which is connected rigidly to the top of the stick. The tautening of the umbrella is effected by supports 3. One end of each support is pivoted on a slider 4 and the other end attached to a yoke 5 and the yoke 5 is connected rigidly to the outer part II of each rib. Tubular members or rings 6 are provided to improve the sliding of the inner parts I in the outer parts II of the ribs.

The inner part I of each rib may consist of round wire thickened at the end 7 to prevent the inner part from passing through the tubular member 6 and from disengaging the outer part of the rib. The outer part of each rib has a U-shaped cross section.

In the yoke 5 an elongated slot 8 is provided, extending preferably in a direction perpendicular to the rib. The slot 8 extends upwardly slightly beyond the lowermost portion of the inner rib. A plate or block 9 is guided in the slot. This plate 9 does not fill the slot completely, but can be moved in a longitudinal direction. The plate 9 has such a length that when engaged by the support 3 it is pressed against the inner part of the rib when the umbrella is opened. In this way, the ribs are automatically clamped in a very simple manner so that the tension of the cover cannot telescope the ribs together when the umbrella is opened. During the closing of the umbrella the support 3 moves away from the lower part of the plate 9. The pressure on the plate 9 is thus removed and the clamping is released automatically.

To counteract the tendency of the cover to telescope the ribs together when the operation of opening the umbrella has begun, a coil spring 10 is provided on the slider 4 for each support 3. One end of the spring engages the slider beneath the joint of the support 3 and the other end engages the support 3 itself. The springs may be relatively weak.

The clamping or locking means may be modified as illustrated in Fig. 5, so that only a projection or cam 12 is provided at the end of

each support. The projection or cam is arranged to enter the yoke 5 and press the inner part I of each rib against the outer part II when the umbrella is in an open position.

A still further clamp is shown in Fig. 6, represented as comprising a projection 13 provided on the support extending upwardly from a point near the outer end thereof, so that the projection engages the rib I when the umbrella is opened, and is guided laterally by the yoke so that it cannot slide off from the inner part of the rib.

According to Fig. 7, a wire or leaf spring 14 is provided which actuates the supports 3 from above, in place of the coil spring 10 which actuates the support from beneath. The wire or leaf spring 14 is attached at one end to the upper edge of the slider 4 and engages the support 3 at its opposite end and thus tends to swing the support downwards.

According to Figs. 8 and 9 the inner ribs 21 are of U-shaped cross-section, in which the outer ribs 27 are slidably arranged. The ribs 27 are of circular cross-section. The inner end of the ribs 27 are connected to a member 23, for example by means of a rivet 26. The supports 25 have forked end pieces and are linked to the member 23 by means of a pivot pin 24.

On the pivot 24 of the support a clamping member 28 is located. This member is so arranged, that it can not be turned out of the member 23. In clamping position the face 28a presses against the inner surface of the inner rib 21. The clamping member is equipped with a projection 29 extending into the angular space between the inner rib 21 and the support 25.

The connection member 23 is bent around at 23a to form a guide. At the outer end of the rib 21 a stop 22 is provided, as usual, to prevent a separation of the inner and the outer rib.

In the drawings the supports are substantially straight. The supports may however be more curved, in order that a short projection 28 may be employed.

The embodiment of the invention shown in Figs. 8 and 9 is particularly simple and can easily be produced at low costs. Since the clamping means are completely covered by the connection members the cover of the umbrella is protected against being damaged.

I claim:

1. In an umbrella frame, a plurality of ribs each comprising an inner part and an outer part arranged to overlap each other, the overlapping portions of said parts having smooth unbroken contacting surfaces so that the parts may slide one upon the other in all positions of overlapping adjustment, a yoke connected to the inner end of the outer rib part and embracing the overlapping portions of said ribs, and means carried by said yoke and slidable with respect thereto adapted upon operation to force the inner rib part towards the yoke and lock the inner rib part against movement with respect to the yoke.

2. In an umbrella frame, a plurality of ribs each comprising an inner part and an outer part arranged to overlap each other, the overlapping portions having smooth contacting unbroken surfaces so that the parts may slide upon one another in all positions of overlapping adjustment, a yoke associated with the overlapping portions of said ribs, and means movably mounted with respect to said yoke, a support pivoted to said yoke adapted to engage said means and move the same into engagement with the inner rib

part so that the inner and outer parts of the ribs may be locked in different positions of overlapping adjustment.

3. In an umbrella frame, a plurality of ribs
5 each comprising an inner part and an outer part arranged to overlap each other, the overlapping portions having smooth unbroken contacting surfaces so that the parts may slide upon one another in all positions of overlapping adjustment,
10 a yoke having slots therein connected to the inner end of the outer rib part, and means movably mounted in the slots of said yoke adapted upon operation to force the inner rib part into engagement with the yoke whereby the inner
15 and outer parts of the ribs are locked so as to prevent relative longitudinal movement with respect to each other.

4. In an umbrella frame, a plurality of ribs each comprising an inner part and an outer part
20 arranged to overlap each other, the overlapping portions having smooth unbroken contacting surfaces so that the parts may slide upon one another in all positions of overlapping adjustment, a yoke connected to the inner end of the outer
25 rib part, a clamping member pivotally mounted on said yoke, a support pivotally connected to said yoke adapted to engage said clamping member and move the same into engagement with the inner rib part whereby the inner rib part
30 is forced into engagement with said yoke to thus lock the rib parts against movement with respect to each other.

5. In an umbrella frame, a plurality of ribs each comprising an inner part and an outer
35 part arranged to overlap each other, the overlapping portions having smooth unbroken contacting surfaces so that the parts may slide upon one another in all positions of overlapping adjustment, a yoke connected to the inner end of the outer rib part and embracing the inner rib
40 part, a clamping member pivotally mounted on said yoke, a projection carried by said clamping

member, and movable means associated with said yoke adapted to engage said projection whereby the clamping member engages the inner rib part and forces the same into engagement with said yoke so as to prevent relative movement between
5 the yoke and the inner rib parts.

6. In an umbrella frame, a plurality of ribs each comprising an inner part and an outer part arranged to overlap each other, the overlapping
10 portions having smooth unbroken contacting surfaces so that the parts may slide upon one another in all positions of overlapping adjustment, a yoke connected to the inner end of the outer rib part and embracing the overlapping
15 portions of said ribs, said yoke having a slot therein, a plate-like block mounted so as to be freely movable within said slot, a support pivotally attached to said yoke adapted upon movement thereof to urge said plate-like block into
20 engagement with the inner rib part which is forced into engagement with the overlapping portion of the outer rib part within the yoke.

7. In an umbrella frame, a plurality of ribs each comprising an inner part and an outer part
25 arranged to overlap each other, the overlapping portions having smooth unbroken contacting surfaces so that the parts may slide upon one another in all positions of overlapping adjustment, a yoke connected to the inner end of the outer
30 rib part and embracing the overlapping portions of said ribs, a support for said rib parts having the end thereof pivotally attached to said yoke, movable means carried by said yoke adjacent the
35 pivoted end of said support, said means being adapted to be moved into engagement with the inner rib part upon movement of the support whereby the inner rib part is urged into engagement with the outer rib part so as to prevent relative longitudinal movement of the inner
40 and outer rib parts.

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