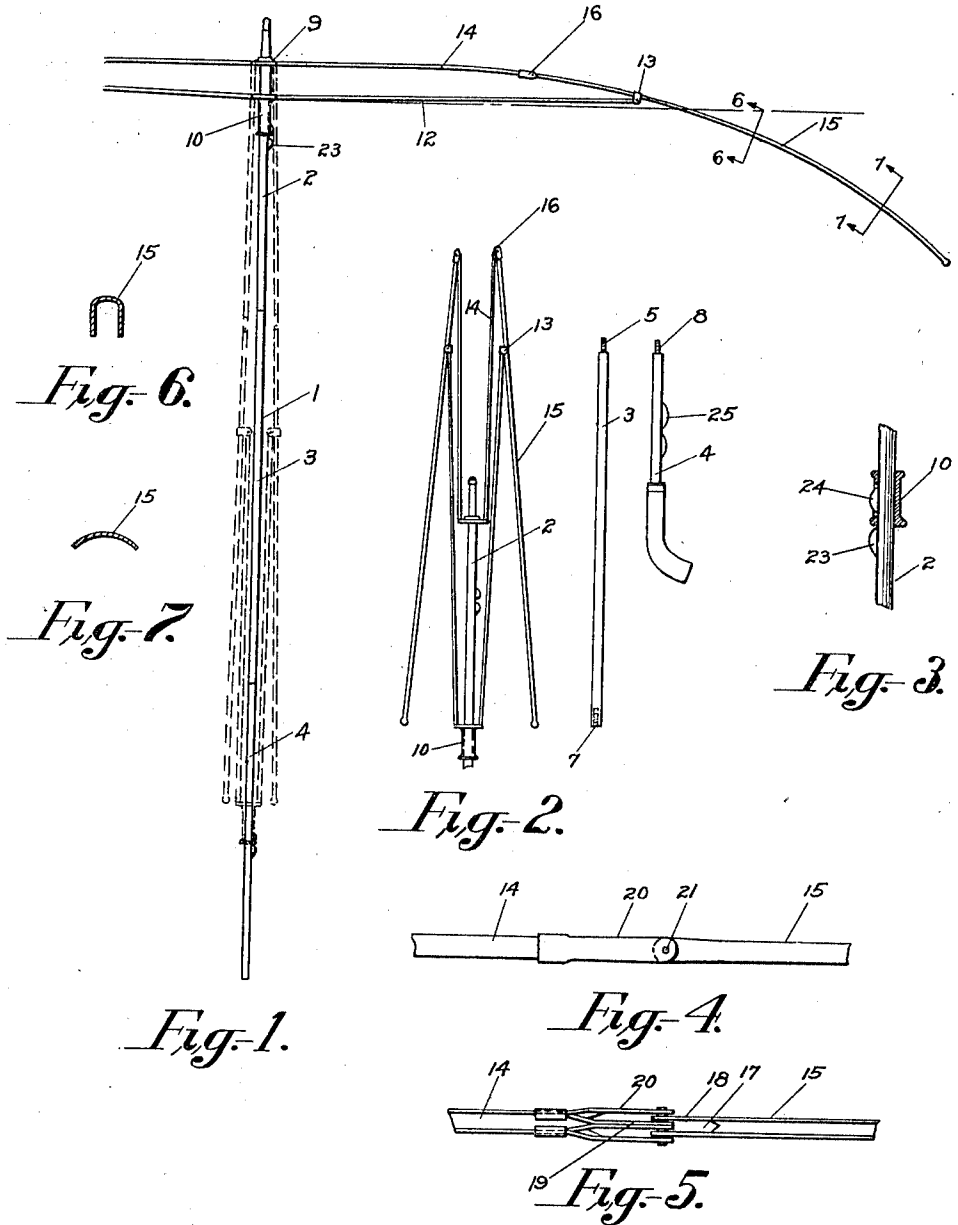


J. F. McALLISTER.
FOLDING UMBRELLA.
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1,061,305.

Patented May 13, 1913.



WITNESSES.
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JOHN FRANK McALLISTER, OF PITTSBURGH, PENNSYLVANIA.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN FRANK McALLISTER, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Folding Umbrellas, of which the following is a specification.

This invention relates to folding umbrellas, and particularly to the manner of holding the rib sections in opened position.

The object of the invention is to provide means for keeping the umbrella opened which is not found in any other umbrella, ordinary or folding. In ordinary umbrellas the spreaders are used only as struts, leaving the pressure of the umbrella to be held in check by a spring catch. This is because a greater amount of pressure is forced upon the outer ends of the ribs than elsewhere, thus causing the ribs to curve, the spring catch being used primarily to hold them in curved position. I believe the above method has been resorted to by all the inventors of folding umbrellas.

The feature of my invention is to divide the pressure into two parts, balancing and suspending it over the spreaders in a manner somewhat like that in which a boy balances a ruler over the point of a knife blade or pencil, considering the rib to correspond to the ruler, and the spreaders to take the part of the knife blade or pencil. This method of balancing the pressure, I believe, removes all barriers to the completion of a durable folding umbrella. A further feature of this balancing of the pressure is that an umbrella so constructed is not so liable to turn inside out in a wind-storm, and furthermore, should this happen the umbrella is not destroyed, as are most umbrellas.

A still further feature of this invention is the provision of a folding umbrella which is light in weight, and is strong and durable, consisting of but few parts, including a stick formed of separable sections, all but one of which may, when the umbrella is folded, be wrapped up inside the cover of the umbrella.

In the drawings, Figure 1 is a longitudinal section through an umbrella constructed according to my invention, the cover being omitted, and the umbrella being illustrated in full lines in opened position and in dotted lines in closed position; Fig. 2 is a similar view, showing the stick dismantled and the

frame folded for packing; Fig. 3 is an enlarged detail view of a catch member and runner; Figs. 4 and 5 are enlarged detail views of the joint between the inner and outer rib members; and Figs. 6 and 7 are respectively cross sections on the lines 6—6 and 7—7, Fig. 1.

The umbrella shown in the drawings comprises a rod or stick 1, which may be formed of wood, metal, or other suitable material, and is preferably formed of a plurality of sections, 2, 3 and 4, to enable it to be taken apart when the umbrella is collapsed or folded for packing. The section 3 is provided at its upper end with screw threads 5 to screw into a threaded socket in the upper member 2, and at its lower end with a threaded socket 7 to receive the threaded upper end 8 of the lower or handle member 4.

Near the upper end of the upper stick member 2 is secured the usual notch or socket 9, to which the inner ends of the umbrella ribs are pivotally secured in the customary manner. Slidable upon the stick 1 is a runner 10, of ordinary form, to the upper end of which are pivotally secured spreaders or stretchers 12, which at their outer ends are pivotally secured as at 13, to the umbrella ribs.

The frame described to this point, when equipped with the usual cover of suitable fabric, may be used in the ordinary manner, that is to say, it may be raised or extended as in full lines in Fig. 1 or may be lowered and closed as indicated in dotted lines, the runner 10 being slid up and down along the stick to open or close the umbrella in the ordinary manner.

To enable the umbrella to be folded into small and compact form, the ribs of the umbrella are each formed of inner and outer members 14 and 15, said members being pivotally secured to each other as at 16, and to the stretchers as at 13.

Heretofore in the art, it has been necessary, to provide some special means for preventing breaking or opening of the joints between the separate sections of the rib members when the umbrella is open and under strain. This was necessary since the pressure on the umbrella acts mostly upon the outer ends of the ribs, and caused more strain to be put upon the pivot connecting the rib sections, than it could bear. The operator in opening a folding umbrella,

moves the runner from the closed position to the opened position, and in so doing moves the runner first to the position where the ribs begin to assume curvature. At this position, the pressure on the umbrella, caused by the peculiar shape of the cover, begins to increase on the outer ends of the ribs, thereby bending or curving the same. From this position to that of opened position the pressure gradually increases in accordance with the amount of curvature assumed by the ribs. Should a joint be placed on the rib of an ordinary umbrella inwardly of the spreaders, the pressure, being mostly on the outer ends of the ribs, and having no opposition or resistance, would immediately collapse the umbrella. Opposition to this pressure must therefore be provided in the form of an extra rib or other appliance. By balancing the pressure, as before stated, the strain is taken up by the spreaders and runners. This is accomplished in the present construction by giving the cover a greater size, which in effect lessens the pressure on the ends of the ribs. Then, by removing the spreaders, or more exactly, the joints between the same and the ribs, to a point substantially midway of the length of each rib, and locating the catch member which is engaged by the runner so that the spreaders in opened position of the umbrella will be in a position almost perpendicular to the stick (as shown in Fig. 1), there is sufficient pressure between the inner and outer ends of the ribs to prevent them from collapsing. This is because the pressure on the ends of the ribs is decreased and there is an equalization of the pressures on the inner and outer portions of the ribs. However, by giving the outer portions of the ribs a gradual taper from U-shape in cross section, as shown in Fig. 6, to the shape of a low, wide arch, as shown in Fig. 7, and then gradually back to U-shape, the outer portions of the ribs may be made more flexible, and in such case there is less strain on the ribs and the cover may be made of the ordinary size. At the same time the equalization of pressures referred to above is maintained. To assist, however, in holding the umbrella opened and preventing collapsing of the same under conditions of hard usage, I provide a special form of joint between the rib members. In the form shown the inner end of the outer member 15, which is substantially U-shape in cross section, as shown in Figs. 4, 5 and 6 has its end portion cut away, as at 17, Fig. 5 to form a pair of members 18 which project into the spaces between the flattened end 19 of the other rib member 14 and the side walls of a small clip 20 secured thereto. A suitable pivot pin 21 passes through the members 18, 19 and 20 which are all pressed tightly together to create considerable friction

in the joint and make the same stiff and not easily broken or opened. The joint is constructed in this manner so as to withstand a great amount of pressure without pulling apart endwise, the parts being held in direct tension when the umbrella is in opened position. Preferably, the members 18, 19 and 20 are of some length, in order to permit the inner and outer rib members to fold close together but not fully into parallelism with each other. The pivotal connection 13 between the spreaders 12 and the umbrella ribs, is on the outer member 15, and comparatively close to the connection 16 between it and the inner member 14.

The umbrella described is operated as follows: It may be extended in the ordinary manner, as shown in full lines in Fig. 1, by moving the runner 10 to its upper position on the stick member 2, where it is held or locked in place by a suitable latch 23 seated in the stick member 2 and yieldingly projected outwardly therefrom in the usual manner, said latch being provided with a projection 24 to engage the runner 10 and prevent movement thereof in either direction on the stick unless the latch is depressed therinto. The umbrella may be closed in the ordinary manner, as indicated in dotted lines, Fig. 1, in which case the runner 10 is moved along the stick 1 to a position upon member 4 where it is held in position by a second latch 25 similar in construction to the latch 23 just described. From the closed position the umbrella may be folded or collapsed to the position shown in Fig. 2, in which case the runner 10 is released from the latch 25, the outer extremities of the ribs are grasped and the runner slid to the position shown in Fig. 2. This folding breaks the joints between the inner and outer members 14 and 15 and projects the same beyond the end of the stick. The cover having been folded between the ribs of the umbrella, the stick may be dismantled and the sections 3 and 4 thereof wrapped with the frame, making one bundle in all.

The umbrella described is of simple construction and is of practically no greater weight than the ordinary umbrella. The different parts may be easily constructed as shown and may be assembled with the ordinary machines or other appliances.

It is to be understood that the invention is not limited to the details of construction shown and that the same may be varied or modified within the scope of the appended claim.

What I claim is:—

A folding umbrella comprising a stick, a notch at or near one end thereof, ribs pivotally secured to said notch and comprising inner and outer members having a stiff pivotal connection therebetween, said outer members being of relatively greater length

than said inner members, spreaders pivot-
ally connected to said outer members near
the inner ends thereof, a runner on said
stick to which said spreaders are connected,
5 said spreaders being located in such position
as to balance the pressure on the umbrella
and hold it open without the use of any
stay pieces or other device, and a catch
member on said stick adapted to engage said
10 runner when said ribs are extended, said

catch member being so located that in the
opened position of said umbrella, said
spreaders are nearly perpendicular to said
stick.

In testimony whereof, I have hereunto 15
set my hand.

JOHN FRANK McALLISTER.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."