No. 620,025. Patented Feb. 21, 1899.

J. H. FLEISCH.

UMBRELLA NOTCH JOINT.

(Application filed Jan. 16, 1899.)

(No Model.)

Fig. 1.

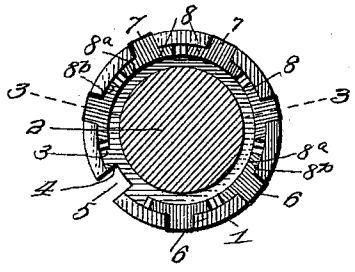


Fig. 2.

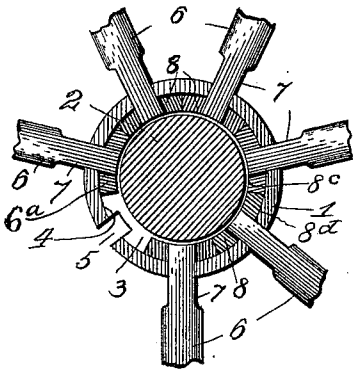


Fig. 3.

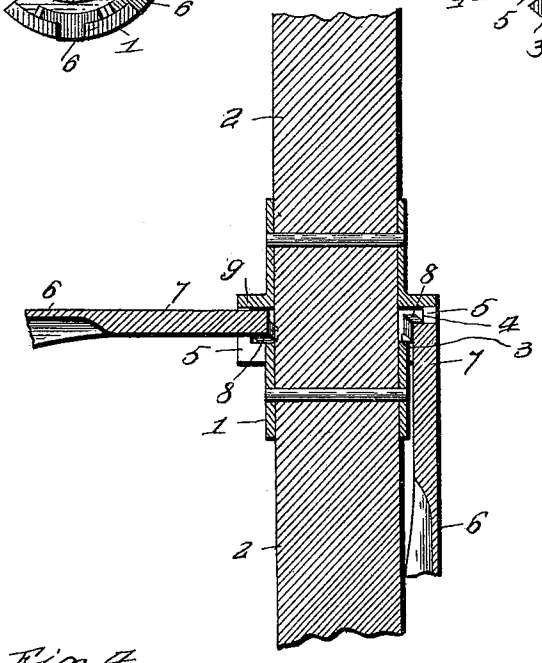


Fig. 4.

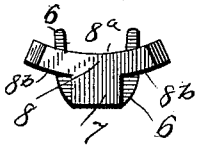
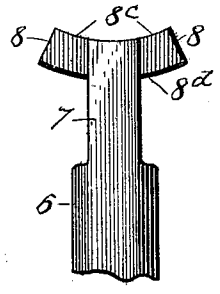


Fig. 5.



Witnesses:
Herbert Bradley
Harry A. Knight

Inventor:
Jacob H. Fleisch.
By Knight Bros
Attorneys.

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UNITED STATES PATENT OFFICE.

JACOB H. FLEISCH, OF NEW YORK, N. Y.

UMBRELLA NOTCH-JOINT.

SPECIFICATION forming part of Letters Patent No. 620,025, dated February 21, 1899.

Application filed January 16, 1899. Serial No. 702,289. (No model.)

To all whom it may concern:

Be it known that I, JACOB H. FLEISCH, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Umbrellas, of which the following is a specification.

My invention relates to joints for umbrellas which are employed for connecting the ribs or spreaders to the crown or slide; and my invention has for its objects to produce a construction of joint which will permit substantial reduction in the diameter of the crown and the slide without sacrificing strength or durability of the connection and also to construct the joint so that the stability of the structure as a whole will be increased and the tendency of the frame to rotate or yield circumferentially upon the rod or staff will be effectually overcome.

To accomplish the first object of my invention, I form the part to which the rib or spreader is connected—that is to say, the crown or slide—with an annular transverse offset and a circumferential longitudinal flange and in which are formed notches or recesses to receive the ribs or spreaders, and upon the side of the end of each spreader or rib is provided a cross-head which will lie within and conform to the flange. The cross-head or projection has the form of a segment of a ring, the outer face or side of which conforms to the inner surface of the flange, while the inner face or side conforms to the rod or staff upon which the crown is mounted or to the sleeve forming part of the slide. In other words, the inner and outer surfaces of the cross-head are made concentric with the staff, and the cross-head constitutes a segment of an annulus which fits the annular space within the flange.

To accomplish the second object—namely, to give an increased transverse bearing for the parts when the umbrella is open—the end or upper surface of the cross-head is similarly formed on a segment of an annulus, which when the umbrella is open will fit snugly but not tightly in the space between the rod or staff and the flange. Hence when the umbrella is opened there is no room for any material lateral play of the parts. In connection with this feature of my invention I also prefer to have the end of the rib or spreader abut against the rod or sleeve, and thus increase the bearing and form a stop for limiting the opening.

Inasmuch as the construction of the crown and slide and the parts—to wit, the ribs and spreaders to be respectively jointed thereto—may be identical in construction so far as concerns the features of my present invention I will simply describe my invention as a means for connecting a hinging part, which may be either a rib or a spreader, to an annular part, which may be either the fixed crown or the slide, and for convenience illustrate it as applied to the ribs and crown.

In the accompanying drawings, Figures 1 and 2 are horizontal sections through the rod or staff of an umbrella and the crown mounted thereon, respectively showing the jointed parts folded and extended. Fig. 3 is an axial section of the same, one of the jointed parts being folded and the other extended. Figs. 4 and 5 show by end and side views the form which is given to the end of the connected part.

1 represents the annular part—*e. g.*, the crown—which is mounted upon or surrounds an inner cylindrical portion 2—*e. g.*, the rod upon which the crown is mounted. The portion 1 is shaped to provide the transverse annular offset 3, in which the cross-heads on the hinging parts work, and a longitudinal annular flange 4, by which said cross-heads are retained. Both the longitudinal flange 4 and a portion of the transverse offset 3 are slotted, as shown at 5, Figs. 1, 2, and 3, in order to receive the ribs, which may swing outward in the slot 5 thus formed for opening and closing the umbrella.

6 represents the ribs, which are preferably formed with reduced necks 7 and with cross-heads 8. The necks 7 fit the slots 5, and a cross-head 8 may be limited in transverse dimensions to that of the hinging portion 6, so as to be readily made integral therewith from a rod. As shown in Fig. 1, the inner surface or side 8^a and the outer surface or side 8^b of a cross-head 8 are formed in arcs concentric with the rod 2. In other words, the cross-head or enlargement 8 is a segment of an annulus which substantially fits the space provided by the offset 3 and flange 4. By referring to Fig. 2 it will be seen that the other two faces 8^c and 8^d of the cross-head 8 are formed similarly to the faces 8^a and 8^b, so that when the rib 6 swings out to open the umbrella the

cross-head 8 in this position likewise constitutes a segment of an annulus fitting the space between the rod 2 and the flange 4, and thus giving an increased transverse bearing which affords the necessary lateral stability to the rib.

From Fig. 3 it will be observed that the rib 6 has the cross-head 8 secured to the inner side of one end and that the rib 6 approximates in thickness the depth of the slot 5, and hence all the ribs will lie within the diameter of the annular portion of the joint. A further advantage of attaching the cross-head to the inner lateral face of the rib is that it permits the rib to lie in a slot formed for the most part in the outer flange, while the cross-head engages on the inner face of said flange when the rib is folded. A further advantage of so attaching the cross-head to the rib is that it permits the end 6^a of the rib to abut against the cylindrical member 2 when the rib is extended, thus increasing the bearing of the parts and forming a stop to limit the outward movement of the rib and greatly strengthening the umbrella against a tendency to reverse and avoiding the use of transverse pins generally employed for limiting the outward movement of the ribs. A cap 9 is secured in position above the joints to hold the parts in place.

As will be seen from the drawings, the cross-heads, which are formed segmentally in two directions—that is to say, on their ends and on their sides—meet when in place, so that together they form a complete ring in the flange member, and their ends are of such shape that when the ribs are spread the ends of the segmental cross-heads abut squarely, and thus greatly stiffen the frame—that is to say, the ends of the cross-heads are formed on radii of the annulus on which the T-head is formed. Said ends therefore are beveled or inclined, and this adapts them to meet to form a complete ring.

It will be understood that the present demands of the trade are for tight-rolling umbrellas, and decrease in the dimensions of old constructions has only been made by manufacturers at the expense of strength and durability. With my improved construction of joint for the hinging parts of umbrellas the transverse dimension of the parts when folded is reduced to a minimum, but strength and durability are retained. The main feature from which these results are obtained is the construction of the cross-head in the form of a segment in two directions. It will be understood that a segment will permit the construction of a very much smaller annular space to receive it than would a straight cross-head which lies tangentially to the inner circular wall of the space. Incidental to the same construction is also the increase of transverse bearing upon the parts, and therefore the strengthening of the frame against twisting. For similar reasons my improved construction of hinging connection is superior to a ball-and-socket joint, as it will be understood that greater transverse dimension of parts and greater stability or rigidity are obtainable within a given diameter of crown or slide than are obtainable with ball-and-socket joints.

For convenience I have described my invention with reference to the crown and ribs only; but obviously the same general construction is equally applicable to connecting the spreaders to the slide, and I therefore desire it to be understood that I do not limit my invention to the use disclosed.

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

1. In a joint for umbrellas, the combination of the flanged annular member 1 provided with radial slots, and the swinging members 6 having cross-heads 8 each on their ends in the form of a segment of an annulus and engaging the flange of the annular member, the segments meeting and together forming a complete annulus and their ends abutting to render the ribs more rigid; substantially as and for the purpose explained.

2. In a joint for umbrellas, the combination of the slotted annular member 4, the swinging members 6 working in the slots, and the cross-heads 8 of segmental annular form both on the ends and sides, so that they conform to the walls of the slotted annular member both when the umbrella is folded and when it is spread; substantially as and for the purpose explained.

3. In a joint for umbrellas, the combination of the annular member having radial slots, the swinging members working in said slots, and the cross-heads of segmental annular form, lying on the sides of the swinging members within their ends, whereby the swinging parts may be made to lie closely to the rod or staff, as explained.

4. In a joint for umbrellas, the combination of the flanged annular member 1, slotted substantially as shown, the swinging members 6 fitted to the slots in the annular member 1, and the cross-heads 8 located at the sides of the ends of the swinging members, engaging the flange of the member 1, and in position to permit the end of the swinging member to abut against the rod or staff when the umbrella is open, substantially as set forth.

5. In a joint for umbrellas, the combination of the annular member 1 and the swinging members 6 fitted in said annular member by means of cross-heads each forming a segment of an annulus, both on the end and on the side, and the ends of the cross-heads being beveled as shown in order that they may come together squarely when the umbrella is spread; substantially as herein explained.

JACOB H. FLEISCH.

Witnesses:
SAMUEL FLEISCH,
HARRY STROUSE.