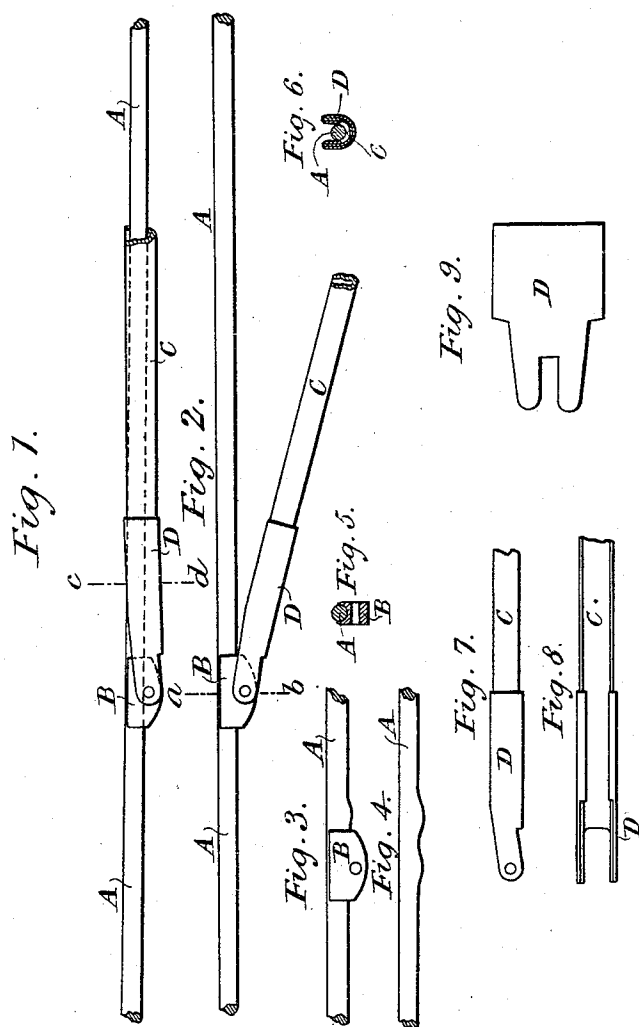


(No Model.)

J. WILLIS.
FRAME FOR UMBRELLAS.

No. 478,150.

Patented July 5, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES WILLIS, OF BOURNEMOUTH, ENGLAND.

FRAME FOR UMBRELLAS.

SPECIFICATION forming part of Letters Patent No. 478,150, dated July 5, 1892.

Application filed December 8, 1891. Serial No. 414,419. (No model.) Patented in England July 13, 1889, No. 11,295, and in France December 26, 1889, No. 202,807.

To all whom it may concern:

Be it known that I, JAMES WILLIS, gentleman, a subject of the Queen of Great Britain, residing at Rosendale, Bournemouth, in the county of Hants, England, have invented certain new and useful Improvements in Frames for Umbrellas, Sunshades, or Parasols, (for which I have received Letters Patent in Great Britain, No. 11,295, dated July 13, 1889, and in France, No. 202,807, dated December 26, 1889,) of which the following is a specification.

According to my invention I form a lock-rib-frame with solid ribs and with trough-stretchers, within which the solid ribs can lie when the umbrella is closed. I joint the stretchers to the ribs by fixing on the latter solid geats, preferably of brass or other metal that can be rapidly and easily worked, and instead of punching the hole through the geat I drill it close up to the rib, so that the joint occupies less depth than when the geat-holes are punched.

By my improvements the frames are made light and neat and an extra strong umbrella is produced, which can be rolled up to a small diameter and be made at a reduced cost. The stretchers at the end which is to be joined to the geat I make to fork, so that the geat may enter between the two prongs, and a joint-pin is passed through the prongs and through the geat. In this way the joint may be made with the geat projecting but little, if at all, beyond the stretcher-fork, and the fork may be made nearly straight with the stretcher. Thus when the frame is closed the rib lies within the stretcher, and the joints which couple the ribs and stretchers are but a little, if at all, deeper than the stretchers alone. The solid geat is made to embrace the rib and is of a width equal to or about equal to the width of the rib, and its depth is equal to the depth of the stretcher.

In the drawings, Figure 1 is a side view of a solid rib combined with a trough-stretcher as above described. In this figure the rib is shown lying within the stretcher. Fig. 2 is a similar side view with the rib turned outward from the stretcher. Fig. 3 is a side view of part of one of the ribs where the geat is se-

cured to it. Fig. 4 is a side view of this part of the rib before the geat is secured to it. Fig. 5 is a cross-section through the line *a b* of Fig. 2. Fig. 6 is a cross-section through the line *c d* of Fig. 1. Fig. 7 is a side view, and Fig. 8 a face view, of the stretcher end. Fig. 9 shows one of the pieces of sheet metal by which the stretcher end is strengthened.

A is a solid rib having secured to it a solid geat B, preferably of brass.

C is a trough-stretcher with a two-forked end. In order that the prongs of the fork may be of sufficient strength, I cause the end of the stretcher to be embraced by a piece of sheet metal D, which is bent around its exterior and its side edges doubled over and made to lie against the inner sides of the trough and to nip and hold to these sides, as shown in Fig. 6. The rib can enter freely into the trough where it is so thickened on the interior, and therefore all along the remainder of the stretcher there is still greater freedom between the stretcher and the rib, which is very advantageous, as in this way proper space is provided for the threads or bracings, by which the cover is at intervals secured to the ribs, to enter, so that the bracings do not impede the rib from entering into and lying in the trough of the stretcher. In order, also, to strengthen the ribs where the geats are secured to them, I preferably press their sides, so as to make them slightly oval from the geat-marks (or slight indentations made in the sides of the ribs for the geat to hold to) toward the tip ends of the ribs to a short distance only beyond where the geat itself terminates, as shown in Fig. 4; but it is not essential to strengthen the ribs in this way. They are in this way made capable of withstanding a greater strain just at this point. The holes through the geats, as I before stated, are formed by drilling instead of by punching, so that they can be formed much more accurately than when formed by punching, as at present, and they can be made close up to the rib. The geats are equal in width to, or slightly greater in width than, the diameter of the rib, as shown in Fig. 5, and the depth is approximately equal to the depth of the stretcher. Thus a neat joint is provided and one that possesses the requi-

site strength to secure the parts firmly together.

I claim as my invention—

- 5 1. In an umbrella, the combination of the solid ribs A, the solid geats B, made to embrace the ribs, of a width approximately equal to the width of the ribs and of a depth approximately equal to the depth of the stretchers, trough-stretchers C, having forked inner ends
10 embracing the geats, and joint-pins passing through the stretcher-forks and through holes in the geats drilled close up to the ribs, whereby a lock-rib frame is produced in which solid ribs lie within trough-stretchers, and geat-
15 pieces are provided sufficiently small not to project beyond the stretchers and yet strong enough to make a sound hinge-joint.

2. In an umbrella, the combination of the solid ribs, solid geats secured thereto of a width approximately equal to the width of the ribs and of a depth approximately equal to the depth of the stretchers, the trough-stretchers, the sheet-metal end pieces D, secured thereto, and having forked ends inclined, as described, and joint-pins securing the forked ends of the stretchers to the geats, substantially as described.

JAMES WILLIS.

Witnesses:

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