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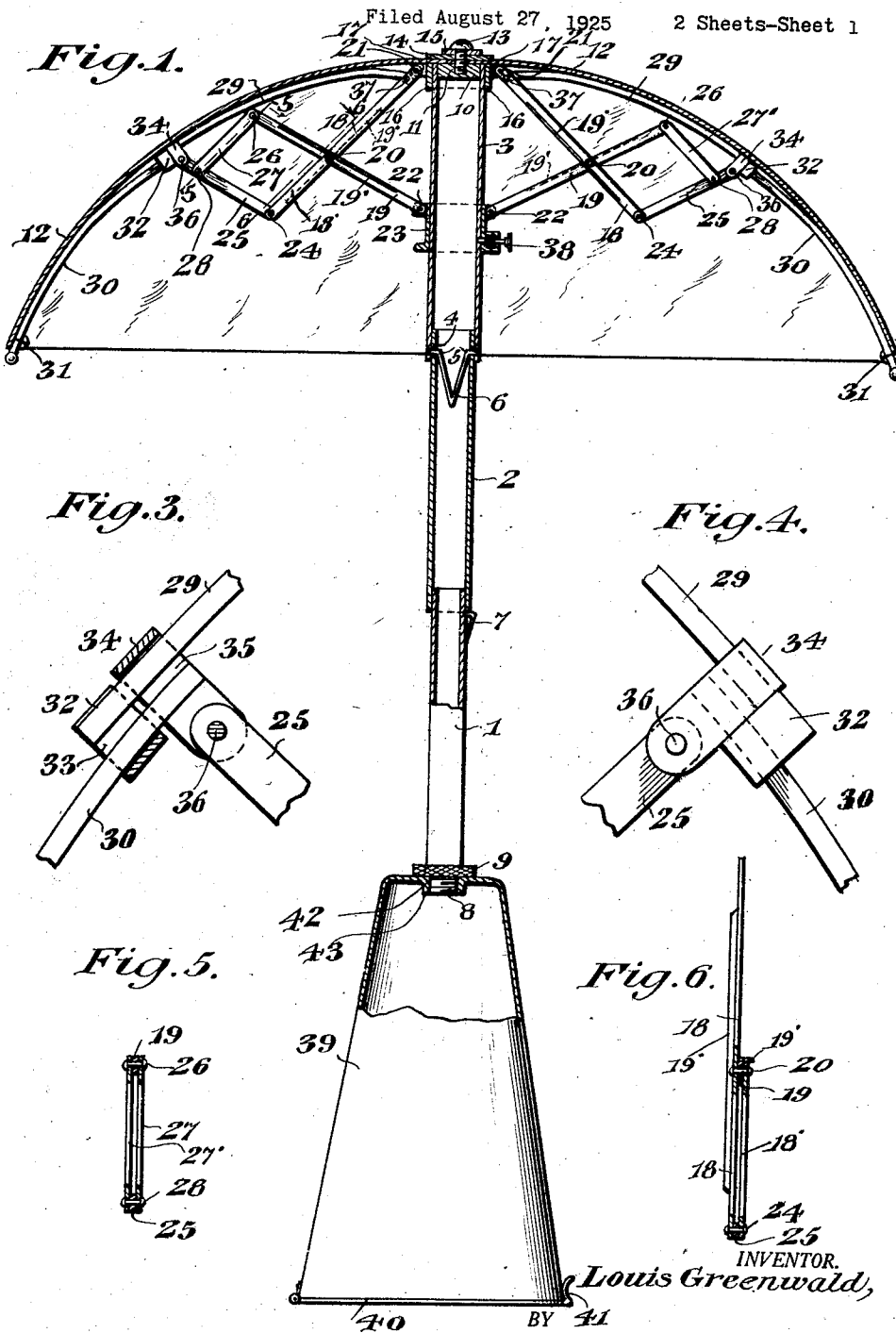
L. GREENWALD

1,577,227

RIB STRUCTURE FOR FOLDING UMBRELLAS

Filed August 27, 1925

2 Sheets-Sheet 1



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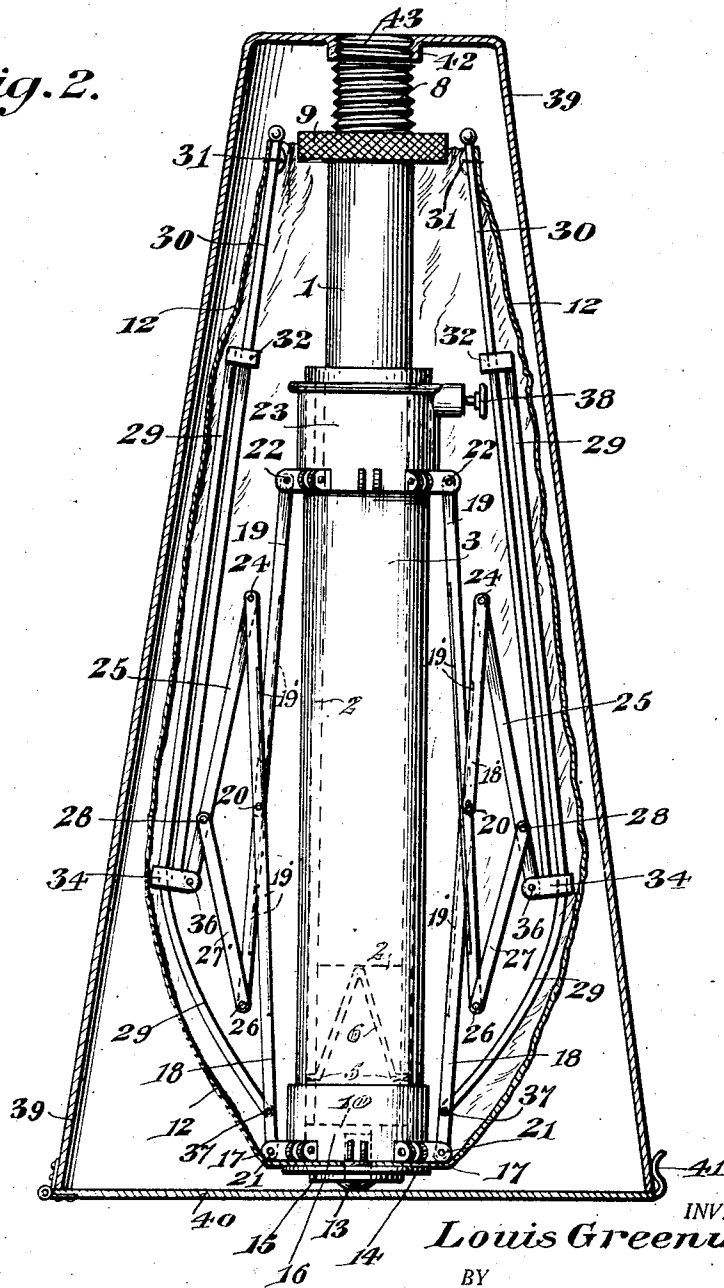
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Fig. 2.



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RIB STRUCTURE FOR FOLDING UMBRELLAS.

Application filed August 27, 1925. Serial No. 52,784.

To all whom it may concern:

Be it known that I, LOUIS GREENWALD, a citizen of Latvia, residing at South Heights, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in a Rib Structure for Folding Umbrellas, of which the following is a specification.

This invention relates to a folding umbrella and is designed primarily as an improvement upon the construction of folding umbrella as disclosed in Letters Patent No. 1,320,327, granted to me October 28, 1919, and not only possessing the objects and advantages as embodied in the form of umbrella as set forth in the Letters Patent aforesaid, but has for its further object to provide, in a manner as hereinafter set forth, a folding umbrella including a detachable hollow handle, a telescopic stem, a cover and collapsible ribs for the cover, and whereby the stem, ribs and cover are so constructed and arranged as to be folded in a compact manner and stored within the handle when the latter is detached, under such conditions providing for the carrying of the umbrella when folded in the pocket of a garment, or to enable the packing of the same in a relatively small space.

Further objects of the invention are to provide, in a manner as hereinafter set forth, an umbrella which is comparatively simple in its construction and arrangement, strong, durable, rigid when extended, conveniently folded in a compact manner, and comparatively inexpensive to manufacture.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is a vertical sectional view of an umbrella in accordance with this invention, and illustrating the same in an extended position.

Figure 2 is a vertical sectional view of the umbrella when folded.

Figure 3 is a fragmentary view in section,

illustrating the coupling connection between the sections of a cover spreading or supporting rib.

Figure 4 is a fragmentary view, in side elevation, of the coupling connection shown in Figure 3.

Figures 5 and 6 are fragmentary views, in section, of a combined shifting and bracing element.

An umbrella, in accordance with this invention, comprises a telescopic staff, stick or stem formed of tubular sections 1, 2 and 3. The section 3 is of greater diameter than the section 2 and the latter telescopes in the former. Section 2 is of greater diameter than the section 1 and the latter telescopes into the former. The section 2, in proximity to its upper end, is provided with a pair of diametrically disposed openings 4, through which extend the angularly disposed terminal end portions 5 of a resilient V-shaped latch 6 positioned within the section 2. The angularly disposed end terminal portions 5 support the section 3 in superposed relation with respect to the section 2, when the stick or stem is extended and when in such position notches on the lower edge of the section 3 receive the terminal portions 5 of the latch 6, as the said terminal portions 5 project laterally through the openings 4 and are positioned in the path of the lower edge of the section 3.

At a point in proximity to the upper end of the section 1, a depressible spring latch 7 is carried thereby, and which acts when in its projected position to support the section 2 in superposed relation with respect to the section 1. The lower terminal portion of the section 1 is formed with peripheral threads 8 for a purpose to be presently referred to and in proximity to the upper terminus of said threaded portion 8 the section 1 has fixed thereto a collar 9 formed with a serrated outer edge.

The upper end of the section 3 has a disk 10 fixedly secured therein, which is flush with the outer edge of said section, and the disk 10 is formed with a socket 11 having a threaded wall. The central portion of the cover 12 is mounted on the disk 10 and upper edge of the section 3. The cover 12 is fixedly secured to the disk 10 by a headed screw 13 extending therethrough and threadedly engaging with the wall of the socket 11. Mounted on the cover 12 is a disk 14 and positioned on the latter is a

packing 15. The screw 13 extends through the disk 14 and packing 15 and the latter abuts against the inner face of the head of the screw 13. This construction provides for securing the cover 12 to the stick as well as a water-tight connection when the umbrella is extended.

Fixedly secured to, as well as enclosing the upper terminal portion of the section 3, is a collar 16 provided with a series of radially extending apertured lugs 17 which have pivotally connected therewith combined shifting and bracing elements for the supporting ribs for the cover. A combined shifting and bracing element is provided for each supporting rib and as each of said elements is of the same construction, but one will be described as the description of one will apply to the others. Each of said elements consists of a pair of oppositely extending lever arms 18, 19, pivotally connected together intermediate their ends, as at 20. The arm 18 extends in an opposite direction with respect to the arm 19, and when the element is in active position the arm 18 extends downwardly and outwardly at an inclination and the arm 19 extends upwardly and outwardly at an inclination. The pivot 20, between the arms 18 and 19, is positioned at a point between the transverse centers and outer ends of said arms. The upper end of the arm 18 is pivotally connected, as at 21, to a lug 17, and the lower end of the arm 19 is pivotally connected, as at 22, to an actuating collar 23, which is common to the several combined shifting and bracing elements.

The lower end of the arm 18 has pivotally connected thereto, as at 24, a link 25, which when the element is extended, is disposed in parallelism with respect to that portion of the arm 19 which extends above the pivot 20. The link 25 is of a length greater than that portion of the arm 19 which extends above the pivot 20. The upper end of the arm 19 has pivotally connected thereto, as at 26, a link 27, which is disposed in parallelism with that portion of the arm 18 which depends below the pivot 20 when the element is extended. The lower end of the link 27 is pivotally connected, as at 28, to the link 25 at a point removed from the upper end of the latter. The link 25 is of greater length than the link 27. The link 25 is pivotally connected, in a manner as hereinafter referred to, to a supporting rib for the cover 12. Mounted on the pivots 20, 24 is the ends of a link 18' and on the pivots 26, 28 the ends of a link 27'. The arms 18 and 19 and links 18', 25, 27 and 27' are formed from straight bars. The arms 18 and 19 are ribbed as at 19'. The link 18' opposes the arm 18 and the link 27' the link 27.

As each of the spreader or supporting

ribs for the cover is of the same construction, but one will be described, as the description of one will apply to the other. Each of the ribs is formed of an upper curved section 29 and a lower curved section 30 slidably connected to each other. The section 30 is of a length to depend below the cover 12 when the latter is extended, and the said section 30 is secured to the cover, as at 31.

The rib sections 29 and 30 are formed of cylindrical stock and the lower end of the section 29 is provided with an oval-shaped collar 32 which depends therefrom at an inward inclination and forms a passage 33 for the rib 30. The upper end of the rib 30 extends within and is secured to a yoke 34, which extends above and depends from the rib 30, and the latter is secured to the yoke intermediate the ends thereof, thereby providing in connection with the upper end of the yoke a passage 35 for the section 29.

The upper end of the link 25 extends into the lower end of the yoke 34 and is pivotally connected thereto, as at 36. The collar 32 and yoke 34 coact to limit the shifting movement of the rib sections relatively to each other when the umbrella is extended. The yoke 34, in connection with the link 25 provides means for shifting the rib section 30 to supporting position, and further the yoke 34 coacts with the collar 32 to shift the rib section 29 to supporting position so that the supporting rib will assume the position shown in Figure 1.

The upper end of the rib section 29 is pivotally connected, as at 37, to the arm 18 in proximity to the upper end of the latter and this connection also assists in shifting the section 29 to supporting position.

When the actuating collar 23 is shifted towards the upper end of the stick or stem section 3, the combined shifting and bracing elements will assume the position shown in Figure 1, whereby the cover supporting ribs will be moved to the position shown in Figure 1, and the said actuating collar 23 will be maintained in its shifted position through the medium of a spring latch 38 engaging in an opening in the section 3.

When the latch 38 is released, the collar 23 can be shifted towards the lower end of the section 3, and which causes the sections of the cover supporting ribs and the combined shifting and bracing elements to assume the position shown in Figure 2. If desired, prior to the folding of the umbrella, the sections of the stick or stem can be moved to telescopic position with respect to each other and as shown in Figure 2.

The handle for the stick or stem as indicated at 39, is hollow and of tapered contour. The large end of the handle 39 is provided with a hinged closure 40, carrying a spring latch 41. The reduced end of the

handle 39 is formed centrally with an opening 42 and an inwardly extending collar 43 having its wall forming a continuation of the wall of the opening 42. The wall of the collar, as well as the opening is threaded, and the threaded terminal portion 8 of the section 1 of the stick or stem is adapted to engage therewith whereby the section 1 is detachably connected to the handle 39. When the handle 39 is disconnected from the section 1 of the stick or stem and the other elements of the umbrella folded to the position shown in Figure 2, they are then positioned in the handle 39 and by this arrangement the umbrella can be carried in the pocket of a garment or packed in a very small space.

It is thought that the many advantages of a folding umbrella, in accordance with this invention, can be readily understood, and although the preferred embodiment of the invention is as illustrated and described, yet it is to be understood that changes in the details of construction can be had which will fall within the scope of the invention as claimed.

What I claim is:—

1. A rib structure for folding umbrellas comprising an actuating collar adapted to be slidably mounted on the umbrella staff, upper lever arms adapted to be pivotally connected at their upper ends to the umbrella staff, lower lever arms pivotally connected at their lower ends to the collar, means for pivotally connecting a lower to an upper lever arm intermediate their ends, spreader ribs each consisting of an upper and a lower section slidably connected together, a link pivotally connected to the lower end of an upper lever arm and to the upper end of a lower rib section, a link pivotally connected to the upper end of a lower lever arm and to said first mentioned link intermediate its ends, and means for pivotally connecting the upper end of an upper rib section to an upper lever arm in proximity to its pivoted upper end.

2. A rib structure for folding umbrellas comprising an actuating collar adapted to be slidably mounted on the umbrella staff,

upper lever arms adapted to be pivotally connected at their upper ends to the umbrella staff, lower lever arms pivotally connected at their lower ends to said collar, means for pivotally connecting a lower to an upper lever arm intermediate their ends, spreader ribs each consisting of an upper and a lower section, a yoke fixed to the upper end of each lower section and having the upper section extending therethrough, a yoke fixed to the lower end of each upper section and having the lower section extending therethrough, a link pivotally connected to the lower end of an upper lever arm and to the yoke of the lower rib section, a link pivotally connected to the upper end of a lower lever arm and to first mentioned said link intermediate its ends, and means for pivotally connecting the upper end of an upper rib section to an upper lever arm in proximity to its pivoted end.

3. In a rib structure for folding umbrellas an actuating collar adapted to be slidably mounted on the umbrella staff, an upper lever arm adapted to be pivotally connected at its upper end to the umbrella staff and provided with a lengthwise extending rib on one side thereof, a lower lever arm pivotally connected at its lower end to said collar and having a lengthwise extending rib on one side thereof, a spreader rib consisting of an upper and a lower section slidably relatively to each other, means carried by the opposed ends of said sections for slidably connecting them together, a link pivotally connected to the lower end of said upper lever arm and to the upper end of said lower rib section, a pair of parallel links pivotally connected to the upper end of said lower lever arm and to said link intermediate its ends, a link extending from the pivot between said lever arms to the pivot between said upper lever arm and the first mentioned link, and means for pivotally connecting the upper end of said upper rib section to said upper lever arm in proximity to the pivoted upper end of the latter.

In testimony whereof, I affix my signature hereto.

LOUIS GREENWALD