No. 742,177. PATENTED OCT. 27, 1903.

J. F. FLAD.

UMBRELLA.

APPLICATION FILED APR. 28, 1903.

NO MODEL.

FIG. 1.

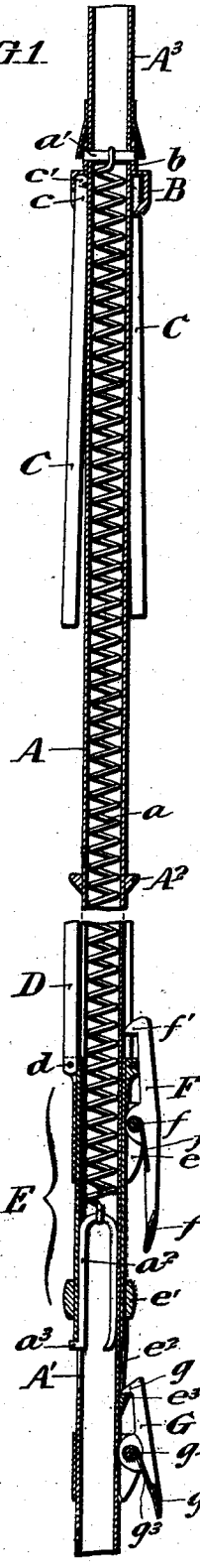


FIG. 3.

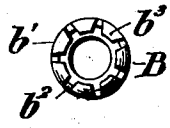


FIG. 2.

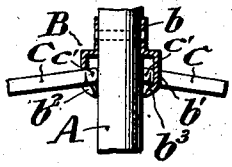


FIG. 4.

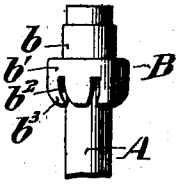
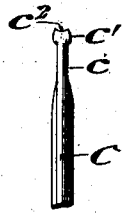


FIG. 5.



WITNESSES:

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No. 742,177. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

JOHN FREDERIK FLAD, OF PHILADELPHIA, PENNSYLVANIA.

UMBRELLA.

SPECIFICATION forming part of Letters Patent No. 742,177, dated October 27, 1903.

Application filed April 28, 1903. Serial No. 154,680. (No model.)

To all whom it may concern:

Be it known that I, JOHN FREDERIK FLAD, a citizen of the United States, residing at No. 1228 North Second street, in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Umbrellas and Similar Articles, whereof the following is a specification, reference being had to the accompanying drawings.

In the drawings, Figure 1 represents a partial longitudinal section through the rod of an umbrella embodying my improvements, the continuity being broken, as indicated, near its central portion, so as to exhibit in the same view the portions of the rod which are near to the handle and the tip, respectively. In this figure the ribs of the frame are indicated as closed and the representation of the canopy or cover is omitted. Fig. 2 is a sectional representation of the inner ends of the ribs and collar to which they are hinged, showing said ribs as in their open position. Fig. 3 is a plan view of the under side of said collar; Fig. 4, a side elevation thereof. Fig. 5 is a detail view showing the conformation of the rib at and near the hinged end.

My invention relates to that class of umbrellas, parasols, &c., which are termed "self-opening," and the main purpose thereof is to embody the necessary automatic opening mechanism without employing the relatively clumsy devices which have characterized such structures as heretofore known to me.

A further object is to simplify the construction of the hinged attachment between the ribs and the collar, with the further advantage of readily permitting the withdrawal of a rib which is to be removed and its replacement by another one.

Referring to Fig. 1 of the drawings, the general structure of the mechanism is there exhibited and is as follows: The rod or stem A is made hollow and has a longitudinal slot A′ extending from a short distance above the junction with the handle to a point somewhat below the annular stop A^2, with which the runner-catch is intended to engage when the umbrella is open. Within the hollow rod A is a spiral spring *a*, whose upper end is attached to a fixed cross-piece *a′*, situate near the junction between the rod A and the tip A^3, and whose free other end is provided with a terminal piece a^2, having a projection a^3, which extends out through the slot A′ and there engages with the lower edge of the runner E. At or near the upper extremity of the rod A is a fixed collar B, adapted to receive the inner ends of the ribs C and afford a hinged connection therefor. Said ribs are provided with the usual stretchers D for opening and closing, and said stretchers are hinged to the runner E, as indicated at *d*.

Owing to the fact that the view of Fig. 1 is broken near the middle the points of attachment between the stretchers and ribs are not shown; but it will be understood that they are of the usual construction.

The inner ends of the ribs comprise a narrowed and flattened neck *c*, terminating in a rounded head *c′*, which has a concavity c^2 at its extremity. As shown in Fig. 5 of the drawings, (which is a top view of such end portion,) the narrowed and flattened neck *c* is formed by merely pinching at the proper place the usual U-shaped rod employed in such constructions. By thus pinching the sides together the rounded head *c′* is left with sufficient projection. The collar or notch B comprises a sleeve *b* for attachment to the rod A and an enlarged hollow boss *b′*, having radial slots b^2 formed at intervals therein, the tongues b^3 intermediate between said slots being bent inwardly, as shown, toward the rod A. Said slots b^2 are of such width as to receive freely the flattened necks *c* of the ribs C, while the interior cavity of the boss itself is sufficient to accommodate the heads *c′* of all the ribs when the necks are inserted within the slots. The concavity c^2 of the head is in juxtaposition with the cylindrical surface of the rod A and permits entire freedom of movement. The insertion (and also the removal) of a rib is permitted by reason of the fact that the boss *b′* is formed of pliable metal, so that the tongues b^3 can be bent inward or outward by moderate pressure, but will resist the tension or strain of the ribs themselves under the conditions of use. It is obvious that if a pair of said tongues b^3 be bent outward, so as to lie substantially parallel to the surface of the rod, the head and neck of a rib can readily be inserted within the slot which is comprised

between said tongues and that they can then be bent inward, so as to retain the head, while permitting its hinged or pivotal movement in a direction coincident with the length of the slots.

The runner E is of the usual tubular construction, sliding freely upon the exterior of the rod A, and is provided with a lateral bearing-piece e, upon which a lever F is pivoted at f, said lever having at its upper end a hooked projection f' and at its other end a thumb-piece f^2 and being also provided with a spring f^3, normally tending to throw the projection f' toward the rod. The lever and its projection constitute a spring-catch adapted to engage with the annular stop A^2 when the umbrella is open.

Near the lower end of the runner is a ring e', which may be soldered thereto to afford a convenient means for holding a downwardly-extending strip e^2, terminating in an abrupt shoulder e^3.

Mounted upon the rod at a point adjacent to the handle is a lever G, having at its upper end a hooked projection g, adapted to engage with the shoulder e^3, and at the other end a thumb-piece g'. Said lever is pivoted at g^2 and provided with a spring g^3, tending to press its hooked upper end toward the rod. A spring-catch is thus provided for the runner when the umbrella is closed. The spring-catch which holds the umbrella open being mounted on the runner, it is very desirable that the spring-catch which holds it closed should be thus mounted upon the rod, so as to avoid any possibility of confusion between the two catches when the umbrella is to be hastily lowered.

In accordance with my construction the tension of the spring a is sufficient to open the umbrella to or near the point where the resisting spring action of the ribs themselves becomes manifest. When in a device of this character the automatic device is adapted to fully open the umbrella, the last portion of the travel of the runner is attended with relatively great strain, and in order that the spring shall be sufficient to overcome it the organization is necessarily such that when the umbrella is to be closed a very considerable effort is required. I have found, however, that by providing a spring of such limited strength that it will only partly open the umbrella—*i. e.*, carry the ribs to the point where the strain upon their elasticity begins—the remaining movement can be readily effected by a quick jerk downward upon the rod, since the nearly-distended canopy will catch the air, so that the jerk will complete the opening action. By means of the organization of the automatic mechanism above described I am enabled to embody the main-spring within the slender hollow rod now almost universally employed in the manufacture of umbrellas, and I avoid the clumsy construction and undue condition of strain necessarily found in a self-opening umbrella whose spring is adapted to wholly complete the opening action.

It will be noted that by arranging the tension of the spring a as I have described the same spring tends to facilitate both the action of opening and closing the umbrella, as in either case upon releasing the engaging catch the spring assists the normal movement of the runner, which is desired, and although the movement must be completed against the tension of the spring, yet this is in no case so strong as to require any noticeable effort.

Having thus described my invention, I claim—

1. The combination, with the hollow slotted rod having hinged ribs mounted thereon and provided with the usual stretchers and canopy; of a spiral spring inclosed within said rod, said spring having a strength limited to the opening of the canopy to or about the point where the tension of the ribs becomes manifest; a runner engaging with the free end of said spring; a spring-actuated lever mounted on the runner and having a hooked projection at its upper end; stop on the rod, adapted to be engaged by said projection; a spring-actuated lever mounted on the rod and having a hooked projection at its upper end; and a shoulder on the runner, adapted to be engaged by said projection; substantially as set forth.

2. The combination with the rod; of the notch, having a hollow boss of pliable material, provided with downwardly-extending and inwardly-bent tongues, with slots intermediate between them; and ribs, each formed of a metal rod of U-shaped section, having necks formed near their upper ends by pinching together the sides of the rod, whereby the unpinched portion between the neck and the extremity forms a head, which engages the boss when the necks of the rod are inserted in the slots, substantially as described.

3. In a self opening and closing umbrella, the combination of a hollow rod; a spiral spring inclosed within said rod, and attached at its upper end near the top of the rod, and connected at its lower end through a slot in the rod with the runner; said spring having a strength limited to the partial opening only of the canopy; and two spring-catches for securing the runner at either extremity of its play, that for holding the canopy open being mounted upon the runner, and that for holding the canopy closed being mounted upon the rod near its lower end, substantially as set forth.

In testimony whereof I have signed my name to this specification, this 22d day of April, 1903, in the presence of two subscribing witnesses.

JOHN FREDERIK FLAD.

Witnesses:
JAMES H. BELL,
M. K. TRUMBORE.