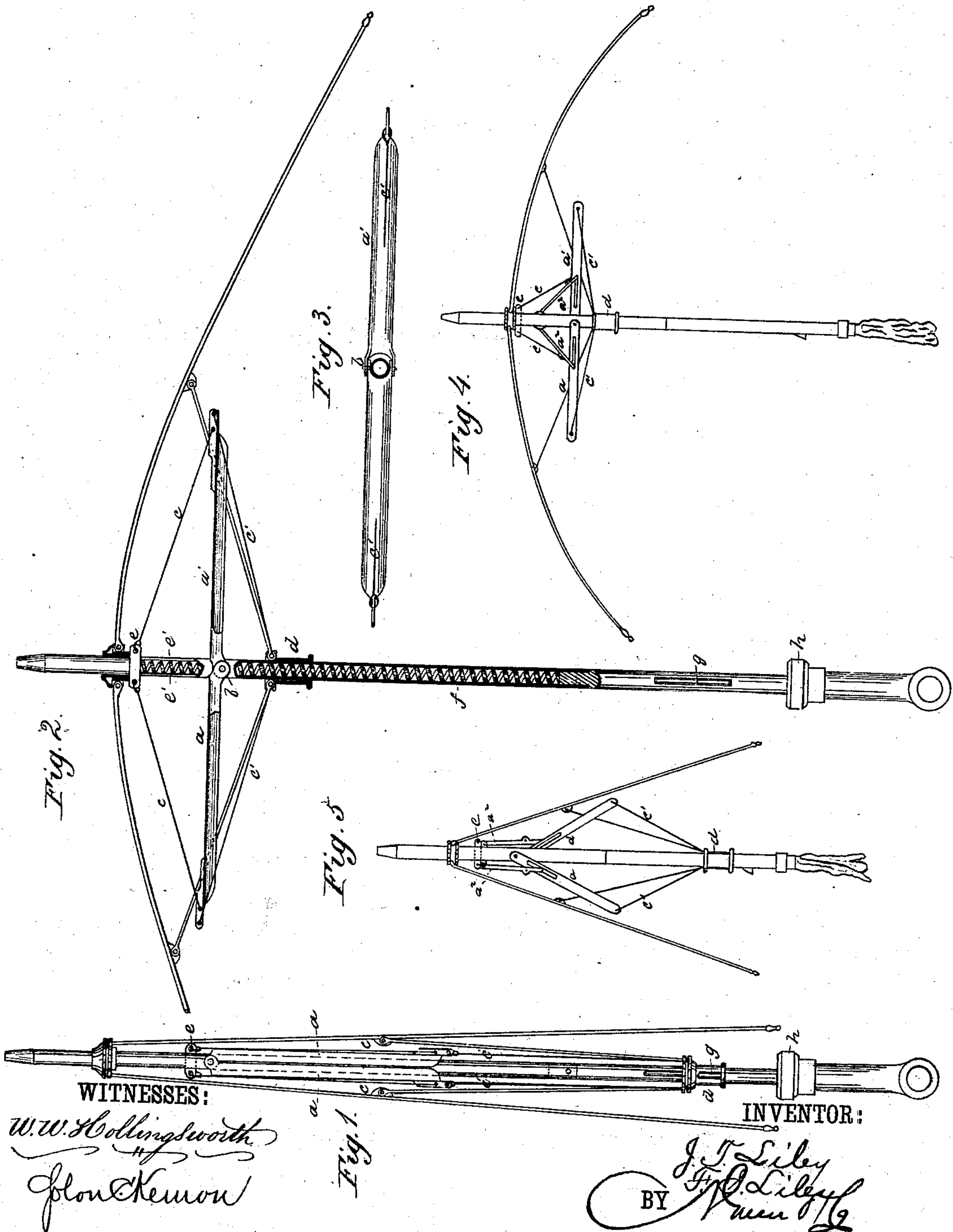


(No Model.)

J. T. & F. S. LILEY.  
Umbrella and Sunshade.

No. 238,937.

Patented March 15, 1881.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN T. LILEY AND FREDERICK S. LILEY, OF LONDON, ENGLAND.

## UMBRELLA AND SUNSHADE.

SPECIFICATION forming part of Letters Patent No. 238,937, dated March 15, 1881.

Application filed July 30, 1880. (No model.)

To all whom it may concern:

Be it known that we, JOHN THOMAS LILEY and FREDERICK SAMUEL LILEY, of Noble Street, London, England, have invented a new and useful Improvement in Umbrellas and Sunshades; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our invention has for its object to provide an umbrella, parasol, or sunshade with means for automatically expanding or opening it when released from the catch or tip-cup which retains it in the closed position.

In the accompanying drawings, Figure 1 is an elevation of the umbrella-frame closed. Fig. 2 is a longitudinal section of the same open. Fig. 3 is a cross-section taken just beneath the toggle arms or levers and looking upward. Figs. 4 and 5 show a modification drawn to a smaller scale.

The stick is made tubular to contain the spring *f*, which is compressed between the bottom of the tube and a sliding cross-head, *e*, furnished with ears that project through longitudinal slots *e'* in the stick at opposite sides.

*a a'* are the toggle-levers, forked at their inner ends to embrace the stick, to which they are pivoted at *b* by separate pins, one at either side, as a single pin passing across would interfere with the spring. In Fig. 2 the part of the stick where the levers are jointed is not shown in section; but it will be understood the spring extends freely through the whole length of the stick to the cross-head *e*. The levers *a a'* are pivoted to the stick at a point just above the highest position of the runner when the umbrella is opened, and the cross-head *e* works in the slotted portion of the stick comprised between the joint *b* and the top notch, to which the ribs are jointed. The outer ends of levers *a a'* are attached, by wire or other connections, *c c' c'*, respectively, to the cross-head *e* and runner *d*.

*g* and *h* are the ordinary runner-catch and tip-cup.

The levers *a a'* are preferably made of semi-tubular form in cross-section to combine strength with lightness, and to enable them to embrace the stick when the umbrella is closed, as shown in Fig. 1.

On releasing the runner or ribs from the catch *g* or tip-cup *h* the spring expands and

forces the cross-head *e* upward, thus, by means of the connections *c c'*, turning the levers *a a'* on their pivots, so as, by means of the connections *c' c'*, to draw the runner upward along the stick, and thereby raise the umbrella. In this position the umbrella is firmly held without any fastening, the levers *a a'* projecting outward between the stretchers.

It will be seen that the range of motion of the runner *d* is about six times (more or less) greater than that of the cross-head *e*, this increased range being obtained by the action of the levers *a a'*, virtually shortening the connections *c c'* by causing them to form an acute angle with one another.

In Figs. 4 and 5 the cross-head *e* is not connected directly to the levers *a a'*, but to the ends of a second pair of shorter levers, *a<sup>2</sup>*, pivoted to the stick above levers *a a'*, and connected to levers *a a'* by studs at their ends sliding in slots in said levers *a a'*.

What we claim as new is—

1. In an umbrella or sunshade, the combination, with a tubular stick having slots *e'*, of the sliding cross-head *e*, spring *f*, and the forked toggle-levers *a a'*, pivoted on separate pins, as shown and described.

2. In a self-opening umbrella or sunshade, the toggle-levers, of semi-tubular section, adapted to close upon and embrace the stick when the umbrella is closed, substantially as shown.

3. In a self-opening umbrella or sunshade, the toggle-levers *a a'*, forked and pivoted to the tubular stick, substantially as shown and described.

4. In an umbrella or sunshade, the combination, with the slotted stick and spring arranged therein, of the cross-head arranged to slide in the slot, and the toggle-levers pivoted to the stick, said levers being connected with the cross-head and runner, substantially as shown and described.

The above specification of our invention signed by us this 21st day of May, 1880.

JOHN THOMAS LILEY.

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