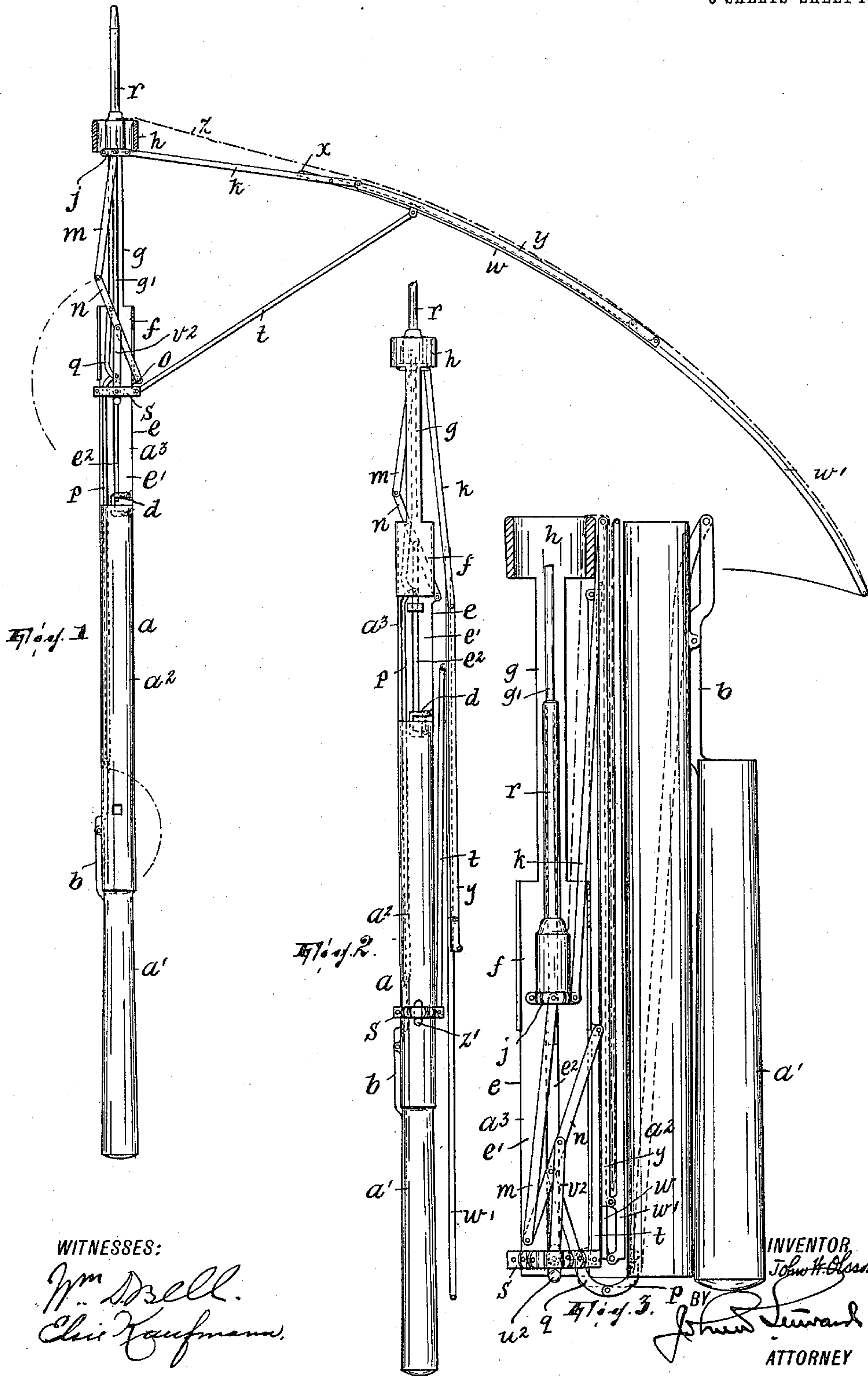


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Patented Nov. 8, 1910.

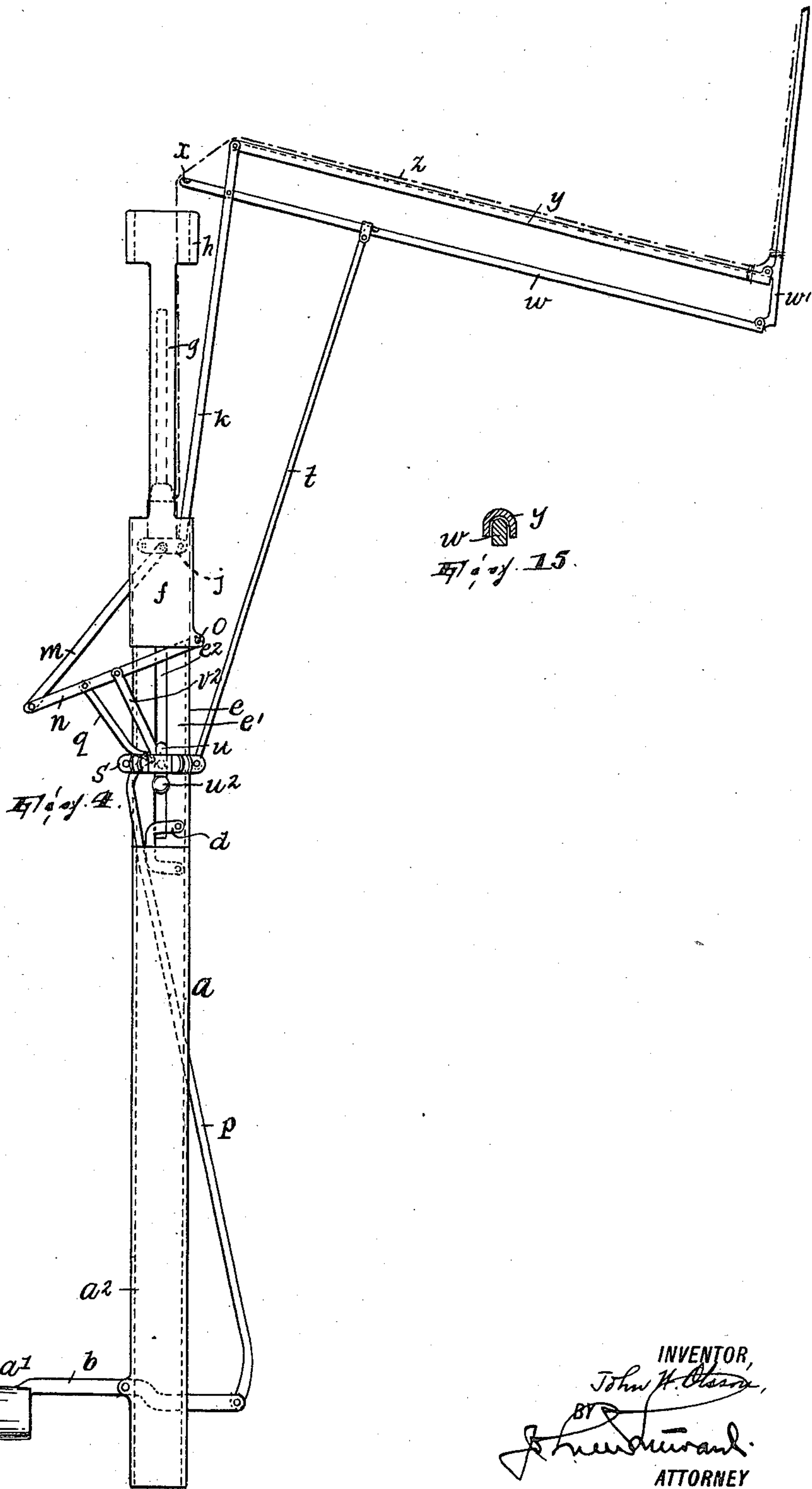
3 SHEETS-SHEET 1.



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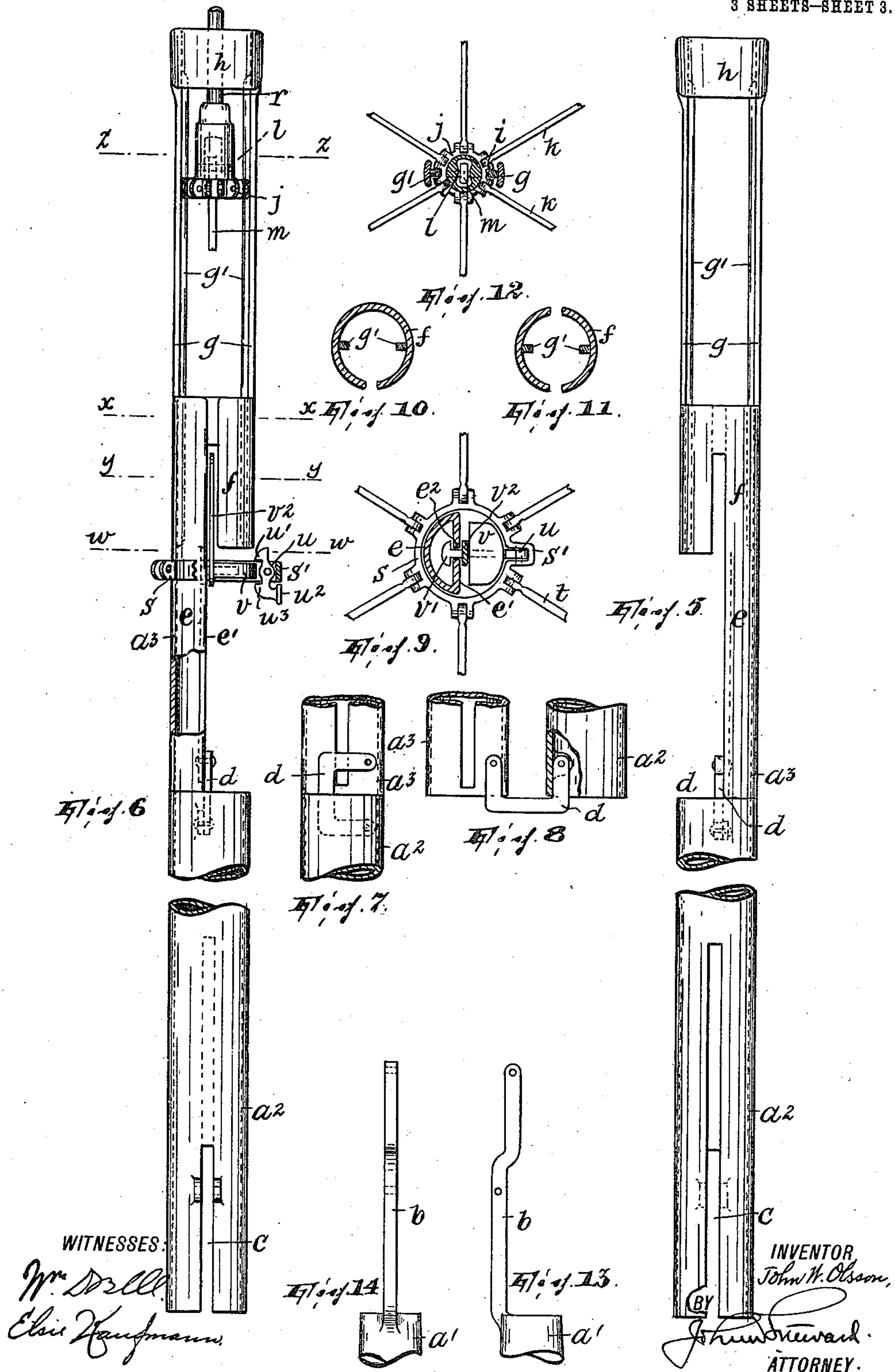


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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

JOHN W. OLSSON, OF NEW YORK, N. Y., ASSIGNOR OF ONE-FOURTH TO RICHARD F. GREENFIELD, OF HIGH BRIDGE, NEW JERSEY.

FOLDING UMBRELLA.

974,811.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed June 1, 1910. Serial No. 564,459.

To all whom it may concern:

Be it known that I, JOHN WILLIAM OLSSON, a subject of the King of Sweden, residing in New York city, county of New York, and State of New York, have invented a certain new and useful Improvement in Folding Umbrellas; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to umbrellas and it consists in certain improvements having for their principal object to provide an umbrella, parasol or the like which may be folded into such form that it may be carried in the pocket or in any other limited space.

In the accompanying drawings, Figure 1 is a side elevation of sufficient of the frame of the improved umbrella to illustrate the invention; Fig. 2 is a similar view showing the frame collapsed; Fig. 3 is a side elevation, partly in section, showing the frame completely folded; Fig. 4 is a side elevation showing the frame partly folded; Fig. 5 is a side elevation of the staff as seen from the right in Fig. 1, the handle being removed; Fig. 6 is a side elevation of the staff and runner as seen from the left in Fig. 1, the staff being partly in section, the handle removed and the runner appearing partly broken away. Figs. 7 and 8 are detail views illustrating a joint in the staff in its unbroken and broken conditions, respectively; Figs. 9, 10 and 11 are sectional views on lines $w-w$, $x-x$ and $y-y$ of Fig. 6. Fig. 12 is a sectional view on line $z-z$ of Fig. 6, in which figure the runner appears in dotted outline, partly depressed; Figs. 13 and 14 are side elevations showing details of the handle; and, Fig. 15 is a cross-sectional view of one of the ribs.

The staff a is made in three sections, a' , a^2 and a^3 , the first of which forms the handle. Section a' is formed with a lever b which is pivoted between its ends so as to play in a slot c in the lower end of section a^2 , which is tubular, the said slot extending higher at one side of section a^2 than at the other (Fig. 5). Sections a^2 and a^3 are pivoted together by means of the angular link d (Figs. 5 to 8) which allows these sections when folded

to stand parallel to but somewhat spaced from each other (Fig. 3). The lower portion e of section a^3 is half tubular, its portion f is tubular, its portion g is in the form of two parallel uprights diametrically opposite each other and its portion h is annular, the whole being integrally formed. The uprights g have longitudinal ribs g' on the insides thereof and extending down into the tubular portion f and these are received by the opposed notches i in a crown j which is capable of movement vertically, guided by the ribs; to this crown are pivotally attached the ends of levers k (reference to which will be again made) which form parts of the ribs. The crown is annular and it is traversed by a pin l on which is pivoted the upper end of a link m whose lower end is pivoted to a lever n fulcrumed at o in the tubular portion f of the section a^3 , said portion being vertically slotted as shown to permit the lever to swing in the arc of a circle represented by the dot-and-dash arc in Fig. 1. A link (comprising link-sections p , q) connects lever b with lever n . Now, upon folding the handle (the end of its lever b following the path indicated by the dotted arc adjoining the pivot between the sections a' and a^2 in Fig. 1), the crown will be drawn down the staff, entering the tubular portion f of section a^3 . The link $p-q$ is made in two sections pivoted together in the manner shown so that, having drawn the crown down in the manner just described, it will fold when the sections a^2 and a^3 are folded, at which time the joint between the link-sections p , q will be coincident with the joints between the sections a^2 and a^3 . The crown may carry the ferruled stem r , which imparts a finish to the umbrella.

s is the runner, the same being an annulus with which the spreaders t are pivotally connected in the usual manner; it has the radial loop s' , in which is pivoted the pawl u , reference to which will be again made. In collapsing the umbrella this runner has movement from the position in Fig. 1 to that in Fig. 2; in folding the umbrella, it only has movement from the position in Fig. 1 to approximately the joint between sections a^2 and a^3 of the staff, as will appear. Along the flat face e' of the half-tubular portion e of the section a^3 of the staff is adapted to slide the block v having a button v' which enters a slot e^2 in said

flat face e' and retains the block in place; this block is pivotally suspended from the lever n by the link v^2 . The parts a' , p , q , m , n and j being in the position shown in Fig. 1, the block v serves as a support for the runner in its upper position; to this end the pawl u has an upper tooth u' which, when the runner is elevated in raising the umbrella, will snap over the block v and support the runner; by pressing on the knob u^2 of the pawl, it may be made to release the runner, so that the umbrella may be collapsed. The pawl also has a tooth u^3 which engages the block v from beneath, so that when the block is lowered the runner will be lowered with it, that is, in the folding of the umbrella.

Each rib comprises the sections w and w' pivoted together so as to fold upon each other; the corresponding stretcher t is pivotally connected to the rib-section w between its ends and somewhat nearer the inner than the outer end thereof. The corresponding lever k has a fulcrum on rib-section w near the inner end of the latter, which is provided with a stop x limiting the unfolding movement of the lever and rib-section w past the position shown in Fig. 1. To the outer end of lever k is pivoted one end of a link y which at its outer end is pivoted to the rib-section w' after the manner of a parallel rule, the link y having a U-shaped cross-section so that when the rib is extended (Fig. 1) the link will substantially sheathe the rib-section w (Fig. 15).

z designates the cover; this is attached in the usual manner to the outer ends of the rib-sections w' , and at its center it is suitably attached to the crown.

z' is the usual spring catch for holding the runner down when the umbrella is collapsed.

The operations of collapsing and opening and folding and unfolding the umbrella are as follows: When the staff is extended block v is held elevated in the manner already described. The pawl u is therefore disengaged therefrom, when it is desired to collapse the umbrella, and the runner drawn down the staff until it is caught by catch z' ; in opening, the operation is just the reverse. In collapsing and opening the umbrella, the ribs remain extended and they, the runner and stretchers operate the same as in an ordinary umbrella. In folding the umbrella the handle is first folded upon the staff-section a^2 , the lever b drawing down upon the link $p-q$ and therefore causing lever n to turn on its fulcrum o , the lever n , through link m , drawing down the crown j ; in the downward movement of lever n , through link v^2 the block v is depressed and since it is engaged with the runner s by means of the pawl u the runner is also lowered. The lowering of the runner operates, through the stretchers t , partially to collapse the ribs,

and while this collapsing movement is progressing each lever k turns on the rib-section w as a fulcrum and causes the link y to turn the rib-section w' upwardly on its pivot on rib-section w . The breaking of the joints between the rib-sections w and w' may be assisted by pressing with the hand against the under sides of the rib-sections w . Fig. 4 shows the movements of the parts as above described as having proceeded about half way. Upon continuing to move the handle into folded relation with staff-section a^2 , the runner will be depressed from lever n through link v^2 while the crown is also being depressed from lever n through link m , the runner moving at this time slightly faster than the crown owing to the relative positions of link v^2 with respect to the runner and lever n and link m with respect to lever n and the crown. The result of this will be that each rib-section w will be turned downwardly in Fig. 4 on its pivot on lever k , link y acting to fold rib-section w' against rib-section w as the latter folds in to the staff. In the position of the parts at this time in the folding operation, the runner approximates the lower end of the staff section a^3 . In the lowering of the crown the central part of the cover z is drawn within the annulus h (Fig. 4). All that now remains to be done is to fold staff-section a^2 on staff-section a^3 , the angular link d allowing such spacing thereof as to accommodate the interposed parts k , t , w y and w' (Fig. 3). In unfolding the umbrella sections a^2 and a^3 are first arranged in alinement with each other. Then the handle is turned on its pivot in section a^2 to bring it in alinement with the latter. In this operation the link $p-q$ raises lever n , which, through parts v^2 and m , raises the runner and crown and causes the extension of the ribs. The operation may be assisted by using the hand to bring the ribs into their extended condition.

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

1. In a folding umbrella, the combination of a staff having a pivoted handle portion, a lever pivoted in the upper part of the staff, a link connecting the lever and handle, a crown and a runner each movable lengthwise of the staff, means for transmitting movement from the lever to the crown, means for transmitting movement from the lever to the runner, stretchers pivoted to the runner, levers pivoted to the crown, folding ribs each comprising an inner and an outer section pivoted together and the inner sections being pivoted in the stretchers and affording fulcra for said levers, and links connecting the ends of the said levers with the outer rib-sections, substantially as described.

2. In a folding umbrella, the combination of a staff having a pivoted handle portion, a lever pivoted in the upper part of the staff, a folding link connecting the lever and handle, a crown and runner each movable lengthwise of the staff, means for transmitting movement from the lever to the crown, means for transmitting movement from the lever to the runner, stretchers pivoted to the runner, levers pivoted to the crown, folding ribs each comprising an inner and an outer section pivoted together and the inner sections being pivoted in the stretchers and affording fulcrums for said levers, and links connecting the ends of said levers with the outer rib-sections, the staff comprising sections pivoted together, substantially as described.

3. In an umbrella, the combination of the staff, an outer and an inner rib-section pivoted together, a lever fulcrumed at the inner end of the inner rib-section, a link pivotally connecting one end of said lever with the outer rib-section, a stretcher having one end thereof pivoted to the inner rib-section, and means, slidable on the staff, for effecting differential movements of the other ends of said lever and stretcher, substantially as described.

4. In an umbrella, the combination of the staff, an outer and an inner rib-section pivoted together, a link extending parallel with the inner rib-section, and having its outer end pivoted to the outer rib-section, a lever fulcrumed at the inner end of the inner-rib-section and having one end pivotally connected with the inner end of said link, a

stretcher having one end thereof pivoted to the inner rib-section, and means, slidable on the staff, for effecting differential movements of the other ends of said lever and stretcher, substantially as described.

5. In a folding rib for an umbrella, the combination of an outer and an inner-rib-section pivoted together, a link extending parallel with the inner rib-section, being longitudinally channeled on the side thereof adjoining the inner rib-section and adapted to receive said rib-section within its channel and having its outer end pivoted to the outer rib-section, and a lever fulcrumed at the inner end of the inner rib-section and pivotally connected with the inner end of said link, substantially as described.

6. In a folding umbrella, the combination of a staff having a pivoted handle portion, folding ribs, a runner, stretchers connecting the runner with the ribs, a part movable lengthwise of the staff, means for disconnectively connecting said part and the runner together, means, operatively connecting the handle and said part, for effecting movement of said part on movement of the handle, and means, operatively connecting the outer rib members and said part, for effecting the folding or unfolding of the ribs upon movement of said part, substantially as described.

In testimony, that I claim the foregoing I have hereunto set my hand, this 21st day of May, 1910.

JOHN W. OLSSON.

Witnesses:

M. PETERSON,
M. WALD.