

1,056,786.

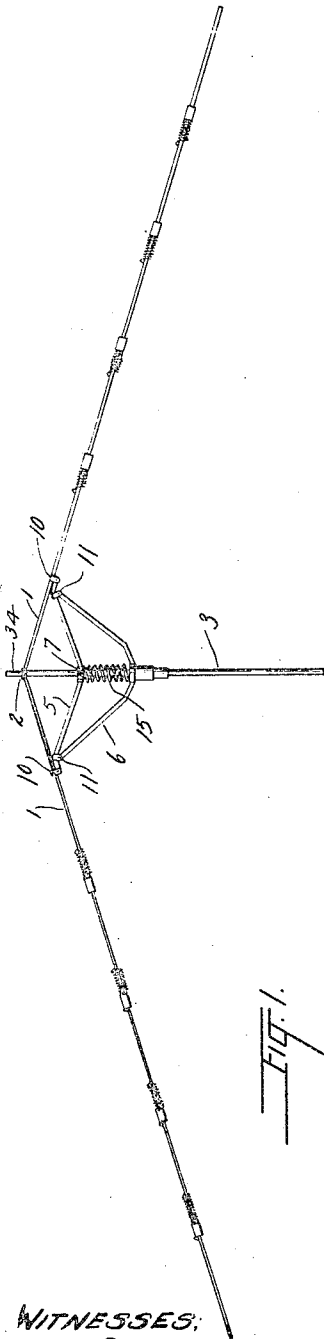


FIG. 1.

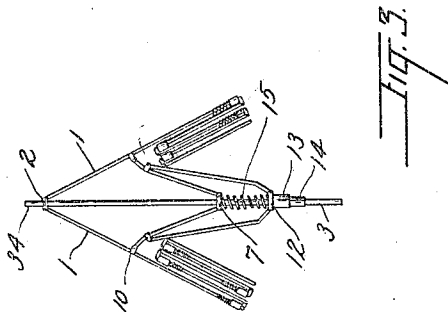


FIG. 3.

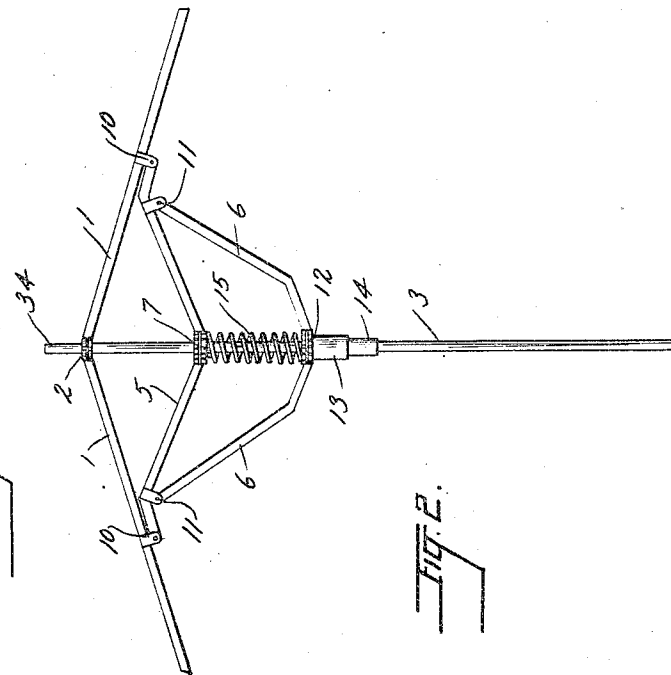


FIG. 2.

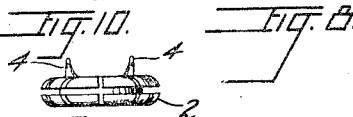
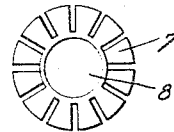
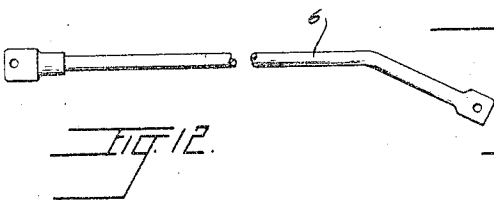
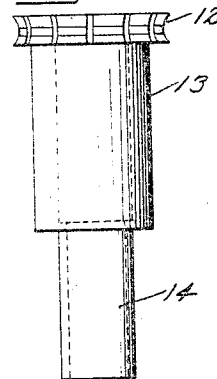
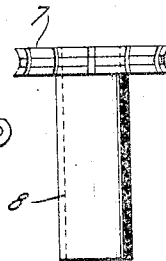
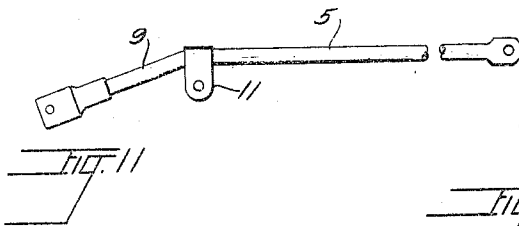
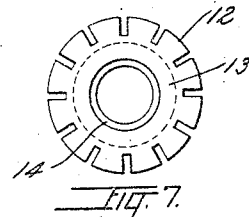
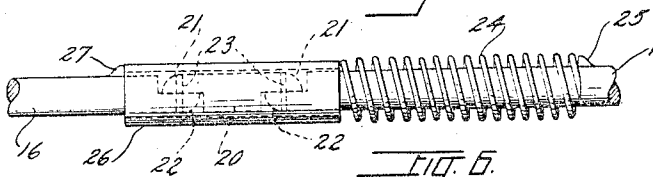
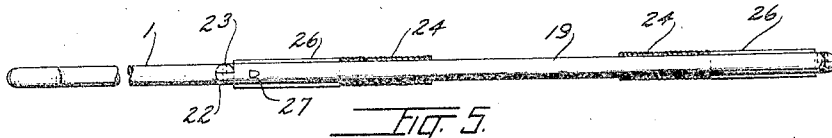
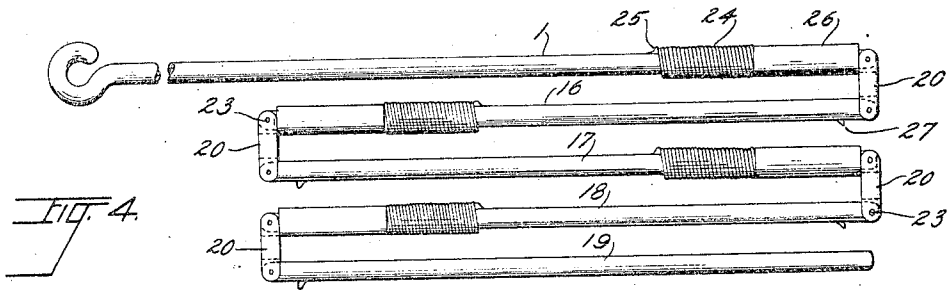
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Patented Mar. 25, 1913.

3 SHEETS-SHEET 2.

1,056,786.



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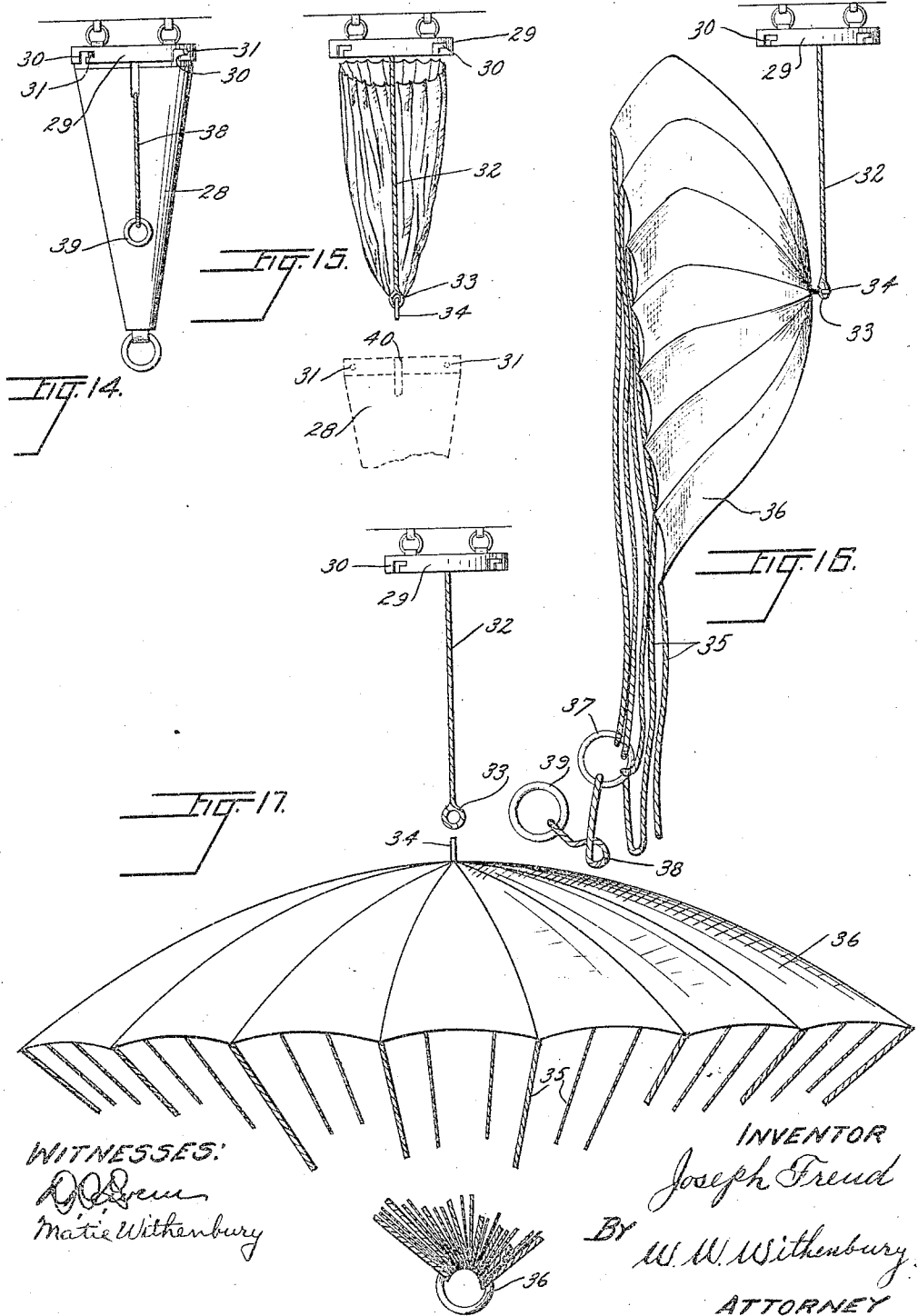
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PARACHUTE.
APPLICATION FILED NOV. 11, 1911.

Patented Mar. 25, 1913.
3 SHEETS—SHEET 3.

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UNITED STATES PATENT OFFICE.

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PARACHUTE.

1,056,786.

Specification of Letters Patent.

Filed Mar. 25, 1913.

Application filed November 11, 1911. Serial No. 659,727.

To all whom it may concern:

Be it known that I, JOSEPH FREUD, a citizen of the United States, and residing at Mendota, in the county of Lasalle and State of Illinois, have invented a new and useful Improvement in Parachutes, of which the following is a complete specification.

The main objects of this invention are to provide an improved parachute; to provide a parachute adapted when not in use to be folded into very small compass; to provide a parachute having jointed ribs adapted to remain in folded position when not in use; to provide improved mechanism adapted to automatically lock the ribs in extended position when the parachute opens; to provide improved means for supporting and releasing the parachute; and to provide a strong and durable construction adapted to quickly open when the parachute is released.

A specific embodiment of the invention is illustrated in the accompanying drawings, in which:

Figure 1 is a transverse section of the parachute embodied in this invention, in open position with the cover removed and showing two oppositely disposed ribs and their extensions. Fig. 2 is an enlarged view similar to Fig. 1 with the rib extensions removed. Fig. 3 is a view showing two oppositely disposed ribs and their extensions in partly folded position. Fig. 4 is an enlarged fragmentary side elevation of one of the ribs with its extensions folded. Fig. 5 is a view taken at right angles to Fig. 4. Fig. 6 is an enlarged side elevation of one of the joints locked in open position. Fig. 7 is a top plan view of the ferrule for the lower stays. Fig. 8 is a side elevation of said ferrule. Fig. 9 is a side elevation of the ferrule for the upper stays. Fig. 10 is a top plan view of the ferrule shown in Fig. 9. Fig. 11 is a fragmentary side elevation of one of the upper stays. Fig. 12 is a fragmentary side elevation of one of the lower stays. Fig. 13 is a side elevation of the connecting collar for the ribs. Fig. 14 is a side elevation of the casing for supporting the parachute. Fig. 15 is a side elevation of the closed parachute with the casing removed and the parachute about to fall. Fig. 16 is a view of the parachute partly released and partly opened. Fig. 17 is a view of the parachute released from its support and in open position.

In the construction shown, the ribs 1 are hinged at their upper ends to an annular collar 2 which is rigidly secured at or near the upper end of the central rod or handle 3 by means of clips 4 which are riveted to said handle. Any desired number of ribs may be employed, and they are spaced at regular radial distances apart around the handle 3. The ribs 1 are supported by upper stays 5 and lower stays 6. The stays 5 are hinged at their inner ends to a collar 7 which is rigidly secured on the upper end of a ferrule or sleeve 8 which is slidably mounted on the handle 3. The outer ends 9 of the stays 5 are bent slightly toward the outer ends of the ribs and are pivoted or hinged to clips 10 on the ribs. The stays 5 are of such length that the combined lengths of two oppositely disposed stays is less than the combined lengths of those portions of two oppositely disposed ribs which lie between the clips 10, so that the parachute is prevented from turning inside out by reason of the fact that the oppositely disposed stays 5 would assume a straight line before the ribs 1 could assume a straight line. The stays 6 are pivoted at their upper ends to clips 11 rigidly secured on the stays 5 near their outer ends, and the lower ends of the stays 6 are turned inwardly toward the handle 3 and are hinged to a collar 12 on the upper end of a cup shaped sleeve 13 which is rigidly secured on a ferrule 14. As shown in the drawings, especially in Fig. 8, said ferrule 14 is of less diameter than said sleeve 13 and extends axially thereof. The upper part of said ferrule 14 projects upwardly into said sleeve 13 through the lower end thereof and in the annular space formed between the upper part of said ferrule and the inner wall of said sleeve is seated the lower end of the coil spring 15. The ferrule 14 is slidably mounted on the handle 3 beneath the ferrule 8 and said coiled spring 15 seats at its lower end in said annular space formed between the respective upper ends of the sleeve 13 and the ferrule 14 and bears at its upper end against the collar 7 on the ferrule 8.

Hinged to the outer end of each rib are a plurality of rib extensions adapted to greatly extend the rib length when in open position. Any desired number of extensions may be used but, as shown, there are 4, indicated by 16, 17, 18 and 19, which are

hinged together and to the end of the rib 1 by means of hinge links 20. The hinge links 20 are of the same diameter as the rib and extension, and at each end it is cut away for half its thickness to provide ears 21 adapted to overlap corresponding ears 22 on the end of the rib and extension, or on two adjacent extensions. The overlapping ears are secured together by pivot pins 23.

On the rib and on each extension above the joint is a coiled spring 24 which abuts at its upper end against a stop lug 25, and bearing against the lower end of the spring is a locking sleeve 26, which, when the extensions are folded, as shown in Fig. 4, abuts at its end opposite from the spring against the hinge link 20 and holds the spring under tension. When the extensions are open and they come into alinement with the rib, the springs immediately force the sleeves 26 over the link 20 until it abuts against a stop lug 27 on the other side of the joint. In this position the sleeve overlaps the link and the adjacent ends of the extensions, or rib and extension, and forms a very stiff and rigid joint.

The parachute is supported beneath the balloon or other device with which it is used by means of a conical casing 28 adapted to contain the parachute in closed position. A cap 29 is supported from a suitable part of the balloon and is provided on its sides with upwardly and laterally opening slots 30. The upper end of the casing is provided with pins 31 adapted to engage in said slots. A rope 32 extends downwardly from the cap 29 and is provided with a ring 33 on its lower end through which the end 34 of the handle 3 projects to hold the parachute in an inverted position.

Cords 35 are connected to the outer ends of the rib extensions and to the margins of the cover 36 intermediate the extensions, and extend downwardly and inwardly and their lower ends are secured to a ring 37. A cord 38 is connected to the ring 37 and has a ring 39 for the operator. The cord 38 extends through a slot 40 in the casing in position for the operator to grasp when he desires to release the parachute.

The operation of the construction shown is as follows: When the parachute is not in operation it is folded to closed position with the extensions folded beneath the ribs, and is held in the casing 28 in an inverted position. In this position the spring 15 is compressed between the collar 7 and the sleeve 13 and is exerting an upward tension on the collar 7 tending to open the parachute. When the casing 28 is removed the parachute begins to turn to upright position, as shown in Fig. 16, and the ribs being released the spring 15 starts to open the parachute. As the ribs open the extensions fall and as the cover catches the air and the

extensions are brought into alinement with the ribs, the springs 24 force the sleeves 26 over the joints and rigidly hold the extensions in place. The weight of the operator on the cords 35 prevents the parachute from turning inside out.

While but one specific embodiment of the invention has been herein shown and described, it will be understood that many details of the construction shown may be varied or omitted without departing from the scope of the claims.

I claim:

1. A parachute comprising a central rod, a plurality of ribs hinged thereto, two sliding collars on the rod, two sets of stays, an upper set and a lower set, the stays of each set being pivoted at their inner ends to one of said collars, the stays of the upper set having their outer ends bent toward the outer ends of said ribs and being pivoted at their outer ends to said ribs, the stays of the lower set being pivoted at their outer ends to the stays of the upper set at a point adjacent to the bent ends of the latter; the bent ends of said stays of the upper set being adapted to abut against said ribs when the parachute is fully open, and an expansively acting spring interposed between said collars.

2. A parachute comprising a central rod, a plurality of ribs hinged thereto, a ferrule adapted to slide endwise on said rod, a sleeve of larger diameter than said ferrule attached to said ferrule; the upper part of said ferrule projecting upwardly into said sleeve through its lower end, a collar on said sleeve, a second collar adapted to slide endwise on said rod, two sets of stays, the stays of each set being pivoted at their inner ends to one of said collars, the stays of one set being pivoted at their outer ends to said ribs, and the stays of both sets being pivotally connected with each other near their outer ends, and an expansively acting coiled spring surrounding the said rod, and having its lower end inserted in the annular space between the upper part of said ferrule and inner wall of said sleeve.

3. The combination of a parachute, having a central rod and a plurality of folding ribs, a casing, closed at one end, in which said parachute is inserted in a closed and inverted position, a support for the casing, to which the latter is detachably connected, with its open end uppermost, and means attached to the said support and adapted for detachable connection with the end of the rod which is downward when the parachute is inverted and within said casing.

4. The combination of a parachute having a central rod and a plurality of folding ribs, a casing, closed at one end, in which said parachute is inserted in a closed and inverted position, a support for said casing,

to which the latter is detachably connected
with its open end uppermost, and a rope
attached to said support and provided with
a ring at its lower end adapted to engage
5 the end of the rod which is downward, when
the parachute is inverted and within the
casing.

In testimony whereof I have hereunto
subscribed my name in the presence of two
witnesses.

JOSEPH FREUD.

Witnesses:

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M. E. WITHEBURY.