

A. ENSSLIN.
SAFETY DEVICE.

APPLICATION FILED AUG. 10, 1911.

1,025,386.

Patented May 7, 1912.

4 SHEETS-SHEET 1.

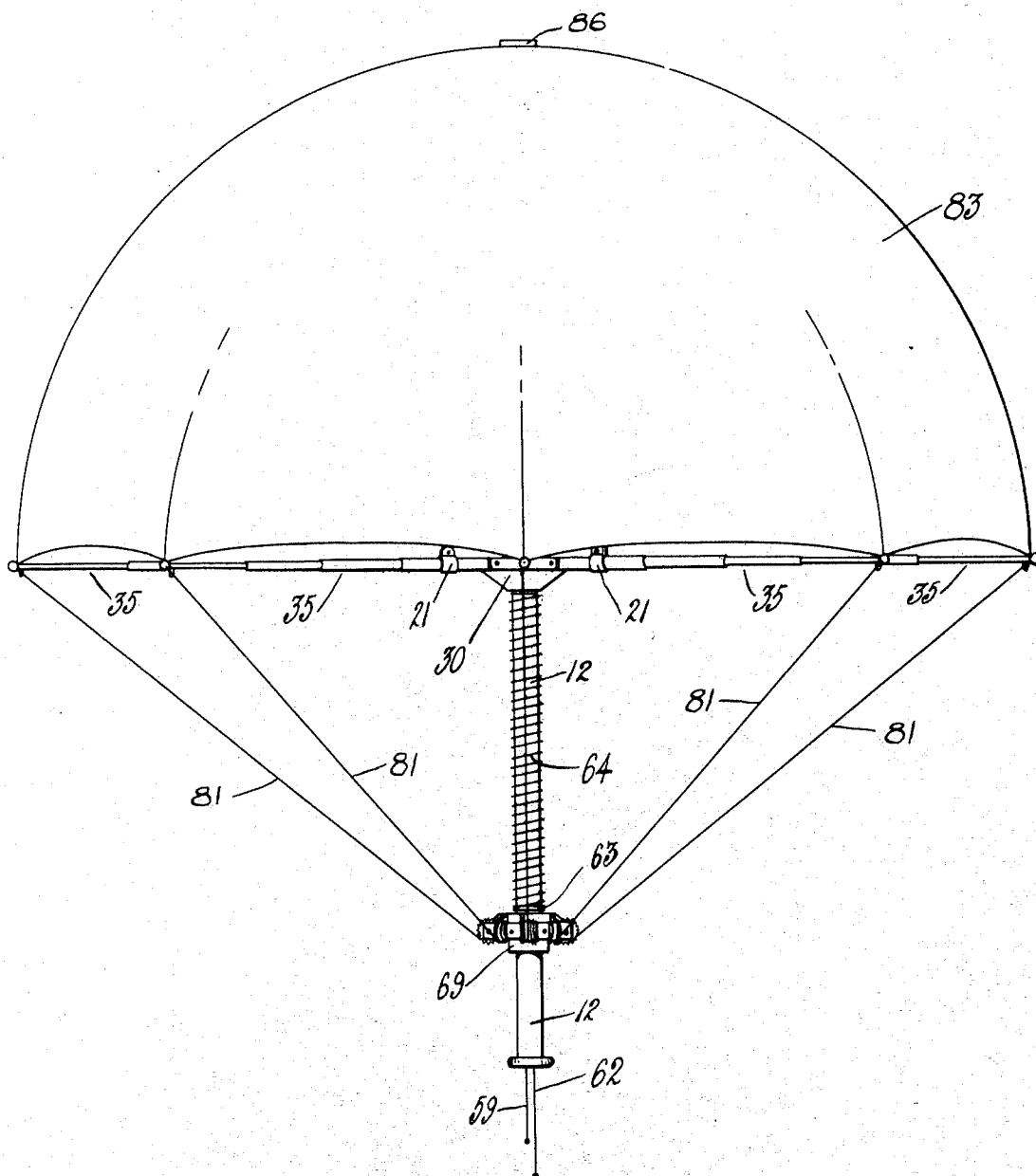


FIG. 1.

WITNESSES.

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George H. McLaughlin.

INVENTOR.

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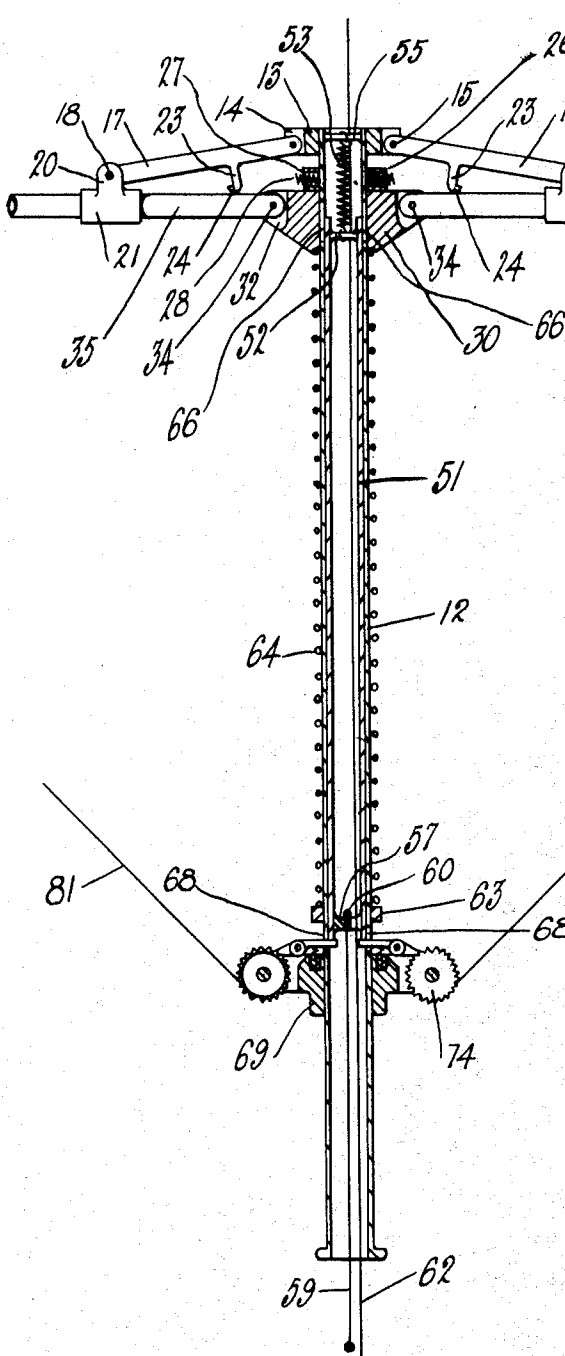


FIG. 2.

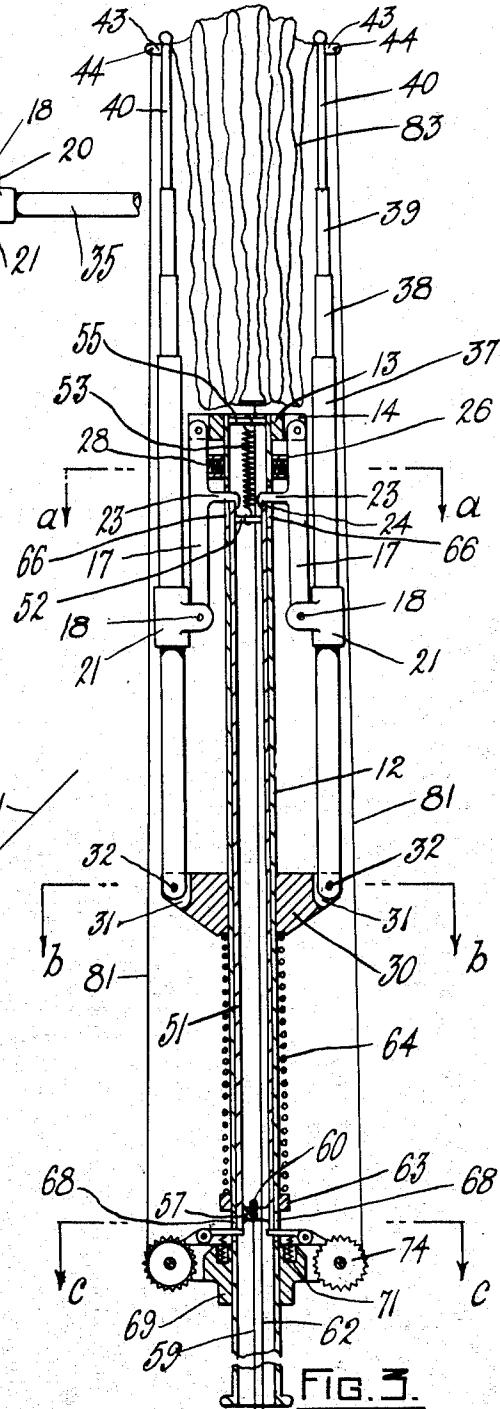


FIG. 3.

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4 SHEETS-SHEET 3.

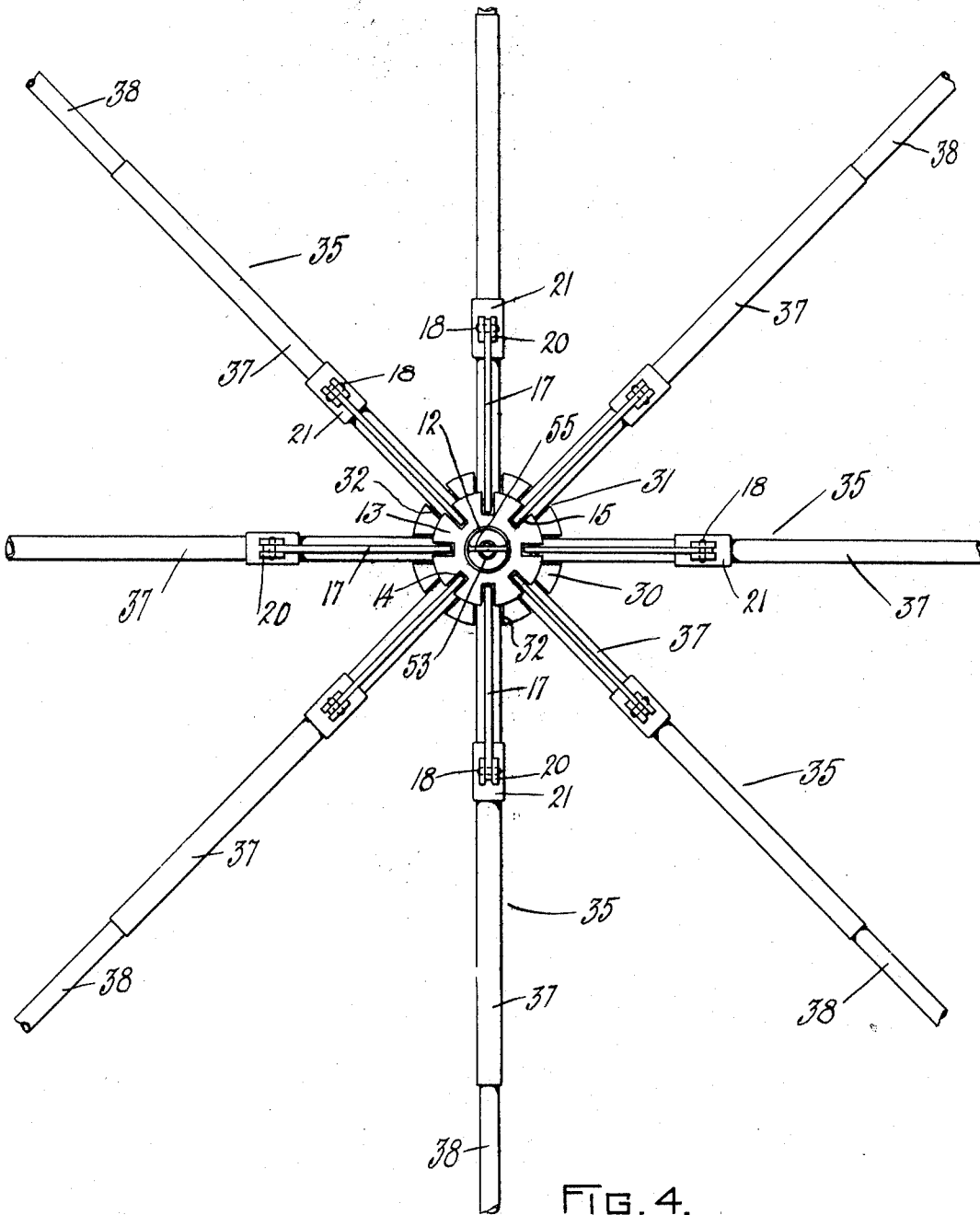


FIG. 4.

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FIG. 5.

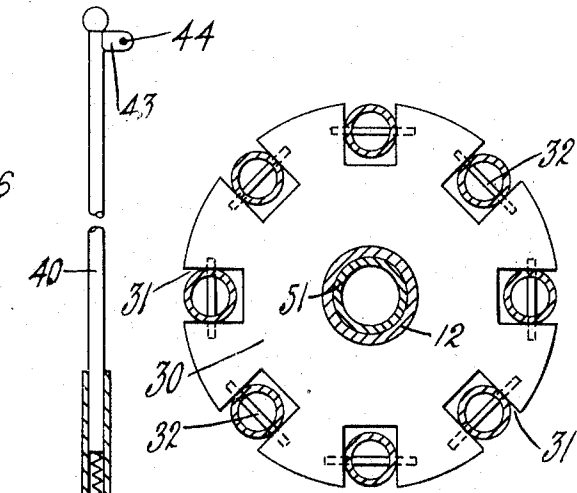


FIG. 6.

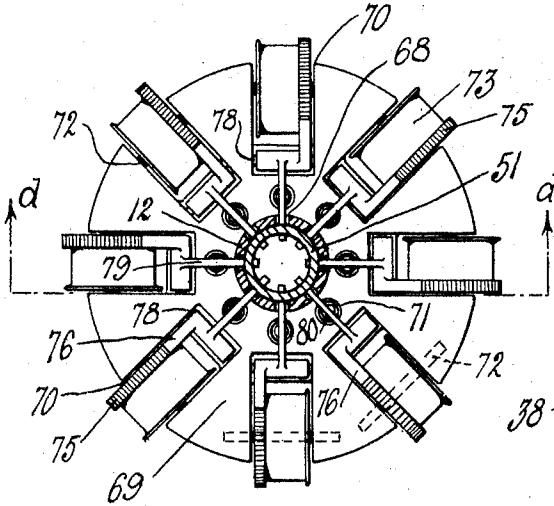


FIG. 7.

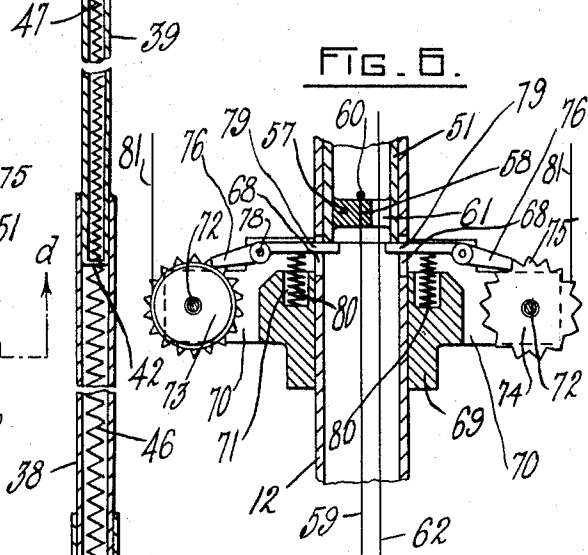


FIG. 5.

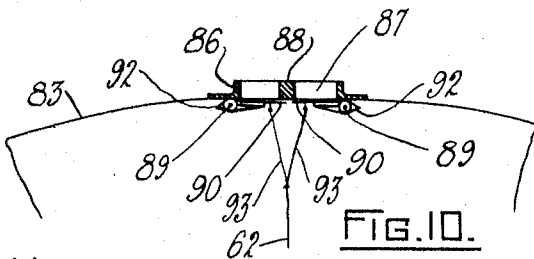


FIG. 10.

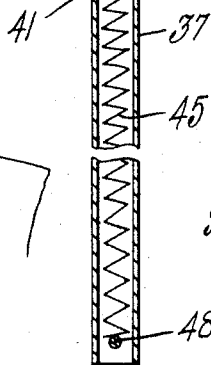
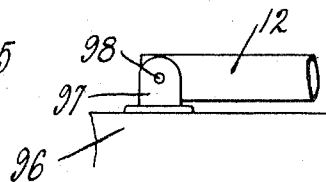


Fig. 11.



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UNITED STATES PATENT OFFICE.

ADOLF ENSSLIN, OF NORTH ATTLEBORO, MASSACHUSETTS.

SAFETY DEVICE.

1,025,386.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed August 10, 1911. Serial No. 643,266.

To all whom it may concern:

Be it known that I, ADOLF ENSSLIN, a subject of the Emperor of Germany, residing at North Attleboro, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Safety Devices, of which the following is a specification.

My invention relates to a safety device adapted for either independent use, or in conjunction with an aeroplane, and has for its essential objects certainty and ease of operation, strength, and lightness.

To the above ends essentially my invention consists in such novel parts and combinations of parts as fall within the scope of the appended claims.

In the accompanying drawings which form a part of this specification and in which like reference numerals indicate like parts throughout the views, Figure 1 is a side elevation of my novel safety device, Fig. 2, a central vertical section of the same in open position omitting the cover and showing parts broken away, Fig. 3, a similar section of the same including the cover, the lower end of the rod being broken away, and the whole in closed position, Fig. 4, a plan of the device distended with portions of the arms broken away, Figs. 5, 6, and 7, sections on lines *a*, *b*, and *c*, respectively of Fig. 3, Fig. 8, a section on line *d* of Fig. 7, Fig. 9, a longitudinal section of a telescoping arm, Fig. 10, a vertical central section of the escape valve, and Fig. 11, a general view of a pivotal connection of my device upon an aeroplane.

In detail my parachute comprises a central tubular rod 12 to whose upper end is fixed a disk or collar 13 provided with a series of radially disposed marginal cavities 14. Pivot pins 15 fixed in the collar cross the cavities, and traverse perforations in the inner ends of flat rods 17 whose outer ends are pivoted as at 18 in lugs 20 upon sleeves 21. Intermediate their lengths the rods 17 are provided with downwardly directed projections 23 provided with laterally directed pointed ends 24 forming hooks. Also fixed to the upper portion of the rod 12 below the member 13 is a disk 26, best seen in Fig. 5, provided with radial openings 27 in which are seated, with an end against the rod, helical springs 28 normally extending beyond the periphery of the disk. Slidably mounted upon the rod 12 is also a disk 30,

best seen in Fig. 6, provided with peripheral cavities 31 interspaced to correspond in number and location with the cavities in disk 13. Pivot pins 32 fixed in the disk 30 cross the cavities 31 and pass loosely through openings 34 in the inner ends of arms 35 upon which are fixed the sleeves 21.

Each arm 35 is composed, as shown in Fig. 9, of a plurality of tapering telescoping sections 37, 38, 39, and 40. The first three sections are tubular, and sections 38 and 39 have closed inner ends 41 and 42. The fourth section is solid, and is provided near its outer end with a lateral lug 43 having a perforation 44. In sections 37, 38, and 39 respectively are helical springs 45, 46, and 47. In the inner end of section 37 is a stop 48 for the inner end of spring 45. Springs 45, 46, and 47 abut against the inner ends of sections 38, 39, and 40 respectively.

Slidably mounted in the tubular rod 12 is a tube 51 in whose upper end is fixed a transverse pin 52 engaged by the lower end of a helical spring 53 whose upper end is attached to a transverse pin 55 fixed in the rod 12. A block 57 in the lower portion of the tube 51 or integral with the latter has a small central opening 58 to receive a depending cord 59 having a retaining ball or knot 60 resting on the top of the block. Any other convenient means may be employed for attaching the cord to the block. The block has also an opening 61 to permit the passage therethrough of a valve cord 62. Fixed to the lower portion of the rod 12 or integral therewith is an annular abutment collar or shoulder 63. A helical spring 64 surrounds the rod, with one end abutting against the member 63, and its other end pressing against the slidable disk 30. Near its upper end the rod 12 is provided with an annular series of longitudinally disposed slots 66 adapted to receive, when the apparatus is closed, the projections 23. Below the collar 63 the rod 12 is provided with a second series of vertically disposed annularly arranged slots 68. Fixed to the rod 12 is a sleeve or block 69, best seen in Figs. 7 and 8, provided with a series of radial orifices 70 upon its periphery extending to the slots 68, and also provided with an annularly disposed series of vertical cavities 71 in radial alinement with the orifices 70. Fixed in the member 69 transversely of the orifices are pintles 72 upon which are mounted rollers

73 integral with or fixed to whose ends are ratchets 74 whose teeth 75 are engaged by pawls 76 pivoted upon pins 78 in the block 69. Each pawl has a tail or arm 79 against the lower surface of which presses one of a series of helical springs 80 seated in the cavities 71. The arms 79 pass through the slots 68 and their upper faces are pressed against the lower end of the tube 51 by the springs 80. Wound upon the rolls 73 are cords 81 which act as guys, having their ends attached to lugs 43 through the perforation 44.

Attached to the ends of the arm sections 40 by any usual convenient means is the margin of a cover 83 of textile or other foldable material and of circular outline at its margin but having sufficient fullness to form a hemispherical outline when expanded.

An escape valve is provided in the center of the cover comprising flanged ring 86 inclosing an opening 87 and provided with a cross bar 88. Pivottally connected to the bottom of the ring 86 at diametrically opposite points thereof, as at 89 are plates 90 serving as flap valves whose inner ends underlap the bar 88 and whose outer ends project as at 92 beyond the pivots to form stops. Depending cords 93 attached to the inner ends of the plates 90 are united with the cord 62 by which the escape valve is operated.

The described safety device is adapted for use independently of any other device, but when intended for use with other structures, as with an aeroplane, any usual preferred pivotal or other connection may be employed. The connection shown in Fig. 11 is an example of such a connection. Here 96 represents the main plane of an aeroplane fixed to which is a bearing 97 for a pivot pin 98 in the lower portion of the rod 12.

The operation of my device is as follows: The operator grasps the lower end of the rod 12 with one hand and while the parts are in closed position, as shown in Fig. 3, pulls the cord 59 downwardly with the other. This movement forces the tube 51 downwardly releasing the hooks 24 from the upper end of said tube and allowing the springs 28 to initially force outwardly the arms 17. At the same time the spring 64 pushes upwardly the slide 30 thereby forcing the telescoping arms 35 from an approximately vertical into a horizontal position against the disk 26. The guys 81 serve to hold the sections of the arms in folded position against their respective springs 45, 46, and 47 when the arms are vertically disposed as in Fig. 3. The downward pull of cord 59 depresses the tube 51 upon the arms 79 of the pawls thereby releasing the ratchet 74 and the rolls 73 permitting the guys 81 to unwind as the arm

sections 38, 39, and 40 are forced outwardly by their respective springs. When the cord 59 is released, the tube 51 is upwardly drawn by the spring 53 releasing the pawl arm 79 and permitting the pawls to fall into engagement with the ratchet teeth.

The descent of the safety device causes the air to completely fill and distend the cover 83, and in case descent is desired to be speeded the operator pulls the cord 62 which opens the escape valve plates 90.

What I claim is:

1. In a safety device, the combination with a rod, of a member slidably mounted upon the rod, extensible arms pivotally connected with the slidable member, a collar fixed to the rod, links connecting the collar and the arms, a cover attached to the arms, a block fixed to the rod, an abutment upon the rod, a spring upon the rod abutting against the abutment and the slidable member, and flexible connections between the block and the ends of the arms.

2. In a safety device, the combination with a rod, of a collar fixed to the upper portion of the rod, a member slidably mounted on the rod below the collar, telescoping arms pivotally connected with the slidable member, a cover upon the arms, links connecting the collar and the arms, means for outwardly pressing the links, a block fixed upon the rod below the slidable member, an abutment upon the rod, a spring upon the rod pressing against the abutment and the slidable member, a cover upon the arms, and flexible members connecting the block and the arms.

3. In a safety device, the combination of a tubular rod, a collar fixed to the rod, a member slidably mounted upon the rod below the collar, telescoping arms pivotally connected with the slidable member, links connecting the collar and the telescoping arms, hooks upon the links, a rod slidably mounted in the first mentioned rod and normally engaged by the hooks, resilient means in the first rod for forcing the second rod into engagement with the hooks, a cord depending from the second rod, a block fixed to first rod below the slidable member, an abutment upon the rod, flexible connections between the block and the arms, and a spring upon the first rod abutting against the abutment and the slidable member.

4. In a safety device, the combination of a tubular rod, a collar fixed to the rod, a member slidably mounted upon the rod below the collar, arms comprising telescoping sections pivotally connected with the slidable member, resilient means in the arms for longitudinally extending the sections, links connecting the collar and the arms, a cover attached to the ends of the arms, a block fixed to the rod, resilient means upon the rod pressing against the slidable member,

rolls mounted in the block, flexible members upon the rolls attached to ends of arms, means upon the block for holding the rolls against rotation, and means in the rod for releasing the holding means.

5 5. In a safety device, the combination of a tubular rod, provided with two series of slots, a collar fixed to the upper portion of the rod above the slots, a member slidably mounted upon the rod below the collar ex-
10 pansible rods pivotally connected with the slidable member, a cover on the arms, links connecting the collar and the arms, hooks upon the links extending through the first
15 series of slots, a longitudinally slidable tubular rod within the first rod adapted to be engaged by the hooks, a spring upon the second rod normally pressing the latter against the hooks, a block upon the first
20 rod, a spring upon the rod in contact with the slidable member, rolls mounted in the block, ratchets upon the rolls, pawls pivotally mounted in the block engaging the ratchets and extending through the second
25 series of slots below the inner rod, a depending cord upon the inner rod, and flexible members upon the rolls connected with the arms.

6. In a safety device, the combination with the rod, of a slidable member upon the rod, arms pivotally connected to the slid-
30 able member normally extending beyond the upper end of the rod, a cover attached solely to the ends of the arms, a collar fixed to the upper end of the rod, links connecting the
35 collar and the arms, hooks upon intermediate portions of the links, and means in the rod adapted to engage the hooks when the arms are in normal position.

7. In a safety device, the combination 40 with the rod, of a slidable member upon the rod, arms pivotally connected with the slidable member, sleeves fixed upon the arms, lugs upon the sleeves, a collar fixed to the
45 rod, links pivotally connected with the lugs and the collar, a spring upon the rod engaging the slidable member, hooks upon the links, and yielding means upon the rod engaging the hooks.

In testimony whereof I have affixed my 50 signature in presence of two witnesses.

ADOLF ENSSLIN.

Witnesses:

HORATIO E. BELLOWES,
GEORGE H. McLAUGHLIN.