No. 753,930. PATENTED MAR. 8, 1904.

J. M. STAFFORD.

FIRE ESCAPE.

APPLICATION FILED MAY 28, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

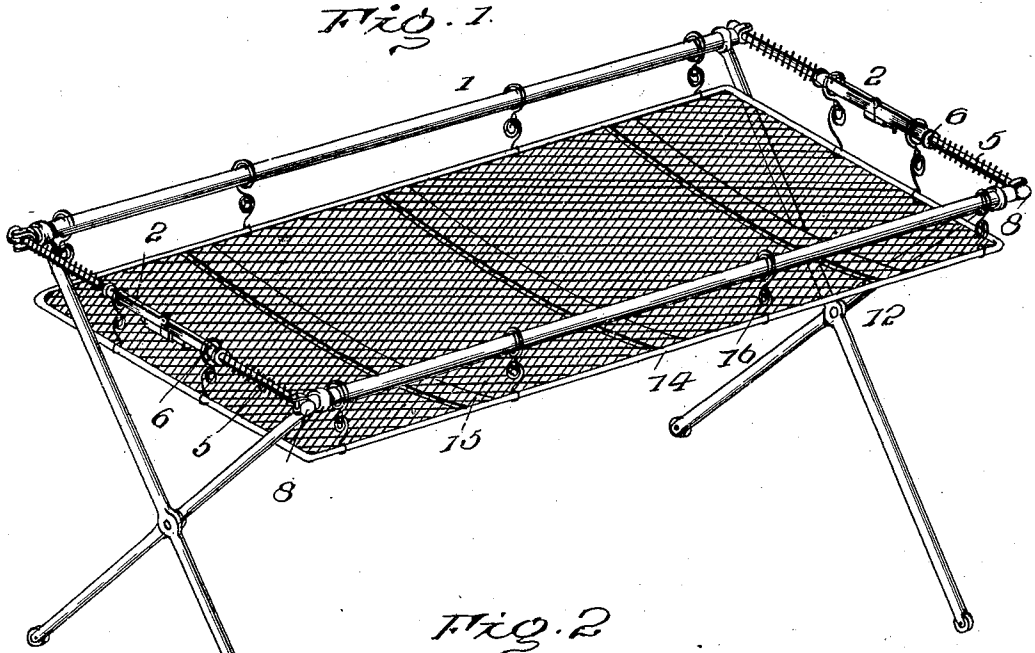
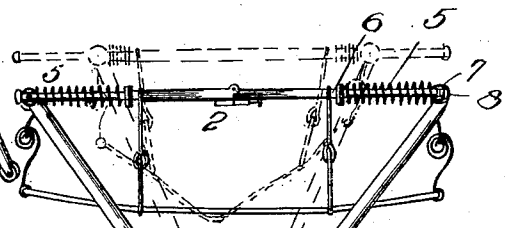


Fig. 2



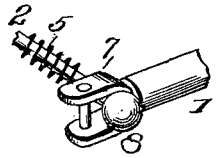
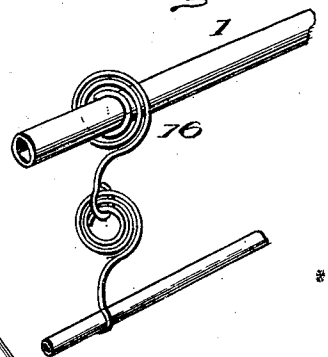


Fig. 3

Fig. 4



WITNESSES

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.

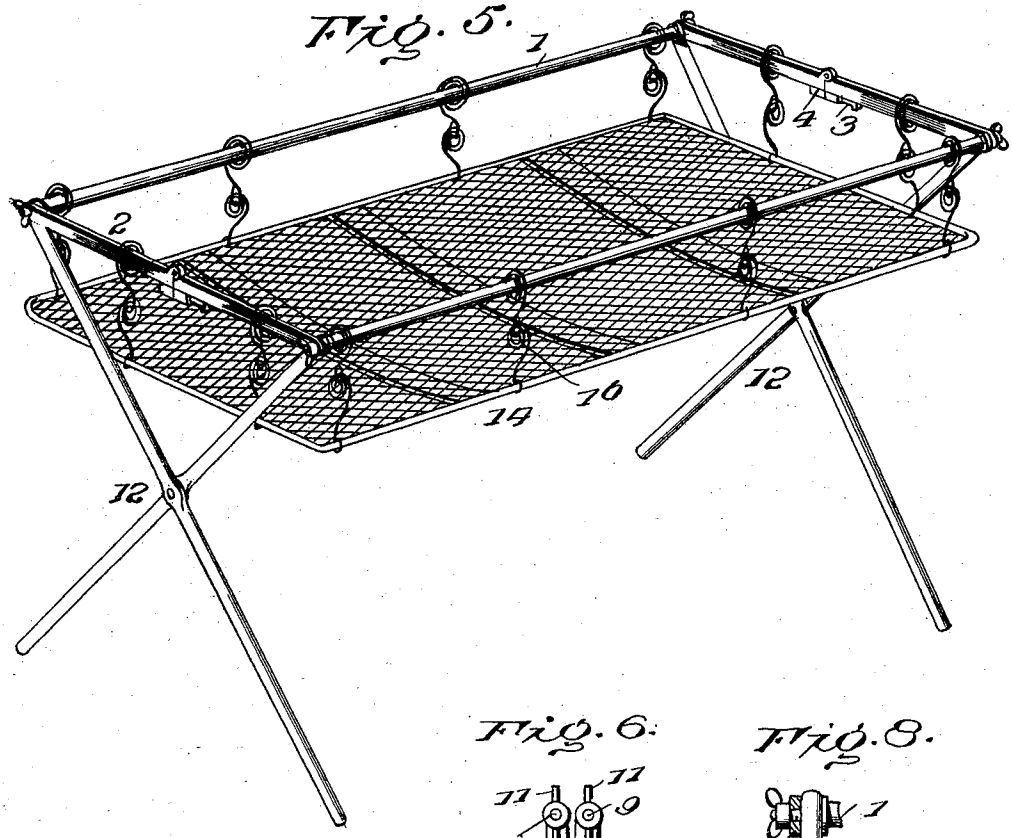


Fig. 6.

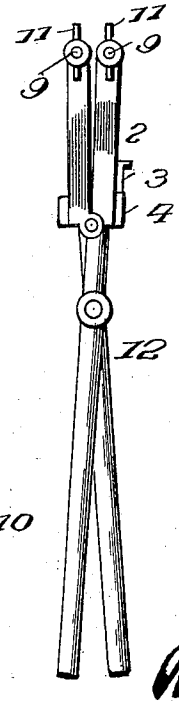


Fig. 8.

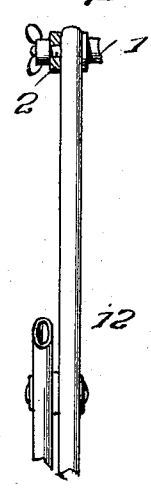
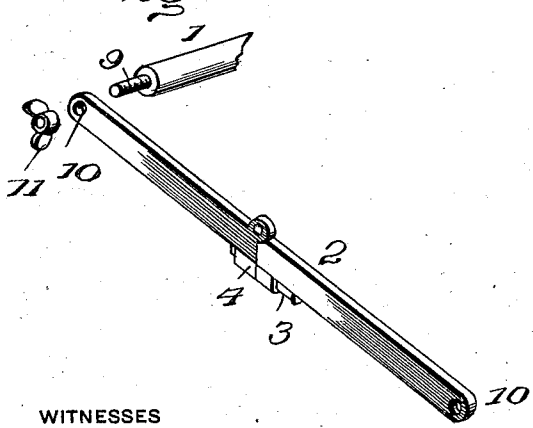


Fig. 7.



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No. 753,930. Patented March 8, 1904.

UNITED STATES PATENT OFFICE.

JAMES M. STAFFORD, OF PETERSBURG, INDIANA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 753,930, dated March 8, 1904.

Application filed May 28, 1903. Serial No. 159,147. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. STAFFORD, a citizen of the United States, residing at Petersburg, in the county of Pike and State of Indiana, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

The object of this invention is the provision of a novel device for saving life in an emergency compelling persons to jump from high elevations after all other avenues of escape have been closed by means of fire, smoke, or other cause.

In its construction the device comprises a frame, a net, and yielding connections of peculiar formation between the frame and net whereby the shock incident to impact of the falling body with the net is minimized and the fall gradually broken, thereby reducing the casualties incident to the use of a device of this character to the smallest amount possible. The connections between the frame and net consist of springs of convoluted or flat spiral form loosely mounted upon the frame-bars and which in action operate in a twofold manner to minimize the shock, the first action bringing the convolutions together and the second action resulting in unwinding the spring against the tension and the frictional engagement of said convolutions.

The improvement also consists of the novel features and structural details, which hereinafter will be more particularly set forth, illustrated, and finally claimed.

In the drawings hereto attached and forming a part of the specification, Figure 1 is a perspective view of a fire-escape embodying the vital features of the invention. Fig. 2 is an end view thereof, the dotted lines showing the relative position assumed by the parts when the device is in operation. Fig. 3 is a detail perspective view of a corner portion of the frame, showing the parts on a larger scale. Fig. 4 is a detail perspective view of a spring connection between the frame and net on a larger scale. Fig. 5 is a perspective view of a modification. Fig. 6 is an end view of the modification shown in Fig. 5, the parts being folded. Fig. 7 is a detail perspective view of an end bar and an end portion of a longitudinal bar, the parts being separated. Fig. 8 is a detail view in elevation of the legs supporting one end of the device, parts being broken away.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The device comprises a frame of rigid material, a net, spring connections between the frame and net, and supporting means for the frame consisting in the preferable form of folding legs. The frame is preferably of oblong or rectangular formation, although this is not essential. The longitudinal bars 1 are preferably continuous or, if desired, may be composed of sections connected in any substantial and rigid manner. The end bars 2 are jointed intermediate of their ends, the joint being stiffened by means of a pin or bolt 3 slid through keepers 4, provided at the lower edge of the pivoted or hinged sections adjacent to the joint. When the pin or bolt 3 is withdrawn, the sections comprising the end bars 2 are adapted to fold upon each other, as shown most clearly in Fig. 6, thereby permitting the longitudinal bars 1 to come together, whereby the device folds into a compact and flat form to be conveniently handled and stored. The longitudinal bars 1 and end bars 2 may be connected in any determinate way. As shown in Fig. 1 and the detail views thereof, longitudinal bars 1 are slidable upon end bars 2 and are held separated or pressed outward by means of coil-springs 5, slipped upon the end portions of bars 2 and confined between collars 6, applied to said bars, and forks 7 at the outer ends of bars 1. Stops 8 at the extremities of end bars 2 limit the outward movement of longitudinal bars 1. These stops 8 consist, preferably, of balls, which present a neat appearance and obviate injurious contact of any object striking thereagainst. The forks 7 may be a part of the bars 1 or may be separate and applied thereto, the latter construction being preferable. For the sake of lightness the several bars comprising the frame and legs are tubular.

In the construction shown in Fig. 5 and the detail views thereof threaded stems 9 are provided at the ends of longitudinal bars 1 and pass through openings 10 near the ends of bars 2 and receive clamp-nuts 11, whereby the frame-bars are secured when assembled.

The device is supported at its ends by folding legs 12, which are pivoted at the point of crossing and have loose connection at their upper ends with the respective longitudinal bars 1. The lower ends of the legs may be provided with rollers or caster-wheels 13, as indicated in Figs. 1 and 2, to facilitate movement of the legs incident to lateral play of longitudinal bars 1 when drawn inward by impact of a body with the net or catcher 14.

The net or catch device 14 may be of canvas, duck, meshed fabric, or textile of any variety or character, so as to obviate injury to a person or object alighting thereon and yet of sufficient strength to withstand the shock and strain. The net may be strengthened by reinforcements 15, which may be strips of any suitable material. The yielding connections between the frame and net consist of springs 16 of convoluted form and loosely mounted upon the frame-bars so as to turn thereon. The springs may be constructed of any spring metal best adapted for the purpose and may be flat or round or of any cross-sectional outline. Each connection may consist of one or more springs, usually two being sufficient, the outer end of one spring being linked to the innermost convolution of the companion or cooperating spring. By having the spring of convoluted form superior results are attained over the employment of coil-springs of the type illustrated at 5. In the preferable construction of the springs strips of spring metal of flattened form are employed. The springs applied directly to the frame-bars are slipped thereon, and normally the convolutions stand apart. When a body or object is received upon the net, the first effect is to close the convolutions by a down pull upon the springs, and the next action is to stretch the springs to effect an unwinding thereof from the frame-bars. This unwinding is resisted by the combined tension of the convolutions and the frictional contact of said convolutions by closing of one upon the other in the initial down pull upon the springs. The combined actions of the springs reduce the shock to a minimum and a sagging of the net, so as to retain the object or body falling thereon.

Having thus described the invention, what is claimed as new is—

1. In a life-saving device of the character set forth, the combination of a frame, a net, and yielding connections between the frame and net consisting of convoluted or flat spiral springs, substantially as set forth.

2. In a life-saving device of the character set forth, the combination of a frame, a net, and yielding connections between the frame and net consisting of convoluted springs loosely mounted upon the frame-bars and adapted to have a twofold action, the first resulting from a closing of the convolutions and the second resulting from unwinding of the convolutions against the inherent tension thereof and the frictional engagement of the convolutions, substantially as specified.

3. In a life-saving device of the character set forth, the combination of a frame, a net, and yielding connections between the frame and net consisting of a series of convoluted springs linked together, the uppermost spring of the series being loosely mounted upon the frame-bars, substantially as described.

4. In life-saving apparatus of the character described, a frame composed of longitudinal and jointed end bars, the longitudinal bars being slidable upon the terminal portions of the end bars, springs exerting an outward pressure upon the longitudinal bars, a net suspended from the frame-bars, and folding legs having their upper ends loosely connected with the longitudinal bars and movable therewith, substantially as set forth.

5. In life-saving apparatus of the character described, a frame composed of longitudinal and end bars, the longitudinal bars being slidable upon the end bars, springs mounted upon the ends bars and exerting an outward pressure upon the longitudinal bars, stops applied to the extremities of the end bars to limit the outward movement of the longitudinal bars, and a net yieldably suspended from the frame-bars, substantially as set forth.

6. A life-saving device of the character described comprising jointed end bars, longitudinal bars slidable upon the end bars, springs mounted upon the end bars and normally pressing the longitudinal bars outward, stops applied to the extremities of the end bars to limit the outward movement of the longitudinal bars, a net, spring connections suspending the net from the frame-bars, and folding legs having their upper ends loosely connected with the longitudinal bars and provided at their lower ends with rolling supports, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES M. STAFFORD. [L. S.]

Witnesses:
MARSHALL KIME,
WADE MALOTTE.