

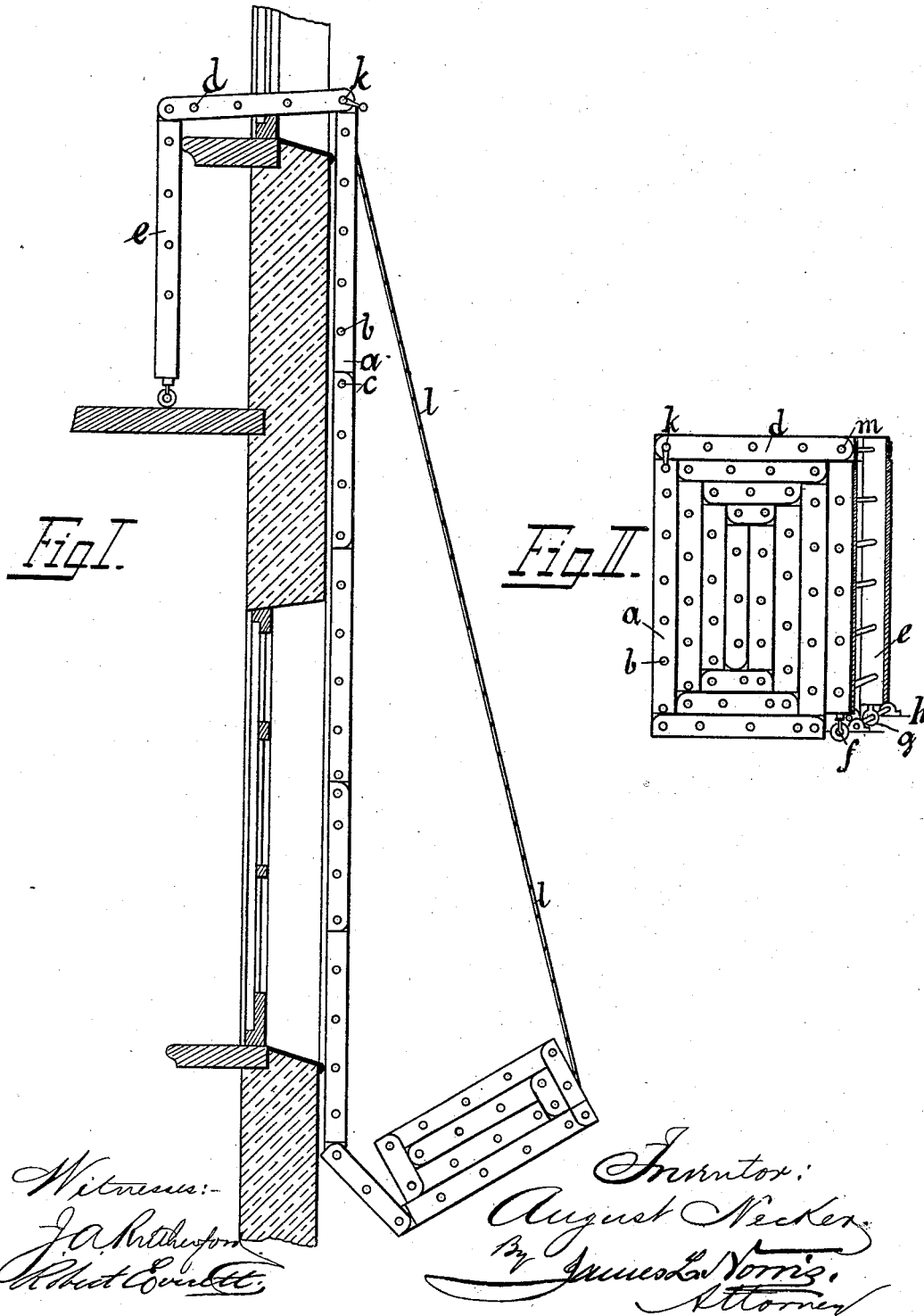
(No Model.)

2 Sheets—Sheet 1.

A. NECKER.
SAFETY LADDER.

No. 494,073.

Patented Mar. 21, 1893.



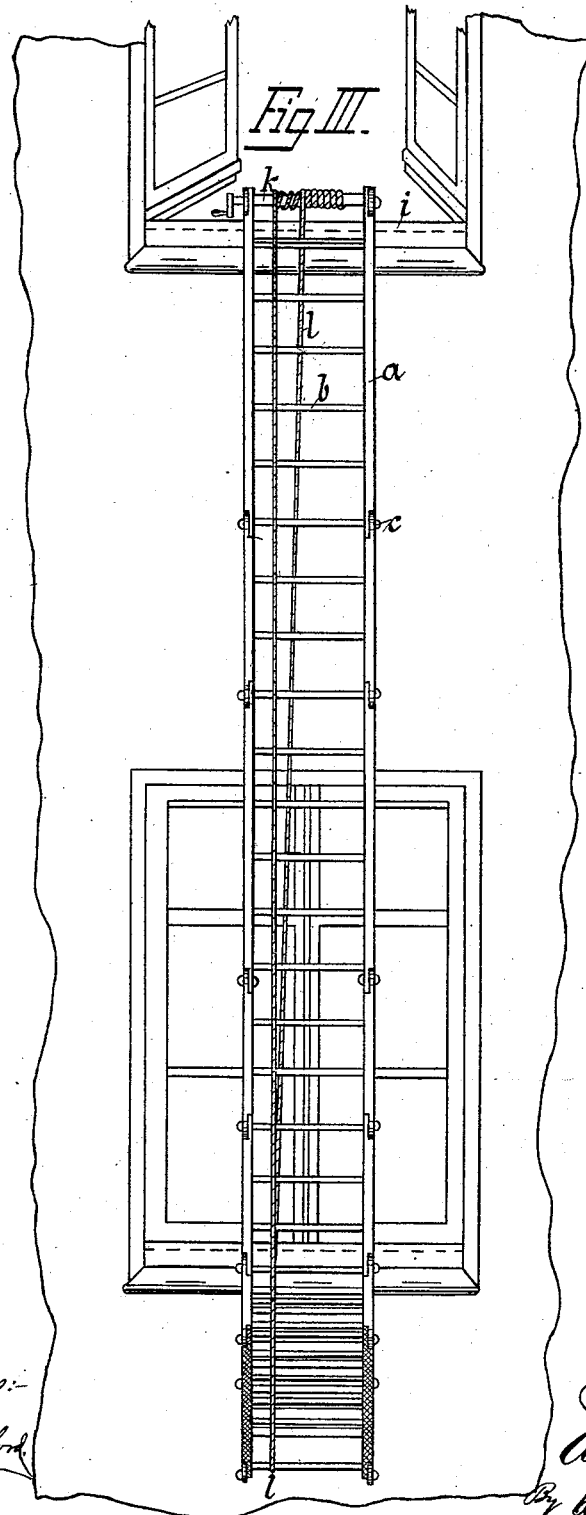
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SAFETY LADDER.

No. 494,073.

Patented Mar. 21, 1893.



Witnesses:
J. A. Hildnerford
Robert G. Smith.

Inventor:
August Necker
By Amos A. Norris,
Attorney.

UNITED STATES PATENT OFFICE.

AUGUST NECKER, OF LIPPSTADT, GERMANY.

SAFETY-LADDER.

SPECIFICATION forming part of Letters Patent No. 494,073, dated March 21, 1893.

Application filed June 14, 1892. Serial No. 436,714. (No model.)

To all whom it may concern:

Be it known that I, AUGUST NECKER, of Lippstadt, in the Kingdom of Prussia and German Empire, have invented a new and useful Improved Safety-Ladder, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of this invention is the special construction of a ladder which when not in use may be folded into the smallest possible compass. When the ladder is to be used it is brought into place and dropped when it will unfold itself automatically. When it is desired to again fold the ladder this is easily done by a crank.

In order that my invention may be the better understood, I now proceed to describe the same, reference being had to the accompanying drawings and to the letters marked thereon.

Like letters refer to like parts throughout the figures.

Figure 1 is a side elevation of my ladder partly folded, either while being unfolded from a window for use or while being folded again after use. Fig. 2 is a perspective view showing the ladder folded. Fig. 3 is a front elevation of Fig. 1.

A number of parts or links *a* carrying rungs *b* are connected together by means of hinges *c*, so that they can only fold in one direction, and when they are being unfolded they can only move until they form a straight line, while it is impossible to turn them farther. There are further arranged two upper parts *d* and *e*, also carrying rungs *b* which may be folded or turned in either direction. They are connected by means of ordinary hinges to the last or top part *a*. One end of the part *e* is provided with a roller *f* and with an eye *g*, the latter being able to turn round a pin and guided by an iron rod *h* rigidly fixed in any suitable manner. The roller *f*, serves as a caster upon which the ladder, when folded up, may be rolled or wheeled, but this is non-essential and may be omitted. The proportion of the parts or links are not alike, but arranged so that the apparatus can be folded into the smallest possible compass as herein-after described.

Beginning with the lowermost part *a* the length of second part is equal to the double breadth of the first part, the third part or link is of the same length as the first plus the breadth of same, the length of the fourth part is equal to treble the breadth of each part, the length of the fifth part is equal to the length of the first part, plus twice the breadth of the same, and so on. In this way as the dimensions are continued according to the same system, the whole ladder may be folded together in the form of a rectangular parallelopiped. The two upper parts *d* and *e* are hinged, so that they can fold in both directions. This is done to allow, for instance, of the ladder being lifted over a window sill, see Fig. 1, in order to be used as a fire escape.

Where the part *d* is hinged to the part *a* there is situated an axle *k*, around which is led an endless rope *l*. The latter touches every rung of the ladder, when the same is stretched or unfolded; it goes around the lowest rung *b* and returns to the axle *k*.

When the folded ladder, as shown in Fig. 2, is turned around the connection *m* between the part *c* and the part *d*, and the part *a* thus placed over the window sill and the ladder, allowed to drop, it will unfold automatically, the force of the jerks being reduced by the endless rope *l*. The rope *l* can also serve as a support and guidance for the persons descending the ladder, who may attach themselves to the rope *l* in the usual manner by means of a belt and safety hook. By turning the crank the rope is tightened and the ladder folded as shown in Fig. 1.

The ladder has not been designed to be carried by the fire brigades, but its purpose is to form part of the equipment of dwellings, in which it is conveniently arranged under the window sill, either open or covered by wainscoting, so that in the moment of danger, if the staircase cannot be traversed, the ladder may be simply dropped out of the window, thus allowing of descent being effected in safety.

Of course the ladder may also be used for any other purpose, for instance to rescue persons who have fallen into pits, chasms, &c.

What I claim, and desire to secure by Letters Patent of the United States, is—

A folding safety ladder, consisting of hinged parts or links, surrounded by an endless rope,
5 said links capable of being folded into a small compass when at rest and which are adapted, when dropped from a position, to unfold until the parts form a straight line, the two upper parts or links being capable of swinging

to either side of the next adjacent link to form an anchorage, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

AUGUST NECKER.

Witnesses:

PAUL FISCHER,
ADOLF PIETSCH.