

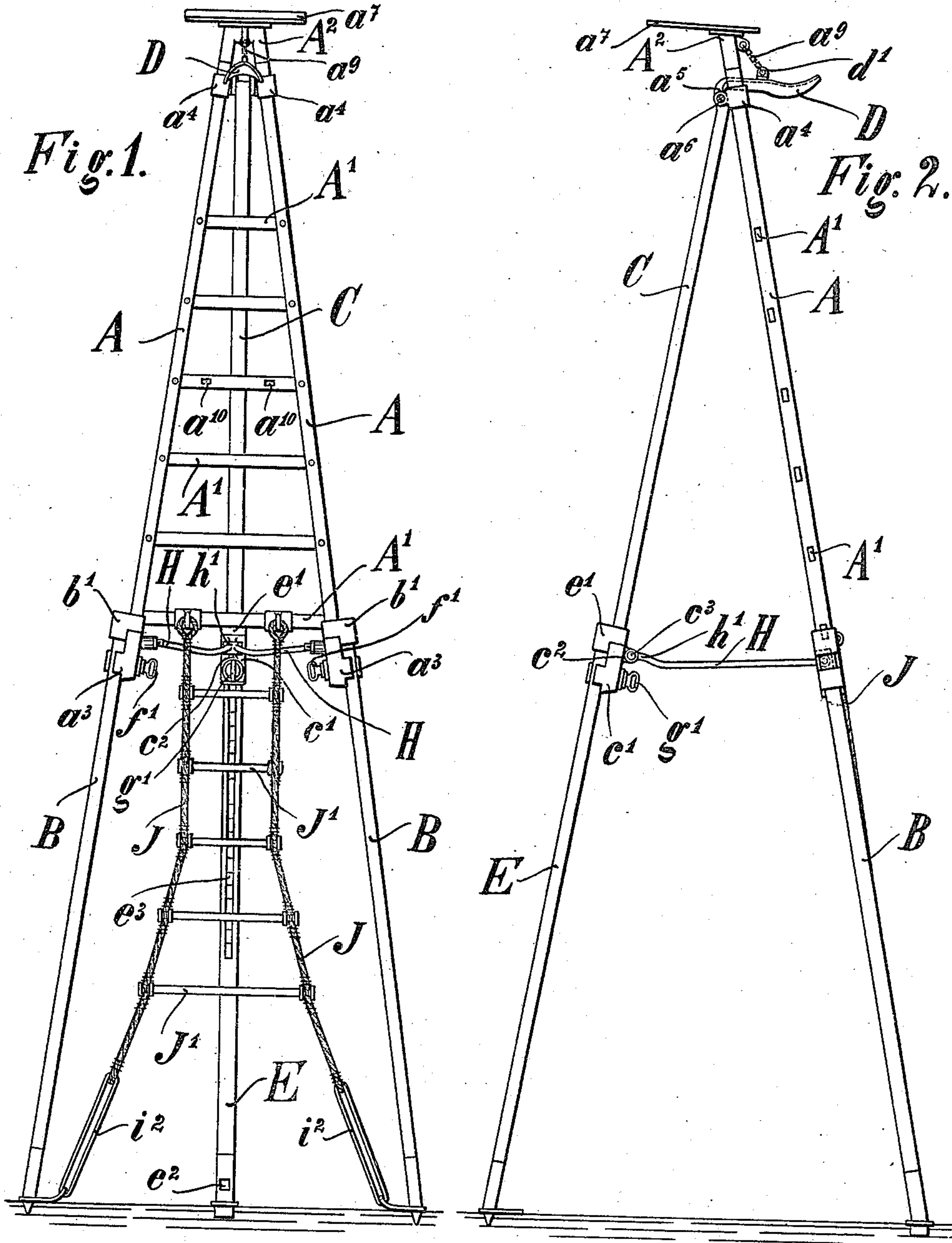
W. MAYER.  
EXTENSIBLE LADDER.

APPLICATION FILED OCT. 24, 1907.

987,585.

Patented Mar. 21, 1911.

2 SHEETS—SHEET 1.



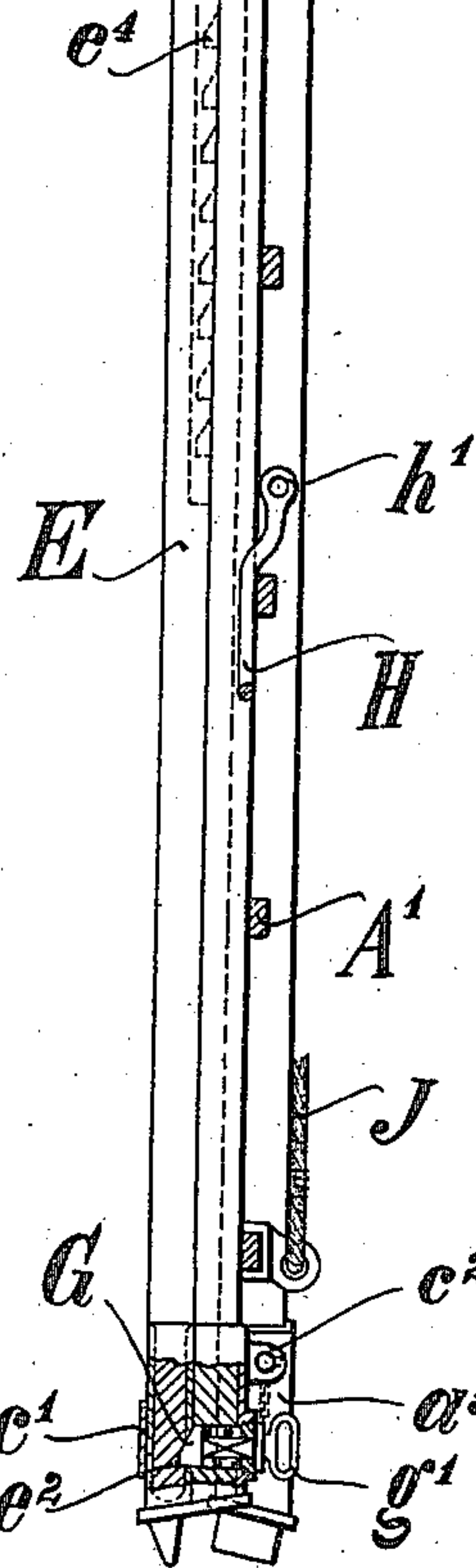
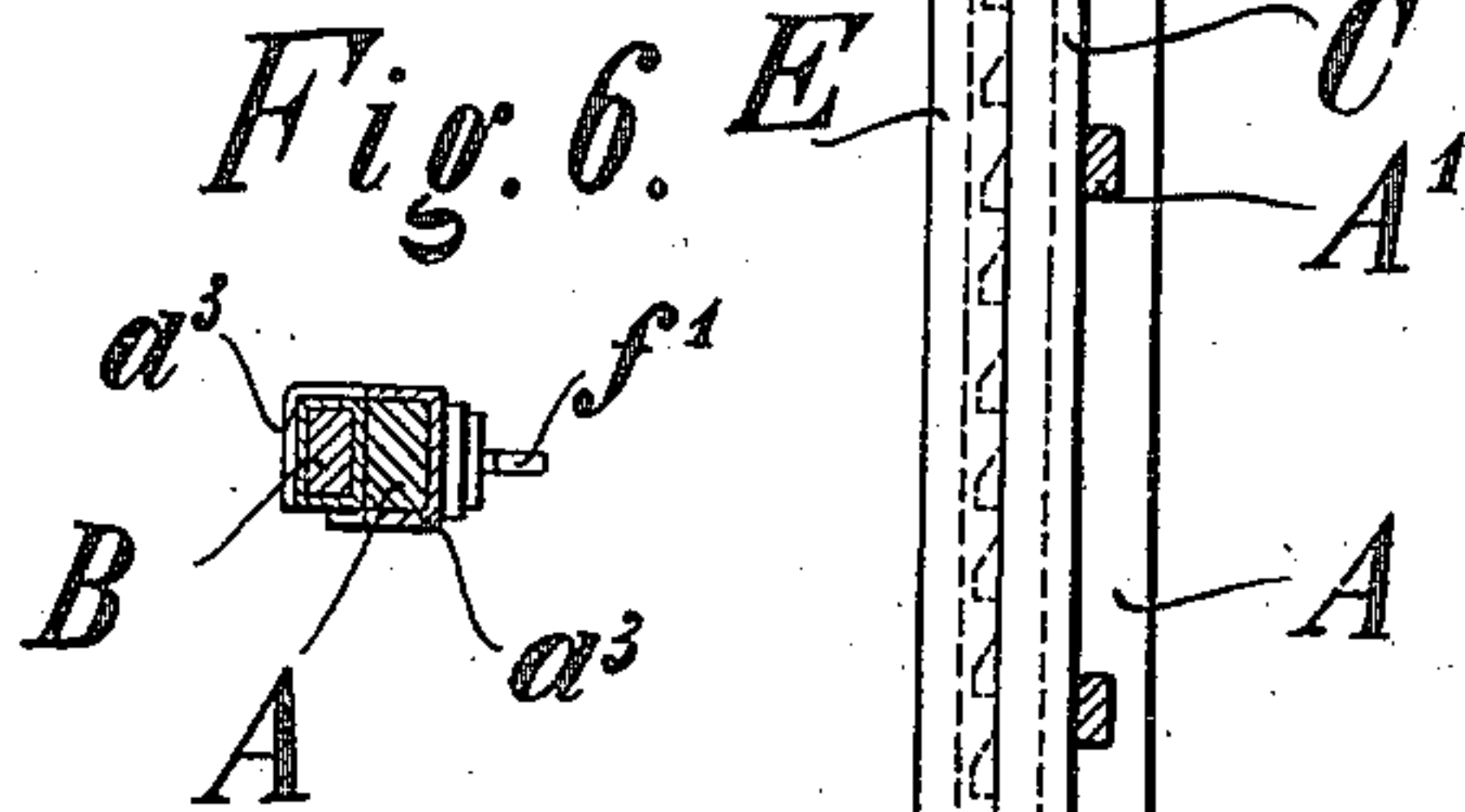
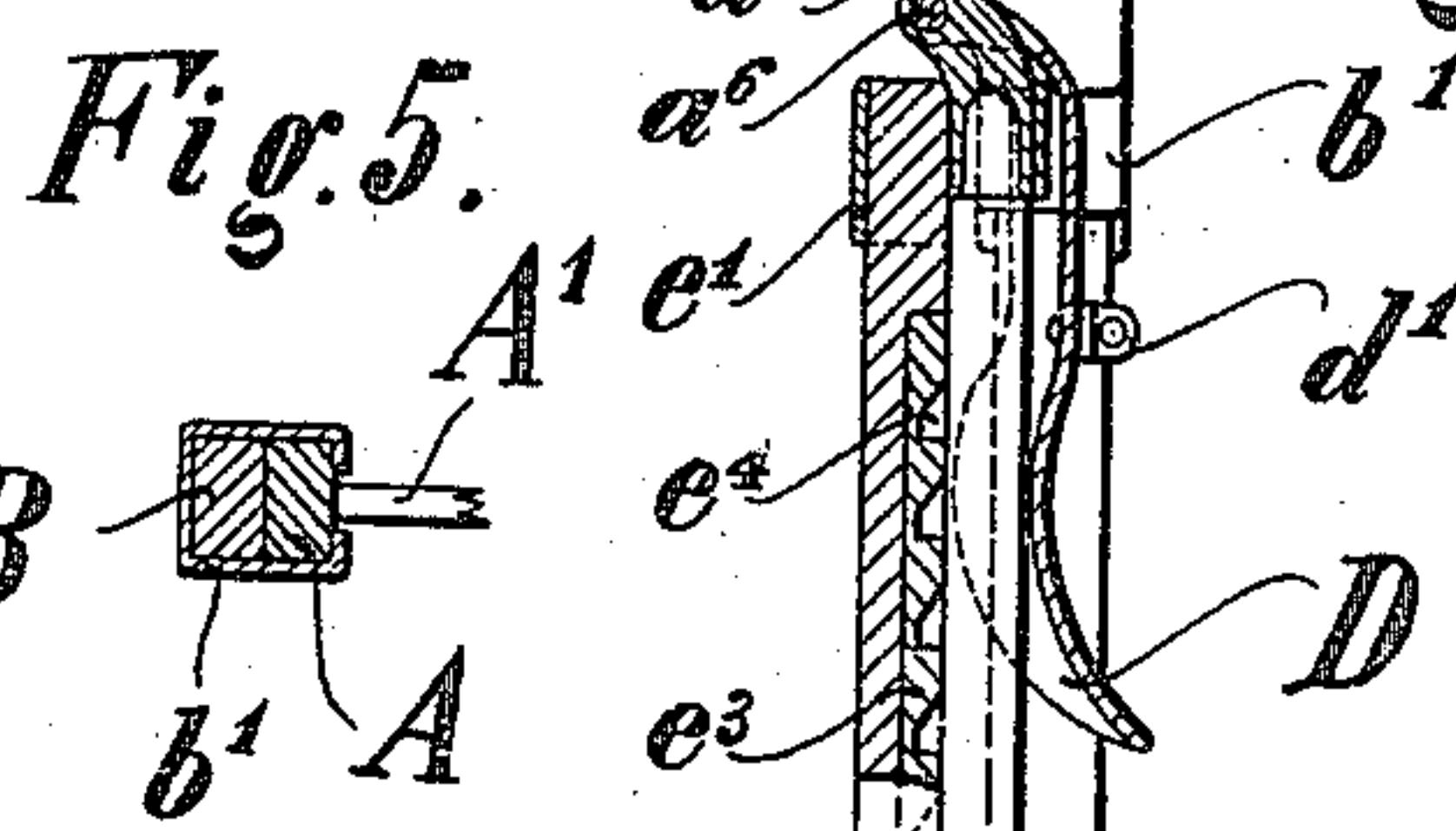
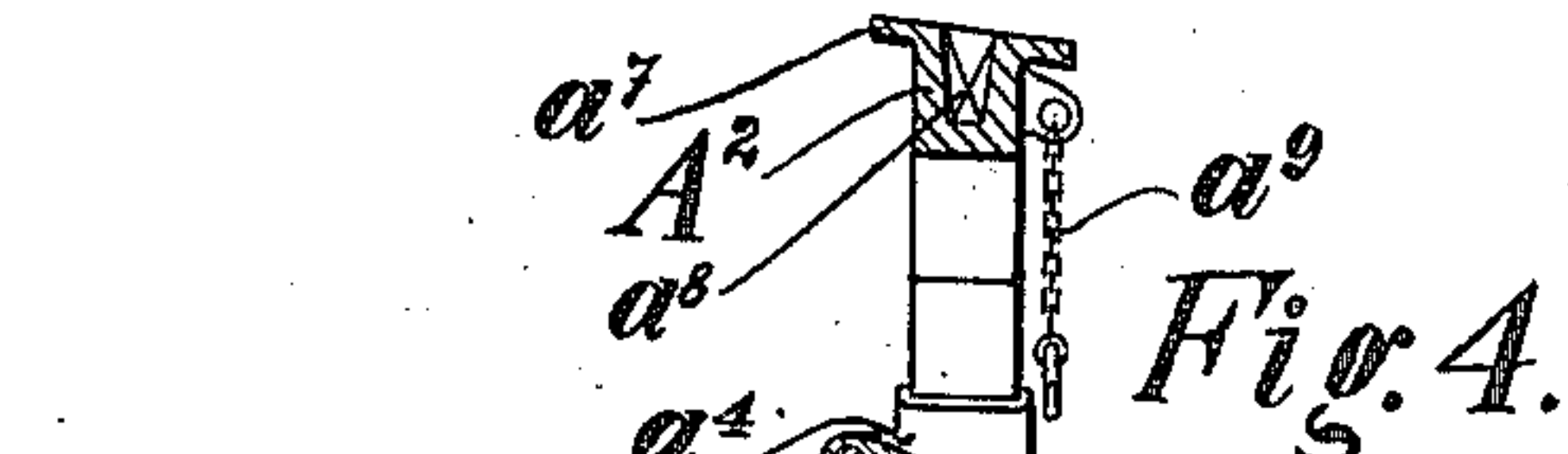
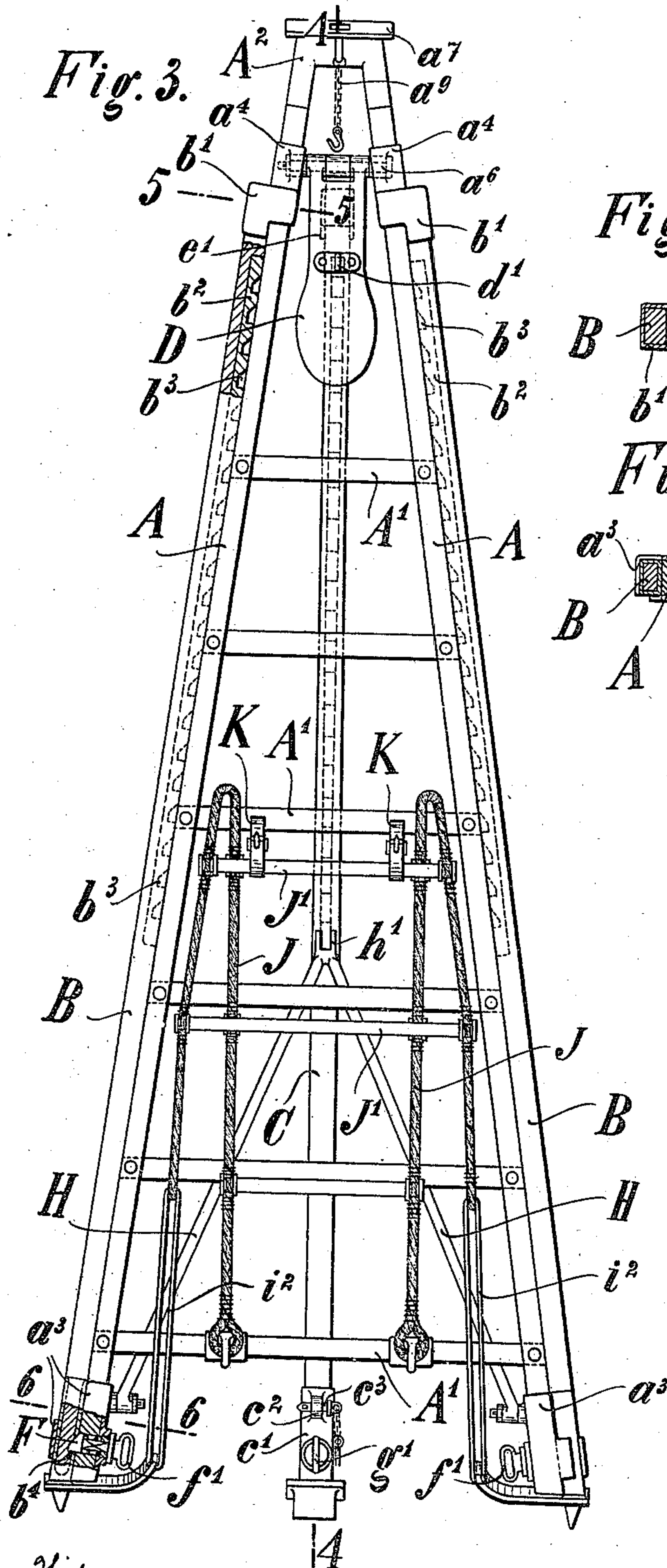
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

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## EXTENSIBLE LADDER.

987,585.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Application filed October 24, 1907. Serial No. 399,003.

*To all whom it may concern:*

Be it known that I, WILHELM MAYER, a subject of the Emperor of Germany, and a resident of Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Extensible Ladders, of which the following is a specification.

The present invention relates to an extensible ladder which especially is adapted to serve as an observation tower in artillery battles.

One embodiment of the invention is shown in the accompanying drawing by way of example.

Figure 1 is a front view of the ladder in the position for use; Fig. 2 is a side view of Fig. 1; Fig. 3 is a front view, on an enlarged scale and partly in section, of the ladder in the collapsed condition; Fig. 4 is a side view, partly in section on line 4—4, Fig. 3; Fig. 5 is a section on line 5—5, Fig. 3; and Fig. 6 is a section on line 6—6, Fig. 3.

The upwardly converging stiles A of the upper section of the ladder are connected with each other by means of rigid steps A' and a head-piece A<sup>2</sup>. The stiles B of the lower section of the ladder are slidably arranged on the stiles A. For that purpose guide-shoes b' (see also Fig. 5) are secured to the upper end of the stiles B and embrace the stiles A, and the lower ends of the stiles A are provided with guide-shoes a<sup>3</sup> (see also Fig. 6) which surround the stiles B. Near the upper end of the upper section of the ladder the stiles A are provided with straps a<sup>4</sup> which have eyes a<sup>5</sup> (Fig. 2) for a bolt a<sup>6</sup>. A two-part support C, E, and a saddle-shaped seat D are jointed to the upper section of the ladder by means of the bolt a<sup>6</sup>. The two parts of the support C, E, are slidably connected with each other by means of two guide-shoes c', e'. One of the shoes (c') is mounted on the part C of the support, while the other shoe (e') is mounted on the part E of the support. The stiles A, B, and the support C, E, are preferably made from wood. In each of the shoes a<sup>3</sup> pertaining to the stiles A is mounted a spring-pressed bolt F which is provided with a handle f'. For these bolts, a notch b<sup>4</sup> (Fig. 3) is provided in the lower end of each of the stiles B, while the upper part of the stiles B has a plurality of notches b<sup>3</sup> for the bolts F. The notches b<sup>3</sup> are provided in

metal rails b<sup>2</sup> which are let into the stiles B. There is also inserted a locking device between the parts C and E of the support which device is formed and arranged exactly like the locking device between the stiles A and B. This device consists of a bolt G (Fig. 4) provided with a handle g' and mounted in the guide-shoe c', a notch e<sup>2</sup> provided in the lower end of the part E of the support and notches e<sup>4</sup> in a metal-rail e<sup>3</sup> let into the part E of the support. To the shoes a<sup>3</sup> are jointed a pair of struts H which combine in a pair of eyes h'. These eyes can be connected to the shoe c' by means of a key-bolt c<sup>3</sup> and an eye c<sup>2</sup> provided on the shoe c'. To the lowermost step of the upper section of the ladder is secured one end of the ropes J of a rope-ladder J J', the other end of the ropes J being connected to the foot of the stiles B by means of straps i<sup>2</sup>. The length of the rope-ladder is so selected that the rope is stretched when the ladder is completely drawn out (Fig. 1). One of the steps A' is provided with two slots a<sup>10</sup> (Fig. 1) for straps K (Fig. 3) by means of which the rope ladder can be secured to the upper section of the ladder when the stiles A and B assume the relative position shown in Figs. 3 and 4.

The head-piece A<sup>2</sup> which connects the stiles A is provided with a plate a<sup>7</sup> and with a socket a<sup>8</sup> (Fig. 4) which is adapted to receive a telescope. From the head piece A<sup>2</sup> is suspended a chain a<sup>9</sup> which on its free end is provided with a hook that can engage in an eye d' on the seat D when the latter is in the position for use (Figs. 1 and 2).

In the collapsed condition of the ladder the parts assume the position shown in Figs. 3 and 4 in which the bolts F and G engage in the notches b<sup>4</sup> and e<sup>2</sup> respectively. The rope-ladder J J' is then folded over the steps A' of the upper section of the ladder in the manner shown in Fig. 3 and is secured in this position by having one of its steps J' secured by means of the straps K to that step A' of the upper section of the ladder which has the slots a<sup>10</sup> for the straps. The struts H are disconnected from the part C of the support and lie with their lower part against the lowermost step A' of the upper section of the ladder and with their eyes h' against the part C of the support (see also Fig. 4).



When the ladder is erected the straps K are first united and the upper section of the ladder and the part C of the support are thereupon moved longitudinally relatively to the lower section of the ladder and the part E of the support. The notches  $b^4$  and  $e^2$  having the form shown in the drawing the bolts F and G are forced back into their housings. The same action takes place when the bolts have entered into engagement with the notches  $b^3$  and  $e^4$  and the ladder is further extended. When the parts of the ladder are brought into the relative position shown in Figs. 1 and 2 the bolts are in engagement with the uppermost of the notches  $b^3$  and  $e^4$ . After the ladder is drawn out the struts H are secured to the support C E by means of the key-bolt  $c^3$ . If it is desired to obtain a less height of observation than that obtained by the adjustment shown in Figs. 1 and 2 the bolts F and G are brought into engagement with the corresponding notches  $b^3$  and  $e^4$ . For the purpose of stretching the rope-ladder J J' in this instance, the straps  $i^2$  are either shortened or they are passed over one of the lower steps J'. On mounting the ladder, the rope-ladder J J' is then first used and subsequently the steps A' of the upper section of the ladder are made use of.

The ladder according to the present invention has especially the advantages of great stability, and small weight and occupies but small space when in the collapsed condition.

Having thus described the invention, what is claimed and desired to secure by Letters Patent is:

1. An extensible ladder comprising relatively slidable sections, the lowermost section being provided with a rope ladder suspended between the lowermost rung of the adjacent section above and parts rigidly connected to the feet of said lower section.

2. An extensible ladder collapsible longitudinally and transversely and comprising a plurality of connected sections, one of which comprises a rope ladder and longitudinal sustaining members; the rope ladder being connected at one end with the longitudinal sustaining members, and at its other

end to the adjacent end of the next ladder section.

3. An extensible ladder comprising an upper ladder section with rigidly related converging stiles, and a lower section comprising a rope-ladder with one end connected to the lower rung of said upper section and stiles laterally movable relatively to each other; the corresponding stiles of the sections being slidably connected to permit the longitudinal collapse of the ladder.

4. An extensible ladder comprising an upper section having stiles and provided with rigid steps connecting the stiles, a lower section provided with stiles having sliding connection with the stiles of the upper section, and a rope-ladder intermediate of the stiles of said lower section and having one end secured to the lower part of the lower section and having its other end secured to the upper section.

5. An extensible ladder comprising a ladder-section with rigidly related vertical stiles, and a section comprising a rope ladder, one end of said rope-ladder being connected to the end rung of said other section and vertical stiles laterally movable relatively to each other; the corresponding stiles of the sections being slidably connected to permit collapsing of the ladder longitudinally.

6. An extensible ladder comprising a section having upwardly converging stiles, an adjacent section having upwardly converging stiles and having sliding connection with the stiles of the first-named section, and a rope ladder mounted intermediately of the stiles of one of said sections and forming the steps of that section, the stiles of the section on which the rope ladder is mounted being movable laterally in respect to each other to allow of sliding engagement with the converging stiles of the other section.

The foregoing specification signed at Dusseldorf, Germany, this 21st day of September, 1907.

WILHELM MAYER.

In presence of—

ALFRED POHLMAYER,  
M. ENGELS.