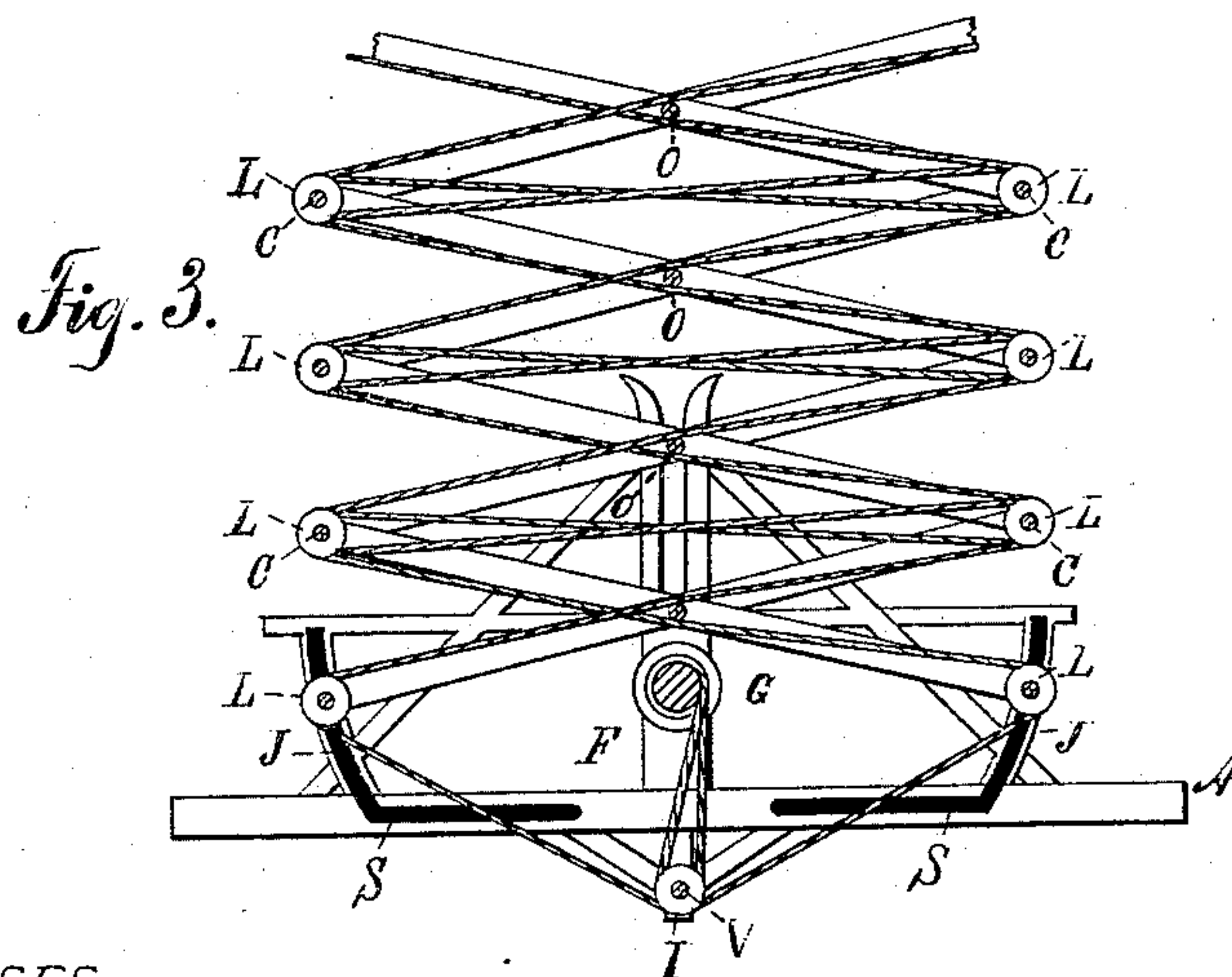
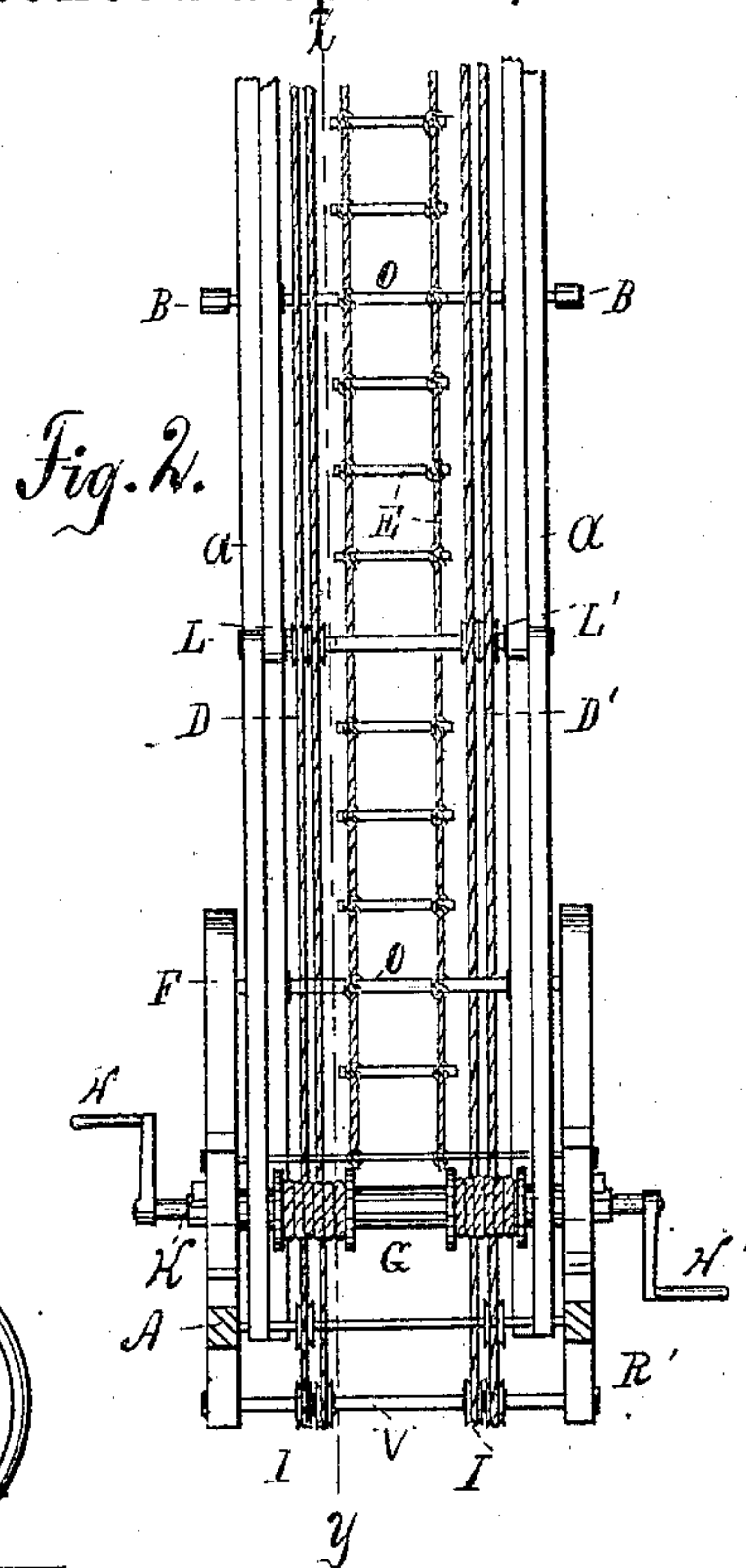
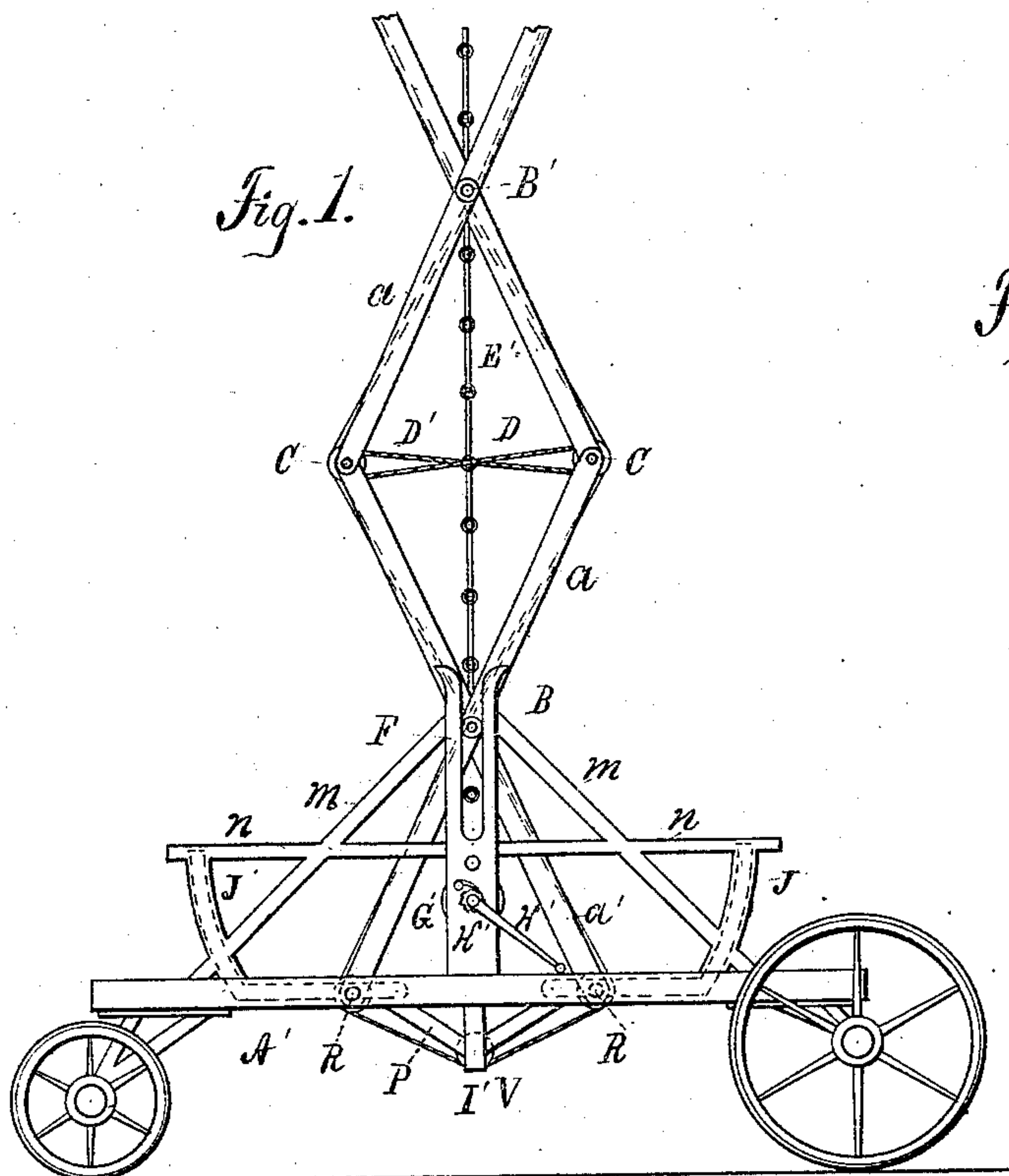


(No Model.)

F. E. JOSEL.  
FIRE ESCAPE LADDER.

No. 285,273.

Patented Sept. 18, 1883.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

FRANCIS E. JOSEL, OF FREEPORT, ILLINOIS.

## FIRE-ESCAPE LADDER.

SPECIFICATION forming part of Letters Patent No. 285,273, dated September 18, 1883.

Application filed April 6, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS E. JOSEL, a resident of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Fire-Ladders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention is an improved fire-ladder mounted upon a truck, by means of which it can be readily moved from place to place, and provided with mechanism whereby it can be speedily raised and lowered. As it is lowered it folds upon itself, so as to occupy a comparatively small space, and the supporting framework is so constructed that when raised the ladder is thoroughly braced. The details of construction of the devices are set out in the following specification, and shown in the accompanying drawings, in which—

Figure 1 is a side elevation of the ladder and truck, the ladder being raised; Fig. 2, an end elevation of same in same position; and Fig. 3, an interior side elevation of the ladder and truck, the ladder being partly lowered or folded, and the front being removed by passing a vertical plane through the line *xy*, Fig. 2.

In the drawings, A is a horizontal platform of timber or other suitable material, mounted upon wheels, and provided midway between its ends with two opposite rigid vertical posts, F F', which extend above and below the platform, the upward extension being, however, much greater than the lower. These posts are slotted from the top downward through about half their length, the slots being preferably somewhat flaring, as shown. Each of the posts is supported by oblique braces M P, above and below the platform, and horizontal braces on either side, N N, and on either side of each post is a segmental guide, J, having on its inner face a deep groove, S, which extends through the entire length of the segment, and is continued horizontally in the inner face of the side piece of the platform toward the post. In each of the grooves S moves freely a friction-roller, R, attached to the outer face of one of the lower sections, *a a*, of a double lazy-tong frame.

This double frame consists of two single lazy-tong frames, one on each side of the platform A and parallel with each other. The two frames are connected by rods O, passing through the central intersections of the levers *a a* of the respective frames, and also by rods C, passing through the terminal intersections of said levers.

On the outer ends of each of the connecting-rods O, and outside of the levers *a a*, are pivoted friction-rollers B, adapted to enter and slide freely in the slots of the vertical posts F F' when the frame is folded, and on each of the rods C are mounted two double-grooved pulleys, L L, whose office will be hereinafter explained.

A windlass, G, provided with cranks H H', is journaled between the posts F F' above the platform A, and below the platform a shaft, V, is journaled in said posts, and has mounted on it, near each end, two loose grooved pulleys, I. At each end of the windlass G are coiled two ropes, D D', the four ropes so attached to the windlass being all wound thereon in the same direction. Of the two ropes at each end of the windlass, one passes to one of the pulleys I immediately beneath, while the other rope passes to the companion pulley, the two ropes passing around said pulleys in opposite directions. From the pulleys I said ropes pass in opposite directions back and forth around the grooved pulleys L, (see Fig. 3,) the ends of both ropes being secured at the top of the lazy-tong frame. From the top rod O, which joins the two frames and serves as a pivot for the topmost joint of each of them, is suspended a rope ladder, E, which is fastened to each of said rods O, from top to bottom of the frame, the length of said ladder being such that every part is stretched straight when the ladder is raised to its fullest working height.

The operation of the mechanism described is evident. To raise the lazy-tong frame the windlass is turned by means of the cranks H H', and the ropes D D' are gradually wound about it. The shortening of the ropes steadily narrows and lengthens the frame, raising each joint farther and farther above the platform until the frame is elevated to the desired height and the ladder E is stretched straight. As the frame rises the friction-rollers R move



downward and inward in the grooves S until they assume the position shown in Fig. 1, when the ladder is fully raised. At the same time the rollers B move upward in a vertical line and successively pass out of the slots in the posts F until, when the elevation is complete, but one of these rollers remains in the slot. The operation of lowering is the reverse of the one just described. The ropes are gradually uncoiled from the windlass, the lazy-tong levers fold closer together, the rollers B one by one enter the slots in the posts F, and the rollers R pass outward and upward in the grooves S. When the ladder is fully lowered, all the rollers B lie within the slots of the posts F, and the rollers R are near the upper ends of the slots S, respectively. During the entire operation of raising and lowering the frame the strain is distributed equally throughout its entire extent by the ropes D D', the topmost pair of pulleys, L, being drawn together with precisely the same force as the lowest pair.

I am aware that a lazy-tong frame applied to the raising of a ladder is an old and well-known device; but, so far as I know, the method of raising them has been to press together horizontally the lowest joint of the frame, the power being distributed throughout the entire structure by the levers composing it. As thus operated, it is evident that the lowest pair of levers must bear the lifting strain of the entire mechanism, whereas by the construction I have shown and described the strain is equally borne by the entire frame.

It is evident that instead of hanging the ladder E in the center of the frame it may be hung on the rods C, or that one may be hung in the center and one at each or either side; but the central position is preferable, as bringing the center of gravity directly and constantly in the center of the machine.

Instead of four ropes, as shown, two may be found sufficient for light ladders, both being preferably at the same end of the windlass, and constituting, in fact, one-half of the arrangement shown in these drawings; but I think four will more equally distribute the strain to all parts of the machine than two.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fire-ladder, the combination of a lazy-tong frame, a flexible ladder attached thereto and extending from top to bottom thereof, a series of pulleys pivoted at the terminal joints of the levers constituting said frame, ropes passing back and forth about said pulleys in opposite directions, and means for coiling and uncoiling said ropes, whereby said frame and ladder may be readily raised and lowered.

2. In a fire-ladder, the combination of two single parallel lazy-tong frames, a series of horizontal rods, O, connecting the central intersections of the levers constituting said frames, respectively, a series of horizontal rods, C, connecting the terminal intersections of said levers, a series of grooved pulleys pivoted on said last-mentioned rods, ropes D D', passing back and forth about said pulleys in opposite directions, a windlass for winding and unwinding said ropes, and a flexible ladder hanging in the center of said double frame and attached to each of said rods O, substantially as shown and described, and for the purpose set forth.

3. The combination of the base A and segments J, provided with the grooves S, the slotted vertical posts F F, and the double lazy-tong frame provided with rollers R R, and series of rollers B B, adapted to move in said grooves and slots, respectively.

4. The combination of the windlass G, ropes D D', wound thereon, pulleys I I, about which said ropes pass in opposite directions, and lazy-tong frames a a, provided with pulleys L L, all combined and operating substantially as shown and described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANCIS E. JOSEL.

Witnesses:

ROBERT H. WILES,  
OSCAR TAYLOR.