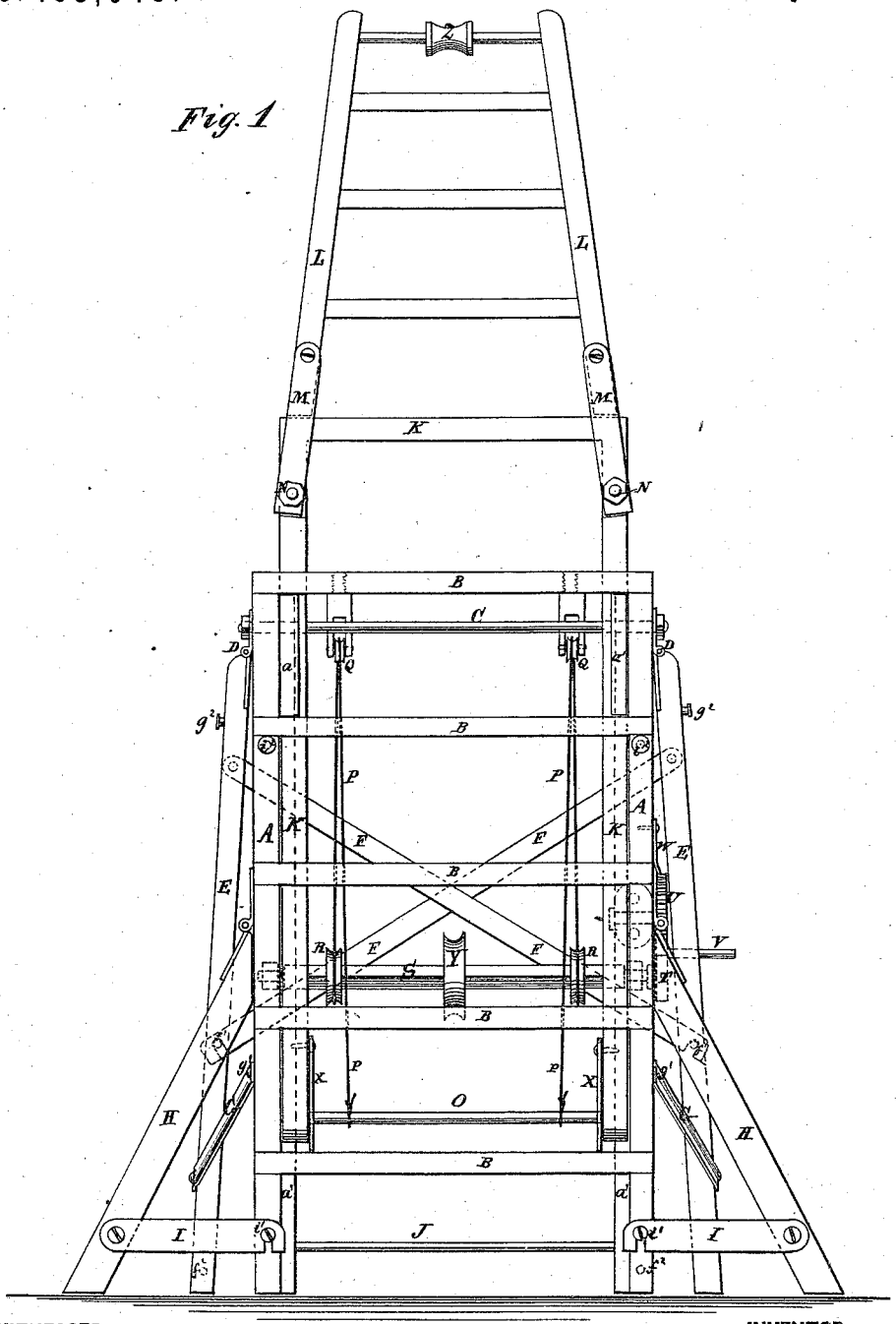
2 Sheets--Sheet 1.

E. CLARK.

Extensible Ladder.

No. 163,049. Patented May 11,.1875.

Fig. 1



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2 Sheets--Sheet 2.

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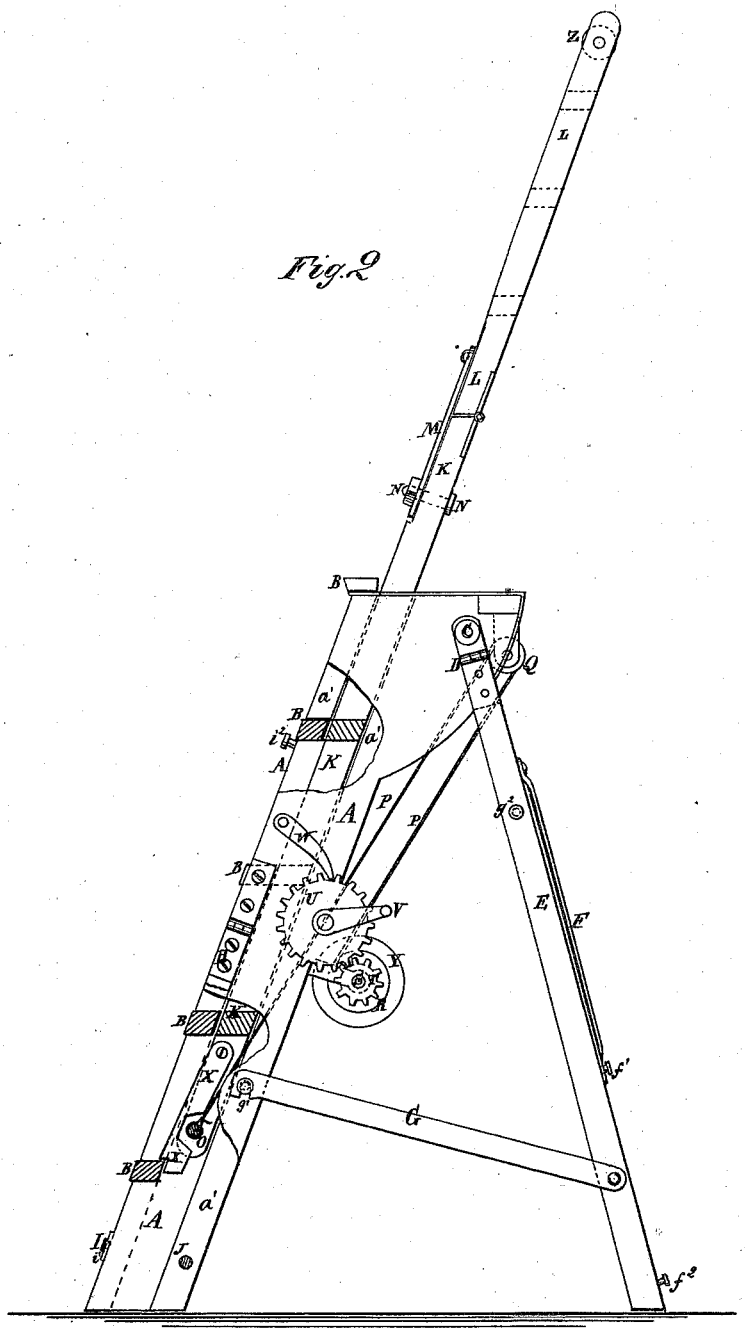
Fig. 2



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UNITED STATES PATENT OFFICE.

EDWARD CLARK, OF NEW YORK, N. Y.

IMPROVEMENT IN EXTENSIBLE LADDERS.

Specification forming part of Letters Patent No. **163,049**, dated May 11, 1875; application filed October 10, 1874.

To all whom it may concern:

Be it known that I, EDWARD CLARK, of the city, county, and State of New York, have invented a new and useful Improvement in Extension Step-Ladder, of which the following is a specification:

Figure 1, Sheet 1, is a front view of my improved extension step-ladder, shown as partly extended. Fig. 2, Sheet 2, is a side view of the same, parts being broken away to show the construction.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved extension step-ladder, which may be made extensible to any desired extent, and which shall be light, strong, and durable, and convenient in use.

The invention consists in the combination of the pivoted buttons or stop-bars with the side bars of the lower extension-section, and with the forward part of a step-ladder; and in the combination of the pivoted or hinged bars and the lock-bolts, with the adjacent ends of the side bars of the extension-sections, as hereinafter fully described.

A are the side bars of the step-ladder, the front edges of which are notched to receive the ends of the steps B. The upper ends of the side bars A are made wide, and through the rear parts of said ends is passed a rod, C, which binds the ladder, and the projecting ends of which pass through holes in the upper parts of the hinges D, which are secured in place by nuts screwed upon the said ends. To the lower parts of the hinges D are attached the upper ends of the legs E, which, by this construction, may be moved backward, forward, and sidewise without danger of breaking them. The legs E, when extended, are connected with each other by the brace-rods F, which are pivoted to the said legs at one end, cross each other, as shown in Fig. 1, and their other ends are hooked upon screws or other catches, f^1, attached to the other legs E. When the step-ladder is folded the free ends of the braces F are hooked upon screws f^2, attached to the same legs that their other ends are pivoted to. The legs E, when extended, are connected with the side bars A, and held in place by brace-rods G, which are pivoted at one end to the lower parts of the legs E, and their other ends are hooked upon screws g^1 attached to the lower parts of the side bars A. When the ladder is folded the free ends of the braces G are hooked upon screws g^2 attached to the sides of the legs E. The lower end of the front part of the ladder is braced by the braces H, the upper ends of which are hinged to the side bars A, and are beveled off upon their inner sides to rest against the side bars A. The braces H are held in position, when extended, by the hook-bars I, which are pivoted at one end to the lower parts of the braces H, and their other or free ends are hooked upon screws i^1 attached to the side bars A. When not in use the braces H are folded up along the sides of the side bars A, and the free ends of the hook-bars I are hooked upon screws i^2 attached to the upper parts of the said side bars A. The braces H I give a wide base to the foot of the step-ladder so that it will stand securely to whatever height it may be extended. The lower end of the forward part of the step-ladder is strengthened by a tie-rod, J, that passes through the lower parts of the side bars A. K is the lower section of the extension, which slides up and down along the inner sides of the side bars A, between the rear edges of the steps B, and the cleats a^1 attached to the said side bars A. The extension-sections slide up and down through a slot in the wide top step of the step-ladder, and to the upper ends of its side bars are hinged the lower ends of the side bars of the upper section L, in such a way that the upper section L may be turned down along the rear side of the lower section K. To the lower part of the side bars of the upper section are pivoted or hinged the upper ends of the bars M, which, when the said upper section is extended, overlap the upper parts of the side bars of the lower section, and are secured by bolts and nuts N. This construction makes the joint between the sections the strongest part of the ladder. For ordinary use the bars M may be secured by a sliding bolt or other convenient fastening. The lower ends of the side bars of the lower section K are connected by a tie-rod, O, to which are attached the lower ends of two cords, P. The cords P pass

over two pulleys, Q, pivoted to the rear part of the top step B, and around two pulleys, R, to which their other ends are attached. The pulleys R are attached to a shaft, S, which works in bearings attached to the rear edges of the side bars A, and to its end is attached a small gear-wheel, T. The teeth of the small gear-wheel T mesh into the teeth of a larger gear-wheel, U, pivoted to a support attached to the side bar A, and to it is attached the crank V, so that the extension sections can be easily raised and lowered by operating the said crank V. To the side bar A is pivoted a pawl, W, which engages with the teeth of the gear-wheel U, to hold the extension-sections in any position into which they may be raised, and to guard against the said sections running down should the crank V be accidentally released. To the lower part of the side bars of the lower section K are pivoted two buttons, X, the lower ends of which are notched to fit upon the rear upper corners of the steps B to support the sections. This construction allows the pawl W to be thrown back, and the cords P to be detached from the pulleys R, allowing the pulley-shaft S to be used for hoisting purposes. For this purpose a large pulley, Y, is attached to the center of the shaft S, to which is secured one end of a cord which passes over a pulley, Z, pivoted to the top round of the upper section L, and to its other end is attached the object to be raised and lowered.

The extension has been described as formed of two sections, but one or more than two may be used, if desired.

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

1. The combination of the pivoted buttons or stop-bars X, with the side bars of the lower extension-section, and with the forward part A B of a step-ladder.

2. The combination of the pivoted or hinged bars M, and the lock-bolts N, with the adjacent ends of the side bars of the extension-sections, substantially as herein shown and described.

EDWARD CLARK.

Witnesses:
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