B. HUBER.

FIREMEN'S ELEVATING LADDER.

No. 175,988. Patented April 11, 1876.

Fig. 2

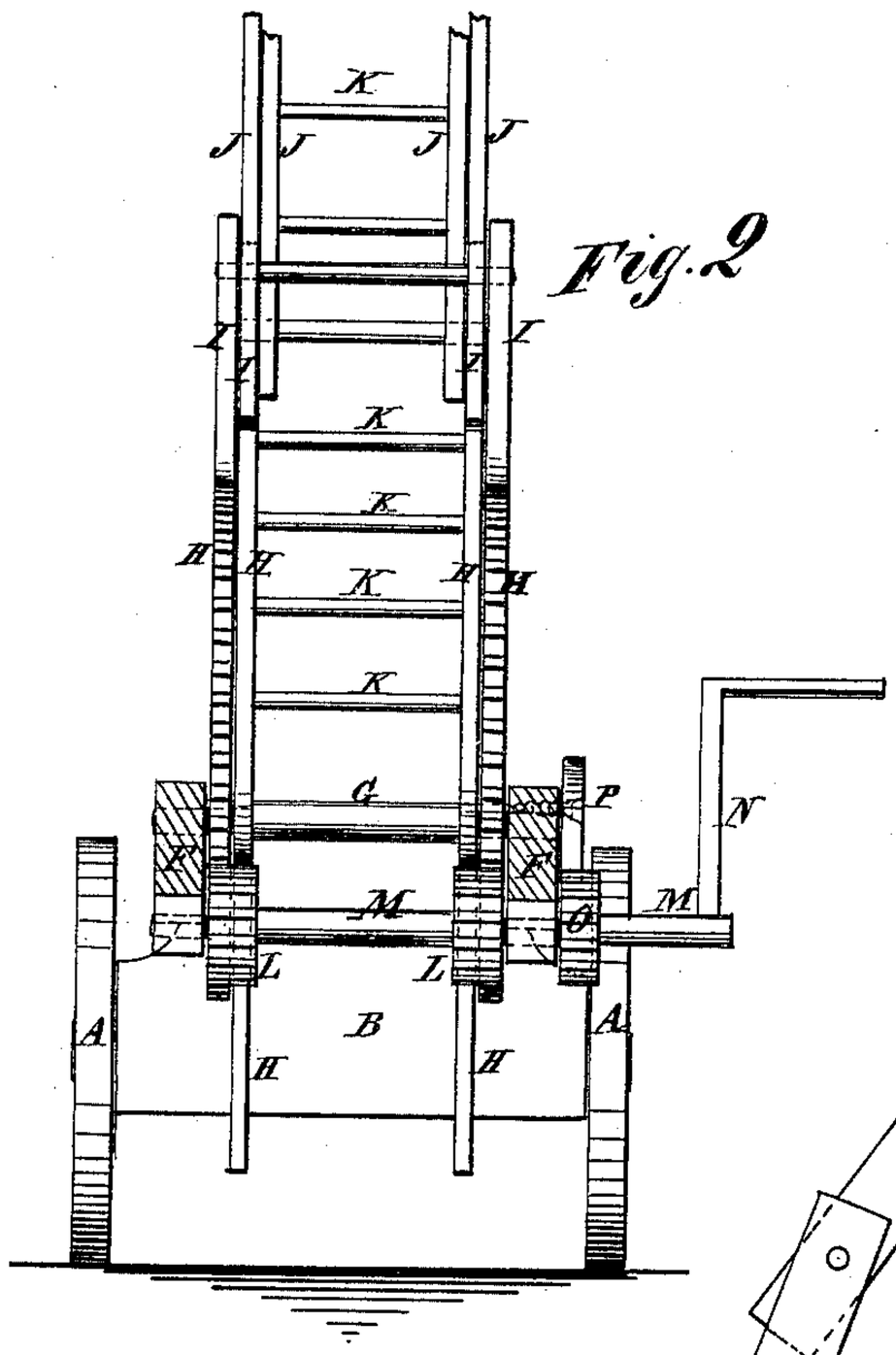
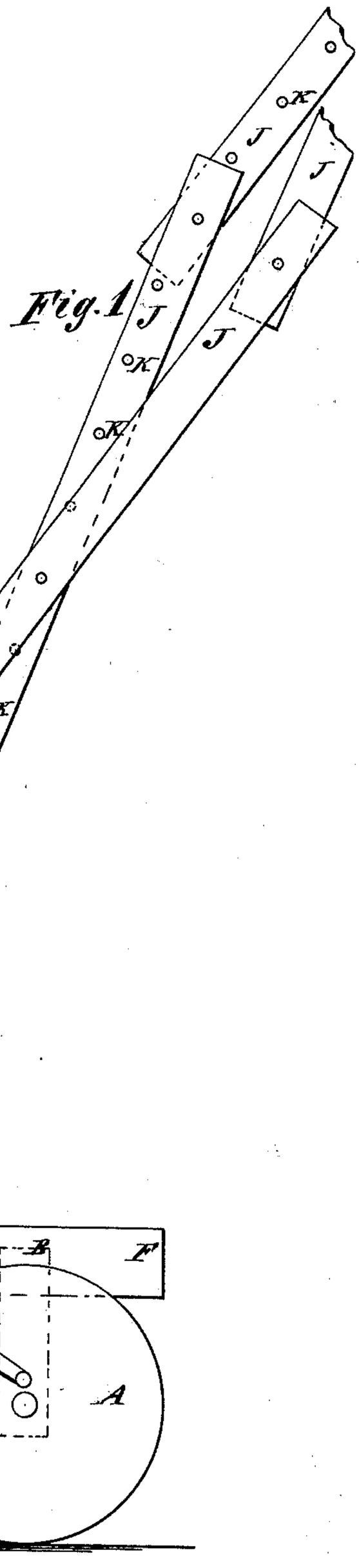


Fig. 1



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BERTHOLD HUBER, OF BROOKLYN, E. D., NEW YORK.

IMPROVEMENT IN FIREMEN'S ELEVATING-LADDERS.

Specification forming part of Letters Patent No. **175,988**, dated April 11, 1876; application filed October 23, 1875.

To all whom it may concern:

Be it known that I, BERTHOLD HUBER, of Brooklyn, E. D., Kings county, New York, have invented a new and useful Improvement in Extension-Ladders, of which the following is a specification:

Figure 1 is a side view of a portion of my improved extension-ladder, and Fig. 2 is a front view of the same, the carriage being shown in section, through the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved extension-ladder which may be raised vertically or inclined at any desired angle, and which will be simple in construction, convenient in use, and at the same time strong, durable, and safe.

The invention consists in the combination of the segmental gear-wheels and their arms with the extension-bars, the beams, and the gear-wheels and shafts by which they are operated; and in the combination of the rounds, arranged diagonally, with the extension-bars of the ladder, as hereinafter fully described.

A are the rear wheels, which revolve upon the journals of the axle B. C are the forward wheels, which revolve upon the journals of the axle D, which is pivoted to the bolster E by the king-bolt. F are two beams which rest upon and are secured to the axle B and bolster E. To the centers of the beams F is attached a shaft, G, to which, at the inner sides of the said beams F, are pivoted two pairs of segmental gear-wheels, H. To the gear-wheel segments H are attached, or upon them are formed, arms I, to the upper ends of which are pivoted the lower ends of two bars, J. The bars J are pivoted to each other at their centers, and to their upper ends are pivoted the lower ends of two other bars, J, and so on until the desired length has been reached. The pivots at the ends and centers of the bars J extend across so as to pivot the two sets of bars. The corresponding bar of each pair of the two sets are connected, by rounds K, at such a distance apart as to serve as the steps of a ladder. The row of rounds K, at one end of the bars J, begins near one edge of said bars and terminates near their other edge, being arranged diagonally, as shown in Fig. 1, so that said rows of rounds will not prevent the bars J from shutting up close together when the ladder is lowered. The rounds K also brace and greatly strengthen the ladder. The teeth of the gear-wheels or segments H mesh into gear-wheels L attached to two shafts, M, at the inner sides of the beams F. The shafts M revolve in bearings attached to the beams F, and to their outer ends are attached the cranks N, by which the ladder is raised and lowered. In the case of very large and heavy ladders, another gear-wheal may be used, which will give a greater power but slower motion. To the shafts M are attached ratchet-wheels O, to receive the pawls P, to lock the ladder in any position into which it may be adjusted. The pawls are made with toes upon both sides, so that they may engage with both sides of the ratchet-wheels O, to hold them securely in whichever position the ladder may be inclined. The ladder is designed to be provided with a brake, so that it may be lowered by its own weight, and quicker than it could be if lowered by means of the cranks, and at the same time have it perfectly under the control of the operator. With this construction the ladder may be raised to the top of a building, or to the window of any desired story, even when its base or carriage may be placed at a distance from the walls, so that awnings, &c., will offer no obstruction to its convenient use. With this construction, also, persons can ascend and descend upon it with the same facility as upon an ordinary straight ladder. The bars J, in the case of large and high ladders, may be strengthened with curved rods and with tie-bolts or trusses, so that it may be perfectly safe and capable of sustaining any desired weight. The ladder, with this construction, can be closed up very compactly, so that it can be conveniently taken from place to place, and will not require much room for storage.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. The combination, with parallel bars J J, of the rounds K, running diagonally thereacross, as shown and described, to enable the ladder to be folded closely together.

2. The combination of a single device, forming both ladder and lazy-tongs, with a curved rack, H I, on each side, and operated by a separate pinion, L, as shown and described, whereby the ladder may be readily thrown from right to left.

BERTHOLD HUBER.

Witnesses:

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