

(No Model.)

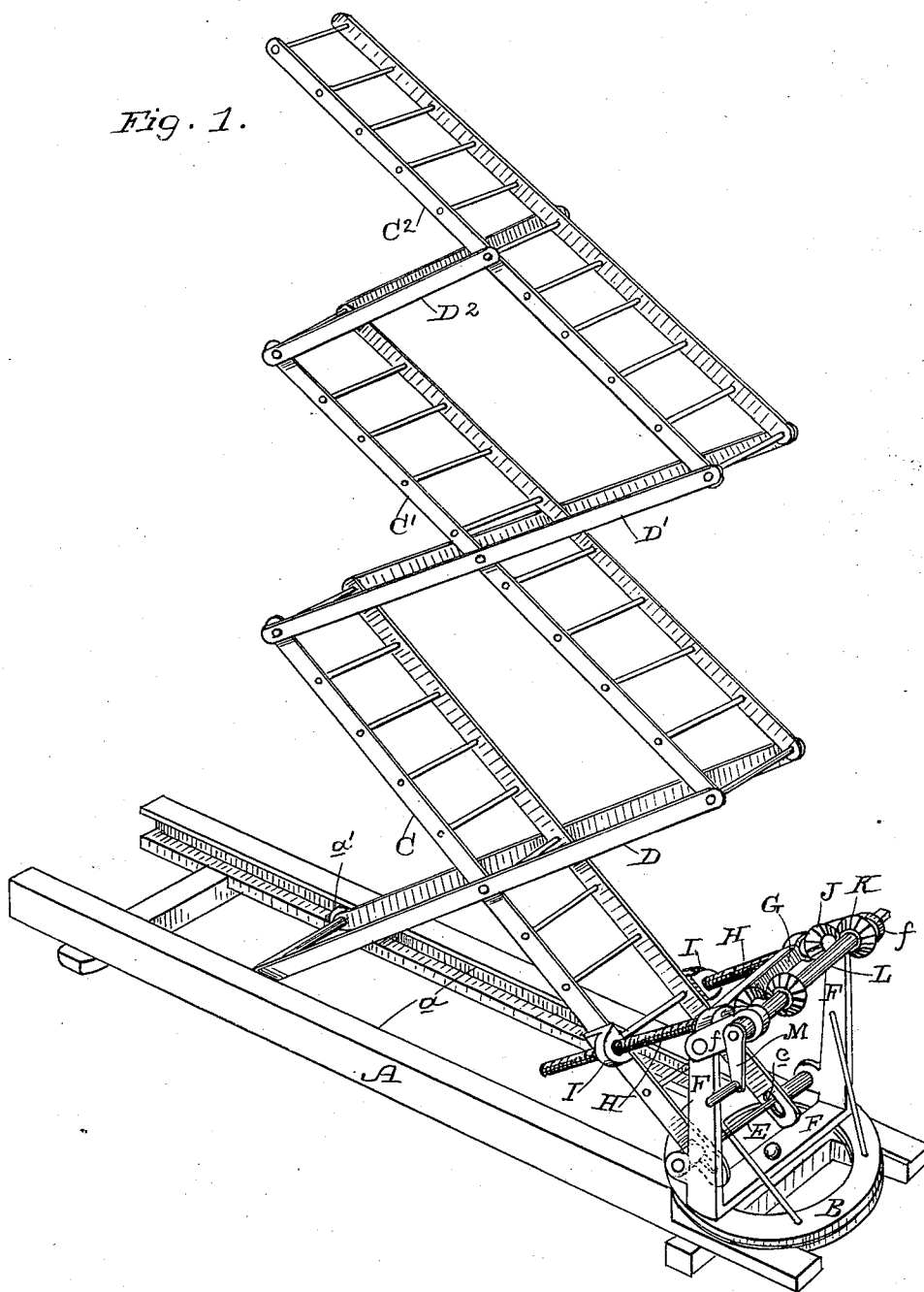
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L. H. FOWLER.
FIRE LADDER.

No. 478,278.

Patented July 5, 1892.

Fig. 1.



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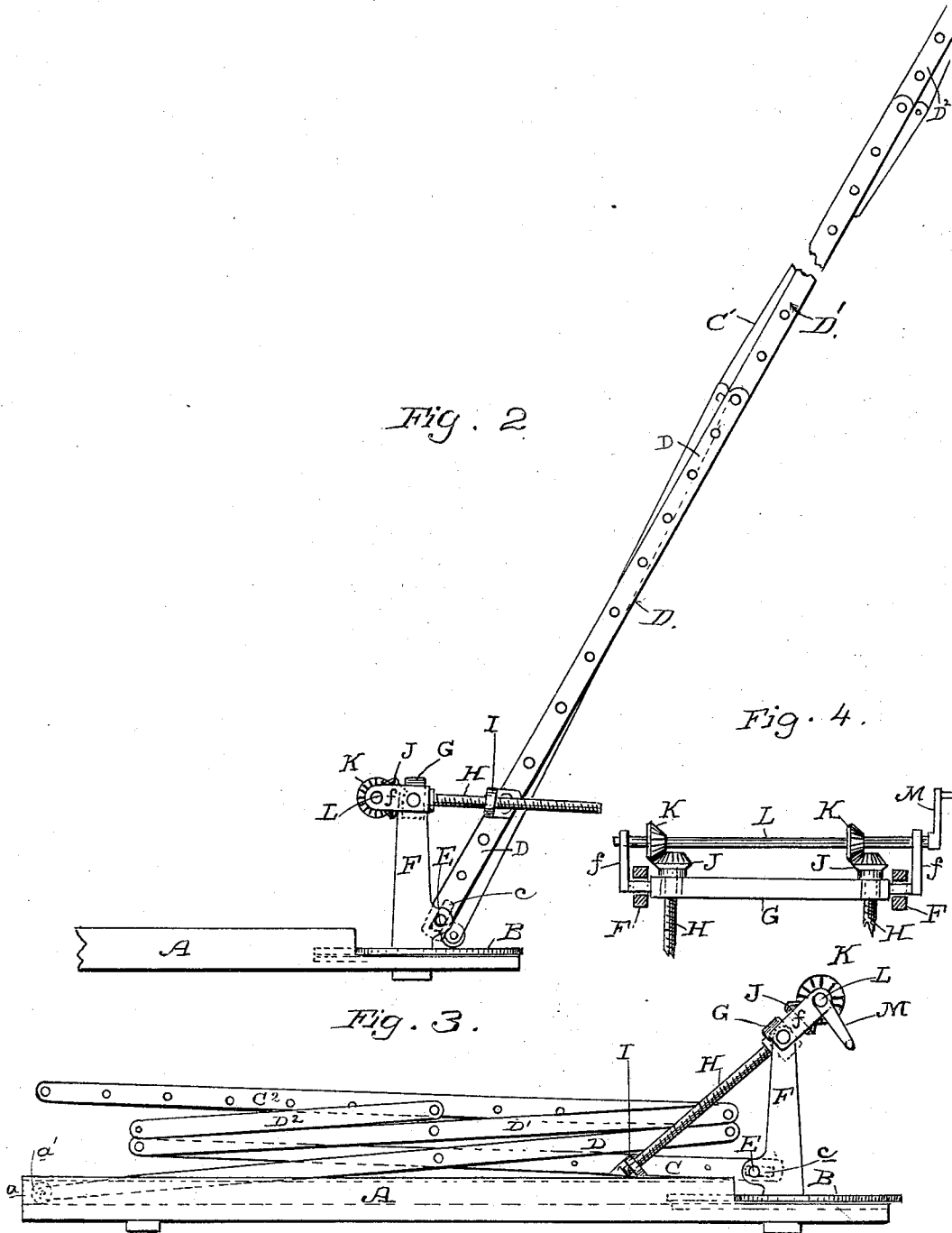
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UNITED STATES PATENT OFFICE.

LEWIS H. FOWLER, OF VALLEJO, CALIFORNIA.

FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 478,278, dated July 5, 1892.

Application filed August 18, 1891; Serial No. 403,029. (No model.)

To all whom it may concern:

Be it known that I, LEWIS H. FOWLER, a citizen of the United States, residing at Vallejo, Solano county, State of California, have invented an Improvement in Fire-Ladders; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of fire-ladders in which pivotally-connected ladder and link sections are so joined as to enable the ladder to be folded or extended.

My invention consists, in connection with a ladder of this description and the framework in which it is mounted, of peculiar and novel power mechanism for raising, inclining the ladder to any angle, and lowering it, hereinafter fully described, and specifically pointed out in the claims.

The object of my invention is to provide a fire-ladder which is adapted to be folded into small compass and readily extended and adjusted to position, the operation requiring the exercise of but small power.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a perspective view of my ladder, showing it partly raised. Fig. 2 is a side elevation showing the ladder raised, turned around, and tilted. Fig. 3 is a side elevation showing the ladder collapsed. Fig. 4 is a detail of the gear connection.

A is the frame or body of a truck, adapted to carry the ladder. Upon this truck is a turn-table B.

The ladder consists of any number of independent sections. (Here shown as three in number and designated by C, C', and C².) The lowermost section is pivoted at its lower end upon a cross-shaft E, supported by a suitable frame-work, such as the standards F, mounted upon the turn-table B. This pivotal connection c is a slotted one to enable the ladder when raised to tilt. Pivoted approximately at the middle of the sides of the lowermost ladder-section is the lowermost link-section D, the upper end of which is pivoted to the lower end of the middle ladder-section. A middle link-section D' is pivoted at its lower end to the upper end of the lowermost ladder-section, at its middle portion to the middle portion of the middle ladder-section, and at its upper end to the lower end

of the uppermost ladder-section. A third link-section D² is pivoted at its lower end to the upper end of the middle ladder-section and at its upper end to about the middle of the uppermost ladder-section. The lower end of the lowermost link-section is mounted and adapted to travel in side guides a in the truck-frame, and to diminish the friction said lower end may be provided with anti-friction rollers a'.

Mounted in the standards F, which rise from the turn-table, is a rock-shaft G, in which, near each end thereof, is seated a screw H. These screws extend through and operate in nuts I, secured to the lowermost ladder-section. Upon the heads of these screws are bevel-pinions J, with which mesh bevel-gears K on a cross-shaft L, supported in arms or bearings f, carried by the ends of the rock-shaft G. Suitable power may be applied to rotate this shaft, as by means of the crank M on its end. The nuts I are secured so that they swing with their changing positions.

The operation of my fire-ladder is as follows: When in a folded position, the ladder and link sections lie in approximately horizontal planes and are carried upon the truck-frame A. The screws occupy then an inclined position, the rock-shaft in which they are mounted permitting of the necessary changes of position of the screws to allow them to accommodate themselves to the varying positions of the ladder. Now, to raise the ladder the power-shaft is turned, whereby the screws are operated, and said screws being seated in the nuts I draw said nuts upwardly. This movement of the nuts raises the lowermost ladder-section, and consequently effects the rapid extension of all the sections and links of the ladder. In this extending movement the lower end of the lowermost link-section travels forwardly in the guides a of the frame in a direction toward the pivoted lower end of the lowermost ladder-section. This extension continues, the screws gradually rising with the lowermost ladder-section by rocking with the shaft G, in which they are mounted, and the swinging nuts conforming until the lower end of the lowermost link-section reaches the turn-table, upon which it is drawn, whereupon the whole ladder is now supported on the turn-table and is in a verti-

cal position, with its ladder and link sections approximately parallel. The ladder can now be turned around sidewise with the turn-table and the power-shaft operated in the reverse direction, whereby the nuts are caused to travel outwardly on the screws, leaving the base of the lower link-section on the turn-table. This has the effect of inclining the whole ladder to any angle desired, and by means of the turn-table the ladder may be adjusted to any bearing-point required. As the ladder tilts on the lower link-section, the slotted connection *c* is necessary. To lower the ladder, it is turned, with the table, to its position in line with the truck, and the lower end of the lowermost link-section being pulled backwardly to give it a start the operation of the screws will cause the nuts to travel outwardly and effect the separation of the link-section from the lowermost ladder-section, thereby causing the lowering or folding up of the entire ladder to its recumbent position upon the frame. This power mechanism is simple and effective and causes a true and accurate movement of the several parts, requiring the exercise of but little power. The power-shaft *L* being carried by the arms *f*, which extend from rock-shaft *G*, the pinions *J* and gears *K* will always remain in engagement.

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

1. In a fire-ladder, the combination of the extensible pivotally-connected sections constituting the ladder, the nuts on one of said sections, the screws operating in and through the nuts, and the rock-shaft carrying the screws, substantially as herein described.

2. In a fire-ladder, the combination of the extensible pivotally-connected sections constituting the ladder, the nuts on one of said sections, the screws operating in and through the nuts, and the rock-shaft carrying the screws and gearing between said shaft and screws, substantially as herein described.

3. In a fire-ladder, the combination of the

pivotally-connected ladder and link sections, the lowermost ladder-section having a pivotal connection and the lowermost link-section having a sliding connection, the nuts on the lowermost ladder-section, the rock-shaft, the screws seated in said rock-shaft and operating in and through the nuts, and the power-shaft and gears for operating the screws, substantially as herein described.

4. In a fire-ladder, the combination of the truck-frame having the side guides, the turn-table mounted upon said frame, the pivotally-connected ladder and link sections, the lower end of the lowermost link-section being adapted to travel in the side guides of the truck-frame to and upon the turn-table, a pivotal connection of the lower end of the lowermost ladder-section with the turn-table, the standards of the turn-table, the rock-shaft in said standards, the operating-screws carried by the rock-shaft, the nuts on the lowermost ladder-section in and through which the screws operate, and a power-shaft and gearing by which the screws are operated, substantially as herein described.

5. In a fire-ladder, the combination of the frame with side guides, the turn-table, the ladder and link sections, the lower link-section sliding in the side guides of the frame to and upon the turn-table, the standards on the turn-table, the cross-shaft *E* of standards upon which the lower link-section is pivotally slotted, the rock-shaft in the standards, the screws carried by the rock-shaft, the swinging nuts on the lower ladder-section receiving the screws, the power-shaft supported from the rock-shaft, and gearing between said power-shaft and screws, substantially as herein described.

In witness whereof I have hereunto set my hand.

LEWIS H. FOWLER.

Witnesses:

S. H. NOURSE,
J. A. BAYLESS.