(No Model.)

E. E. FOX & G. McDORMAND.

LADDER.

No. 308,602. Patented Dec. 2, 1884.

Fig. 1.

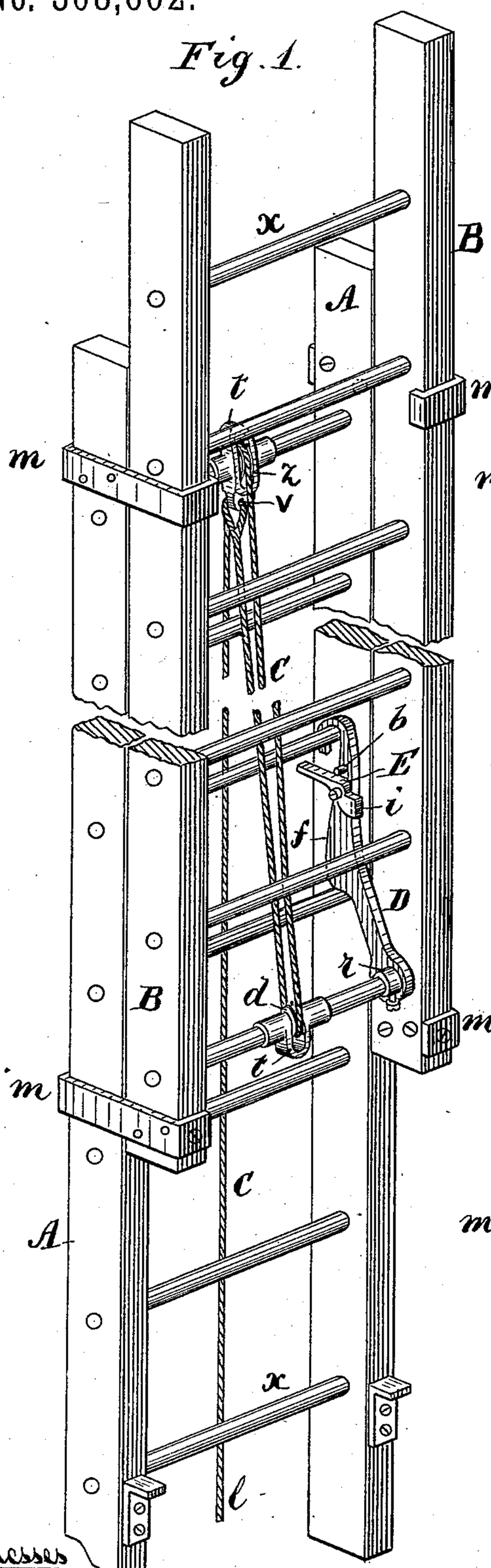
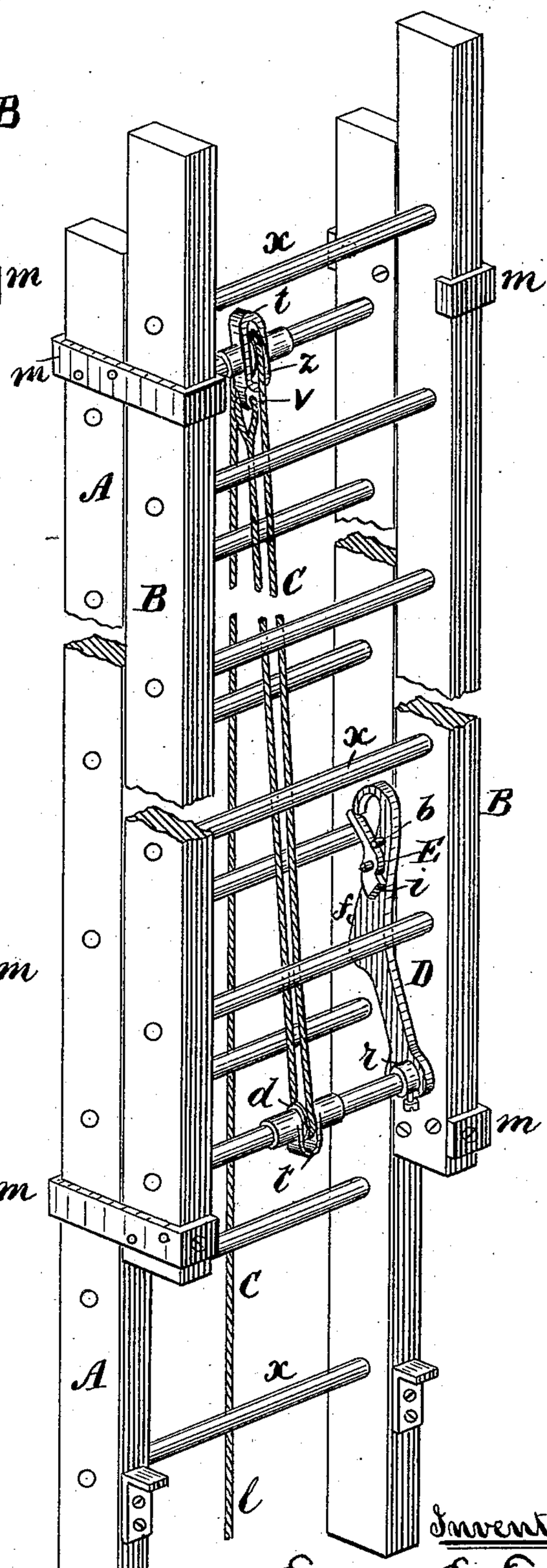


Fig. 2.



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UNITED STATES PATENT OFFICE.

EUGENE E. FOX AND GEORGE McDORMAND, OF SOMERVILLE, MASS.

LADDER.

SPECIFICATION forming part of Letters Patent No. 308,602, dated December 2, 1884.

Application filed September 30, 1884. (No model.)

To all whom it may concern:

Be it known that we, EUGENE E. FOX and GEORGE MCDORMAND, of Somerville, in the county of Middlesex, State of Massachusetts, have invented a certain new and useful Improvement in Ladders, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an isometrical perspective view of our improved ladder, representing the hook engaged with a rung; and Fig. 2, a like view representing the hook disengaged.

Like letters of reference indicate corresponding parts in both figures of the drawings.

Our invention relates to that class of ladders which are extensible, and is designed as an improvement on the ladder secured to us by Letters Patent of the United States bearing date September 2, A.D. 1884, and numbered 304,420; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more desirable and effective device of this character is produced than is now in ordinary use.

In said patented ladder the hooks were secured to a rocker-shaft provided with an arm or lever to which the hoisting chain or cord was attached, the hooks being forced into engagement with the rungs by means of a spring when the cord was released; but in actual use we have found that the hooks when so operated are not always sure to engage the rungs at the proper time, and that great skill and experience are required in order to manipulate the ladder effectually. The use of an arm or lever on the rocker-shaft also necessitates arranging the two sections of the ladder at a greater distance apart than would otherwise be required, and the spring is liable to be accidentally broken or deranged by the rough handling such ladders are liable to receive. These objections and difficulties are obviated by our present improvement, the nature and operation of which will be readily understood by all conversant with such matters from the following explanation:

The ladder consists of two sections, A B, each provided with a series of rungs, *x*, the sections being fitted to slide longitudinally on each other by means of the clamps *m*.

A sheave, *d*, is journaled centrally on the lower rung of section B, and a corresponding sheave, *z*, on the upper rung of section A, the sheaves being respectively provided with guards *t*.

Projecting downwardly from the rung on which the sheave *z* is journaled there is an arm, *v*, and secured to this arm there is a cord, C, the cord being carried thence under and around the sheave *d*, thence over and around the sheave *z*, and thence to the ground at 1.

Pivoted by its lower end to the same rung on which the sheave *d* is journaled there is a gravitating hook, D, so constructed and arranged as to adapt it to fall inwardly and engage the rungs of section A. This hook is provided with a cam, *f*, on its inner edge, and with a pivoted lever or latch, E, adapted to close the hook as the section B descends. The lever is provided with a counter-balance, *i*, for keeping it in a horizontal or proper position to engage the rungs of section A in closing the hook, and there is also a guard-pin, *b*, to keep the lever from falling so low when the hook is open as to prevent it from engaging said rungs. The thickened portion or cam *f* acts as a weight to cause the hook to gravitate toward the rungs of section A, the hook being kept in proper position on its pivotal rung by the fixed collet *r*.

Only one hook is represented in the drawings; but it will be understood that two may be employed on the same rung, if desired.

In the use of our improvement, when the cord C is pulled downwardly to raise section B or cause it to slide upwardly on section A, and thus extend the ladder, the inner or free end of the latch E will strike the rung, thereby opening the hook, after which the cam *f* will be brought into contact with the same rung, causing the upper end of the hook to be thrown outwardly to enable it to pass the next succeeding rung. The section B continuing to advance, and the cam *f* having passed the rung with which it was in contact, the hook will now fall inwardly and engage a rung of section A in a manner which will be readily obvious without a more explicit description.

When the ladder is extended and the hook is engaged with a rung of section A, as shown

in Fig. 1, if, now, it is desired to lower or close the ladder, the cord C is pulled downwardly until section B is raised a sufficient distance to disengage the hook D from the rung with which it is engaged, and carry the lever E above said rung, at the same time bringing the cam *f* into contact with the rung and throwing the free end of the hook outwardly, after which the cord is released, thus permitting section B to descend, bringing the lever E into contact with the ring and closing the hook, as shown in Fig. 2, it being obvious that when the hook is closed it will pass downwardly over all of the rungs in section A without engaging them.

The point of the lever E projects or is extended slightly beyond the hook D, so that in case the hook is closed as section B passes upwardly the lever will catch on the rungs of section A and open it.

We are aware that in the expired patent of Ackerman, No. 65,525, a hook is shown provided with a weighted tumbler pivoted to its upper end and near the front side thereof; but said hook is essentially different from that in our ladder, being more complicated, expensive to construct, and liable to get out of order. In our ladder the hook is provided with a cam on its under or rear side, the cam being integral with the body of the hook, thereby simplifying it and rendering it strong and durable. We do not therefore claim anything shown or described in the patent of said Ackerman when in and of itself considered.

Having thus explained our invention, what we claim is—

I. In an extensible ladder, the pivoted hook D, provided with the cam *f* and lever E, in combination with the sections B A and means for raising section B, substantially as described.

2. In an extensible ladder, the pin *b*, in combination with the hook D, for preventing the latch or lever E from dropping too low, substantially as set forth.

3. In an extensible ladder, the combination of the following instrumentalities, to wit: two sections, each provided with a sheave and rungs and adapted to slide one on the other, a cord passing over the sheaves for raising and lowering one of the sections, and a gravitating hook pivoted to a rung of one of the sections and adapted to engage the rungs of the other section, said hook being provided with a lever or latch for closing its mouth and a cam for throwing it outwardly to enable it to pass upwardly over the rungs of the section to which it is not pivoted, substantially as described.

4. The improved extensible ladder herein described, the same consisting of the section A, provided with the rungs *x* and sheave *z*, the section B, provided with the rungs *x* and sheave *d*, the hook D, provided with the cam *f* and lever E, and the cord C, constructed, combined, and arranged to operate substantially as set forth.

5. In an extensible ladder, the lever E, extended beyond the end of the hook D, whereby said lever is enabled to engage the rungs of section A and open the hook as it passes upwardly over said rungs, substantially as described.

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