

(No Model.)

W. WRIGHT.
LADDER TRUCK.

No. 575,193.

Patented Jan. 12, 1897.

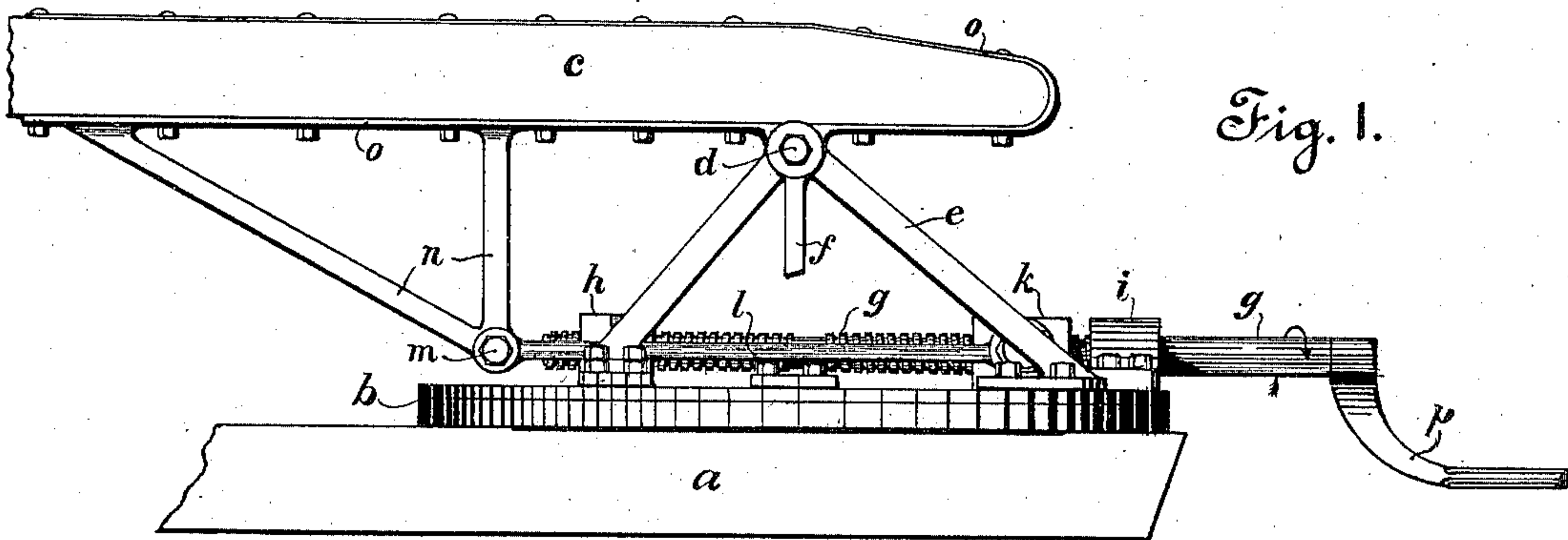


Fig. 1.

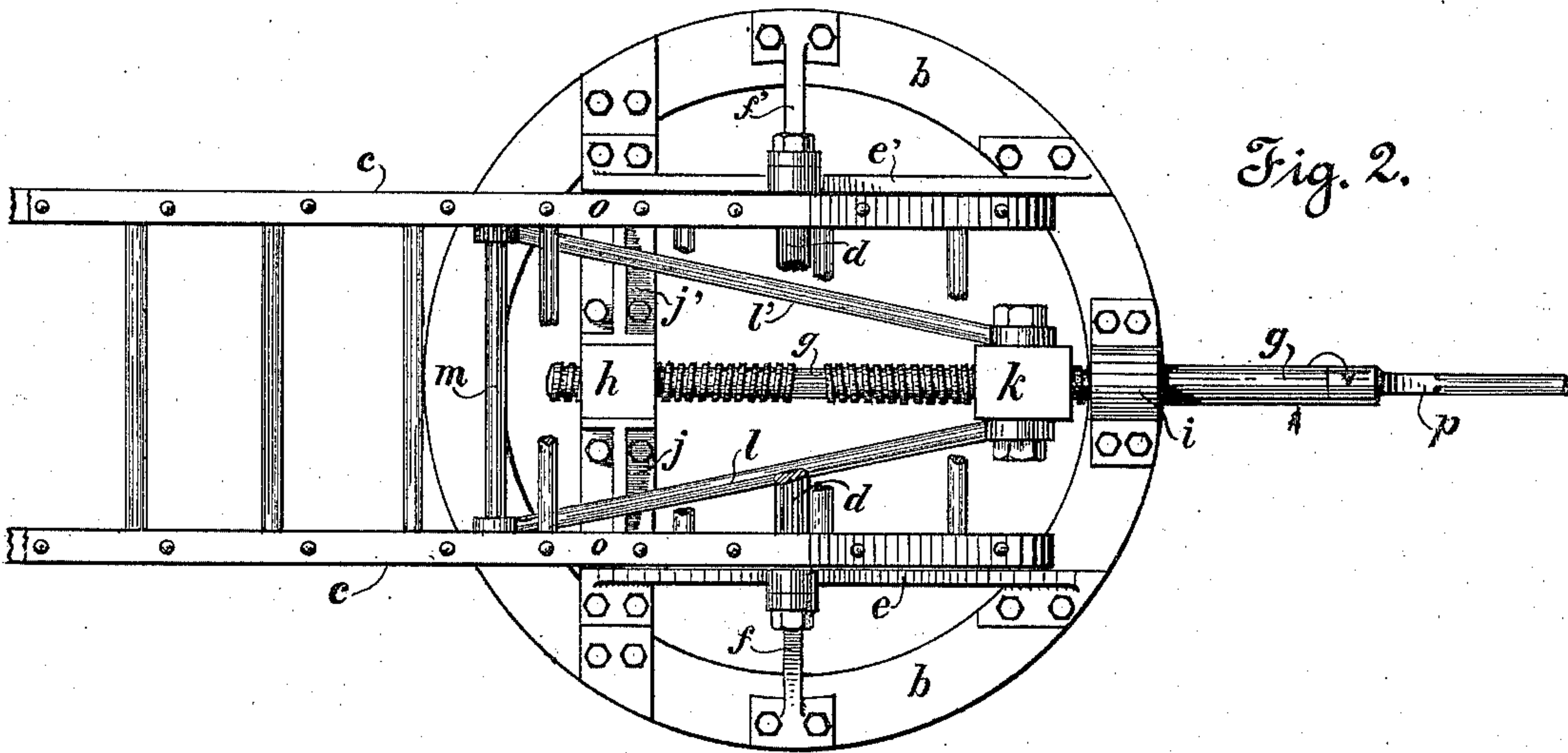


Fig. 2.

Fig. 3.

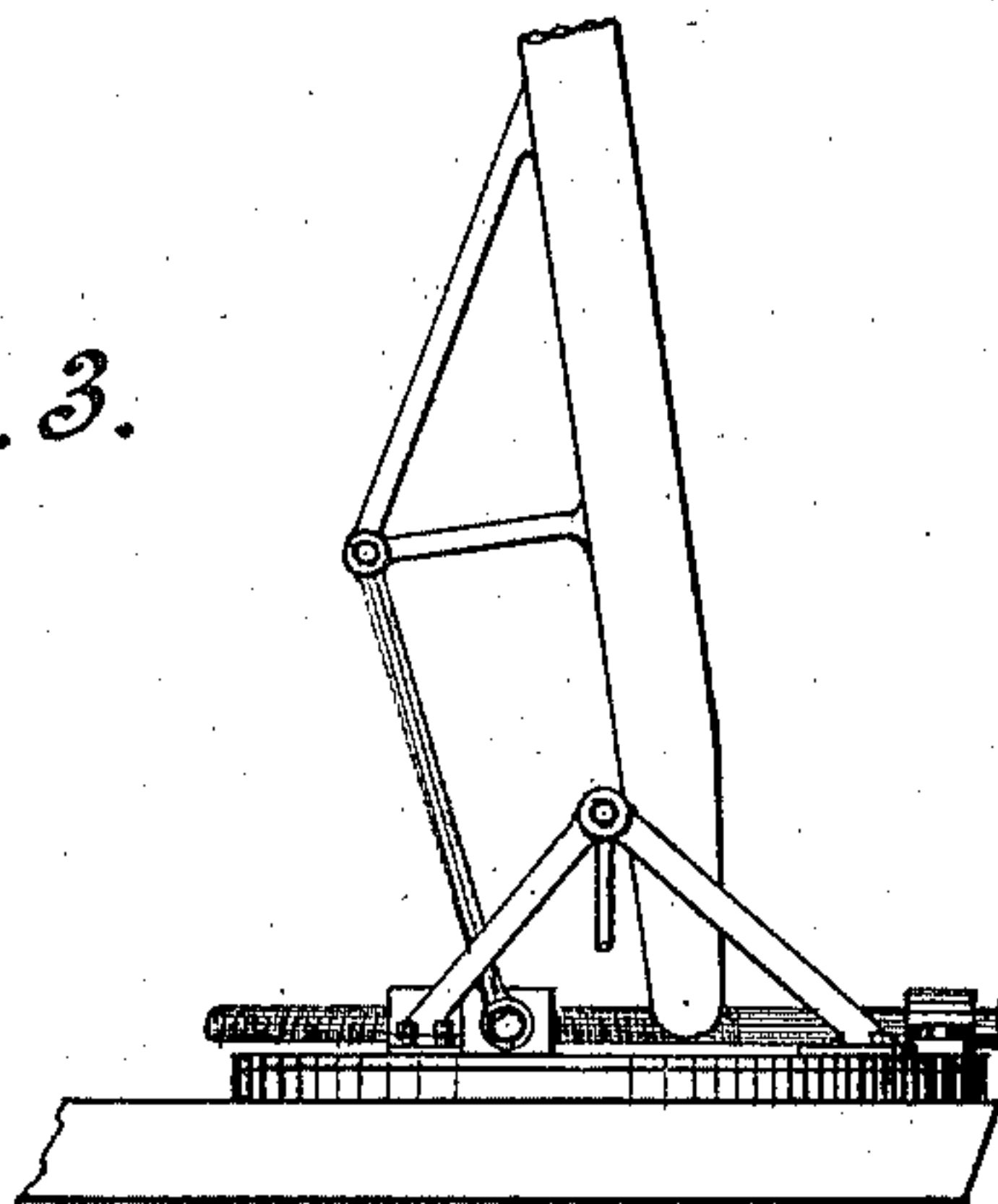
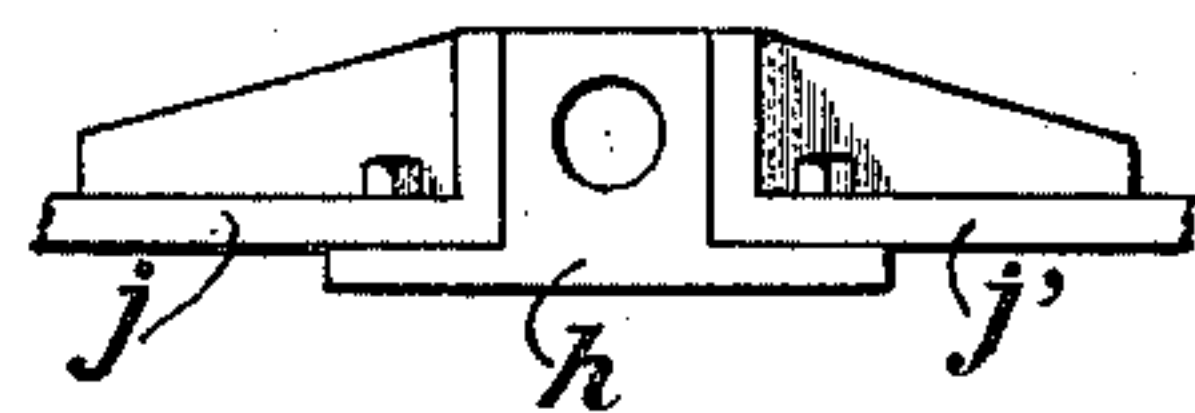


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM WRIGHT, OF ELMIRA, NEW YORK.

LADDER-TRUCK.

SPECIFICATION forming part of Letters Patent No. 575,193, dated January 12, 1897.

Application filed April 3, 1896. Serial No. 586,081. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WRIGHT, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Turn-Table Extension-Ladder Trucks, of which the following is a specification.

My invention relates to improvements in extension-ladder trucks, used more particularly for fire service, in which the main or butt ladder is mounted upon a turn-table on the body of the truck and a screw is employed to raise the said ladder from a horizontal to a vertical or intermediate position; and the objects of my invention are, first, to so construct the screw and its connections that the ladder shall be raised in a much shorter time and with less exertion on the part of the men at the crank in proportion to the time than has heretofore been done, and, second, to set the main ladder down closer to the frame, so that the tiller-man may sit above it and have an unobstructed view ahead. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a truck and ladder, showing my invention; Fig. 2, a plan view of the same; Fig. 3, a side elevation, on a smaller scale, showing the ladder in raised position; and Fig. 4, a detail showing the manner of securing the stationary nut.

Similar letters refer to similar parts throughout the several views.

To the truck-frame *a* is secured the turn-table *b*, above which swings the main ladder *c* on the shaft *d*, which is supported above the turn-table by the V-braces *e e'* and side braces *f f'*. The screw *g* is secured to the top plate of the turn-table in a diametrical position by the stationary nut *h* and journal-box *i*. The stationary nut is fastened between the two braces *j j'*, which are strengthened by ribs, as shown more clearly in Fig. 4, to hold the nut up under the downward pressure of the ladder. One half of the screw between the stationary nut and journal-box is cut with a left-hand thread and the other half with a right-hand thread. The left-hand thread screws into the stationary nut, while upon the right-hand thread is a traveling nut *k*. From studs at the sides of this nut

run the connecting-rods *l l'* to the bar *m*, joining the lower points of the triangular braces *n*, which project downward from beneath the sides of the main ladder, at some little distance to the rear of the shaft *d*. These braces and the eyes which hinge the ladder to the shaft *d* are welded to straps *o*, which run around the ends of the ladder sides and form bearings for the heads and nuts of the fastening-bolts, as shown.

By locating the braces *n* to the rear of the pivotal point of the ladder, *i. e.*, the shaft *d*, and at a proper distance therefrom I gain in leverage something more than I lose by setting the pivotal point down nearer to the screw, since I move the point of application of the lifting force away from the fulcrum and nearer the weight. Since the bar *m* is on a level with the axis of the screw when the ladder is in its lowest position, there will be a direct thrust through the rods *l l'* upon the nuts and screw during the first lifting of the ladder, when the work is the greatest. This avoids pressure of the screw upon its bearings during this period and the consequent frictional resistance to turning in said bearings. As the ladder rises the component of downward thrust upon the screw increases, but since the leverage of the weight of the ladder is continually decreasing, and more rapidly as the arc of its travel increases, the total force required to be exerted upon the screw is continually decreasing until, when the ladder is in vertical position, the downward and forward thrust of the ladder upon the screw becomes zero, since the weight of the ladder then rests wholly upon the shaft *d*. Another point of advantage in my construction is that the travel of the nut *k* is small and consequently the length of the screw exposed between bearings is so short that the screw alone will support all the downward thrust upon it, and guides for the traveling nut to support this thrust are unnecessary. This simplifies construction, reduces expense, and avoids frictional resistances.

The operation of my device is as follows: When the crank *p* is turned in the direction of the arrow, the nut *k* moves forward, pushing on the rods *l l'* and raising the ladder. At the same time the screw is drawn forward by the nut *h*, the crank end of the screw sliding

through the journal-box *i*. The nut *k* will therefore travel twice the pitch of the screw for each revolution of the crank. In other words, if the distance between the nuts *h* and *k* is twenty-four inches and the pitch of the screw is one thread to the inch the nut *k* will travel the twenty-four inches in twelve turns of the crank, and the screw will have moved forward a distance of twelve inches.

From the nature of my construction it will be seen that I can set the main ladder quite low upon the truck, the height depending upon the weight of the ladder and the leverage required to raise it easily. For a seventy-five-foot extension-ladder I propose to place the shaft *d* about eighteen inches above the top of the turn-table.

It will also be noticed that by extending the end of the screw beyond the stationary nut and squaring it for the crank I may operate the ladder with equal facility when the turn-table has been turned half-way around.

I may place a roller-bearing in the journal-box *i* to make the screw run easier, if necessary, and I may also reverse the positions of the stationary nut and journal-box.

Changes may be made in the manner of connecting the nut *k* to the ladder and also in the manner of securing the stationary nut in place, and I do not, therefore, wish to be understood as confining myself to the specific construction illustrated.

I am aware that prior to my invention screws having right and left hand threads

have been used in raising the main ladders of this species of truck, and I do not claim this idea broadly.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a turn-table truck, the combination of a screw supported upon the turn-table, a traveling nut upon the screw, a ladder pivoted to the turn-table above the screw, braces depending from the ladder at the rear of its pivotal point and connections between the braces and the traveling nut whereby the pressure upon said nut shall be in the direction of the axis of the screw when the ladder is in its lowest position.

2. In a turn-table truck, the combination of a right-and-left screw, a nut for one of its threads rigidly attached to the turn-table, a journal-box for the shank of the screw also attached to the turn-table, a traveling nut on the other thread of the screw, a ladder pivoted to the turn-table above the screw, braces depending from the sides of the ladder at the rear of its pivotal points and having their extremities on a line with the axis of the screw when the ladder is in its lowest position, and connecting-rods between said extremities and the traveling nut.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM WRIGHT.

Witnesses:

A. S. DIVEN, 2d,
EUGENE DIVEN.