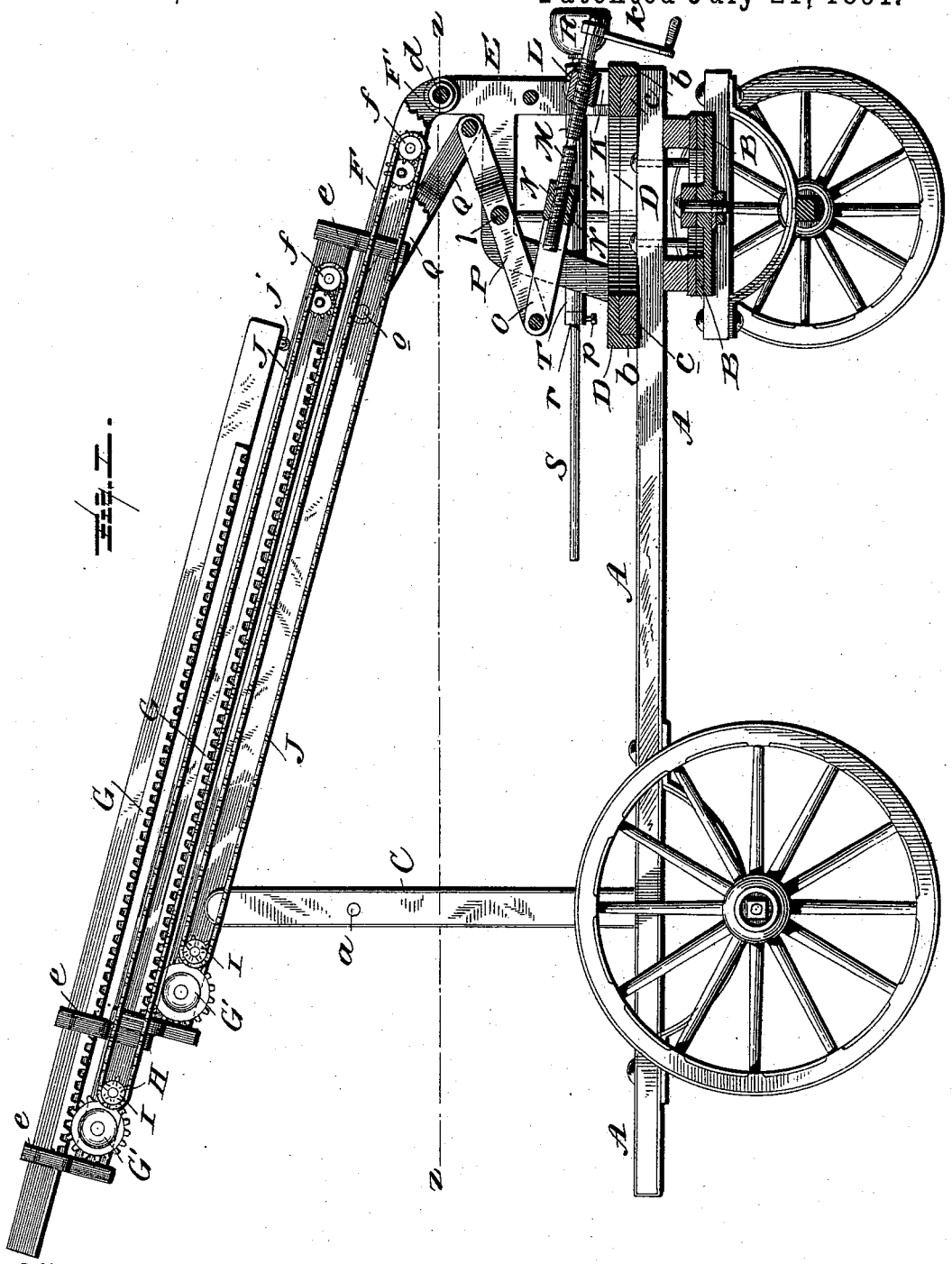
(No Model.) 2 Sheets—Sheet 1.

A. RUTHENBERG.

EXTENSION LADDER TRUCK.

No. 456,224. Patented July 21, 1891.



Witnesses
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E. A. Bond.

Inventor
August Ruthenberg,
per Chas. G. Fowler
Attorney

(No Model.) 2 Sheets—Sheet 2.

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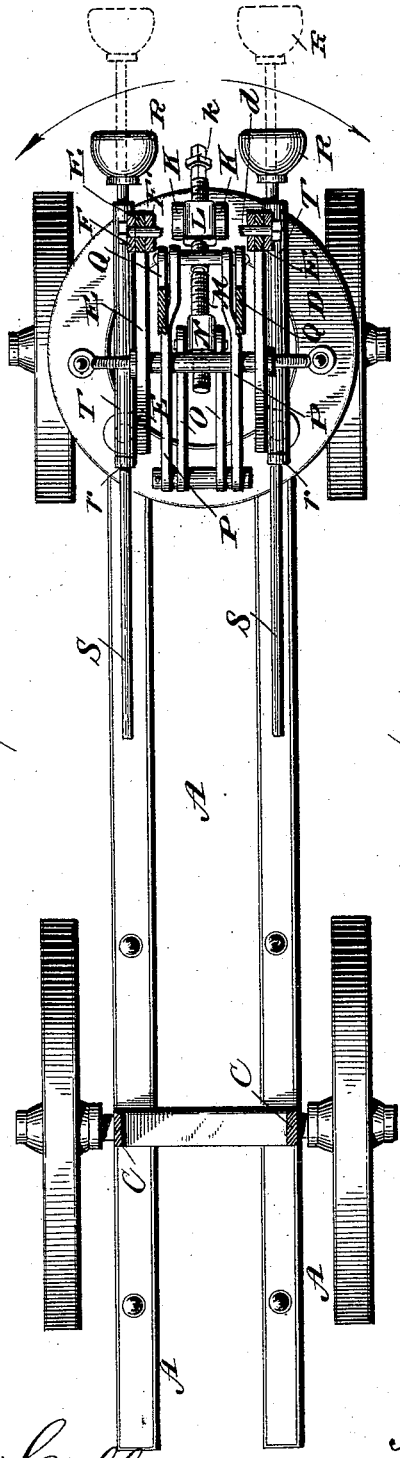

Fig. 1.

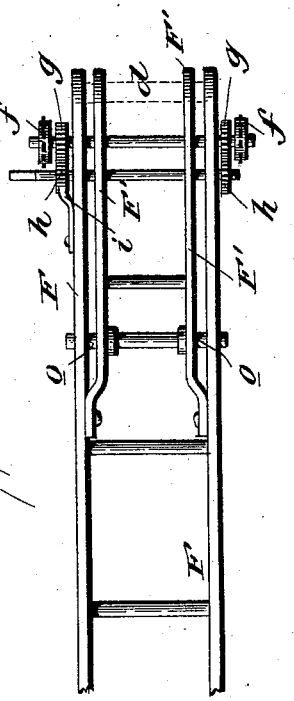

Fig. 2.

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UNITED STATES PATENT OFFICE.

AUGUST RUTHENBERG, OF ROCHESTER, NEW YORK.

EXTENSION-LADDER TRUCK.

SPECIFICATION forming part of Letters Patent No. 456,224, dated July 21, 1891.

Application filed February 24, 1891. Serial No. 382,487. (No model.)

To all whom it may concern:

Be it known that I, AUGUST RUTHENBERG, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Extension-Ladder Trucks; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

This invention relates to certain new and useful improvements in ladders designed more particularly for use by the fire departments in case of fire, but of course applicable to other uses to which it may be put.

It has for its objects, among others, the provision of an improved ladder and truck which can be easily and quickly managed, the ladder raised and lowered or extended by the exertion of little power. I provide a double screw for raising the ladder, said screw actuating the toggle-levers which support the ladder. The double screw is much stronger than a single screw and accomplishes about four times the work with one-quarter the power or labor. A double lever is employed in connection with this double screw to add strength and power. I provide adjustable counterweights to counterweight the ladder or whole truck to be employed to counterbalance the ladder when it is mounted by several men with the hose and to prevent it toppling over when it is turned away from the building. These weights are carried by sliding rods easy to handle and readily affixed in their adjusted position.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation, with parts in section, showing my improved ladder slightly elevated, but with the sections not extended. Fig. 2 is a horizontal longitudinal section thereof on the line Z Z of Fig. 1. Fig. 3 is a top plan of a portion of the rear or pivot end of the lowermost section of the ladder.

Like letters of reference indicate like parts throughout the several views in which they occur.

Referring now to the details of the drawings by letter, A designates the platform of the truck supported upon the wheels and axles in the usual manner, the truck being designed to turn on the turn-table B of any preferred construction. To the platform or sills over the rear axle are secured the standards C, which may be formed of a single piece, as indicated in Fig. 2, or ordinary uprights, and near their upper ends connected by a cross-bar *a*, which is designed to form a rest for the ladder when the latter is down.

The entire ladder and its operating means are supported on the circular table or support D, which is provided with a depending surrounding flange *b*, which is designed to embrace the circular guide *c*, and on which it is designed to be turned, forming a turn-table upon which the ladder may be swung round to the desired position. Secured to the upper face of this table or support are the castings or brackets E, one near each side thereof, and suitably braced to give great strength thereto. On a rod *d* connecting the upper ends of these castings or brackets is pivoted the end of the lowermost section F of the ladder, which at this point is braced by the arms F′, as seen best in Fig. 3. This ladder may be formed in as many sections as desired, being shown as composed of three, and these sections are designed to be extended to lengthen the ladder as occasion may require in the following manner: Each section except the lowermost one is provided upon each side with a rack G, secured thereto in any suitable manner and designed to engage a toothed wheel G′ at the outer end of the next lower section, as seen in Fig. 1. Suitable guides *e* are provided to keep the sections parallel. The toothed wheel of each section meshes with a smaller toothed wheel H, carried by a shaft on the same section, and on the same shaft is a sprocket-wheel I, over which passes a sprocket-chain J, which passes over a sprocket-wheel *f* at the other end of the same section, and on the same shaft as the latter sprocket-wheel is a

gear-wheel *g*, which meshes with a gear-wheel *h* on an adjoining shaft, the end of which is extended and adapted to receive a wrench or other means whereby it may be turned to extend the sections when desired. A retaining-pawl *i* may be provided, as seen in Fig. 3, to prevent retrograde movement of the parts. At the lowermost end of the uppermost section of the ladder I provide anti-friction rollers *j*, as seen in Fig. 1, to support and guide the same over the next lower section and diminish the friction between the two. The sections of the ladders may be of any approved form.

Secured to the forward part of the upper face of the support D is a bracket or ears K, between which is pivotally held a nut L, with which engages the double screw M, the outer end of which is squared or otherwise formed to receive a crank-handle or other analogous provision *k*, by which it may be revolved. The other end of this screw engages a nut N, pivotally held between the arms O, which are pivotally attached to the arms P of the double lever, which is pivoted at *l* to the brackets E, as seen in Fig. 1, the other ends of the double or toggle lever being pivotally connected to the lowermost section of the ladder near its pivot, as seen in Fig. 1, the pivotal points of attachment of the arms Q, which form the connection, being shown at *o* in Fig. 3.

The double screw and peculiar form of connection gives me great power with the expenditure of but little labor, the screw acts at two points at once, and the toggle-lever gives great power and forms a strong support for the ladder when raised. It enables me to throw up the ladder or lower it with great rapidity.

In order to prevent the overturning of the ladder and truck when the ladder is turned away from the building with the men thereon and to counterbalance it in case greater weight is placed thereon, I have provided the counter-weights R, which are carried by rods S, adapted to slide in guide-sleeves T on the brackets E or on the support D, the said rods being designed to be secured in their adjusted positions in any suitable manner—as, for instance, by a set-screw *p*, held in a collar or sleeve *r*, as seen in Fig. 1. Fig. 2 indicates the manner of use of these weights.

Various modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

1. The combination, with the ladder and its turn-table and means for extending the sections and for raising and lowering them, of counter-weights carried by rods sliding on the turn-table, as set forth.

2. The combination, with the ladder and its turn-table and raising and lowering means, of guide-sleeves carried by the turn-table and weighted rods adapted to slide in said sleeves, substantially as specified.

3. The combination, with the pivoted lowermost ladder-section, of a double screw, pivotal connections between the same and the section, and pivoted nuts, one of which is carried by the pivotal connections and with which the screw engages, substantially as specified.

4. The combination, with the pivoted lowermost ladder-section, of a double screw, the toggle-lever pivotally connected with the section, a nut carried thereby and engaging the screw, and a pivoted nut on the section-support with which the screw engages, substantially as specified.

5. The combination, with the support and the brackets thereon, of the ladder-section pivoted on the brackets, the pivoted nut on the support, the double lever pivoted between the brackets, the pivotal connection between the lever and ladder-section, and the arms pivotally connected with the other end of the lever and provided with a nut with which the screw engages, and the double screw, all substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

AUGUST RUTHENBERG.

Witnesses:
JOHN S. GUNDAUL,
PETER REINHARDT.