

(No Model.)

2 Sheets—Sheet 1.

I. W. SALYERDS & L. SHADBOLT.  
FIRE LADDER.

No. 481,199.

Patented Aug. 23, 1892.

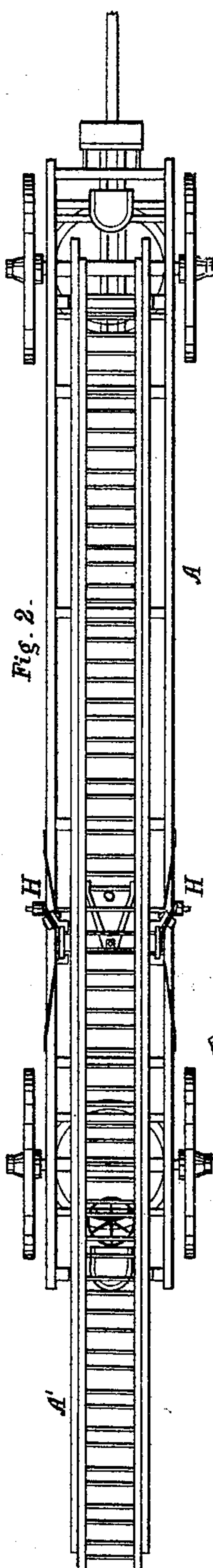


Fig. 2.

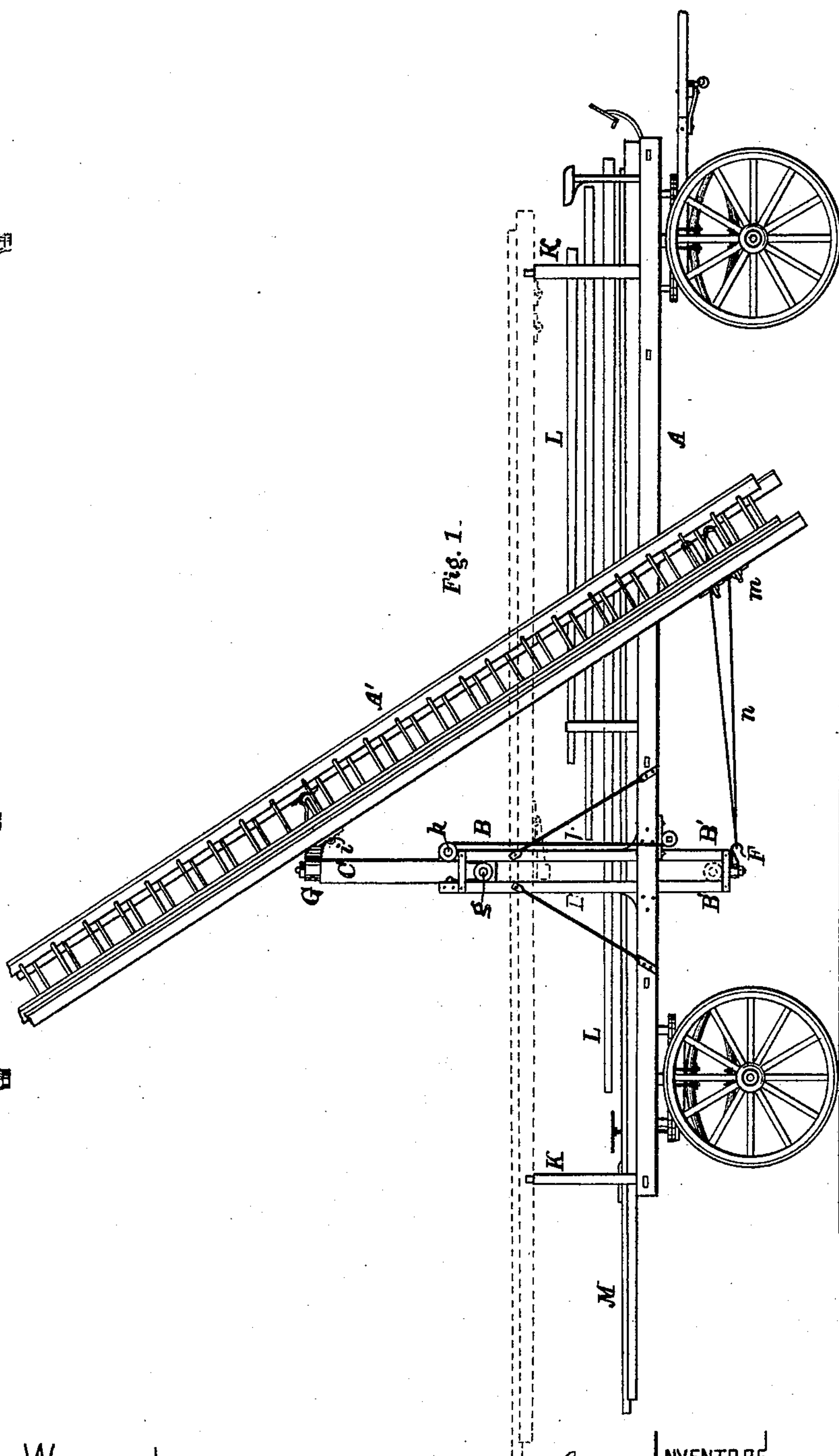


Fig. 1.

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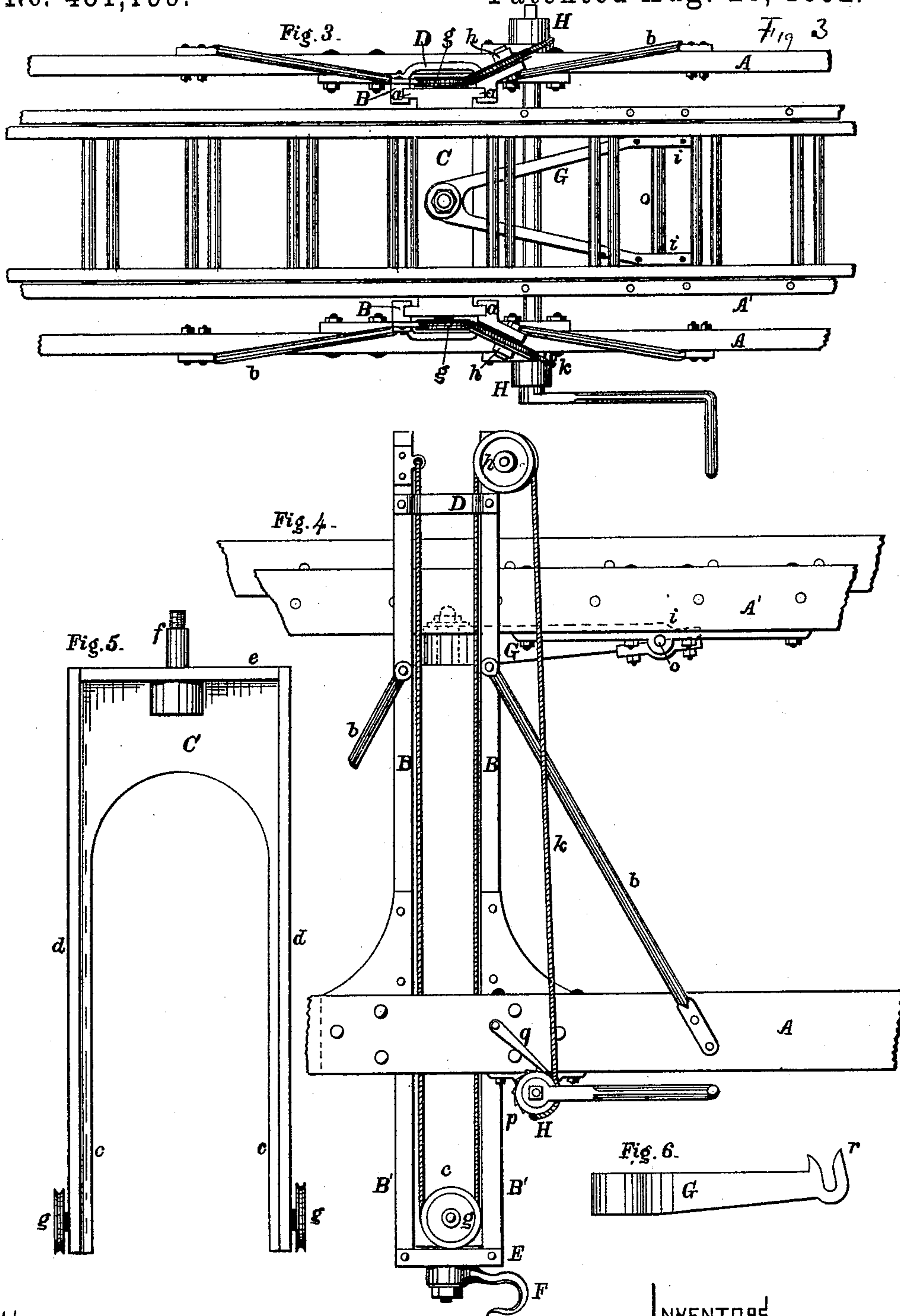
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# UNITED STATES PATENT OFFICE.

ISAAC W. SALYERDS AND LAWRENCE SHADBOLT, OF SCOTTSVILLE, NEW YORK.

## FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 481,199, dated August 23, 1892.

Application filed June 20, 1891. Serial No. 396,984. (No model.)

*To all whom it may concern:*

Be it known that we, ISAAC W. SALYERDS and LAWRENCE SHADBOLT, both citizens of the United States, and residents of the village of Scottsville, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Fire-Ladders, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to certain improvements in fire-ladders, which are hereinafter fully described and claimed.

Our invention is represented in the accompanying drawings, in which—

Figure 1 is a side elevation thereof showing the ladder raised from its truck, and in dotted lines showing the same housed upon the truck. Fig. 2 is a plan view thereof showing the ladder housed. Fig. 3 is an enlarged plan view of the devices for raising and supporting the ladder, showing a portion of the ladder thereon. Fig. 4 is a side elevation of the devices for raising the ladder. Fig. 5 is a front elevation of the slide which bears the ladder. Fig. 6 is a side view of the jib or yoke having forks on each arm.

A represents the truck on which the supports for the ladder A' are erected.

B B represent a pair of standards, preferably vertical, erected upon the truck and rigidly fastened to the same and provided with suitable guides *a a* on their opposed inner surfaces to retain and guide the slide C. The standards B B and the guides *a a* extend, also, below the frame of the truck on either side, as shown at B' B', in order that the lower ends of the slide C may be allowed to go below the frame of the truck A and that thus the ladder may be housed low down on the truck. The standards B B are suitably stayed to the truck-frame, as by the bars *b b*. Each pair of standards is suitably fastened together and stayed, as by the cross-bars D, fastened to the two parts of each pair of standards. At the same time each pair and both pairs of standards are fastened together at the bottom of the extensions B' B', as by the cross-piece E. About half-way between the two pairs of extensions B' B' and to the bottom of the cross-piece E is fastened a swiveled hook F. The slide C is about two-thirds as long as the standards

B B and their extensions B' B'; but any length may be given to the slide which will give sufficient bearing-surface in the guides in order both to render it steady and to permit sufficient motion therein. The slide consists of two legs *c c*, which are provided with flanges *d d* or other suitable means to fit into and slide in the guides *a a* of the standards B B and of their extensions B' B'. These two legs are fastened together at the top by a suitable cross-piece *e*, and upon the upper side of the cross-piece at its middle is fixed a suitable vertical pivot or pin *f*. On the outer side and at the lower end of each of the legs *c c* is a pulley *g*.

Near the top of one of the standards B B on either side of the truck is a pulley *h*. This pulley, in the form of device which we prefer, is set on the outer side of the standard and at an angle to the center line of the truck for the purpose hereinafter described.

Upon the pin *f* is swiveled a bifurcated jib or yoke G, the two ends of which are fastened to the two side bars of the ladder A' by suitable bearings *i i*. This jib or yoke is capable of revolution on the pin *f* in a horizontal plane. The ladder A', being pivoted to the yoke by the bearings *i i*, which are horizontal, may oscillate in a vertical plane. The jib or yoke G therefore forms a universal joint, connecting the ladder A' to the slide C. This jib or yoke is of such length that when the ladder is turned crosswise of the truck the bearings *i i* will be outside of the tops of the standards B B, and, if desired, outside of the side frames of the truck. The base on which the ladder is supported when elevated is thus formed by the foot of the ladder resting on the ground on one side of the truck and by the wheels on the opposite side of the truck. The base is therefore considerably broader, and consequently more firm than the base formed only by the four wheels of the truck. Extension-bars may be attached to the truck to broaden the base, and pike-poles may be used to assist in steadying the ladder; but these are common devices, and hence are not set forth.

As hereinafter shown, our invention is intended to be used in still another manner than that just described.



On either side of the truck a chain, rope, or cable  $k$  is rigidly fastened to one of the standards near the top thereof. Each cable  $k$  passes downward and around the pulley  $g$  on each side of the slide C, then upward and over the pulley  $h$ , then downward again to a suitable drum or winch H. The pulley  $h$  is set on the outer side of the standard at an angle to the middle line of the truck, as above described, in order that the cable  $k$  may be led outside of the truck-frame, so that the drum H may be set outside of the frame and may be the more easily operated.

The foregoing parts constitute a ladder-support, which may be elevated. With a very large ladder gears may be employed to multiply the power used in raising it. Racks K K are erected upon the truck at or near each end for the ladder A' to rest upon when housed, it being also then supported, as shown in Fig. 4, by the ends of the legs  $c$  of the slide C, resting upon the cross-piece E.

The ladder A' is an extension-ladder of any suitable kind; but it may be a ladder of the ordinary form. Near the foot of it we provide a drum  $m$  and a cable  $n$ , which cable may be fastened to the hook F, and on turning the drum  $m$  the cable  $n$  may be wound upon it, and the foot of the ladder will thus be drawn into the truck A, increasing the angle of elevation of the ladder and holding the ladder firmly in place. Suitable ratchets and dogs are provided to hold the drum  $m$  in place. These devices constitute means for adjusting and setting the ladder at different angles of elevation.

The jib or yoke G is connected to the ladder by the bearings  $i$  and at such points on the side bars that the ladder will be balanced in these bearings with a slight preponderance of weight on the side of the foot of the ladder; but the ladder may be exactly balanced or may be overbalanced on the side of the foot to any degree that special circumstances may indicate as proper. Across the ladder and rigidly fastened to its under side is the shaft  $o$ , whose ends fit into the bearings  $i$  and turn in them. We prefer so to make these bearings  $i$  as to permit the truck to be easily detached from the ladder A', so that another ladder can be fitted to the truck. This may be accomplished in many ways by devices known to ordinary mechanics. A split journal-box such as shown in Fig. 4 forms a firm and yet detachable bearing, or for the same purpose a pair of forks  $r$ , directed upward and fixed on the ends of the arms of the jib or yoke G, may receive the ends of the shaft  $o$ . (See Fig. 6.) The ladder is thus fixed in its bearings by gravity, and the jib or yoke is easily detached from the ladder by lowering the slide until the forks  $r$  are detached from the ends of the shaft  $o$ . The ladder may be adjusted and set at the proper angle of elevation against a building by the devices above described and the ladder may then be detached.

Supplemental ladders L L may be placed upon the truck, if so desired, there being sufficient room underneath the ladder A' when housed to permit them to be placed upon the truck, with other suitable appliances, for use at fires. A duplicate extension-ladder M may be carried on the truck.

Suitable ratchet-wheels  $p$  and dogs  $q$  are applied to the drums H to hold them in place at any particular point.

If now, when the various parts are in the position shown in Fig. 4, the cables  $k$  are wound upon the drums H, the slide C will be raised, and when it is lifted so high that the top of the cross-piece  $e$  of the slide C is above the tops of the standards B B the ladder may be removed from the supports K K. The ladder may then be turned around the pin  $f$ , its foot may be brought to the ground, the cable  $n$  is then attached to the hook F, the ladder may be adjusted and set at a suitable angle of elevation, and the extension may be raised. (See Fig. 1.) The ladder A' when raised may be swung around on the pin  $f$  (the foot not touching the ground, but being held in by the cable  $n$ ) through such an arc of a circle as the cable will permit. This is nearly one hundred and twenty degrees, and this operation can take place with the extension raised and with one or more men on the upper part of the ladder, and by lowering the extension of the ladder or by suitably weighting its foot, and thus balancing it on its bearings  $i$ , it may, after unhooking the cable  $n$ , be easily swung around over the rear of the truck, so as to point in a direction opposite to the first one.

A hose-nozzle may be fastened to the top of the ladder and the hose may be connected with the nozzle before the ladder is raised. In raising the ladder the hose will be run out and raised at the same time and the device becomes a variety of stand-pipe. On account of the universal joint on which the ladder is swung, the nozzle may be easily directed to any point by moving the foot of the ladder from side to side and to and from the truck.

It will be seen that this device in one aspect amounts to a crane for placing a ladder in position against a building with its foot on the ground. In another aspect it is a fire-ladder operated by and resting on the truck.

Our invention has the following advantages, among others: In practice it is found that with a long extension-ladder one or two men can elevate the slide of our device to its highest point, can lift the ladder from its supports on the truck, can adjust and set it at any desired angle of elevation, and can run up the extension and turn the extended ladder with firemen upon it around within an arc of about one hundred and twenty degrees. By letting down the extension or by sufficiently weighting the foot of the extended ladder and with assistance they can turn the ladder in an opposite direction. This, however, is seldom necessary to be done.



Our ladder may be slightly elevated at a somewhat low angle, allowing the point of the ladder or of the extension to pass under the masses of electric conductor-wires found in the streets of many cities. The truck may then be moved sidewise under the wires, (the ladder being properly balanced). Then the foot of the ladder can be drawn in and the extension can be fully raised against the building without it being necessary to cut any of the electric wires.

This ladder is more simple and is lighter than any practical fire-ladder of which we have any knowledge. It is more easy to manufacture, and consequently is cheaper and is more easy to manage and elevate. The ladders now in use of which we have any knowledge require several men to elevate or handle them and they are not intended to be detached from their trucks.

In case of an accident to the extension-ladder of our device it can be detached from the truck and can be quickly and easily replaced by another ladder without the intervention of a machinist and without injury to the truck. In cold weather, if ice should form on the ladder, so as to render it difficult to be operated, the ladder may then also be detached from the truck and another ladder may take its place, or a series of ladders may be placed in position by our truck and the truck itself may be taken away from the neighborhood of the fire.

Heavy ladders may be raised by our truck more easily and quickly than by hand, and we contemplate this as one of its several uses.

What we claim is—

1. In a fire-ladder, the combination of a truck, an elevatable ladder-support, a jib or yoke pivoted to said support by a vertical pivot, and means whereby the ladder is by gravity detachably fixed in horizontal bearings to said jib.

2. In a fire-ladder, the combination of a truck, an elevatable ladder-support, a jib or yoke pivoted to said support by a vertical pivot and provided with forks, as *r*, and a ladder having a horizontal shaft, as *o*, adapted to rest removably in said forks.

3. In a fire-ladder, the combination of a truck, standards having vertical guides, a slide moving in said guides, a ladder pivoted to said slide by a universal joint, and means for elevating said slide and for fastening said slide at any point of its path.

4. In a fire-ladder, the combination of a truck, standards having vertical guides, a slide moving in said guides, a ladder pivoted to said slide by a universal joint, means for elevating said slide and for fastening said slide at any point of its path, and means for adjusting and setting the ladder at different angles of elevation.

5. In a fire-ladder, the combination of a truck, standards having vertical guides, a slide moving in said guides, a jib or yoke pivoted to said slide by a vertical pivot, a ladder journaled to said jib or yoke by horizontal bearings, means for elevating said slide and for fastening said slide at any point of its path, and means for adjusting and setting said ladder at different angles of elevation.

6. In a fire-ladder, the combination of a truck, standards having vertical guides, a slide moving in said guides, a jib or yoke pivoted to said slide by a vertical pivot, a ladder journaled to said jib or yoke by horizontal bearings, pulleys attached to the outside of said slide, and pulleys attached to the upper part of said standards on either side, a rope, cable, or chain attached on either side to one of said standards near the top thereof, passing downward under the pulley attached to said slide, and thence upward over the pulley attached to said standards, and a drum adapted to receive and wind said cable.

7. In a fire-ladder, the combination of a truck, standards having vertical guides, a slide moving in said guides, a jib or yoke pivoted to said slide by a vertical pivot, a ladder journaled to said jib or yoke by horizontal bearings, pulleys attached to the outside of said slide, and pulleys attached to the upper part of said standards on either side, a rope, cable, or chain attached on either side to one of said standards near the top thereof, passing downward under the pulleys attached to said slide and thence upward over the pulleys attached to said standards, and a drum adapted to receive and wind said cable, a swivel-hook fastened directly beneath said vertical pivot, and a pivot attached to said hook and winding upon the drum fixed to said ladder.

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Witnesses:

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