

No. 714,100.

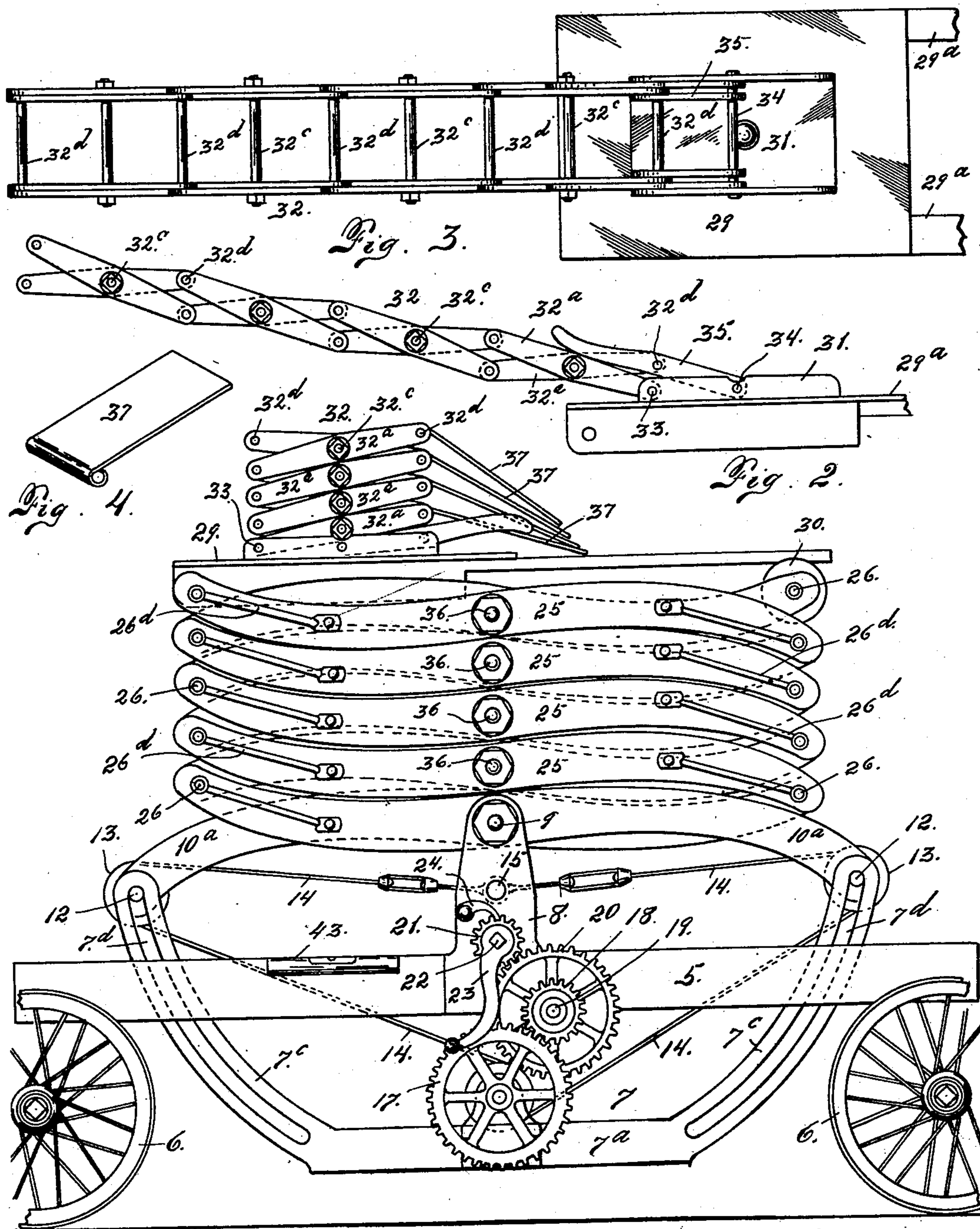
Patented Nov. 18, 1902.

M. S. CROSS.
FIRE ESCAPE.

(Application filed Apr. 7, 1902.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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Fig. 1.

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No. 714,100.

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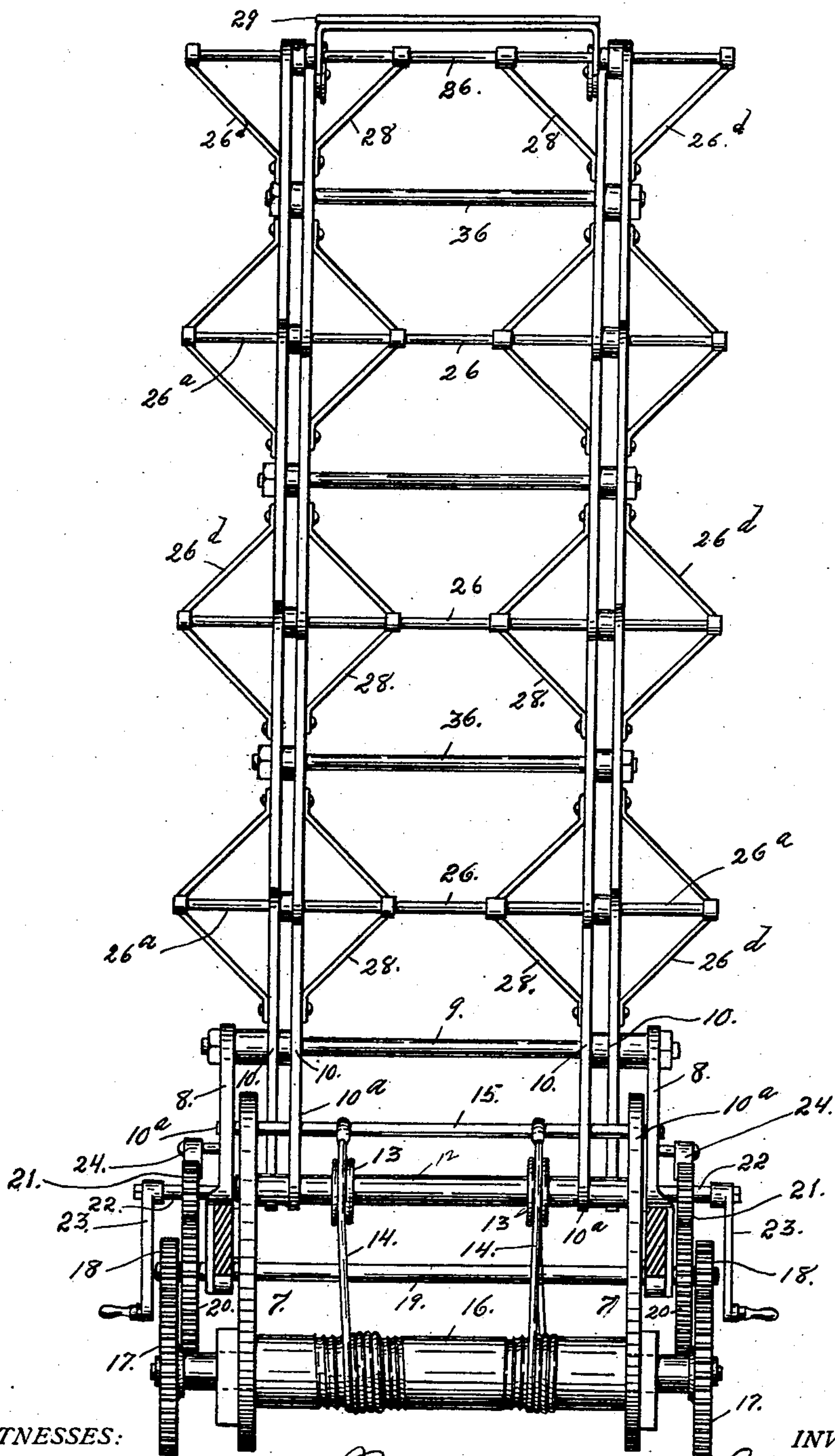
M. S. CROSS.

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(No Model.)

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Fig. 5.

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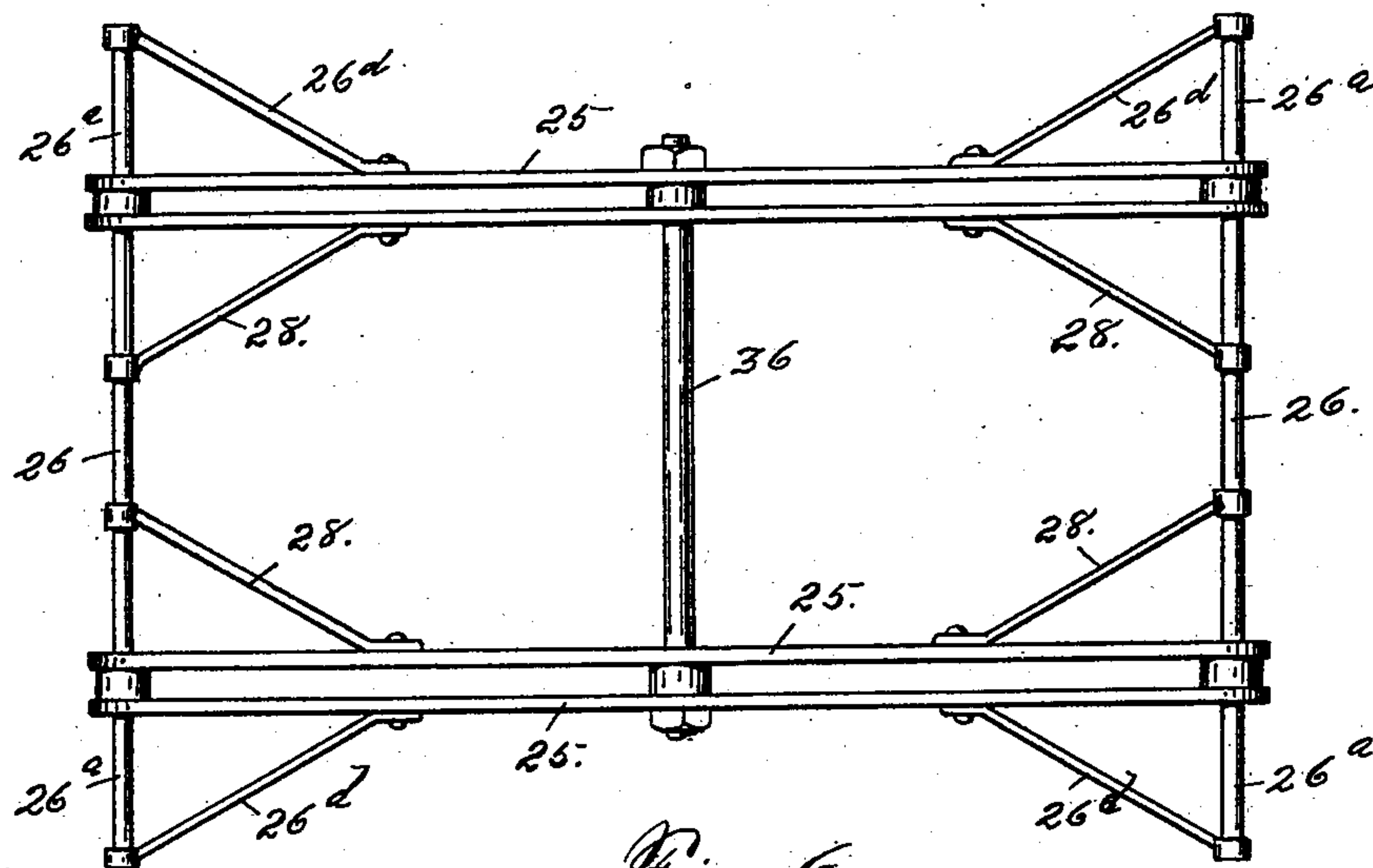


Fig. 6.

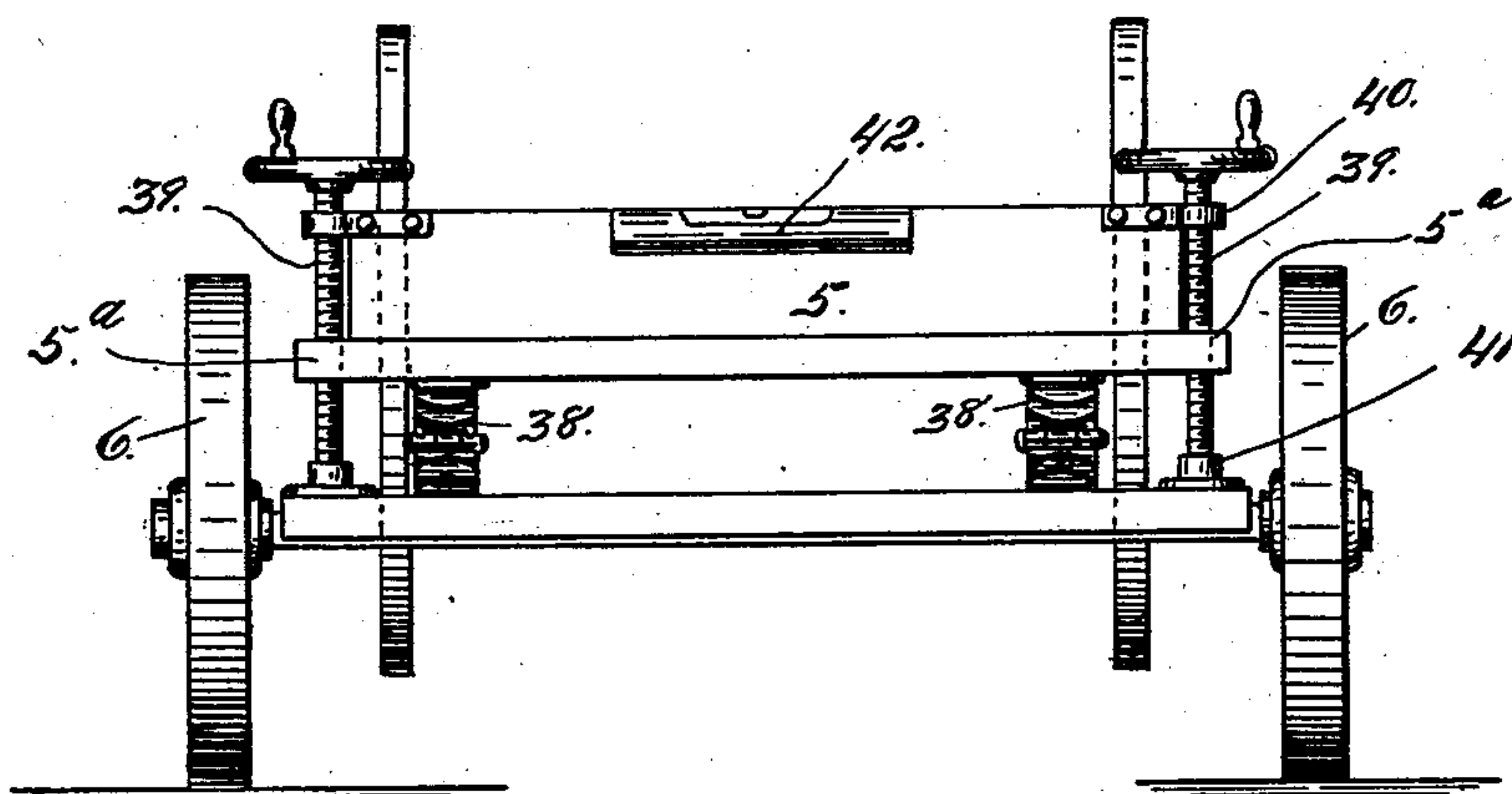


Fig. 7.

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UNITED STATES PATENT OFFICE.

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FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 714,100, dated November 18, 1902.

Application filed April 7, 1902. Serial No. 101,692. (No model.)

To all whom it may concern:

Be it known that I, MARION S. CROSS, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Fire-Escapes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in fire-escapes of the class mounted on vehicles.

My improvement is constructed on the lazy-tongs principle and is provided with a platform which may be quickly elevated to any reasonable height by means of a hoisting construction operated by hand or by any other suitable power. Pivottally mounted on the main platform of the structure is an auxiliary platform provided with an extension-ladder which may be quickly projected to span the space between the platform and the building, whereby the firemen may quickly walk to the roof or into the windows on any floor. The extremities of the lazy-tongs levers are connected by shafts, which extend beyond the levers, braces being provided connecting the outer levers with said shaft extremities and other similar braces connecting the inner levers with the shafts intermediate the two sets of levers, said braces being pivottally connected at one extremity. The construction may of course be employed in many relations other than for fire-escape purposes, as will be readily understood.

Having briefly outlined some of the more important features of my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of my improved fire-escape mounted on a vehicle, the wheels of which are partly broken away for lack of space on the sheet. Figs. 2 and 3 are side and top views, respectively, of the platform shown in detail and equipped

with an extension-ladder. Fig. 4 is a detail view in perspective of one of the hinged plates used in connection with the extension-ladder. Fig. 5 is a view in detail of the fire-escape shown in the elevated position and viewed at right angles to Fig. 1. In this view the wheels of the vehicle are removed. Fig. 6 is a plan view of a section of the structure, illustrating the braces. Fig. 7 is an end view of the vehicle, showing jack-screws for holding the platform firmly in place when the apparatus is in use.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the body, and 6 the wheels, of the vehicle upon which the structure is mounted. Secured to the body of the vehicle is a frame composed of two separated bars 7, each having a horizontal lower part 7^a and two upwardly-curved slotted parts 7^c. Mounted on opposite sides of the body 5 are two uprights 8, which form the support for the lowermost shaft 9 of the lazy-tongs structure. The two lowermost levers 10 on each side are fulcrumed on the shaft 9. An arm 10^a of each of these levers is the longer. The longer arms 10^a of each pair of levers 10 are pivottally connected with shafts 12, located at opposite ends of the machine. The reduced extremities of these shafts 12 pass through the slots 7^d of the curved parts 7^c of the side frame-bars 7. Mounted on and made fast to each shaft 12 is a pair of pulleys or wheels 13, having grooved peripheries, around which pass cables 14, connected with a shaft 15, mounted on the standards 8 directly below the shaft 9. As shown in the drawings, there are four of these cables, two leading in one direction and two in the opposite direction from the shaft 15. After passing around the pulleys 13 these cables lead to a drum or roller 16, upon which the cables are wound while elevating the lazy-tongs structure. Upon each extremity of this drum is made fast a gear-wheel 17, meshing with a smaller gear 18, fast on a shaft 19, which is also provided with a gear 20, meshing with a pinion 21, fast on a shaft 22, provided at each extremity with a hand-crank 23. This system of gears is intended to reduce the speed between the shaft 22 and the drum 16, thus

making it practicable for two men to hoist a structure of considerable weight. It is evident, however, that any suitable power may be employed. Locking-dogs 24, mounted on the uprights 8, engage the pinions 21 and automatically hold the structure at any desired elevation. By throwing these dogs out of engagement with the pinions the apparatus may be lowered at will.

Above the lazy-tongs levers 10 is located a series of similar levers 25, arranged in pairs and fulcrumed on shafts 36, located above the lowermost shaft 9. The shorter arm of each lever 10 is pivotally connected at its extremity with an arm of a lever 25 above by a horizontal shaft 26, and the adjacent extremities of each pair of levers 25 above are connected by similar shafts 26. These shafts 26 are connected with the pairs of levers on opposite sides of the structure and are provided with extensions 26^a, which form a pivotal support for braces 26^d, whose opposite extremities are secured to the outside levers 25. Similar braces 28 for the inside levers 25 are pivotally connected with the shafts 26 intermediate the pairs of levers.

Pivotally mounted on one of the uppermost shafts 26 of the lazy-tongs structure is a platform 29, having arms 29^a resting on rollers or wheels 30, mounted on the corresponding shaft 26 at the opposite end of the structure. Pivotally mounted on the platform 29 is an auxiliary platform 31, upon which is located an extension-ladder 32, constructed after the lazy-tongs pattern. This ladder is composed of levers 32^a, arranged in pairs on opposite sides and fulcrumed on rungs 32^c. One lever 32^a of each pair of levers at one extremity of the ladder is pivotally connected with the auxiliary platform, as shown at 33. Fulcrumed on a rung 34, mounted on the auxiliary platform, are two levers 35, which are connected beyond their fulcrum with a rung 32^d of the other two levers of the two pairs adjacent the platform. Hence these levers 35 are so arranged that by their manipulation the lazy-tongs ladder may be extended to the position shown in Figs. 2 and 3 and returned to the position shown in Fig. 1 at will. To certain of the rungs 32^d of the levers 32^a are pivotally connected or hinged plates 37, adapted to cover the top of the ladder when the latter is extended. To avoid confusion, these plates are not shown in Figs. 2 and 3. Underneath the body of the vehicle which supports the lazy-tongs superstructure are located springs 38, which normally support the gravity of the load. When, however, the apparatus is in use at fires or under any other circumstances requiring that the lazy-tongs structure be elevated, it is considered desirable to employ jack-screws (see Fig. 7) to lift the load from the springs and relieve the body 5 from the vibration incident to any spring-supported structure. This feature is considered important, particularly when the structure is elevated to a considerable height, to steady it

and obviate any swaying or rocking tendency, since a slight movement of this character at the surface of the vehicle-body would result in a considerable movement at the platform 29 or at the top of the structure when raised. These jack-screws are journaled in bearings 40 and 41 and threaded in lateral projections 5^a on the platform, the arrangement being such that when the screws are turned in one direction the body 5 may be raised and the entire burden thrown upon the screws, which when properly adjusted will support the vehicle-body in a horizontal position, as indicated by the spirit-levels 42 and 43, thus causing the lazy-tongs superstructure to occupy a vertical position when elevated. When the lazy-tongs structure is not in use, the movement of the jack-screws may be reversed and their lower extremities lifted from the sockets or bearings 41, when the burden will again rest upon the springs 38.

From the foregoing description the use and operation of the apparatus will be readily understood. When employed at fires, the vehicle will be drawn to the scene of conflagration and stopped at a convenient point in the street, the jack-screws will be turned down and the body 5 leveled, the desired number of men will get on the platform 29, and the ladder will be elevated to the desired height by turning the cranks 23 when hand-power is employed or by applying any other suitable power to the shaft 32. When elevated, the ladder 32 will be extended to the roof or window of the building, allowing the firemen to pass thereto either for the purpose of saving life or to enable them to more advantageously cope with the fire. When people are to be rescued from the building, a considerable number may be taken on the platform 29 and lowered to the ground and the operation repeated as often as necessary or until all have been saved.

Having thus described my invention, what I claim is—

1. The combination with a suitable support, of a lazy-tongs superstructure comprising two sets of side levers, shafts connecting the extremities of the bars, which shafts extend beyond the levers, braces connecting the outer levers with said shaft extremities, other similar braces connecting the inner levers with the shafts intermediate the two sets of side levers, the said braces being pivotally connected at one extremity to enable them to move in harmony with the lazy-tongs structure, a frame having slotted guides for the extremities of the lowermost shafts, cables connected with the support, and passing around the lowermost shafts, a drum with which said cables are connected, a crank-shaft, and a train of speed-reducing gears connecting the crank-shaft with the drum, substantially as described.

2. The combination with a suitable support, of a lazy-tongs superstructure mounted thereon and comprising two sets of side levers

whose outer extremities are connected with shafts extending beyond the levers, braces connecting the outer levers with said extremities, and other similar braces connecting the inner levers with the shafts intermediate the two sets of side levers, the said braces being pivotally connected at one extremity to enable them to move in harmony with the lazy-tongs structure, substantially as described.

3. The combination with a suitable support, of a lazy-tongs superstructure comprising two sets of side levers, shafts connecting the extremities of the levers, which shafts extend beyond the levers, braces connecting the outer levers with said shaft extremities, and other similar braces connecting the inner levers with the shafts intermediate the two sets of side levers, said braces being pivotally connected at one extremity, a platform mounted on top of said structure, an auxiliary platform pivotally mounted on the main platform, and an extension-ladder mounted on the auxiliary platform, substantially as described.

4. The combination with a suitable support, of a lazy-tongs superstructure comprising two sets of side levers, shafts connecting the outer extremities of the levers, the said shafts extending beyond the levers, braces connecting the outer levers with said shaft extremities, and other similar braces connecting the inner levers with the shafts intermediate the two sets of levers, the said braces being pivoted at one extremity for the purpose set forth, a platform mounted on top of said structure, an auxiliary platform pivotally mounted on the main platform, and a lazy-tongs ladder mounted on the auxiliary platform, two of the levers at one extremity being pivotally connected with the auxiliary platform, and manipulating levers fulcrumed on the auxiliary platform and pivotally connected with the other two end levers of the ladder, substantially as described.

5. The combination with a suitable support, of a lazy-tongs superstructure consisting of two sets of side levers, transverse shafts connecting the extremities of the levers and extending beyond the latter, braces connecting the outer levers with said shaft extremities, and other similar braces connecting the inner levers with the said shafts intermediate the two sets of levers, the said braces being pivotally connected at one extremity, a platform mounted on top of said structure, an auxiliary platform pivotally mounted on the main platform,

an extension-ladder mounted on the auxiliary platform, and plates hinged to the ladder-rungs and arranged to form a top covering therefor when the ladder is extended, substantially as described.

6. The combination with a suitable support, of a lazy-tongs superstructure comprising two sets of side levers, transverse shafts connecting the extremities of the levers, and extending beyond the levers, braces connecting the outer levers with said shaft extremities, and other similar braces connecting the inner levers with the shafts intermediate the two sets of side levers, the said braces being pivotally connected at one extremity, a platform mounted on top of said structure, and an extension-ladder mounted to turn on the platform, substantially as described.

7. The combination with a vehicle whose body portion is normally spring-supported, of jack-screws for leveling the said body and holding it against vibration, and a lazy-tongs superstructure mounted on said body, and composed of two sets of side levers connected in operative relation at their outer extremities by horizontal shafts, whose extremities project beyond the levers, braces connecting the outer levers with said shaft extremities, and other similar braces connecting the inner levers with the shafts intermediate the two sets of side levers, the said braces being pivotally connected at one extremity, and means mounted on the vehicle and acting on the lowermost shafts for elevating said structure, substantially as described.

8. The combination with a suitable support, of a lazy-tongs superstructure comprising two sets of side levers, transverse shafts connecting the extremities of said levers, the extremities of said shafts projecting beyond the levers, braces connecting the outer levers with said shaft extremities, and other similar braces connecting the inner levers with the shafts intermediate the two sets of side levers, the said braces being pivotally connected at one extremity to enable them to move in harmony with the lazy-tongs structure, and suitable operating mechanism for raising the superstructure, substantially as shown and described.

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

MARION S. CROSS.

Witnesses:

DENA NELSON,
A. J. O'BRIEN.