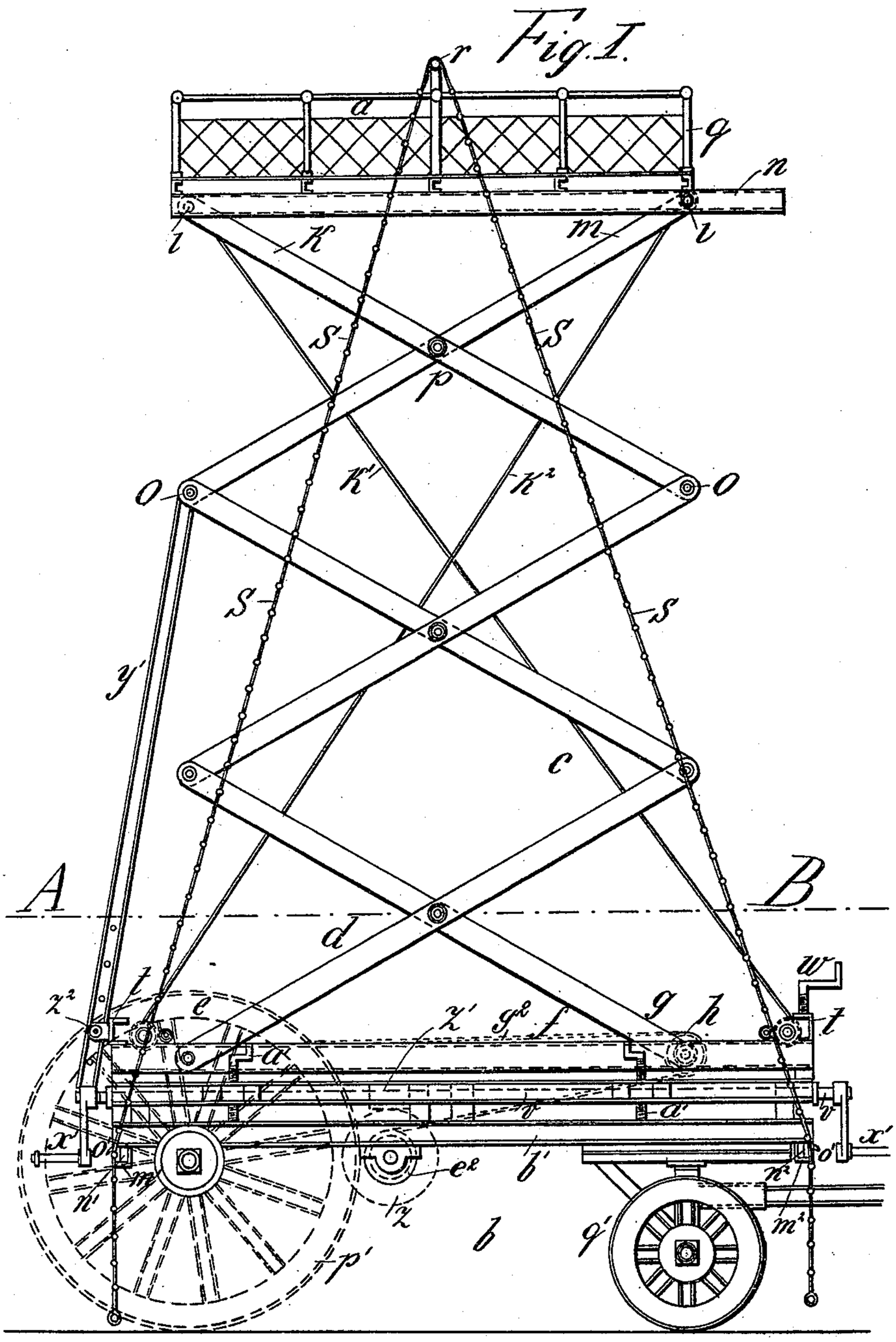
(No Model.) 4 Sheets—Sheet 1.

O. WITZEL.

FIRE LADDER.

No. 494,452. Patented Mar. 28, 1893.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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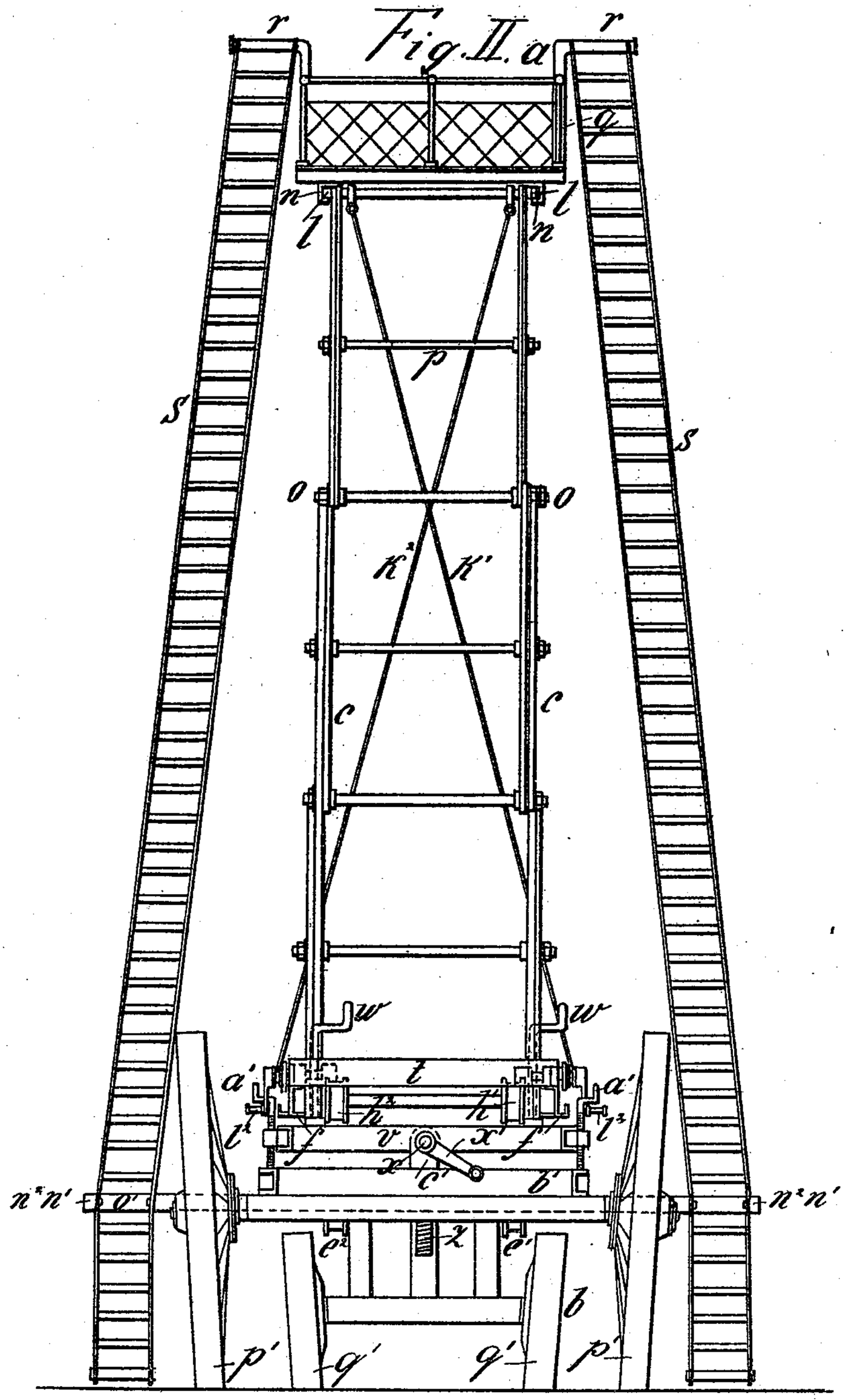

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(No Model.) 4 Sheets—Sheet 3.

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FIRE LADDER.

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Fig. III.

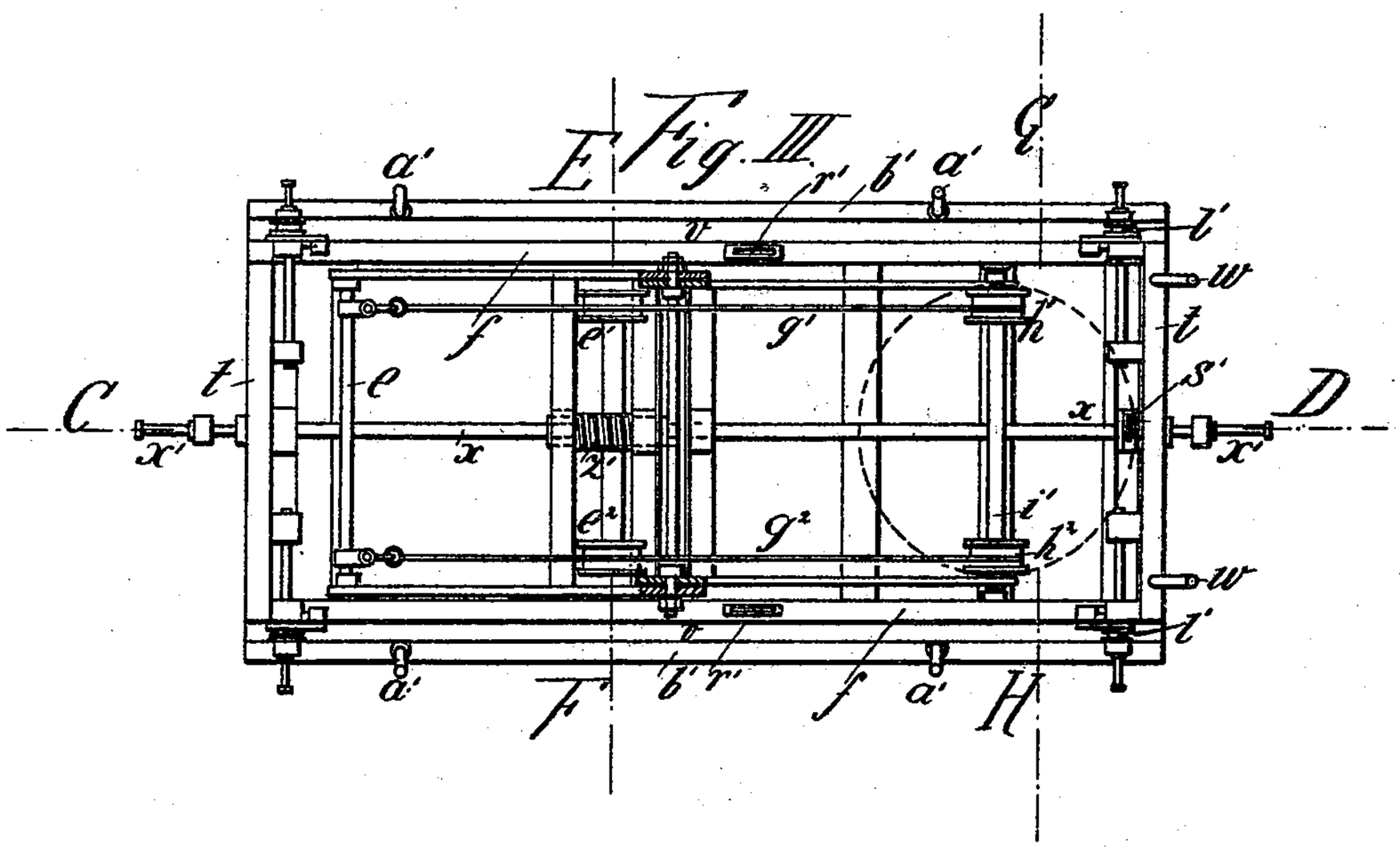
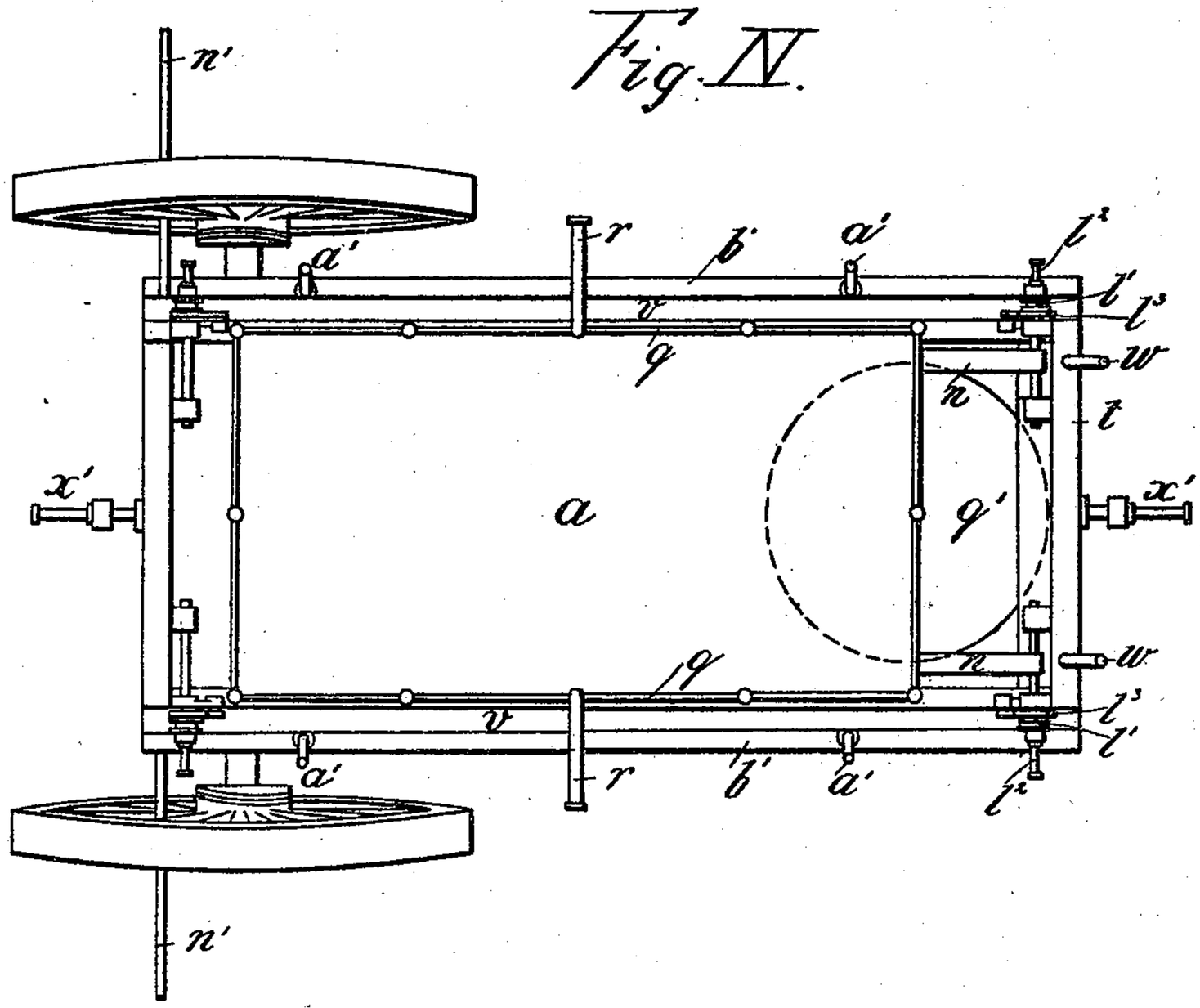


Fig. IV.



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FIRE LADDER.

No. 494,452. Patented Mar. 28, 1893.

Fig. V.

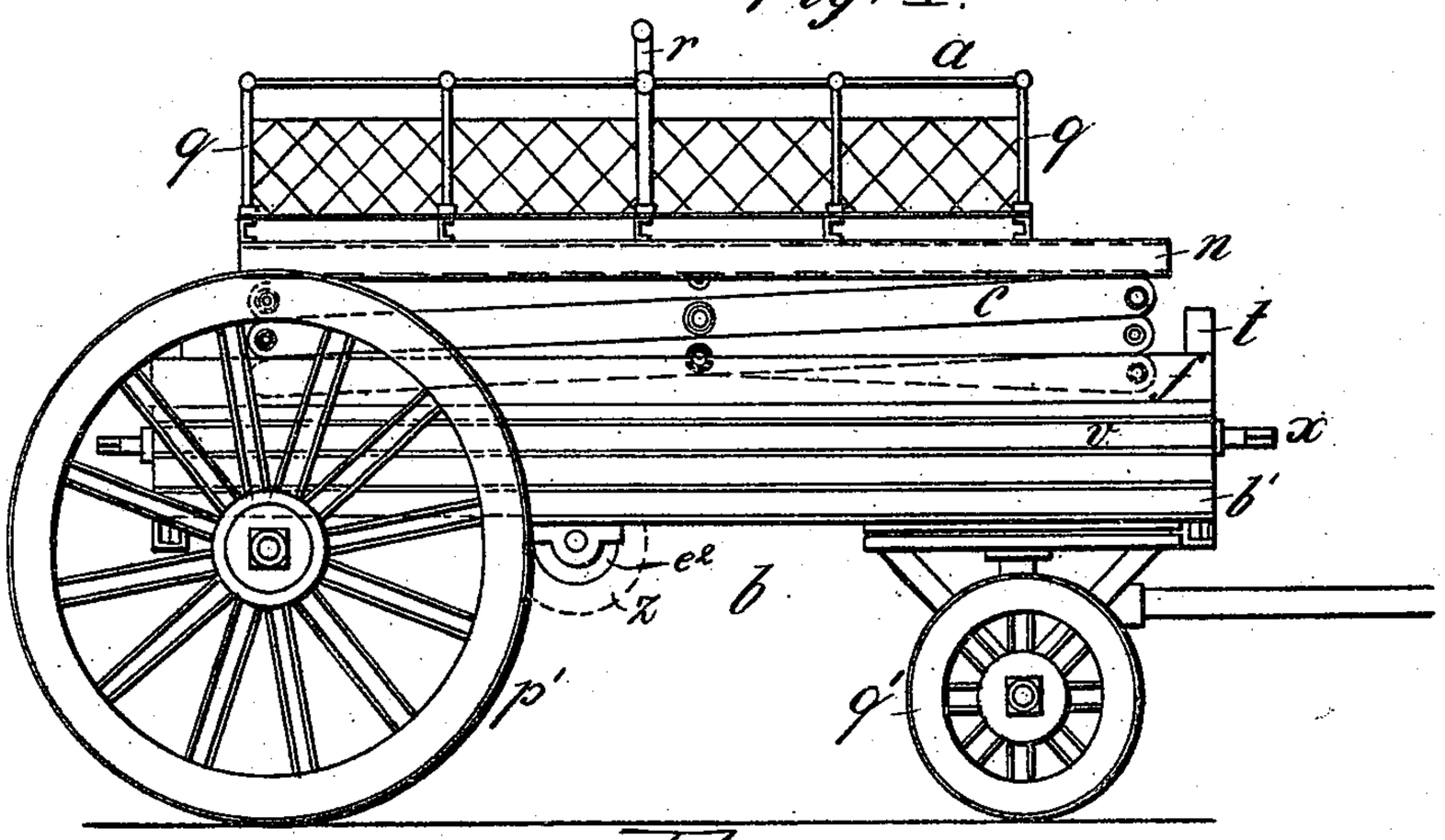


Fig. VI.

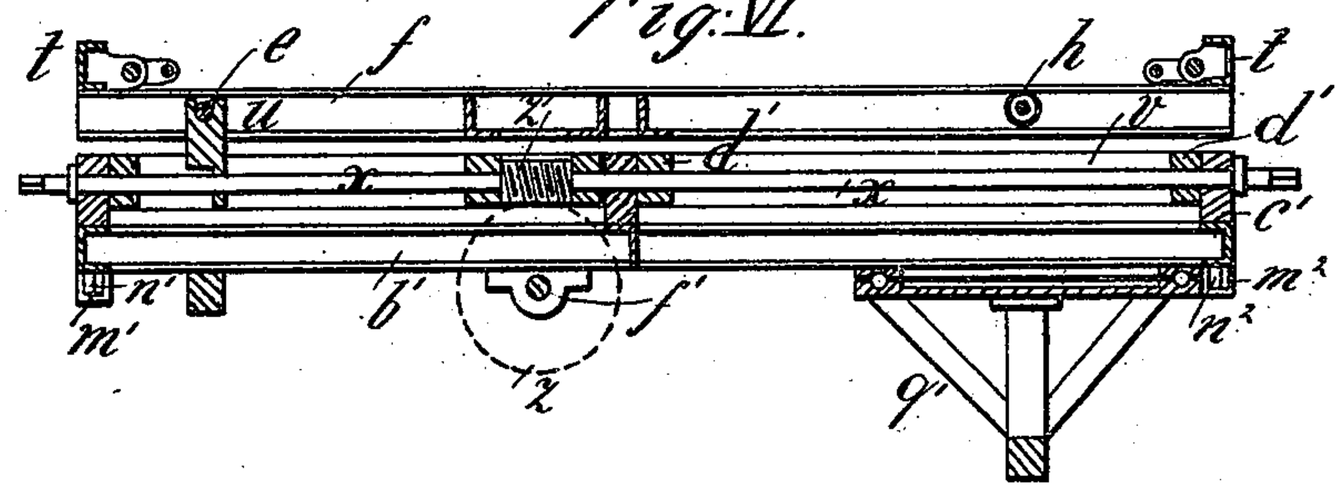


Fig. VII.

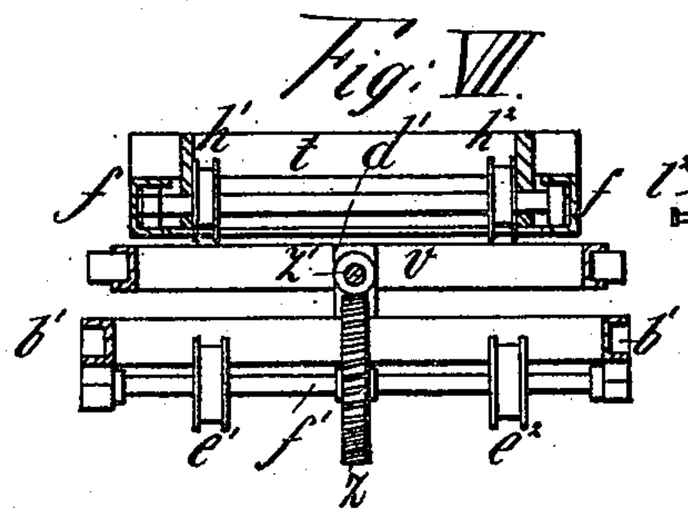
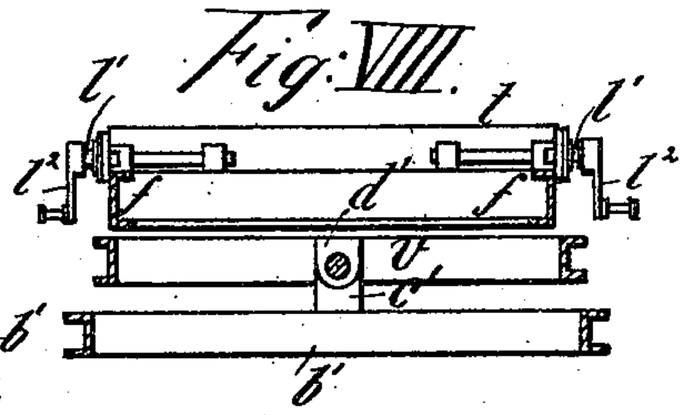


Fig. VIII.



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UNITED STATES PATENT OFFICE.

OSCAR WITZEL, OF LANGENSALZA, GERMANY.

FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 494,452, dated March 28, 1893.

Application filed June 28, 1892. Serial No. 438,318. (No model.)

To all whom it may concern:

Be it known that I, OSCAR WITZEL, a subject of the King of Prussia, residing at Langensalza, in the Kingdom of Prussia and German Empire, have invented new and useful Improvements in Fire-Ladders, of which the following is a specification.

My invention relates to improvements in portable fire ladders in which the platform is connected by means of lazy tongs with the carriage framing and can be raised or lowered as desired, according to the adjustment of the tongs.

The invention has for its object to improve fire ladders or escapes of the character alluded to, and to this end it consists in the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 illustrates the fire ladder with partially raised platform, in side elevation, the rear carriage wheel framing being shown dotted for the sake of greater clearness of the carriage framing. Fig. 2 is a front elevation showing the ladder in the position of Fig. 1. Fig. 3 is a horizontal section through the fire ladder on the line A. B. Fig. 1. Fig. 4 is a plan of the ladder. Fig. 5 is a side elevation of the fire ladder with lowered platform and ready for transport. Fig. 6 is a longitudinal section on the line C. D. Fig. 3. Fig. 7 is a cross section through the carriage framing on the line E. F. Fig. 3, and Fig. 8 is a cross section on the line G. H. Fig. 3.

The arrangement of the portable fire ladder is as follows: The platform *a* is connected with the lower carriage framing *b* by means of two laterally arranged tongs *c*. The tongs *c* are capable of rotation with the left lower arm *d* about the shaft *e* on the channel irons *f* of the carriage framing *b* while the other lower arm *g* of the tongs is capable of movement by means of running rollers *h* adapted to travel on tracks or ways formed by the channel irons *f*. The platform *a* is also capable of rotation on the left side at *i* with the left upper arm *k* of the tongs while the running rollers *l* at the other upper arm *m* of the tongs are adapted to travel on horizontal ways formed by the channel bars *n*. The links composing the tongs are suitably connected by through rods *p*.

The platform *a* is provided with a railing *q* running round the same and carries two horns *r* over which the climbing ladders *s* are laid. The attachment of the latter to the carriage framing will be hereinafter described. The carriage framing *b* carries first the channel irons *f* which receives the lower guide rollers *h* of the arm *g* of the tongs, and which at the same time constitute the pivots for the lower left arms *d* of the tongs. The channel irons *j* are connected by means of transverse girders *t* to form a frame. The shaft *e* constitutes at the same time the pivot for the channel irons *f* for adjustment of the latter which rest in supports *u* on the girders of the middle framing *v*. Adjusting screws *w* serve to raise and depress the front end of the channel irons *f* and thereby adjust the same horizontally in the longitudinal direction. The middle framing *v* composed of longitudinal and transverse girders, is capable of rocking on the central longitudinal shaft *x*. Screws *a'* arranged at both longitudinal sides of the middle framing *v* and adjustable therein, bear against the under frame *b'* of the carriage framing and allow of the rotation of the middle framing *v* about the shaft *x* as an axis and consequently the adjustment of the fire ladder. The supports *c'* belong to the under frame *b'* and the supports *d'* belong to the middle framing *v*. The movable lower arm *g* of the tongs is by means of a hoisting device moved nearer to or away from the arm *d*. The hoisting device consists of the two drums *e'* and e^2 on the drum shaft *f'* operated by means of a worm wheel *z* on the drum shaft which engages a worm *z'* on the shaft *x*, and the ropes *g'*, g^2 secured at one end to some fixed part as for instance the shaft *e* and passing round the pulleys *h'* h^2 on the shaft *i* from whence said ropes extend to pulleys *e'*, e^2 on the drum shaft *f'*; so that when the shaft *x* is rotated in the proper direction, the drums *e'*, e^2 are turned to wind up the ropes *g'*, g^2 and thus pull or draw the rollers *h* toward the lower pivoted extremities of the links *d*.

The manner in which the ropes are applied is indicated by dotted lines in Fig. 1. Straining ropes k' k^2 pass from the outer upper ends i and t of the tongs c diagonally to the opposite transverse sides of the carriage framing and are actuated and tightened by means of small windlasses l' with crank l^2 and ratchet wheel l^3, Fig. 4. On the under frame b' are also provided in suitable guides m' m^2 withdrawable rods n' n' n^2 n^2 which are provided with hooks o' to which the rope ladders s s are attached which are laid over the horns r and are tightened by stepping on same. The rods n' n' n^2 n^2 are drawn laterally out of the carriage whereby the rear rods n' n' pass through the openings between the spokes of the rear carriage wheels p' and thereby at the same time effect the skidding or fixing of the carriage framing. The forward carriage framing is capable of turning in a circle so that the ladder can be turned round in a circle as desired. Spirit levels r' r' serve to effect the horizontal adjustment of the upper framing f t. A second spirit level s' serves for the horizontal adjustment of the middle framing v. The cranks x' for operating the windlass y are arranged at the front and rear sides of the carriage framing so as to facilitate working. On the connecting rods o of the second or third lowest pairs of arms of the tongs there may be provided supporting bars y' the lower ends of which are fixed in brackets z^2 or by any other means and serve for stiffening the tongs. The supporting bars y' are either removable or are so arranged that their lower ends can slide by means of rollers on special channel irons and can be fixed upon the latter.

In using the fire ladder, it is drawn in its folded or collapsed condition to the place of use, then first the platform a is adjusted by adjusting the middle framing v horizontally in a transverse direction by means of the screws a' and then the frame f t is adjusted horizontally by means of the adjusting screws w. Then the rope ladders s which have been brought along on the platform, are laid over the horns r and the rods n' n^2 are drawn out and the rods n' passed through the openings between the spokes of the rear carriage framing so that the carriage framing is made fast at the same time. Then by rotating the cranks x' of the hoisting device, the pulleys h' h^2 are pulled whereby the arms g of the tongs are brought near to the arms d and the platform a is raised to the desired height. The rollers l of the upper tong levers m move during this operation in the upper channel irons n. When the ladder has been brought to a desired height, then by means of the windlass l' the straining ropes k' k^2 are drawn tight, the rope ladders s are hooked on the rods n' n' n^2 n^2 and the ladder can be easily climbed.

The fire ladder according to this invention has the advantage of being extremely compact, that is to say, when in its folded or collapsed state it can be drawn through the gateways of houses and can be set up in the yards thereof which is not possible with the extensible portable climbing ladders hitherto employed. By the use of the adjusting mechanism on the frame f t, and on the middle framing v the platform can be brought into a horizontal position and can be inclined as desired according to the requirement.

The rope ladders s allow of conveniently climbing on to the platform and of working the ladder at various heights. By means of the rope ladders s s and the straining ropes k' k^2, the platform is secured against swaying.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a portable and adjustable fire ladder the combination of the rope ladders s s with rigid rungs, which are passed over horns r on the platform a and are fixed at their lower ends to and there held by withdrawable rods n' n' n^2 n^2, substantially as described.

2. In a fire escape, the combination with a suitable carriage, of tongs c having one pair of lower links pivoted to the carriage and the other pair provided with rollers h adapted to travel back and forth on said carriage, a drum shaft f' mounted on the carriage and having a worm wheel z and drums e', e^2, a shaft x having a worm z' engaging the worm wheel, means for rotating the worm carrying shaft, and ropes g', g^2 connected at one end with stationary parts of the carriage, passing round the said rollers on the lower pair of links and engaged with the drums on the drum shaft, substantially as described.

3. In a fire escape, the combination with the carriage framing b having the bracket z^2, and the lazy tongs c supported by the carriage framing, of the supporting bar y' pivoted at its upper end to the links of the lazy tongs and having its lower end portion engaged with the bracket on the carriage framing, substantially as described.

4. In a fire escape, the combination with a wheeled framing, the platform a having the horns r, and the lazy tongs for raising and lowering the platform, of the sliding or withdrawable rods carried by the wheeled framing and adapted to be slid outward thereupon, and the rope ladders passing over the horns of the platform and connected with the said rods, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

OSCAR WITZEL. [L. S.]

Witnesses:
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