(No Model.)

3 Sheets—Sheet 1.

C. A. ROBERTS.

FIRE ESCAPE.

No. 294,275. Patented Feb. 26, 1884.

Fig. 1.

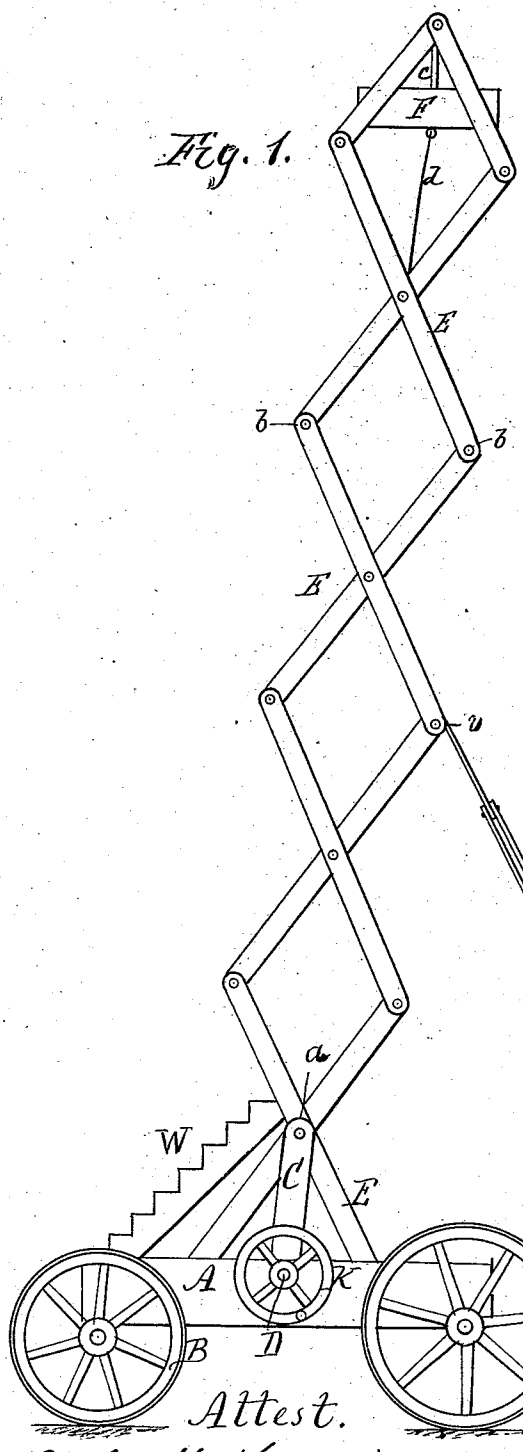
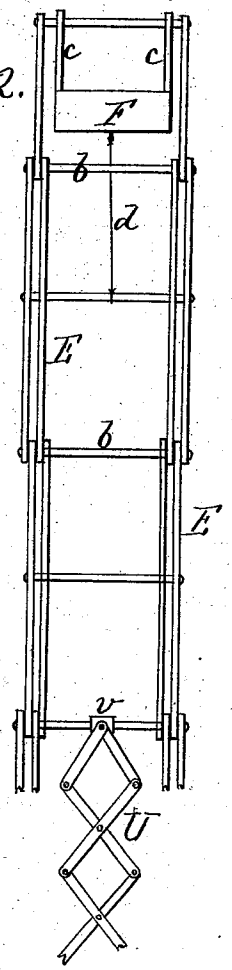


Fig. 2.



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Fig. 3.

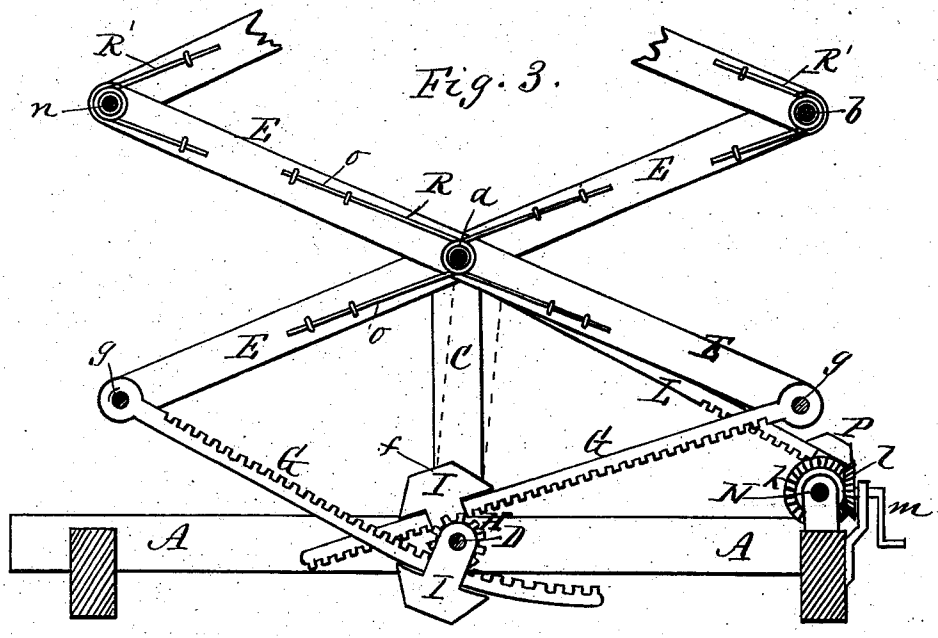
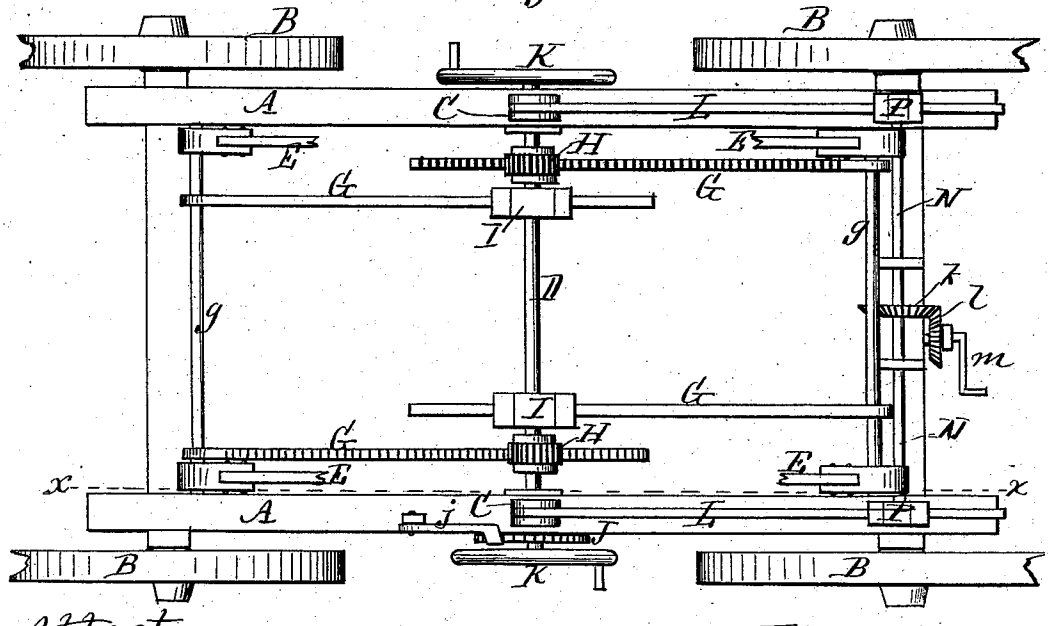


Fig. 4.



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Fig. 5.

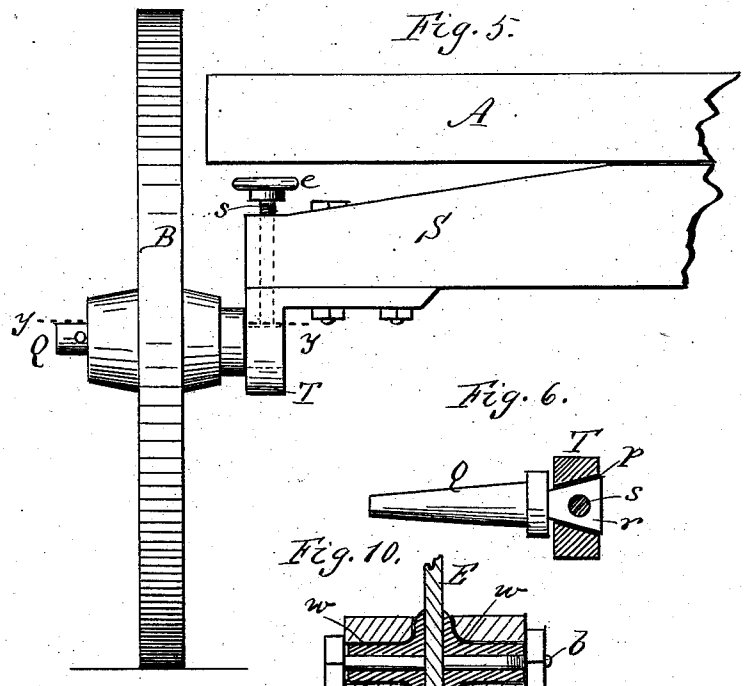


Fig. 6.

Fig. 10.

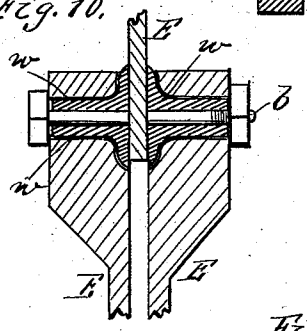


Fig. 7.

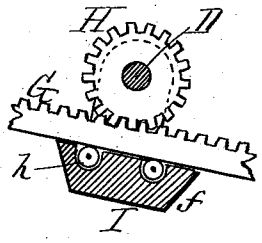


Fig. 9.

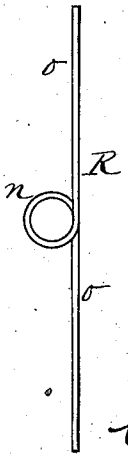
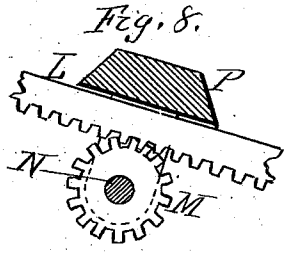


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHESTER A. ROBERTS, OF CALEDONIA, NEW YORK.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 294,275, dated February 26, 1884.

Application filed June 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHESTER A. ROBERTS, of Caledonia, Livingston county, New York, have invented a certain new and useful Improvement in Fire-Escapes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the apparatus in the extended position. Fig. 2 is an elevation of the upper portion of the same at right angles to Fig. 1. Fig. 3 is a longitudinal vertical section of the carriage or truck in line *x x* of Fig. 4, enlarged, and showing a portion of the extension-arms in elevation. Fig. 4 is a plan of the carriage or truck and the devices for operating the extension-arms. Fig. 5 is an elevation of one side of the carriage or truck, showing the means for adjusting the supporting-wheels. Fig. 6 is a horizontal section in line *y y* of Fig. 5. Fig. 7 is a detail view, showing in section the rack, pinion, and guide-block for raising the extension-arms. Fig. 8 is a similar view of the devices for adjusting the standards that hold the extension-arms. Fig. 9 is an elevation of one of the springs which are attached to the extension-arms.

My improvement relates to that class of fire-escapes in which a series of extension-arms in the form of lazy-tongs are mounted on a carriage or truck, and are raised and lowered by crank-wheels. Fire-escapes of this class have long been known.

My invention consists in the particular means for operating the extension-arms, as hereinafter described and claimed.

In the drawings, A shows a carriage or truck mounted on wheels B B, and provided with two vertical standards, C C, which are pivoted on the axis of a cross-shaft, D, so as to turn forward and back in the longitudinal line of the frame, as indicated by the dotted lines in Fig. 3. The tops of these standards are connected by a cross-shaft, *a*.

E E E E are the series of extension-bars or lazy-tongs, pivoted together at *b b* in the usual way, and having their lower bearing or fulcrum on the shaft *a*, which connects the tops of the two standards C C. Two sets of these bars are used—one on each side of the machine—and they are connected by the pivots *b b*, which extend across in the form of rods, as shown in Fig. 2. At the top of the bars is a hanging cage or basket, F, attached to the upper pivot, *b*, by arms *c c*, and this cage serves to elevate firemen and others, and also to lower persons escaping from a burning building. The bottom of the cage is connected with the next pivot below by a cord, *d*, which prevents swinging of the cage in use.

My improvement is as follows:

H H are two spur-gears made fast to the shaft D on each side of the machine, and G G are two racks attached to rods *g g*, connecting the lower ends of the two sets of extension-bars, said racks extending inward and engaging with the gears H H, one above and the other below. Four gears and four racks are used, as shown in Fig. 4.

I I are guide-blocks, through which the racks run. These guide-blocks rest and turn freely on the shaft D, and have slots, through which the racks pass freely. At the outer ends are heads *f f*, having plane inner surfaces, which fit the smooth backs of the racks and form guides thereto, as shown most clearly in Fig. 7.

It will be seen that as the shaft D is turned the gears engaging with the racks will draw the latter inward and draw the lower ends of the bottom bars toward each other, and thus extend the bars, as shown in Fig. 1. As the bars are drawn inward, the racks constantly assume different angles, and the guide-blocks I are necessary to keep them in position to engage with the gears. By turning freely on the shaft D they keep a right-angled position to the racks, so that no binding can occur.

If desired, small friction-rolls *h h*, Fig. 7, may be used inside the blocks for the back of the racks to roll on.

K K are crank-wheels on the outer ends of the shaft D, and J is a ratchet on the shaft, with which engages a pawl, *j*, by which the bars may be held extended at any height.

The machine may be operated by turning the crank-wheels by hand, or power may be applied in any desired manner; and, if desired, gearing may be connected with the shaft D, so as to impart a greater power at the initial movement and a less power when the bars are partially raised.

L L are two racks, pivoted at one end to the

tops of the pivoted standards C C, the other ends engaging with spur gears or pinions M M on a shaft, N, at the rear end of the machine. These racks pass through guide-blocks P P, similar to the blocks I I, and turning on the shaft N in the same manner. In the center of the shaft N is a bevel-gear, *k*, and with this engages a bevel-pinion, *l*, having a crank, *m*. By turning the crank, motion will be given to the shaft, and the racks L L will be thrown out or in, correspondingly changing the position of the standards C C. The shaft N is provided with a ratchet, with which engages a pawl for holding the standards at any adjustment.

The object of adjusting the standards is to incline the bars, when extended, toward a building, as shown in Fig. 1, so that while the carriage stands at some distance from the building the cage at the top can be swung up to the windows.

A special feature in this invention is the combination of the pivoted standards, by which the extension may be set at any incline, the racks pivoted to the top thereof for producing the adjustment, and the racks attached to the ends of the lower bars and engaging with gears on a common center, by which the extension-bars can be raised or lowered at whatever incline they may stand.

It will be seen that since the standards turn on the same center as the gears H H, the extension, as it is carried forward and back by inclining the standards, will not cause binding of the racks on the gears, as each side moves equally.

R R are strong springs, each consisting of a central coil, *n*, and two straight arms, *o o*, Fig. 9. Each joint of the extension-bars is provided with one of these springs. The coil rests around the pivot, and the two arms are respectively attached to the two bars, as shown in Fig. 3. The tendency of the springs is to expand or open the bars to raise the extension. The bottom springs, which connect with the shaft *a*, are very stiff and strong, and exert a powerful action to assist in raising the bars. The side springs serve to equalize the action and prevent any tendency of binding in raising the bars.

In Fig. 5 is shown a device for adjusting and leveling the carriage upon the wheels, to properly support the apparatus in uneven places. The axle S has at each end a metallic bracket, T, in which is formed a dovetailed vertical slot, *p*, Fig. 6. In this slot slides a dovetailed tongue, *r*, of the journal Q, on which rests the wheel B.

s is a screw, which passes down through the end of the axle, and screws into the tongue *r*. At the top of the screw is a hand-wheel, *e*, and by turning the screw the axle can be raised or lowered on the journal. One of these devices is used at each corner of the machine, and by their use the apparatus can be adjusted to a level on any incline.

U, Figs. 1 and 2, shows a secondary set of extension-bars mounted on an independent carriage or truck, V, and used simply as a brace or support to the main apparatus when set in an inclined position, as shown in Fig. 1. It consists of a single set of extension-bars, which stand at right angles to those of the main apparatus. At the top the secondary set of bars are attached by a swivel, *v*, to one of the pivots *b*, and at the bottom they may be operated by any suitable means.

By the means just described the main extension can be braced and sustained when inclined to any position, which is essential in elevating to considerable heights.

W is a set of stairs on top of the carriage and at one side, for the purpose of mounting on or dismounting from the cage.

In Fig. 10 is shown a joint for the extension-bars, by which greater strength is produced. The upper single bar is made fast to a thimble or spool, *w*, through which the pivot *b* passes. The two lower bars rest on the spool and turn thereon, thereby obtaining a larger bearing and greatly strengthening the joint. The heads of the pivot hold the bars in place.

The extension-bars are made in alternate lengths of double levers, as shown in Fig. 2, so that when closed the single levers will fold between the double ones.

Having described my invention, I claim—

1. In a fire-escape, the combination, with the extension-bars, of pivoted standards which support the bars, racks attached to the top of the standards, and engaging at their outer ends with gears, by which the standards can be adjusted to any position, and racks attached to the bottom of the lower set of bars, extending inward and engaging with gears on a shaft turning on the same center with the standards, for the purpose of raising and lowering the extension-bars, as herein set forth.

2. In a fire-escape, the combination of pivoted standards for supporting the extension-bars, a set of extension-bars pivoted to the top of the standards, a set of gears on a shaft in the same center as the pivots of the standards, and a set of racks attached to rods connecting the ends of the bottom bars, and engaging with the gears on the shaft, as herein set forth.

3. In a fire-escape, the combination of the pivoted standards C C, the set of extension-bars E E, the gears H H on the shaft D, the racks G G, attached to the bottom of the extension-bars and engaging with the gears, and the guide-blocks I I, turning on shaft D and holding the racks in place, as herein shown and described.

4. In a fire-escape, the combination, with the pivoted standards C C and extension-bars E E, of the main spring R, having its fulcrum on the cross-rod *a* at the top of the standards, and connected with the two lower bars, and the springs R′ R′, connected with the outer joints, as set forth.

5. In a fire-escape, the combination, with the axle S, of the bracket T, provided with the dovetailed slot *p*, the journal Q, provided with a dovetailed tongue, *r*, which rests in the slot, and a screw, *s*, passing through the axle and into the tongue, as and for the purpose specified.

6. In a fire-escape, the combination, with the main extension-bars E E, resting on the pivoted standards C C, of the secondary extension-bars U, mounted on a separate frame, and standing at right angles to the main bars, and attached by a swivel to one of the pivots of the main bars, as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CHESTER A. ROBERTS.

Witnesses:

R. F. OSGOOD,

EDWIN CAMPBELL.