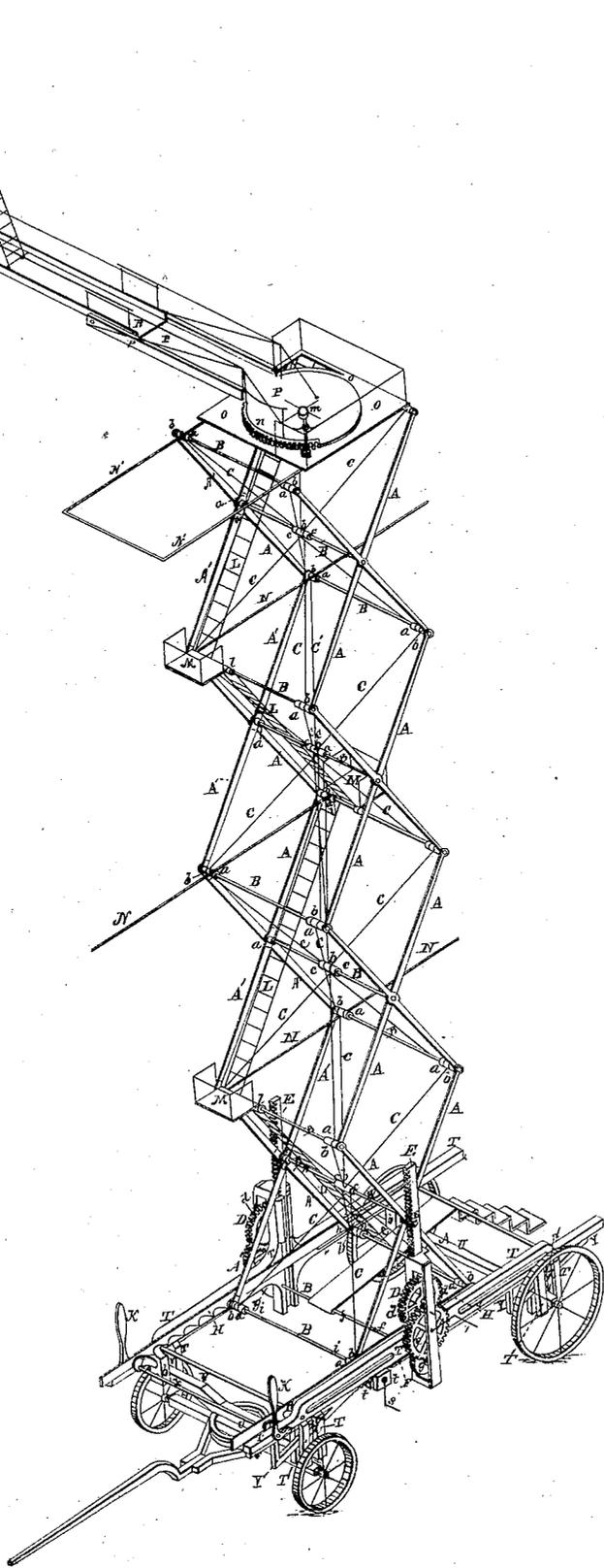


J. W. Sprague

Fire Escape

Patented Jan. 22, 1861.

*N^o 212.
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UNITED STATES PATENT OFFICE.

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FIRE-ESCAPE.

Specification of Letters Patent No. 31,216, dated January 22, 1861.

To all whom it may concern:

Be it known that I, JOSEPH W. SPRAGUE, of the city of Rochester, county of Monroe, and State of New York, have invented certain new and useful Improvements in Methods of Constructing Fire-Escapes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

I am aware that fire escapes have been heretofore constructed, in which the general principle employed by me has been made use of, viz. the elevation of a platform by means of the expansion of a double series of connected levers, or "lazy tongs." Fire escapes heretofore constructed upon this plan have been too heavy for convenient locomotion, and have lacked stiffness.

It is the object of the present invention to overcome these difficulties, and also to increase the safety and convenience of the machine.

The nature of my invention consists then: First. In providing the machine with a system of internal bracing—to obviate the necessity of external guying. Second. In constructing this system of internal bracing in such a manner as that the braces shall not interfere with each other, in raising or lowering the machine. Third. In applying the raising power to that part of the lower system of levers, where these levers cross each other, so as to have as little waste of power as possible; and in arranging the motions of the lower ends of the lower levers, by means of guides, so as to give steadiness to the machine, while in the act of being raised or lowered. Fourth. In providing a continuous passageway from the top to the bottom of the machine, by means of a series of short ladders, provided with platforms for convenience in passing from one ladder to the next. Fifth. In constructing the platforms in such a way as to compel them to maintain a horizontal position, whatever may be the elevation of the machine. Sixth. In attaching to the upper platform a revolving platform, combined with a light platform, to be slid into the window of a burning building, thus affording a passageway from the building to the machine. Seventh. In providing for the inequalities of the street,

where the machine may be needed, by arranging the wagon frame, on which it rests, in such a way as to admit of leveling. Eighth. In attaching ratchets to the lower ends of the lower levers, in such a way as to relieve the raising apparatus from all strain, after the machine is raised. Ninth. In effecting such a combination between the cams, (which must raise the ratchets just al- luded to before the machine can be lowered) and the brakes, that the very act of raising the ratchets tightens the brakes—thus rendering it impossible for any careless person to allow the machine to descend too rapidly—and making it automatic in regulating the descent. Tenth. In constructing the levers of sheet metal, with bent edges, (thus combining lightness and stiffness) and inserting additional metal at the centers and ends of the levers, to afford them suitable bearings where they come in contact.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The accompanying drawing represents an isometric view of the machine, when raised.

A, A, A', A', represent levers combined together, forming two systems of "lazy-tongs" by the opening and closing of which the machine is raised or lowered. The form of construction adopted for these levers has been already described; it is shown in the levers A', A'.

B, B, represent struts connecting together the two systems of combined levers. The levers are free to rotate on these struts. Shoulders, as *a, a*, rigidly attached to the struts, (either with or without revolving collars, *b, b*, placed between the shoulders *a, a*, and the levers,) prevent the two systems of levers from approaching each other; while nuts or washers, attached to the struts outside of the levers, prevent the two systems of levers from separating from each other.

C, C, represent internal diagonal braces, for giving lateral stiffness to the machine when elevated. Where these braces intersect the struts B, B; they (the braces) are attached to collars *b, b*, which revolve upon the struts B, B, while shoulders *a, a*, and *c, c*, attached to the struts B, B, prevent any lateral motion of the collars. In the accompanying model and drawing, these braces C, C, are shown soldered to the revolving collars *b, b*;

but it is intended that in large machines, these braces shall be attached to the collars by screws and nuts, so as to admit of adjustment. If these braces were all similarly situated, they would so interfere with each other as to render it impossible to raise or lower the machine. To obviate this difficulty the following arrangement is adopted. If a line is drawn along the center of any lever, from end to end; it may be seen that of the four braces, which move with this lever, two are on one side of the center line, and the remaining two on the other side of the center line. Looking down upon the machine from above it will be seen that those braces, whose interference with each other is not prevented by the preceding arrangement, are provided for by causing them to shut by (side by side) each other, instead of directly upon each other. When the machine is lowered, the first and second set of braces (commencing from below) lie above and below each other—the second and third side by side—the third and fourth above and below each other—the fourth and fifth side by side—and so on. The combination of these two systems of arranging the braces prevents all interference between them. It is evident that these two systems of arrangement may be combined in different order from that here shown, the same result being arrived at.

D, D, represent two cranks for raising and lowering the machine. The pinion, that revolves with the crank D, gears into the wheel *d*. The pinion that revolves with the wheel *d* gears into the rack E; the elevation or depression of which raises or lowers the machine. The wheel *e*, that revolves with the crank D gears into a pinion, attached to an axle *f* passing under the machine, and similarly connected with the raising apparatus on the other side, so as to give uniformity of motion to the racks E, E. To the axle *f*, two friction wheels *g*, *g*, are attached, operated upon by the friction bands F, passing partly around the wheels, and acting as brakes.

The racks E, E, are attached to the strut *w*. The elevation of these racks causes the two systems of levers A, A, A', A', to expand. The lower ends of the four lowest levers each carry a wheel, which is retained in a groove in the wagon-frame along which it rolls. When the machine is elevated, its weight rests on these four wheels.

H, H, represent two ratchets, for relieving the strain from the raising apparatus after the machine is elevated. One end of each ratchet *h*, is attached to the lower end of one of the lowest levers A, A', while the other end of the ratchet slides over a strut *z*, passing through the lower end of the corresponding lever A, A', at the other end of the machine. In raising the machine

these ratchets slide freely over the strut, but as soon as descent commences the teeth on the ratchet catch the strut, relieve the raising apparatus from all strain, and hold up the machine.

I, I, represent cams arranged on a shaft *k*, to which are attached the handles K, that move the brakes F, F. The ratchets H, H, rest on these cams. The act of depressing the brake-handle K tightens the brakes F, F, rotates the cams I, I, and lifts up the ratchets H, H, so that they can no longer prevent the descent of the machine, which is now regulated by the action of the friction brakes.

L, L, represent ladders for ascending and descending. The ends of these ladders are free to rotate upon the struts B, B, with which they are connected.

M, M, represent platforms, at the intersections of these ladders. These platforms are attached to collars *l*, free to revolve on the struts B, B. A guide lever N, passes from each platform to the strut B, at the opposite end of the machine. This guide lever N, is arranged, in any convenient manner, so as to slide horizontally upon B, while it is prevented from departing from it vertically. In the accompanying model the device used is a loop, attached to a collar, revolving on the strut B; the guide lever N, sliding through the loop.

O, represents the upper platform, which is attached to the machine in the same manner as the smaller platforms M, M, except that in this case the weight of the platform O, bears directly upon the guide levers N', N', (which are double) and keeps them down upon the opposite strut B.

P, represents a revolving platform, attached to O, and rotated by a capstan *m*, acting upon the toothed sector *n*.

R, represents a light platform, sliding on P, to be extended into the window of a burning building.

S, represents an additional ladder, extending above the upper platform. When the machine is not in use, the ladder S, is turned back—down upon the platform R; the platform R, is moved back upon the platform P; the platform P, is turned quarter around from the position shown in the accompanying drawing, until it lies between the two systems of levers A, A, A', A'. The levers A, A', are then lowered and the whole machine occupies but little space.

T, T, represent the wagon frame supporting the machine. On one side this wagon-frame is attached to the front and rear axles U, U, by two pins *p*, *p*, which allow the wagon frame to rotate slightly up and down. On the opposite side, between the wagon frame and each axle, is placed a sliding wedge Y. The wedges Y, Y, belonging to the two axles U, U, are both attached to the

bar *r*, and moved simultaneously by the crank *s*, the pinion attached to which gears into the rack *t*, attached to the bar *r*. The motion of the wedges *Y, Y*, causes the wagon frame *T*, to rotate slightly about the pins *p, p*; thus affording a means of leveling the machine, when it is to be used on an uneven street. The slots *V, V*, guide the axles, so as to prevent them from moving relatively forward or backward. A pin *x*, attached to the wagon frame, passes under the bar *r*. Another pin *z*, attached to the axle, passes over the inclined portion of each wedge *Y*. These pins do not interfere with the legitimate motion of the wedges; but prevent any vertical play between the wagon frame and the axles.

An inspection of the drawing shows plainly all necessary details of the running gear of the carriage.

What I claim as my invention and desire to secure by Letters Patent, is—

1. The braces *C, C*, combined with the levers *A, A*, and struts *B, B*, when the same

are constructed and operated substantially as above described for the purpose aforesaid. 25

2. The combination of the platforms *M, M*, the ladders *L, L*, and the guide bars *N, N*, when the same are constructed and operated substantially as herein described. 30

3. The combination of the upper platform *O*, the revolving platform *P*, and the sliding platform *R*, substantially as herein described.

4. The attachment of the wagon frame to the axles in such a manner, as to allow the wagon frame to be leveled, by means of the sliding wedges *Y, Y*, substantially as herein described. 35

5. The arrangement of the cams *I, I*, in combination with the ratchets *H, H*, and with the brakes, in such a manner that the act of raising the ratchets shall tighten the brakes, substantially as herein described. 40

JOS. W. SPRAGUE.

Witnesses:

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GEORGE ARNOLDT.