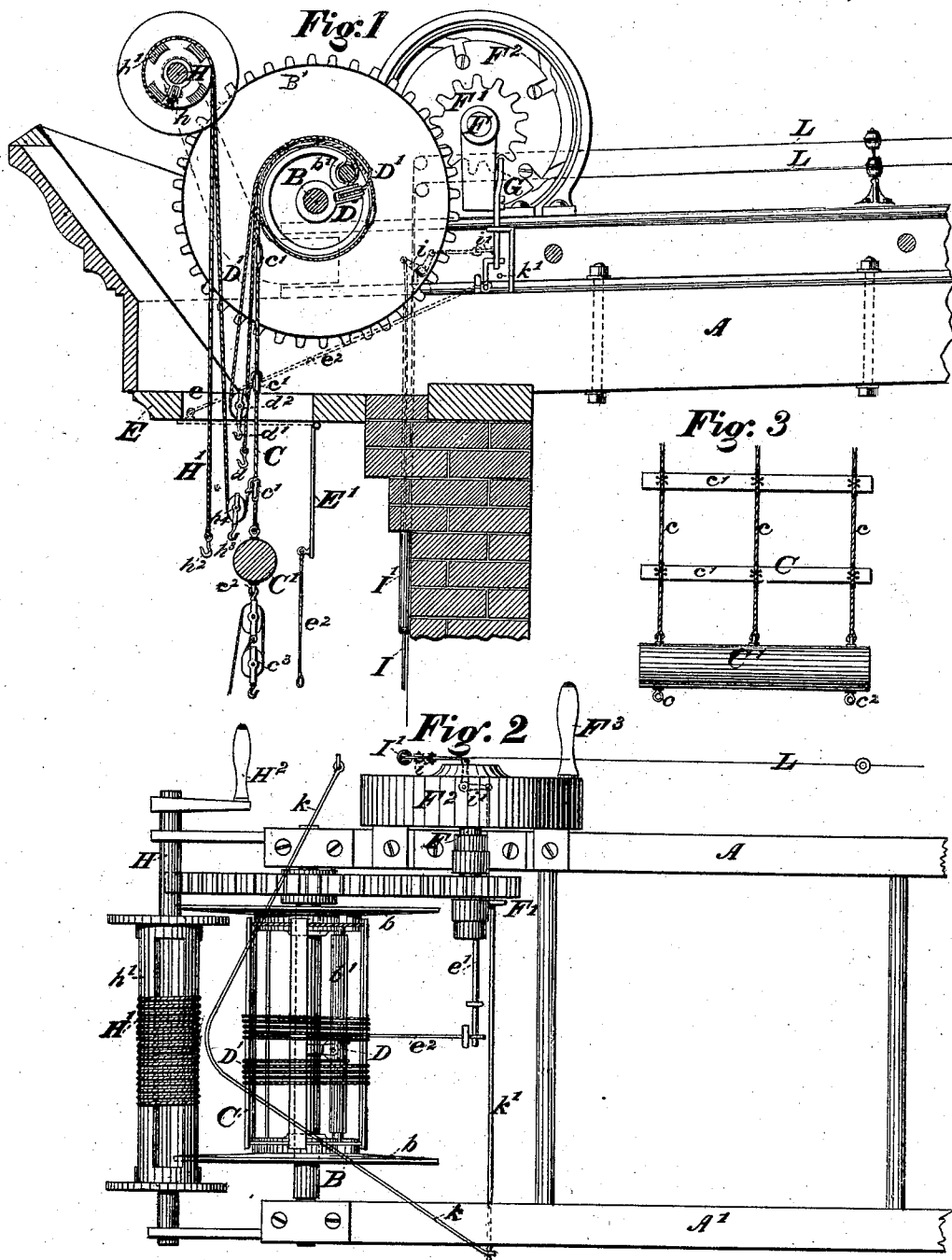


H. A. RICHARDS & B. H. JENKS.

FIRE-ESCAPE.

No. 173,739.

Patented Feb. 22, 1876.



Witnesses:

John C. Wendling
Geo. D. Collier.

Inventors:

Henry A. Richards
Barton H. Jenkins
by J. Snowden Bell
attor.

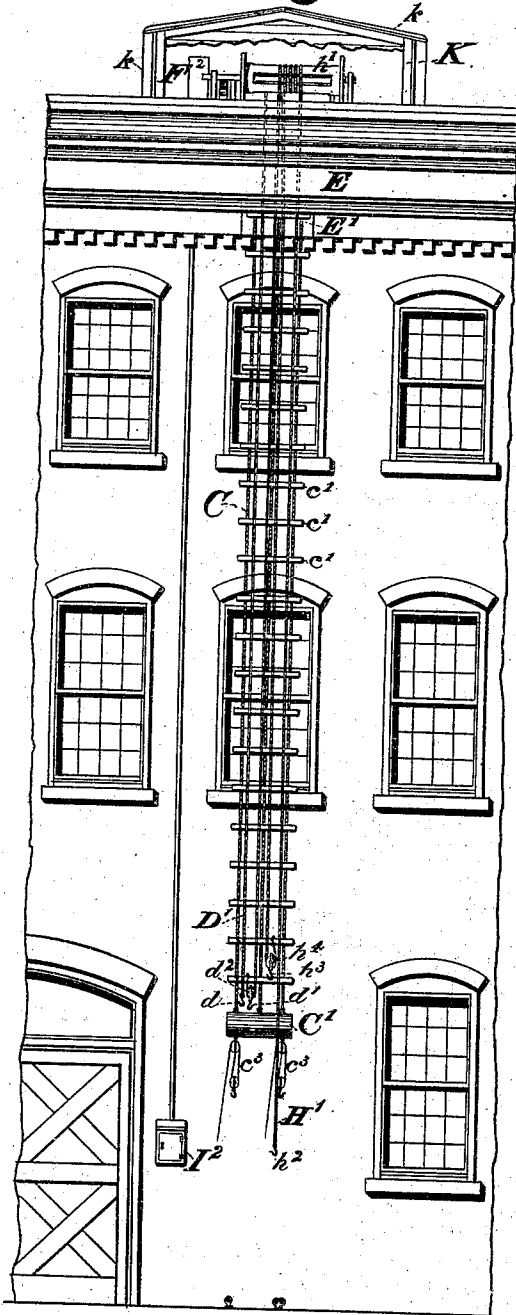
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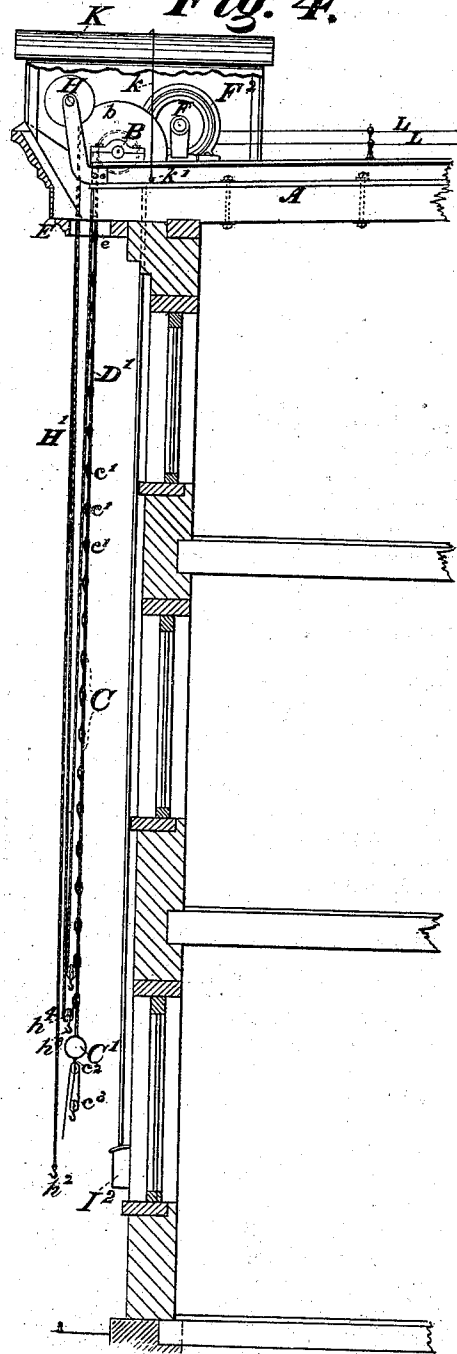
Fig. 5.



Witnesses:

John Spending
Geo. D. Bollier

Fig. 4.



Inventors:

Henry A. Richards
Barton H. Jenks
by J. Snowden Bell
atty

UNITED STATES PATENT OFFICE.

HENRY A. RICHARDS, OF CHICAGO, ILLINOIS, AND BARTON H. JENKS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. 173,739, dated February 22, 1876; application filed July 23, 1875.

To all whom it may concern:

Be it known that we, HENRY A. RICHARDS, of the city of Chicago, in the county of Cook and State of Illinois, and BARTON H. JENKS, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Fire-Escapes and Hose-Elevators, of which the following is a specification:

The object of our invention is to provide suitable and efficient means for escape from the roofs or upper stories of buildings in the event of fire, as well as to afford access to such portions of buildings for firemen, and to provide means for elevating hose, &c.; to which ends our improvements consist in combining a winding apparatus and an indestructible supporting structure with a flexible metallic ladder, hose-elevators, a governor, and a device whereby the ladder and hose-elevators are lowered and a telegraphic fire-alarm simultaneously struck, all as hereinafter more fully set forth.

It is a well-known fact that the extent and disastrous character of conflagrations are principally due to the delay which ensues between the commencement or discovery of the fire and the application of means of extinguishment, as almost any fire, if attacked at its commencement, can be readily and speedily quelled with limited appliances, while on the other hand, in a comparatively short space of time, it may, if allowed to gain strength, attain such proportions as to be absolutely uncontrollable. Moreover, the difficulty of promptly carrying water to the roofs and upper stories of high buildings has frequently prevented the efforts of the fire-department from being successful.

Our invention, hereinafter described, is designed, in addition to affording means of escape for the inmates of buildings, to provide means for obtaining access to the highest parts of buildings simultaneously with the striking of the alarm, and this without opening the lower doors or windows, so that there may be no delay in applying water to the fire and no draft created to accelerate the same.

In the accompanying drawings, Figure 1 is a vertical central section of a fire-escape and hose-elevator embodying our improvements;

Fig. 2, a plan or top view of the same; Fig. 3, a view of the ladder; Fig. 4, a front view of a building with the improved fire-escape and hose-elevator applied, and Fig. 5 a vertical longitudinal section of a portion of said building.

To carry out the objects of our invention we provide substantial metallic girders $A A'$, which constitute the bed or frame of the apparatus, and which are built solidly into the front and rear (or intermediate) walls of the building, so as to be independent of the ordinary roof thereof, or may be placed upon the roof structure. A shaft, B , carrying spider-heads b near its ends, is mounted in bearings on the girders $A A'$, and carries a flexible metallic ladder, C , which is wound upon the spider-heads, and secured to a bar or rod, b' , extending from one head to the other. The ladder C is composed of three or more strands, c , each strand being formed of a series of small wire-ropes twisted together, and of a series of steps, c' , preferably of flat band-iron. A weight, C' , is attached to the bottom of the ladder to insure its descent when desired to be lowered, and hooks c'' are likewise provided to make the bottom of the ladder fast to eye-bolts in the pavement. The hooks c'' are connected to the bottom of the ladder by pulley-block tighteners c^3 , to enable the ladder to be made perfectly tight when lowered and hooked to the pavement. A sheave, D , is connected to the shaft B by a bearing fastened to the shaft, over which sheave passes a wire cable, D' , one end of the cable having a simple hook, d , and the other a hook, d' , and snatch-block d^2 . These hooks are fastened to the bottom step of the ladder, and the cable D' is wound up over the ladder. The ladder and cable pass through an opening, e , in the bottom of the cornice E , which opening is closed by a sheet-iron door, E' . A spur-gear, B' , upon the shaft B meshes with a pinion, F^1 , upon a counter-shaft, F , mounted in a bearing on the girder A . The counter-shaft F likewise carries a centrifugal governor, F^2 , to regulate the rapidity of the descent of the ladder, and a crank, F^3 , to elevate the same. If desired, the gearing and counter-shaft might be dispensed with, and the governor and crank be

placed directly on the shaft B; but the arrangement shown is designed to diminish the amount of power required to raise the ladder and cable. The ladder and cable, when wound up, are retained in position by a pivoted detent, G, which engages the teeth of the pinion F¹, and holds the same, and consequently the shaft B, stationary. This detent is withdrawn from the teeth of the pinion in a manner presently to be described. An independent shaft, H, which may be used for elevating an invalid-basket or for a separate hose-elevator, is mounted in bearings on the girders, and carries an elevator-cable, H¹, which passes over a sheave, h, secured in a bearing upon the shaft H in the same manner as the cable D¹ is attached to the shaft B, and is wound upon a drum, h', on the shaft. One end of the cable H¹ carries a hook, h², and the other a hook, h³, and snatch-block h⁴, the hooks being fastened to the ladder C, so that the cable will be drawn down by the ladder when the latter is lowered. The cable H¹ is wound up by a crank, H², on the shaft H. The whole apparatus is covered by a metallic casing or roof, K, to protect it from the weather. The detent G is withdrawn from the teeth of the pinion F¹, when it is desired to lower the ladder, by means of a hand trip-rod, I, or wire cable, which passes down a closed casing or pipe, I¹, on the front of the building, and terminates in a locked box, I², on the outside thereof near the pavement.

The box I² is similar to the ordinary fire-alarm boxes, and is, preferably, fitted with a similar key, so that a patrolman or fireman can start the apparatus if a fire is observed. Suitable openings or relays can be made in the inclosing case or pipe I¹ at the different stories, so that the rod can be moved and an alarm struck from any story of the building. The upper end of the trip-rod I is connected with a vertical bell-crank, i, and this with a horizontal bell-crank, i', which is, in turn, connected with the lower arm of the pivoted detent G, so that a downward pull upon the rod I will release the detent from the teeth of the pinion, and the weight C' will cause the immediate descent of the ladder and cables. Fire-alarm or district-telegraph wires L are connected with the alarm-box I², so that the movement of the trip-rod to lower the ladder will cause an alarm to be simultaneously transmitted to the fire-department. At the same time the door E' of the cornice is thrown open by the withdrawal of a rod, e¹, connected to the detent G from the eye of a rod, e², connected to the door, and the fastening-rod k of the roof or cover K of the apparatus is likewise released by a similar and simultaneous withdrawal of a rod, k', connected with the detent, from the fastening-rod k, so that the cover may be opened to obtain access to the roof.

It will thus be seen that by a simple movement of the trip-rod the cornice-door is opened, the ladder and elevators lowered, the fasten-

ing of the cover unlocked, and a fire-alarm struck.

On the arrival of the engines the firemen can mount to the roof of the building without opening the lower doors or windows, and, by attaching hoses to the hooks on the snatch-block ends of the elevator-cables, the hose can be quickly raised to the roof or upper stories. The firemen will be enabled to perform their duties with greater freedom and confidence from the knowledge that an avenue of escape is open to them in the event of the burning of the stairway, and from their ability to quickly raise lines of hose to the roof they can attack the fire more advantageously by applying water from above instead of below.

In the case of an extensive conflagration lines of hose can be concentrated at contiguous points very rapidly, and by rapid changes of position, for which the apparatus affords ample facilities, the adjoining districts can be effectually protected.

The girders afford a firm support to the apparatus, even if the roof should fall in, so that safety is insured as far as possible.

The peculiar construction of the ladder with its central and side strands prevents it from swaying when persons are passing up and down, as the hands can be applied to the central strand, and the feet to the steps on each side thereof.

The independent elevator-cable H¹ affords facilities for raising and lowering a basket, for the removal of sick or disabled persons, articles of furniture, &c.

Moreover, the inclosing of the trip-rod in a protecting case or pipe prevents the apparatus from being tampered with by mischievous or careless persons, or by burglars for the purpose of gaining admittance to a building, as, even if the case were broken into by them, the alarm would be sounded simultaneously with the lowering of the ladder.

We claim as our invention, and desire to secure by Letters Patent—

1. The combination of a winding shaft or drum, a flexible weighted ladder, and a hose-elevator, connected thereto so as to hang vertically therefrom, and a trip-rod for releasing the ladder and hose-elevator, substantially as set forth.

2. The combination of a winding shaft or drum, a flexible weighted ladder, a hose-elevator attached to the winding-drum, and an automatic governor to regulate the rapidity of descent of the ladder and elevator, substantially as set forth.

3. The combination of a fire-escape and hose-elevator and metallic supporting-girders, secured to the top of a building, substantially as set forth.

4. The combination of a fire-escape and hose-elevator and a protecting case or cover, substantially as set forth.

5. The combination of a fire-escape and hose-elevators and a door in the cornice of a building closing the opening, through which the

ladder and elevators are lowered and opened automatically by the lowering thereof, substantially as set forth.

6. The combination of a winding-drum, a weighted ladder, eyebolts upon or near the pavement, and pulley-block tighteners to connect the ladder and eyebolts, substantially as set forth.

7. The combination of a winding-shaft, a gear-wheel thereon, a detent engaging the teeth of the gear-wheel, and a trip-rod for operating the detent, substantially as set forth.

8. The combination, with the detent and trip-rod, of releasing-rods for the cornice-door and the cover of the apparatus, substantially as set forth.

9. The combination, with a fire-escape, of an independent elevator-shaft, carrying a winding-drum and sheave, and a cable, for the transportation of an invalid-basket or other articles, substantially as set forth.

10. A flexible ladder for fire-escapes having bar-steps, united by three or more cable-strands embracing the steps, substantially as set forth.

HENRY A. RICHARDS.
BARTON H. JENKS.

Witnesses:

J. SNOWDEN BELL,
CHAS. W. SCHUELLENNANN.