

(No Model.)

3 Sheets—Sheet 1.

C. F. ERNST.
COMBINED FIRE ESCAPE AND HOIST.

No. 461,499.

Patented Oct. 20, 1891.

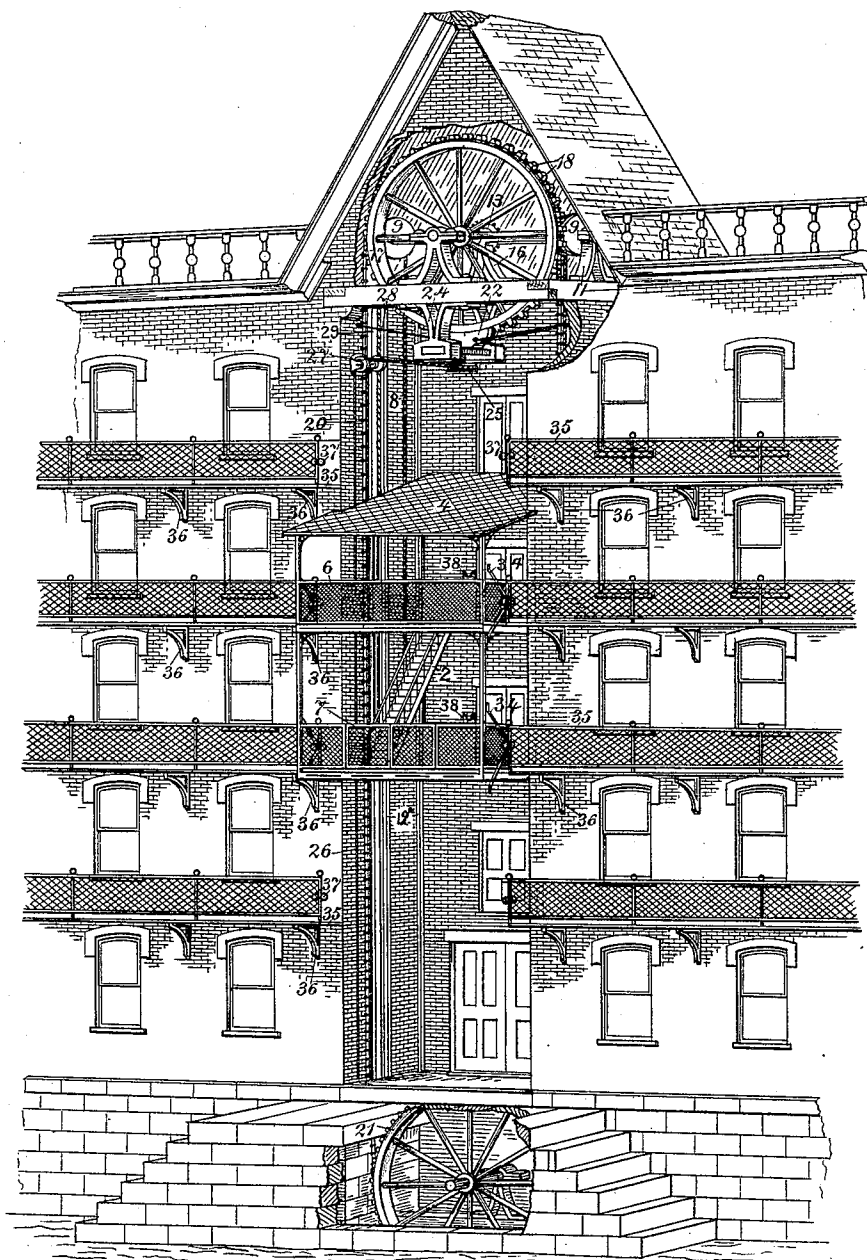


Fig. 1

Witnesses

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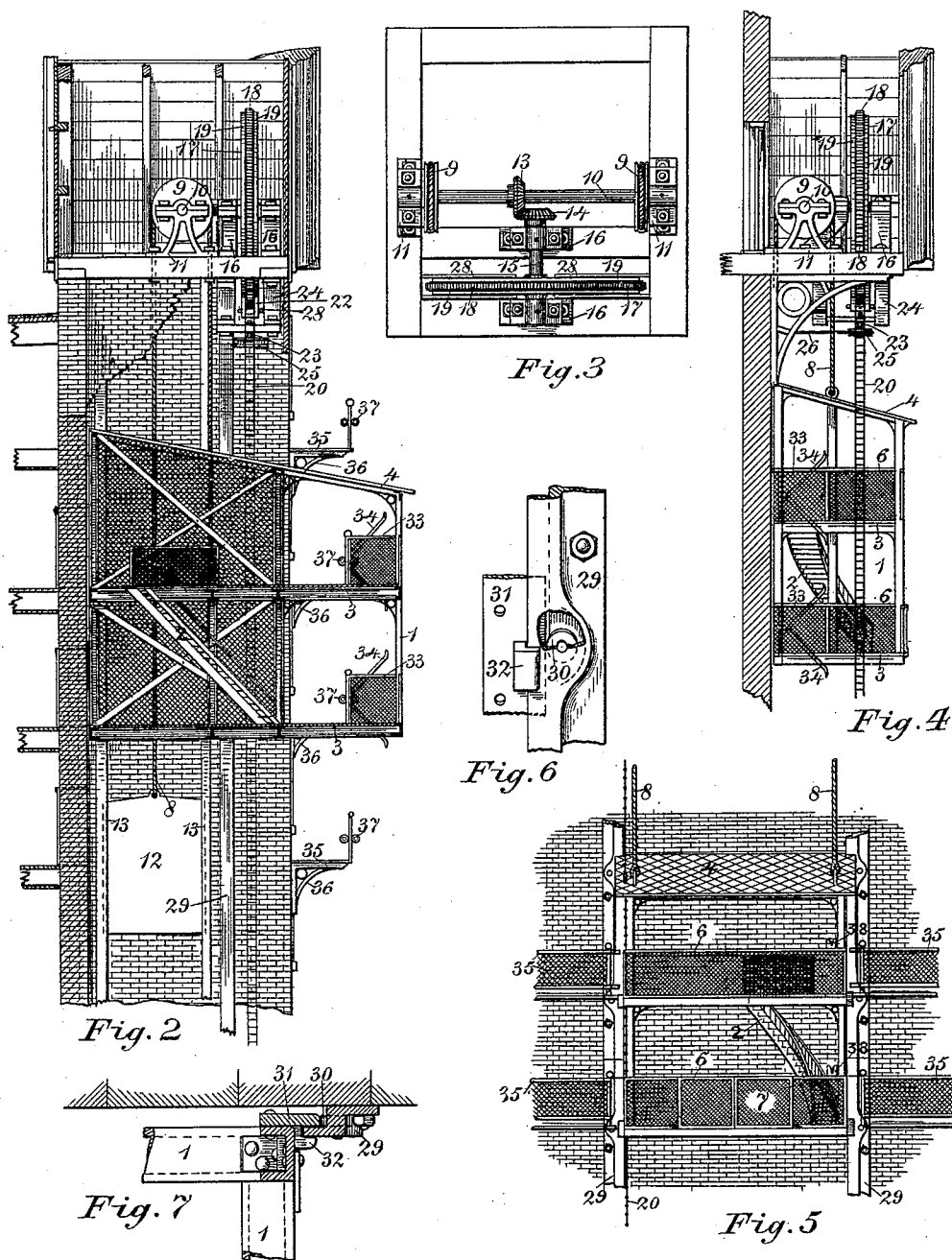
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Witnesses

[Handwritten signatures of witnesses]

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3 Sheets—Sheet 3.

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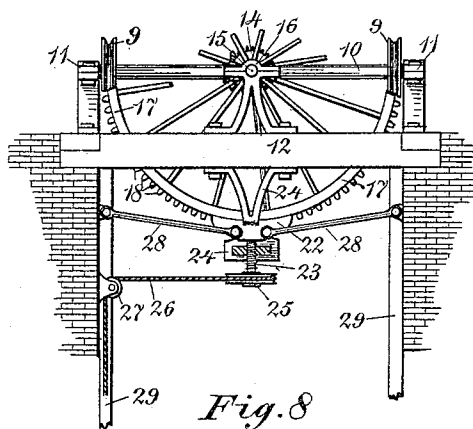


Fig. 8

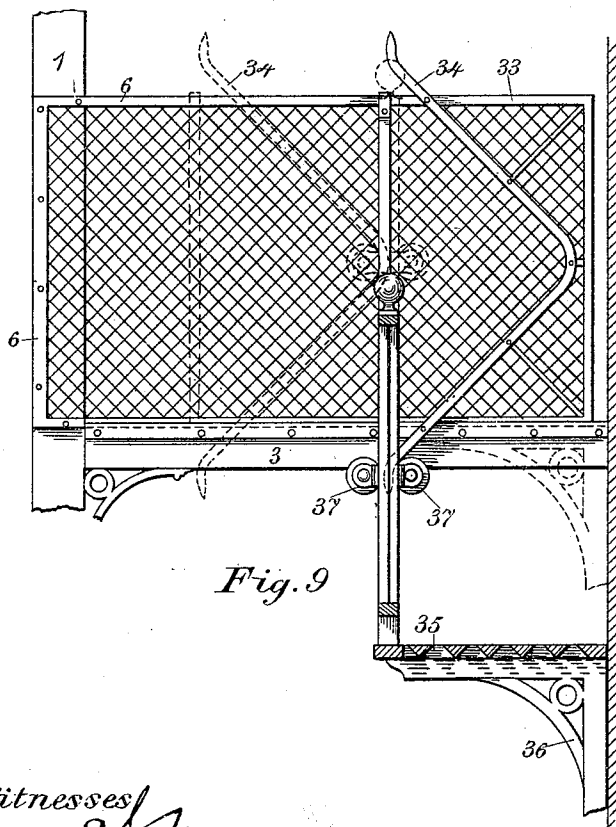


Fig. 9

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UNITED STATES PATENT OFFICE.

CHARLES FREDERICK ERNST, OF NEW HAMBURG, ONTARIO, CANADA.

COMBINED FIRE-ESCAPE AND HOIST.

SPECIFICATION forming part of Letters Patent No. 461,499, dated October 20, 1891.

Application filed October 24, 1890. Serial No. 369,249. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FREDERICK ERNST, a subject of the Queen of Great Britain, residing at New Hamburg, in the county of Waterloo, in the Province of Ontario, Canada, have invented a new and useful Combined Fire-Escape and Hoist, of which the following is a specification.

My invention relates to an improved fire-escape in combination with or which can be used as a hoist at all ordinary occasions, and in case of fire it provides the best means of assistance to firemen in getting hose to the top or any intermediate stage of the highest buildings, dispensing with the use of cumbersome and unsteady ladders; and the objects of my invention are, first, to provide a safe, ready, convenient, and reliable means of escape from the highest buildings; second, to provide a means for elevating quickly and safely firemen's hose to the top or any intermediate point in the highest buildings; third, to provide a fire-escape applicable to other uses, which will more likely cause it to be in condition for instantaneous operation when required for its prime use; fourth, to provide an auxiliary to firemen and dispense with the use of ladders, often totally inadequate in very high buildings, and, fifth, to provide a fire-escape that is outside the exterior walls of the building, and thereby cannot afford the means whereby the fire is communicated from floor to floor and descent by the hoist so often entirely cut off. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which similar numbers of reference correspond to the numbers of reference employed throughout this specification and refer to similar parts in said drawings, in which—

Figure 1 represents a perspective view of a portion of the front of a building adapted to and equipped with my combined fire-escape and hoist. Fig. 2 represents a side elevation and partial section of my improved fire-escape and hoist in the adapted well of the building. Fig. 3 represents a plan of the hoisting mechanism employed at the top of the hoist-well in which the car operates. Fig. 4 represents a partial section and side elevation of my fire-escape applied to a building in existence before being equipped with said

invention. Fig. 5 represents a front elevation of the car employed in my invention and the means of guiding and attaching the same to a building without a well. Fig. 6 represents a detail of one of the guides to the said car and the anti-friction roller placed therein. Fig. 7 represents a cross-section of the guide referred to in the foregoing figure and a portion of the corner of the car employed in my fire-escape. Fig. 8 represents a detail of a portion of the hoisting and sustaining mechanism at the top of the well to exhibit the brake-shoe and connections, and Fig. 9 represents an enlarged detail of a portion of the car and the end of the portico to exhibit the means whereby the gates are opened and closed on approaching and leaving the portico.

The car 1 employed in my invention is constructed, preferably, of iron in the form of angle, channel, and other bars and screening or net-work of the same material. The said car, as shown in the different figures, is double-decked and is provided with a stairway 2, leading to and from the connected floors or decks 3, which are also of some non-inflammable material, as is the roof 4. The said car 1 may be inclosed round the sides within the well with stout iron netting, as shown, for protection, except that doorway-openings are left at the rear. Across the front of each deck 3 and for a short portion of the sides a railing 6 is provided, having similar netting or lattice-work of iron rods or bars beneath, extending to the floor. In the lower deck 3 sliding doors 7 of any kind are employed across the front, as shown, each one intended to be traversed to its respective corner, providing an opening to load and unload baggage or goods and to let passengers out.

The car 1 is supported by means of strong wire ropes or chains 8, attached to a suitable point in each side, and thence passes upward to the top of the well and over grooved wheels 9, carried on and near each end of a bearing-shaft 10, supported in suitable bearings 11. The said ropes or chains 8 carry each a heavy counter-weight 12, of the ordinary form, which operate in vertical slides 12^A, of any suitable material and secured to the sides of the well. The bearing-shaft 10 and its bearings 11 are secured in position to a frame-work at the top of the building, which is carried either on the

top of the walls of the well or by suitable brackets secured to the face of the building, as shown in Fig. 4. At the center of the bearing-shaft 10 is secured a bevel, or, rather, a miter gear-wheel 13 to mesh with a similar wheel 14, carried on the end of a shaft 15, supported in similar bearings 16 to the bearings 11, carrying the shaft 10. On the shaft 15 is carried a large wheel 17, provided with a series of teeth or sprockets 18 along the center of its face and having a smooth margin 19 on either side thereof. Over the wheel 17 and engaging the sprockets 18 thereon an endless sprocket-chain 20 is carried, which passes down to the bottom of the well and over a similar wheel 21. (Shown in Fig. 1.) The said chain 20 passes between the sides of the car 1 and the walls of the well in which the said car operates, and is for the purpose of being operated on to elevate the car 1 when a load overcoming the weights 12 is placed therein. Against the bottom side of the large wheel 17 a brake-shoe 22 is maintained in contact by a screw 23, supported in a suitable hanger-frame 24, which is supported by the same frame-work as the bearings 11 and 16 above. The said brake-shoe 22 is adapted to engage the margins 19 on either side of the sprockets 18 and to permit the said sprockets 18 to pass through it without contact. On the lower end of the screw 23, which bears against the lower side of the said brake-shoe 22, is a chain-pulley 25, over which a chain 26 (or a securely-attached wire rope) passes, thence to rollers 27, secured to the side walls, as shown in Fig. 1, and from the said rollers 27 it hangs close to the wall and extends to the lower end of the well. The brake-shoe 22 is maintained in position by links 28, attached to it at one end and to the walls or the frame-work at the other end.

The slides 29, which guide the car 1 in a vertical course and are secured to the walls of the building, differ considerably in form in adapting my invention to a new building intended for and constructed with a view to using my fire-escape and in an old building afterward fitted with my invention. In the former case channel-bars or any suitable form of iron preferable may be used; but in the latter case, where I attach the car to the face of a building, I employ cast-iron slides bolted to the face of the building and in lengths of several feet in each, which carry anti-friction rollers 30 at reasonable intervals. The said slide 29 of the latter form engages adapted brackets and bars 31 and 32, respectively. The latter are continuous to the height of the car 1; but the brackets 31 only occur at intervals and project, as shown in Fig. 6, to engage the slides 29. The bars 32 are secured to the rear side of the car.

At the front corners of the car 1 and on the sides of both upper and lower decks 3 are provided similar gates 33 to those on the front of the lower deck, and on each gate 33 is pro-

vided a curved bar 34 for the purpose of automatically opening and closing said gates on approaching and leaving the balconies 35, which are attached to the face of the building at each story and on line with the floors inside. The said balconies 35 are constructed of iron in the usual form or forms and supported by brackets 36, all on which I have no claim of invention; but on the end of the said porticos, at the fire-escape, I attach a pair of anti-friction rollers 37, so as to operate the curved bar 34 on the gates 33 as it passes between said rollers and causes the gates 33 to be thrown open on the floors of the portico 35 and the car 1 becoming on the same level and closing the gate on leaving it.

On the front corners of the car 1 I attach a nozzle-bearer 38, as shown in Figs. 1 and 5. The said bearer is for the purpose of holding the nozzle of firemen's hose in case of fire in the building to elevate it to any point required much more readily and with greater safety than can be done by ladders or any other means.

The operation of my invention is very simple. To remain fixed or in one place the brake 22 is applied to the wheel 17 by pulling on one line of the brake-chain 26, so as to clamp the said wheel 17. Desiring to ascend, the opposite line of the said brake-chain 26 is drawn downward, which releases the said wheel 17 and permits the car to ascend, which it does on account of the counter-weights 12 being sufficiently heavy to carry one or more persons in addition to the car 1. When a considerable weight or a number of persons are in the car, it will descend, and its speed can be regulated by the brake-chain 26; but to elevate a large weight or a number of persons it is necessary to do so by pulling on the sprocket-chain 20, which, by connected mechanism, above and already described, draws the car 1 by means of the chains or cables 8, which support the car. In buildings where power is in use or available, connections by means of or to the wheel 21 in the bottom of the well can be employed to work the car 1 in the ordinary way that hoists and elevators are operated.

Having now described my improved fire-escape and hoist, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a combined fire-escape, hoist, and fireman's auxiliary, the combination of the car or cage constructed of channel, angle, or other shaped bars of metal frame-work and the roof and floors of similar or other non-inflammable material with the stairway between said floors, substantially as shown and described.

2. In a combined fire-escape, hoist, and fireman's auxiliary, the combination of the car or cage constructed of channel, angle, or other shaped bars of metal framing, the roof and floors of similar or other non-inflammable material, and the stairway between said floors

with the metal or other non-inflammable lattice-work at the front and sides of said car, substantially as shown and described.

3. In a combined fire-escape, hoist, and fireman's auxiliary, the combination of the car or cage constructed of channel, angle, or other shaped bars of metal framing, the roof and floors of similar or other non-inflammable material, the stairway between said floors, and the lattice-work at the front and sides of said car with the sliding gates in said lattice-work at the front and sides, substantially as shown and described.

4. In a combined fire-escape, hoist, and fireman's auxiliary, the combination of the car or cage constructed of channel, angle, or other shaped bars of metal framing, the roof and floors of similar or other non-inflammable material, the stairway between said floors, the lattice-work at the front and sides of said car, and the sliding gates in said lattice-work at the front and sides with the curved bars secured on and carried by said gates, whereby they are opened and closed, substantially as shown and described.

5. In a combined fire-escape, hoist, and fireman's auxiliary, the combination of the car or cage constructed as specified, the roof and floors, as provided, the stairway between said floors, the lattice-work at the front and sides, the sliding gates in said lattice-work, and the curved bars secured on and carried by said gates, whereby they are opened and closed, with the rollers secured on the ends of the porticos to open and close said gates, substantially as shown and described.

6. In a combined fire-escape, hoist, and fireman's auxiliary, the combination of the car or cage constructed as specified, the roof and floors, as provided, the stairway between said floors, the lattice-work at the front and sides, the sliding gates in said lattice-work, the curved bars secured on and carried by said gates, whereby they are opened and closed,

and the rollers secured on the ends of the porticos to open and close said gates, with the said porticos supported on the face of the building on line with the floors internally, substantially as shown and described.

7. In a combined fire-escape, hoist, and fireman's auxiliary, the combination of a car or cage constructed of channel, angle, or other shaped bars of metal framing with the forks secured conveniently to said car and adapted to bear a nozzle of firemen's hose, substantially as shown and described.

8. In a combined fire-escape, hoist, and fireman's auxiliary, in combination, the car or cage constructed of channel, angle, or other shaped bars of metal framing, the means provided on said cage to guide it, the means to attach cables thereto to support it, the said cables attached thereto and counterweighted to support said car, bearing-wheels to support said cables, and the sprocket-wheels belted by a chain and geared to operate and be operated by said bearing-wheels, substantially as shown and described.

9. In a combined fire-escape, hoist, and fireman's auxiliary, in combination, the car or cage constructed of channel, angle, or other shaped bars of metal framing, the means provided on said cage to guide it, means to attach cables thereto to support it, the said cables attached thereto and counterweighted to support said car, bearing-wheels to support said cables, the chain-belted sprocket-wheels geared to operate said bearing-wheels, and the brake-shoe supported by means, as specified, and having a cable to operate it against the upper sprocket-wheel, and thereby control the cage, substantially as shown and described.

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Witnesses:

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