(No Model.)

C. A. KNAUER.

FIRE ESCAPE.

No. 292,322. Patented Jan. 22, 1884.

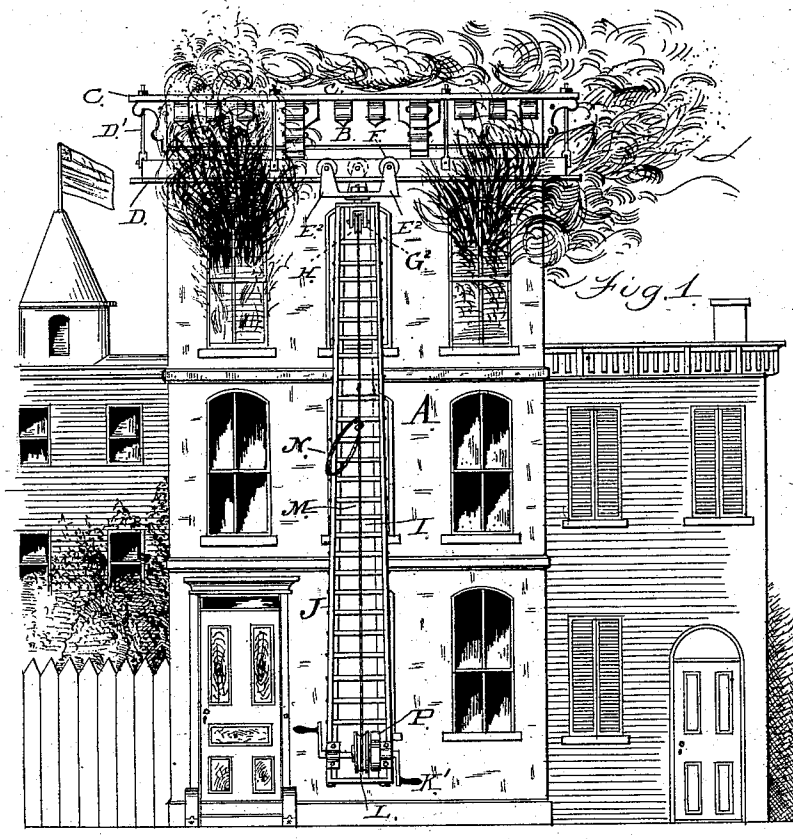


Fig. 1.

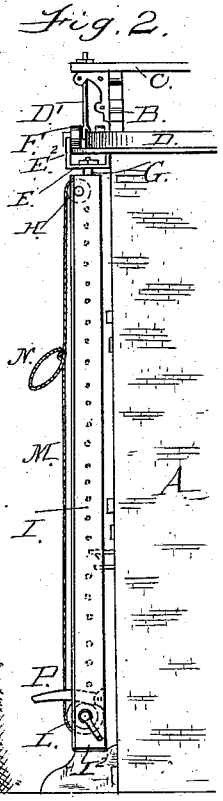


Fig. 2.

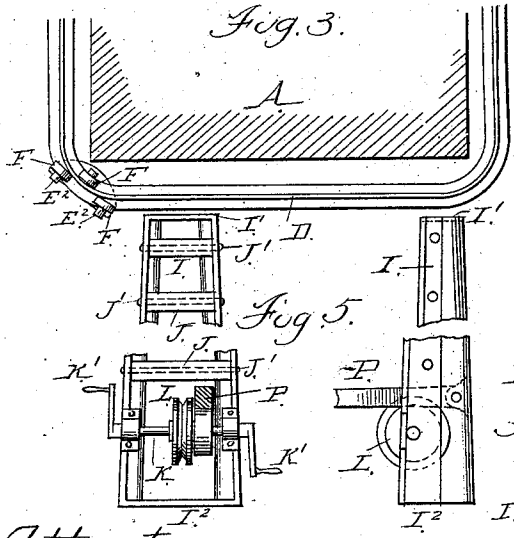


Fig. 3.

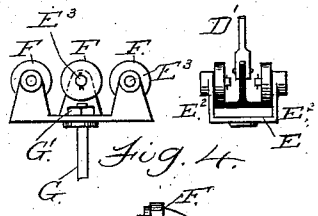


Fig. 4.

Fig. 5.

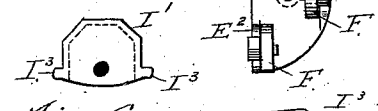


Fig. 6

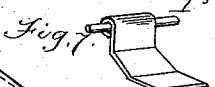
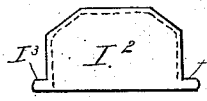


Fig. 7.



Attest:

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UNITED STATES PATENT OFFICE.

CYRUS A. KNAUER, OF POTTSTOWN, PENNSYLVANIA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 292,322, dated January 22, 1884.

Application filed May 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, CYRUS A. KNAUER, a citizen of the United States, and a resident of the borough of Pottstown, county of Montgomery, State of Pennsylvania, have invented a new and useful Improvement in Fire-Escapes, of which the following is a specification.

This improvement relates more particularly to that class of fire-escapes in which a pendent ladder is movably connected with the building.

The object of the improvement is to provide a ready and safe mode of escape for the inmates of the building, and one which may be rapidly adapted to escape from any window, upon the free sides of the same. Provision is also made for the removal of the sick or decrepit by the operation of a looped cord or rope, in combination with a winch at the base of the ladder.

The above objects are attained in the use of my invention, as shown in the accompanying drawings, forming part of this specification, like letters designating like parts.

Figure 1 is a front elevation of a building with my improved fire-escape attached thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a partial plan on the line of the T-rail, exhibiting the continuation of the same around the isolated faces of the building; Fig. 4, details of the construction of the truck; Fig. 5, details of the construction of the ladder; Fig. 6, top and bottom end views of the ladder. Fig. 7 represents the re-enforcing rod I^3, in connection with the sides of the ladder.

In the drawings, A represents a building; B, the cornice; C, the cap; D, a T-rail reversed, suspended from the cap by bolts D′, the bolts being stayed back to the wall above the height of the truck-wheels; E, the base of the truck, with a pivot-hole, E′, at center; E^2, three pedestals for truck-wheel bearings; E^3, bearing-pins; F, three truck-wheels; G, bifurcated ladder-suspender; G′, suspender-nut; G^2, bifurcation for sheave; H, rope-sheave; I, ladder; I′, top or suspension end; I^2, base of ladder; I^3, iron wire re-enforce; J, rungs of wood; J′, iron rods passed through rungs and ladder and riveted on the outside of same; K, drum-shaft; K′, cranks; L, drum or sheave; M, endless rope; N, loop in the same.

In order to secure a light and strong ladder, and as much as possible to protect persons using the same from the flames, I make it of light sheet-iron, of a disked section, as shown at Fig. 6, and run a rod of from one-fourth to one-half inch round iron down each side, as at I^3. The rungs J are made of wood prepared so as to be incombustible, have a hole bored through them longitudinally to fit a rod, J′, of about three-eighths to one-half inch round iron, are fitted at their respective places between the ladder-sides, and the wrought-iron rod J′ passed through and riveted, thus securing the rungs J in place and furnishing a cool hand-hold to the user of the ladder, although the flames may be impinging against the same. As one of the various modes of preparing the rungs of the ladder, I would specify the boiling of the same for several hours in soluble glass, and their after exposure in tanks containing solutions of lime-water and chloride calcium, whereby the wood is petrified and rendered incombustible. (*Vide* Feuchtwanger on Soluble Glass, page 51, 1870.) The sheets composing the ladder length are lap-jointed or riveted together. At the base of the ladder and at a suitable height from the ground a drum, L, is mounted upon a shaft, K, and alongside of it a brake-pulley and arm, P. Cranks K′ operate the shaft for hoisting, and the brake P regulates the descent of persons or articles connected with the rope controlled by the drum. At the top the ladder is hung free upon a suspender-bolt, G, secured by a nut, G′, to the truck-floor, and having a sheave, H, in its jaw G^2 beneath the top end, I′, of the ladder. The truck is constructed with a floor, E, and three pedestals, E^2, and a central hole, E′, and boss for the suspension-bolt G. It may be made of wrought or cast iron, as deemed most desirable. Wrought-iron pins F^3 in the heads of the pedestals receive the truck-wheels F, the floor of the truck being at such depth below the pins as will give ample room for the nut G′ below the T-rail when running on the same. This construction of truck with three wheels gives great steadiness thereto, and permits it to pass around curves of very much shorter radius than would be possible with a four-wheeled truck. The T-rail D, where it is passed around an isolated building, will be

suspended at the proper distances from the wall (to insure the ladder clearing window and door projections) by bolts D′ passing down through the bracket-cap. The bolts, to prevent swaying of the track, would be stayed back to the wall above the height of the truck-wheels; but when the track would only be applied to the front of the building, it would be retracted from the bolts D′ at each side to the wall, and secured thereto in any suitable manner, and the stays would be omitted. The rope M, with its loop N, is reeved over the sheave H and twice around the drum L in such manner that the loop N shall be outside of the rungs, the unlooped part of M passing down to the drum between the rungs and the back of the ladder. This portion of the apparatus is for the purpose of removing the sick or helpless by the aid of others, and is operated as follows: The loop N is, by revolution of the crank and drum, drawn to the proper height, and the loop is seized and drawn inside of the room, passed around the body of the person, and signal given to the operator below, who turns upon the crank and raises the party off of the floor and out of the window, clear of the building. He now applies his force to the brake P, leaving go of the crank, and he lets down the burden with ease and without any risk whatever.

The ladder, from its manner of suspension, may be used with its face toward the building or away from it, as shown in Fig. 1, or it may be thrown at an angle sidewise, either to the right or left, as may be desired, and will pass over any part of its track.

When not in use as a fire-escape, the ladder will be turned with its face toward the building, and may be locked over the rain-water conductor or between the windows, out of the way.

Having shown the value of my improved fire-escape and explained its construction and mode of operation, I desire to secure by Letters Patent the following claims thereon:

1. The combination of the reverse T-rail track, suitably suspended and supported, with the three-wheeled truck and its dependent ladder, said ladder provided with a top sheave and bottom drum, friction-brake, and wheel, with an endless rope provided with a loop, all arranged, constructed, and operated as and for the purpose described.

2. A fire-escape traversing ladder-truck constructed, as shown, with two wheels on one side of the frame and one intermediate wheel on the opposite side, having a central suspension ladder bolt, G, provided with a forked end, G^2, and sheave H, in combination with the reverse T-rail track D and the ladder I, and with drum L and brake P by rope M, substantially as and for the purpose set forth.

3. A fire-escape ladder, I, of metal, of a dish form in section, as shown in Fig. 6, having an iron-rod re-enforce, I^3, and provided with non-conducting rungs J, secured in place by rods J′, with a drum, L, at its lower end, and brake and wheel P on shaft K, cranks K′, and endless rope M N, in combination with suspension-bolt G, truck E, wheels F, and track D, substantially as shown, and for the purpose specified.

4. In combination with a fire-escape ladder transferable by truck upon a track, as described, a drum and brake-wheel with brake-shaft and cranks, endless rope and loop within reach of an operator upon the ground, whereby a weight may be drawn from the interior of the building and let down upon the level of the street, substantially as and for the purpose set forth.

CYRUS A. KNAUER.

Witnesses:
JOHN H. STEELE,
CHS. RUTTER.