W. LIESS, DEC'D.

L. LEASE, ADMINISTRATRIX.

FIRE ESCAPE.

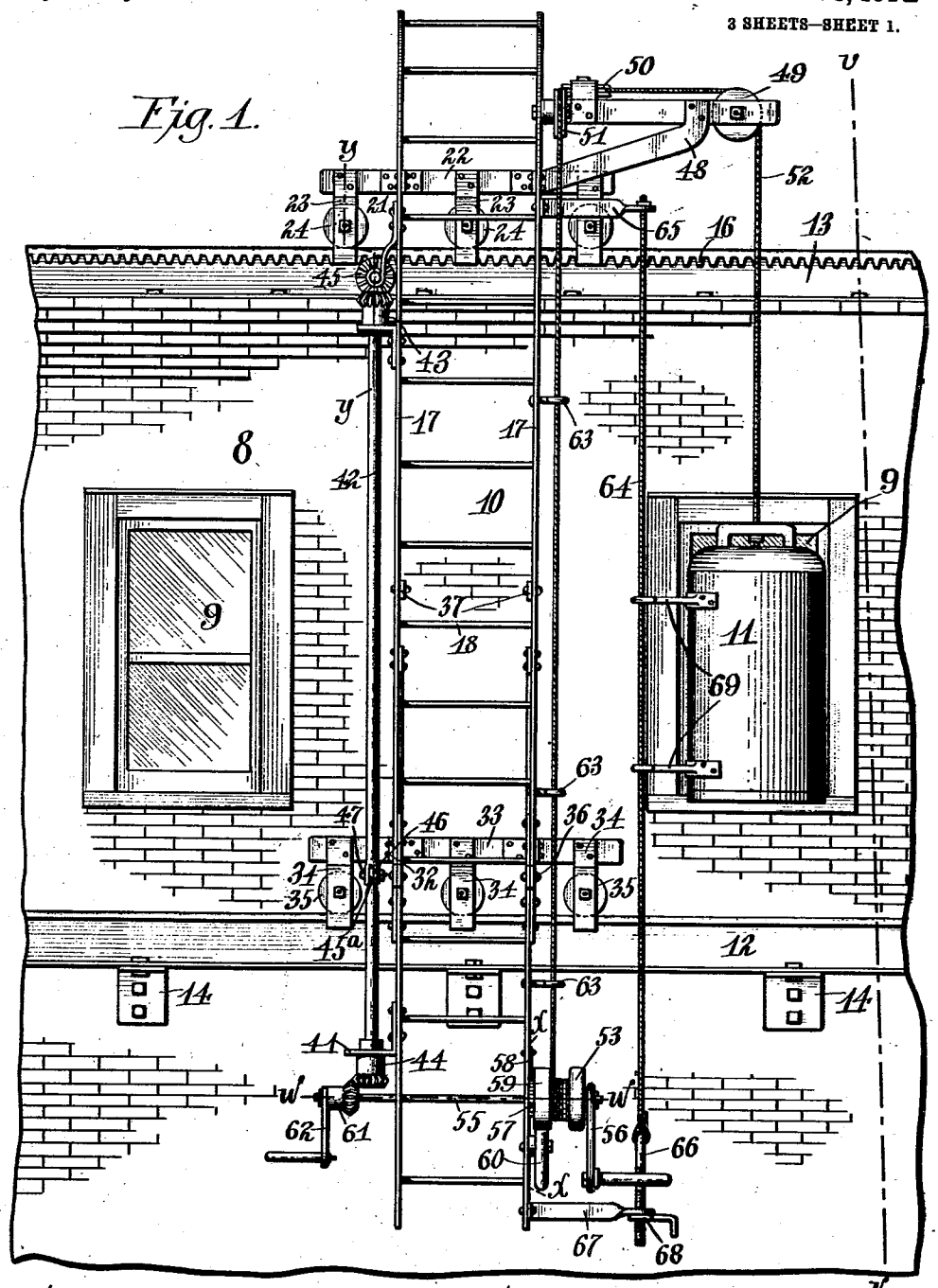
APPLICATION FILED AUG. 22, 1911.

1,086,329.

Patented Feb. 3, 1914.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

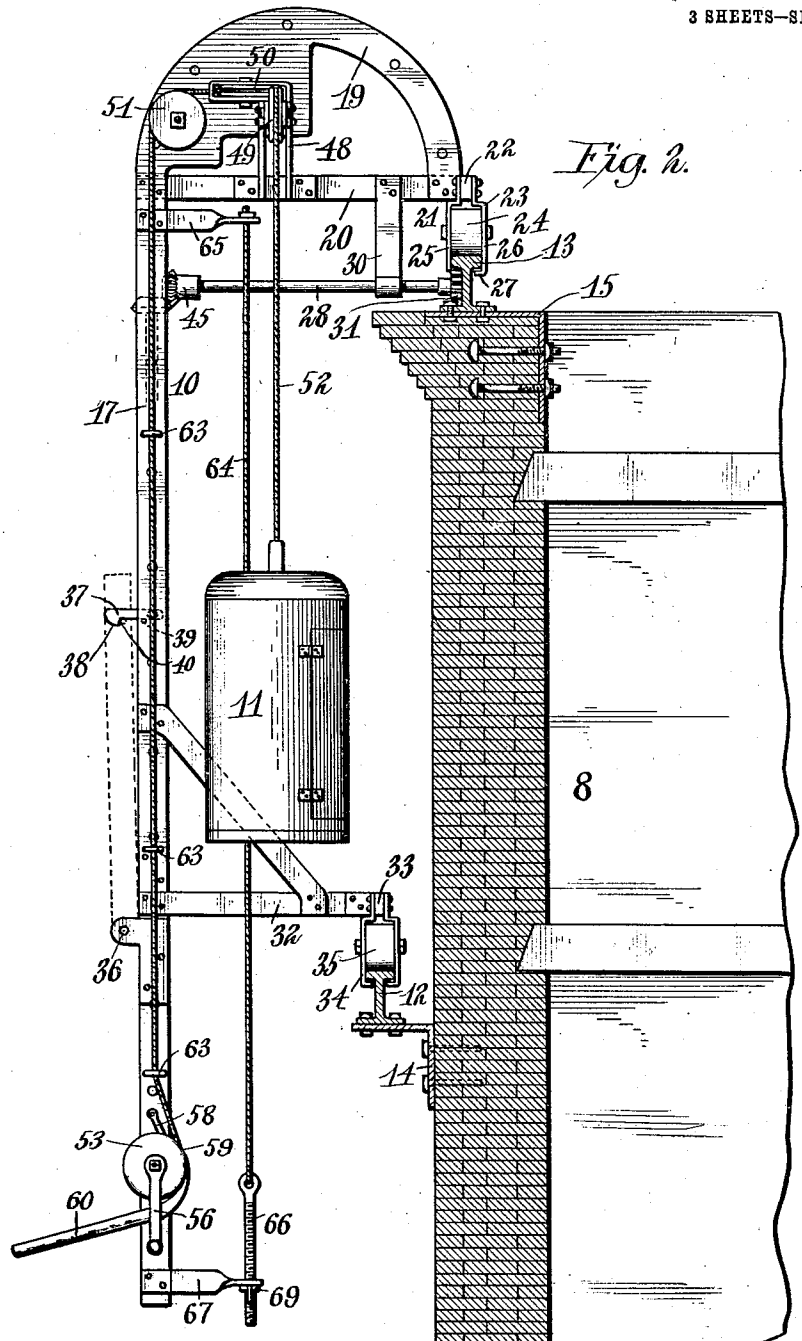


Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 3.

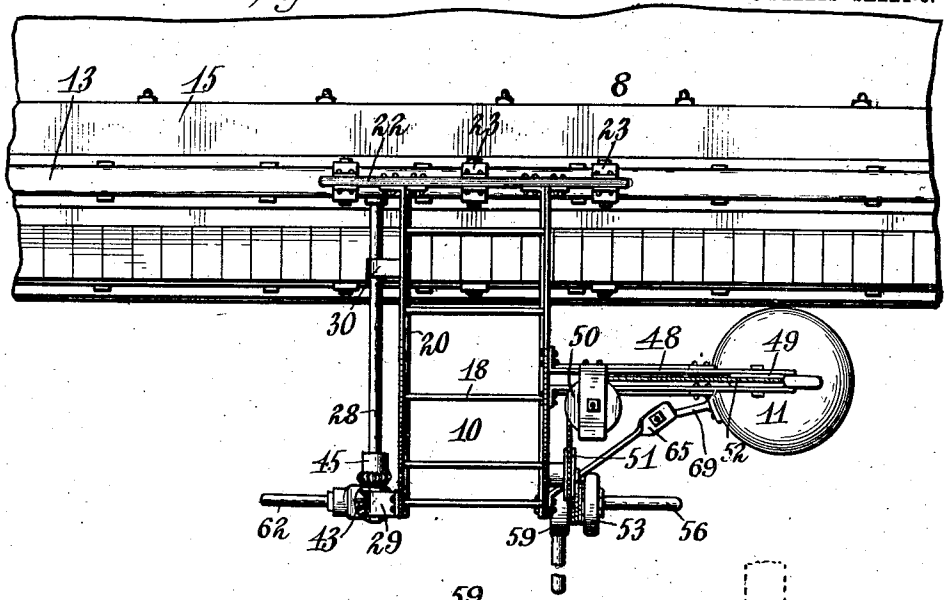


Fig. 4.

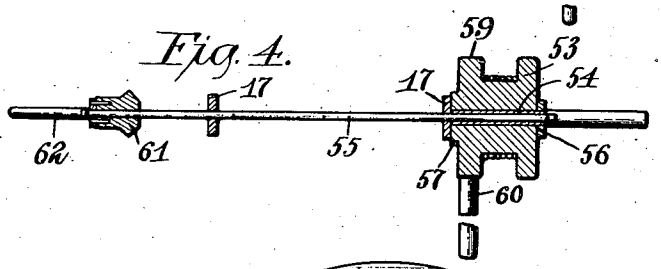


Fig. 5.

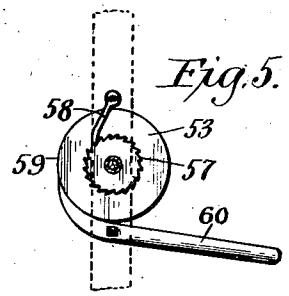


Fig. 6.

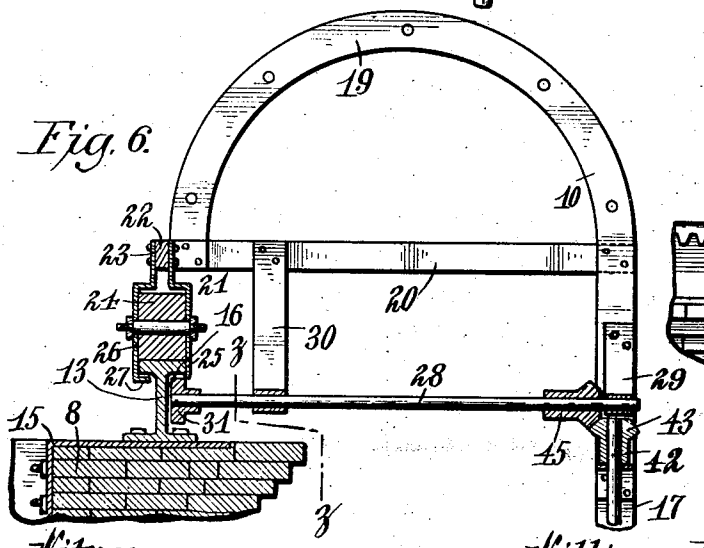
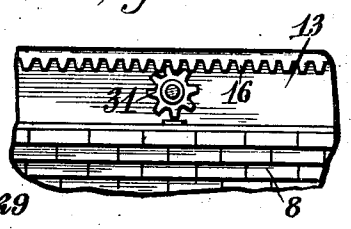


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM LIESS, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO FRANK BOSZ, OF BUFFALO, NEW YORK; LOUISA LEASE ADMINISTRATRIX OF SAID WILLIAM LEASE (OR LIESS), DECEASED.

FIRE-ESCAPE.

1,086,329. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed August 22, 1911. Serial No. 645,443.

To all whom it may concern:

Be it known that I, WILLIAM LIESS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Fire-Escapes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in fire escapes and more particularly to that type which is movable horizontally along the building.

One of the objects of my invention is to provide a fire-escape which can be positively controlled so as to bring the same in line with any of the windows or exits of a building.

Another object is the provision of a fire-escape having both a ladder and an elevator cage moving vertically independently of the ladder and horizontally therewith.

A further object is the provision of means permitting the lower end portion of the ladder and its adjuncts to be elevated so that it cannot be reached from the ground, except by means of another ladder placed against the building and to so construct said lower end portion and hold the same elevated that when persons escaping from a burning building descend the ladder they may easily swing the lower end portion down and descend to the ground.

A still further object to my invention is the provision of means at the lower end portion of the ladder for operating the ladder and causing it to move horizontally, also for operating the elevator cage and causing it to move vertically.

With these and other objects in view, the invention consists in certain novel features of construction, combination and arrangement of parts as will be hereinafter more fully described and particularly pointed out in the appended claims.

In the drawings: Figure 1 is a front elevation of my improved fire-escape applied to a building. Fig. 2 is a vertical section taken on line *v—v* Fig. 1. Fig. 3 is a plan view of a portion of a building equipped with my improved fire-escape. Fig. 4 is an enlarged horizontal section taken on line *w—w*, Fig. 1. Fig. 5 is an enlarged horizontal section taken on line *x—x*, Fig. 1. Fig. 6 is an enlarged vertical section taken on line *y—y*, Fig. 1. Fig. 7 is a vertical section taken on line *z—z*, Fig. 6.

Referring now to the drawings in detail, like numerals of reference refer to like parts in the several figures.

The reference numeral 8 designates a building having windows or other exits 9, by means of which the occupants of the building may have access to the fire-escape. The fire-escape comprises a ladder 10 and an elevator cage 11 movable horizontally. Suitable mechanism supporting and operating the ladder and elevator cage are provided and will now be described.

At a suitable point or points in the height of the building, a track or tracks 12 are provided and also a somewhat similar track 1^c at the top of the building. The track 1^c is secured to brackets 14 extending from the face of the building, while the track 13 is secured to a metallic plate 15 bolted or otherwise fastened to the cornice portion of the building, as best shown in Fig. 2. Said tracks are substantially of I-formation in cross section so that they have oppositely disposed outstanding flanges at their upper and lower edges, the track 13 having one of its flanges at its upper edge, preferably the outwardly extending one, provided with teeth which form a gear rack, as at 16.

The ladder 10 has the usual stiles or side-bars 17 and rounds 18 and at its upper end it is re-curved, as at 19, with the ends of its stiles terminating at a point slightly above the track 13; said ends being connected with the straight portions of the stiles by stiffening bars 20. Secured to the upper ends of the stiles is a carriage 21 comprising a cross-bar 22 having secured thereto a plurality of saddles 23 in which are rotatably held, bearing wheels 24 that ride on the upper surface of the track 13. Each saddle comprises two members 25, 26 spaced apart to receive between them the rollers 24, one of which members is bent at right angles at its lower end, as at 27, to extend underneath one of the flanges of the track, thus positively retaining the rollers on the track.

28 designates a shaft journaled in bearings 29, and 30 secured, respectively, to one of the stiles of the ladder and to one of the stiffening bars 20; said shaft having a gear wheel 31 secured to its rear end which meshes with the gear rack 16 on the track 13.

Extending inwardly from the ladder at one or more points in the length thereof, depending of course on the height of the building to which it is applied, is a frame 32 having a cross-bar 33 at its rear end to which are secured a plurality of saddles 34 differing in construction from the saddles 23 only in that both members thereof have their lower ends bent at right angles to extend underneath both flanges of the track 12, each saddle having a bearing roller 35 adapted to travel on said track. The lower end portion of said ladder is arranged to be elevated so that it will be out of reach from the ground except when using a ladder, thus guarding against surreptitious entrance to the building by means of the fire-escape. For this purpose the lower end portion is pivotally connected to the main portion, as at 36, and can be swung upwardly into the position shown in dotted lines, Fig. 2, when the fire-escape is not in use. In order to retain the pivoted section in elevated position, gravity dogs 37 are provided which have rounded noses 38 and are held in substantially horizontal position by means of stops 39 extending inwardly from the stiles to which the dogs are pivotally secured, as best shown in Fig. 2. When swinging the lower pivoted section inwardly, the lower round thereof comes in contact with the rounded noses of the dogs and slightly moves them so that the round can pass behind the abrupt faces 40 of said dogs.

Secured to the stile of the ladder to which the bracket 29 is fastened, is a bracket 41 in which is journaled a vertical shaft 42 having secured to its upper end a bevel gear 43, and to its lower end a bevel gear 44; said bevel gear 43 being in mesh with a bevel gear 45 secured to shaft 28. The shaft 42 extends to a point beneath the pivotal point of the pivoted section of the ladder and in order to permit said section to be elevated, it is also necessary to construct shaft 42 of sections. For this purpose the lower portion of the shaft is flattened at its upper end, as at 45^a, and the lower end of the upper section is forked, as at 46, to receive the flattened portion of the lower section, a pivot pin 47 passing through the sections at this point in line with the pivots of the ladder or substantially so.

Extending laterally from the ladder at its upper end is a braced frame 48 having a rope sheave 49 on a horizontal pivot and a second rope sheave 50 on a vertical pivot and secured to the ladder adjacent said frame is a third rope sheave 51 on a horizontal pivot. Over these sheaves passes a supporting and elevating cable 52 having secured to one of its ends the elevator cage 11 and having its other end wound around a cable drum 53; said drum having preferably an axial sleeve 54 and being rotatable on a shaft 55 journaled in the stiles of the lower pivoted portion of the ladder. Secured to one end of the sleeve 54 is an operating crank 56 by means of which the drum is rotated and secured to or formed on said drum is a ratchet wheel 57 which is engaged by a dog 58 pivotally secured to the adjacent stile of the ladder; said dog and ratchet serving to prevent retrograde movement of the drum and consequently holding the elevator cage at any desired position. The drum has a brake surface 59 against which acts a brake lever 60, to which pressure is applied so that the unwinding of the cable from the drum is retarded and consequently the elevator cage governed in its descent. Secured to the opposite end of shaft 55 is a bevel gear 61 which is in mesh with the bevel gear 44 on the vertical shaft 42 and fastened to said gear is an operating crank 62 whereby said bevel gears and shafts may be rotated. The cable 52 passes through guide eyes 63 secured to the ladder so that it will always be retained parallel with the ladder, or approximately so. A guide cable 64 is provided, having its upper end secured to a bracket 65 extending from the upper or main portion of the ladder and its lower end secured to a screw 66 passing through a bracket 67 secured to the lower end of the pivoted portion of the ladder, a suitable nut 68 being threaded onto said screw and impinging against the under face of bracket 67 to hold the guide cable taut. Extending from the elevator cage are arms 69 through which the guide cable 64 is passed and as said guide cable is held taut, the elevator cage is compelled to travel in a vertical plane with little or no swinging movement. When swinging the lower section of the ladder on the upper or main section, the shaft 42 doubles upon itself as does the elevating cable 52 and guide cable 64 and as two guide eyes are arranged on opposite sides of the pivotal point of the ladder sections and comparatively close thereto, there will only be a slight downward movement of the elevator cage by reason of slackness in the elevating cable between said eyes. It is clear that this slackness can be eliminated to a greater extent than herein shown, as the eyes may be placed quite close to and on opposite sides of said pivotal point.

Having thus described my invention, what I claim is:—

1. The combination of a plurality of horizontally-disposed tracks, one of said tracks having a gear rack thereon, a ladder for horizontal movement on said tracks and having a lower end portion capable of being swung upwardly, a vertically-disposed shaft journaled to one side of said ladder and having a lower end portion adapted to be swung

upwardly with the lower end portion of said ladder, means for rotating said shaft, a gear wheel in mesh with said rack, and means for rotating said gear wheel from said shaft to cause the latter to be moved horizontally.

2. The combination of a plurality of tracks arranged at different points in the height of a building, a carriage for each track, a ladder secured to said carriages and having a lower section capable of swinging movement, brackets extending laterally from said ladder, one of said brackets extending laterally from said lower section, a guide cable held taut to said brackets, an elevator cage guided for movement by said guide cable, an elevating cable secured to said elevator cage, and means for winding up or paying out said elevating cable.

3. The combination of a ladder comprising an upper or main portion and a lower portion pivotally secured to the lower end of said upper or main portion, said ladder having a pair of brackets, one of said brackets extending from said upper or main portion and the other from said lower portion, a guide cable having one end secured to one of said brackets, an adjusting screw passed through the other bracket and having the other end of said guide cable secured thereto, an adjusting nut threaded on to said screw and impinging against said last-mentioned bracket, a frame extending laterally from said ladder, guide sheaves secured to said frame, an elevating cable passing around said sheaves, an elevator cage secured to one end of said elevating cable and having guide arms coöperating with said guide cable, and means for winding up or paying out said elevating cable.

4. The combination of a plurality of horizontally-disposed tracks of substantially I-formation in cross section, said tracks being arranged in different planes in the height of a building, the uppermost track having a gear rack thereon, a carriage for said uppermost track having a plurality of saddles comprising two spaced members, one member of each saddle being bent inward underneath the adjacent flange of the track, a roller in each saddle adapted to travel on the track, a carriage on the other track or tracks, a ladder secured to said carriages and comprising an upper portion and a lower portion hinged to said upper portion; a gear wheel in mesh with said gear rack, and foldable mechanism extending from said gear wheel to the lower end of said ladder to cause rotation of said gear wheel and consequent horizontal movement of said ladder.

5. The combination of a plurality of horizontally-disposed tracks, one of said tracks having a gear rack thereon, a ladder supported by said tracks and comprising an upper and lower section pivotally connected, a vertically-disposed shaft at one side of said ladder having bevel gears at opposite ends, said shaft comprising two sections pivotally connected with its pivotal point coincident with the pivots of said ladder sections, a horizontally-disposed shaft having a gear wheel in mesh with said gear rack and a bevel gear in mesh with one of the bevel gears of said vertically-disposed shaft, a horizontally-disposed shaft journaled in the stiles of said ladder at their lower ends, a bevel gear on said shaft in mesh with the other bevel gear of said vertically-disposed shaft, means for rotating the bevel gear on said last-mentioned horizontally-disposed shaft, a cable drum rotatable on said last-mentioned shaft at the opposite side of the ladder, a frame extending laterally from said ladder at its upper end and having cable sheaves thereon, an elevating cable passed around said cable sheaves and having one end wound upon said cable drum, an elevator cage secured to the other end of said elevating cable, and means for rotating said cable drum.

In testimony whereof I have set my hands in the presence of two subscribing witnesses.

WILLIAM LIESS.

Witnesses:
EMIL NEUHART,
JACOB OBERST, Jr.