

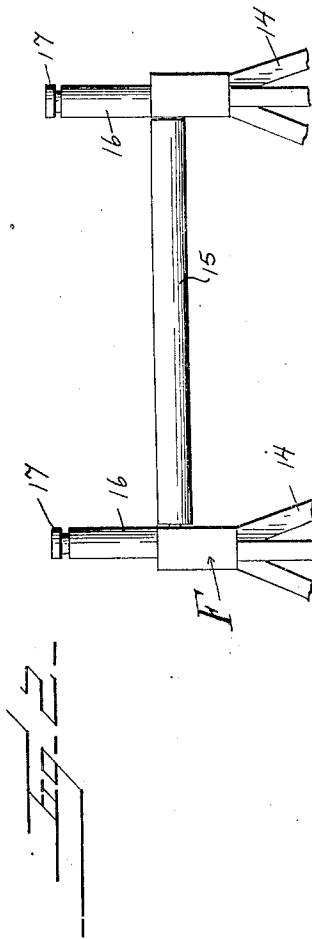
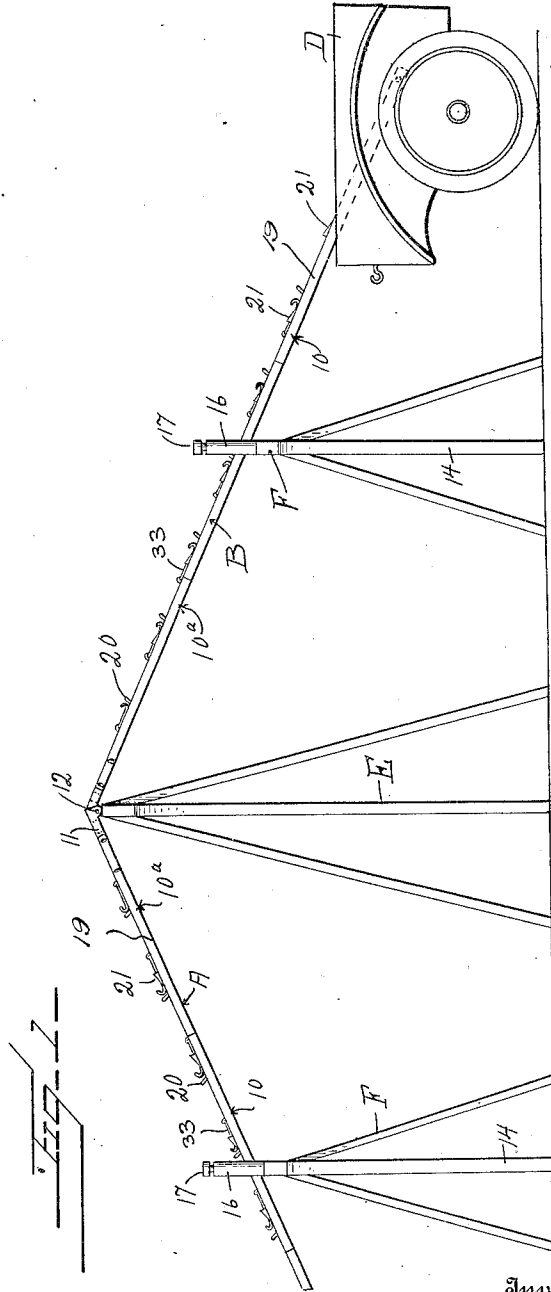
K. C. FERRIS, DEC'D.
 GUARANTY TRUST COMPANY OF NEW YORK, EXECUTOR.
 FIRE LADDER.

APPLICATION FILED JULY 27, 1918.

1,359,680.

Patented Nov. 23, 1920.

4 SHEETS—SHEET 1.



Inventor

K.C. Ferris

By

Watson E. Coleman
 Attorney

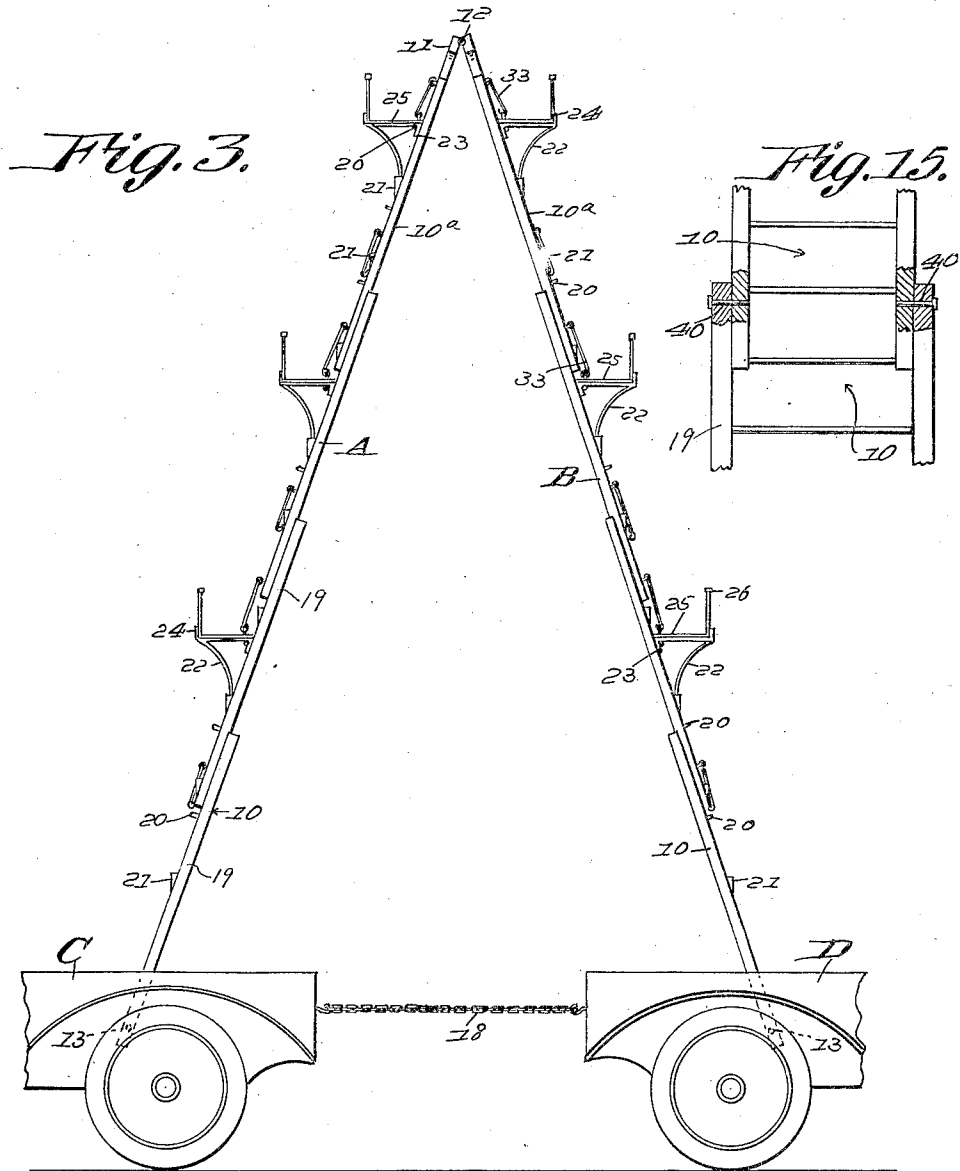
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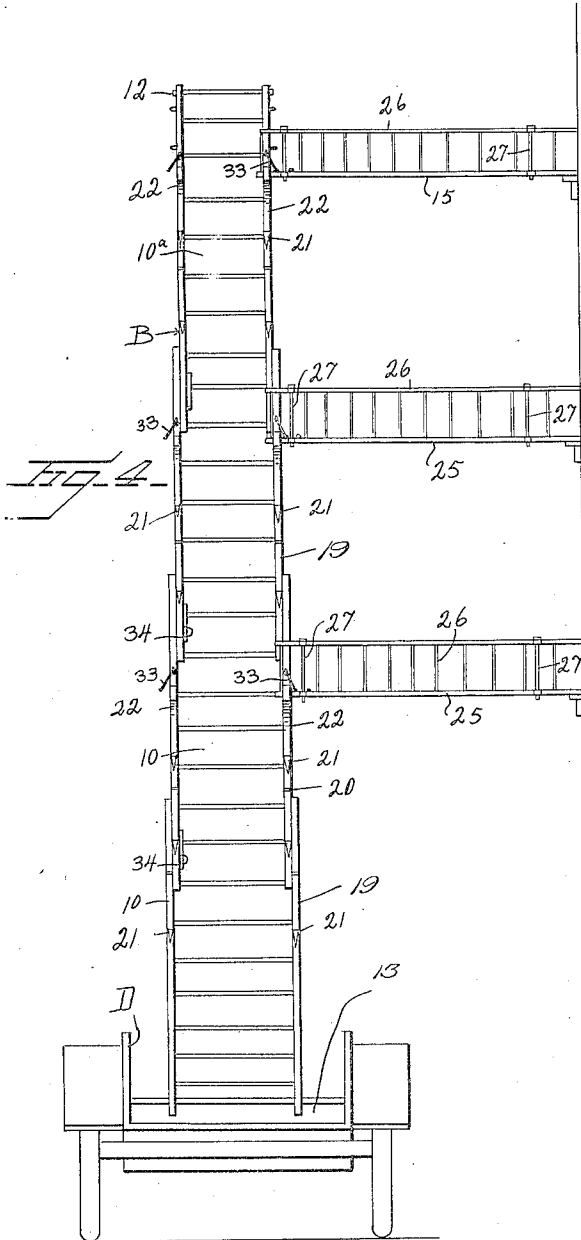
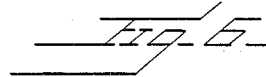
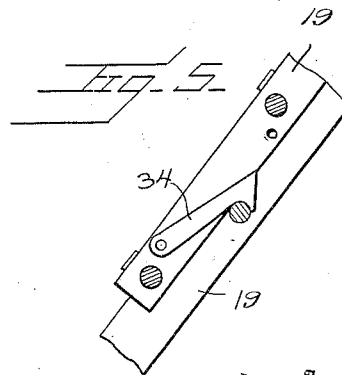
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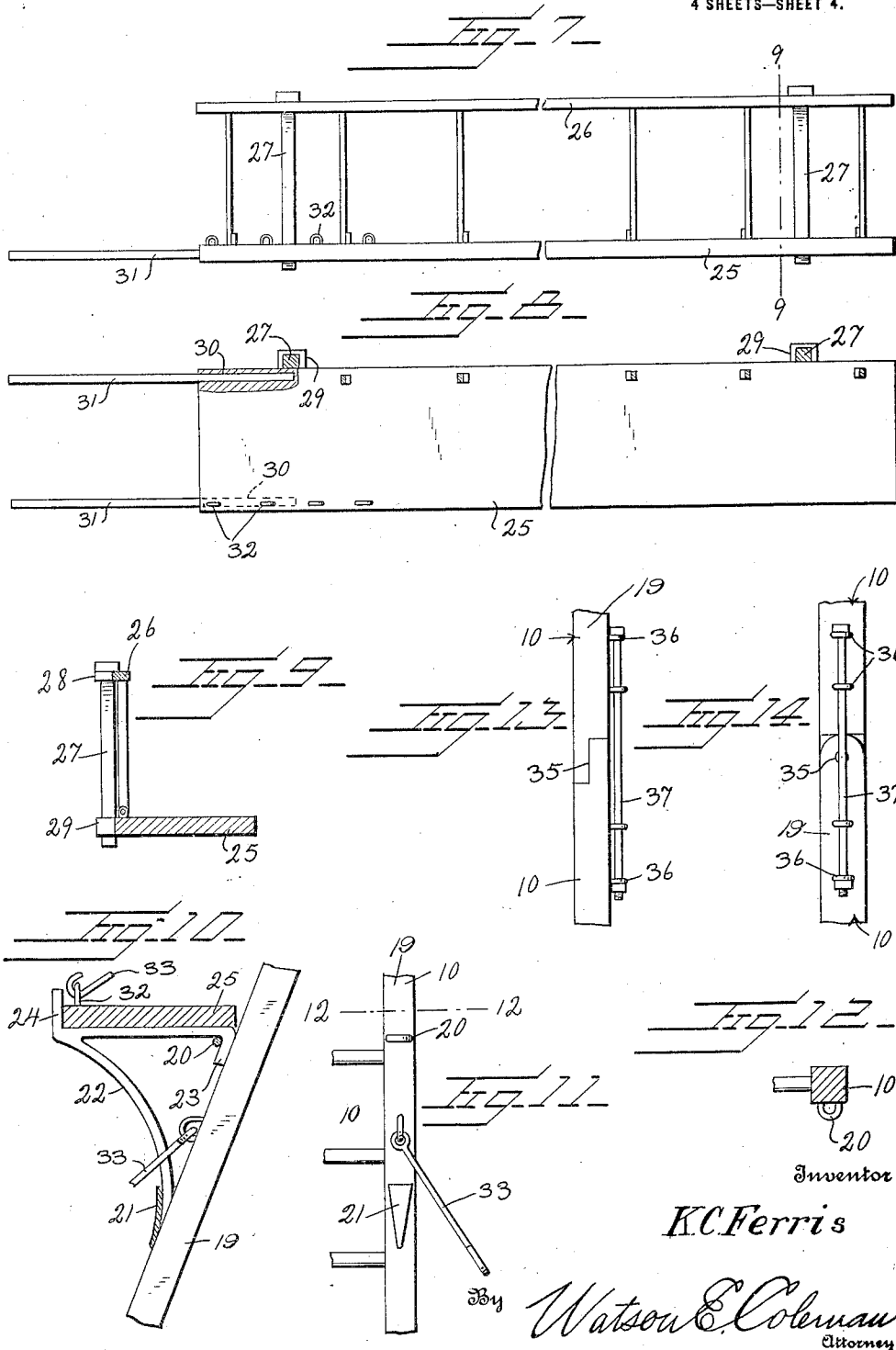
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UNITED STATES PATENT OFFICE.

KATHARINE C. FERRIS, OF TRYON, NORTH CAROLINA; GUARANTY TRUST COMPANY OF NEW YORK, EXECUTOR OF SAID KATHARINE C. FERRIS, DECEASED.

FIRE-LADDER.

1,359,680.

Specification of Letters Patent. Patented Nov. 23, 1920.

Application filed July 27, 1918. Serial No. 247,023.

To all whom it may concern:

Be it known that I, KATHARINE C. FERRIS, a citizen of the United States, residing at Tryon, in the county of Polk and State of North Carolina, have invented certain new and useful Improvements in Fire-Ladders, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to fire-escape ladders, and has for its general object the provision of a very simple and effective fire-escape ladder so constructed that the ladder may be raised to any desired height by power operated means, and further so constructed that brackets or supporting members may be attached to the ladder as it is raised from which brackets bridges may be disposed reaching to the windows of the burning building.

A further object is to provide improved means for supporting these brackets and locking the bridges thereto, and provide means whereby the series of ladders may be initially supported while they are being raised into position.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation showing the manner in which may improved fire escape ladder is initially raised;

Fig. 2 is a fragmentary elevation of one of the members for supporting the ladders while being raised;

Fig. 3 is a side elevation showing the ladders raised;

Fig. 4 is a front elevation showing the ladders raised with the bridges engaged with window ledges;

Fig. 5 is a fragmentary view of two ladder sections shown in Fig. 4, showing the manner in which these ladder sections are automatically engaged with each other;

Fig. 6 is an elevation of an implement whereby the ladders may be handled;

Fig. 7 is a side elevation of one of the bridges;

Fig. 8 is a top plan view of one of the bridges partly broken away;

Fig. 9 is a transverse section of the bridge on the line 9—9 of Fig. 7;

Fig. 10 is a fragmentary side elevation of the ladder section and the bracket coaxing

therewith, the ring and socket being in section;

Fig. 11 is a front elevation of the construction illustrated in Fig. 10 with the bracket removed;

Fig. 12 is a section on the line 12—12 of Fig. 11;

Fig. 13 is a front fragmentary elevation of two ladder sections showing a different manner of joining them;

Fig. 14 is a side elevation of the construction shown in Fig. 13, and Fig. 15 is a fragmentary face view of a ladder provided with locking pins.

Referring to the drawings, it will be seen that the ladders used comprise a series of sections 10, these sections diminishing in width from the base section to that section which forms the apex of the ladder. There are two series of these ladder sections, one section designated A and the other B, and the end ladder sections or apex ladder sections 10^a of the two series are provided with coaxing hinged joints 11, connected by a detachable pintle 12. The series of sections A and B are intended to be carried upon two motor driven trucks C and D.

Each of these trucks is provided at its rear end with a transverse bolt 13 to which the first of the ladder sections are hingedly connected. The ladder sections may be hingedly or slidingly connected to each other but in any case the sections are supported in superposed position upon the truck and may project out slightly beyond the truck so that when two trucks C and D are backed up adjacent to each other, the ladder sections 10^a, that is the topmost ladder sections, may be connected by means of the hinged joint 11 and the pintles 12. When this has been accomplished the trucks C and D move away from each other drawing out the ladder sections to a sufficient degree and then the trucks are backed toward each so that the ladder sections will be moved upward at their connected ends. When they have been raised a certain distance they are supported by means of the detachable support E. The adjacent ladder sections in this position, as shown in Fig. 1, are supported by means of the supports F.

Each of these supports F, as shown in Fig. 2, includes the laterally disposed standards 14, a transverse roller 15 supported on the standards, vertical rollers 16, and stops 17.

Where the upper ladder sections 10^a are connected to each other and supported upon the support E the trucks are pulled away from each other so that the ladders will successively be drawn from the trucks, the ladder sections being supported in the position shown in Fig. 1. When sufficient ladder sections have been withdrawn from the truck and expanded, the trucks are then backed toward each other, raising the ladder sections until the trucks arrive in the position shown in Fig. 3, when the trucks are connected by means of a chain 18 or other suitable device so that they cannot spread apart. The ladder sections then extend upward in convergent relation and thus the ladder sections are given a relatively long base. The lower ladder sections are, of course, of sufficient width to provide a suitably wide base for the wide structure.

Each section of the ladder is provided on each rail 19 with a series of eyes 20 and a series of sockets 21 and there is provided a plurality of brackets 22, preferably metallic, the lower end of one leg of each bracket being adapted to be disposed in the corresponding socket 21, while the upper leg of the bracket has a hooked end 23 adapted to be inserted in the corresponding eye 20. The outer end of the bracket has an upwardly extending lug 24.

These brackets may be readily inserted in their corresponding sockets and eyes so that the entire extent of the ladder may be provided with the brackets, or only a portion of the ladder may be provided with these brackets. These brackets are designed to support a plurality of bridges 25 which extend from the brackets to the windows of the building. Each of these bridges is provided with a hand rail 26 hinged to the bottom of the bridge and these railings 26 are held in a vertical position by means of bolts 27 each passing through a socket 28 on the railing and a socket 29 on the body of the bridge. The bolt and socket are preferably square, as thereby the railing will be held more rigidly in position. Preferably the bridge will be covered with asbestos as will the railing.

In order that the bridge may be readily manipulated so that two men may readily handle the bridge and shift it across the gap between a bracket and the window to which the bridge is to connect, I provide the inner end of the bridge with two sockets 30 and provide two handling irons 31 adapted to be inserted in these sockets. Thus the bracket forms a fulcrum and the handling irons permit the bridge to be rested on this fulcrum and raised, lowered or shifted into any desired position. For the purpose of holding the bridge from any accidental disengagement from the brackets, I provide on the bridge a plurality of staples or eyes 32

and on the side rail of the ladder, between the sockets and eyes 21 and 20 respectively, I provide hooks 33 adapted to engage these staples or screw eyes 32. The staples or eyes 32 preferably project upward and the corresponding hook extends downward, thus preventing the bridge either tipping or sliding. There are a number of these staples or eyes 32 in order to allow the bridge to take different positions and permit the bridge to be extended to windows which are not directly opposite the brackets but in an oblique relation thereto. In Fig. 4, I illustrate the bridges as being extended from the ladder to the corresponding windows.

In Figs. 3, 4, and 5 I have illustrated the ladder sections as having sliding engagement with each other, after the manner of the extension ladders in ordinary use, and each ladder section as being provided with a hook 34 of ordinary construction which, as the ladder section is raised, engages with the rungs of the next ladder section so as to automatically hold the ladder sections raised relative to each other. These hooks, as before stated, are of an ordinary form and may be swung out of the way to allow the ladder sections to collapse with relation to each other.

In Figs. 13 and 14, I show a ladder wherein the sections are hinged to each other as at 35 and in order to hold these ladder sections in aligned relation, the ladder sections are provided with perforated lugs 36 through which bolts 37 pass. As the trucks recede from each other and draw out the ladders, four men, two on each side of the ladder, thrust the rods or bolts 37 through the eyes or lugs 36. The ladders may be readily handled by means of poles 38 having crotches 39 at their upper ends. This crotch is placed under the sides of the ladder sections and the sections are pushed into the truck as the ladder collapses.

In Fig. 15 I have shown a ladder in which the sections are detachably connected to each other by locking pins 40. This permits the sections to be laid one upon the other in a truck and then connected to form the ladders as the sections are drawn out of the truck; that is, one ladder section will be drawn out by a movement of the trucks away from each other and then the next ladder section is connected to the first named ladder section by the pins 40, and so on until all of the ladder sections have been drawn out of the trucks.

In the general operation of this ladder construction, there will be two motor trucks used for the ladders. Another motor truck will be used for carrying the bridges, brackets and iron rods. One man places the brackets in position and two men carry the bridges up the ladder and apply them over the brackets. If the firemen are well

trained, the ladders can be raised or lowered in a very short time and it is obvious that the ladders may be forced to a great height and will have a perfectly firm base or foundation. A director should stand in full view of the two drivers of the trucks and signal when the trucks are to go forward, stop when the rods or bolts 37 are being put in place, and when to back toward each other to raise the ladders.

It will be seen that this ladder, while easily handled and readily raised to any desired height, is particularly safe for the removal of women and children and that once the ladder is in position, access may be had to any part of the building by placing the bridges to adjacent windows. The ladder, as a whole, may be shifted by shifting the trucks. Thus it is a relatively easy matter to remove the ladders in case there is danger of the ladders burning, without the necessity of lowering the ladders. While I have illustrated a particular form of my invention, it will be obvious that many details may be changed without departing from the spirit of the invention and that the construction may be varied in many ways.

It will be understood that, as before stated, either sliding ladders or hinged ladder sections may be used. The sliding ladders may be of any suitable construction, but if the ladder sections slide upon each other the fronts of the ladders are left clear for the rings, pockets and hooks to receive the brackets. Sliding ladders have every advantage over folding ladders except that the number of sections is necessarily limited by the fact that one section is slightly smaller than the section next below.

To get either kind of ladder back into the truck, it is necessary that the sections should be held straight and on a level with the truck with low supports and that the sections should be firmly supported where

the two ladders meet. Rods thrust through the rings as illustrated in Fig. 14 are a means for securing stiffness at the joint for hinged or pivoted ladder sections.

Having described my invention, what I claim is:—

1. A fire ladder structure including two series of ladders, motor trucks supporting the two series of ladders, the topmost ladder of both series being provided with means whereby the two series of ladders may be hingedly connected to thereby permit the ladders to be withdrawn from the trucks by movement of the trucks away from each other and raised by elevating the joined ends of the two series and shifting the trucks toward each other.

2. A fire-escape ladder comprising two series of connected ladder sections, means for shifting the two series of ladder sections into an upwardly convergent relation, sockets mounted upon the rails of the ladder sections, brackets detachably mounted in the sockets, bridges adapted to rest upon said brackets, and means for detachably connecting the bridges to the brackets.

3. A fire-escape structure of the character described including two motor trucks, a series of ladder sections in each truck operatively connected to each other, the topmost ladder sections being provided with hinged joints whereby they may be detachably hinged to each other, and means for supporting the joined ends of the ladder sections in convergent relation at a relatively slight angle, the ladder sections being raised by backing the trucks toward each other.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

KATHARINE C. FERRIS.

Witnesses:

EMMA M. CHENY,
JULIA ABRAMS.