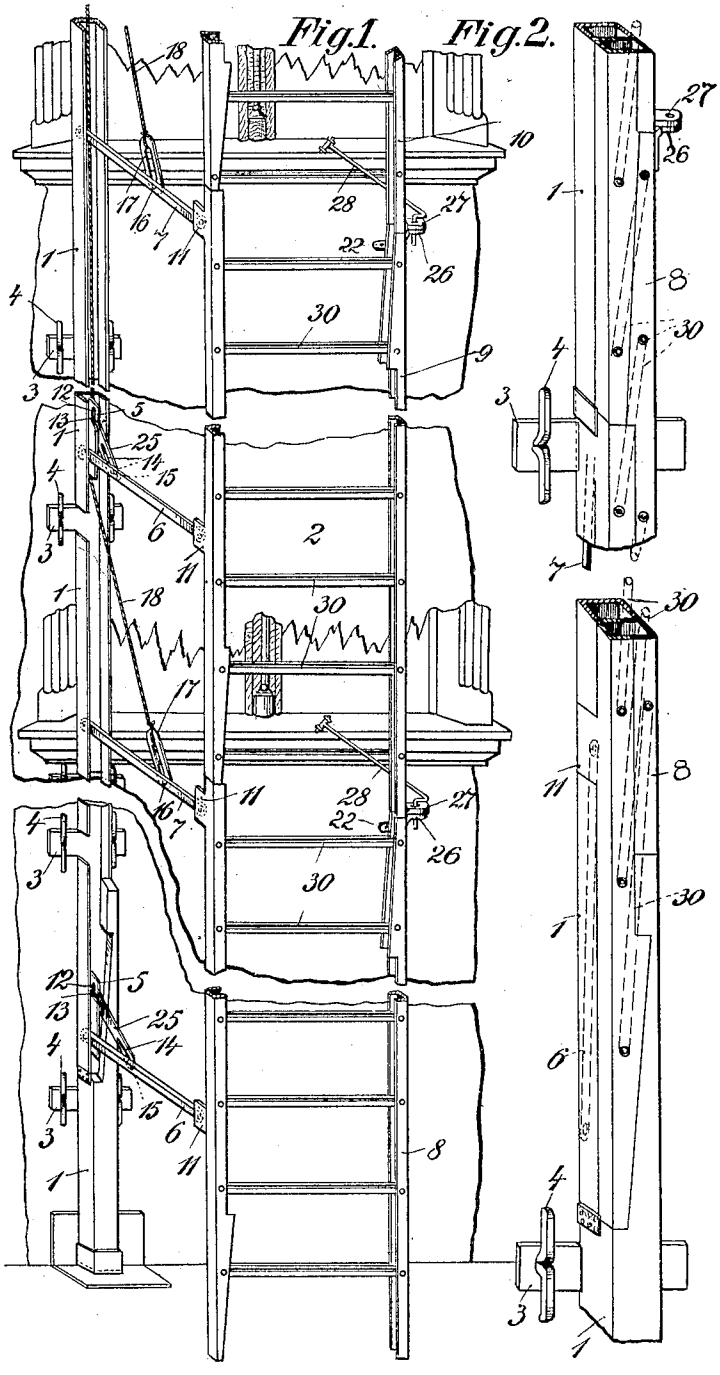
No. 887,550. PATENTED MAY 12, 1908.

J. J. VAN BROEKHOVEN.

FIRE ESCAPE.

APPLICATION FILED DEC. 4, 1906.

3 SHEETS—SHEET 1.



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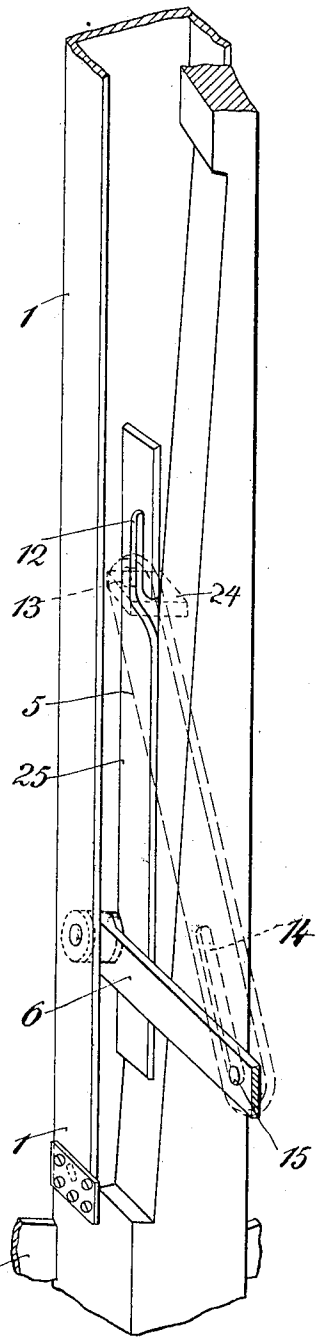
3 SHEETS—SHEET 2.

Fig. 3.



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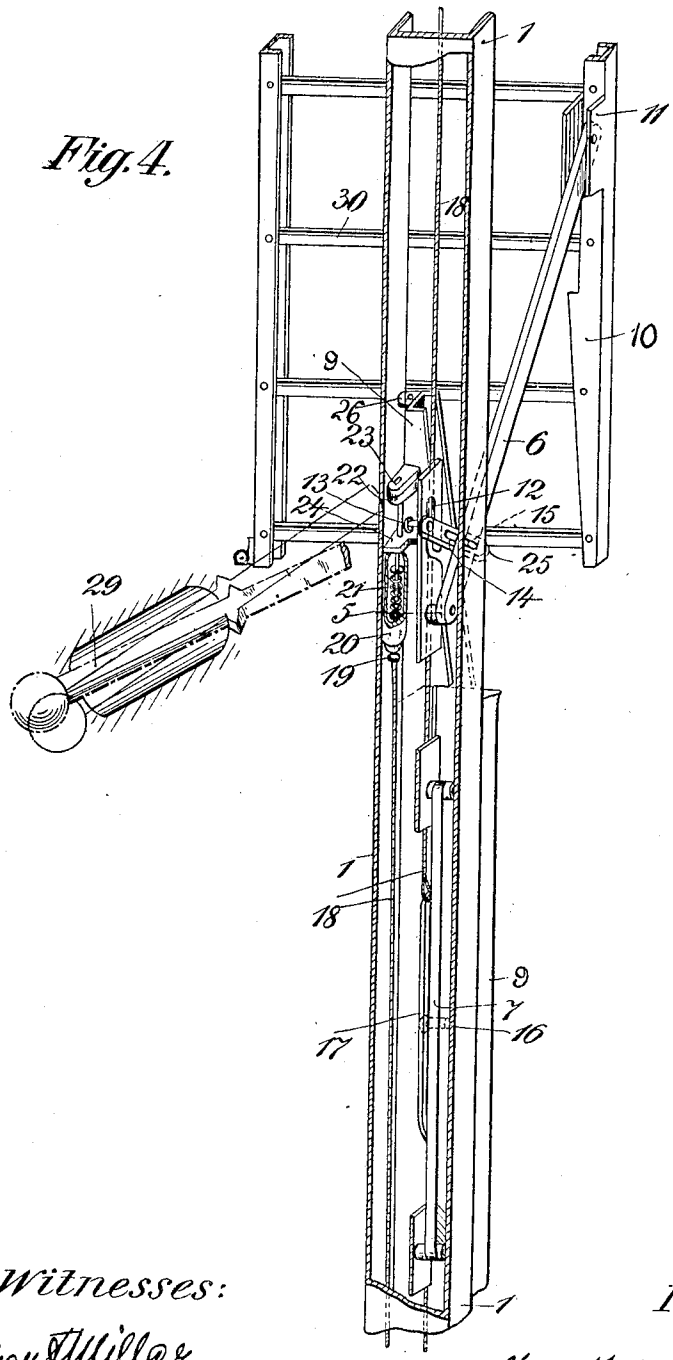
3 SHEETS—SHEET 3.

Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

JACOBUS JOHANNES VAN BROEKHOVEN, OF WYCHEN, NEAR NYMEGEN, NETHERLANDS.

FIRE-ESCAPE.

No. 887,550. Specification of Letters Patent. Patented May 12, 1908.

Application filed December 4, 1906. Serial No. 346,330.

To all whom it may concern:

Be it known that I, JACOBUS JOHANNES VAN BROEKHOVEN, a subject of the Queen of the Netherlands, and resident of Wychen, near Nymegen, Netherlands, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

The present invention relates to a new and improved fire-escape in the form of a folding ladder fixed against the side of the house. When out of use the ladder is folded into a groove or recess at the side of the windows and is so constructed that it can be quickly and easily made ready for use but only from the inside, and either of the various stories. The ladder consists of several parts according to the number and height of the floors, and both in the open and closed condition they fit on top of one another and are fastened firmly together by means of bolt mechanism.

In the drawings a form of construction of the new fire-escape is shown.

Figure 1 is a front view of the ladder having three parts one above the other ready for use. Fig. 2 is a partial front view of the ladder in the closed condition. Fig. 3 shows on an enlarged scale parts of the ladder and accessories seen from the front. Fig. 4 is a back view and section of the ladder showing one part closed and another part at the moment of opening.

At the side of the windows of a house, preferably in a recess for the purpose, an iron channel, gutter, or casing 1, having a U shaped cross-section is fixed. This iron casing 1 is open towards the front and leads from the top floor to the pavement. It can be let into the wall, and at the lower end built into the ground

On the casing 1 all the various parts of the ladder 2 are fastened. The casing 1 is fastened at several suitable places by means of fish-plates 3 and hooks or nails 4. Within the casing 1 on the back wall of the same the oblong metal plates 5 are fixed, and serve to attach the lower supports 6 of the ladders 8, 9 and 10. The upper supports 7 of the ladder parts 8, 9 and 10 are on the other hand directly jointed on a side wall of the casing 1. The supports 6 and 7 are at their other ends jointed to flanges 11 on the left sides of the ladder parts 8, 9 and 10. The iron plates 5 fixed in the casing 1 are provided at the upper end with an incision 12, in which the links 25 are led by means of a pin 13 (Fig. 3). The links 25 are by means of the pins 15, which engage into slots 14 provided in these links 25 pivotally connected to the lower supports 6 of the ladder parts 8, 9 and 10. (Figs. 1, 3 and 4). The upper supports 7 of the ladder parts 8, 9 and 10 bear at the same time a pin 16 which engages a slot provided in a plate 17 which is connected with the locking bolt 19 situated in a boxing 20 by means of the steel rope 18 or similar means (Fig. 4). The bolt boxing 20 is preferably fixed on the inside of the right wall of the casing 1. The bolt 19 is acted upon by a helical spring 21 which tends to push the bolt upwards. On the right side of the ladder parts 8, 9 and 10 are ears 22 directed towards the house, and on corresponding places on the right wall of the casing 1 are also ears 23. The ears 22 and 23 lie directly above one another when the ladder is closed (Fig. 4), and are held together by the locking-bolt 19 under the action of the spring 21, so that the ladder is held in the closed position, until the weight of the released next ladder beneath falling withdraws the said bolt connected by the steel rope 18. To the locking bolt 19 is further fastened a disk 24, which on the falling of the next ladder above (Fig. 4) is pressed down by the pin 13 of the link 25. Hereby the bolt 19 is removed from the holes in the ears 22 and 23, so that this ladder is also released.

In order to produce a quick and easy fitting of the ladders on one another on opening, the right sides of the ladders are provided with partly inclined ears 26. On the lower ends of right sides of the ladders are also ears 27. In the position for use both the ears lie one above the other and are secured together and to the window by the hook 28. The unbolting of the closed ladder is always operated from the room by means of a hand lever 29 led through the wall (Fig. 4). This lever lies in a specially arranged metal case near the windows. The ladder can be made ready for use from the lower stories just as well as from the upper ones. For instance if anyone from the lower floor wants to use the ladder the following operations take place. The head of the lever 29 is somewhat raised, whereby the front end of the same presses down the disk 24 and the bolt 19, so that the ears 22 and 23 and therefore the ladders are unbolted. Since the supports 6 and 7 bearing the ladders 8, 9 and 10 slant outwards a little (Fig. 2), it is obvious that on unbolt-

ing the ladder comes out of the casing 1 and falls outwards until it touches the earth at the same time the rungs 30 fall with the right side of the ladder on account of their own weight. In order to prevent the right side from falling too far out, the rungs 30 are provided in well known manner with suitable stops. As the upper supports 7 of each ladder as above described are connected by means of a wire rope 18 with the locking bolt 19 of the next ladder above, so the release of a lower ladder must always produce the unbolting and release of another ladder above. From below therefore the unbolting of the lowest ladder operates the next one, and the weight of the second induces the release of the third, and so on.

If the operation of the ladder takes place in the other direction from above, it takes place in the following way. For instance the ladder of the second story may be unbolted by means of the lever 29 from the room in the above described way. The same falls out. The lower support 6 of this ladder during the falling out of the ladder pulls down by means of the link 25 the pin 13 which moves in the slot 12. The pin 13 comes against the disk 24 of the bolt 19 of the next ladder beneath and moves the disk until the bolt 19 is withdrawn from the holes 22 and 23 (see Fig. 4). When this is the case the next ladder beneath has been unbolted and falls out by its own weight. The ladder under this one is then also worked in exactly the same way. The ladders above are released in the above described way.

In order to guarantee a sure and smooth closing or folding of the ladder, it should preferably have the form of construction given in the drawing. In order to resist a rusting or freezing together of the ladder parts the surfaces which rest on one another can be provided for instance with copper or brass facings.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a fire escape consisting of a number of folding ladders arranged one above the other, in combination, a casing fixed on the wall of the house, supporting arms pivotally fastened at one end to the said casing, the folding ladders pivotally fastened to the free ends of the said supporting arms, an ear arranged on each of the said ladders, and a corresponding number of ears fixed in the said casing, one of the last said ears and the said ear on the ladder lying above each other when the ladders are closed, a spring governed locking bolt for each of the said ladders arranged in the said casing and adapted to engage into the two said ears lying above each other and to keep the corresponding ladder in the closed position, means to withdraw the said locking bolt by hand from the corresponding story, a means connecting the said locking bolt with the next ladder beneath and adapted to withdraw the said locking bolt, means on the next ladder above adapted to move the said locking bolt out of engagement with the said ears, and means to secure the said folding ladders in the position for use, substantially as described and for the purpose set forth.

2. In a fire-escape consisting of a number of folding ladders, arranged one above the other, in combination, a casing fixed on the wall of the house, supporting arms pivotally fastened at one end to the said casing, the folding ladders pivotally fastened at one side to the free ends of the said supporting arms, the two sides of the said ladders connected together by pivoted rungs, an ear arranged on the free side of each of the said ladders, and a corresponding number of ears fixed in the said casing, one of the last said ears and the said ear on the folding ladder lying above each other when the ladders are closed, a boxing fixed in the said casing, and a spring governed locking bolt in the said boxing and adapted to engage into the two said ears lying above each other, and to keep the corresponding ladder in the closed position, means to withdraw the said locking-bolt by hand from the corresponding story, a wire-rope fastened at one end to the said locking bolt and at the other end to one of the said supporting arms of the next ladder beneath, means on the next ladder above adapted to move the said locking bolt out of engagement with the said ears, and means to secure the said folding ladders in the position for use, substantially as described and for the purpose set forth.

3. In a fire-escape consisting of a number of folding ladders arranged one above the other, in combination, a casing fixed on the wall of the house and having a U-shaped cross-section, supporting arms pivotally fastened at one end to the said casing, the folding ladders pivotally fastened at one side to the free ends of the said supporting arms, the two sides of the said ladders connected together by pivoted rungs, an ear arranged on the free side of each of the said ladders, and a corresponding number of ears fixed in the said casing, one of the last said ears and the said ear on the folding ladder lying above each other when the ladders are closed, a boxing fixed in the said casing, and a spring governed locking-bolt in the said boxing and adapted to engage into the two said ears lying above each other and to keep the corresponding ladder in the closed position, means to withdraw the said locking bolt by hand from the corresponding story, a wire-rope fastened at one end to the said locking bolt and at the other end to one of the said supporting arms of the next ladder beneath, a link pivotally connected at one end to one of the said supporting arms of the next ladder

above, a vertically guided pin fixed on the other end of the said link, the said pin arranged to move the said locking bolt out of engagement with the said ears, and means to secure the said folding ladders in the position for use, substantially as described and for the purpose set forth.

4. In a fire escape consisting of a number of folding ladders arranged one above the other, in combination, a casing fixed on the wall of the house and having a U-shaped cross-section, supporting arms pivotally fastened at one end to the said casing, the folding ladders pivotally fastened at one side to the free ends of the said supporting arms, the two sides of the said ladders having a U-shaped cross section and connected together by pivoted rungs, an ear arranged on the free side of each of the said ladders, and a corresponding number of ears fixed in the said casing, one of the last said ears and the said ear on each folding ladder lying above each other when the ladders are closed, a boxing fixed in the said casing, and a spring governed locking-bolt in the said boxing and adapted to engage into the two said ears lying above each other and to keep the corresponding ladder in the closed position, a wire-rope fastened at one end to the said locking bolt and at the other end to a slotted rail movably connected to one of the said supporting arms of the next ladder beneath, a disk fixed on the said locking bolt, a slotted guide plate fixed in the said casing, a link pivotally connected at one end to one of the said supporting arms of the next ladder above, and a pin fixed on the other end of the said link and engaging the slot in the said slotted guide plate, the said pin arranged to act upon the said disk on the said locking-bolt, a hand-lever arranged adjacent to each locking bolt in the wall of the house and having its one end projecting into the room and the other end resting upon the said disk on the corresponding locking-bolt, ears on the top and bottom end of the free side of each ladder, and hooks pivoted on the wall of the house and adapted for connecting two adjacent ears of the last said ears when the ladders are in the position for use, substantially as described and for the purpose set forth.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JACOBUS JOHANNES VAN BROEKHOVEN.

Witnesses:

JOHAN PETER YEIGER,

AUGUST SIEGFRIED DOCEN.