L. HENKLE.

FIRE-ESCAPE.

No. 191,677. Patented June 5, 1877.

Fig. 1.

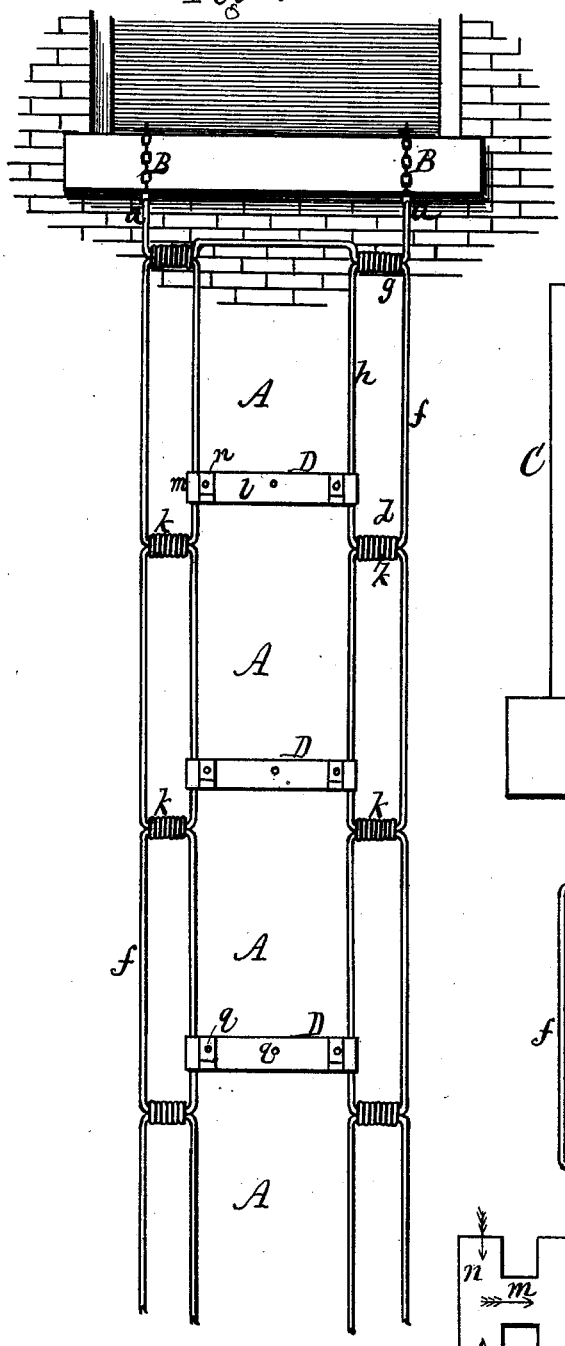


Fig. 2.

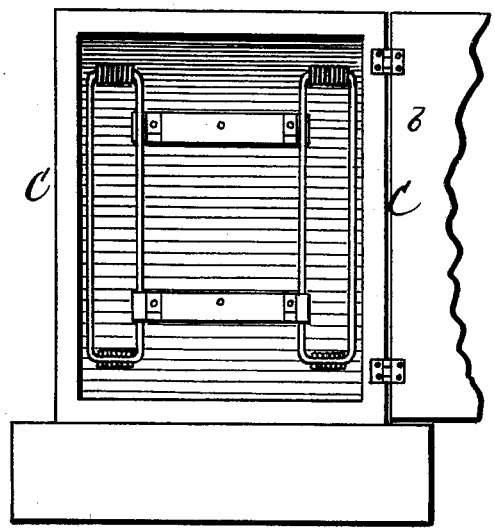


Fig. 3.

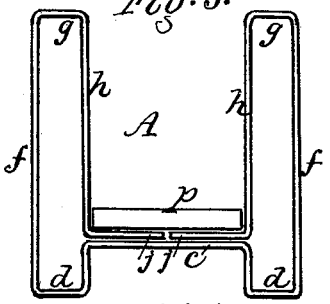
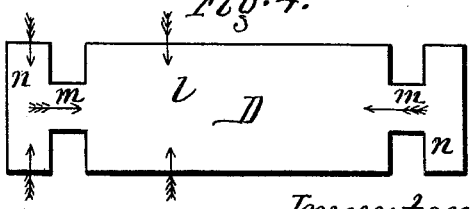


Fig. 4.



Attest.
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Atty.

UNITED STATES PATENT OFFICE.

LEONARD HENKLE, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO WILLIAM H. MOORE, OF SAME PLACE.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **191,677**, dated June 5, 1877; application filed May 4, 1877.

To all whom it may concern:

Be it known that I, LEONARD HENKLE, of the city of Rochester, in the county of Monroe, and State of New York, have invented a certain new and useful Improvement in Fire-Escapes; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of the improvement attached to a window. Fig. 2 is a plan view of a box situated in the room beneath the window-sill, and showing the ladder folded together and stowed within the box. Fig. 3 is a plan of one of the wire links or sections of the ladder. Fig. 4 is a plan of one of the wrappings forming the step before it is folded.

My improvement relates to that class of wire-ladders which are made in links or sections, capable of being folded in compact form, and which are attached to the window-sill in use, and lowered to the ground to enable persons to escape from the upper stories of buildings. The invention consists in the construction and arrangement of the ladder, as hereinafter more fully described and definitely claimed.

A A A represent the several links or sections of which the ladder is composed. These are made of any desired size, usually about sixteen inches long and ten inches wide, and a sufficient number are connected together to reach to the ground. At the top the ladder has hooks *a a*, which connect with chains B B, attached within a box or receptacle, C, inside the room, and attached on the floor directly beneath the window-sill. This box is shown in plan in Fig. 2, the hinged cover *b* being thrown open. It may be made in the form of a hassock or ottoman, suitably upholstered, in which case it presents an ornamental appearance. In use the chains are simply thrown out over the window-sill, as shown in Fig. 1, with the ladder suspended therefrom, and they prevent the kinking or binding of the ladder.

The links or sections A A are made of wire, in the form shown in Fig. 3. The bend is first made in the middle of the wire which forms the straight length *c*. The wire is then bent downward on each side, forming the loops *d d*. It is then carried upward, forming the outer sides *f f*. Loops *g g* are then formed at the top, corresponding with *d d*, and the vertical inside lengths *h h* are then carried down parallel with *f f*. At the lower end the two ends *j* of the wire are turned in horizontally over the length *c*, meeting in the center. This forms the link or section complete from one piece of wire, and the links have double sides, by which some special advantages are secured, as will be presently described. The top loops *g g* of one link are connected with the bottom loops *d d* of the next link by coils of flexible wire *k k*, wound around both in the spaces between the sides *f h*, as clearly shown. This gives sufficient strength of connection, and also forms a free and easy joint, by which the several links can be folded together, in zigzag form, in a compact body, and stored in the box C, as before described.

D is a wrapping, of sheet metal or other suitable material, which is placed around the horizontal lengths *c j* to bind said parts together and form the step. This wrapping is cut of the form shown in Fig. 4, consisting of a wide central body, *l*, a narrow neck, *m*, at each end, and outside this a lap, *n*, at each end, of the same width as the central body.

When this wrapping is applied a thin narrow strip of wood, or equivalent material, *p*, Fig. 3, is placed over the lengths *c j* to serve as a filling to the step, and also as a body to rivet the wrapping to, as well as give stiffness and strength to the step. The wrapping is then placed around the parts. The edges of the central body *l* are first folded over to embrace the sides. The ends are then folded inward, so that the necks *m m* embrace the side wires. The laps *n n* are then turned over, embracing the ends of the central length at each side of the side wires, thus producing a double lock.

The different folds of the wrapping are indicated by the arrows in Fig. 4. When this is done, rivets *q q q* are applied in the center, and the ends passing through the wood filling, as above described. This forms a step located some distance above the joint of the links,

made thin and light to not interfere with the folding of the ladder, and of very great strength and stiffness.

This ladder differs from others in having double sides *f h*.

By this means the wires may be made lighter, and greater stiffness against lateral swaying or swinging is secured, which, in long ladders, is a source of great danger. By this means, also, equal strain is produced on the whole width of the wrapping or joint wires *k k*. It also furnishes a better hand-hold to the person descending. Greater strength is also secured.

Having thus described my invention, what I claim herein as new is—

1. A fire escape ladder, consisting of links or sections A A, made each of a single piece of wire, bent in the manner described, to form double sides *f h*, with loops *d g* at top and bottom to receive the binding-wires *k k*, and with the straight lengths *c j* forming the step, as shown and described, and for the purpose specified.

2. The combination, with the links or sections A A, provided with the double sides *f h*, of the separate binding-wires *k k*, wound over the loops *d g* in the space between said double sides, as shown and described, and for the purpose specified.

3. The combination, with the lengths *c j* forming the step, of the filling-strip *p*, placed over the said lengths, and an inclosing wrapping embracing the whole, said wrapping being riveted to the strip, in the manner and for the purpose specified.

4. The wrapping D, constructed with the central body *l*, the narrow necks *m m*, and the laps *n n* at the ends, for the purpose of folding over and embracing the step, as shown and described, and for the purpose specified.

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

LEONARD HENKLE.

Witnesses:
R. F. OSGOOD,
JACOB SPAHN.