T. H. KNIGHT, O. H. CURTIS & G. C. GIBBS.

Fire-Escape.

No. 204,581. Patented June 4, 1878.

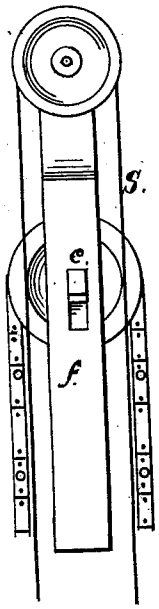


Fig. 3.

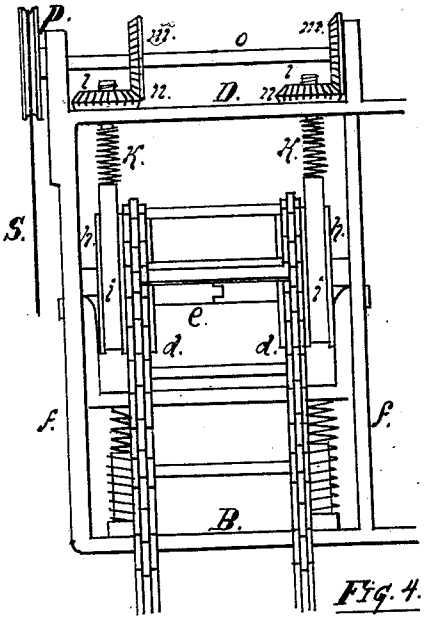


Fig. 4.

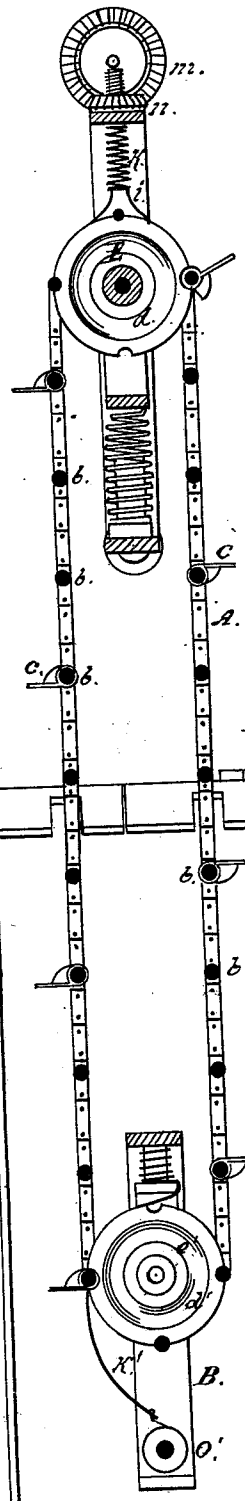


Fig. 1.

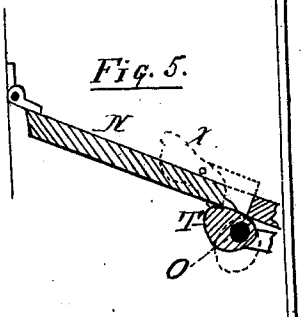


Fig. 5.

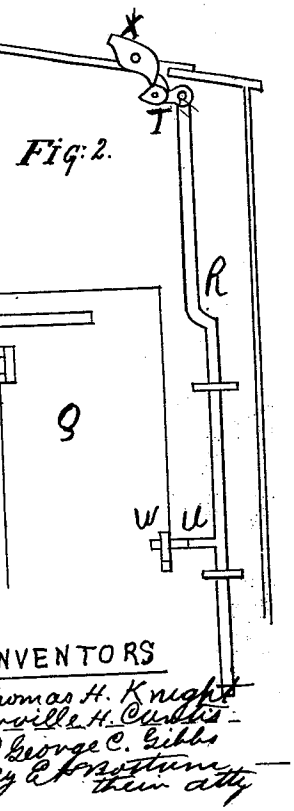


Fig. 2.

WITNESSES:

R. H. Wells

O. P. Mosey

INVENTORS

Thomas H. Knight
Orville H. Curtis
and George C. Gibbs
By E. Bostwick
their atty

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS H. KNIGHT, ORVILLE H. CURTIS, AND GEORGE C. GIBBS, OF MILWAUKEE, WISCONSIN; SAID KNIGHT ASSIGNOR TO SAID CURTIS.

IMPROVEMENT IN FIRE-ESCAPES.

Specification forming part of Letters Patent No. **204,581**, dated June 4, 1878; application filed February 2, 1878.

To all whom it may concern:

Be it known that we, THOMAS H. KNIGHT, ORVILLE H. CURTIS, and GEORGE C. GIBBS, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Fire-Escapes; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification:

Our invention relates to that class of fire-escapes which employ an endless ladder suspended from a pulley or drum, which allows one side of the ladder to descend as the other ascends, with suitable means attached thereto to govern or check the rate of the descent.

In the accompanying drawing similar letters denote like parts throughout.

Figure 1 is a sectional view of our invention in its entirety. Fig. 2 is a sectional view of an inclosure to protect the lower part of the escape from unwarranted use and interference. Fig. 3 is a view of the upper supporting drum or pulley and the frame in which it is held. Fig. 4 is another section of the same at right angles to that shown in Fig. 3. Fig. 5 shows the descending trap-door in the protecting house or inclosure referred to, and the means employed for automatically operating the same by the slightest descent of the ladder.

A is the endless ladder, of the general form shown in the drawing, and formed of chain or wire cable, preferably the latter, with either rounds or steps. It is hung over the pulley or drum on pulley E on the enlarged portions *d d*. Pulley E rotates on a shaft, *e*, that slides vertically in slots in the sides *f* of frame B D. Pulley E is also hung in the brake-bands *i i*, as shown in the drawing, which pass under and around the grooved portions *h h*, as shown in Fig. 4.

By means of strong springs *k k*, the brake-bands *i i* are attached to screw-bolts *l l*, which pass through the upper part of the frame-work D, on the upper side of which are bevel-pinions *n n* on screw-bolts *l l*. The pinions *n n* mesh into driving-gears *m m* keyed on shaft *o*, to which, outside the frame, is attached the pulley P. By means of a band or cord around pulley P, (marked S,) the tension of brakes *i i*, and consequently the rate of descent, may be regulated either from the ground or any part of the escape-ladder.

Supporting-springs, when the length of the ladder and its consequent weight render it necessary, may be placed underneath the yoke connected to shaft *e*. The lower end of the ladder passes around a pulley, similarly constructed, in the main, but with strong springs pressing it downward, as shown in Fig. 1. A brake-band, *k'*, passes partially around the pulley in the lower frame, as shown in Fig. 1, one of its ends being attached to the frame-work and the other wound about a cylinder or shelf, O', by means of a small crank and ratchet, or other equivalent device for the purpose. This, together with the method of tightening the brakes at the top, serves to give the required amount of friction in the movement of the escape to enable the persons upon it to descend slowly, whether the weight is great or small. A band passes over the pulley P, and also over a loose wheel at the bottom, so as to form a means of tightening up the friction at the top from the ground.

The frames B B are attached rigidly to the side of the house or other building by bolts or other suitable means.

In order to protect the escape from interference and use by thieves, I inclose its lower part with a protecting house or cover. (Shown in the lower part of Fig. 1 in section.) It consists of the house M, provided with a door, N, on its top, hinged so as to open downward, and provided with slots in its free edge, as shown in the drawing, within which the ladder passes freely. The free edge of door N rests on the eccentric-shaft O in such a manner that when the shaft is held up by means of the detent or catch X (shown in Fig. 5) the door N is held firmly closed and up. When the escape commences to descend the side piece strikes the upper end of catch X, allows the eccentric-shaft O to drop, and with it the trap-door N.

On one end of the eccentric-shaft O is fastened a bell-crank, T, which, as the eccentric-shaft O falls, raises the bar R and catch-piece U out of notched catch W, Fig. 2, and allows door Q to open. A spring may be so placed as to open the door Q forcibly when the catch is released.

Our invention operates as follows: The frame B, supporting the escape at the top, is firmly fastened to the upper part of the building, and the lower frame-work and pulley are fastened firmly beneath the upper one, and near the ground. The inclosure M, being secured, prevents access to the escape from below. On an alarm of fire, persons desirous of using the escape should step upon the rounds of the escape, when it will begin to descend slowly toward the ground. The hand of the person descending can govern the rate of descent by means of cord S over pulley P. As soon as the escape commences to descend it will trip the catch that holds up door N, allow the door to swing open, and at the same time releases the catch that confines door Q, which opens and allows free egress. Should too great a weight be placed on the escape to be controlled by brakes *i i*, the brake K′ should be applied at the bottom until the rate of descent is properly regulated.

Having thus described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. The combination of the escape or ladder A, the supporting-pulley E, sliding vertically in a frame, as shown, strap-brakes *i i*, springs K K, and screw-bolts *l l*, provided with nuts *n n*, substantially as and for the purposes set forth.

2. The combination of the shaft O, catch X, bell-crank T, connecting-rod R, provided with catch-piece U, and door Q, provided with catch W, all constructed and operating substantially as hereinbefore set forth.

3. The shaft O, provided with the pinions *m m*, pulley P, and band S, in combination with beveled pinions *n n*, bolts *l l*, springs K K, brakes *i i*, and pulleys *h h*, substantially as and for the purposes set forth.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

THOMAS H. KNIGHT.
ORVILLE H. CURTIS.
GEORGE C. GIBBS.

Witnesses:
E. H. BOTTUM,
ALBERT CUNNINGHAM.