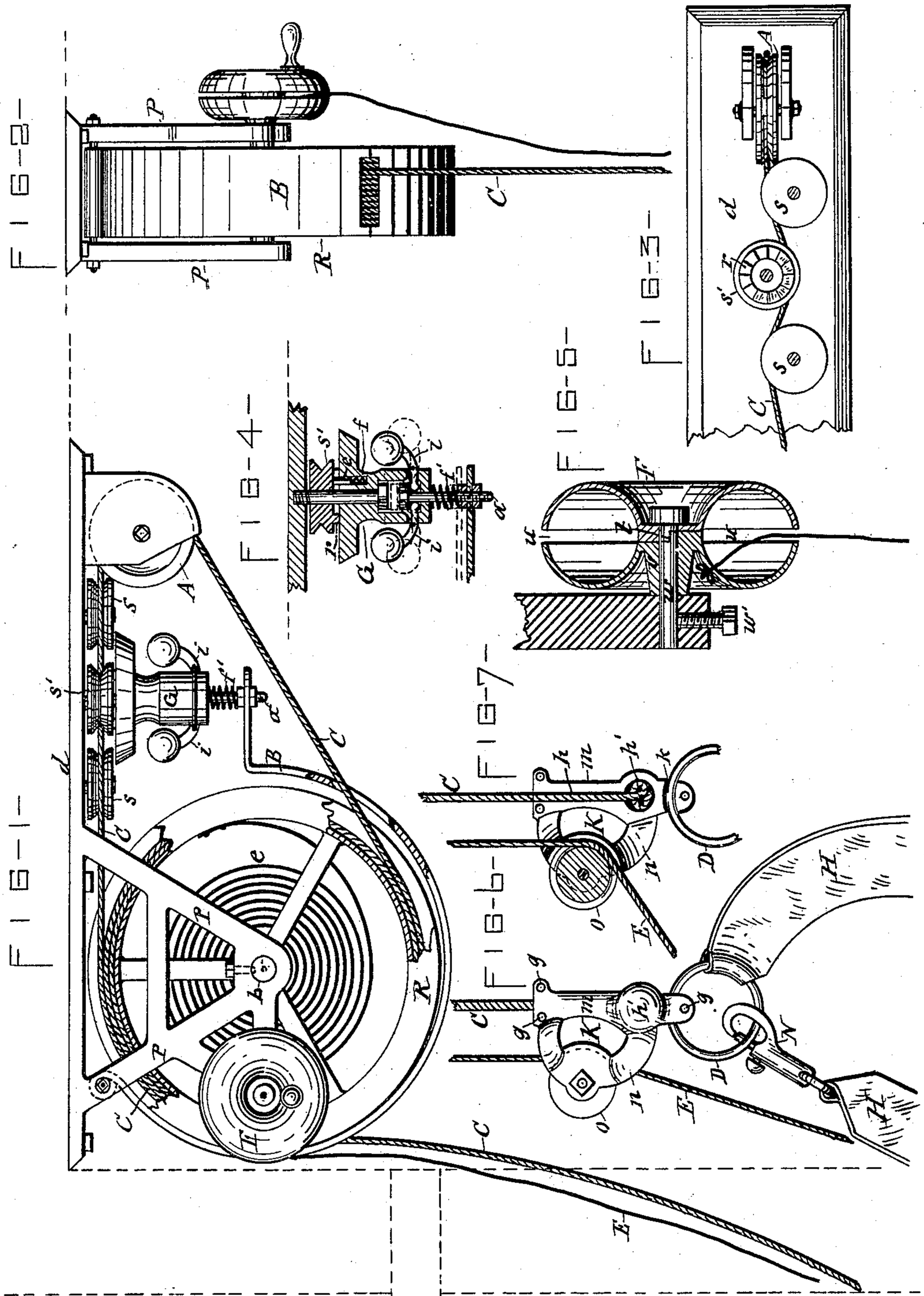
(No Model.)

M. J. & O. L. COOK & F. R. SMITH.

FIRE ESCAPE.

No. 287,365. Patented Oct. 23, 1883.



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UNITED STATES PATENT OFFICE.

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FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 287,365, dated October 23, 1883.

Application filed July 31, 1883. (No model.)

To all whom it may concern:

Be it known that we, MANSFIELD J. COOK, ORANGE L. COOK, and FRANKLIN R. SMITH, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Fire-Escapes, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

The object of this invention is to provide safe, reliable, and convenient means for the escape of persons from elevated portions of burning buildings; and it consists in the combination, with a drum or reel and a cable wound thereon, of certain novel devices for controlling the movement of the reel; and it also consists in other peculiarities of the details of the fire-escape, all as hereinafter more fully described, and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a side elevation of our improved fire-escape mechanism, illustrating its application to the ceiling of a room. Fig. 2 is a front view of the same. Fig. 3 is a plan view of the sheaves which guide the cable and transmit motion to the brake-controlling governor. Fig. 4 is a vertical transverse section of the governor. Fig. 5 is an enlarged transverse section of the guy-line reel and its attachment. Fig. 6 is an enlarged detail view of the connection of the main cable and the guy-line with the belt by which the person escaping from the building is suspended from the cable, and Fig. 7 is a sectional view of the same.

Similar letters of reference indicate corresponding parts.

R represents a reel pivoted on a shaft, *b*, which is fixed to a pedestal or hanger, P, secured in a convenient position inside of the building, preferably to the ceiling of the room, and near the window thereof, as illustrated in Fig. 1 of the drawings.

C denotes a wire cable wound upon the reel R, and having one end fixed thereto. Said cable passes from the reel around a counter-pulley, A, and thence in a sinuous course between sheaves *s*, *s'*, and *s*, which are pivoted in horizontal position, and in the same plane on a suitable base, *d*, from which sheaves the cable is extended over the reel or around some other suitable carrier, and has connected to its free end a belt, H, as hereinafter more fully described.

To the axis of the sheave *s'* is connected a centrifugal governor, G, having a vertical reciprocating stem, *a*, actuated by the vibratory governor-arms *i* in the usual manner. To the aforesaid stem *a* is connected one end of a brake-band, B, which has its opposite end firmly secured to the foot of the pedestal or hanger P, and encompasses the greater portion of the periphery of the reel R. The velocity of the running cable, drawn out by the person descending therewith from the building, actuates the governor by the medium of the sheave *s'*, and with the increase of the aforesaid velocity the vibratory governor-arms *i* approach a horizontal position, and thereby push the stem *a* in a direction which causes said stem to draw the brake B against the periphery of the reel R. In order to allow the governor to remain dormant during the return movement of the rope or cable and the rewinding of the same on the reel, and to also graduate the action of the aforesaid reel-controlling mechanism, so as to avoid jars to the cable, we pivot the governor G on the axes of the sheaves *s'*, and arrange between them a clutch adapted to connect said parts when moved in one direction, and to release the same when moved differentially or in opposite directions, as hereinafter explained. Said clutch in this case consists of an annular ratchet, *r*, on the sheave *s'* and a pawl, *c*, on the adjacent face of the governor. The teeth of the ratchet are vertical or abrupt on one side, so as to afford a positive hold for the pawl when the sheave *s'* is actuated by the drawing out of the cable from the reel, and the opposite side or back of the ratchet-teeth is beveled to allow the pawl to slip over the ratchet when the sheave *s'* is revolved by the cable returning to and rewinding on the reel, thus allowing the governor to remain dormant during the last-mentioned movement of the cable, and also allowing the governor to expend its momentum while the motion of the cable has been checked by the application of the brake B to the reel R. When the governor is placed in a suspended position, as shown in Figs. 1 and 4 of the

drawings, we employ a spring, *f*, for maintaining the pawl in contact with the ratchet *r*, and another expansive spring, *f'*, between the governor-stand and the end of the brake-band, to force the governor-arms up in their dormant position and to throw the brake-band off the reel. When the apparatus is placed on the floor of the room and the governor stands in the usual upright position, the aforesaid springs *f* and *f'* can be dispensed with, as the devices then operate by gravity.

e represents are coil-spring, having one end fixed to the stationary shaft *b* and the opposite end attached to the inner periphery of the reel, said spring being wound in such a direction as to cause it to become tightened or wound up by the unwinding of the cable from the reel, and receive sufficient tension to reverse the motion of the reel and rewind thereon the cable C after it is relieved of the weight suspended therefrom, thereby returning the belt H to its elevated position, for the reception of another person desiring to escape from the building. If it is desired to dispense with the aforesaid recoil-spring, the reel is to be fixed to the shaft *b*, and the shaft is to be mounted loosely on the pedestal, and to be provided on its end with a suitable crank by which to turn the reel.

The connection of the belt with the cable C we prefer to effect by means of a yoke or carrier, K, consisting of a vertical shank, *m*, from the side of which projects a bow, *n*, as illustrated in Figs. 6 and 7 of the drawings. In order to facilitate the construction of said yoke and the connection of the same with the cable and belt, we form said yoke of two vertically-divided parts fastened together by bolts or rivets *g g*, the adjacent sides of the shank *m* being provided with a vertical channel, *h*, of proper size to contain the end portion of the cable, and terminating in an enlarged cavity, *h'*, for the retention of a knot on the end of cable, as illustrated in Fig. 7 of the drawings. Below the cavity *h'* the yoke-sections are provided with a transverse groove, *k*, in which lies a ring, D, attached to one end of the belt H, the opposite end of which is provided with a snap-hook, N, for its connection with the ring D.

Between the bowed portions *n* of the yoke-sections is pivoted a pulley, *o*, over the back portion of which passes a guy-rope, E, the upper end of which is connected with a small reel, F, pivoted on the hanger P. This reel we prefer to form of two annular concave plates joined at the center of their concave sides, with interlocking-shoulders *t*, and having between their outer edges a space, *u*, through which the guy-rope runs, the end of said guy-rope being fastened to the interior of the reel F. One section of said reel is provided with a hub, *v*, which furnishes the bearing for the reel. A pin, *w*, passing through the center of the reel and its hub and inserted in a hole in the hanger P, where it is secured by a set-screw, *w'*, or other suitable means, forms the pivot of the reel. It will be observed that this construction greatly facilitates the molding, casting, and fitting of the parts.

In using the described fire-escape the free end of the belt H is passed around the waist of the person and connected with the ring D by the snap-hook N, and the guy-rope E is drawn from the reel F, and its free end is thrown out of the window to allow persons to draw it away from the building and hold said rope while the person secured to the belt H descends from the building. In this descent the yoke K travels on the guy-rope E by means of the pulley *o*, and thus carries the descending person away from the outside of the building and out of the flames or smoke that may issue from the windows of the lower stories. The velocity of the descent is controlled by the governor G and its connection with the brake B, in the manner hereinbefore described. After the rescued person is released from the belt H the coil-spring *e* reverses the motion of the reel R, and thereby winds up the cable and restores the same to its elevated position preparatory to rescuing others from the building.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a fire-escape, the combination, with a reel and a cable wound thereon, of sheaves arranged to guide the cable, a governor actuated by said sheaves, and a brake for controlling the run of the cable, actuated by the governor.

2. The combination, with a reel and cable wound thereon, of a recoil-spring applied to the reel, sheaves arranged to guide the cable from the reel, a governor actuated by said sheaves, and a reel-brake actuated by the governor, substantially as described and shown.

3. In combination with the reel, cable, and brake, a sheave interposed in the track of the cable, and a governor for transmitting motion from the sheave to the brake, substantially as and for the purpose set forth.

4. In combination with the reel R and cable C, the counter-pulley A, horizontal sheaves *s*, *s'*, and *s*, the governor G, mounted on one of said sheaves, and the brake-band B, connected with the reciprocating stem *a* of the governor, substantially as shown, and for the purpose set forth.

5. In combination with the reel R, cable C, and brake B, the sheave *s'*, provided with the ratchet *r*, and the governor G, provided with the pawl *c*, substantially as and for the purpose shown and set forth.

6. The yoke K, composed of two parts provided on their adjacent sides with the channel *h* and cavity *h'*, in combination with the cable provided with a knot on its end, substantially as described and shown.

7. The yoke K, composed of two parts provided, respectively, with the channel *h*, cavity *h'*, slot *k*, and bow *n*, in combination with the

cable C, ring D, pulley *o*, and guy-line E, substantially as described and shown.

8. The reel F, composed of two annular concave plates joined at the center and provided with interlocking shoulder *t*, hub *v*, and peripheral slot *u*, in combination with the pivotal pin *w*, substantially as described and shown.

In testimony whereof we have hereunto signed our names and affixed our seals, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 19th day of July, 1883.

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FRANKLIN R. SMITH. [L. S.]

Witnesses:
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