J. J. DAWSON.

FIRE ESCAPE.

APPLICATION FILED MAY 15, 1912.

1,047,618.

Patented Dec. 17, 1912.

3 SHEETS—SHEET 1.

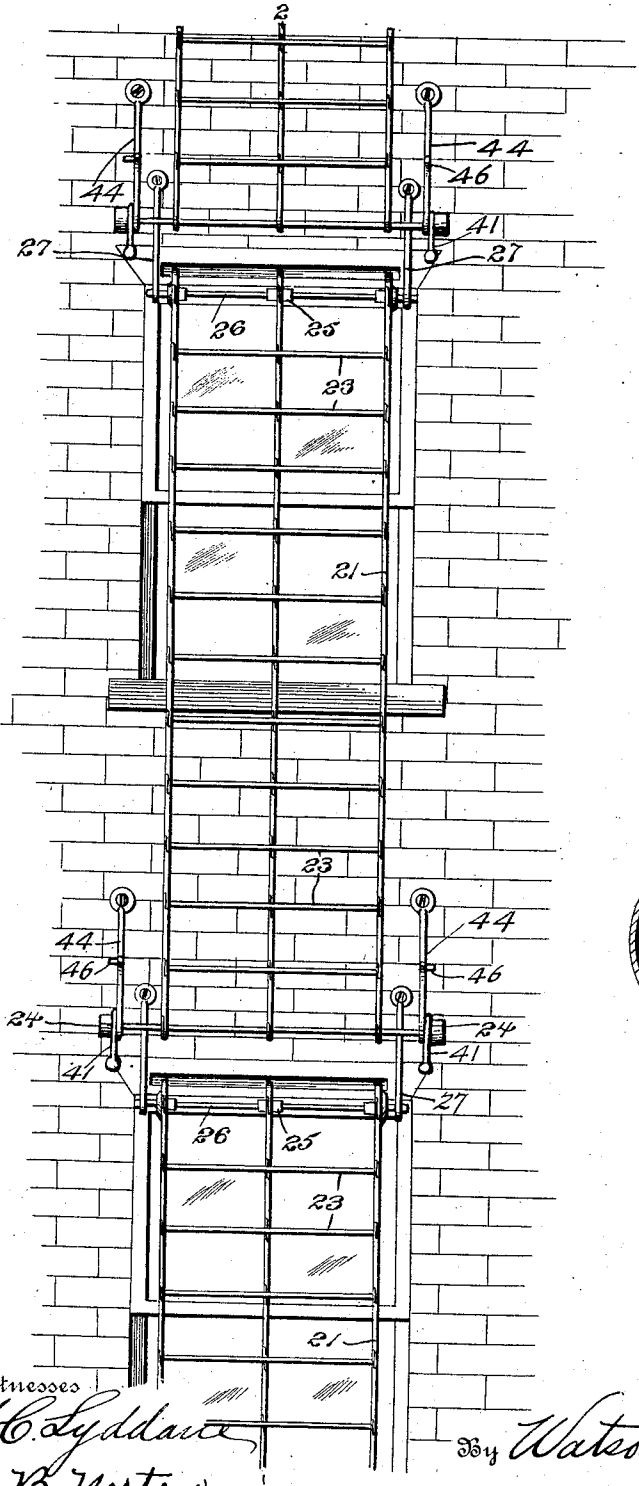
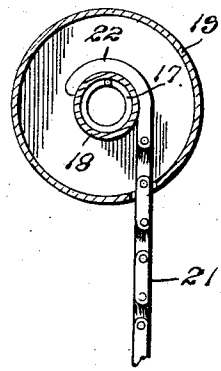


Fig. 1.

Fig. 6.



Witnesses
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3 SHEETS—SHEET 2.

Fig. 2.

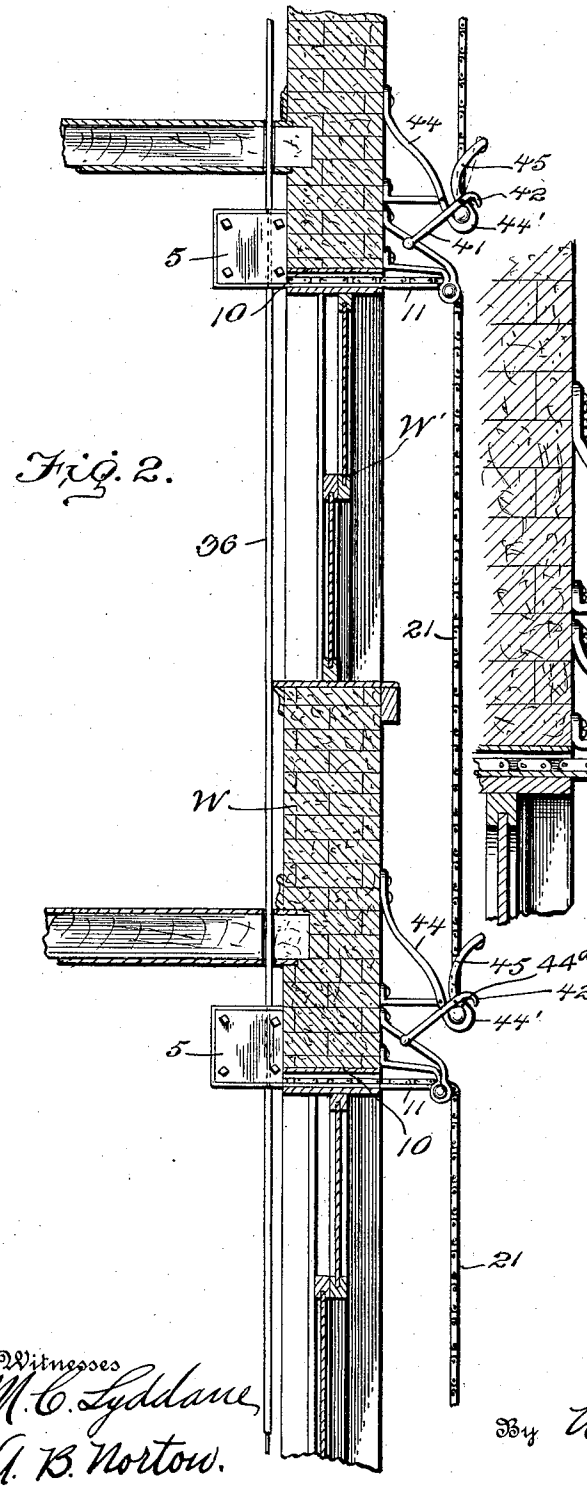
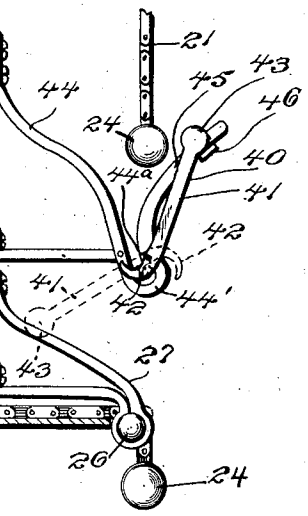


Fig. 3.



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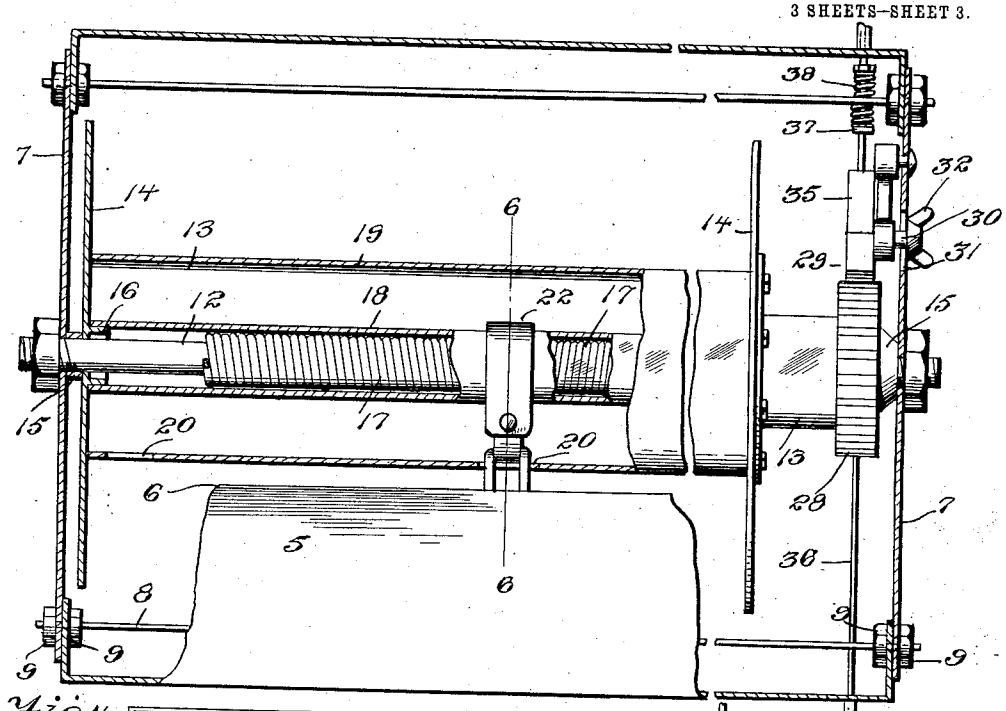

Fig. 4.

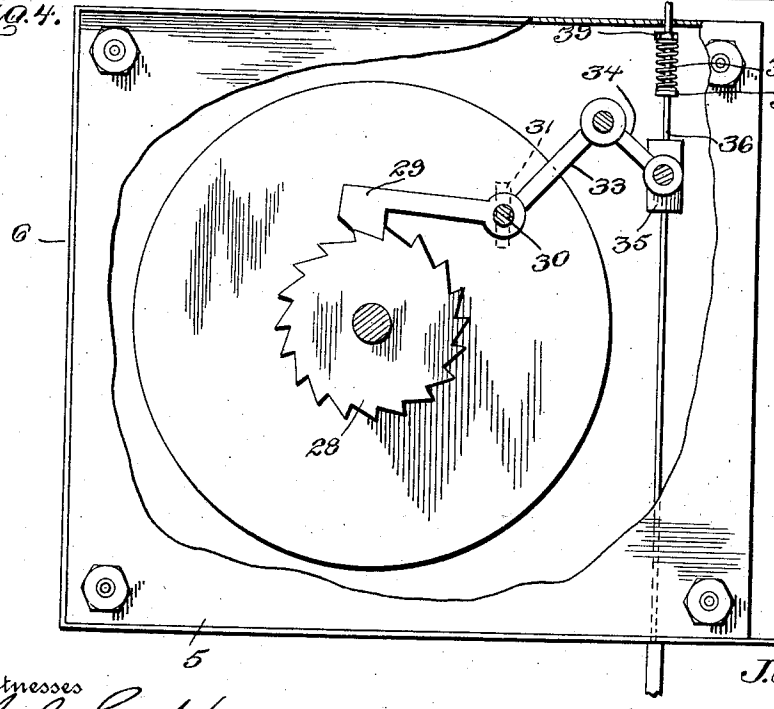

Fig. 5.

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UNITED STATES PATENT OFFICE.

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FIRE-ESCAPE.

1,047,618. Specification of Letters Patent. Patented Dec. 17, 1912.

Application filed May 15, 1912. Serial No. 697,579.

To all whom it may concern:

Be it known that I, JOHN J. DAWSON, a citizen of the United States, residing at Toppenish, in the county of Yakima and State of Washington, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in fire escapes and has for its primary object to provide a device of this character of that type wherein sectional ladders are employed, one ladder being provided for each story of the building, and housings for the ladder sections arranged within the building whereby the same are entirely out of sight when the escape is not in use, thus maintaining the sightly appearance of the building.

A further object of the invention is to provide a series of flexible ladders, a drum for each of the ladder sections on which the same is adapted to be wound, and means for simultaneously permitting of the unwinding of the ladder sections to their operative positions.

A further object of the invention resides in the provision of improved means for automatically locking the free ends of the ladder sections when the same are in their operative positions, whereby swaying of the sections under the weight of persons descending the same is prevented.

A further and more specific object of the invention is to provide a plurality of flexible ladder sections movable by gravity to their operative positions, a drum for each of said sections on which the same is adapted to be wound, means for locking said drums against rotation to hold the ladder sections against gravity movement, and a common releasing element for actuating said locking means whereby the ladder sections simultaneously assume their operative positions upon the building wall.

A final object of the invention is to provide a fire escape of the above type which combines extreme lightness with a maximum of strength and durability, may be manufactured at comparatively small cost, and is small in bulk, thus admitting of their shipment in large quantities at a minimum expense.

With the above and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a building wall provided with my improved fire escape, the flexible ladder sections being shown in their operative positions; Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a similar view on an enlarged scale showing one of the ladder sections in its inoperative position and also illustrating the gravity locking device for the adjacent ladder sections; Fig. 4 is a section taken on the line 4—4 of Fig. 3, a part of the drum and tubular spring shield being shown in elevation; Fig. 5 is an end elevation of the drum and locking means therefor, the end plate of the drum housing or casing being removed; and Fig. 6 is a detail section taken on the line 6—6 of Fig. 4.

Referring in detail to the drawings W indicates the wall of a building and W′ the window frames and sashes arranged therein at each story of the building.

Within the apartments of the building and upon the inner face of the wall thereof above the windows and adjacent to the ceiling a drum case or housing generally designated by the numeral 5 is arranged and secured to the building wall in any preferred manner. This housing includes a body plate 6 forming the top, bottom and front walls thereof and the end plates 7. These end plates are connected by means of the longitudinal rods 8, the ends of which are threaded to receive suitable nuts 9. These threaded ends of the connecting rods may also be disposed through openings in flanges provided upon the end edges of the body wall 6. The building wall W above the window frame is provided with an opening 10 through which a plate 11 extends. This plate may constitute an extension of the body wall 6 of the drum housing or casing, or may comprise a separate element and be suitably secured to the end plates 7 of the housing. The function and purpose of this extension plate 11 will more fully appear from the following description.

A shaft 12 is fixed in the ends 7 of the housing 5 and upon said shaft a drum 13 is mounted to rotate. The heads or ends 14 of this drum are spaced from the end plates 7 by means of the tubular sleeves or washers

15. These drum heads are also provided with inwardly extending tubular sleeves 16 which are concentrically spaced from the shaft 12. Upon the shaft 12 a pair of coiled springs 17 are arranged. These springs are loosely disposed upon said shaft and are spirally coiled in relatively opposite directions. The inner ends of the springs are fixed to the shaft 12 while the outer ends thereof are suitably secured to the ends of the drum. A tubular shield 18 surrounds the shaft and the springs 17 and loosely receives at its ends the inwardly projecting tubular extensions 16 of the drum heads.

The tubular body 19 of the drum 13 is provided at each end and at its center with short longitudinal slots 20 which receive the inner ends of the flexible ladder chains 21, said chains being provided with loop plates or stirrups 22 which are engaged upon the spring shield 18. The ladder chains 21 are of the ordinary link form and the rounds 23 of the ladder are secured at their ends to the outer chains 21, said rounds extending through the links of the intermediate ladder chain. These flexible chains are disposed through the opening 10 in the building wall for sliding movement over the plate 11 above referred to, and the outer or free end of the ladder section is provided with weights 24. The ladder section is supported in spaced relation to the outer face of the building wall by means of the rollers 25 arranged upon a rod 26 mounted in the outer ends of suitable bracket arms 27 fixed to the face of the wall. The chains 21 after passing through the opening 10 of the wall move over these rollers, the weighted end of the ladder sections causing the same to descend and hang vertically from the rod 26.

The flexible ladder sections are held against gravity movement and with their weighted ends disposed adjacent to the rods 26 by means of a locking device whereby rotation of the drums 13 is prevented. To this end, a ratchet 28 is secured to the reduced end 13′ of the drum and with the teeth of said ratchet a locking dog or pawl 29 coöperates. This locking dog is pivotally mounted upon a stud 30 which is movable in a short slot 31 provided in the end plates 7 of the drum housing. A wing nut 32 is threaded upon the outer end of said stud whereby the dog 29 may be raised out of engagement with the ratchet teeth 28 so that the latter sections can be independently wound upon their respective drums. The pawl 29 also includes an angular arm 33 which is pivotally connected by means of a link 34 to a block 35 fixed upon a pull rod 36. This pull rod extends the entire height of the building wall and may be incased in a glass tube extending through each of the apartments of the building and secured to the wall thereof so that said rod cannot be accidentally pulled or tampered with. This rod is movable through suitable guide lugs 37 which are secured to the end plates 7 of the drum housing and upon said rod at each of the drums a coiled spring 38 is arranged, said spring bearing at one of its ends against the lug 37 and at its other end against a nut 39 threaded upon the rod. By adjusting this nut, it will be readily seen that the tension of the spring 38 can be regulated as desired in order to support the weight of the pawl 29 and elements connecting the same to the pull rod and normally retain said pawl in engagement with the teeth of the ratchet 28.

It is desirable in fire escapes wherein flexible ladders are employed to provide means for holding the ladder sections against swaying movement under the weight of a person descending the same and for this purpose I have provided the gravity locking members 40 which are arranged above the guide rods 26 for the ladder sections at each story of the building. These locking members include the rods 41 which are provided with hooks 42 on one of their ends and weights 43 on the other ends thereof. A pair of such locking members are arranged above each window of the building and are pivotally mounted adjacent to their hooked ends 42 upon the brackets 44 secured to the face of the building wall. The normal positions of these locking members is shown in Fig. 3. When the upper ladder section descends, the weighted lower end thereof strikes the hooked ends 42 of the locking members 41 and moves the same from the positions shown in Fig. 3 to the position shown in Fig. 2 wherein the weighted ends 43 of said locking members are disposed adjacent to the building wall and below the brackets 44, the hooked ends of said members being engaged over the extended ends of the lower round of the ladder section to which the weights 24 are attached. The locking members retain the end of the ladder in the loops 44′ of the brackets and in engagement with the shoulders 44ª formed thereon. Suitable supporting arms 45 are formed integral with the brackets 44 and are provided with stop lugs 46 on their outer ends with which the weighted arms 41 engage, said lugs limiting the outward movement of the locking members and maintaining the same in the raised position shown in Fig. 3.

From the foregoing the construction and manner of operation of my improved fire escape will be clearly understood. Should a fire originate in any apartment of the building through which the pull rod 36 extends, the glass case in which said rod is arranged is broken and the rod pulled or forced downwardly against the tension of the springs 38 whereby the locking dogs 29

are lifted from engagement with the ratchets 28 on the end of each of the winding drums 13 so that the ladder sections may descend by gravity and hang vertically in spaced relation to the outer face of the building wall, said sections hanging in front of the windows of the several apartments. As above explained, when the lower weighted ends of the latter sections engage the locking devices they are automatically locked upon the brackets 44 and held against swaying movement. In this manner, it will be seen that the pull upon the common release rod 36 by a person in any one of the apartments will simultaneously release all of the ladder sections so that they form what is practically a continuous vertical ladder upon the face of the building wall. Each of the sections is capable of sustaining the weight of several persons so that the occupants of the apartments may very quickly effect their escape. In the descent of the ladder sections, the drums 13 are rotated to unwind the ladder chains 21 therefrom, and in this rotation of the drum the coiled springs 17 upon the shafts 12 are closely wound and placed under tension, the weights 24 of course being sufficiently heavy to cause the complete unwinding of the chains from the drum so that the lower ends of the ladder sections are engaged and held by the locking members 41. When it is desired to replace the ladder sections within the housings 5, they are simply pulled upwardly to disengage their lower ends from the locking devices whereupon the uncoiling of the springs 17 effects the reverse rotation of the drums to wind the chains 21 thereon, it being understood that the locking dogs 29 have first been disengaged from the ratchets 28 by moving the pivot stud 30 thereof in the slot 31 of the end wall of the housing and tightening the wing nut 32. When in their inoperative positions, the outer weighted ends of the ladder sections are disposed closely adjacent to the guide rods 26 and said ladder sections practically entirely disposed inside of the building within the housings 5. The sightly appearance of the face of the building wall is thus in no wise detracted from by the provision of my improved fire escape. The walls of the casing or housing 5 may be suitably ornamented if desired so that the same will present an ornamental appearance.

Owing to the comparatively few elements employed in the construction of the invention, it will be obvious that the same is extremely light, may be easily and quickly installed at small expense and is highly durable and efficient in practical use. My improved fire escape may be utilized by the fireman in ascending to the various apartments of the building as well as by the occupants thereof in descending to the street. While I have shown and described the preferred construction and arrangement of the various elements, it will be obvious that the invention is susceptible of considerable modification without departing from the essential feature or sacrificing any of the advantages thereof.

Having thus described the invention what is claimed is:—

1. In a fire escape, the combination with a flexible ladder mounted at one of its ends upon a building wall, of means mounted upon the face of the building wall to automatically engage and lock said ladder in its operative position to hold the same against excessive swaying movement under the weight of a person descending the same.

2. In a fire escape, the combination with a flexible ladder mounted at one of its ends upon a building wall, of brackets secured to the face of the building wall and provided with hooks to receive the other end of the ladder when the same is in its operative position, and means mounted upon said brackets adapted to be engaged by the ladder and moved into locking engagement therewith to hold the ladder against excessive swaying movement under the weight of a person descending the same.

3. In a fire escape, the combination with a flexible ladder mounted at one of its ends upon a building wall, of brackets secured to the face of the building wall and provided with hooks to receive the ladder rung at the free end thereof, and gravity movable locking elements pivotally mounted upon said hooks and adapted to be engaged by the ladder rung in the movement of the ladder to its operative position whereby said elements are positioned upon the hooks to lock the ladder rung in said hooks and prevent excessive swaying movement of the ladder under the weight of a person descending the same.

4. In a fire escape, a plurality of flexible ladder sections, a drum for each of said ladder sections arranged within the apartments of a building, said ladder sections being movable by gravity to their operative positions, means associated with each of the drums to lock the same against rotation and hold the ladder sections against such gravity movement, a common releasing element for actuating the locking means of said drums whereby the ladder sections may simultaneously move to their operative positions upon the face of the building wall, and movable locking elements arranged upon the face of the building wall to be engaged and actuated by the ladder sections in their descent to hold said sections against abnormal swaying movement, under the weight of a person descending the same.

5. In a fire escape, a plurality of flexible ladder sections, arranged upon the wall of a building, a drum upon which each of said

sections is adapted to be wound, said sections being movable by gravity to their operative positions, and a plurality of gravity movable locking elements adapted to be engaged and actuated by the free ends of the ladder sections at the end of their movement to cause said elements to engage the ladder sections and hold the same against abnormal swaying movement under the weight of a person descending the same.

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

JOHN J. DAWSON.

Witnesses:
G. G. LEE,
LAURA P. PAGE.