A. WICHERTJES.

FIRE ESCAPE.

APPLICATION FILED SEPT. 23, 1912.

1,078,759.

Patented Nov. 18, 1913.

4 SHEETS—SHEET 1.

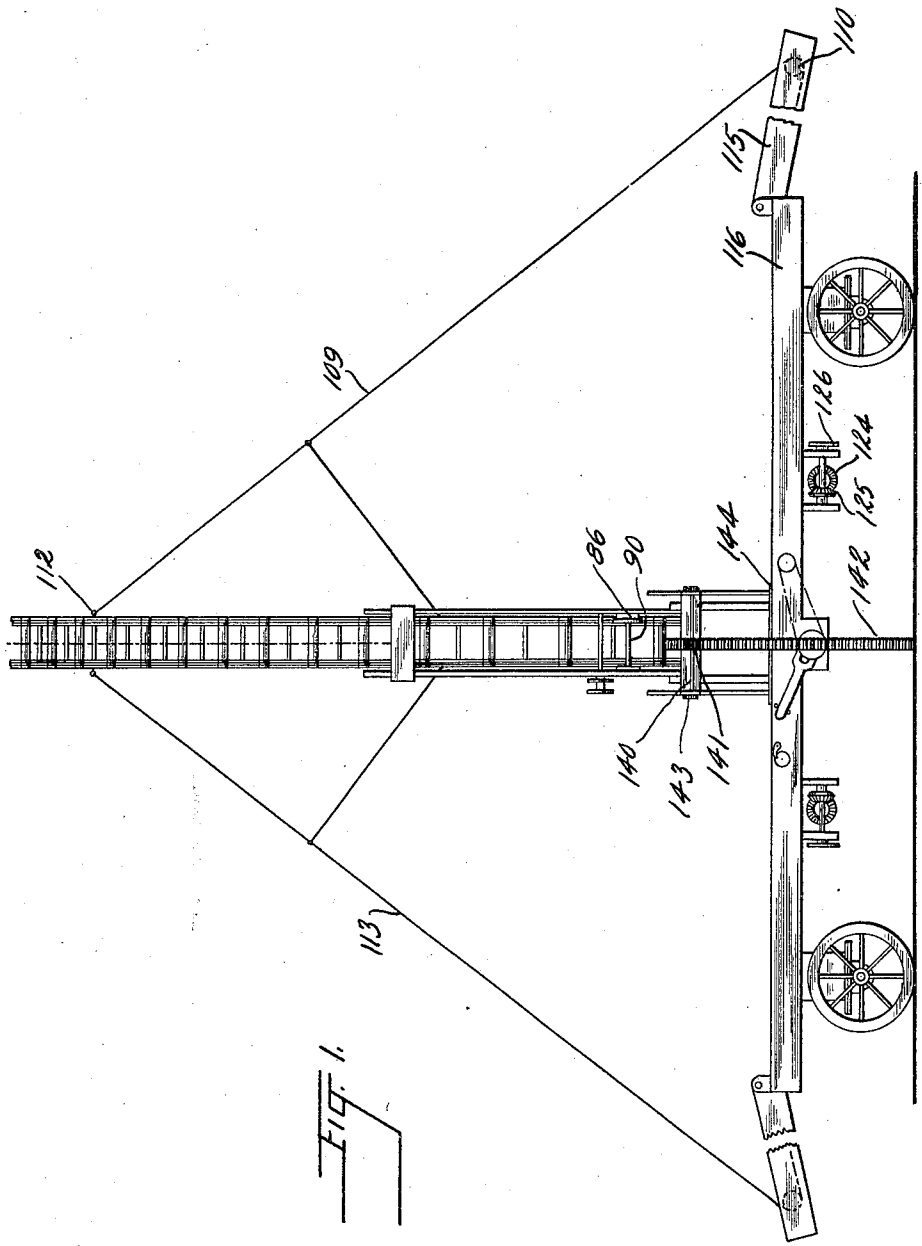


FIG. 1.

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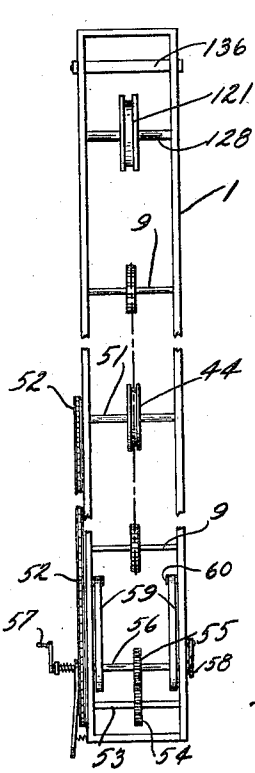


Fig. 3.

Fig. 2.

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Fig. 5.

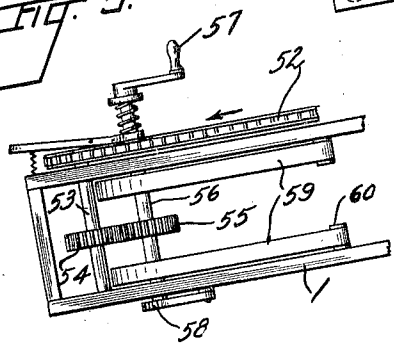


Fig. 6.

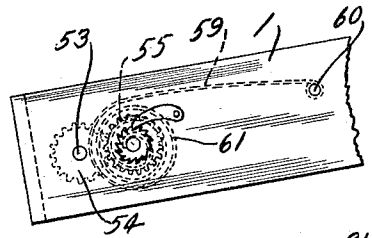
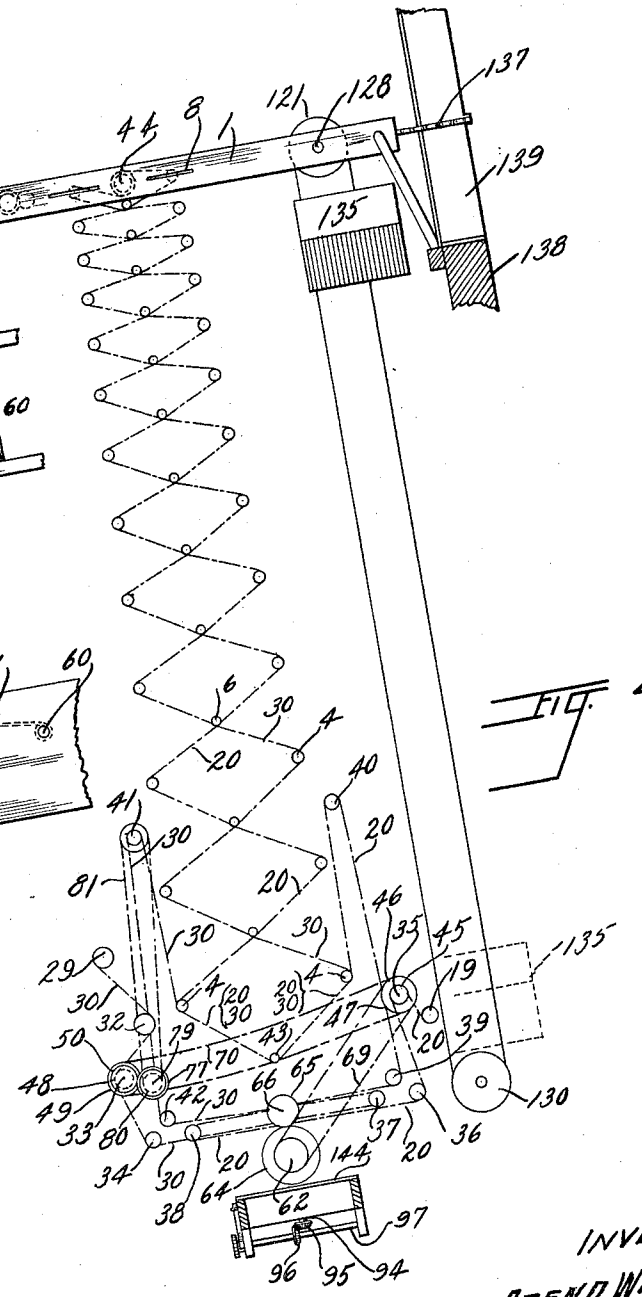


Fig. 4



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4 SHEETS—SHEET 4.

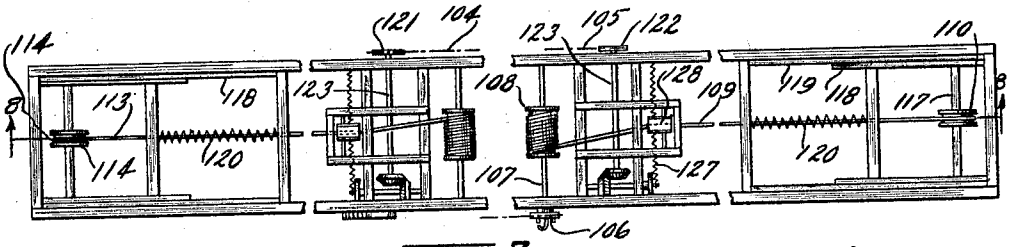


FIG. 7.

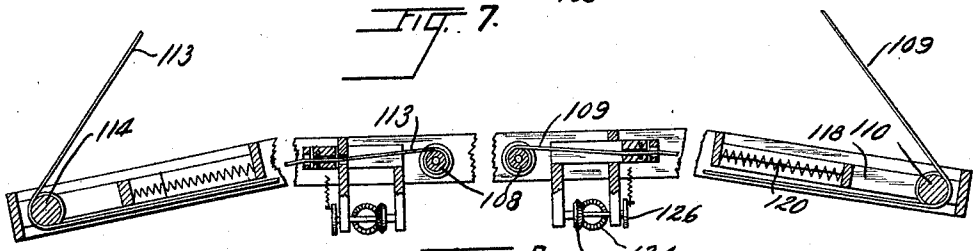


FIG. 8.

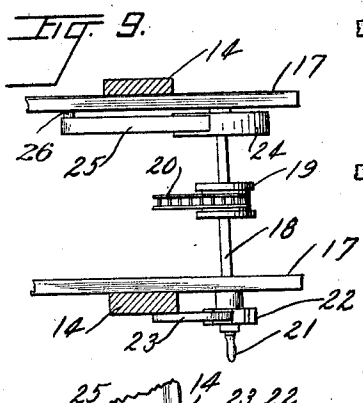


FIG. 9.

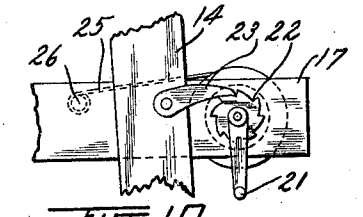


FIG. 10.

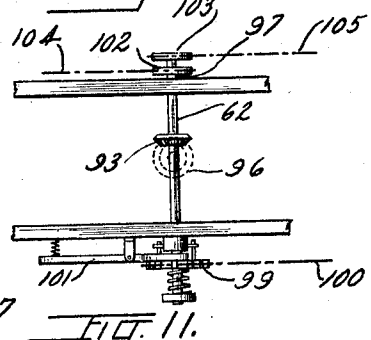


FIG. 11.

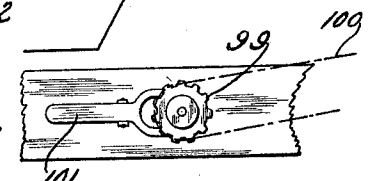


FIG. 12.

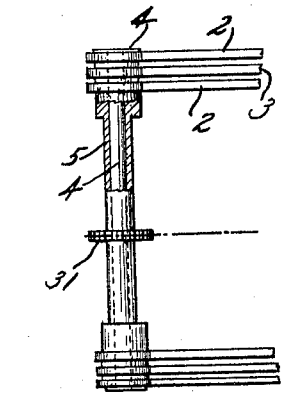


FIG. 13.

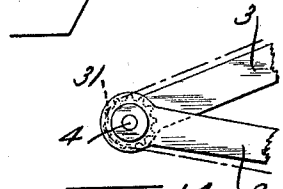


FIG. 14.

WITNESSES:

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AREND WICHERTJES, OF CHICAGO, ILLINOIS.

FIRE-ESCAPE.

1,078,759. Specification of Letters Patent. Patented Nov. 18, 1913.

Application filed September 23, 1912. Serial No. 721,996.

To all whom it may concern:

Be it known that I, AREND WICHERTJES, a subject of the Queen of the Netherlands, and a resident of Chicago, Illinois, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

The essential object of this invention is to provide a fire escape of that type which can be carried upon a wagon or truck and which can be extended so as to reach the upper stories of a building which may be on fire, and thus afford a means of escape to the occupants of such a building.

In the drawings, Figure 1 is an elevation of the invention in extended position and mounted upon the truck or wagon; Fig. 2 is a view taken at right angles to Fig. 1 though showing the truck in the same position as depicted in Fig. 1; Fig. 3 is a top plan view of the upwardly extending section of the device; Fig. 4 is a side elevation showing the chains and other appliances for extending the extensible portion in dotted lines; Fig. 5 is an enlarged detailed view of the parts shown at the bottom of Fig. 3; Fig. 6 is an enlarged detail of the clutch or locking devices shown in Fig. 5 and taken at right angles to said Fig. 5; Fig. 7 is a view looking downwardly from the line 7—7, Fig. 2; Fig. 8 is a longitudinal section on the line 8—8, Fig. 7; Fig. 9 is a detailed view of one of the members over which the chain for extending the extensible portion passes; Fig. 10 is a view taken at right angles to Fig. 9; Fig. 11 is a view similar to Fig. 7 showing the parts which are placed in the broken-away section of Fig. 7; Fig. 12 is a view taken at right angles to Fig. 10; Fig. 13 is an enlarged detailed view which is typical of any of the end joints of the extensible members; and Fig. 14 is a view taken at right angles to Fig. 13.

The extensible member carries the platform 1 which is adapted to be raised or lowered as desired. Said extensible member comprises a plurality of double links 2 (see Fig. 13) and single links 3, all of these links being pivoted upon a shaft 4. Said shaft 4 is encircled by the collar or sleeve 5, Fig. 13. The members 2 and 3 are also each connected to pivots 6 (Fig. 2), and it is obvious, therefore, that if the lower ends of the lowest links 2 and 3 be pulled together, the whole member comprised of arms or links 2 and 3 and pivot members 4 and 6 will expand or be extended and the platform 1 which is carried at the upper end will be elevated. In other words, to pull the lower ends of the lowest links or the rods 7 which cross connect said lower ends together will elevate the platform 1; whereas, to permit the members 7 to recede from each other will lower the platform 1.

As best shown in Figs. 2 and 4, the sides of the platform 1 are slotted at 8 and rods 9, which are carried upon the topmost arms of the extensible member, pass through said slots. As the extensible member is extended, the rods 9 will approach each other, but as said member is permitted to collapse and the platform 1 to lower, the rods 9 are spread apart from each other.

In a simple device of light weight construction it would be entirely feasible to elevate the platform simply by pulling the rods 7 toward each other, but in actual practice with a full sized machine, merely to pull said members 7 together would simply break or bend said members and would not elevate the members 2 and 3, it being obvious from the detailed description that the members 2 and 3 merely comprise a huge lazy-tongs.

As best shown in Figs. 1 and 13 there are two links 2 and one link 3 on each side of the machine, and the lower ends of the lowermost links are connected together by rods 7, Fig. 2. Said rods 7 move back and forth in slots 12 on sides 13. In lieu of slots 12 guideways may be provided upon the inner sides of the members 13. As the rods 7 are pulled toward each other by means hereinafter more particularly described, the platform 1 at the top of the lazy-tongs is elevated. The frame-work members 14 and 15, Fig. 2, are secured to the sides 13 and members 13, 14, and 15 together with the top 16 comprise a substantially rectangular frame, the members of which are rigidly bolted or united together. But one such frame is visible in Fig. 2 although it will appear from Fig. 1 that there is a rectangular frame upon each side of the device.

The members 14 support a pair of arms 17, Fig. 9, and in said arms 17 a shaft 18 is journaled, which shaft 18 carries a drum 19 to which one end of the chain 20 is secured. Said shaft 18 is provided with a crank 21 and carries a ratchet 22 controlled

by a pawl 23. The shaft 18 also bears a housing 24 and the spring 25 has one end secured to the shaft 18 within the housing and the other to a pin 26 upon the bracket 17, the foregoing construction being best shown in Figs. 2, 9 and 10. A somewhat similar construction is to be found supported from the frame members 15, the brackets 27 on the left-hand side of Fig. 2 being adapted to support a shaft 28 which bears a drum 29 to which one end of the chain 30 is secured. Each sleeve 5 (Fig. 13) carries a sprocket wheel 31 over which the chains 20 and 30 are adapted to pass, and each of the pivot members 6 may be provided with a sleeve upon the under surface of which the chains ride. Below the shaft 28 and journaled in the frame members 15 are shafts 32, 33, and 34 (see Fig. 2) each carrying sprocket wheels or pulleys over which the chain 30 is adapted to pass. Upon the other side of the frame are shafts 35 and 36 carrying similar wheels over which chain 20 rides. The right-hand rod 7 carries a roller 37 and the left-hand rod 7 carries a roller 38. The frame 14 carries, in addition to the other shafts journaled therein, shafts 39 and 40, and the frame 15 supports shafts 41 and 42, it being understood that all of said shafts carry suitable sprocket wheels to accommodate the chains. That rod 6 which is lowermost in the series is, for convenience, given the specific reference numeral 43 (Fig. 4) though it should be understood that 43 does not distinguish in construction from any of the other pivots 6.

Upon the platform 1 is the pulley 44 to which the upper ends of the chains 20 and 30 are firmly secured. It has been stated before that one end of chain 30 is secured to the drum 29, and said chain 30 passes, successively, over the shafts 32, 33, 34, 37, 42, and 41, thence under the lowermost pivot 4 upon the left-hand side, thence under the pivot 43, thence around the lowermost pivot 4 on the right-hand side; after which the chain 30 passes under each member 6, over each even-numbered pivot on the left-hand and each odd-numbered pivot on the right-hand side, and so on from side to side as shown in the diagrammatic view Fig. 4. Chain 20 starts from drum 19, the position of which is indicated on the right-hand side, Fig. 4, and thence passes, successively, over shafts 35, 36, 38, 39, and 40, thence over the lowermost member 4 on the right-hand side, under the member 43, over the lowermost member 4 on the left-hand side, and thence beneath each member 6 and over each alternate member 4.

Upon the shaft 35 three sprocket wheels are secured. Wheel 45 is fixed upon the shaft in the space between the sides 1 and 2, said sprocket being indicated only in a conventional manner in Fig. 4, and outside of the frame 14 are the two sprocket wheels 46 and 47. At the opposite end of the machine the shaft 33 is also provided with three toothed wheels, sprocket 48 being at the middle of the shaft and sprocket 49 and gear 50 outside of the frame. The chain 20 travels over the sprocket 45 and the chain 30 travels over the sprocket 48; hence it will be obvious that if the shafts bearing said sprocket are caused to rotate, the chains 20 and 30 will be actuated, and if the direction of revolution of the shafts 33 and 35 be clockwise, both of the chains 20 and 30 will be wound upon their respective drums 19 and 29.

As hereinbefore stated, the top frame or platform 1 bears the double drum 44, Fig. 3, and to said drum 44 the upper ends of both chains 20 and 30 are secured. Drum 44 is mounted upon a shaft 51 which bears a sprocket wheel at its outer end, over which sprocket the chain 52 passes (see Figs. 3 and 5). The chain 52 passes over a sprocket on the outer end of shaft 53, which shaft carries the gear 54, and gear 54 in turn meshes with and drives the gear 55 upon the shaft 56, which shaft also bears the crank 57 and the ratchet 58. Springs 59 each have one end secured to a pin 60 and the other end to a wheel or drum 61 upon the shaft 56 Fig. 6. Springs 59 communicate their action through the shafts and chains best shown in Figs. 3 and 5 to the drum 44, and the action of these members is normally to cause the chains 20 and 30 to be wound as tightly as possible upon said drum. The drum 44 in other words acts as a spring take-up for both of the chains, although the springs 59 will permit the drum to have a slight rotation against the resistance of these springs and thus prevent undue strain upon the apparatus, the general effect will be to keep the chains 20 and 30 pulled as tightly as possible upon the drum 44, and although it is not absolutely correct to say that the chains 20 and 30 are rigidly secured to the platform 1, yet the springs are secured so well that their respective upper ends can not pull loose.

The shaft 62 which is journaled in the side members 13 carries sprocket 63 and gear 64. Said gear meshes with and is driven by the gear 65 which is upon the same shaft 66 as the ratchet 67 which is locked by the dog 68 (see Figs. 2 and 4). A chain 69 passes over the sprocket wheel 63 upon the shaft 62 and also over the sprocket wheel 47 upon the shaft 35, and thus if power be applied in any suitable manner to the shaft 66 it is obvious that the rotation of said shaft will be transmitted into rotation of the shaft 35, the transmission means being obviously the gears 65 and 64, the shaft 62, chain 69, and the sprocket 47. Another sprocket wheel 70 passes over the sprocket 46 upon the shaft 35 and also over the

sprocket 49 upon the shaft 33, and the revolution of the shaft 66 is likewise translated into revolution of the shaft 33. It follows, therefore, that since the revolution of shafts 33 and 35 will cause a pull upon the chains 20 and 30, that when power is applied to the shaft 66 said chains are, respectively, caused to wind upon the drums 19 and 29, and as the chains 20 and 30 are so wound, they will pull upon the lazy-tongs, and by pulling each member 4 toward the one which is in the same plane, will cause the lazy-tongs to be extended and the platform 1 to be elevated. The various pawl and ratchet devices 22, 23, and 27 will lock the drums 19 and 29 against retrograde rotation, and as fast as the chains 20 and 30 are fed to their respective drums, the springs 25 and their companion springs which are provided for the drum 29, will wind up the chains upon the drums. The lazy-tongs, therefore, when once extended and the platform 1 raised cannot contract until the operator loosens the pawls and ratchets which lock the shafts carrying the drums 19 and 29. The crank 21 (Figs. 9 and 10) can be grasped by the operator after the pawls are loosened and the lazy-tongs when once extended permitted to return slowly to normal position, the speed of return being controlled by the operator who grasps the crank 21.

Since it might result in undue stress and strain upon the lazy-tongs to rely upon the chains 20 and 30 alone for extending the device and elevating the platform, the auxiliary elevating device (best shown in Fig. 2) is provided. To the members 15, the lever 75 is pivoted or fulcrumed at 76, which lever carries a gear 77 at one end and a ratchet 78 at the other. When the parts are in the position shown in Fig. 2, the gear 77 will mesh with and be driven by the gear 50 on the shaft 33. The shaft 79, which carries the gear 77 also carries a sprocket 80. A chain 81 passes over said sprocket 80 and over a sprocket wheel 82 upon the shaft 83. A rope or cable 84, which passes over a pulley 85 carried upon the side of the member 16, is attached to a block 86 which moves vertically in the guideways 87. There are two such blocks 86, one on each side of the machine, and they are connected together by a rod 90, which rod 90 is adapted to press upon the lowermost links 2 and 3 of the lazy-tongs at the point where said links cross. The parts being in the position shown in Fig. 2, the rotation of the shaft 66 is, as will be evident, translated into upward movement of the blocks 86, and in this way the lazytongs is given a start when it is first desired to elevate the platform. After the platform has begun to move upwardly the lever 75 can be thrown or moved in a counter-clockwise direction, Fig. 2, thus carrying the gear on the end of the lever out of mesh with the pinion or gear which drive it, and stopping further upward movement of the blocks 86. In other words, the lever 75 and connected parts are permitted to remain in the position depicted in Fig. 2 until it has become evident that platform 1 is fairly started on its upward movement and then at any convenient time before the block 86 has moved to the extreme upward limit of its travel, the lever 75 can be shifted and the blocks 86 will drop to starting position by gravity.

The shaft 62 (see Fig. 11) carries a miter gear 93, and this gear 93 meshes with and drives a miter gear upon the upper end of the shaft 94, Fig. 4. At its lower end shaft 94 carries miter gear 95 which meshes with and drives a miter gear 96 upon the shaft 97. At one end shaft 97 carries a sprocket 99 over which the chain 100 passes, and the spring-controlled clutch 101 (Figs. 11 and 12) presses against said sprocket wheel 99 and prevents the same from rotating too quickly. At its opposite end the shaft 97 carries the two sprockets 102 and 103, over which pass, respectively, the chains 104 and 105. The chain 100 passes over a sprocket 106 upon the shaft 107 (Figs. 1 and 8) and said shaft carries a drum 108 over which the cable or rope 109 is wound. Said cable or rope passes beneath the pulley 110 and is secured to the extensible lazy-tongs adjacent its top at 112. A similar rope or cable 113 is provided for the opposite side of the machine. The size of the parts and their arrangement is such that as the platform 1 moves upwardly the ropes 109 and 113 will unroll from their respective drums, and when the platform descends, said ropes will be rewound upon the drums. The function of said ropes is to hold the lazy-tongs, when in elevated position, from bending or swaying and thus keep same from toppling over. The pulleys 110 and 114 are carried upon members 115 which are pivoted to and which extend from the main body 116 of the truck. When the apparatus is not in use the members 115 can be folded upon the bed 116, and the storage space necessary to accommodate the entire vehicle thus somewhat reduced. Said pulleys 110 and 114 are carried upon shafts 117 which are mounted upon blocks 118, which slide in guideways 119 against the resistance of springs 120, and the springs 120, therefore, permit the ropes 109 and 113 a slight amount of play.

The chains 104 and 105, respectively, drive sprockets 121 and 122 (see Fig. 7) which are upon shafts 123. The shafts 123 carry beveled gears 124 which mesh with and drive beveled gears 125 on shaft 126. Arms 127 extend from shaft 126 to the boxes 128 through which the ropes 109 and 113 pass, and said boxes 128 are reciprocated

in a horizontal plane (*i. e.*, from top to bottom in Fig. 7) and this cause the ropes 109 and 113 to wind evenly upon their respective drums.

The framework of the members 13, 14, 15, and 16, which supports the extensible lazy-tongs, is adapted to be rotated in the manner of a turn-table upon the bed 116 of the vehicle, and the lazy-tongs may readily be turned from the position shown in Fig. 2 to that depicted in Fig. 1, in order to accommodate the device to the various positions in connection with which it may happen to be used.

The platform 1 bears a shaft 128 over which the pulley or sheave 129 passes. A similar sheave 130 is carried in a pair of supports 121 which project outwardly from the frames 13 (see Fig. 2). Said sheave 130 is adapted to be rotated by the crank 132 which is provided with a gear 133 which meshes with and drives a gear secured upon the same shaft as the sheave 130. A belt or rope 134 passes over the sheaves 121 and 130 and to this rope the car 135 is secured, said car being adapted to be elevated or lowered in accordance with the turning of the crank 132. The platform 1 carries a pivoted brace 136 and a chain 137 by which the device may be anchored to the burning building 138 in connection with which the apparatus is to be used, and people from the building may step from the window 139 into the car, from whence they can be lowered to the ground or may climb upon the platform 1 and from thence descend to the ground in any convenient manner.

The members 131 support a shaft 140 which bears a toothed wheel 141 coöperating with the rack-bar 142, Figs. 1 and 2, the shaft 140 being provided with a ratchet 143 at its left-hand end, Fig. 1. By turning the crank upon the outer end of the shaft 140, the rack bar 142 can be depressed from the position shown in Fig. 2 to that in which the outer end of the rack bar rests upon the ground, and this steadies the device and keeps the same from vibrating or yielding.

The framework, composed of the parts 13, 14, 15, and 16, is mounted upon a turn table 144, Fig. 2, which turn table rests upon and is supported by the main frame of the truck 116. The extensible lazy-tongs and all other parts which are carried upon the framework may thus be turned to any desired angle upon the truck, it being noted, as hereinabove stated, that the extensible member, as shown in Fig. 1, is at right angles to the position of the same member in Fig. 2, although the truck 116 is in the same position in both of said figures. The shaft 97 passes through the center of the turn-table 144 and provides a sort of an axis or axle so as to cause the turn-table to turn properly.

I claim as my invention:

A fire escape comprising a platform at one end, a base at the other, an extensible lazy tongs composed of a plurality of links each pivoted at its end and at its middle to some other link in the series, a pair of chains each secured at one end to said platform, a pair of drums to which the other ends of said chains are secured, each of said chains being passed successively over the pivot at the lower end of a link, the pivot at the upper end of the same link and the pivot at the upper end of that link next higher in the series than the first-mentioned link, means for operating said drum and thereby extending the lazy tongs, and a spring-actuated take-up coöperating with those ends of said chain secured upon said platform.

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

AREND WICHERTJES.

Witnesses:
LE ROY NELSON,
J. L. FARNUM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."