P. H. SHEA.

FIRE ESCAPE.

APPLICATION FILED JUNE 26, 1914.

Patented Dec. 15, 1914.

1,121,142.

3 SHEETS—SHEET 1.

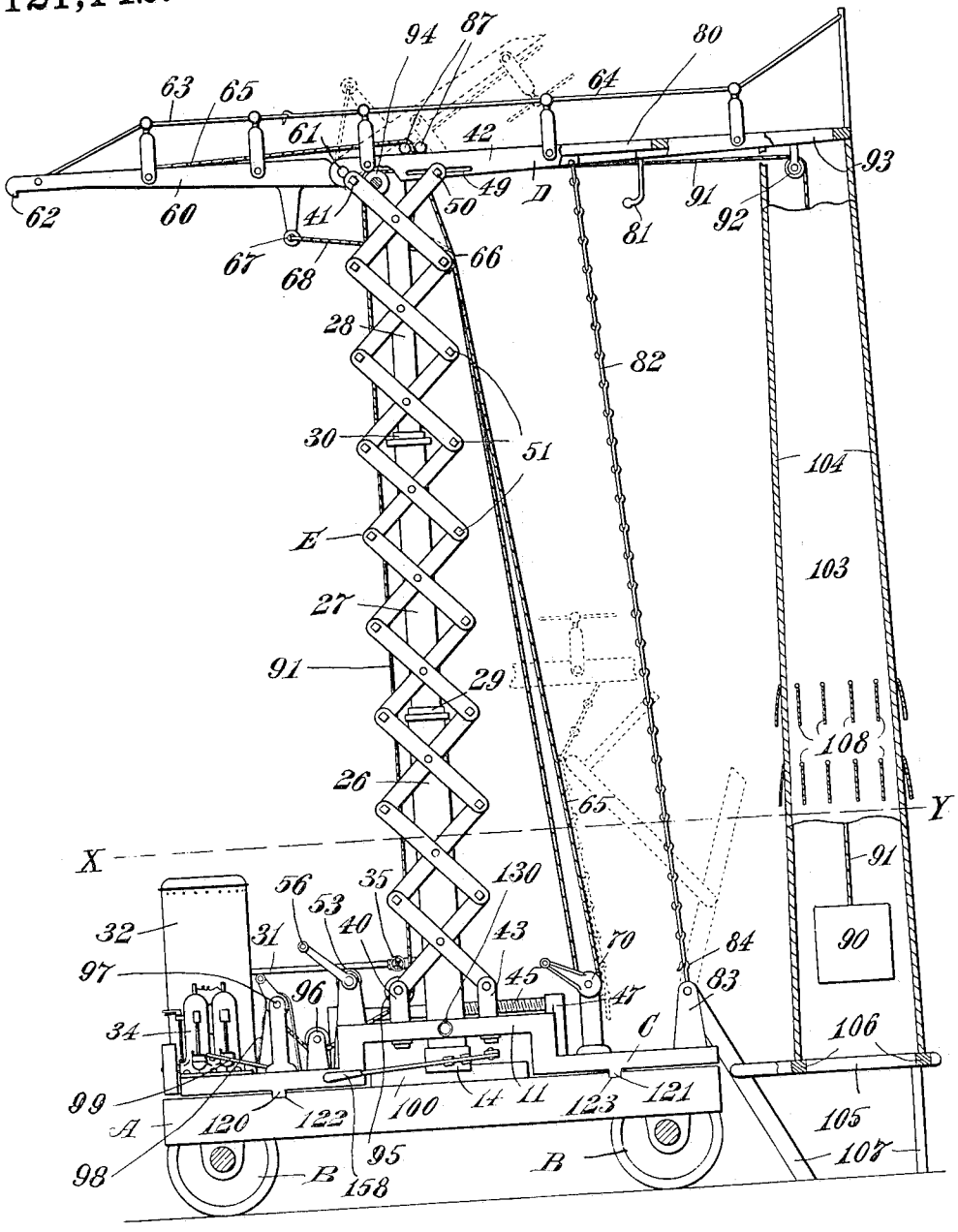


Fig. 1.

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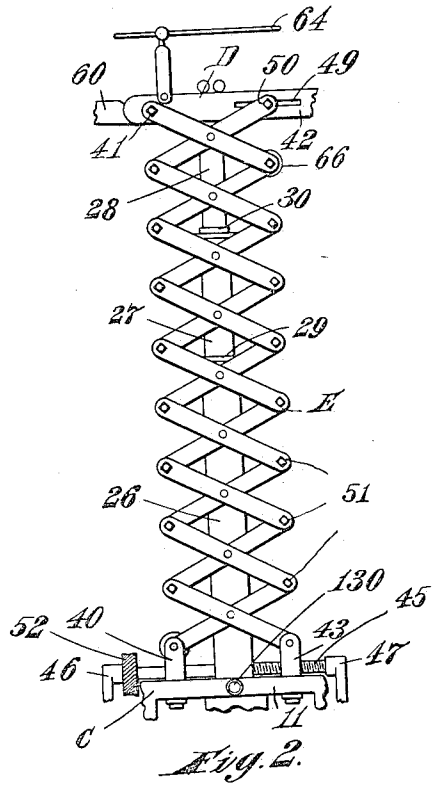


Fig. 2.

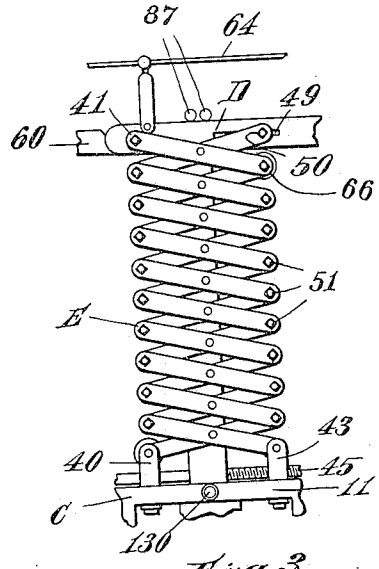


Fig. 3.

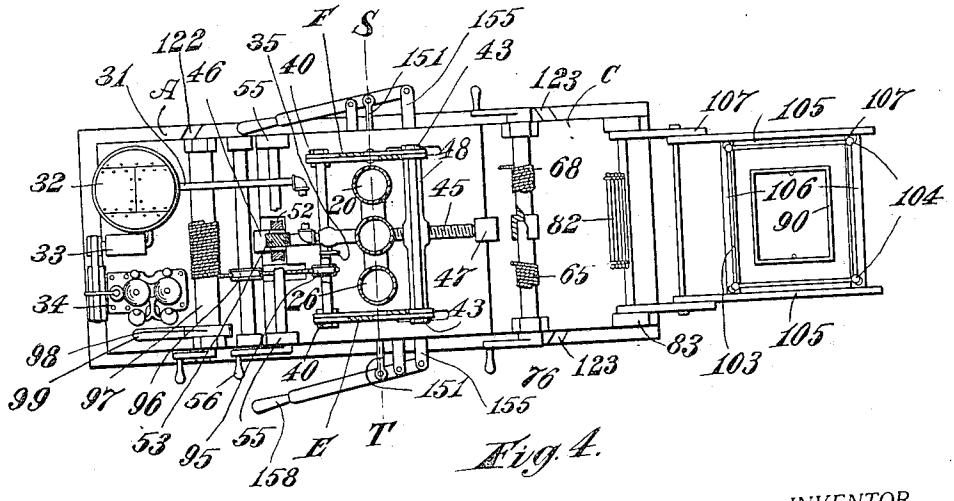


Fig. 4.

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3 SHEETS—SHEET 3.

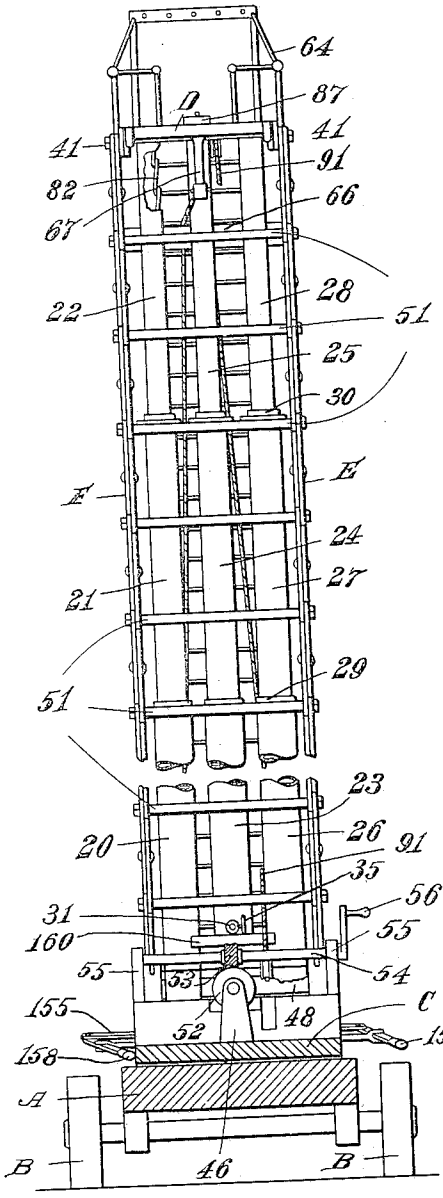


Fig. 5.

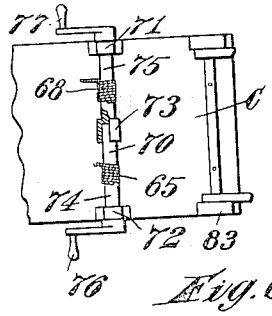


Fig. 6.

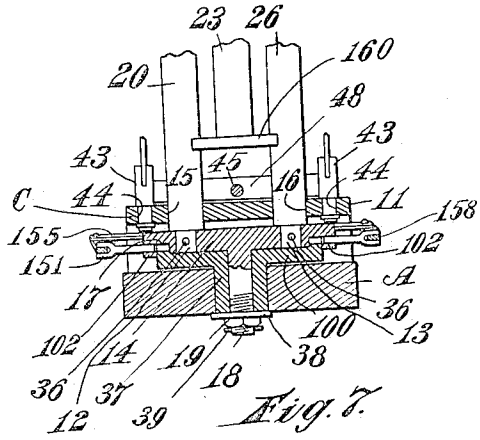


Fig. 7.

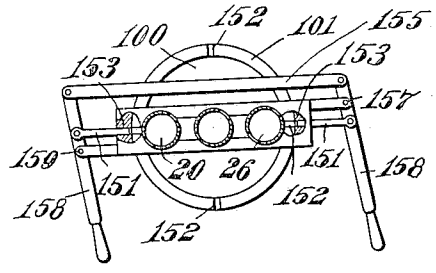


Fig. 8.

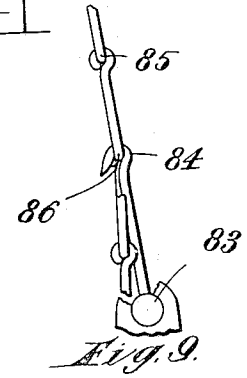


Fig. 9.

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FIRE-ESCAPE.

1,121,142.

Specification of Letters Patent. **Patented Dec. 15, 1914.**

Application filed June 26, 1914. Serial No. 847,449.

To all whom it may concern:

Be it known that I, PATRICK H. SHEA, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

This invention relates to fire escapes and similar devices for rescuing persons or saving property from burning buildings. It belongs to that class of devices which are intended to be transported on a wheeled truck which may be drawn by animals or which may be propelled by its own power. It is of what might be called the collapsible tower type, that is, while being transported through the streets, it is of relatively small height, but it can be rapidly raised to a relatively great height and can be stopped and held at any intermediate point. At the top, it carries a platform with a drawbridge which can be operated from the ground so as to extend from the platform to a window ledge or other part of the burning building. On the end of the platform opposite the drawbridge, I prefer to provide a ladder which extends downward to the truck, and at the same end, I may also provide a hoist. I prefer to inclose this hoist in a flexible chute whereby the occupants will be protected from fire and water while descending or ascending.

The principal feature of my invention is the combination of a series of telescoping tubes, one set of which is pneumatically operated, with a system of lazy tongs, and mechanism whereby the lazy tongs may be extended or retracted and held in any desired position. The pneumatically operated tubes serve the purpose of rapidly and forcibly raising the platform with its attachments, either in direct coöperation with the action of the lazy tongs or, as may occur, against their resistance, until they are gradually released and permitted to extend. If the pneumatic pressure is sufficient or more than sufficient to hold up the platform and whatever it carries, the action of the lazy tongs will be to hold it down, while if the pneumatic pressure alone is not sufficient to hold it up, the action of the lazy tongs will be to assist in holding up the weight. In either event, a large part of the weight is maintained by the tubes and the pneumatic pressure therein while the lazy tongs act more as a regulator for the height and as a stiffener to make the device more rigid.

In the drawings, Figure 1 is a side elevation showing the platform raised to its greatest height. Fig. 2 is a detail side elevation of the telescoping tubes and lazy tongs showing their position when partly raised. Fig. 3 is a detail side elevation showing their position when almost at the lowest point. Fig. 4 is a plan view looking down on the line X—Y of Fig. 1. Fig. 5 is an elevation from the left of the device as shown in Fig. 1 with some parts removed for clearness. Fig. 6 is a detail plan view of one of the windlasses. Fig. 7 is a sectional elevation on line S—T of Fig. 4. Fig. 8 is a detail of the mechanism for locking the revoluble base in position with reference to the truck body. Fig. 9 is a detail of the ladder and adjustable connection with the base.

A represents the body of a truck and B represents the wheels thereof. The base C of my device is pivotally mounted on body A approximately near the center thereof. I prefer to make it of wood strongly braced and put together or of metal and I prefer that the middle portion at 11 should be raised as shown in Fig. 1. Under and across raised portion 11, I place a supporting bar 14 which has a depending stud 18 which extends down through a collar 37 which is integral with a circular base 100 which is fixed to body A and extends downward through body A. Stud 18 is threaded and over it is a washer 38 and upon it is screwed a nut 19 which may be kept from unscrewing by a split pin 39. Circular base 100 has an annular upwardly extending flange 101 which enters grooves 17 in the under part of bar 14. This leaves on bar 14 a downwardly extending grooved flange 102 outside of annular flange 101. The lower larger members 20 and 26 of two sets of telescoping tubes pass downward through suitable holes 15 and 16 in raised portion 11 and preferably are reduced in size at 12 and 13 where they enter suitable holes in bar 14 thus being supported thereon by annular shoulders. Pins 36 which enter 14, 20 and 26 hold these parts together. In this manner, base C carrying tubes 20 and 26 is revoluble on circular base 100.

It may be desirable to have depending curved projections 120 and 121 which engage curved slots 122 and 123 in body A all being curved on a radius which coincides with the pivotal center of bar 14 to assist in guiding and steadying the base C when it is revolved. It is desirable to lock the base C in position at right angles to truck body A or in direction parallel therewith and for this purpose I prefer to use locking bolts 151 which are slidable in opposite radial directions in bar 14 and are adapted to enter any of the four sockets 152 arranged preferably 90 degrees apart in the upwardly extending flange 101 of base 100 through suitable holes 153 in bar 14. These locking bolts 151 are pivoted to hand levers 158 which are pivoted at 157 and 159 extended from bar 14. They are pivotally connected by a connecting rod 155. By means of these hand levers 158, the locking bolts 151 may be released at the same time or caused to engage with any two of the sockets 152 when in the proper position. The device may thus be securely locked either lengthwise or crosswise of the truck body.

The tubes 20 and 26 extend vertically from base C and between them supported by a suitable base bar 160 is a third tube 23. Extending inside of tube 20 are telescoping tubes 21 and 22 and inside of tube 26 are telescoping tubes 27 and 28 while inside of tube 23 are telescoping tubes 24 and 25. The lower members of these three sets of telescoping tubes are fixed while the upper and interior members are slidable with a running fit. The middle set comprising tubes 25, 23, 24 must be air tight. The members of the same size are suitably braced and connected together at 29 and 30 while at the bottom they are held in position by base C and at the top by platform D to the bottom of which top members 22, 25, 28 are fixed. I prefer to use the outside telescopic tubes 20, 21, 22, 26, 27, 28 merely as guides and to use the middle set 23, 24 and 25 for lifting purposes.

Into the bottom member 23 enters a tube 31 which connects with a pressure or storage tank 32 connected with an air pump 33 driven by any suitable motor 34. If convenient, this motor 34 may be the one which produces the power for driving the truck in which case suitable clutches and other connections must be provided. If preferred, the air pump and motor may be dispensed with and the storage tank 32 may be filled at a station as for instance, the engine house. In storage tank connecting tube 31, I place a two way valve 35 by which air may be introduced from the tank 32 into the lifting telescoping tubes or it may be discharged therefrom. This valve has one port which can be turned to connect with the atmosphere from member 23 and another which can be turned to connect directly through pipe 31 with tank 32. At the side of the telescoping tubes, I locate one or preferably two systems of lazy tongs parallel with each other and preferably at right angles to a plane which passes through the three tubes. These lazy tongs E and F are both alike and each is pivoted at the rear and bottom to a fixed support 40 while at the top and rear each is pivoted at 41 to platform D. At the front and top, the forwardly extending members are connected and supported by a connecting rod 50 slidable in horizontal slots 49 through the depending side frame work 42 of the platform D. At the bottom and front each forwardly projecting member is pivoted to a movable member 43 which is slidable in a suitable groove 44 in base C. These front bottom slidable members 43 and 43 are fixed to a brace 48 through which passes a powerful screw 45 supported by bearings 46 and 47. To operate lazy tongs controlling screw 45, I prefer to arrange at one end a gear 52 which engages an appropriate gear 53 carried by a shaft 54 supported by standards 55 and operative by a handle 56. 52 and 53 should be worm gears. The pitch of the thread on screw 45, gear 52 and gear 53 is so small that neither the weight of the platform D, of the lazy tongs and other parts will cause them to reverse nor will the pneumatic pressure used in lifting the parts be sufficient to cause them to act. In this way, I find that no catch or locking mechanism is necessary. By this combination of lifting telescoping tubes and lazy tongs, when it is desired to raise platform D, the two way valve 35 is turned to admit compressed air from tank 32 into tube 23 and handle 56 is turned in the proper direction at the same time. The lifting action thus obtained is much more powerful than would be secured by attempting to extend the lazy tongs merely by bringing together the supports 40 and 43, as, when in the down position, the leverage on the lazy tongs is so small that unless exceedingly heavy, they would be likely to break before the platform could be lifted. With my arrangement, however, the weight is taken up by the lifting tubes and it is merely necessary to turn the handle 56 in such direction as to cause the supports 43, 43 to approach 40, 40 thus permitting the lazy tongs to extend. If it is desired to stop the device at any point such as shown in Fig. 2, it is necessary only to stop turning handle 56. To lower the platform, the valve 35 is turned so as to discharge the air from the lifting tubes rapidly or slowly as desired and the handle 56 is turned in the appropriate direction to permit the lazy tongs to extend or retract. I prefer to connect my parallel sets of lazy tongs by connecting rods 51 which act as pivots for the members thereof.

At one end of my platform D, I prefer to pivot at 61, a drawbridge 60 which preferably has a hook 62 at its lower outer extremity adapted to hook onto a window sill if desired. It preferably has rails 63 which may be of rope properly supported and which, when in the down position, may be an extension of the rails 64 of platform D. This drawbridge may be operated from base C. It may be raised by means of a rope 65 attached to its outer end and passed between two pulleys 87 as shown in Fig. 1. It then passes downward over a roller 66 revoluble on one of the connecting rods 51 between the two sets of lazy tongs and thence to a windlass 70 shown in detail in Fig. 6. To lower the drawbridge, I attach to a standard 67 which extends downward therefrom, a lowering rope 68 which extends also over roller 66 and thence to windlass 70. This windlass 70 is preferably supported by bearings 71 and 72. Through bearing 72 passes a barrel 74 at the outer end of which is handle 76. Its other end enters a hub 73 carried by a barrel 75 which passes through bearing 71 and has a handle 77. It will be seen that as the end of rope 68 is attached to barrel 75, it can be wound up or unwound as desired. The end of rope 65 is attached to barrel 74 and it can therefore be wound up or unwound by turning handle 76. Barrels 74 and 75 support each other but do not interfere in any way.

Through platform D toward the end opposite from draw bridge 60 is a man hole 80 below which I prefer to use a downwardly extending guard member 81 and adjoining which extends a flexible ladder 82 which is preferably made of metal. This ladder extends downward and preferably connects with a standard 83 carried by base C. I prefer also to arrange the length of this ladder so that it will become taut when platform D is at or near the desired height whereby it will act not only as a brace or guy for any weight on drawbridge 60 but will be firm and stiff instead of shaking when persons are descending or ascending. I find it convenient to adjust the length of ladder 82 by using two hooks 84 pivoted to standard 83 as shown in Fig. 9. As will be readily seen, the open hooks 84 can be hooked over any of the rounds as 85 or 86 of the ladder and it may be thereby lengthened or shortened. This permits an adjustment only as small as the distance between the rounds but any slack can be readily taken up by raising or lowering platform D by means of the lifting tubes and lazy tongs. I preferably use also at the outer end of platform D, a hoist which comprises a car 90 supported by a rope 91 which passes over a pulley 92 in proximity to a man hole 93 through platform D. This rope 91 extends therefrom over another pulley 94 thence downward over other pulleys 95 and 96 to a windlass 97 whereby car 90 may be raised or lowered at will. I prefer also to use a foot brake device 98 whereby the descent of the car may be regulated by the foot as well as by the hands, as by a pedal 99. I prefer to have my car 90 travel up and down through a chute of canvas 103. This may be made of fire proof canvas although I find that ordinary canvas is sufficient to protect the occupants from heat and smoke. I prefer to make this chute rectangular with ropes 104 at each corner.

As shown in Fig. 1, the bottom of chute 103 may be attached to members 105 pivoted to standard 83 whereby they can be folded over carrying the chute with them as shown by the dotted lines. As will be seen, all the working parts are carried by the base C so that there is no chance of tangling up the ropes, connections, etc., when the platform is swung into position, as it usually will be at right angles to the roadway. The center of annular flange 101 is also the center of stud 18. Base C may be revolved by hand but I prefer to use two sockets 130 into which suitable turning spokes may be inserted as a matter of convenience. But having three sets of tubes in line, with two sets of lazy tongs at right angles thereto, a well braced or trussed tower is formed which is laterally rigid. Members 105 are preferably connected by cross bars 106 forming a frame through which car 90 can pass. They are preferably steadied or supported when in the down position by legs 107. Several lines of reef-points 108 on chute 103 permit the slack to be gathered in and lashed to frame members 105 and 106 when the platform is to be used at a point below its highest point.

I claim:

1. In a portable fire escape, the combination of pneumatically operative telescopic lifting tubes, means for furnishing pneumatic pressure therefor, a platform carried thereby, lazy tongs attached to the platform in operative relation with the telescopic tubes, and positive means adapted to control the operation of the lifting tubes for extending or retracting the lazy tongs as described.

2. In a portable fire escape, the combination of a base, pneumatically operative telescopic tubes carried at the bottom thereby, a platform attached to the top of said tubes, means for providing pneumatic pressure for said tubes, lazy tongs which extend between the base and platform in operative relation with the telescopic tubes, and a screw in operative relation with the lazy tongs adapted to control the operation of the lifting tubes by extending or retracting the lazy tongs as described.

3. In a portable fire escape, the combination of a base, pneumatically operative tele-

scopic tubes carried at the bottom thereby, a platform attached to the top of said tubes, means for providing pneumatic pressure for said tubes, two systems of lazy tongs parallel with and connected with each other at right angles to the telescopic tubes and extended between the base and platform, and positive means adapted to control the operation of the lifting tubes for extending or retracting the lazy tongs as described.

4. In a portable fire escape, the combination of pneumatically operative telescopic lifting tubes, means for furnishing pneumatic pressure therefor, a platform attached to the top thereof, lazy tongs attached to the platform in operative relation with the telescopic tubes, a base which carries the lower members of the lifting tubes and of the lazy tongs, and a screw which connects the bottom members of the lazy tongs, together with a worm gear carried thereby, and another worm gear operative by a handle in engagement therewith as described.

5. In a portable fire escape, the combination of a truck body having wheels, with a base revoluble thereon, a plurality of sets of pneumatically operative telescopic tubes carried at their bottoms by the base, a platform attached to the top members of said tubes, means for providing pneumatic pressure for said tubes, lazy tongs which extend between the base and platform in operative relation with the telescopic tubes, and positive means adapted to control the operation of the lifting tubes for extending or retracting the lazy tongs as described.

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

PATRICK H. SHEA.

Witnesses:
GARDNER W. PEARSON,
HARRY R. LAWRENCE.