

July 16, 1929.

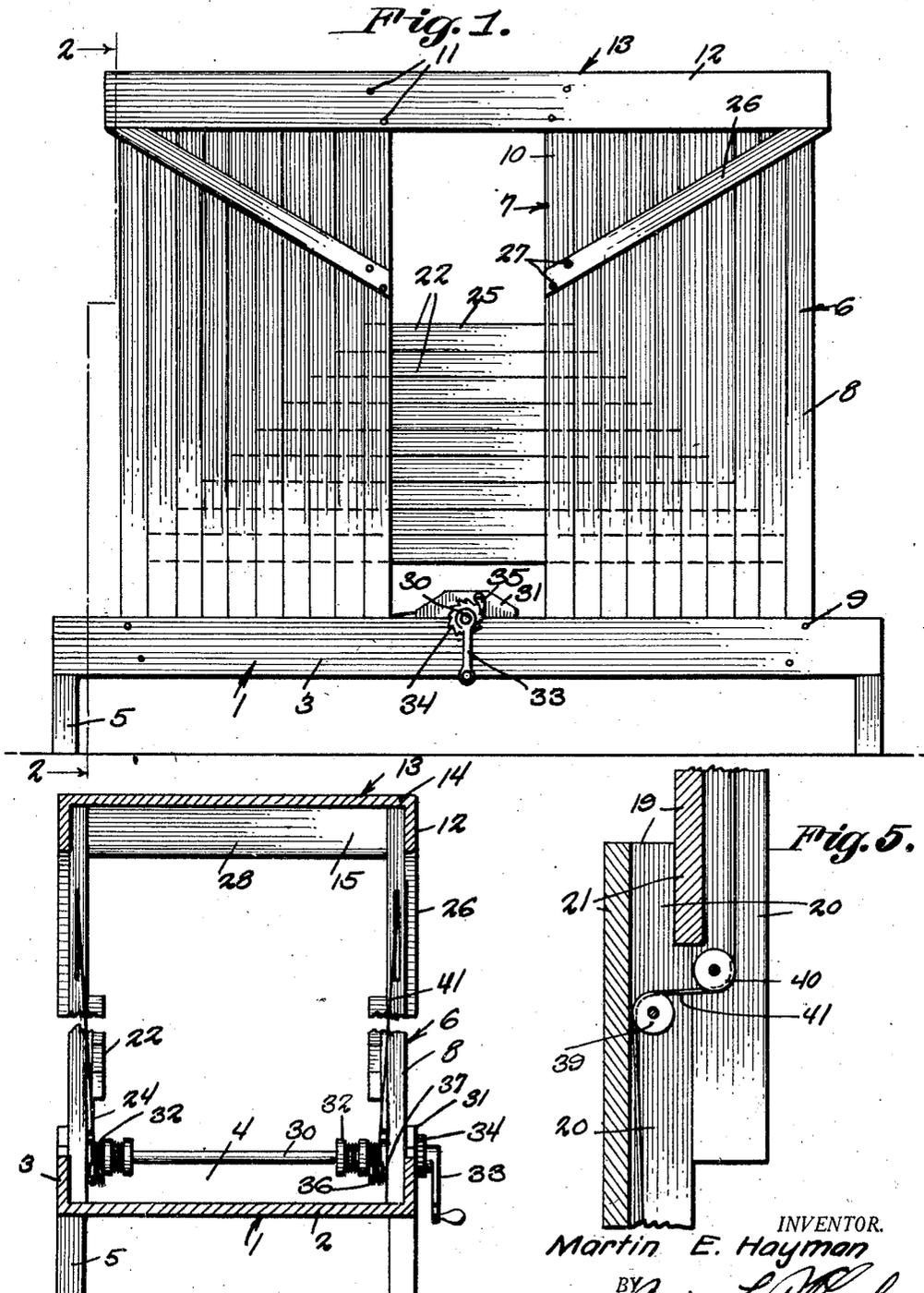
M. E. HAYMAN

1,721,020

PORTABLE ELEVATOR

Filed Dec. 28, 1927

3 Sheets-Sheet 1



Witnesses
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Fig. 2.

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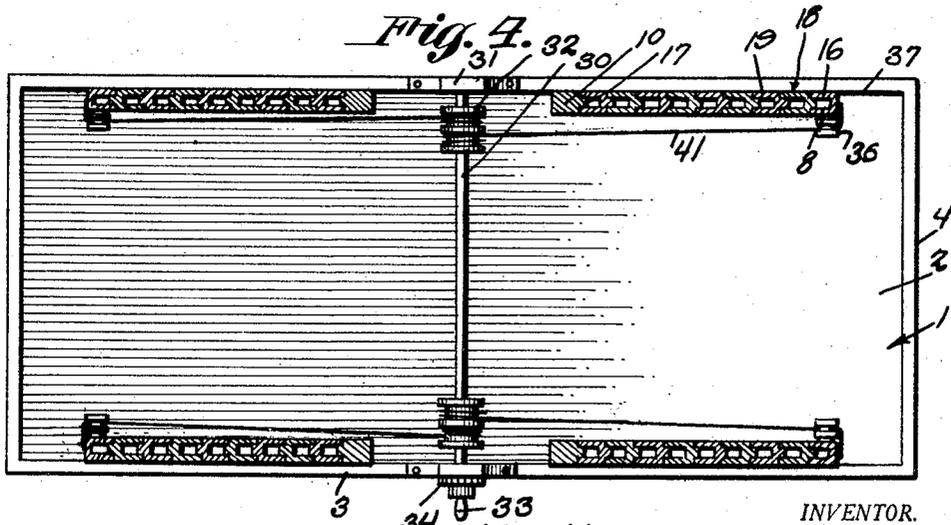
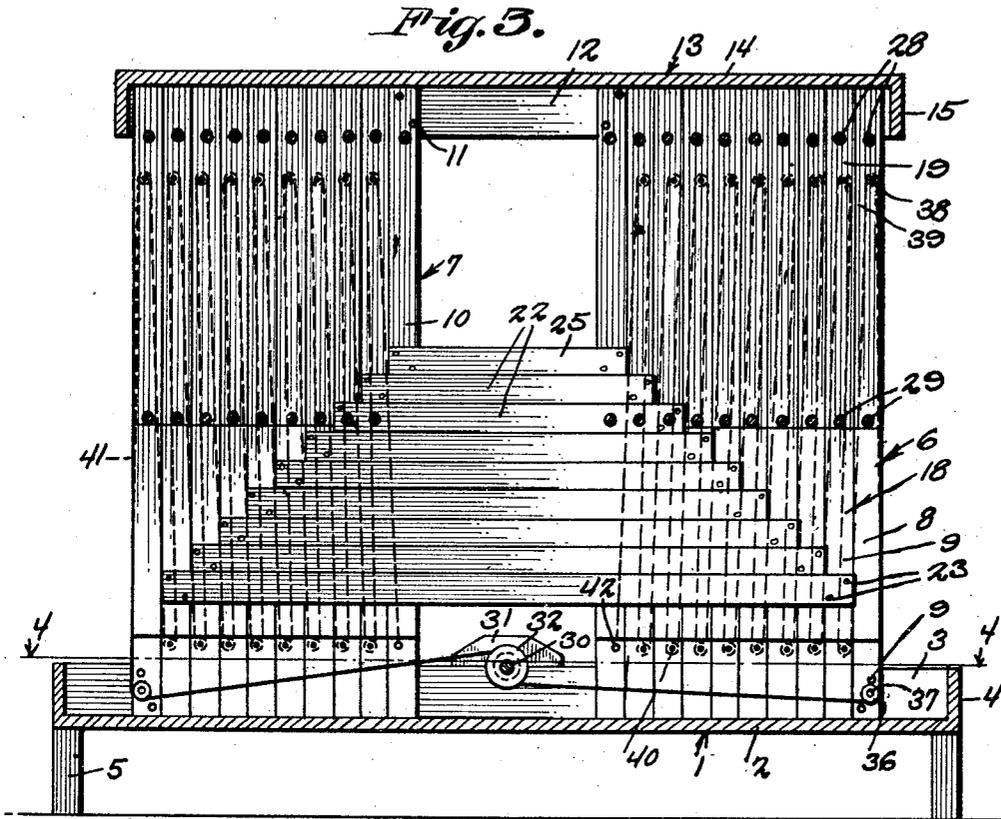
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PORTABLE ELEVATOR

Filed Dec. 28, 1927

3 Sheets-Sheet 2



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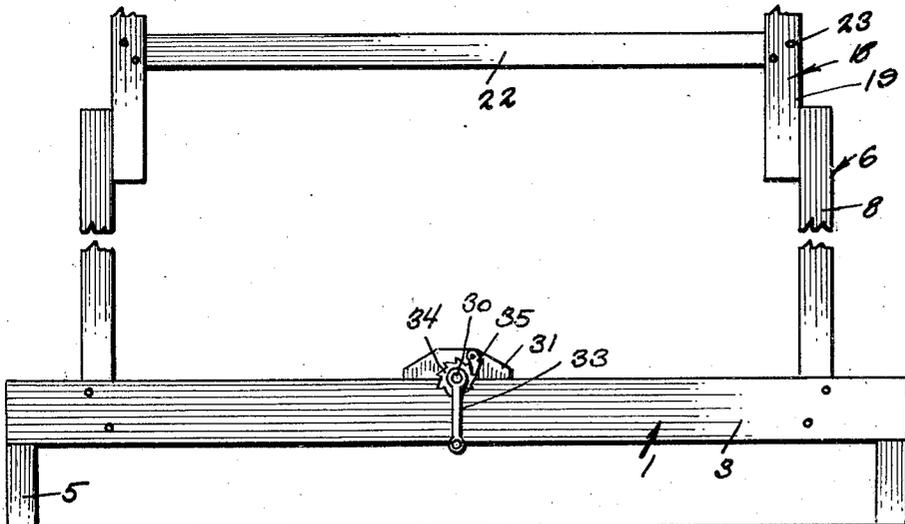
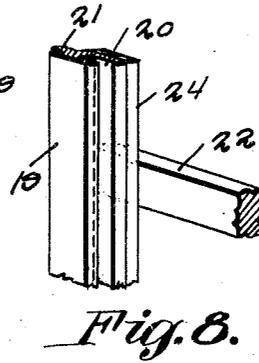
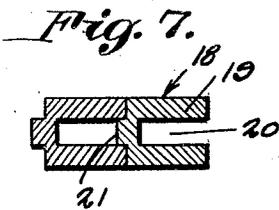
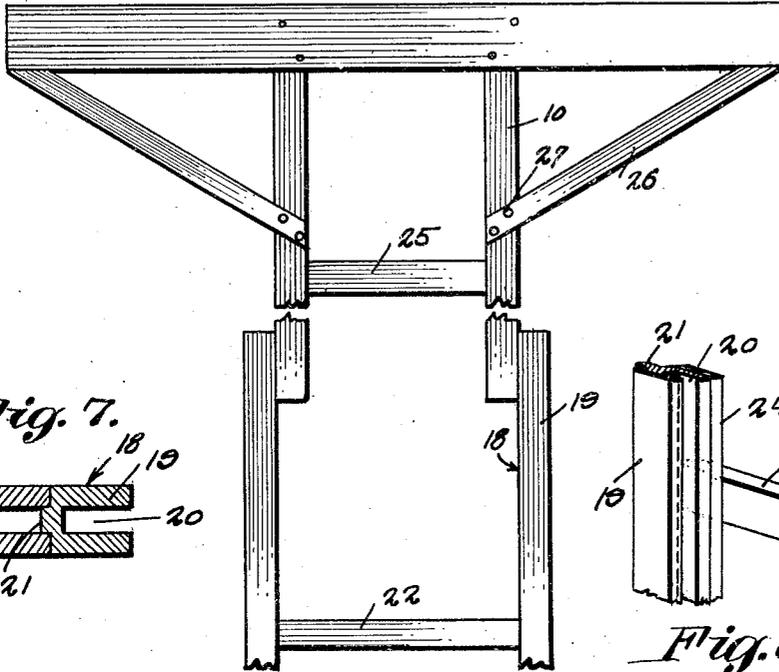
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PORTABLE ELEVATOR

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3 Sheets-Sheet 3

Fig. 6.



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UNITED STATES PATENT OFFICE.

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PORTABLE ELEVATOR.

Application filed December 28, 1927. Serial No. 243,067.

This invention relates to a portable elevator and has as one of its objects to provide an elevator which may be conveniently transported to a burning building and readily and quickly operated to facilitate and expedite the rescue of the occupants of such building, in a manner to greatly facilitate the work of the firemen and render their duties safer to perform.

Another object of the invention is to provide a portable elevator which may be adjusted so as to occupy a minimum space when not in use or when being transported from place to place, and which may be readily operated to effect elevation of the platform thereof to any desired point within the limits of the apparatus, the construction being such that the platform of the elevator may be adjusted to a greatly elevated position, compared to the space which the structure will occupy when the platform is fully lowered.

While the accompanying drawings and the description which is to follow, constitute a disclosure of the preferred embodiment of the invention, it will be understood that various changes may be made within the scope of what is claimed.

In the accompanying drawings:

Fig. 1 is a view in front elevation of the elevator embodying the invention;

Fig. 2 is a vertical front to rear sectional view taken substantially on the line 2—2 of Figure 1 looking in the direction indicated by the arrows;

Fig. 3 is a vertical sectional view taken substantially centrally, transversely of the elevator;

Fig. 4 is a horizontal sectional view taken substantially on the line 4—4 of Figure 3 looking in the direction indicated by the arrows;

Fig. 5 is a detail fragmentary sectional view through the companion upright of two of the elevating frames of the elevator;

Fig. 6 is a view in front elevation of the elevator with the platform in elevated position, the structure being broken away at intermediate points;

Fig. 7 is a horizontal sectional view through two companion uprights of two of the elevating frames;

Fig. 8 is a fragmentary perspective view of a portion of one of the uprights and one of the braces for the frame of which it constitutes a part.

The portable elevator embodying the invention includes a foundation which is indicated in general by the numeral 1 and which includes a base 2 and upstanding side and end members indicated respectively by the numerals 3 and 4. Preferably the base 2 will be supported by relatively short supporting legs or pedestals 5, and the structure is adapted to be mounted upon the bed of a truck so that it may be readily transported.

The structure comprises a plurality of nested, relatively vertically adjustable elevating frames, the outermost one of which is indicated in general by the numeral 6 and the innermost one by the numeral 7. The outermost frame 6 comprises four corner uprights indicated by the numeral 8 which uprights are bolted or otherwise secured at their lower ends as at 9, to the sides 3 of the foundation structure 1, the lower ends of the uprights being disposed in contact with the upper surface of the base 2, to reinforce the connection between the uprights and the foundation structure and maintain the uprights in vertical position, it being understood that these uprights may be otherwise or additionally braced if found expedient. The innermost frame 7 likewise comprises four corner uprights which are indicated by the numeral 10, and at their upper ends these uprights are bolted or otherwise secured as at 11, to the depending side beams 12 of a platform structure 13 the top of which is indicated by the numeral 14, this top being of rectangular form and being provided, in addition to the side beams 12, with depending end pieces 15, the platform, in the fully collapsed or lowered condition of the structure, as a whole, resting upon the upper ends of the uprights 8 of the said outermost frame 6 and the said upper ends of these uprights being received substantially within the corners of the platform structure 13 as will be evident by reference to Figures 2 and 3 of the drawings. Each upright 8 is formed in its inner laterally presented side with a vertically extending groove 16, and each upright 10, of the innermost frame 7, is formed upon its side which opposes the companion upright 8 or in other words the upright 8 at the same side of the structure, with a longitudinally, medially extending tongue or rib 17. The intermediate frames are indicated in general by the numeral 18, and each of these frames comprises four corner uprights indicated by the

numeral 19, each upright having a relatively deep longitudinally extending groove 20 formed in one side thereof and provided with a relatively shallow longitudinally, medially extending tongue 21 at the other side thereof. By reference to Figure 4 of the drawings it will be observed that the uprights at the corresponding corners of the intermediate frames 18 are nested, the tongue 21 of each upright 19 slidably fitting in the groove 20 in the next adjacent upright, the uprights 18 being so arranged that the uprights of the frame which is nested next within the outermost frame 6, will have their tongues 21 slidably engaged in the grooves 16 in the companion upright 8. In a similar manner, the uprights 19 of the intermediate frame 18 which is next adjacent the innermost frame 7, which is the platform supporting frame of the structure, slidably receive, in their grooves 20, the tongues 17 of the upright 10 of the said innermost frame. It will now be evident that the elevating frames of the structure are so nested that the frames may be relatively vertically slidably adjusted, and in order that the frames may be suitably braced and their respective uprights suitably held in proper spaced relation to one another, cross braces 22 are arranged to extend between the corresponding uprights 19 of the said intermediate frames 18 at the front and rear of the structure, these cross braces being bolted or otherwise secured as at 23 to the front uprights and preferably against slabs 24 which are disposed and secured against the inner sides of the said uprights 19. A similar cross brace 25 is arranged to extend between the companion uprights 10 of the innermost frame 7 at the front and rear sides of the structure and are secured at their ends to the said uprights as clearly shown in Figure 3. It will now be observed, particularly by reference to Figures 1 and 3 of the drawings, that when the structure is collapsed, the cross braces 22 will rest one upon another throughout the entire series at the front and rear of the structure, the cross braces 25 resting upon the uppermost cross braces 22. With the elevating frames thus nested and collapsed, the upper ends of the uprights of all of the frames will occupy a common plane and engage the under side of the top 14 of the platform 13. In order that the platform 13 may be effectually braced with respect to the uprights of the innermost frame 7, diagonal brace members 26 are secured at their lower ends as at 27 to the said uprights 10 and extend upwardly and outwardly and are secured at their upper ends to the corners of the platform structure 13 at the juncture of the depending front and rear members 12 with the end members 15 thereof. The uprights are relatively braced by brace rods 28 and

29 which extend between corresponding uprights of the frames 6, 7 and 18 and which are located respectively near the upper ends of the said uprights and near the intermediate portions thereof.

In order to effect successive extension of the elevating frames in an upward direction so as to suitably elevate the platform structure 13, a shaft 30 is rotatably journaled in suitable bearings 31 mounted upon the upstanding members 3 of the foundation structure 1, and a pair of winding drums, or a double winding drum 32, is mounted upon the shaft near each end thereof. A crank handle 33 is fixed upon the forward end of the shaft, in advance of the front member 3, and a ratchet wheel 34 is likewise fixed upon this end of the shaft, a pawl 35 being mounted upon the forward bearing 31 for coaction with the said ratchet gear 34 and serving to prevent backward rotation of the shaft, so long as it is in engagement with the said ratchet gear. Pulleys 36 are mounted upon stub shafts 37, in turn mounted upon the front and rear members 3 of the foundation structure 1 near the ends thereof and immediately outwardly beyond the lower ends of the uprights 8 of the outermost frame 6, and pulleys 38 are rotatably mounted in the upper ends of the grooves 16 in the uprights 8 of the said frame 6. Similar pulleys 39 are rotatably mounted in the upper portions of the grooves 20 in the members 21 of the uprights of the intermediate frames, as most clearly shown in Figure 5 of the drawings, and other pulleys 40 are rotatably mounted in the said grooves 20 near the lower ends thereof, the grooves at the lower ends of the uprights 19 extending entirely through the lower end portions of the uprights, so as to permit of the passage between the uprights of portions of cables 41. One of the cables 41 is connected to and wound about each of the winding drums 32, and led laterally to and passed about the respective one of the pulleys 36, and thence upwardly and over the respective pulley 38, each cable, from this point, being led downwardly and beneath the pulley 40 upon the next adjacent upright 19, thence upwardly within the groove 20 of said upright, over the pulley 39 in said groove, and thence downwardly and about the pulley 40 of the next adjacent upright, throughout the entire series of uprights at the four corners of the structure, the end of each cable being anchored in any suitable manner as at 42 to the respective one of the uprights 10 near the lower end thereof.

From the foregoing description of the invention it will be understood that as the shaft 30 is rotated through the medium of the crank handle 33, the cables 41 will be wound upon the drums 32, and inasmuch as all of the cables are in this manner tautened, the

innermost elevating frame 7 will be pulled upwardly within the nested frames until the stretches of the cables between the anchored ends 42 thereof and the pulleys 39 of the innermost elevating frame, extend substantially directly across the grooves of the uprights of the said frame whereupon the said innermost intermediate elevating frame will be elevated or moved upwardly within the next adjacent intermediate frame, and so on throughout the series of frames, either partially or wholly, until the platform structure 13 has been elevated to the desired point. It will therefore be evident that the platform structure 13 may be elevated to a height equal substantially to the combined height of all of the elevating frames 7 and 18, the frame 6 remaining stationary, as it is anchored to the foundation structure 1. It will be understood of course that the platform structure 13 may be permitted to lower, by disengaging the pawl 35 from the ratchet wheel 34, and permitting the shaft 30 to rotate backwardly to unwind the cables 41.

Having thus described the invention, what I claim is:

1. In an elevator of the class described, a base, a plurality of elevating units one of which is anchored upon the base, each of said units comprising corner uprights arranged at opposite sides of the base, cross bars connecting and bracing the uprights of each unit at each side of the structure, the uprights of all of the units at each corner of the structure being arranged side by side throughout the series and being formed in one side with a longitudinal guiding groove and at the other side with a longitudinal

tongue slidably fitting in the groove in the adjacent upright and constituting means for preventing relative displacement of the uprights of the several units, and means operable to successively elevate the units with respect to one another.

2. In an elevator of the class described, a base, a plurality of elevating units one of which is anchored upon the base, each of said units comprising corner uprights arranged at opposite sides of the base, cross bars connecting and bracing the uprights of each unit at each side of the structure, the units of all of the uprights at each corner of the structure being arranged side by side throughout the series and being formed in one side with a longitudinal guiding groove and at the other side with a longitudinal tongue projecting part way into and slidably fitting in the groove in the adjacent upright and constituting means for preventing relative displacement of the uprights of the several units, a shaft rotatably mounted upon the base, means operable to rotate the shaft, drums mounted upon the shaft, the drums being located near opposite ends of the shaft and between the series of uprights at opposite sides of the structure, pulleys journaled in the grooves of the uprights near the upper and lower ends thereof, and cables each anchored to a respective one of the uprights of the innermost unit and trained upwardly and downwardly over and beneath the pulleys in the grooves of the successive uprights of the respective series and over a respective one of said drums.

In testimony whereof I affix my signature.

MARTIN E. HAYMAN.