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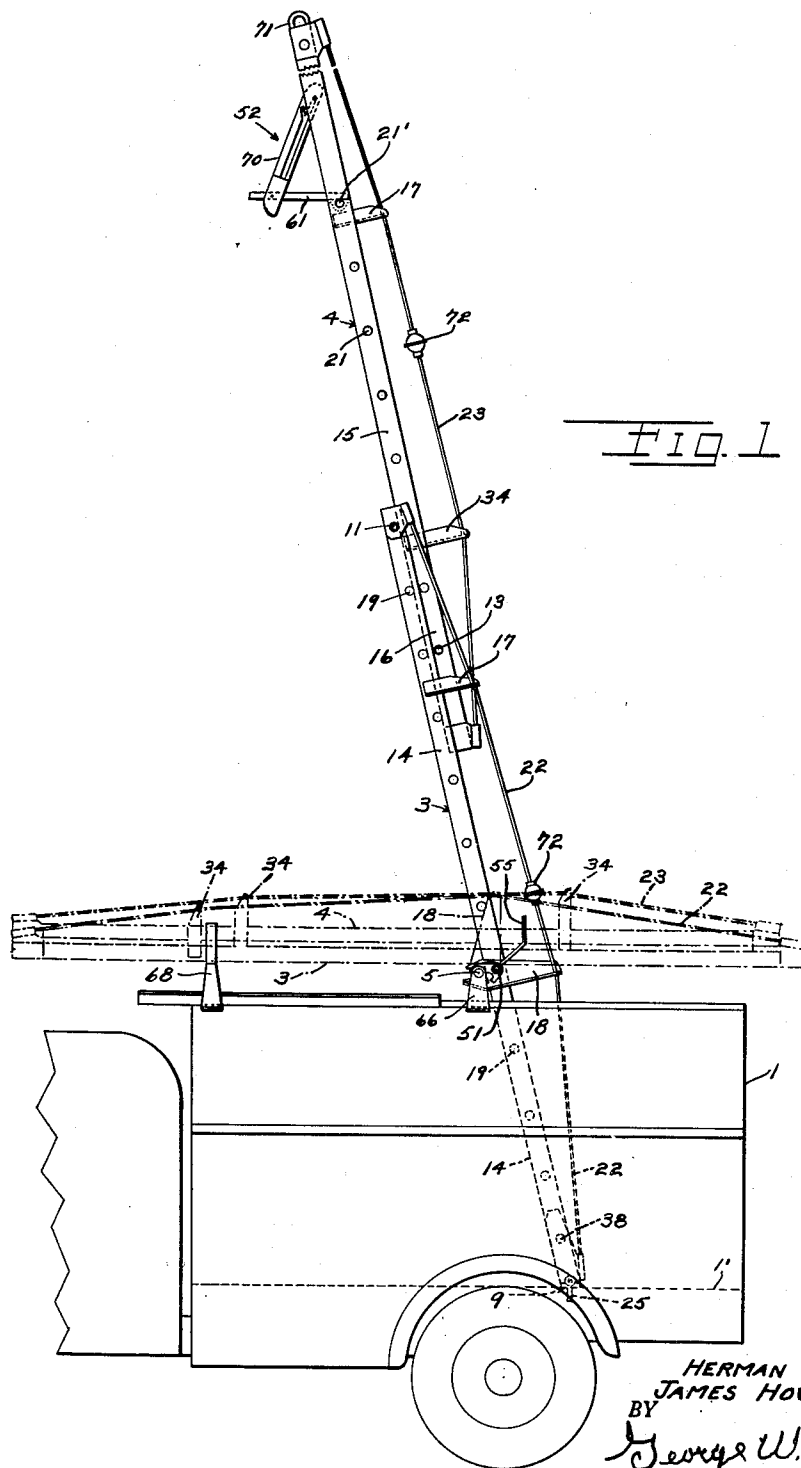
H. J. TROCHE ET AL

2,667,296

AERIAL LADDER

Filed Feb. 18, 1950

5 Sheets-Sheet 1



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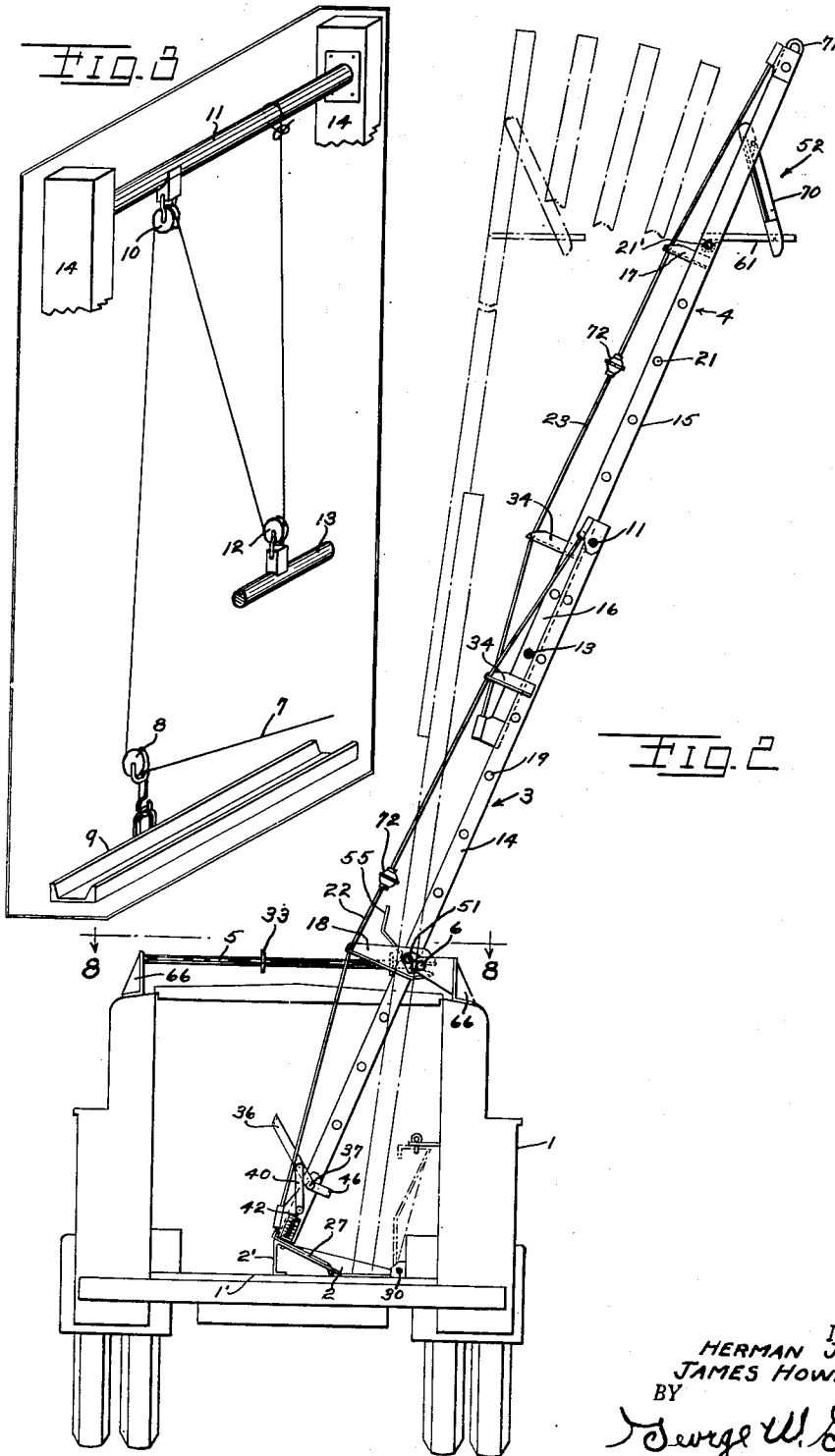
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5 Sheets-Sheet 2



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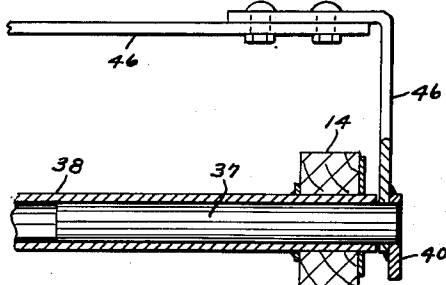
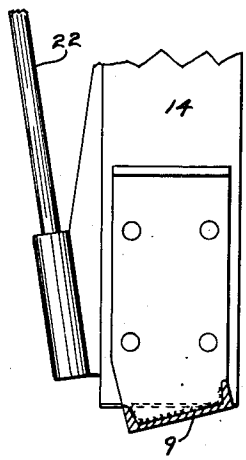
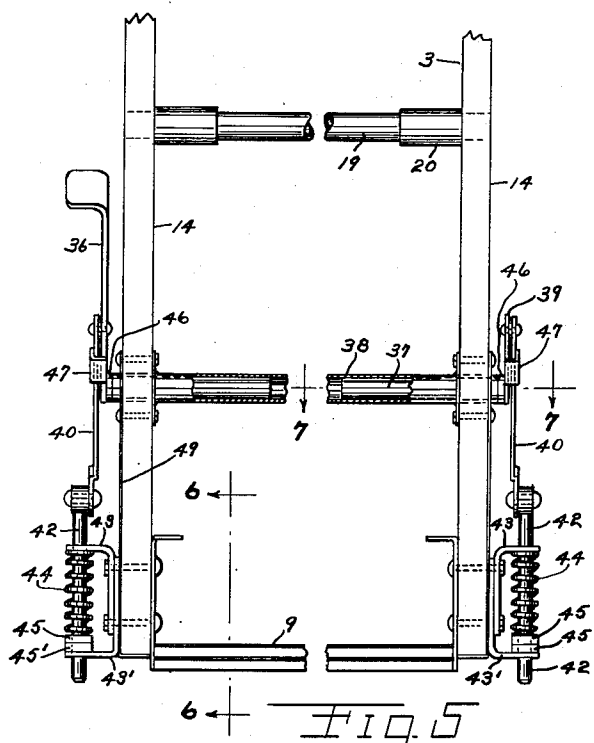
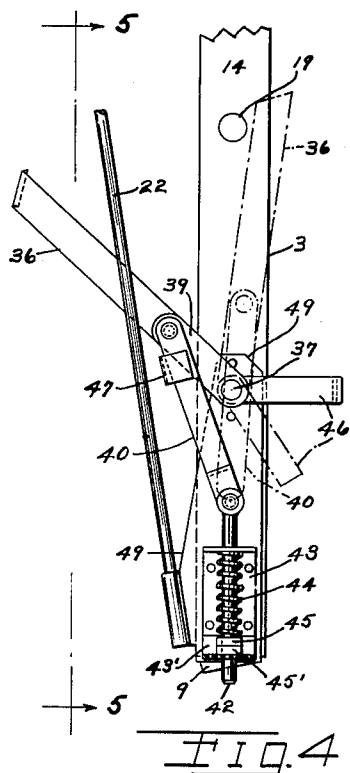
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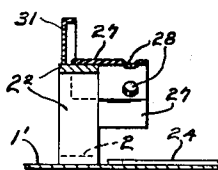
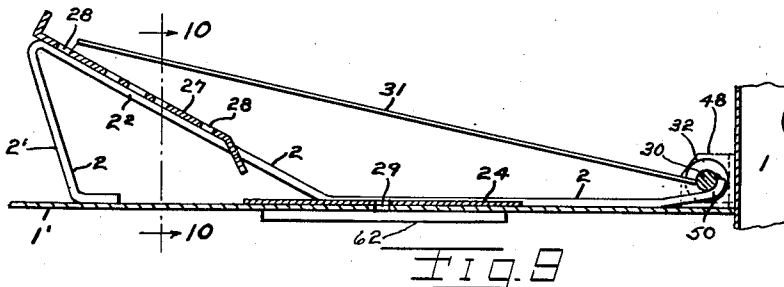
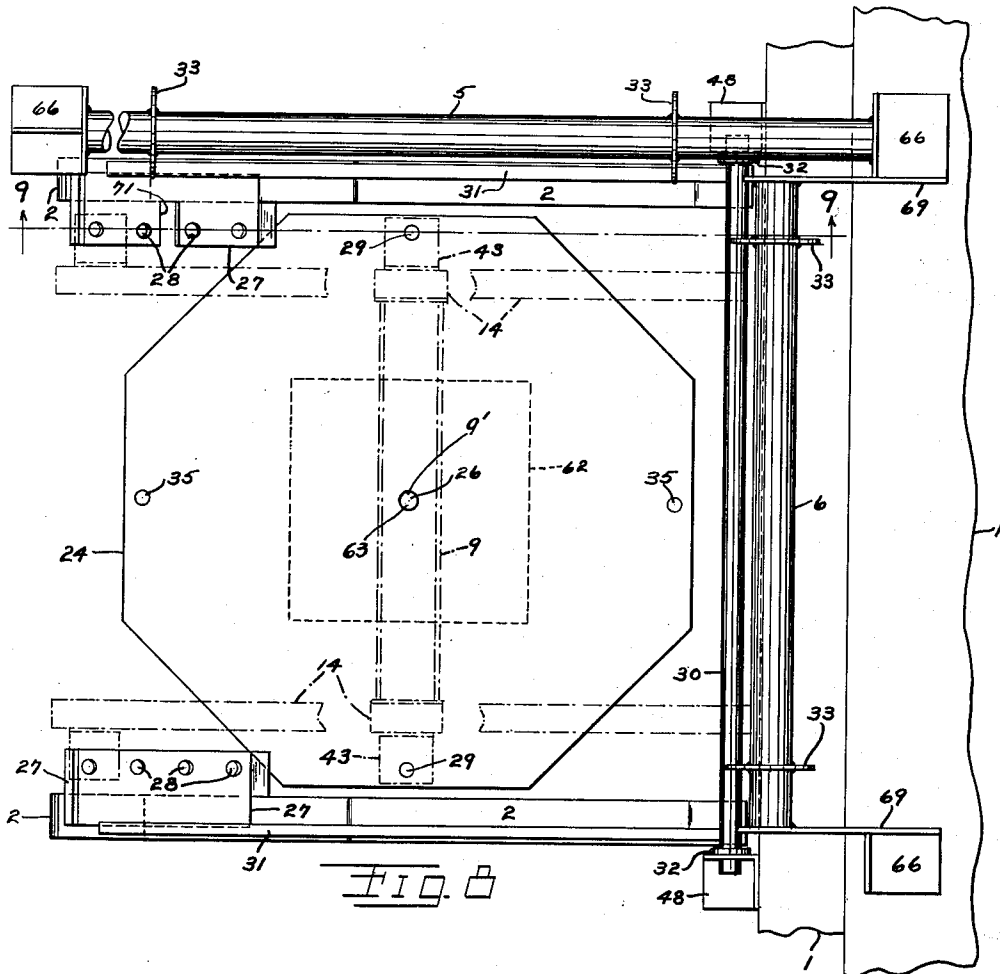
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AERIAL LADDER

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5 Sheets-Sheet 4



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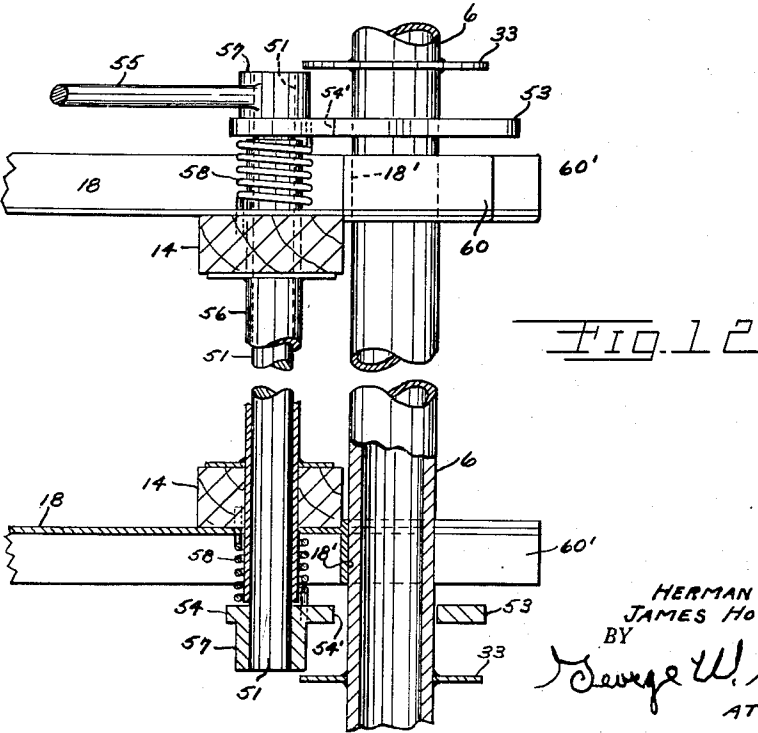
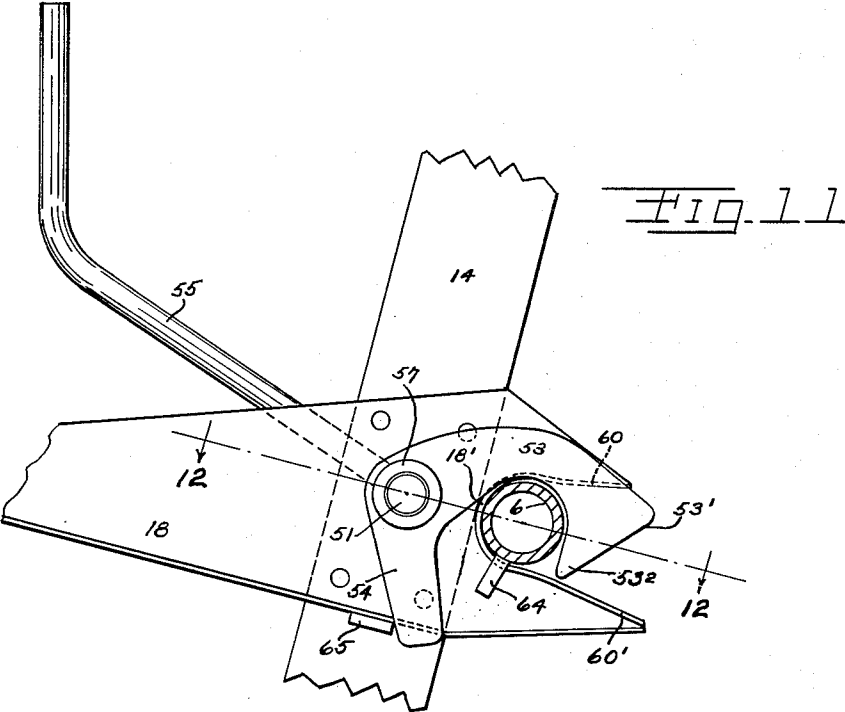
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AERIAL LADDER

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5 Sheets-Sheet 5



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AERIAL LADDER

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Application February 18, 1950, Serial No. 145,056

2 Claims. (Cl. 228—48)

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The invention relates to aerial ladders, and particularly to aerial extension ladders adapted to be mounted on utility truck bodies and utilized in the installation and maintenance of utility line equipment. The improved aerial ladder when not in use or when being transported is also bedded on the truck body in closed condition.

The objects of the invention are to provide an aerial ladder of the character stated which is of light weight and may readily and easily be removed from its bed, shifted into different positions and extended, collapsed and restored to its bed, all by one operator; which is storable in or on the truck body for transporting without the loss of storage and crew space; which has a wide range of operating positions; and which provides a high factor of safety for the workmen.

The annexed drawings and the following description set forth in detail certain means illustrating the improvements in aerial ladders, such means constituting, however, only one of the various forms in which the principle of the invention may be embodied.

In said annexed drawings:

Figure 1 is a side elevation of the aerial ladder, with the parts thereof extended to substantially its full working position, the position of the ladder being that in which it has been tilted down from its bed, extended, and is in a position where it can be turned about into different angular positions relative to the truck body upon which it is mounted, the position shown in Figure 1 being that in which the extended ladder can be utilized longitudinally of the truck body; a part of the truck body being also shown in the figure; also, there is shown in dot-and-dash lines a nested transporting position of the ladder upon the roof of the truck body, the two parts of the ladder being in closed condition;

Figure 2 is a side elevation of an extreme outboard working position of the ladder, a position in which the ladder has been turned substantially 90° from the position thereof shown in Figure 1 and moved outboard at the top, certain other outboard positions through which the ladder moves in reaching the full line position shown in Figure 2 being indicated by dot-and-dash lines, the left-hand dot-and-dash position shown being a turning ladder position, differing by 90° from the turning position shown in Figure 1, this left-hand dot-and-dash position shown in Figure 2 being one in which the ladder can be utilized in a substantially vertical position but pointed outboard of the truck body, or being one which is preparatory to the further desired exact positioning of

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the ladder outboard of the truck body, the extreme outboard positioning being indicated, as stated, by the full line showing of Figure 2;

Figure 3 is a diagrammatic view illustrating a rope and pulley structure for raising and lowering the upper ladder part;

Figure 4 is a side elevation, upon an enlarged scale, of a locking assembly for securing the ladder upon the floor of the truck body, a non-locking position of an operating lever and some related elements being shown in dot-and-dash lines, this mechanism being utilized for locking the ladder for operation thereof substantially vertically, either longitudinally or pointed outboard of the truck body, although when the ladder is used longitudinally of the truck body or pointed outboard and used substantially vertically of the truck body, it is not necessary to use this locking assembly, as will be hereinafter fully described, this locking assembly in these uses being utilized, if desired, as an added safety feature;

Figure 5 is a front elevation of the elements shown in Figure 4, taken in the plane indicated by the line 5—5, Figure 4;

Figure 6 is a vertical transverse section, upon an enlarged scale, taken in a plane substantially at right angles to the plane of the ladder, this figure plane being indicated by the line 6—6, Figure 5;

Figure 7 is a fragmentary plan section of a ladder stile and rung and a clamping mechanism detail, upon an enlarged scale, taken at right angles to the plane of the ladder and in the plane indicated by the line 7—7, Figure 5;

Figure 8 is a broken plan view, upon an enlarged scale, of a pivot plate secured to the floor of the truck body and of a base pivotally-mounted adjacent one of its ends on a side wall of the truck body and adapted to be swung from an idle position adjacent the wall of the truck body down to a working position where it rests upon the floor of the truck body, as shown in Figure 9, the free or swinging end of the base in its lower position extending substantially to the longitudinal center line of the truck body, the base being shown in this Figure 8 in a lower ladder supporting position on the floor of the truck body, and the view being taken from the plane indicated by the line 8—8, Figure 2, this view also indicating in broken lines a bottom end ladder channel extended between the side rails or stiles of a lower ladder section, and also channel brackets exteriorly of the rails of the lower ladder section, through which channel brackets the ladder-locking bolts extend;

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Figure 9 is a fragmentary vertical section, taken transversely of the truck body and from the plane indicated by the line 9—9, Figure 8, and on the lower part of Fig. 8;

Figure 10 is a fragmentary vertical section, taken longitudinally of the truck body and in the plane indicated by the line 10—10, Figure 9;

Figure 11 is an elevation, upon an enlarged scale, taken substantially at right angles to the plane of the ladder, of one of a pair of certain automatic clamps mounted on the stiles of the lower ladder part for locking the ladder to certain relatively right-angular pivot tubes mounted upon the truck body, respectively adjacent one side of the truck body, and transversely of the truck body, and adjacent the top of the latter, this view being an illustrative one in which the clamp is shown as being locked to the pivot tube extended longitudinally of the truck body and thus the ladder is in position for use outboard of the truck body; and

Figure 12 is a broken section, partially in plan, taken in a plane at right angles to the plane of the ladder and indicated by the line 12—12, Figure 11.

It will first be stated that aerial ladders of the character herein presented are so designed and mounted that they may be utilized for servicing operations directly above the truck body or outboard thereof to the road curb and beyond. When working directly overhead, the truck body can be operated so that one overhead position of the ladder serves the purpose. However, when working outboard, there must be considerable latitude to the reach of the ladder in order to provide for all reasonable uses thereof and, furthermore, the curb side of the street is often blocked by parked vehicles and other obstructions so that the ladder must be utilized over such obstructions from a position in the street inwardly of the curb.

Referring to the annexed drawings in which the same parts are indicated by the same respective numbers in the several views, a sloped skeleton frame 2 movable transversely of the truck body, Figure 2, is pivotally mounted adjacent one edge on and adjacent the bottom of the inside face of a side wall of a truck body 1, within the truck body, Figures 2, 8 and 9. The opposed longitudinally-spaced sides of the frame 2 are shown in Figure 8, and from Figure 9 it will be noted that the lower ends 50 of these sides are wrapped about and secured to a shaft 30 pivotally mounted in brackets 48 secured to and adjacent the bottom of the right-hand truck body side wall. Upon this skeleton frame 2 and its associated elements, when the frame is pulled down to ladder-receiving position upon the floor 1¹ of the truck body 1 in the manner hereinafter fully described, and as shown in Figures 8, 9, and 10, is mounted the improved aerial extension ladder for outboard use. The ladder has a stationary lower section 3 with rungs 19 and an upper slidable or extensible section 4 having wood rungs 21 and the rails 15 of which are slidable upon the rungs 19 of the lower section 3 for extending and closing the ladder. As stated, the skeleton frame 2 is utilized for supporting the ladder in its various outboard operating positions, the ladder in such positions bearing against and being clamped to a longitudinal pivot tube 6 mounted, as hereinafter fully described, upon the roof of the truck body, the clamping of the ladder to the pivot tube 6 being such as to permit swinging of the ladder over said pivot tube.

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When the ladder is used in a substantially vertical position and pointed outboard of the truck body, it is not supported upon the skeleton frame 2, but is otherwise supported, all as will be hereinafter fully described. When the ladder is used longitudinally of the truck body 1, it is positioned in a substantially vertical position and is not mounted upon the skeleton frame 2, which also will be hereinafter fully described. When the ladder is utilized longitudinally of the truck body 1, it is clamped to a cross-wise pivot tube 5 for swinging movement thereover, this pivot tube 5 being mounted upon and above the roof of the truck body 1.

The mounting for the cross-wise pivot tube 5 and the longitudinal pivot tube 6 comprises braced brackets 66 erected on the roof of the truck body 1 adjacent its sides to which the pivot tubes 5 and 6 are secured by plates 69 welded to the pivot tubes 5 and 6 and to the braced brackets 66.

When the ladder is manipulated or utilized substantially vertically, either pointed longitudinally of the truck body 1 or pointed outboard of the truck body 1, it is mounted upon a pivot plate 24, Figure 8, and secured to the floor 1¹ of the truck body 1 by a pivot pin 25 passed through a central socket 26 of the pivot plate 24, and registering sockets in the bottom ladder channel 9 and in the truck body floor 1¹, or is secured by locking bolts passed through transversely aligned sockets 35 or longitudinally aligned sockets 29 of the pivot plate 24 and registering sockets in the truck body floor 1¹, all as hereinafter fully described.

The axes of the cross-wise pivot tube 5 and the longitudinal pivot tube 6 lie in the same horizontal plane. These pivot tubes are provided with respective disks 33 between which the ladder is swivelly clamped to the pivot tubes.

The improved ladder may be mounted upon and used with either a truck body having a roof, or one without a roof, but is described herein and shown in the accompanying drawings as utilized with a body having a sliding roof.

In transporting position the upper ladder part 4 rests upon the lower ladder part 3 and the shortened ladder assembly is carried above the roof of the body 1 upon the cross-wise tube 5, Figure 1, which tube 5 forms a support for one end of the closed ladder assembly, an opposite end ladder support 68 being provided which is erected upon the truck body 1 and has a ladder hold down part.

When it is desired to utilize the ladder, the hold down support 68 is unfastened and the closed ladder sections rocked over the tube 5 by pulling on the rear end of the lower ladder part 3 until the ladder assembly is in about a vertical position which aligns a central socket 9¹ of the bottom ladder channel 9, secured between the side rails 14 of the lower ladder section 3, and which in this position of the ladder extends cross-wise of the truck body 1, Figure 1, with a central socket 26, Figures 1 and 8, formed through the pivot plate 24, there also being a socket 63 through the truck body floor 1¹ registering with the pivot plate socket 26. A removable tapered-end pivot pin 25, Figure 1, is dropped through the registering sockets and thus the closed ladder assembly is pivotally mounted upon the floor 1¹ of the truck body 1 and bears against the cross-wise pivot tube 5 to which it is pivotally locked as hereinafter fully described. The procedure just described is a preparatory one if it

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is desired to use the ladder outboard of the truck body 1.

However, if it is desired to use the ladder with its plane cross-wise of the truck body 1, the pivot pin 25 may be inserted through the mentioned registering sockets, as described, or the ladder can be secured by engaging manually-movable depending locking bolts 42, Figures 4 and 5, mounted exteriorly of the side rails 14 at the lower end of the ladder section 3, with and locking them in opposed transversely-spaced sockets 35 formed through and adjacent the opposite longitudinally-extending sides of the pivot plate 24, Figure 8, and registering with transversely-opposed sockets 63 formed in the body floor 1¹. If it is desired to use the pivot pin 25 and the pivot plate socket 26 and the sockets registering therewith, the locking bolts 42 and the transversely-spaced sockets 35 and the floor sockets registering therewith may be utilized as an added safety feature. The axes of the sockets 26 and 35 of the pivot plate 24 are in alignment transversely of the truck body 1, so that the ladder is rocked over the pivot tube 5 into the same position whether it is to be secured by the pivot pin 25 through the socket 26 or by the opposed locking bolts 42 through the sockets 35. The structure and operation of the locking bolts 42 will be hereinafter fully described.

Assuming, however, that the desired position of the ladder is for its use in outboard operation, other than for use in a substantially vertical position but pointed outboard such as is shown by the left-hand dot-and-dash position of the ladder in Figure 2, it is turned angularly about upon the pivot pin 25, from the position shown in Figure 1 to the left-hand dot-and-dash position shown in Figure 2. If it is desired to use the ladder in the left-hand dot-and-dash position shown in Figure 2, the pivot pin 25 can be utilized to secure it. If additional security is desired, the locking bolts 42 can be engaged with longitudinally opposed sockets 29, Figure 8, of the pivot plate 24, and registering longitudinally-spaced floor sockets 63, which sockets 29 are in alignment with the central pivot plate socket 26 and are angularly 90° removed from the aforementioned transversely-aligned pivot plate sockets 35. However, if it is desired to use the ladder in a substantially inclined position, the pivot pin 25 is removed, and the ladder moved bodily inwardly of the truck body 1 at the bottom, and the locking bolts 42 are engaged with a selected longitudinally-aligned pair of two series of transverse sockets 28 formed through inclined support plates 27 mounted on the inner or free ends of the respective arms of the skeleton frame 2, all as hereinafter fully described. There are a plurality of pairs of the longitudinally-aligned sockets 28 and the adjacent pairs are transversely spaced and transversely-aligned. These pairs of sockets 28 are also transversely-aligned with the longitudinally-aligned sockets 29 of the pivot plate 24.

As stated, the pivot pin 25 is a removable member and it is utilized in the socket 26 only for angular rotating of the ladder and also for substantially vertical operation of the ladder. When the ladder is to be utilized, it is locked by the bolts 42 to the floor 1¹ through the sockets 29, or through the sockets 35, or locked in any longitudinally-aligned pair of the transverse series of sockets 28 formed in longitudinally-opposed inclined upper-flanged support strips 27 mounted on the longitudinally opposed arms of the afore-

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mentioned skeleton frame 2, Figures 8, 9, and 10. This mounting of the ladder on the support strips 27 is for the purpose of actual outboard use of the ladder, i. e., an outboard use shown in its extreme position by the full line showing of the ladder in Figure 2. As stated, there are a plurality of longitudinally-spaced pairs of the two transverse series of sockets 28 in the inclined support strips 27.

If any one of the pairs of longitudinally-aligned sockets 28 below the upper sockets 28, Figure 9, are utilized, the outboard position of the ladder would not be as extreme as the position thereof shown in Figure 2, that pair of sockets 28 being utilized with the locking bolts 42 which will produce the desired inclined or outboard position of the ladder within the range provided by the plurality of pairs of sockets 28.

When not in use, the pivot pin 25 is temporarily stored in any convenient location such as on a pin 59 mounted in the side wall of the truck body 1.

For the purpose of providing adequate depth of socket for the pivot pin 25 a substantial block 62 Figures 8 and 9, is welded to the bottom face of the truck body floor 1¹, this block 62 having a socket registering with the pivot plate socket 26 and any other vertically-aligned sockets.

After the closed ladder has been rocked down to a position adjacent the floor 1¹ of the truck body, and pivotally secured in the socket 26, or locked through the sockets 35 or swiveled for lateral positioning and/or locking in the sockets 29, or pulled outwardly at the bottom for locking in a pair of the inclined series of sockets 28, it is extended to the amount desired by pulling the upper ladder part 4 up over the lower ladder part 3, this action consisting in sliding the side rails 15 of the upper ladder part 4 over the rungs 19 of the lower ladder part 3. Substantially the maximum amount of extension is shown in Figures 1 and 2, this extension being to an extent in which the lower support bars 34 of the bridge of the strut bars 23 of the upper ladder part 4 are about the height of the upper rung 11 of the lower ladder part 3, providing an overlapping ladder part area indicated by "15," Figures 1 and 2. This extension of the ladder is effected by pulling on a cord 7, Figure 3, which tracks over a swivel pulley 8 mounted on the bottom channel member 9 of the lower ladder section 3, thence tracks over a swivel pulley 10 depending from the top rung 11 of the lower ladder section 3, thence tracks over a swivel pulley 12 mounted on the bottom rung 13 of the upper ladder section 4, and thence is secured to the upper rung 11 of the lower ladder section 3. The two ladder sections are of such transverse dimensions that this pulling upon the cord 7 causes the side rails 15 of the upper ladder section 4 to travel upwardly upon the rungs 19 of the lower ladder section 3. In the accompanying drawings the side rails 15 of the upper ladder section 4 are shown as traveling on end wear collars 20 of the lower section rungs 19, Figure 5.

Describing now in detail the structure and operation of the several elements and assemblies by which the aforescribed manipulation and use of the ladder are effected.

The structure and actuation of the pivoted skeleton frame 2 are as follows. As stated, this frame 2 is fastened to the inside face of the right-hand side of the body 1, when not in use, and when it is desired to use the ladder outboard, the skeleton frame 2 is unfastened by

removing a lock pin and chain assembly therefor and turned with the shaft 30 down to the position shown in Figure 9. It will be noted that the frame 2 is a three-sided member of which the two longitudinally opposed sides have lower end portions which lie upon the floor 1¹ of the truck body 1 and angular transverse end portions providing supporting legs 2¹ and intermediate inclined base or support portions 2² upon which respectively are mounted the upper-flanged inclined ladder support plates 27. These plates 27 are welded at their outer transverse sides to transverse inclined angles 31, Figures 8, 9, and 10, welded at their bottom edges to the two sides of the skeleton frame 2 and secured at their lower ends to collars 32 secured to the shaft 30, against which collars 32 the end mountings 42 of the shaft 30 abut. The supports 27 are each provided with the series of four transversely-spaced sockets 28 there-through transversely-aligned with the sockets 29 of the pivot plate 24 and adapted to receive the hinged locking bolts 42 depending from the links 43 of two locking mechanisms, Figures 4 and 5. These locking mechanisms depend from and exteriorly of the side rails 14 of the ladder section 3, Figures 4 and 5. The plurality of pairs of longitudinally-aligned sockets 28, and the inclination of the inclined support plates 27 through which they are formed, provide means whereby the ladder can be positioned and locked laterally outboard at different inclinations therefor, the extreme position of which is shown by the full line ladder position of Figure 2.

The means for actuating the locking bolts 42 are shown in Figures 4 to 7, inclusive. A hand lever 36 is pivotally secured at one end to a shell 38 which is mounted in the ladder rails 14 and forms the bottom rung of the lower ladder section 3 in combination with stub end shafts 37. Pivoted at one end to the lever 36 intermediate the ends of the latter is a link 40 pivoted at its opposite end which is offset, Figures 4 and 5, to one end of a locking bolt 42. The locking bolt 42 passes through the upper and lower flanges of a channel bracket comprising an angle member 43 and an angle member 43¹ which are secured together and also bolted to and exteriorly of a brace 49 for the ladder rail 14. Adjacent the bottom of the bolt 42, and encircling it, within the bracket 43—43¹, is a collar 45 which is adapted to impinge upon an adjacently lower block 45¹ secured to the inside face of the bracket member 43¹. Mounted between the inside face of the bracket member 43 and the top face of the collar 45 is a compression spring 44 secured at its bottom end to the collar 45.

There is one of the locking mechanisms just described mounted upon each side rail 14 of the lower ladder part 3 except that the locking mechanism on the right-hand rail 14 is not provided with a hand lever 36. In lieu of this hand lever 36, the right-hand locking mechanism is provided with a short link 39, Figure 5, pivotally secured to the shell 38 at one end and pivoted to the link 40 at its opposite end.

The locking mechanisms upon the two sides of the ladder are secured together by a channel bar 46, Figure 7, whose respective legs are secured to the two ends of the shell 38 adjacently exteriorly of the ladder rails 14.

The locking bolts 42, when in ladder-locking position, pass through the sockets 35, Figure 8, of the pivot plate 24 and also through aligned holes in the floor 1¹ of the truck body 1, when

the ladder is used longitudinally of the truck body 1, and pass through selective pairs of sockets 28 in the support strips 27, when the ladder is used outboard of the truck body 1, and also pass through the sockets 29 of the pivot plate 24 and aligned holes in the floor 1¹ of the truck body 1, when the ladder is used in a substantially vertical position, but is pointed outboard of the truck body 1, as shown by the left-hand dot-and-dash position thereof in Figure 2.

It is evident from an inspection of Figure 4 that pulling downwardly upon the hand lever 36 will cause the upper end of link bar 40 to swing outwardly and downwardly from the dot-and-dash non-locking position thereof shown and permit the springs 44 to effect the downward movement of the locking bolt 42 whereby the locking bolt 42 will be caused to pass through the sockets 29 or 35 of the pivot plate 24, and the registering sockets in the floor 1¹ of the truck body 1, or through a pair of the longitudinally-aligned holes 28 of the support strips 27, all depending upon the position of the ladder and the direction in which it is pointing and, in the event the ladder is resting upon the pivot bar 6 and is outboard, depending upon the inclination of the ladder.

When it is desired to release the locking bolts 42, the hand lever 36 is pushed toward the dot-and-dash position thereof shown in Figure 4, whereby the bolts 42 are lifted into ladder-unlocking positions and the links 40 pass the projections of the axes of the bolts 42.

U-straps 47 secured to the links 40 intersect the locking paths of movement of the hand lever 36 and the short link 39 whereby the extent of the locking movement of the bolts 42 is limited.

As above stated, the ladder is normally swingingly clamped to the cross tube 5 and this tube 5 serves to hold and support the bottom end of the ladder in transporting position and provides an overbalancing medium over which to rock the ladder down preparatory to use thereof as well as providing a clamping medium for the ladder for use thereof longitudinally of the truck body 1. For use of the ladder pointed outboard of the truck body 1, or used outboard of the truck body 1, the longitudinal pivot tube 6 is the one to which the ladder is pivotally clamped for swinging movement of the ladder. The normal position of the clamping means is the locked position which is assumed automatically upon contact of the clamping means with the pivot bar 5 or the pivot bar 6. These clamping means, and the elements for unclamping them, are shown in detail in Figures 11 and 12. Assuming that it is desired to use the ladder outboard, or pointed outboard, pivot tube 6 would be the one utilized and, for illustrative purposes, this is the condition shown in Figures 11 and 12. Adjacently inwardly of the longitudinal pivot tube 6 and parallel therewith is mounted in the side rails 14 of the lower ladder section 3 a shell 56 through which extends a shaft 51 to whose projecting ends hubs 57 are pinned. A release lever 55 is pinned to the left-hand hub 57. The hubs 57 are disposed slightly inwardly of the lateral ladder-aligning disks 33 which overlap the hubs 57. Formed integrally with the inner ends of the hubs 57 are coupling elements pivotally mounted on the shaft 51 and having each a jaw 53 and a tail piece 54. Abutting the outer side face of the rail 14 is a support bar 13 for the strut rod 22 of the lower ladder section 3, through which bar 13 the shaft 51 and shell 56 pass, as also a

coil spring 58 one end of which is secured in the rail 14 and the other end of which is secured in an enlarged end portion 54¹ of the hub 57 with which the coupling element is integrally formed. The inner edges of the support portions 18 overlap the rails 14 of the lower ladder section 3. The tendency of the spring 58 is to turn the hub 57 and the release lever 55 and consequently the coupling member so as to cause the jaw 53 of the latter to clamp down over the pivot bar 6 as shown in Figure 11. The outer end of the strut support member 18 has an arcuate portion 18¹ adapted to engage the pivot tube 6 and thence is of sub-divided nature so as to provide upper and lower pads which have inwardly converging guide surfaces 60 and 60¹ which, as the clamping member, upon the movement of the ladder, approaches the pivot bar 6 pass over the upper and lower surfaces of the pivot bar 6 and thus perform a guiding function.

There is the same clamping mechanism adjacent each rail 14 of the lower ladder section 3 except that the release lever 55 is provided on the left side only.

As stated, the coupling member is normally in locked position for swiveling of the ladder over a pivot tube. This ladder locking is automatically effected as follows. As the rails 14 carry the pivotally-mounted coupling members having the jaws 53 approach the pivot tube, the upper part of a downwardly sloping face portion 53¹ of the jaw 53 encounters the pivot tube 6 and, upon further approach of the rails 14, the sloping portion 53¹ of the jaw 53 causes the coupling member to swing on the shaft 51, against the tendency of the spring 58, whereby eventually the nose 53² of the jaw 53 clears the pivot tube 6 and the spring 58 then snaps the jaw 53 into the clamping position on the pivot tube 6 shown in Figure 11. The clamping movement is limited by a stop lug 65 secured to the ladder rail 14. Furthermore, the stop lug 65 prevents the jaw part of the coupling member from swinging down too far, when the coupling member is disengaged from the pivot tube 6 and the ladder is backed off from the pivot tube 6. Such function of the stop lug 65 prevents the upper part of the jaw 53 from encountering the pivot tube 6, as the ladder approaches the pivot tube 6, and assures that this encountering of the pivot tube 6 will be by the upper part of the downwardly sloping face portion 53¹ of the jaw 53 and thus effect the proper upward swinging of the jaw 53 as the ladder more nearly approaches the pivot tube 6.

When it is desired to unclamp the ladder from the pivot tube 6, the release lever 55 is pulled downwardly which causes the coupling member to be turned with the shaft 51, against the action of the spring 58, until the tail piece 54 of the coupling member strikes a lug 64 secured to the pivot tube 6. This amount of pivotal movement of the coupling member raises the jaw 53 thereof sufficiently so that the nose 53² of the jaw 53 is turned to a position above the pivot bar 6. This amount of movement of the release lever 55 has set up some moment so that continued

pulling upon the release lever 55 causes the tail piece 54 of the coupling member to slide on the lug 64 which moves the ladder rearwardly away from the pivot tube 6 and thus backs the entire coupling mechanism away from the pivot tube 6.

Certain other structural features of the improved ladder which are shown in the accompanying drawings are as follows:

Adjacently above the upper strut support 17 of the upper ladder part 4 is pivotally mounted a jointed working platform structure 52 which, when the upper ladder section 4 is raised, automatically swings outwardly from said ladder section 4 to provide a support 61 for the workmen, this support 61 upon the lowering of the upper ladder section 4 striking the rungs of the lower ladder section 3 and folding up with the depending part 70 of the platform structure. For obtaining the level of the support 61 a longitudinal series of engageable notches are provided in the depending part 70 of the platform structure. The platform structure 52 is made secure in any desired manner before the operator steps on the support 61. In its opening and closing movements the support 61 slides upon an upper steel rung 21¹ of the upper ladder section 4.

At the top of the upper ladder section 4 a safety belt loop 71 is provided. Also, insulators 72 are provided upon the strut bars 22 for the lower ladder section 3 and the strut bars 23 for the upper ladder section 4.

What we claim is:

1. For use with a ladder, the sub-combination of a ladder pivot and clamping means comprising, in combination with a support, a pivot bar mountable on the support, a clamp pivotally mountable on the ladder and having a projecting jaw on one side of its pivotal mounting and a tail piece upon the opposite side, springs normally holding the jaw in clamping position on the pivot bar, means for unclamping the jaw, a lug on the bar limiting the unclamping movement of the clamp when the jaw thereof has been pivotally moved to unclamping position, the tail piece of the clamp riding on the lugs to push the ladder and the clamp away from the pivot bar upon further movement of the unclamping means.

2. The sub-combination of a ladder pivot and clamping means set forth in claim 1 in which a ladder guide is provided having flaring opposed surface portions moving closely adjacent opposed sides of the pivot bar as the ladder moves relatively to the bar.

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Number	Name	Date
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1,899,742	Bay	Feb. 28, 1933
1,952,761	Larsen	Mar. 27, 1934
1,953,390	Bosch	Apr. 3, 1934
2,035,537	Cowan et al.	Mar. 31, 1936
2,245,481	Kiley et al.	June 10, 1941