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Ashworth

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[54] ACCESS EQUIPMENT

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[58] Field of Search 182/2, 129, 115, 63, 127; 182/67, 65

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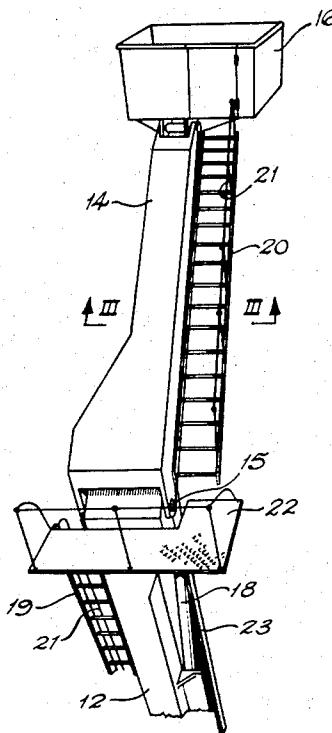
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[57]

ABSTRACT

Access equipment having an articulated boom structure comprising two or more booms pivoted end to end, the lowermost boom being pivotally mounted on a supporting structure such as a vehicle, the boom structure being movable between a stowed position wherein said booms are located adjacent the supporting structure and a working position wherein the free end of the boom structure is raised to an elevated position above the supporting structure, characterised by the provision of a ladder extending alongside each of a pair of adjacent booms, said ladders being arranged on opposite sides respectively of said pair of booms and there being a landing at the knuckle joint between said booms and extending between the two ladders so as to provide easily negotiable means for a person to pass from one ladder to the other.

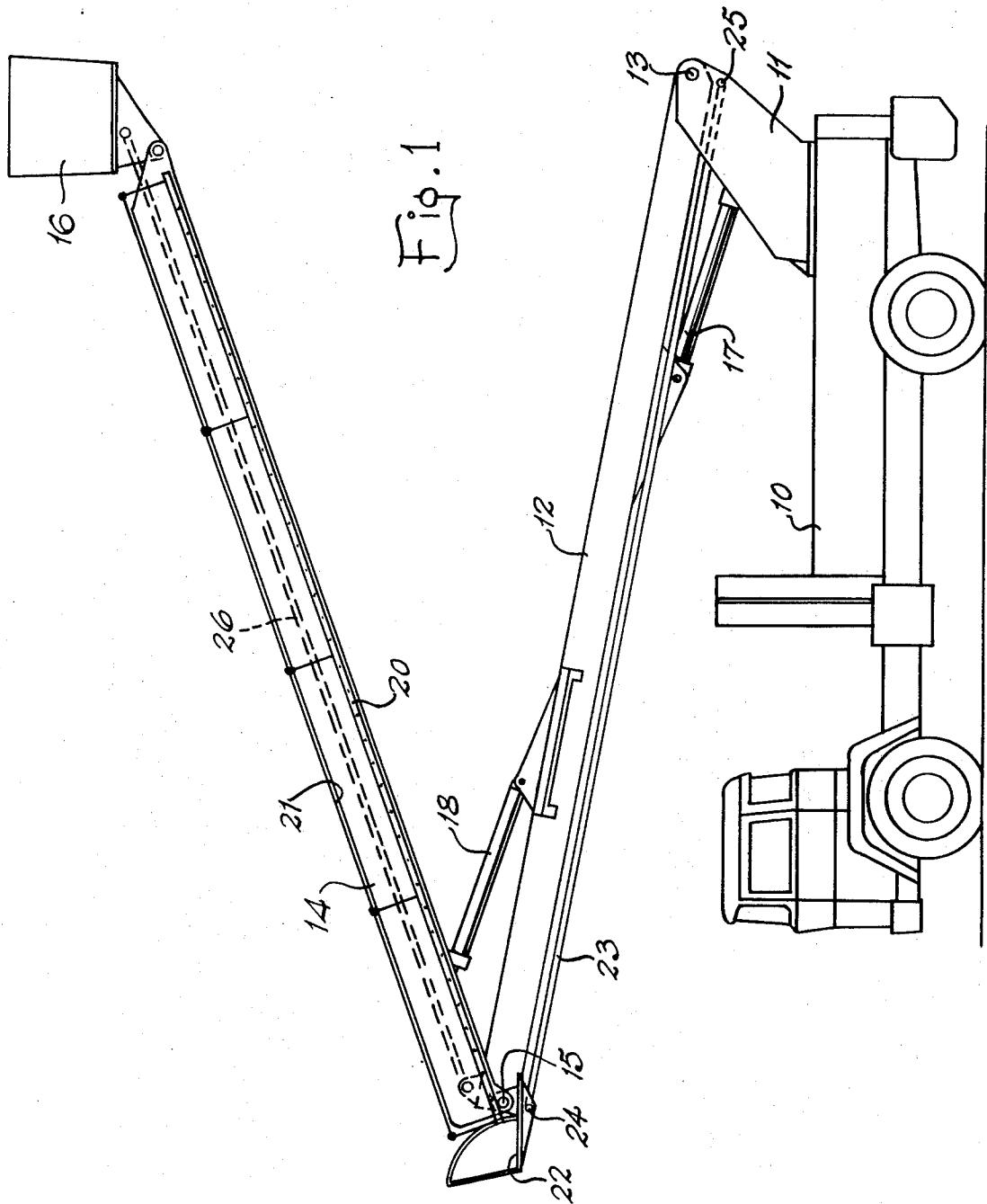
9 Claims, 4 Drawing Figures



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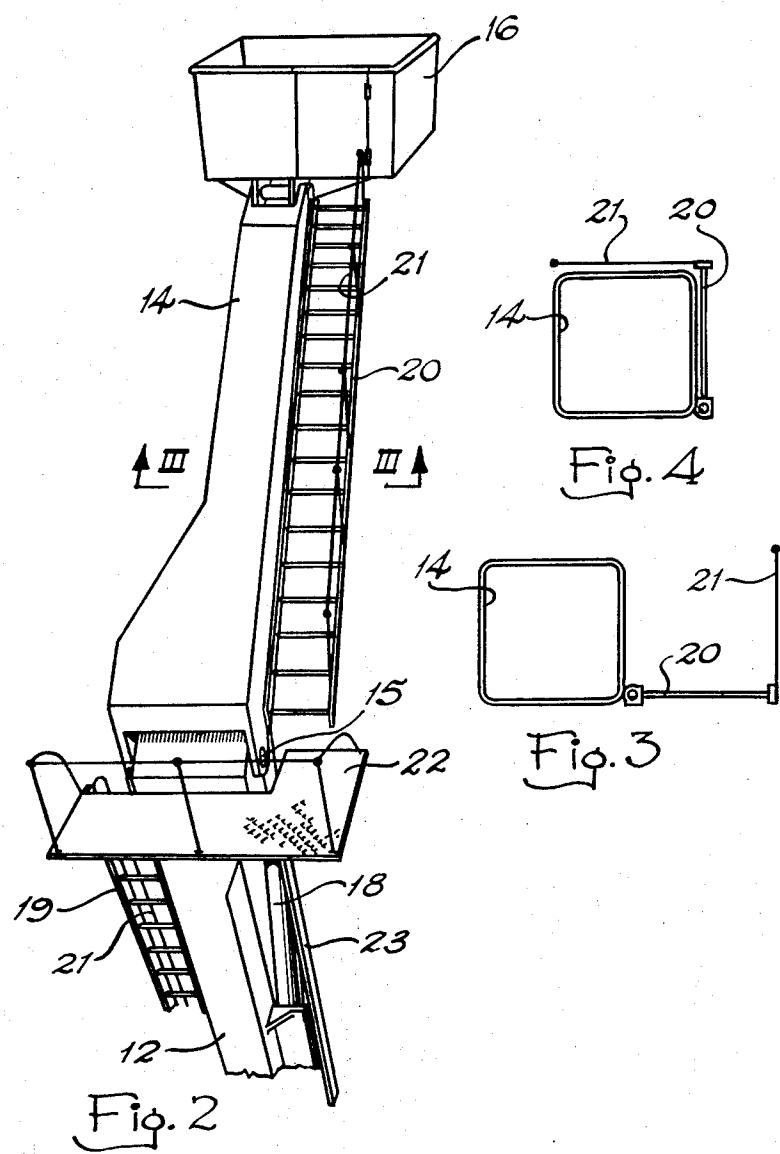
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ACCESS EQUIPMENT

This invention concerns access equipment of the kind (hereinafter termed of the kind referred to) having an articulated boom structure comprising two or more booms pivoted end to end, the lowermost boom being pivotally mounted on a supporting structure such as a vehicle, the boom structure being movable between a stowed position wherein said booms are located adjacent the supporting structure and a working position wherein the free end of the boom structure is raised to an elevated position above the supporting structure.

Access equipment of the kind referred to is frequently provided with a working platform or cage on the free end of the boom structure which can be manned by an operator or alternatively is provided with equipment on the free end of the boom structure which may require an operator's attendance from time to time.

Access equipment of the kind referred to is known wherein a ladder extends alongside each boom to serve as a continuous access or escape facility whereby personnel can climb up or down the boom structure between the free end thereof and the ground or other safe landing area, and whereby an operator can escape from the free end of the boom structure in the event of failure of the system used to lower same. The ladders are disposed on the same or opposite sides of adjacent booms.

A problem with such a ladder arrangement lies in the difficulty which is encountered in crossing over from one ladder to the next at the knuckle joint between adjacent booms. This is particularly prevalent with unskilled personnel and makes the ladder arrangement unsuitable for rescuing persons from a burning building for example. Such persons can, of course, be rescued by loading them into a cage at the free end of the boom structure and lowering the structure, but in many instances it is desirable to have a continuous escape facility as is provided by a conventional fire fighting ladder.

It is an object of the present invention to provide access equipment of the kind referred to which is equipped with ladders to provide a continuous escape facility and which overcomes the problem aforesaid.

According to the present invention access equipment of the kind referred to is characterised by the provision of a ladder extending alongside each of a pair of adjacent booms, said ladders being arranged on opposite sides respectively of said pair of booms and there being a landing at the knuckle joint between said booms and extending between the two ladders so as to provide easily negotiable means for a person to pass from one ladder to the other.

Preferably said landing forms part of or is connected with a parallelogram-type linkage whereby the landing is maintained level for any angular separation of the adjacent booms.

The invention will be further apparent from the following description, with reference to the several figures of the accompanying drawings which show, by way of example only, one form of access equipment of the kind referred to and embodying the invention.

Of the drawings:

FIG. 1 is a side elevation of the equipment;

FIG. 2 is a perspective view of part of the equipment of FIG. 1;

FIG. 3 is a cross section through the equipment on the line III—III of FIG. 2 and showing the ladder means in an operative position;

and FIG. 4 is a view similar to FIG. 2 but with the ladder means in a stowed position.

Referring now to the drawings, it will be seen that the equipment comprises a vehicle 10 having a turntable structure 11 mounted thereon which provides a supporting structure for a first boom 12 pivoted to the turntable structure 11 at 13. A second boom 14 is pivoted at 15 to the upper end of the first boom 12, and the free end of the boom 14 carries a working platform or cage 16 pivotally connected thereto.

Hydraulically operable cylinders 17 and 18 enable the first boom 12 to be pivoted with respect to the turntable 11 and the second boom 14 to be pivoted with respect to the first boom 12 respectively, whereby the cage 16 can be raised and lowered between an elevated working position and a stowed position adjacent the vehicle 10 when the booms 12 and 14 are disposed in parallel horizontal relationship overlying the vehicle 10.

25 Ladders 19 and 20 are provided and extend alongside the booms 12 and 14 respectively, each on the opposite side of the pair of booms from the other. Each ladder is hingedly connected along its length with its associated boom and provided with handrail means 21. 30 Thus each ladder can be folded between a working position (as shown in FIGS. 2 and 3) and a stowed position (as shown in FIG. 4) wherein the ladder and handrail means lie in juxtaposed relationship respectively with two sides of its associated boom.

35 A landing 22 providing easily negotiable means whereby a person may pass from one ladder to the other is connected with the boom structure at the knuckle joint between the booms 12 and 14. The landing 22 is pivotally connected with the boom 12 at 15. A rod 23 extends between the landing 22 and turntable structure 11 and is pivotally connected therewith at 24 and 25 respectively. The turntable structure 11, boom 12, rod 23 and landing 22 form a parallelogram-linkage (the points 15, 24, 13 and 25 being located at the corners of a parallelogram) whereby the landing 22 is maintained horizontally disposed throughout angular movement of the boom 12 relative to the turntable structure 11. A further parallelogram-linkage comprised by the boom 14, cage 16, landing 22 and connecting rod 26 serves to maintain the cage 16 level for any positions of the booms 12 and 14.

45 It will be seen therefore that the equipment provides readily negotiable means for personnel to climb between the cage and the vehicle when the cage is in an elevated position and more particularly provides a continuous escape facility for rescuing persons from elevated positions which can be used by all but infants, the aged, or the infirm.

50 It will be appreciated that it is not intended to limit the invention to the above example only, many variations such as might readily occur to one skilled in the art, being possible without departing from the scope thereof.

55 Thus, for example, the boom structure may comprise more than two booms, a ladder being provided for each boom and a landing being provided at the junction between each pair of ladders.

It will be understood that when the boom structure is mounted on a vehicle, the vehicle should be provided with extendable and retractable ground engaging jacks to give the necessary stability to the vehicle to support the boom structure in all of its elevated working positions.

What is claimed is:

1. Access equipment comprising a boom assembly wherein upper and lower booms are transversely pivotally interconnected at a knuckle joint, said booms being relatively movable about the pivot at said joint between a folded position and an extended position wherein said upper boom extends upwardly from an end of the lower boom, ladders mounted on and extending substantially the length of each boom, said ladders being disposed on opposite sides of the respective booms and having adjacent ends at said knuckle joint spaced apart transversely of the boom assembly, and means providing a landing mounted on said boom assembly at said knuckle joint extending transversely of the boom assembly substantially between the adjacent ladder ends whereby to provide easily negotiable access between said ladders in the extended position of said booms.

2. Access equipment as defined in claim 1, wherein said landing is pivotally mounted on said lower boom.

3. Access equipment as defined in claim 2, comprising a vehicle turntable on which the lower boom is pivoted at the end opposite said knuckle joint, and a rod pivotally connected at opposite ends between said turn-

table and said landing to form a parallelogram linkage system whereby said landing is maintained substantially level during relative angular movements of said booms.

4. Access equipment as defined in claim 1, wherein a working platform is pivotally mounted upon the free end of said upper boom adjacent the end of the ladder mounted on that boom.

5. Access equipment as defined in claim 4, comprising a parallelogram linkage system that includes said landing and is connected to said working platform whereby both said landing and said working platform are maintained substantially level for any relative angular positions of said booms.

6. Access equipment according to claim 1 wherein each of said ladders is provided with a handrail.

7. Access equipment according to claim 6 wherein each of said ladders is hingedly connected with its associated boom along its length whereby it can be folded between an operative position and a stowed position wherein the ladder and the handrail are juxtaposed with two sides of its associated boom respectively.

8. Apparatus according to claim 1 wherein the lowermost end of the boom structure is pivotally connected with a vehicle mounted turntable.

9. Access equipment as defined in claim 1, comprising a parallelogram linkage system that includes said landing as an element thereof whereby said landing is maintained substantially level for any relative angular positions of said booms.

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