April 22, 1952 E. E. ROBINSON 2,593,921

NOZZLE PIPE FOR USE WITH AERIAL LADDERS

Filed April 4, 1950

Fig. 1

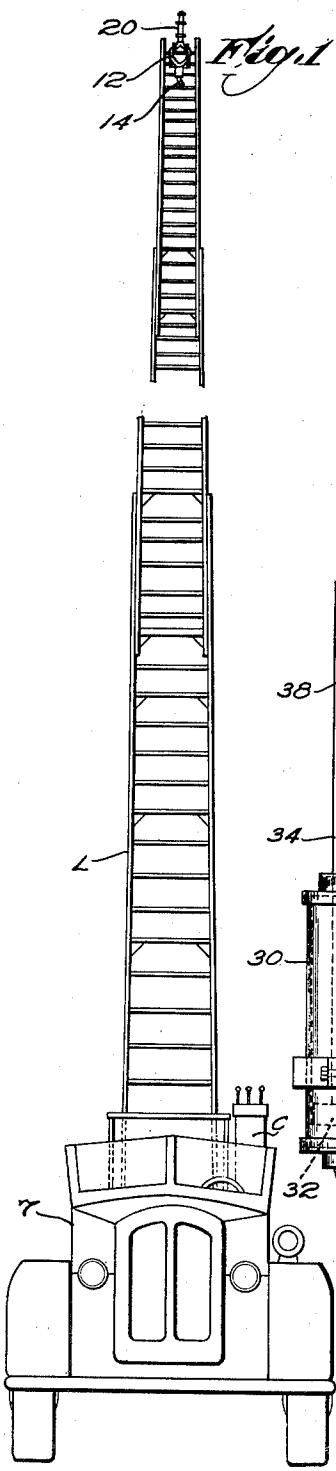


Fig. 2

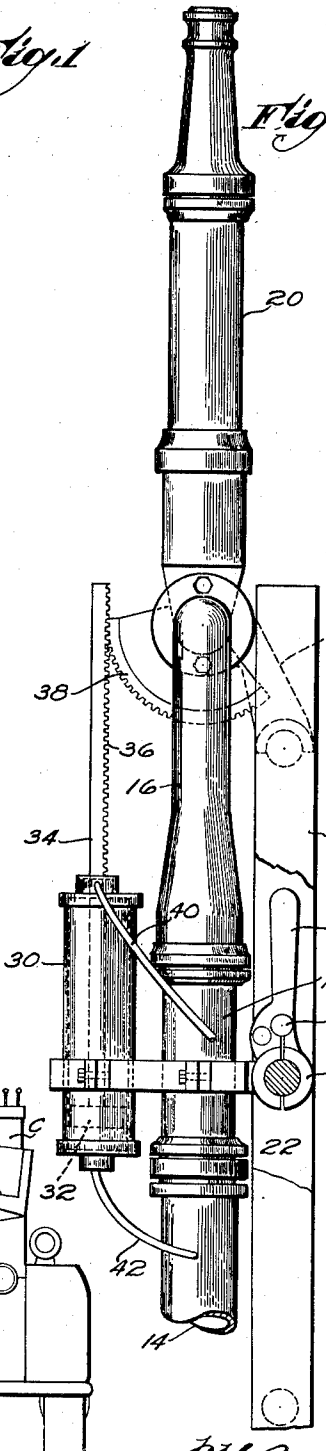


Fig. 3

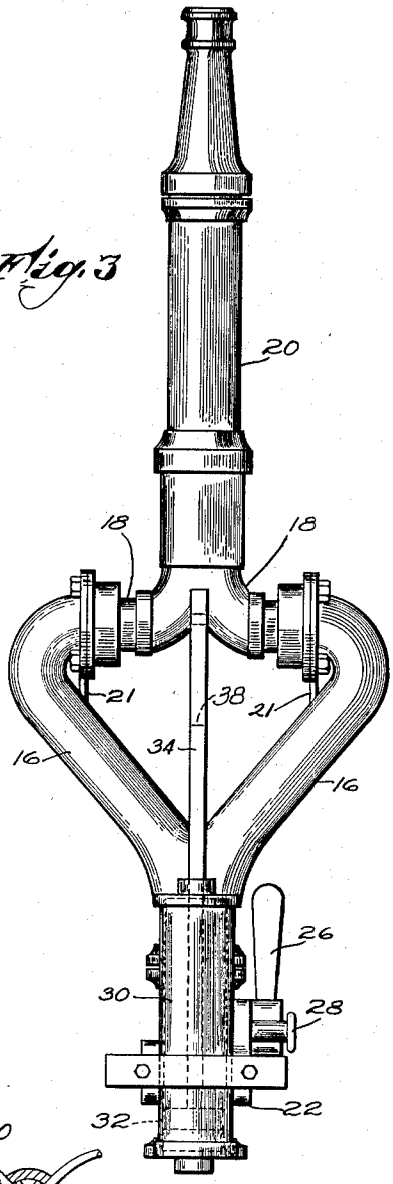
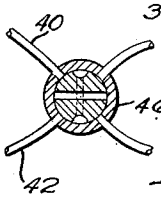


Fig. 4



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NOZZLE PIPE FOR USE WITH AERIAL LADDERS

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2 Claims. (Cl. 169—25)

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This invention relates to fire fighting equipment, and the object is to provide a demountable and portable mechanism for controlling and directing a stream of water, which may be quickly attached to or detached from the ladder of a so-called aerial ladder truck and which, when mounted on such a ladder, may be operated from the truck. When so used the truck operates in the manner of a so-called water tower.

My invention will be well understood by reference to the following description of the illustrative embodiment thereof shown by way of example in the accompanying drawings, wherein:

Fig. 1 is an end view of an aerial ladder truck with the ladder raised and supporting a device illustrative of the invention, a portion of the ladder being broken away;

Fig. 2 is a side view showing the upper portion of the ladder with the device in position;

Fig. 3 is an elevation of the parts as seen from the left of Fig. 2, the ladder being omitted; and

Fig. 4 is a diagrammatic view in section of a control valve.

In Fig. 1 of the drawings I have shown a truck T with the ladder L carried thereby in raised and extended position. Such a ladder is characteristically formed of a number of relatively sliding sections to permit its extension to a desired height and is mounted on a turntable. The extended ladder may be raised or lowered in the manner of a derrick boom and turned as occasion requires. The truck is provided with a hydraulic system for moving the ladder which may be operated from a suitable central station C on the truck. In Fig. 1 of the drawings a number of handles appear at the station C indicating the presence of the various controlling mechanisms.

Hose lines might of course be carried by such a ladder and operated from the end thereof by hand, as in the case of any other ladder. In accordance with my invention, I provide a nozzle mechanism which may be attached to the ladder either before or after it is raised and which in cooperation with the controlling means for positioning the extended ladder may itself be controlled from a remote point at the base of the ladder, desirably from control station C, so that the stream of water may be accurately directed to any desired spot.

Referring now to Figs. 2 and 3, the construction here shown comprises a generally Y-shaped yoke having a stem portion 12, to which a water-carrying hose or hoses 14 may be attached. The arm portions 16 of the yoke are inturned toward one another as best seen in Fig. 3 and between

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them is pivotally received the outwardly turned branch elbows 18 of the nozzle member 20, which is thus adapted to turn in a vertical plane viewing Figs. 1 and 2. In the example of the invention shown the range of this turning movement is through about 120°.

The pipe comprising the yoke and the nozzle is arranged to be demountably secured to spaced rungs of the ladder L and herein the flanges at the ends of the arms 16 have secured thereto brackets 21 having downwardly facing seats at their ends which may rest on and partially embrace one of the rungs of the ladder as best seen in Fig. 2. Secured at the lower portion of the stem 12 of the yoke is a clamp for embracing another rung of the ladder, the clamp herein embodying a half-round portion 22 to seat against the inner side of the rung and a complementary portion 24 pivoted thereto which may be swung by means of the handle 26 to the closed position of Fig. 2, the two members then embracing the rung. A spring pressed latch bolt 28 engages an extension of the part 16 of the clamp to maintain it in this locked position until the latch bolt is withdrawn and the handle 26 rocked counterclockwise viewing Fig. 2 to open the clamp.

Fixedly mounted on the stem portion 12 of the Y is a hydraulic cylinder 30, here shown as of the double-acting type, having extending from its piston 32 a rigid piston rod 34. The piston rod is positively connected to the nozzle member 20 to turn it about its pivotal axis, and herein the projecting end of the piston rod is formed as a rack 36 which meshes with a gear segment 38 mounted on the nozzle, concentric with the pivotal axis of the latter.

Flexible hose 40 and 42 extends from the ends of the cylinder 32 and the flow of motive fluid to either side of the piston may be controlled by a suitable valve 46 diagrammatically shown in Fig. 4. This valve may be located on the truck at the base of the ladder, conveniently at the control station C, and we may consider that one of the handles illustrated in Fig. 1 controls such a valve. Since the truck has a hydraulic system motive fluid for the cylinder 30 may be taken therefrom without the necessity of providing a separate pump.

For simplicity, in Fig. 4 the control valve 46 has been diagrammed as a valve of the rotary plug type and it is shown in the figure in neutral position. In this case the hydraulic fluid is locked in at either side of the piston 32 and the latter is held stationary and the nozzle 20 is maintained in the corresponding adjusted posi-

tion. When the valve is turned 45 degrees in one or the other direction from the position illustrated, motive fluid is admitted to one side or the other of the piston and permitted to exhaust from the opposite side. The resultant up or down movement of the piston, viewing Fig. 2, causes swinging movement of the nozzle **20**, clockwise or counterclockwise respectively. The slow powerful movement which may be effected by the hydraulic mechanism permits very accurate aiming of the water stream.

The hose **40** and **42** through which motive fluid is supplied may if desired be secured by detachable conduit couplings of known type, which prevent the escape of fluid when the couplings are detached.

The pipe and its hydraulic motor may be stored as any similar swivelled nozzle and put in position on the ladder by a simple manual operation involving a mere movement of superposition followed by a simple manual actuation of the clamp. The pipe may if necessary be carried up and mounted when the ladder has already been raised or extended. When it is mounted manipulation of the ladder brings it into adjacency to the desired point of operation and the exact direction of the stream may then be adjusted with great precision.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, as is in fact clear in several matters from the description itself. Reference is to be had to the appended claims to indicate those principles of the invention exemplified by the particular embodiment described and which I desire to secure by Letters Patent:

1. A demountable and portable pipe adapted for use with an aerial ladder truck comprising a Y-shaped yoke having a hose connection at the stem member thereof, a manually operable clamping mechanism on the yoke for securing it to spaced rungs of the ladder in substantially parallel relation to the plane of said rungs, a nozzle member pivotally received between the arms of the yoke, a double-acting hydraulic cylinder mounted on the stem portion of the yoke at its side which is remote from the ladder when secured by the clamping mechanism, the cylinder having a movable member positively connected to the nozzle member for turning the same, the cylinder having flexible-hose connections for supply of motive fluid thereto from remote fluid supply means on the truck under control of a suitable remote control valve.

2. A demountable and portable pipe adapted for use with an aerial ladder truck comprising a Y-shaped yoke having a hose connection at the stem member thereof, a manually operable clamping mechanism on the yoke for securing it to spaced rungs of the ladder in substantially parallel relation to the plane of said rungs, a nozzle member pivotally received between the arms of the yoke, a hydraulic cylinder mounted on the stem of the yoke at its side which is remote from the ladder when secured by the clamping mechanism, the cylinder having a movable member with a rigidly related axially translating rack, the nozzle member having a sector centered on its pivotal axis and meshing with the rack, the cylinder having flexible-hose connections for supply of motive fluid thereto from remote fluid supply means on the truck under control of a suitable remote control valve.

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