

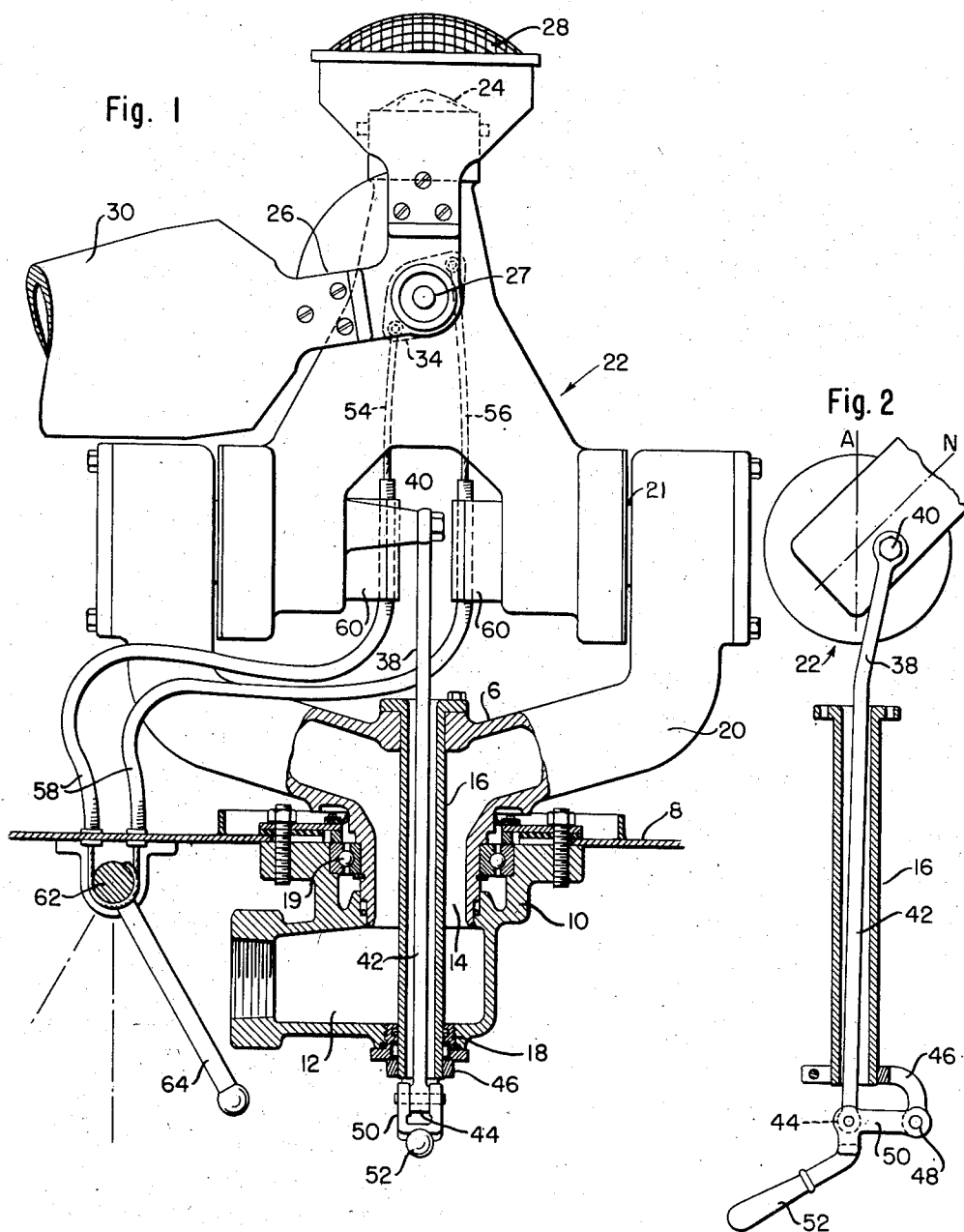
Jan. 4, 1955

H. G. FREEMAN

2,698,665

CONTROL APPARATUS FOR FIRE FIGHTING TURRETS

Filed Dec. 22, 1951



INVENTOR.
HOWARD G. FREEMAN
BY *Kenway Fenney*
Walter & Reddick
ATTORNEYS

1

2,698,665

CONTROL APPARATUS FOR FIRE-FIGHTING TURRETS

Howard G. Freeman, Worcester, Mass., assignor to Rockwood Sprinkler Company, Worcester, Mass., a corporation of Massachusetts

Application December 22, 1951, Serial No. 262,958

8 Claims. (Cl. 169—25)

The present invention relates to control apparatus for fire-fighting turrets.

In my copending applications, Serial Nos. 255,216 and 255,217 filed November 7, 1951, I have described certain types of fire-fighting turrets, particularly constructed for the handling of either streams of water or foam. The controls for training and elevating the nozzle and for shifting from water to foam are, as described in said applications, essentially hydraulic, although provision is made for mechanical operation in the event of failure of the automatic hydraulic system.

The principal object of the present invention is to provide a simple and readily operated turret control system in which the controls are essentially manual and mechanical.

With this object in view, the present invention comprises an arrangement whereby, with the use of a single handle, the nozzle may be turned in azimuth or elevated at the will of the operator. This construction is particularly useful for crash trucks wherein the turret is mounted on the roof of the truck and the operator may control the direction of the nozzle from his position in the cab. This construction is suitable for relatively light turrets as distinguished from those which are so heavy that power operation may be necessary.

A further feature of the invention consists in the use of pattern control apparatus which is also mechanically operated notwithstanding the position of the nozzle in azimuth or elevation. By pattern control I refer to means whereby the character of the discharge may be varied through the use of shaper devices that may be selectively placed in cooperation with the nozzle, as described in the application of John L. Wiik, Serial No. 259,421 filed December 1, 1951. Preferably, this consists of a double cable assembly whereby the shaper devices are actuated by tension on one cable or the other, as will hereinafter be described in detail.

In the accompanying drawings Fig. 1 is an elevation, partly in section, of the preferred apparatus according to the present invention and Fig. 2 is a detail sectional view of a part of the apparatus.

The illustrated embodiment of the invention comprises a turret body 6 adapted to be rotated about a vertical axis for training of the turret in azimuth. The body protrudes upwardly through the cab roof of the crash truck, the line of the roof being indicated at 8. A frame 10 which extends downwardly into the cab serves as a support for the body, the frame having a liquid inlet 12 connecting with the central passageway 14 of the body. A rotary control tube 16 is secured at its upper end to the body 6 and extends downwardly through the water passage 14 and the liquid inlet member 12, the bottom of the tube terminating slightly below the surfaces of the member 12. The tube rotates within a bearing member 18 secured in the member 12. The body is journaled in ball bearings 19 in the frame. Suitable seals are provided against leakage of liquid, but are not specifically described.

The body is provided with the usual flaring arms, one of which is indicated at 20, the arms having water passages branching from the passage 14 in the usual manner. The arms 20 carry bearing members 21 at their upper ends to support the nozzle member 22. The nozzle member is journaled for rotation about the horizontal axis of the bearings whereby it may be positioned in elevation. The nozzle member has suitably sealed water passages connecting with the passages in the arms 20,

2

whereby water or other fire-fighting liquid is passed through the body to the nozzle member. The member 22 terminates in a suitable discharge device shown as a fog nozzle head 24 of the type described in detail in my Patent 2,302,021 dated November 17, 1942. Also the nozzle body as described in said application preferably carries a cradle 26 suitably pivoted at 27 on the nozzle member, whereby either a shaper screen 28 or a shaper tube 30 may be selectively placed in front of the nozzle 24. The particular manner of mounting the cradle is shown in the above-mentioned copending application of John L. Wiik, and the particular construction is not described in detail here. The cradle is provided at one side with a bracket 34 to which the operating connections are made as will be hereinafter described.

The controls for the apparatus will now be described. A link 38 is pivotally connected at 40 to the rear of the nozzle member 22. The link has a straight portion 42 which extends completely through the tube 16. Since the turret construction is preferably such that the axis of the tube intersects the elevation axis of the nozzle member, the link is bent slightly above the tube in order to make the connection 40 at a suitable point. It will be seen from Fig. 2 that the connection must always be displaced from the elevation axis for all possible positions of the nozzle, in order that a moment arm will be available. In Fig. 2, the azimuth axis A and the nozzle axis N are shown, the elevation axis being perpendicular to both A and N and passing through their intersection. As shown in Fig. 2, the connection 40 is forward of the elevation axis and is below the nozzle axis. Even when the nozzle member is raised to a vertical position (as in Fig. 1) or perhaps slightly beyond the vertical, the point 40 will lie forward of the elevation axis and thus provide a moment arm for lowering of the nozzle.

At its lower end the link carries a bearing 44. A bracket 46 is secured to the bottom end of the tube and formed at its lower end with a bearing 48. A lever 50 is pivoted both on the bearing 48 and the bearing 44 and it carries at its outer end a handle 52. This handle serves for operating the nozzle both in azimuth and elevation.

To turn the nozzle in azimuth it is only necessary to turn the handle 52. This operates through the bracket 46 to turn the tube 16 which by its connection at its upper end to the body 6 turns the body and with it the nozzle to any desired position. Elevation of the nozzle is effected by raising or lowering the handle 52 which by pushing or pulling on the link 38 acts through the pivot 40 to turn the nozzle about its elevation axis. By reason of the pivotal connections 44 and 48, the azimuth and elevation movements may be controlled independently through the same handle 52. It is desirable that the nozzle member be counterbalanced in order that the operator may not be under the necessity to hold the nozzle in any particular elevation through the medium of the handle alone. To this end the spring counterbalance mechanism described in my copending application, Serial No. 262,959 filed December 22, 1951, is preferred.

The pattern control is effected by flexible wire cables, preferably of the enclosed type, as for example, Bowden wires. These are shown as two lengths of flexible wire 54 and 56, which are connected respectively to the bracket 34 of the cradle 26. The wires are enclosed in flexible sheaths 58 leading from the cab roof nearly to the bracket 34. The outer ends of the sheaths may be secured by suitable clips 60 on the nozzle body 22. The wires are secured at their lower ends to a cylinder 62 connected with a handle 64 inside the cab, whereby tension may be applied to one wire or the other.

The wires 54 and 56 must be sufficiently flexible to accommodate the full azimuth and elevation movements of the nozzle body without allowing such movements to affect the cradle. The nozzle is movable in elevation slightly more than 90° and may be movable in azimuth up to about 300°. This requires considerable flexibility in the sheaths 58, as well as in the cables, and hence requires that the cables be operable in tension only. Therefore two cables are used, whereby one or the other is in tension to turn the bracket 34, whereby the cradle may

be shifted to any one of its three positions. As shown in Fig. 1, the screen 28 is positioned in front of the head 24. On motion of the cradle about 45°, the discharge from the head is unimpeded, and on motion of about another 45°, the shaper tube 30 is disposed in front of the head. The head alone is generally used with water alone, while the screen 28 is used with foam to produce a "fog-foam," and the shaper 30 is used to produce a stream of fog.

Having thus disclosed my invention, I claim:

1. A fire-fighting turret comprising a body member, means for mounting the body for rotation in azimuth, a nozzle member journaled on the body for rotation in elevation, communicating liquid passages in the body member and nozzle member, a tube on which the body member is mounted and extending along the azimuth axis, pattern control means associated with the nozzle for controlling the pattern of fire fighting material discharged from the nozzle, a link passing through the tube and connected with the nozzle member at a point displaced from the elevation axis for any position of the nozzle, a handle connected with the tube and link for independently turning the body in azimuth and the nozzle member in elevation, and dual flexible cable means for operating the pattern control means independently of the position of the body member and nozzle member.

2. A fire-fighting turret comprising a body member, means for mounting the body for rotation in azimuth, a nozzle member journaled on the body for rotation in elevation, communicating liquid passages in the body member and nozzle member, a tube on which the body member is mounted and extending along the azimuth axis, pattern control means associated with the nozzle for controlling the pattern of fire fighting material discharged from the nozzle, a link passing through the tube and connected with the nozzle member at a point displaced from the elevation axis for any position of the nozzle, a bracket connected with the tube at the lower end, a handle pivotally connected to both the bracket and the link for independently turning the body in azimuth and the nozzle member in elevation, and dual flexible cable means for operating the pattern control means independently of the position of the body member and nozzle member.

3. A fire-fighting turret comprising a body member, means for mounting the body for rotation in azimuth, a nozzle member journaled on the body for rotation in elevation, communicating liquid passages in the body member and nozzle member, a tube on which the body member is mounted and extending along the azimuth axis, a link passing through the tube and connected with the nozzle member at a point displaced from the elevation axis for any position of the nozzle, a pivoted cradle, pattern control devices on the cradle, a handle connected with the tube and link for turning the body and nozzle member, and dual flexible cable means operating in tension to operate the cradle regardless of the positions of the body member and nozzle member.

4. A fire-fighting turret comprising a body member, means for mounting the body for rotation in azimuth, a nozzle member journaled on the body for rotation in elevation, communicating liquid passages in the body member and nozzle member, a tube on which the body member is mounted and extending along the azimuth axis, a link passing through the tube and connected with the nozzle member at a point displaced from the elevation axis for any position of the nozzle, a pivoted cradle, pattern control devices on the cradle to be selectively associated with the nozzle member, a handle connected with the tube and link for turning the body and nozzle member, and dual flexible cable means operating in tension to operate the cradle regardless of the positions of the body member and nozzle member.

5. A fire-fighting turret comprising a body member, means for mounting the body for rotation in azimuth, a nozzle member journaled on the body for rotation in elevation, communicating liquid passages in the body mem-

ber and nozzle member, a tube on which the body member is mounted and extending along the azimuth axis, a link passing through the tube and connected with the nozzle member at a point displaced from the elevation axis for any position of the nozzle, a pivoted cradle, pattern control devices on the cradle to be selectively associated with the nozzle member, a bracket connected with the tube at the lower end, a handle pivotally connected to both the bracket and the link for independently turning the body member in azimuth and the nozzle member in elevation, and dual flexible cable means operating in tension to operate the cradle regardless of the positions of the body member and nozzle member.

6. A fire-fighting turret comprising a body member, means for mounting the body for rotation in azimuth, a nozzle member journaled on the body for rotation in elevation, communicating liquid passages in the body member and nozzle member, a tube on which the body member is mounted and extending along the azimuth axis, a link passing through the tube and connected with the nozzle member at a point displaced from the elevation axis for any position of the nozzle, a pivoted cradle, pattern control devices on the cradle to be selectively associated with the nozzle member, a handle connected with the tube and link for turning the body and nozzle member, a bracket secured to the cradle, and dual flexible cable means secured to the bracket and operating in tension to operate the cradle from a remote position regardless of the positions of the body member and nozzle member.

7. A fire-fighting turret comprising a body member, means for mounting the body for rotation in azimuth, a nozzle member journaled on the body for rotation in elevation, communicating liquid passages in the body member and nozzle member, a tube on which the body member is mounted and extending along the azimuth axis, a link passing through the tube and connected with the nozzle member at a point displaced from the elevation axis for any position of the nozzle, a pivoted cradle, pattern control devices on the cradle to be selectively associated with the nozzle member, a handle connected with the tube and link for turning the body and nozzle member, a bracket secured to the cradle, a pair of flexible cables secured to the bracket in diametrical relation to operate the cradle from a remote position regardless of the positions of the body member and nozzle member, said operation being produced by tension in a selected cable substantially unaffected by the other cable.

8. A fire-fighting turret comprising a body member, means for mounting the body for rotation in azimuth, a nozzle member journaled on the body member for rotation in elevation, communicating liquid passages in the body member and nozzle member, a tube secured to the body member coaxially with the azimuth axis, a bracket secured to the tube to provide a horizontal pivot axis displaced from the azimuth axis, pattern control means associated with the nozzle for controlling the pattern of fire fighting material discharged from the nozzle, a handle secured at one end to the bracket to rotate in said pivot axis and provided at the other end with a grip, a link passing through the tube, said link being pivotally connected at one end with the nozzle member at a point displaced from the elevation axis for any position of the nozzle and at the other end with the handle at a point intermediate of the grip and said pivot axis, and dual flexible cable means for operating the pattern control means independently of the position of the body member and nozzle member.

References Cited in the file of this patent

UNITED STATES PATENTS

927,837	Delene	July 13, 1909
1,644,972	Zeitter	Oct. 11, 1927
2,082,330	Frede	June 1, 1937
2,240,392	Dowell	Apr. 29, 1941
2,507,668	Hamilton	May 16, 1950