July 30, 1940. A. G. SHEPPARD 2,209,666

FIRE ENGINE

Filed Aug. 26, 1938 6 Sheets-Sheet 1

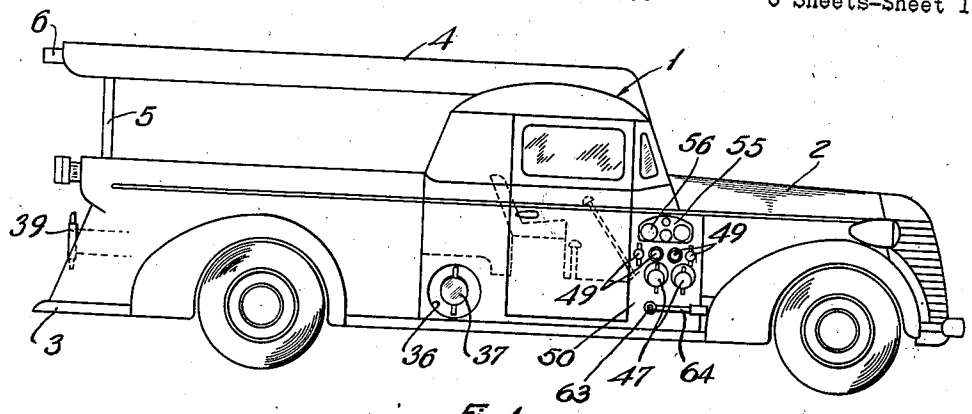


Fig. 1.

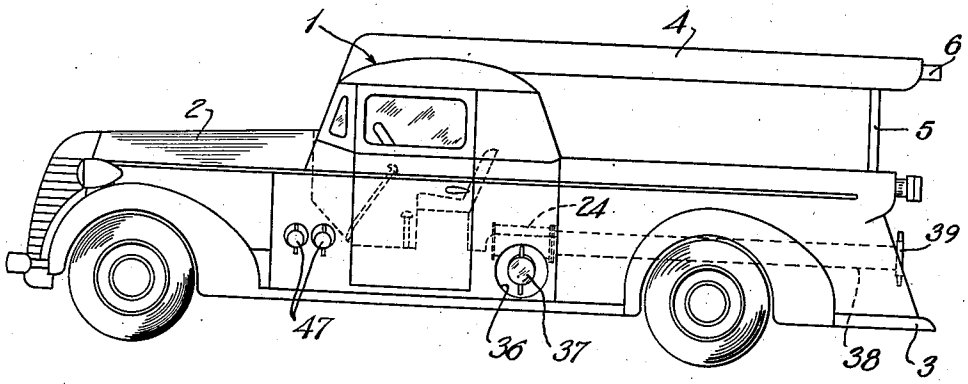


Fig. 2.

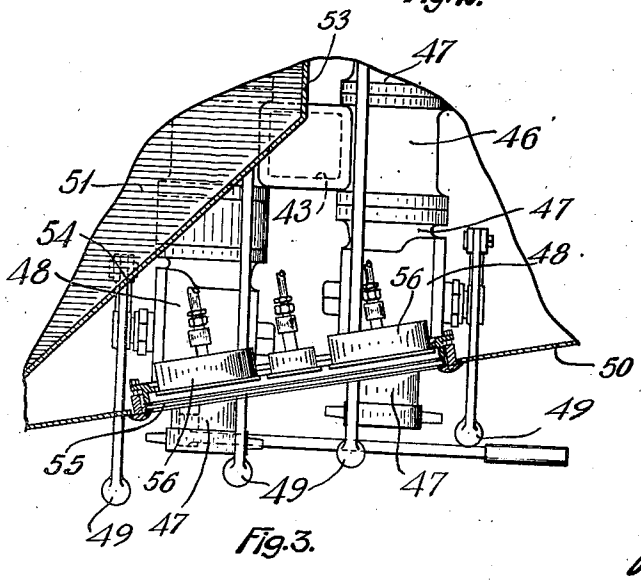


Fig. 3.

INVENTOR.
Allan G. Sheppard
ATTORNEYS.

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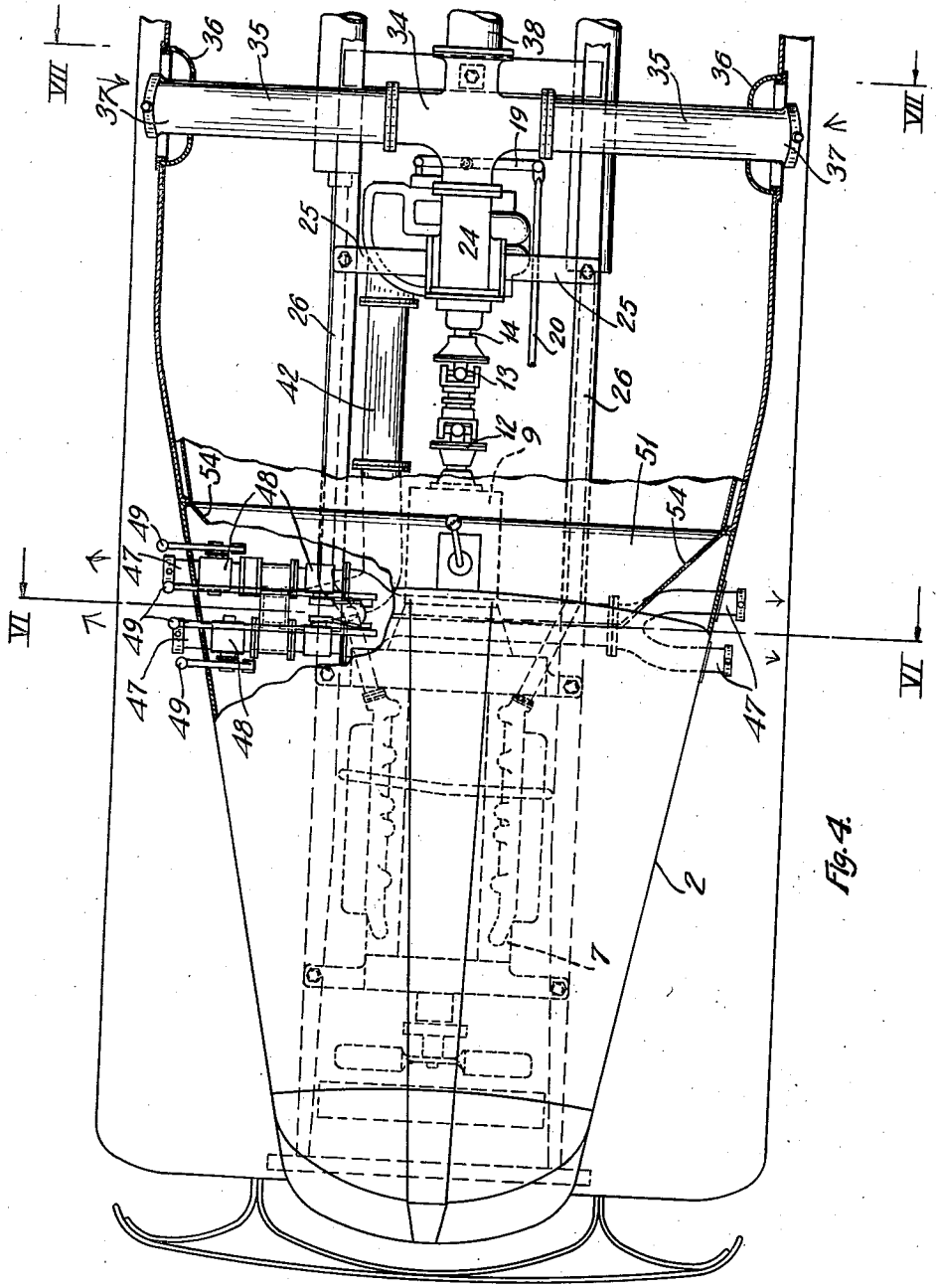


Fig. 4.

INVENTOR.
Allan G. Sheppard
BY
Hoffman, Kimball & Hayden
ATTORNEYS.

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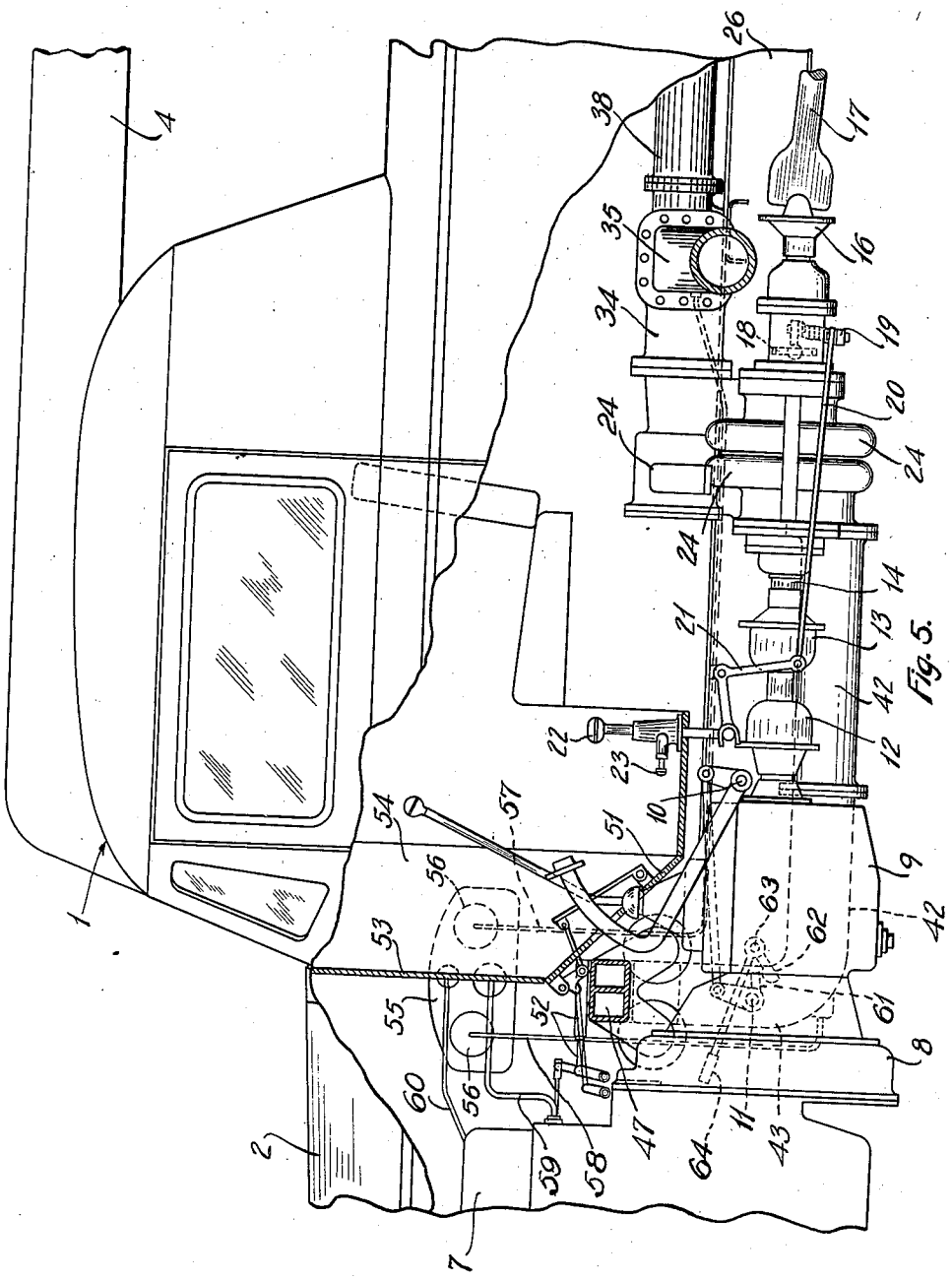


Fig. 5.

INVENTOR.
Albert G. Sheppard
BY Fay, Kimball & Hyde
ATTORNEYS.

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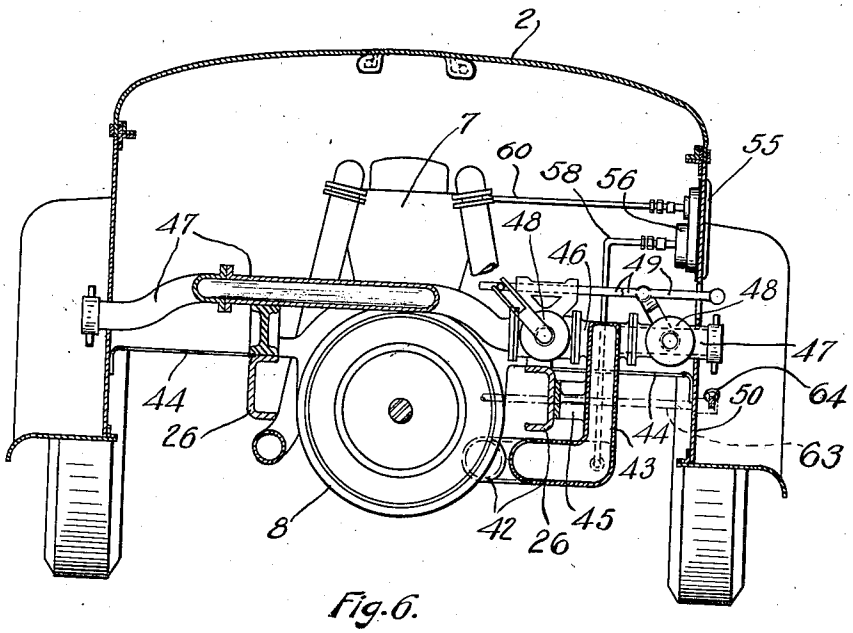


Fig. 6.

INVENTOR.
Allan G. Sheppard
BY Fleming Kimball & Eggleston
ATTORNEYS.

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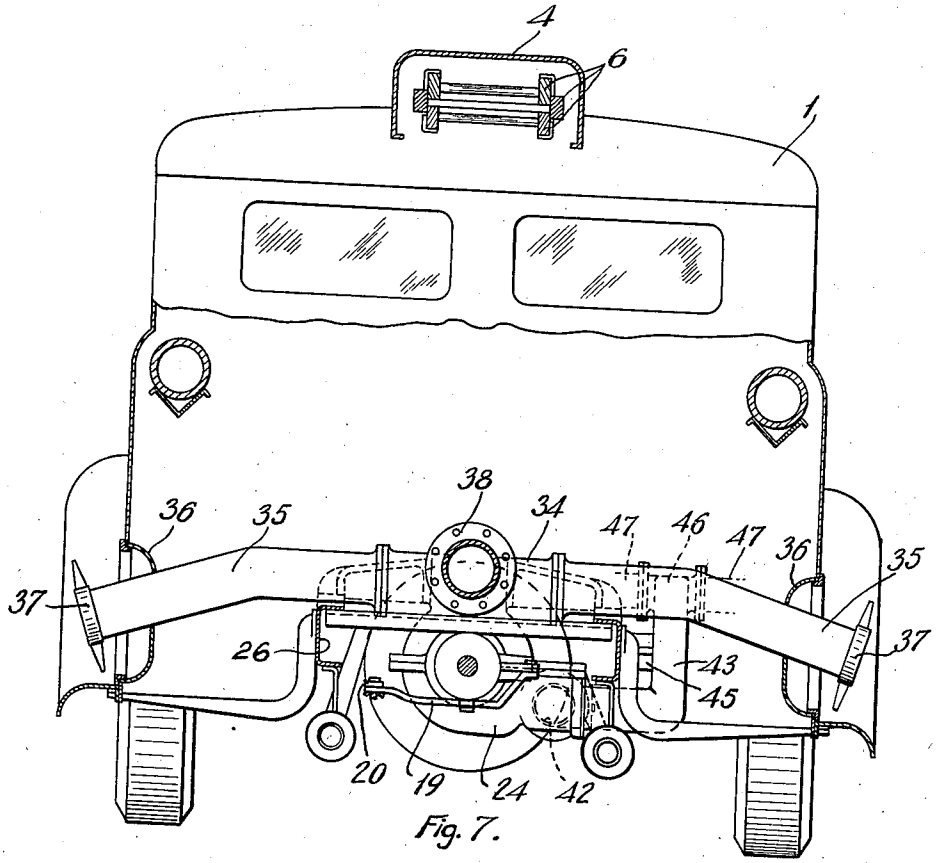


Fig. 7.

INVENTOR.
Alden G. Sheppard
BY Jeffery Kinkaid & Eggleston
ATTORNEYS.

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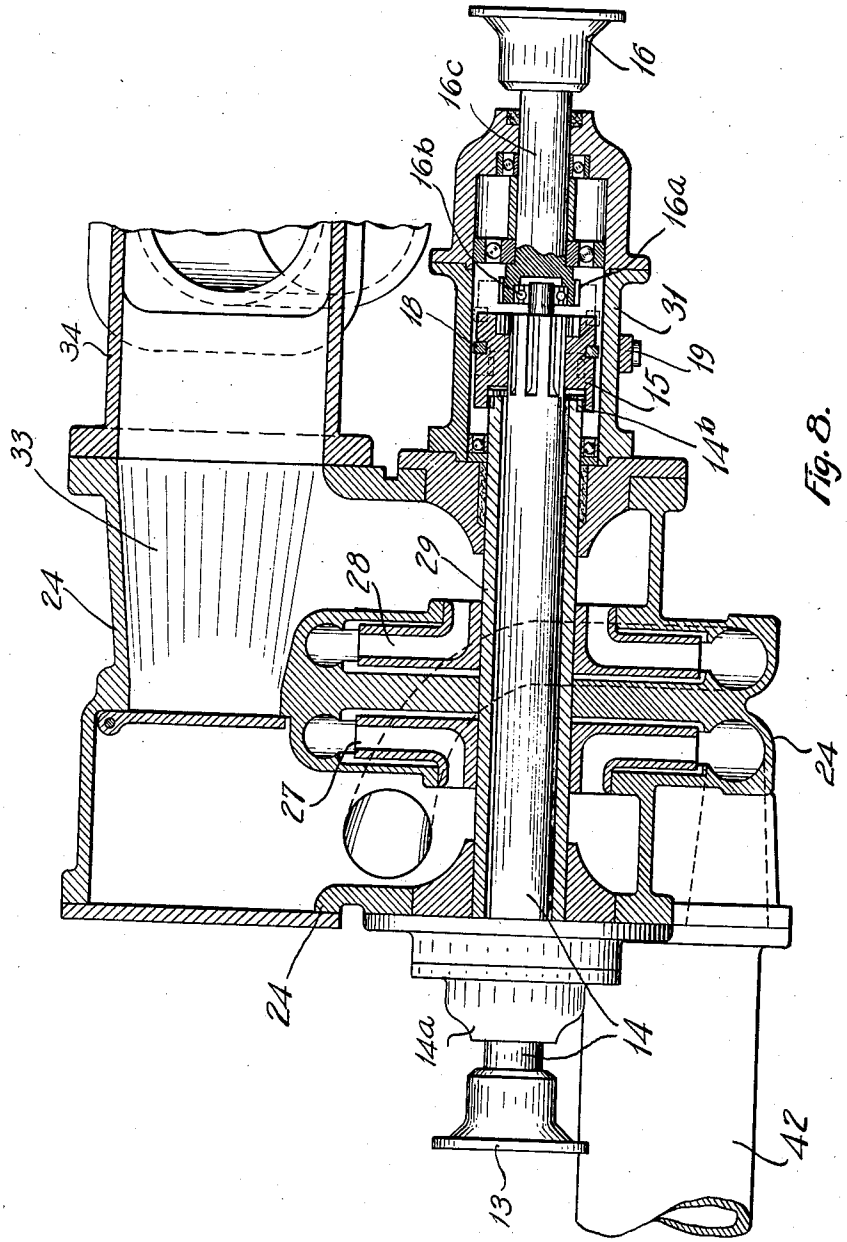


Fig. 8.

INVENTOR.
Allan G. Sheppard
BY Jeffery Kinkaid & Eggleston
ATTORNEYS.

Patented July 30, 1940 2,209,666

UNITED STATES PATENT OFFICE

2,209,666

FIRE ENGINE

Allan G. Sheppard, Elmira, N. Y., assignor to American - LaFrance - Foamite Corporation, Elmira, N. Y., a corporation of New York

Application August 26, 1938, Serial No. 226,907

2 Claims. (Cl. 169—24)

The invention relates to improved motor-driven fire engines or motor pumpers and has to do with the general structure and mode of operation thereof whereby particular advantages and conveniences are obtained as will be observed by those skilled in this art from the description which follows.

The new fire engine in its preferred form is shown in the drawings whereof Figs. 1 and 2 are respectively right hand and left hand elevations;

Fig. 3 is a detail horizontal section of the discharge gate and gauge panel mechanism;

Fig. 4 is a top plan of the forward part of the vehicle with parts broken out;

Fig. 5 is a side elevation of parts of Fig. 4, partly in section;

Fig. 6 is a cross section of the vehicle on line VI—VI of Fig. 4;

Fig. 7 is a similar cross section on line VII—VII of Fig. 4; and

Fig. 8 is a larger scale vertical longitudinal section of the fire pump.

Referring to Figs. 1 and 2, the vehicle has its driver's seat location in a cab 1 about midway of the wheel base, the engine being in front, enclosed as customary under a cowl and hooded structure marked 2 and the body or tonneau being extended rearwards of the rear wheels where it is provided with an entrance step 3. A ladder compartment 4 is supported on the roof of the cab and on rear stanchions 5. Ladders 6 set in this compartment are protected against the elements but can be readily pulled out by a fireman standing on the rear step.

Referring more particularly to Figs. 4 and 5, the propelling engine, which is also the pumping engine, is marked 7 supported on the vehicle frame in any suitable way and includes the usual fly wheel and clutch case 8 (Fig. 5) and transmission box 9 which latter may be constructed as usual except that the clutch pedal (shown only in Fig. 5) is fulcrumed at 10 at the rear of the transmission box and operates the clutch shaft 11 by a linkage connection as shown in Fig. 5.

Engine power is transmitted to the rear driving wheels from the transmission 9 through two universal joints 12 and 13, the pump shaft 14 (see also Fig. 8) a second clutch or pump clutch 15 and a third universal 16 to the propeller shaft proper 17. For vehicle propulsion, the clutch 15, which is splined on the rear end of the pump shaft 14, is shifted to its closed position shown by dotted lines in Fig. 8. Through the teeth 16a engaging with the internal teeth on the right hand end of the clutch, the pump shaft 14 becomes connected to the shaft section of the rear universal 16. The construction will be clear from Fig. 8.

The shifting is done by a clutch fork 18 through a lever 19 fulcrumed on the bottom of the clutch housing, a link rod 20, bell crank 21, and a plunger rod 22. When this rod is pulled upwardly, it closes the clutch 15 and the clutch teeth 16A so that engine power is transmitted to the propeller shaft and thence to the rear wheels in the usual manner. A latch 23 on the plunger casing serves to lock the clutch in one position or the other.

The pump shaft 14 is journalled in a bearing 14a at the forward end of the pump housing 24 and at its rear end in a bearing 16b formed in the end of the shaft section 16c which in turn is supported on the rear end of the pump casing.

The pump is of the centrifugal type supported by bracket 25 (Fig. 4) on the side girders 26 of the vehicle frame. In the case illustrated, it is a double impeller pump having impellers marked 27 and 28 fixed to a sleeve shaft 29 journalled front and rear in the pump casing. The pump shaft 14 above referred to passes centrally through this pump sleeve which is provided with splined teeth 14b at its rear end, where it projects into the clutch housing 31, adapted to be engaged by corresponding internal teeth on the front end of the clutch 15. After the clutch 15 has been disengaged from its propeller shaft connection, it can be caused to engage the pump sleeve 29 thereby constituting a direct drive from the engine through the pump shaft 14 to the pump. It may have a middle position in which the drive is interrupted both to the pump and the propeller shaft as desired.

The fire pump is located on the vehicle frame just in the rear of the driver's seat and draws its water through a suction chamber 33 and a suction head 34 located at its upper side and having three arms or branches, of which the two which are marked 35 are lateral branches extending one to each side of the vehicle into recessed pockets 36 in the vehicle side wall where they are provided with the usual suction couplings 37. The third branch 38 extends directly to the rear of the vehicle just above the rear entrance step 39 where it is also provided with a suction coupling 39. Thus the pump can be connected to a water source on either side or at the rear of the vehicle as circumstances may require.

The fire pump shown is intended to have its impellers work in multiple or in series for which reason it is to be understood as provided with

the necessary change-over mechanism and control, only parts of which are shown in the drawings. This mechanism is well known and has no direct relation to this invention.

Whether set for operating in multiple or in two stages, the water is delivered from the pump through a horizontal pressure conduit **42** situated at one side of the power transmission line at a level slightly below the frame side girders and extending forwardly to a point adjacent the motor casing **8** where it turns outwardly of the side girder **26** and thence extends vertically upwards as a riser **43** to a point above the sod pan **44** which represents the floor of the engine compartment. The riser is attached to the side girder by a bracket **45** (Fig. 6) and is connected at its upper end with a distribution head **46** (see also Fig. 3) to which are connected two pairs of laterally extending discharge conduits **47** one pair extending to the right of the vehicle and one pair to the left and each controlled by a discharge gate **48** and terminating in a hose coupling for connection to the hose lines as will be understood. The two conduits **47** which extend to the left of the vehicle are formed as a single twin conduit structure as shown by Fig. 5, being forked at its end to form separated couplings for the hose lines. As shown in Fig. 6, the twin structure is arched over the fly wheel casing **8**, being situated in the space above that casing and below the toe board of the cab. The two right hand discharge conduits **47** are individual pipe sections. The four gate valves **48** are respectively provided with operating pull rods **49**, all of which extend horizontally through the side cowling **50** of the engine compartment.

The normal engine controls, used in the driving of the vehicle and indicated generally by **52**, pass over the left hand twin discharge conduits. The toe board **51** of the driver's cab extends upward from the cab floor to a point of junction with the lower edge of the dash partition **53**. According to this invention, the ends of the toe board and dash partitions are connected with or meet the front edges of two inclined cab walls **54** thus to form the foot room space for the occupants of the cab. The inward inclination of the walls **54** does not materially reduce the foot room space but does provide a space in the nature of a rear extension of the engine compartment to accommodate the discharge gate mechanism and parts appertinent thereto and more particularly the gauge panel **55** which is let into an opening in the cowling **50** directly above the gate-operating handles **49**. In this position, the several gauges **56** carried by the gauge panel project at their rear sides into the warmth of the engine and are thereby protected against freezing, including their several tube connections to the different parts of the system. These are shown diagrammatically in Fig. 5 at **57**, **58**, **59** and **60**.

It is found that there is little tendency for the pump to freeze, or become injured if freezing should accidentally occur, because in the first place the pump is of the centrifugal type and in the second place because it works in the hot draft of the engine fan, usually operating when the apparatus is outside of the fire house. The location of the fire pump amidship of the vehicle frame, so that its lateral suction tubes are in the rear of the cab door, or the entrance to the driver's seat, and spaced several feet rearwardly of the discharge conduits **47** and the hose lines connected thereto represents a desirable assembly in that when the engine is at work the operator can easily step over such suction tubes or hose lines when necessary. This is not easily done when the suction tubes are located directly beneath the hose lines as in prior constructions. The operator may thus pass quickly from the front to the rear of the vehicle as contingencies may require which is an important advantage. Moreover, this location of the suction conduits, spaced away from the discharge conduits instead of being under them, allows for the location of the manual engine clutch in this position so that the operator when standing on the ground in view of the gauge panel, which is his normal station, can readily use it. The clutch shaft **11** (Fig. 5) is provided with a short arm **61** engaged by another arm **62** on a shaft **63** which extends horizontally to the outside of the cowling wall **50** where it is furnished with a manual lever arm **64**. It will be seen that pulling up on this arm opens the motor clutch and thus allows the operator to disconnect the power from the pump whenever necessary.

It will be understood that the vehicle is also supplied with various other incidental and necessary appurtenances which have been omitted from the drawings because they will be readily supplied and are not directly related to the purposes of the invention.

I claim:

1. In a vehicular fire engine of the motor pumper type having a wheel carried frame, means defining a substantially enclosed motor space on the forward end of said frame including a hood and a dash partition, a motor within said space, a transmission line extending rearwardly from and operatively connected to said motor, and a fire pump located midway of said frame and adapted to be driven by said motor, the improvement which comprises a dash partition which is substantially at right angles to the longitudinal axis of said fire engine throughout a substantial portion of its width and height but is slanted toward the rear for a substantial distance adjacent the vertical sides thereof to define in cooperation with said hood a partially enclosed space forming part of said motor space and adapted to be heated by the air passing through said motor space, said dash partition being also slanted toward the rear of said fire engine for a substantial portion of the lower edge thereof to form a toeboard and deflector to direct said air passing through said motor space toward said fire pump, intake conduits connecting said pump with intake ports on the exterior of said fire engine at points situated not substantially forward of said fire pump, said intake conduits being adapted to be warmed by air passing from said motor space, a discharge conduit extending from the discharge of said fire pump forwardly through a portion of said motor space to discharge ports in that portion of said hood adjacent said dash partition, said discharge conduit being in the neighborhood of and adapted to be warmed by an exhaust from said motor throughout a substantial portion of the length thereof, and gauges mounted in the hood above said discharge ports, whereby freezing of said pump, conduits and gauges is inhibited when said motor is in operation.

2. In a vehicular fire engine of the motor pumper type having a wheel carried frame, means defining a substantially enclosed motor space on the forward end of said frame including a hood and a dash partition, a motor within said space, a transmission line extending rearwardly from and operatively connected to said

motor, and a fire pump located midway of said frame and adapted to be driven by said motor, the improvement which comprises a dash partition which is substantially at right angles to the longitudinal axis of said fire engine throughout a substantial portion of its width and height to define in cooperation with said hood a space forming part of said motor space and adapted to be heated by the air passing through said motor space, said dash partition being slanted toward the rear of said fire engine for a substantial portion of the lower edge thereof to form a toeboard and deflector to direct said air passing through said motor space toward said fire pump, intake conduits connecting said pump with intake ports on the exterior of said fire engine at points situated not substantially forward of said fire pump, said intake conduits being adapted to be warmed by air passing from said motor space, a discharge conduit extending from the discharge of said fire pump forwardly through a portion of said motor space to discharge ports in that portion of said hood adjacent said dash partition, said discharge conduit being in the neighborhood of and adapted to be warmed by an exhaust from said motor throughout a substantial portion of the length thereof, and gauges mounted in the hood above said discharge ports, whereby freezing of said pump, conduits and gauges is inhibited when said motor is in operation.

ALLAN G. SHEPPARD.