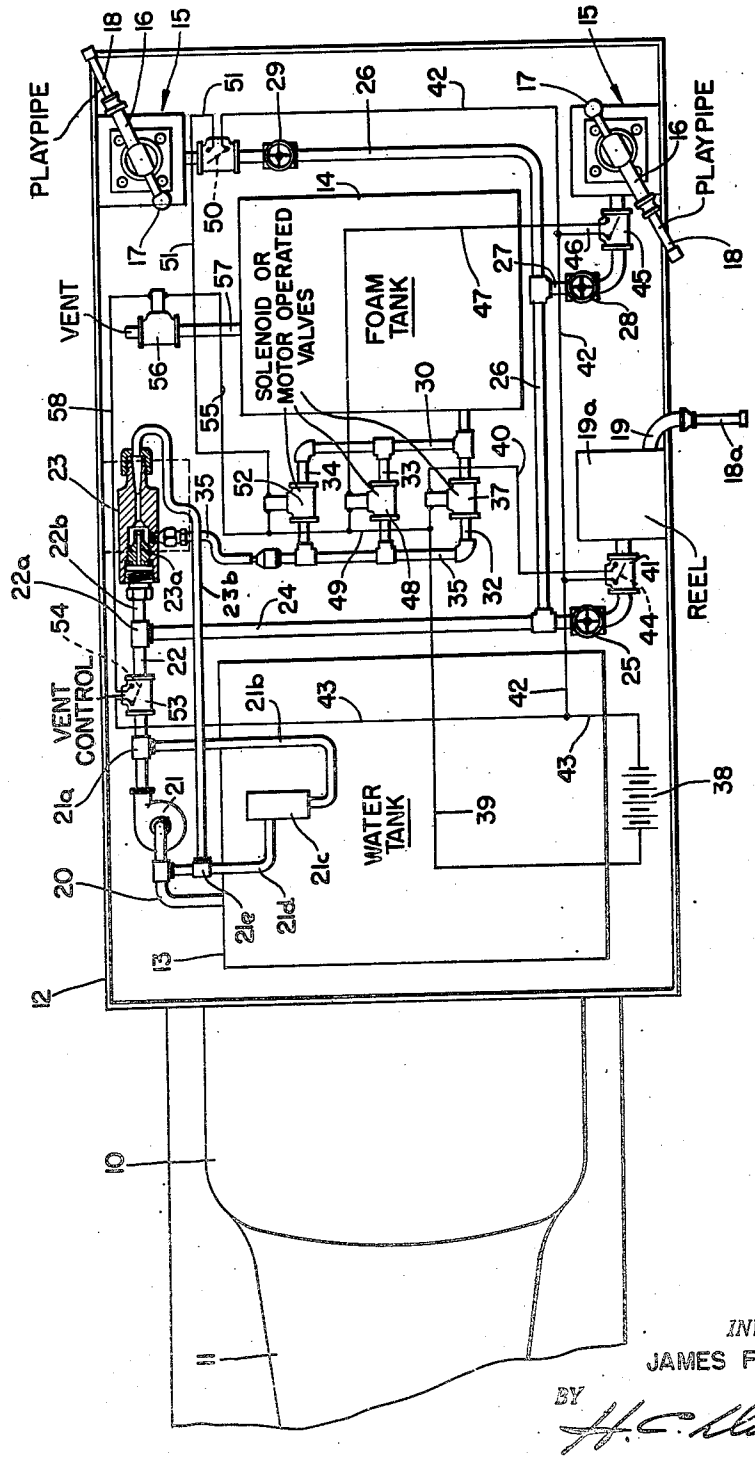
Sept. 23, 1952 J. FAULKNER 2,611,439

AUTOMATIC FOAM COMPOUND PROPORTIONING MEANS FOR FIRE EXTINGUISHERS

Filed Dec. 13, 1950



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Patented Sept. 23, 1952 2,611,439

UNITED STATES PATENT OFFICE

2,611,439

AUTOMATIC FOAM COMPOUND PROPORTIONING MEANS FOR FIRE EXTINGUISHERS

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Application December 13, 1950, Serial No. 200,591

18 Claims. (Cl. 169—15)

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This invention relates to fire extinguishing systems of the foam type in which a predetermined amount of foam compound is mixed with water and the mixture is then projected through one or more nozzles into a play pipe or foam producer in which air is incorporated in appropriate amounts to produce a satisfactory fire extinguishing foam.

While the invention has a number of adaptations and is not restricted to any particular form of system, it is especially advantageous in connection with a system in which water and foam compound, drawn from separate sources of supply, are mixed at a suitable point and then delivered to a variable number of play pipes or foam producers. A typical system of this character is encountered in a so-called crash truck used at airports for extinguishing fires in airplanes. Such crash trucks are provided with limited amounts of water and foam compound in separate containers. These containers hold quantities of water and foam compound in about the proportion in which it is desired to intermix them for best results in the production of foam. A plurality of play pipes capable of producing foam are mounted on the truck. These may be mounted on special turrets or may be attached to flexible hose lines mounted on the truck, or both types may be included. When an accident occurs the truck is sent as close to the scene as possible and, depending upon the circumstances, any number of the play pipes may be placed in operation. The various play pipes may be cut in and out of operation a number of times in the course of putting out a fire.

In view of the limited quantity of foam compound which it is practicable to carry on a truck, it is important that this be mixed with the water at all times in the correct amount for best results. If only one of, say, four play pipes is put into operation, the amount of foam compound delivered should be in proportion to the amount of water discharged through that play pipe. If another play pipe is put into operation the amount of foam compound delivered to the point at which the water and foam compound are intermixed should be doubled, otherwise insufficient foam compound would be present to form suitable foam. So, also, if two play pipes are in operation at a particular time and one is then shut off, it is important to reduce the amount of foam compound delivered to the mixing means to avoid wastage.

An important object of the present invention has been to provide simple, effective and reliable

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automatic means for controlling the delivery of foam compound to the means by which it is introduced into the water stream, in accordance with the number of play pipes in operation at any particular time. Toward this end, means responsive to the delivery of water to the several play pipes is provided for operating appropriate valves which control the supply of foam compound. This means is preferably operated electrically. In view of the necessary distances between the control points and the valves to be controlled, it has been found that electrical devices of the character indicated are not only much simpler and more economical than mechanical connections from the manual valve operating means which control the delivery of water to the several play pipes, but they are also more dependable in operation and require less effort on the part of the operator.

Another object of the invention has been to provide automatic means for venting a normally airtight foam compound tank whenever foam compound is being discharged therefrom. It is important that the tank or container be airtight when the apparatus is not in operation to avoid losses due to evaporation. However, when the apparatus is being operated it is equally important to supply air above the level of the foam compound in the tank in order to insure the proper delivery of the foam compound and also to prevent possible collapse of the tank due to the production of a relatively high vacuum therein. It has been found that a valve which is automatically responsive to the flow of water to one or more of the play pipes of the system or to the pressure of such water, and particularly an electrically operated valve which is responsive to such flow or pressure, is more reliable in its operation than various mechanical expedients that might be employed. A check valve, for example, is not only unreliable in its operation, but is difficult to make completely airtight so as to eliminate evaporation losses.

Other objects, features, advantages, and applications of the invention will appear, or become obvious, from the detailed description of an illustrative embodiment of the same which will now be given in conjunction with the accompanying drawing in which the single figure is intended to illustrate schematically, in plan, a crash truck embodying the invention.

Referring now to the drawing, the crash truck is provided with a cab 10 in which the driver and his assistant or assistants may be seated as the truck is driven to the scene of a fire. The truck may have a conventional hood 11 housing a

suitable engine (not shown) for propelling the truck and for operating various devices incident to the use of the equipment carried by the truck. Connections from the engine for these purposes may be of any of the types commonly employed in automobiles or trucks. A relatively large body 12 of any suitable character is provided for retaining and partly enclosing the equipment. The latter includes a relatively large water storage tank or container 13 and a smaller foam compound tank or container 14. Both of these tanks may be made airtight, if desired, although it is primarily important to make the foam compound tank airtight to avoid loss by evaporation of the foam compound, which may be any known and suitable type of liquid adapted to facilitate the production and stabilization of foam.

Mounted at any suitable point on the truck body are a plurality of turrets 15, two of these being shown in the drawing at the right end of the truck body. These turrets may be of any suitable construction adapted to receive liquid at the base of a vertically disposed standard and deliver the liquid to a normally horizontal pipe 16. The latter preferably has a swivel connection with the standard and is capable of both horizontal turning about the axis of the standard and vertical tilting through an appropriate angle to enable discharge of foam in any desired direction. A hand grasp 17 may be provided to assist in turning the top member of the turret carrying the pipe 16 into any desired position. At the outer end of the pipe 16 there is mounted, in any suitable way, a foam producing play pipe 18. The latter may be of any appropriate construction, such as that disclosed in the patent to Timpson No. 2,390,280, granted December 4, 1945. The arrangement is such that a mixture of water and foam compound, delivered to and through the pipe 16 in the manner to be explained, will serve to aspirate air into the play pipe and incorporate such air to produce foam. One or more additional play pipes 18*a* of similar construction may be connected with a hose line or hose lines 19 carried by a reel or reels 19*a* suitably mounted on the truck body. The hose line or lines 19 may be of any suitable length to enable effective delivery of the foam produced in the play pipes 18*a* to the seat of the fire. As will be explained, a separate valve, which may be operated manually or otherwise, is provided in each of the lines leading to the several play pipes to place any of these in or out of operation as desired.

A pipe 20 extending from a point adjacent the bottom of the water tank 13 serves to connect the latter with a pump 21, which may suitably be of the centrifugal types arranged to be driven through any suitable connections (not shown) with the crank shaft of the engine of the truck. This pump may be capable of delivering the water through a pipe 22, connected with its discharge side, to the various points at which it is desired under any suitable pressure, preferably between 100 and 500 pounds per square inch. A T fitting 21*a* in the line 22 adjacent the discharge side of the pump is connected by a branch line 21*b* with a pressure relief valve 21*c*. When this is operated, due to the building up of excess pressure by the pump, some or all of the water is returned through a fitting 21*e* to the intake line 20.

Pipe 22 is connected with a T fitting 22*a* from which a branch line 22*b* serves to deliver a part of the water to an injector 23 of the jet type. This injector is provided with a nozzle 23*a* which directs the water into a Venturi passage, the restricted portion of which develops a suitable suction. This injector may, if desired, be replaced by a simple inductor similar to that shown in Fig. 3 of the patent to Timpson No. 2,356,286, granted August 22, 1944. From the discharge side of the inductor or injector the mixture of water and foam compound, which is introduced by aspiration into the jet chamber in advance of the reduced portion of the Venturi passage of the injector, through connections to be explained, is delivered through a pipe 23*b* to the fitting 21*e* from which it is returned to the intake line 20 of the pump. From the T fitting 22*a* the main body of water with the proper proportion of foam compound is delivered through a line 24 to the various play pipes mentioned. As shown, the pipe 24 may be connected with the hose line 19 through a branch formed as a direct extension of the pipe, this branch being provided with a hand operated valve 25 for controlling the discharge of liquid through the hose line. A lateral branch line 26, extending from the main line 24, has a further branch line 27 extending therefrom which is connected with the turret 15 at the lower right hand corner of the drawing. A hand operated valve 28 controls the delivery of the liquid mixture to this turret and its play pipe 18. Line 26 also has a branch connected with the turret 15 at the upper right hand corner of the drawing, this branch being provided with a hand operated valve 29 for controlling delivery of the mixture to that turret and its play pipe. The pump 21 is capable of supplying an adequate amount of water under a suitable pressure to meet the requirements of all of the play pipes when in operation in a parallel relationship.

Foam compound may be withdrawn from the tank 14 through a main line 30 which is connected through a series of branch lines 32, 33, and 34 with another main line 35. In the branch line 32 there is provided an electrically operated valve 37. This may be of any suitable construction and may either be operated to open the valve, against the action of a spring, by means of a solenoid, or may be motor driven to open and close the valve. To operate this valve, current is drawn from a source 38, which may suitably be the regular storage battery of the truck, and delivered through a line 39 to one side of the valve operating means. The opposite side of the latter is connected by a line 40 with a liquid flow responsive switch unit 41 which is normally open when the valve 25 is closed. From the opposite side of the switch the circuit is completed to the opposite side of the current source through lines 42 and 43. When the valve 25 is opened and liquid is delivered to the hose line 19, the switch 41 is closed in response to the flow of the liquid. For this purpose there may be provided, within the housing of the switch member 41, an arm or vane 44 which extends into the path of the liquid and is rocked or raised by the latter, to bring about closing of the switch contacts in any suitable way. For example, the pivot of the arm 44 may carry a switch arm on the outside of the housing 41. It will be understood that other forms of flow responsive or pressure responsive means may be employed to operate the switch. For example, a diaphragm in the wall of the fitting 41 could be connected with the switch arm, or other movable member of the switch, to close it whenever water under pressure is delivered through the fitting. In a

similar manner, when the valve 28 is opened, to cause delivery of the water and foam compound to the connected play pipe 18, a switch 45, similar to switch 41 and responsive to pressure or to the flow of the mixture to this play pipe, will be closed and will complete a circuit from the line 42 through a branch line 46 and a line 47 to an electrically operated valve 48 which may be of the same character as the valve 37. From the opposite side of the operating means of valve 48 the circuit is completed through a line 49 to the line 39, back to the opposite side of the current source. In a similar manner a flow responsive switch 50, between the valve 29 and the play pipe in the upper right hand corner of the drawing, is closed whenever the valve 29 is opened to permit delivery of water and foam compound to this play pipe. The circuit from the current source 38 is completed through this switch as follows: Through lines 43, 42 and 51, an electrically operated valve 52, and lines 49 and 39 to the opposite side of the current source. Valve 52 may be of the same construction as the valves 37 and 48 and when energized serves to deliver an additional amount of foam compound to the line 35. Obviously, additional play pipes may be provided and corresponding branch lines, similar to lines 32, 33 and 34, will then be added with valves similar to 37 controlled by valves in the branch lines to the added play pipes. Thus, foam compound will be delivered into the line 35 in proportion to the number of play pipes in operation. The line 35 is connected to a fitting extending through the wall of the injector in the region of a small chamber surrounding the jet 23a and serves to introduce foam compound into the stream of water flowing through the injector. If a simple Venturi inductor is used the line 35 will be connected with the reduced section of the venturi. To meter properly the amount of foam compound delivered to the inductor or injector, through each of the valves 37, 48 and 52, etc., to that required by a single play pipe, a suitable nozzle or other restricting means may be provided on either the intake or the discharge side of each of said valves. These nozzles may be made readily replaceable to accommodate the system to different types of foam compound which may require different proportioning to the amount of water used. Thus, by way of example, the system may be readily adapted for use with a foam compound required to the extent of only 3% of the volume of water used or one that is required to the extent of 10% or any intermediate or greater or lesser amount.

The foregoing arrangement is such that upon opening of the valve 25, while the valves 28 and 29 remain closed, only a sufficient amount of foam compound will be delivered through the valve 37 and the lines 32 and 35 to the inductor 23 to provide a suitable foam producing mixture with the quantity of water delivered to the play pipe 18a. If the valve 28 is now also opened, an additional amount of foam compound will be delivered through valve 48 and lines 33 and 35 into the inductor 23 so that there will be sufficient foam compound to provide the desired mixture with the water delivered to the two play pipes. Similarly, if the valve 29 is also opened, a still further amount of foam compound will be delivered through the valve 52 and lines 34 and 35 to the inductor, so that the same proportion between water and foam compound will be maintained at the three play pipes in operation. It will be understood that it is immaterial which

of the play pipes is first placed in operation. Furthermore, if one of the play pipes is cut out of operation, by the closing of its related valve 25, 28 or 29, the corresponding foam compound valve 37, 48 or 52 will be closed so that the desired proportioning will be maintained. Obviously the system may be extended to include any number of play pipes and a corresponding number of branch lines and electrically operated valves in the conduit system leading from the foam compound tank to the inductor.

Since it is important to maintain the foam compound tank in airtight condition, whenever the system is not in operation, and since the aspirating action of the inductor 23 depends to some extent upon the pressure above the foam compound in the tank 14, it is desirable to open a vent leading into the upper portion of the tank 14 whenever the system is placed in operation. This will also eliminate the danger of collapse of the foam tank due to the creation of a partial vacuum within it. For this purpose a flow or pressure responsive switch 53, similar to switch 41, is provided in the main line 22 of the water conduit system or, if preferred, in the line 24. The arm 54 of this switch will serve to close the latter whenever any water is permitted to flow through the line 22. When the switch is so closed, current from one side of the source 38 will flow through the conduit 39, conduit 49, and a conduit 55 to an electrically operated vent valve 56, which may suitably be of the same construction as the valve 37. It permits the introduction of air into the tank 14 from the atmosphere through a vent line 57. From the opposite side of the electrical operating means of the valve 56 the circuit is completed through a conduit 58, switch 53 and conduit 43 to the opposite side of the current source. In the event that the water tank 13 is also made airtight, a vent valve similar to valve 56 may be provided in a vent pipe similar to pipe 57 extending into the water tank above the water level. This valve may be placed in parallel with the valve 56 and will then be operated at the same time, thus eliminating danger of collapse of the water tank and rendering the operation of the pump 21 more uniform.

While an illustrative embodiment of the invention has been described in considerable detail, it will be understood that various changes may be made in the construction and arrangement of the several parts and in the purpose and functioning of the system, without departing from the general principles and scope of the invention. Thus, if desired, the line 23a from the discharge side of the inductor or injector could be connected directly into the line 24, through a T connection therewith, instead of being returned to the intake side of the pump.

I claim:

1. In a fire extinguishing system having separate sources of supply for water and foam compound respectively, conduits for delivering said water and compound separately to a mixing point, and a conduit for delivering a mixture of said water and compound to at least one foam producing nozzle, the combination comprising a source of electric current, an electrically operated valve associated with said foam compound source, a circuit from said current source to and through said valve for operating the same, a switch in said conduit, and means carried by one of said conduits along the path of flow of water from its source to said mixing point and actuated in re-

sponse to such flow for controlling the operation of said switch.

2. A fire extinguishing system comprising means including a conduit for supplying water under pressure to a mixing point, an air-tight container for foam compound, a normally closed air vent on said container, a conduit for delivering foam compound from said container to said mixing point, a conduit for delivering a mixture of said water and compound to at least one foam producing nozzle, a source of electric current, an electrically operated valve associated with said air vent adapted to permit the introduction of air into said container, a circuit for delivering current from said current source to and through said electrically operated valve for operating the same, a switch in said circuit, and means along the path of flow in one of said conduits and actuated in response to such flow for controlling the operation of said switch.

3. A fire extinguishing system comprising means including a conduit for supplying water under pressure to a mixing point, a container for foam compound, means including a conduit for delivering foam compound from said container to said mixing point, a conduit for delivering a mixture of said water and compound to at least one foam producing nozzle, a source of electric current, an electrically operated valve in said conduit for delivering foam compound to said mixing point, a circuit from said current source for delivering current to and through said valve for operating the same, a switch in said circuit for closing the same, and means in the path of flow of water in said first mentioned conduit and actuated in response to such flow for actuating said switch.

4. A fire extinguishing system comprising means including a conduit for supplying water under pressure to a mixing point, a container for foam compound, means including a conduit for delivering foam compound from said container to said mixing point, a conduit for delivering a mixture of said water and compound to at least one foam producing nozzle, a source of electric current, an electrically operated valve associated with said container, a circuit from said current source for delivering current to and through said valve for operating the same, a switch in said circuit for closing the same, and means in the path of flow of water in said first mentioned conduit and actuated in response to such flow for actuating said switch.

5. A fire extinguishing system comprising a plurality of foam producing devices, means for supplying water under pressure, conduit means arranged to deliver said water to said plurality of devices, means for selectively placing one or more of said devices in operation at will, means for storing foam compound, means including a plurality of conduits for delivering variable amounts of foam compound from said storing means to said conduit means, and means for varying the amount of foam compound so delivered in accordance with the number of foam producing devices in operation, said last mentioned means comprising a source of electric current, a plurality of electrically operated valves in said conduits each adapted to be separately placed in circuit with said current source to cause operation of the valve, a plurality of electrical switches each related to one of said valves, and means along the path of flow of liquid to each of said foam producing devices and actuated in response to such flow for placing a related switch in circuit with said current source.

6. A fire extinguishing system comprising a plurality of foam producing devices, means for supplying water under pressure, conduit means arranged to deliver said water to said plurality of devices, means for selectively placing one or more of said devices in operation at will, means for storing foam compound, means for delivering variable amounts of foam compound from said storing means to said conduit means, and means for varying the amount of foam compound so delivered in accordance with the number of foam producing devices in operation, said last mentioned means comprising a source of electric current, electrically operated valve means adapted to be placed in circuit with said current source to cause operation of said valve means, a plurality of electrical switches one related to each of said valve means for controlling the delivery of current to said valve means, and means along the path of flow of liquid to each of said foam producing devices and actuated in response to such flow for operating a related one of said switches.

7. A fire extinguishing system comprising a plurality of foam producing devices, means for supplying water under pressure, conduit means arranged to deliver water to said plurality of devices, means for selectively placing one or more of said devices in operation at will, means for storing foam compound, means for delivering variable amounts of foam compound from said storing means to said conduit means, normally closed vent means for said storing means, and means for varying the amount of foam compound so delivered in accordance with the number of foam producing devices in operation, said last mentioned means comprising a source of electric current, electrically operated valve means adapted to be placed in circuit with said current source to cause operation of said valve means, a plurality of electrical switches each related to one of said valve means for controlling the delivery of current to said valve means, means connected with each of said switches and disposed along the path of flow of liquid to different ones of said foam producing devices for operating a related one of said switches, means for opening said vent means, and means associated with said conduit means and actuated in response to the flow of liquid to any of said devices for operating said opening means.

8. A fire extinguishing system comprising a plurality of foam producing devices, means for supplying water under pressure, conduit means arranged to deliver said water to said plurality of devices, means for selectively placing one or more of said devices in operation at will, means for storing foam compound, means for delivering variable amounts of foam compound from said storing means to said conduit means, normally closed vent means for said storing means including an electrically operated vent valve, means for varying the amount of foam compound so delivered in accordance with the number of foam producing devices in operation, said last mentioned means comprising a source of electric current, electrically operated valve means adapted to be placed in circuit with said current source to cause operation of said valve means, a plurality of electrical switches one related to each of said valve means for controlling the delivery of current to said valve means, separate means connected with each of said switches and each

responsive to the flow of liquid to a different one of said foam producing devices for operating the related switch, and connections from said current source to said vent valve including a switch responsive to the flow of liquid to any of said devices for controlling the operation of said vent valve.

9. A portable fire extinguishing system which comprises an engine driven vehicle, a water storage container and a foam compound container on said vehicle, a plurality of foam producing devices carried by said vehicle, a first conduit means connecting said storage container with said devices, a pump driven by the engine of said vehicle for forcing water under pressure through said first conduit means, valve means for controlling the delivery of said water under pressure to one or more of said devices selectively at will, a second conduit means for delivering foam compound from said foam compound container to said first conduit means, valve means in said second conduit means for controlling the rate at which foam compound is delivered to said first conduit means, and means for automatically controlling the rate of delivery of said foam compound in accordance with the number of devices to which said water is being delivered which comprises electrically operated valve means in said second conduit means, a source of electric current and connections therefrom to said electrically operated valve means, a plurality of switches in said connections, means connected with each of said switches and disposed in the path of flow of liquid to a related one of said devices for actuation in response to such flow to operate the related switch.

10. A portable fire extinguishing system which comprises an engine driven vehicle, a water storage container and a foam compound container on said vehicle, a plurality of foam producing devices carried by said vehicle, a first conduit means connecting said storage container with said devices, a pump driven by the engine of said vehicle for forcing water under pressure through said first conduit means, valve means for controlling the delivery of said water under pressure to one or more of said devices selectively at will, a second conduit means for delivering foam compound from said foam compound container to said first conduit means, said second conduit means comprising a plurality of branch lines between its point of connection with said first conduit means and said foam compound container, each branch line being adapted to deliver a predetermined amount of foam compound, an electrically operated valve in each of said branch lines, a source of electric current and connections therefrom to said electrically operated valves, a plurality of switches each arranged to close the connection to a related one of said electrically operated valves, and means connected with each of said switches for operating the same, each of said last mentioned means including a member along the path of flow of liquid to a related one of said devices and arranged for operation in response to such flow.

11. A portable fire extinguishing system which comprises an engine driven vehicle, a water storage container and a foam compound container on said vehicle, a plurality of foam producing devices carried by said vehicle, a first conduit means connecting said storage container with said devices, said first conduit means comprising a main line and a plurality of branch lines one extending therefrom to each of said devices, a pump driven by the engine of said vehicle for delivering water under pressure to said main line, a valve in each of said branch lines for controlling the delivery of water to a related one of said devices, a second conduit means for delivering foam compound from said foam compound container to said main line of said first conduit means, said second conduit means comprising a plurality of branch lines between its point of connection with said first conduit means and said foam compound container, each branch line being adapted to deliver a predetermined amount of foam compound, an electrically operated valve in each of said branch lines, a source of electric current and connections therefrom to said electrically operated valves, a plurality of switches each arranged to close the connection to a related one of said electrically operated valves, and means connected with each of said switches for operating the same, each of said last mentioned means including a member along the path of flow of liquid to a related one of said devices and arranged for operation in response to such flow.

12. A portable fire extinguishing system which comprises an engine driven vehicle, a water storage container and a foam compound container on said vehicle, a plurality of foam producing devices carried by said vehicle, a first conduit means connecting said storage container with said devices, said first conduit means comprising a main line and a plurality of branch lines one extending therefrom to each of said devices, a pump driven by the engine of said vehicle for delivering water under pressure to said main line, a valve in each of said branch lines for controlling the delivery of water to a related one of said devices, a second conduit means for delivering foam compound from said foam compound container to said main line of said first conduit means, said second conduit means comprising a plurality of branch lines between its point of connection with said first conduit means and said foam compound container, each branch line being adapted to deliver a predetermined amount of foam compound, an electrically operated valve in each of said branch lines, a source of electric current and connections therefrom to said electrically operated valves, a plurality of switches each arranged to close the connection to a related one of said electrically operated valves, and means connected with each of said switches for operating the same, each of said last mentioned means including a member along the path of flow of liquid to a related one of said devices and arranged for operation in response to such flow, normally closed vent means for said foam compound container, said vent means having an electrically operated vent valve for opening the same, a circuit from said current source passing through said vent valve, a switch in said last mentioned circuit, and means connected with said switch for operating the same, said last mentioned means being disposed in the path of flow of water through said main line and being arranged for actuation in response to such flow.

13. A fire extinguishing system which comprises a plurality of foam producing devices, a source of water under pressure, a first conduit means comprising a main line and branch lines for delivering water from said source to said devices, valves in said branch lines operable at will to control the delivery of the water to a variable number of said devices, a foam compound container, a second conduit means comprising a plurality of branch conduits in parallel

relation connected with said container and arranged to receive foam compound therefrom and deliver the same to said main line, an electrically operated valve in each of said branch conduits, a source of electric current, means in each of said branch lines along the path of flow of water therethrough and actuated in response to such flow, and devices actuated by each of said means for controlling the delivery of current to one of said electrically operated valves.

14. A fire extinguishing system which comprises a plurality of foam producing devices, a source of water under pressure, a first conduit means comprising a main line and branch lines for delivering water from said source to said devices, inductor means connected with said main line, valves in said branch lines operable at will to control the delivery of the water to a variable number of said devices, a foam compound container, a second conduit means comprising a plurality of branch conduits in parallel relation connected with said container and arranged to receive foam compound therefrom and deliver the same to said inductor means, an electrically operated valve in each of said branch conduits, a source of electric current, means in each of said branch lines along the path of flow of water therethrough and actuated in response to such flow, and devices actuated by each of said means for controlling the delivery of current to one of said electrically operated valves.

15. In a fire extinguishing system having separate sources of supply for water and foam compound respectively, conduits for delivering said water and compound to a mixing point and a conduit for delivering the mixture to at least one foam producing nozzle, the combination comprising a valve associated with said foam compound source for controlling the delivery of foam compound therefrom, means associated with said conduit and disposed along the path of delivery of water under pressure therethrough for actuation in response to the flow of the water to said foam producing nozzle, and connections from said means for operating said valve.

16. In a fire extinguishing system having separate sources of supply for water and foam compound respectively, conduits for delivering said water and compound to a mixing point and a conduit for delivering the mixture to at least one foam producing nozzle, the combination comprising a source of energy, a valve associated with said foam compound source for controlling the delivery of foam compound therefrom, conduit means for delivering energy from said energy source to said valve for operating the same, means associated with said conduit and

disposed along the path of delivery of water under pressure therethrough for actuation in response to the flow of the water from its source to said nozzle, and connections from said means for controlling the delivery of said energy to said valve.

17. In a fire extinguishing system having separate sources of supply of water and foam compound respectively, a pump for boosting the pressure of said water, conduits for delivering water from said pump and from said compound source to a mixing member having a Venturi passage, and a conduit for delivering the mixture selectively to one or more of a plurality of foam producing nozzles, the combination of a plurality of branch conduits in the connection from said foam compound source to said mixing member, a valve in each of said branch conduits, means associated with each of said branch conduits and disposed along the path of delivery of water under pressure therethrough for actuation in response to the flow of the water to the related one of said nozzles, and connections from said means for operating the valve in the related one of said branch conduits.

18. In a fire extinguishing system having separate sources of supply of water and foam compound respectively, a pump for boosting the pressure of said water, conduits for delivering water from said pump and from said compound source separately to a mixing member having a Venturi passage, and a conduit for delivering the mixture selectively to one or more of a plurality of foam producing nozzles, the combination of a return conduit connecting the discharge side of said pump with the intake side thereof, a pressure relief valve in said return conduit, a plurality of branch conduits in the connection from said foam compound source to said mixing member, a valve in each of said branch conduits, means associated with each of said branch conduits and disposed along the path of delivery of water under pressure therethrough for actuation in response to the flow of the water to the related one of said nozzles, and connections from said means for operating the valve in the related one of said branch conduits.

JAMES FAULKNER.

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