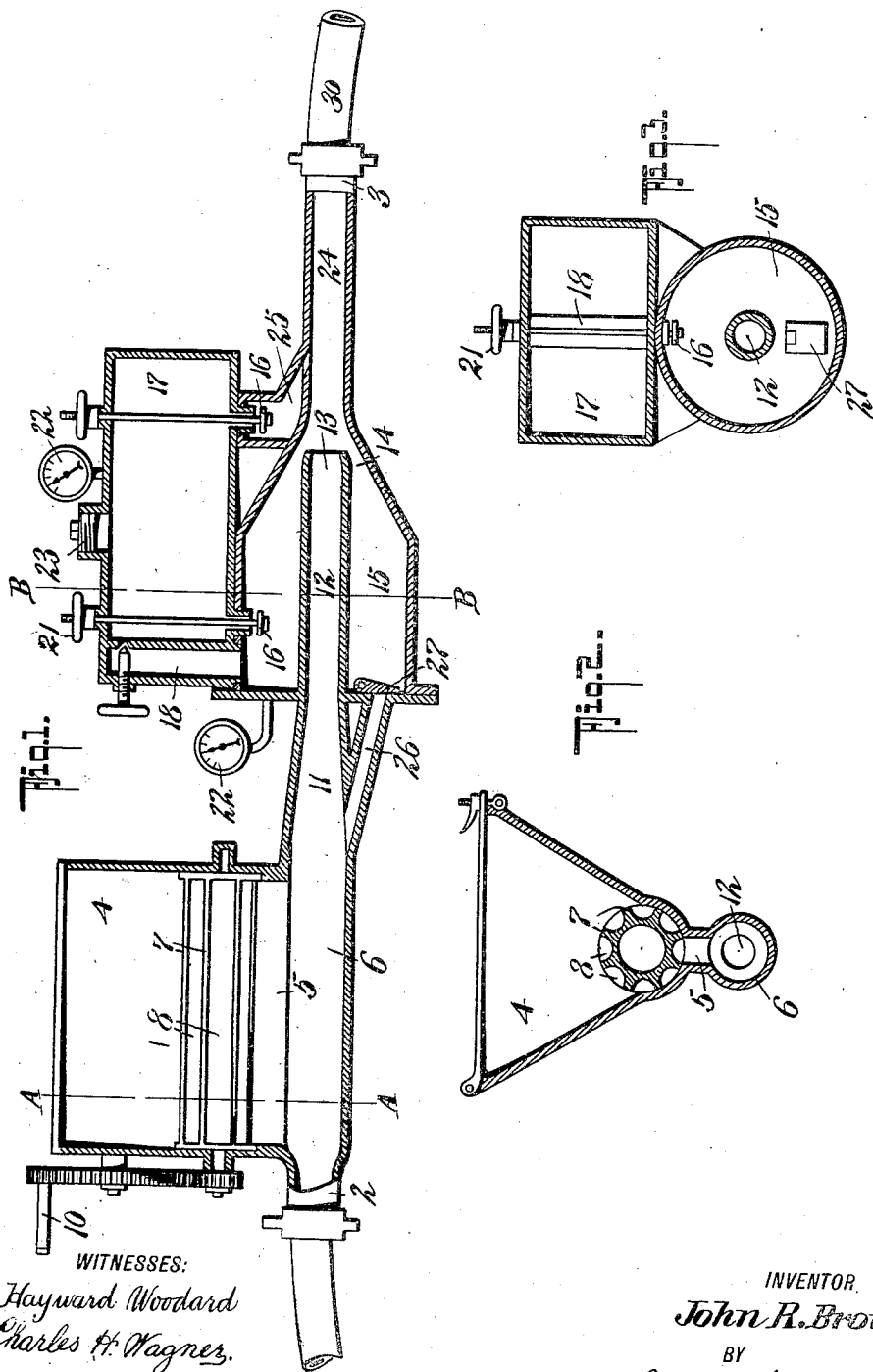


J. R. BROWN.
FIRE EXTINGUISHING DEVICE.
APPLICATION FILED JAN. 22, 1909.

936,086.

Patented Oct. 5, 1909.



WITNESSES:
Hayward Woodard
Charles H. Wagner.

INVENTOR,
John R. Brown
BY
Fred G. Stetson
ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN R. BROWN, OF VANCOUVER, BRITISH COLUMBIA, CANADA.

FIRE-EXTINGUISHING DEVICE.

936,086.

Specification of Letters Patent.

Patented Oct. 5, 1909.

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To all whom it may concern:

Be it known that I, JOHN R. BROWN, a citizen of the Dominion of Canada, residing at Vancouver, in the Province of British Columbia, Canada, have invented a new and useful Fire-Extinguishing Device, of which the following is a specification.

This invention relates to a means whereby the extinguishing properties of a stream of water from a hydrant or fire engine may be increased by the introduction into it of certain chemical or chemicals and of provision whereby the energy of the stream is increased by the generation of gas from the combination of such chemicals.

The invention may be applied either as a permanent addition to a hydrant or fire engine but preferably as a detached apparatus which may be used in combination therewith when the urgency of the requirement may justify the additional expense of its use.

Fires are numerous which to bring immediately under control an expense would be justified far in excess of what the operation of this device would involve either because the fire had assumed a dominating ascendancy or where even a small fire tends to spread among valuable merchandise: it is to meet such a requirement that the invention which is the subject of this application is designed.

The invention is particularly described in the following specification, reference being made to the drawings by which it is accompanied, in which,

Figure 1 is a vertical longitudinal section showing the application of my invention to a stream of water from a fire engine or hydrant Fig. 2 a cross-section at A A in Fig. 1 and Fig. 3 a cross section at B B in the same figure.

In this drawing 2 represents a connection to which the hose from a hydrant or fire engine may be attached and 3 a pipe connection at the other end to which the delivery hose to the nozzle may be connected. Between these pipes there is a free passage to which the various chemical connections are made in a manner to be described.

Adjacent to 2 and surmounting the passage 6, which is of larger diameter than 2, is a hopper or receptacle 4 which may be charged with carbonate of soda or other dry chemical which either alone or in combination with other chemicals are known to have flame reducing properties. In the lower

part of this receptacle 4 and between it and the passage 5 connecting it with the water delivery pipe 6 is a rotatable member 7 having flutes or elongated pockets 8 which as the member 7 is rotated will carry the soda or other dry chemical from the hopper and will deliver it in measured quantities into the stream of water passing through 6. This member 7 may be rotated in any approved manner: in the drawing it is shown as done by gear wheels by means of the handle 10.

The delivery end of 6 conically converges at 11 to a pipe 12 which is approximately of the same diameter as 2, the end of which pipe 12 is contracted slightly at 13 where it delivers into a converging cone 14, forming the forward end of a cylindrical mixing chamber 15 into which is delivered through a check valve 16, acid or other liquid chemical from a superposed tank 17. Between the upper part of this tank 17 and the upper part of the mixing chamber 15 is a passage 18 provided if necessary with a stop or valve 18^a, the object of which passage is to equalize the pressure between 17 and 15 that the acid may flow freely from the upper tank 17 to the lower chamber 15.

The amount of acid which flows through the check valve 16 may be regulated by means of a hand wheel 21 from the outside of the tank.

Both the mixing chamber 15 and the acid tank 17 may be furnished with pressure gages 22 that the pressure of the carbonic acid gas generated by the admixture of an acid with an alkaline solution may be ascertained. The acid tank 17 is also provided with a closable aperture 23 of ample size through which it may be charged.

The converging nozzle 14 forms the entrance to a pipe 24 the diameter of which is slightly larger than the original pipe 2 and into this pipe 24 a second acid delivery from the tank 17 may be made by a connection 25 in which is a closable check valve 16 for the regulation of the acid flow. This acid delivery connection 25 should enter the pipe 24 at a forwardly directed angle so that the flow of the water past its orifice may induce rather than check the flow of the acid from the tank.

From the converging cone 11 to the lower part of the mixing chamber 15 is a passage 26 provided with a check valve 27 opening forward into the mixing chamber the object of which passage is to permit a portion of

the water with its dissolved soda to pass from 6 into the mixing tank 15 and to prevent the generated pressure passing back.

To the farther end 3 of 24 provision is made for the attachment of a delivery hose 30 to the nozzle through which the stream is played upon the fire.

The operation of the device will now be readily followed: The water as it is delivered from the hydrant or engine through the connection 2 will receive as it passes through 6 under the hopper 4, measured quantities of soda or other chemical by the rotation of the member 7. A portion of the solution of soda and water will pass through the passage 26 into the mixing chamber 15, where it will receive a regulated supply of acid through the valve 16. The acid will combine with the alkaline solution and will generate carbonic acid gas at a considerable pressure. This water charged with carbonic acid gas under pressure will be delivered violently through the combining cone 14 where it will take up and mix with the water and soda solution delivered through the pipe 12. The restriction 13 at the end of this pipe will tend to increase the velocity of the discharge through it and will lessen the chance of the increased pressure generated in 14 forcing the water back through 12. From the mixing chamber 15 the carbonated water is delivered in pulsations which enables the check valve 27 opening at intervals between the pulsations to furnish a supply of soda water to the mixing chamber. During the accelerated forward flow through 14 a further regulated amount of acid is furnished through the pipe 25 which will satisfy the requirements of the soda in solution but which if added in the mixing chamber might cause an excess of back pressure that would impede the flow through 26. Thereafter the stream of water charged with carbonic acid gas will be delivered from 3 to the hose pipe 30 for discharge onto the fire.

The device may form a permanent attachment to a fire engine but will preferably be separately mounted on wheels to accompany such and be used in connection therewith or with a hydrant as required. It should be connected as close as possible to the engine or hydrant, as under such conditions, while the water is passing through the hose pipe under pressure, opportunity is afforded it to absorb the carbonic acid gas and become more thoroughly carbonated before projection on the fire.

The essential feature of the invention lies not only in the admixture with a flowing stream of water of such chemicals as will increase its fire extinguishing properties, but in the provision of a mixing chamber so constructed that carbonic acid gas may be generated in it and the pressure of such gas will

not hinder but increase materially the forward impulse of the water toward the nozzle. With this arrangement the advantages of a chemical engine, the efficiency of which as a fire extinguisher is now fully recognized but the use of which for considerable conflagrations is limited by the excessive size which would be required, is added to a stream of water from an ordinary hydrant or fire engine.

The expense of the chemicals will undoubtedly hinder the general use of the device, but in view of the fact that it is purposed only as a supplementary addition which may or may not be used, to a water extinguishing means will overcome any objection on this account which may be raised.

Having now particularly described my invention and the manner of its use, I hereby declare that what I claim as new and desire to be protected in by Letters Patent is:

1. In a fire extinguishing device, a water-pass, a casing surrounding a part of said water-pass and in communication therewith at one end, a passage of reduced diameter between said water-pass and the other end of said casing, means for admitting a dry chemical to the water as it flows through said pass in advance of said casing, and means for admitting a fluid chemical into said casing.

2. In a fire extinguishing device, a water-pass, a casing surrounding a part of said water-pass and in communication therewith at one end, a passage of reduced diameter between said water-pass and the other end of said casing, means for admitting a dry chemical to the water as it flows through said pass in advance of said casing, means for admitting a fluid chemical into said casing, and means for admitting a fluid chemical into the water as it flows through said water-pass near the exit end of said pass.

3. In a fire extinguishing device, a water-pass consisting of a tube having an enlarged entrant end and a reduced exit end, another tube projected into the enlargement of said first mentioned tube through the enlarged end thereof and terminating adjacent to the reduced portion of said enlarged ended tube, means for admitting a dry chemical into said other tube, and means for admitting a fluid chemical into the enlarged portion of said first mentioned tube.

4. In a fire extinguishing device, the combination with a pipe through which water is constrained to pass, of means of delivering an alkali therein from a superposed hopper, a conical delivery from the water pipe into a pipe of less diameter having a restricted outlet, a mixing chamber surrounding this restricted pipe which chamber is provided with a conical delivery toward the restricted opening of the inner pipe, means for passing a proportion of the alkali water

from the water pipe into the mixing chamber, an acid tank surmounting the mixing chamber, controllable passages from the acid tank into the mixing chamber, and means for equalizing the pressure in the acid tank with that in the mixing chamber.

5. In a fire extinguishing device the combination with a pipe through which water is constrained to flow, of means of delivering measured quantities of soda into the pipe, a converging outlet from the pipe terminating in a pipe of less diameter, a mixing chamber surrounding this restricted pipe, a passage from the water pipe into the after end of the mixing chamber said passage closable with a check valve opening into the mixing chamber, an acid tank surmounting the mixing chamber, a controllable passage from the acid tank into the mixing chamber, said passage being closable with a check valve that will permit the flow of the acid outward but will prevent back movement into the acid tank, a conical delivery from the mixing chamber terminating approximately with the termination of its inner pipe, and means for delivering acid through a controllable passage into the delivery pipe.

6. In a fire extinguishing device, a water-pass consisting of a tube having an enlarged entrant end and a reduced exit end, another tube projected into the enlargement of said first mentioned tube through the enlarged end thereof and terminating adjacent to the reduced portion of said enlarged ended tube, means for admitting a dry chemical into said other tube, means for admitting a fluid chemical into the enlarged portion of said first mentioned tube, and means for admitting a fluid chemical into the reduced portion of said first mentioned tube.

7. In a fire extinguishing device, a water-pass consisting of a tube having an enlarged entrant end and a reduced exit end, another tube projected into the enlargement of said first mentioned tube through the enlarged end thereof and terminating adjacent to the reduced portion of said enlarged ended tube, means for admitting a dry chemical

into said other tube, means for admitting a fluid chemical into the enlarged portion of said first mentioned tube, and means for admitting a fluid chemical into the reduced portion of said first mentioned tube and a by-pass between said enlarged end of said first mentioned tube and said other tube.

8. In a fire extinguishing device, a water-pass formed of a tubular member having a reduced portion and an enlarged portion, a pipe projecting through said enlarged portion and terminating adjacent to the reduced portion of said tube, means for connecting said pipe with a source of water supply, means for admitting a dry chemical to said pipe near its entrant end, and means for admitting a fluid chemical into said tube.

9. In a fire extinguishing device, a water-pass formed of a tubular member having a reduced portion and an enlarged portion, a pipe projecting through said enlarged portion, and terminating adjacent to the reduced portion of said tube, means for connecting said pipe with a source of water supply, means for admitting a dry chemical to said pipe near its entrant end, and means for admitting a fluid chemical into said tube, at the enlarged end thereof and also through the reduced end thereof.

10. In a fire extinguishing device, a water-pass formed of a tubular member having a reduced portion and an enlarged portion, a pipe projecting through said enlarged portion, and terminating adjacent to the reduced portion of said tube, means for connecting said pipe with a source of water supply, means for admitting a dry chemical to said pipe near its entrant end, means for admitting a fluid chemical into said tube, and a valved by-pass between said pipe and the enlarged end of said tube.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN R. BROWN.

Witnesses:

ROWLAND BRITAIN,
A. G. WOOLSEY.