(No Model.)

A. F. SPAWN.

FIRE EXTINGUISHER.

No. 280,410. Patented July 3, 1883.

Fig. 1.

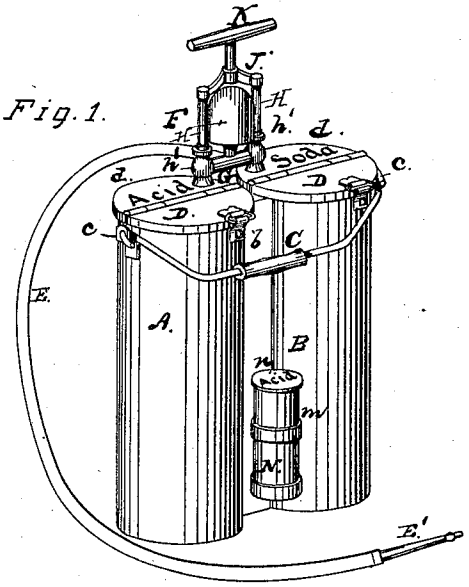


Fig. 5.

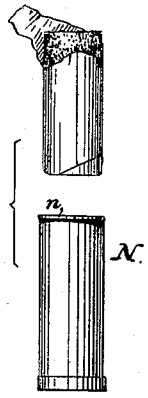


Fig. 2.

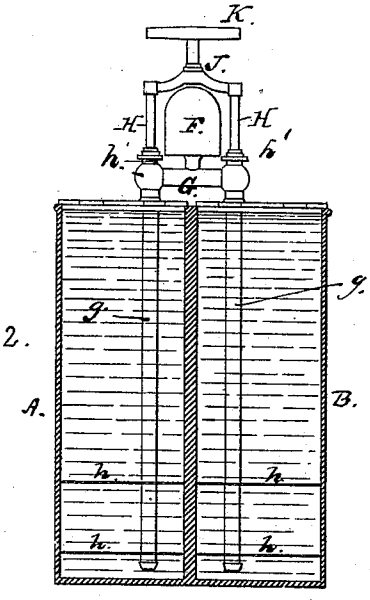


Fig. 4.

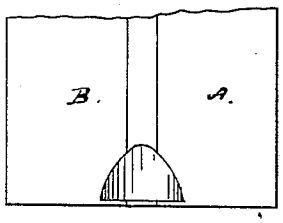
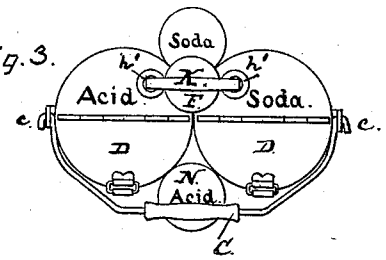


Fig. 3.



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UNITED STATES PATENT OFFICE.

ABEL F. SPAWN, OF OAKLAND, CALIFORNIA.

FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 280,410, dated July 3, 1883.

Application filed January 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, ABEL F. SPAWN, a citizen of the United States, residing in Oakland, Alameda county, State of California, have made and invented certain new and useful Improvements in Hand or Portable Fire-Extinguishers; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawings.

My invention relates to portable fire-extinguishing apparatus of the kind or class in which a body of carbonic-acid gas is generated by chemical means at the time when it may be required for use, and at such time is applied by allowing it to escape and be ejected through a hose or nozzle.

My improvements have for their object, first, to provide an apparatus that is absolutely safe and free from liability to explode at the time of use; secondly, to obtain an equal and uniform or constant pressure and discharge of the generated gas, whereby the force and energy of the stream of gas ejected by the apparatus are the same at the termination as at the beginning of the operation; thirdly, to accelerate the production and discharge of the gas, and thereby greatly increase the value and effectiveness of the apparatus.

The following description fully explains the nature of my said improvements and the manner in which I proceed to construct, apply, use, and carry out the same, the accompanying drawings being referred to by figures and letters.

In the said drawings, Figure 1 is a general perspective view of my improved fire-extinguisher ready for use. Fig. 2 is a vertical section through the centers of the water-cylinders. Fig. 3 is a top view or plan of Fig. 1. Fig. 4 shows the stirrup or foot-plate provided at the bottom of the cylinders to hold down and steady the apparatus while the pump is being worked. Fig. 5 illustrates the mode of preparing the charges of chemicals for the aqueous solutions.

A B are two cylinders forming independent compartments, each adapted to contain a body of water. They are joined together by a web, *b*, and a handle, C, attached by ears *c c* to the outside of each cylinder, is provided for conveniently handling and carrying the structure. One of these cylinders is employed to receive the alkali and the other the acid, by the combination of which the gas is produced. These substances are introduced, however, only at the time when the apparatus is to be used. At all other times the cylinders contain nothing but the water. The top of each cylinder is partly closed by a permanent part or cover, *d*, and partly by a hinged cover or lid, D, capable of being opened to give access to the interior. On top of the permanent part is fixed the means by which the two solutions are drawn from the cylinders and brought together to form the gas. It also forms the means by which the generated gas is forced out through the conducting-hose E and nozzle E′. This part of the apparatus consists of a generating chamber or compartment, F, and two long narrow pump cylinders or tubes, *g g*, one in each compartment A B, and extending down nearly to the bottom, through horizontal perforated partitions *h h*, placed across the lower portion of the cylinder-space. Each tube is fitted with a valve and valve plunger or rod, H, the end of which is carried out through a stuffing-box, *h′*, and is then joined to a cross-head, J, with a common handle, K. These tubes are single-acting pumps, and as the handle K is worked up and down they operate simultaneously to raise a quantity of the liquid from the two cylinders A B at each stroke and bring them together in the common receiver or "generator," as I have termed it. This compartment is connected to a common outlet-tube, G, extending across from one tube, *g*, to the other one, *g*, and at this point of connection an outlet and a coupling or means to attach the end of a hose, E, is provided.

Upon the outside, and preferably between the two cylinders A B, are provided two sockets or holding-rings, *m*, to receive the cans or receptacles N N, in which are contained the acid and alkali in dry-powdered or pulverized form. These holders are placed on opposite sides of the web or connecting-rib *b* between the two cylinders and as shown in the drawings. They consist of two rings, *m m*, of suitable size to receive and hold the receptacles N, which are of cylindrical form, and are closed by a cap or cover, *n*, to protect the contents from atmospheric influences. In order to effect a clean and instantaneous discharge of the

contents of these cans or receptacles N at the time of action, I form the charge or quantity of the matter, acid, or alkali, as the case may be, into the form of a cartridge by wrapping or covering it with oiled or waxed paper, which, being interposed between the interior sides of the can and the contained matter or substance, will prevent any portion from adhering or becoming fixed to the sides. When the can is inverted over the open top of one of the cylinders A B its entire contents will be instantly precipitated into the water, no matter how long the apparatus may have remained inactive, and the full charge is thereby rendered immediately available. The contents of the cans are also better protected from the air and are not liable to absorb moisture and become caked.

Now, as thus constructed and combined together, the apparatus is operated as follows: The two cylinders are supplied at all times with a quantity of water, and stand thus charged ready for use. The cans or receptacles N are also fitted with the charges of the substances, such as crystallized acid in one and an alkali, as bicarbonate of soda, in the other. At the time of operation the contents of one can N is precipitated into the water of one cylinder, A, and that of the other can into the other cylinder, B, where they fall on the perforate partitions *h*, which serve to keep the particles from settling on the bottoms of the cylinders, and also to facilitate and hasten the dissolution as the pumps are set in motion. Power now being applied to the handle K the tubes draw the water downward through the chemicals and raise the solutions up into the generating compartment, where they are brought together in about equal quantities as the pumps are kept at work. By the pressure thus produced and accumulating in this compartment the gas is forced out and is continuously discharged from the hose as long as any solution remains; and the force or energy depending entirely upon the rapidity with which the handle K is worked, the pressure and strength of the discharging stream can be kept constant and be always as effective at the end as at the beginning of the operation.

From the above description of the construction and operation of my apparatus it will be noticed that there is no chemical solution left standing in any of the cylinders or compartments to act upon their joints and surfaces; that the large cylinders do not receive and are not required to withstand any pressure from generated gas, so that they can be constructed of light material, as they are simple water-tanks; also, that the force of the discharging stream of gas is not obtained from, but is independent of, the gaseous pressure in the generating-chamber, so that the stream can be more effectively applied and its force maintained at the same degree.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A portable fire-extinguisher wherein are combined twin tanks A B, a common generating-chamber having an outlet and a hose or a nozzle, pump-cylinders *g g*, having connection with said generating-chamber and communicating with the said tanks for drawing off the contents of said tanks and ejecting them simultaneously into said chamber, and a cross-head to which the pump-cylinder plungers are connected, so as to be operated together by the movements of said cross-heads, all substantially as hereinbefore described, to operate as and for the purpose set forth.

2. The combination together of the twin tanks A B, each being an independent compartment, the common generating-chamber F, mounted thereon, the perforate partitions *h h* in the said tanks, the pump-cylinders *g g*, having their suction ends carried down into said tanks below said partitions and their discharge ends connected to the generating-chamber, the reciprocating plungers, and the common cross-head with an operating-handle, all substantially as hereinbefore described, to operate as set forth.

3. In a portable fire-extinguisher, the combination of twin tanks adapted to hold two independent bodies of water, a common generating-chamber mounted on said tanks, and means for drawing off from said tanks simultaneously and forcing into said chamber equal portions of the solutions, said means consisting of pump-cylinders *g g*, reciprocating plungers H H, a connecting cross-head, and an operating handle, substantially as hereinbefore described.

4. A portable fire-extinguisher consisting of twin tanks A B, having openings in the tops covered by lids and united by a web, *b*, on which is provided holding means for the removable receptacles, the generating-chamber F, mounted on said tanks, pump-cylinders *g g*, having a common cross-head and handle to which their plungers are connected, and removable receptacles N N, to contain charges of an acid and an alkali, substantially as hereinbefore described.

5. In a fire-extinguisher, the combination, with the receptacle N, adapted to be quickly removed and replaced and to hold a charge of an acid or an alkali in a dry state for precipitation into the tank A or B, of a wrapping case or envelope to prevent contact of said charge with any part of the interior surfaces of said receptacle, whereby the whole charge is easily and quickly dislodged, substantially as hereinbefore described.

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