(No Model.)

H. C. JOHNSON.

FIRE EXTINGUISHER.

No. 458,171. Patented Aug. 25, 1891.

Fig. III.

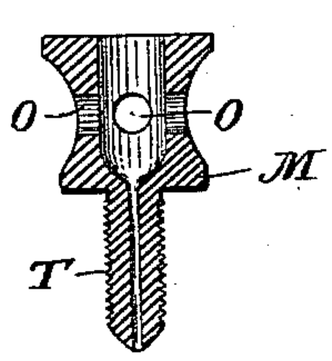


Fig. IV.

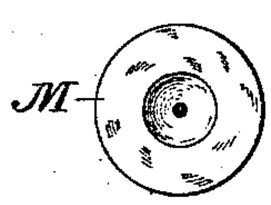


Fig. I.

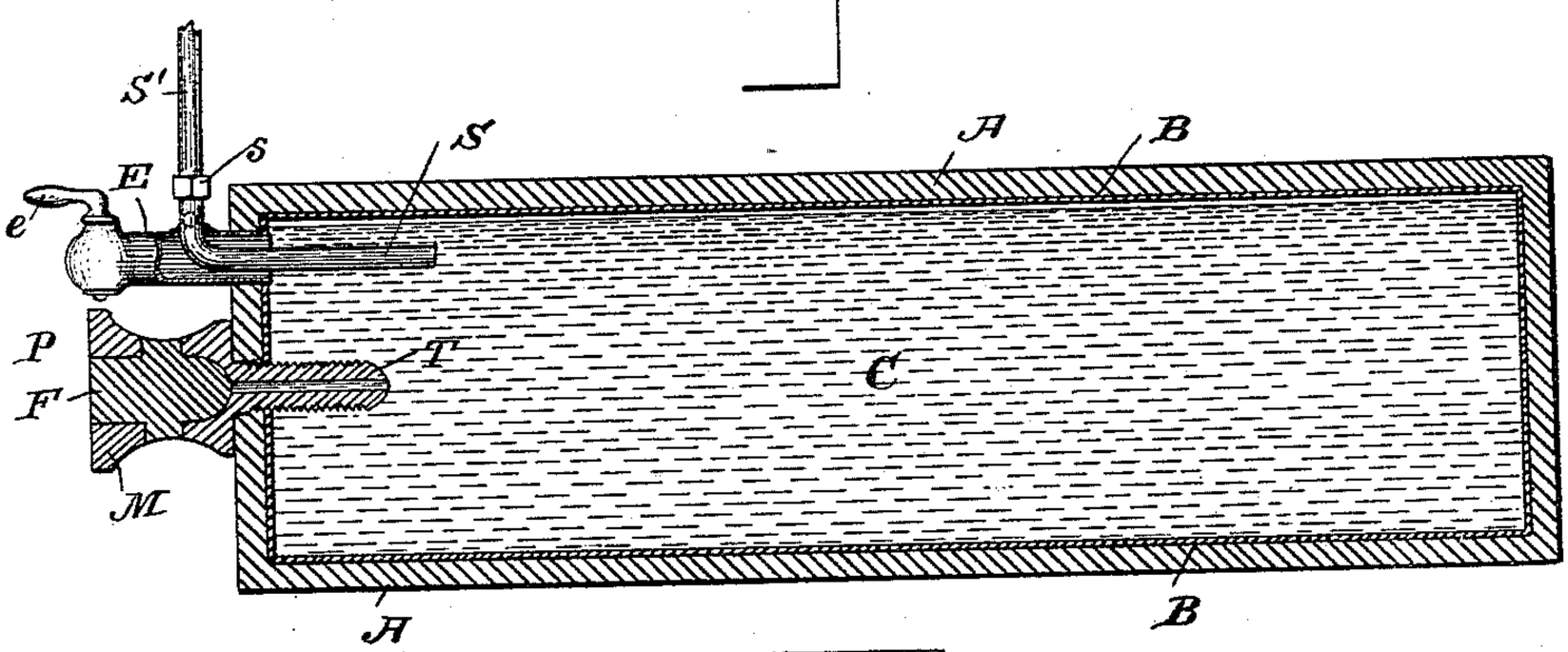
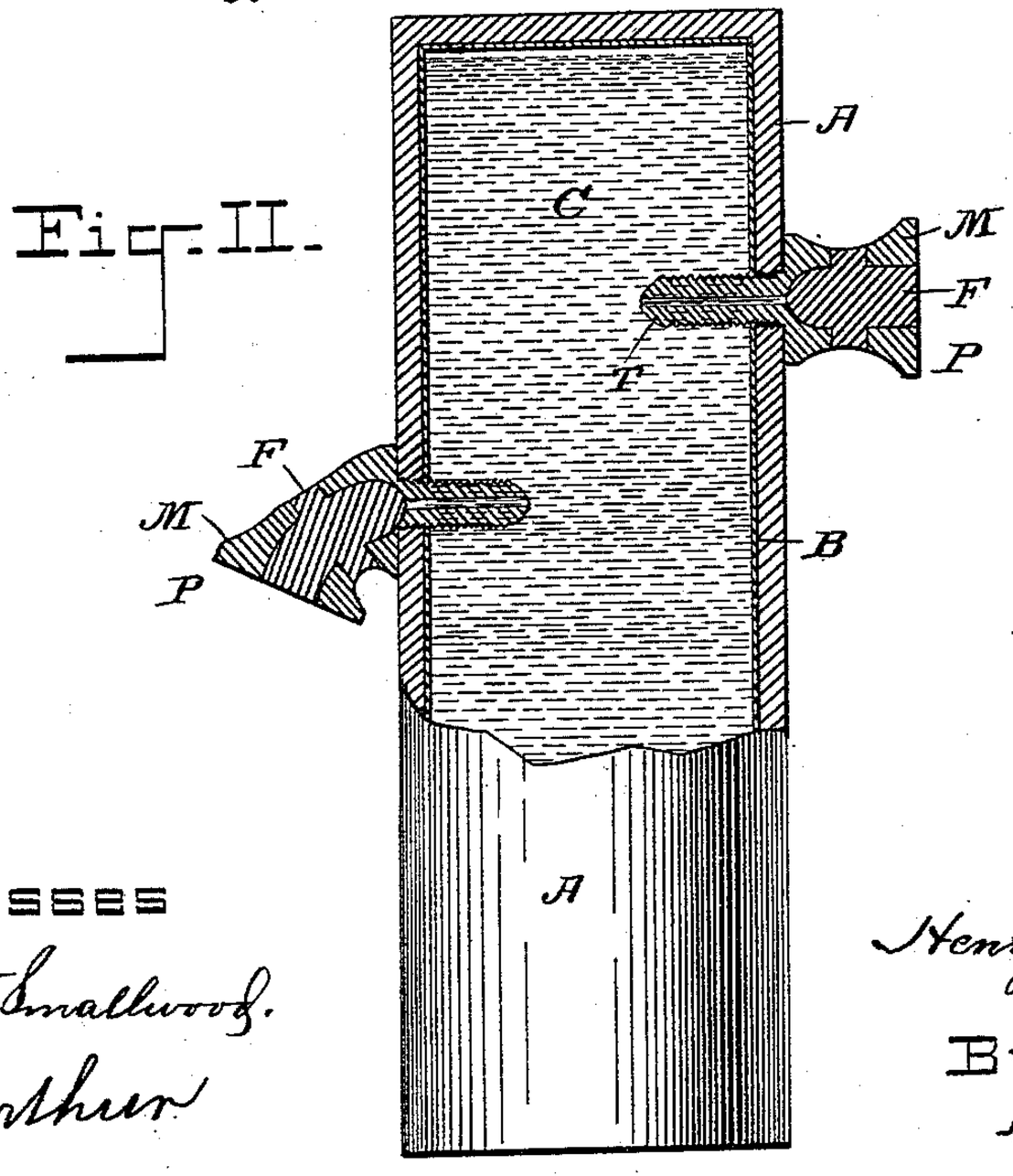


Fig. II.



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY C. JOHNSON, OF MEADVILLE, PENNSYLVANIA.

FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 458,171, dated August 25, 1891.

Application filed February 19, 1890. Renewed January 20, 1891. Serial No. 378,413. (No model.)

To all whom it may concern:

Be it known that I, HENRY CLAY JOHNSON, a citizen of the United States, residing at Meadville, county of Crawford, State of Pennsylvania, have invented certain new and useful Improvements in Fire-Extinguishers, of which the following is a specification.

My invention relates to a fire-extinguisher that is adapted and arranged to be carried from place to place, and is constructed in such a manner as to adapt it for placing on a shelf, upon any article of furniture, or upon the floor of a room, or in any other suitable or desired locality, the device being of such a nature as that it will operate automatically to extinguish a fire in the presence of a certain predetermined temperature.

My invention consists in a seamless bottle, can, or vessel substantially constructed, and made preferably of steel, and lined with a compound consisting, preferably, of rosin and pitch to give it a proper interior coating. The vessel so constructed is filled with compressed carbonic-acid gas reduced to a state of liquefication and inserted therein by any suitable means. The vessel is also provided with means of exit for the liquefied carbonic acid in a gaseous form, as follows: A plug made of fusible metal—such, for instance, as will melt at a temperature of 197° Fahrenheit, and which may consist of three parts of lead, two parts of tin, and five parts of bismuth, or a mixture which may melt at 122° Fahrenheit, and which may consist of five parts of tin, three parts of lead, three parts of mercury, and three parts of bismuth, or of any other suitable combination which may be provided and which may be adapted to melt and flow at any desired predetermined temperature. This fusible plug is provided with suitable supporting metal to retain it in the desired position, and this latter feature, in combination with the fusible plug when used with a portable fire-extinguisher, is one of the special objects of my invention. The supporting-shell of refractory metal within which the fusible plug is contained is adapted to protect said fusible plug from mechanical injury and also to support it securely against the internal pressure of the carbonic acid or other fluid, while at the same time affording a suitable seat for the fusible plug, in which the latter can hermetically close the outlet while at ordinary temperatures. To reduce the pressure against the fusible plug, the plug-shell of refractory metal is constructed with a thin tubular shank, which is screwed into the case or receiver of the extinguisher, and has a thread-like or small bore for two purposes: first, so that there may be but a small area of the fusible plug exposed to the pressure of the confined fluid, and, second, in order that when the gas is liberated by the fusing of the plug the escape of the gas may not be sudden, but gradual. To support the fusible plug against the internal pressure, the plug-shell of refractory metal is formed with suitable shoulders or bearings for the fusible plug substantially at right angles to the line of pressure. These bearings or shoulders are preferably formed by lateral openings through the refractory shell of the plug, which openings become filled with the fusible metal as it is poured into the shell in a molten state, so as to form arms thereof in the refractory metal to secure the fusible plug in its seat until melted or softened by heat.

Referring to the accompanying drawings, which form a part of this specification, Figure I represents a vertical section of one of my improved fire-extinguishers. Fig. II is a similar view of a modification. Figs. III and IV are respectively a longitudinal section and an end view of the plug-shell or casing employed to contain the fusible metal and protect it against mechanical injury.

In the drawings, A represents in longitudinal section a can or vessel formed, preferably, as hereinbefore stated, of seamless steel having an interior coating of an admixture of rosin and pitch to prevent the liquefied carbonic-acid gas obtaining direct access thereto. This lining is shown at B and the liquefied carbonic-acid gas is shown at C.

My improved automatic plug or stopper P is preferably located at one end of the can or receiver A, as shown in Fig. I. The said automatic plug or stopper consists of a plug F of metal fusible at such predetermined temperature as will cause release in the event of fire contained within a shell M of refractory metal and extending into the can or receiver, being provided at its inner end with a tubular shank T, threaded on its exterior, so that the plug

may be tightly screwed into the can or containing-vessel and through which the gas when liberated is permitted to escape. The bore of the shank T is in practice made very small to reduce the area of pressure against the fusible metal and also to cause the escape of the gas when liberated to be very gradual. The fusible metal plug is shown at F, cast within the shell M, so as to be protected from injury thereby. The shell M of brass or other refractory metal (shown separately in Figs. III and IV) is provided with radial openings O or other suitable cavities, into which the fusible metal extends, so as to form arms or supports for retaining it in position and prevent mechanical contact or abrasure from dislodging it.

In Fig. II, I show a portable fire-extinguisher set on end, having plug P upon the side. This is shown on the right hand side of the figure; but on the left-hand side I show a modified form of plug, goose-neck in shape, to permit the fusible plug to fall out by gravity when partly melted, which may be employed in some cases where it is found desirable. It will be understood, of course, that in place of carbonic-acid gas, liquefied as shown, I may employ other suitable fire-extinguishing fluids that are adapted to operate the same under similar conditions. It will be seen that the fusible metal is exposed as well as the harder metal, so that the heat has immediate access to the fusible metal and will not have to go through the more refractory.

In some cases it is desirable to modify the bore of the tube T, making it wider or narrower, as may be desired. Where the extinguishing qualities of the gas only are to be utilized, the opening may be made large; but where I desire to combat the effect of the heat by utilizing the refrigerating qualities of the gas, as in the protection of safes or vaults, I make the opening smaller.

As one means of introducing the liquefied gas into the can or receiver, I have shown in Fig. I a fixed pipe S, to which a supply-pipe S′ may be secured by a suitable coupling *s*, a check-valve or a cock in lieu thereof being provided in the pipe S to prevent the escape of gas when the supply-pipe S′ is removed, also an escape-pipe E for the displaced air to be closed by a cock *e*, when the air is driven out, which will be effected instantaneously under the pressure of gas. The pipe E and stop-cock *e* manifestly afford means for the discharge of gas from the receiver by hand to any extent, and the apparatus may thus be used for extinguishing a fire when it is discovered before giving time for the melting of the fusible plug.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of the strong receiver or case A, the plug shell or nipple M, communicating with the interior thereof through a contracted tubular shank T and having an external cavity of much larger area, and the fusible plug F, contained in said external cavity of the shell, as herein set forth.

2. The combination of the strong receiver or case A, the plug-shell M, of refractory material, communicating with the interior through a contracted tubular shank T and having an exterior cavity of much larger area formed with bearing shoulders or abutments substantially perpendicular to the line of pressure, and a fusible plug contained in the said cavity of the shell and engaging with the said vertical shoulders or abutments to resist the internal pressure, as explained.

3. The combination of the strong receiver or casing A, the refractory plug shell or nipple M, having lateral openings, and the fusible plug or stopper F, hermetically closing the nipple and extending into the lateral openings therein, so as to resist outward pressure, substantially as set forth.

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