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STEAM TRAP.
APPLICATION FILED MAY 15, 1908.

925,773.

Patented June 22, 1909.

Fig. 1.

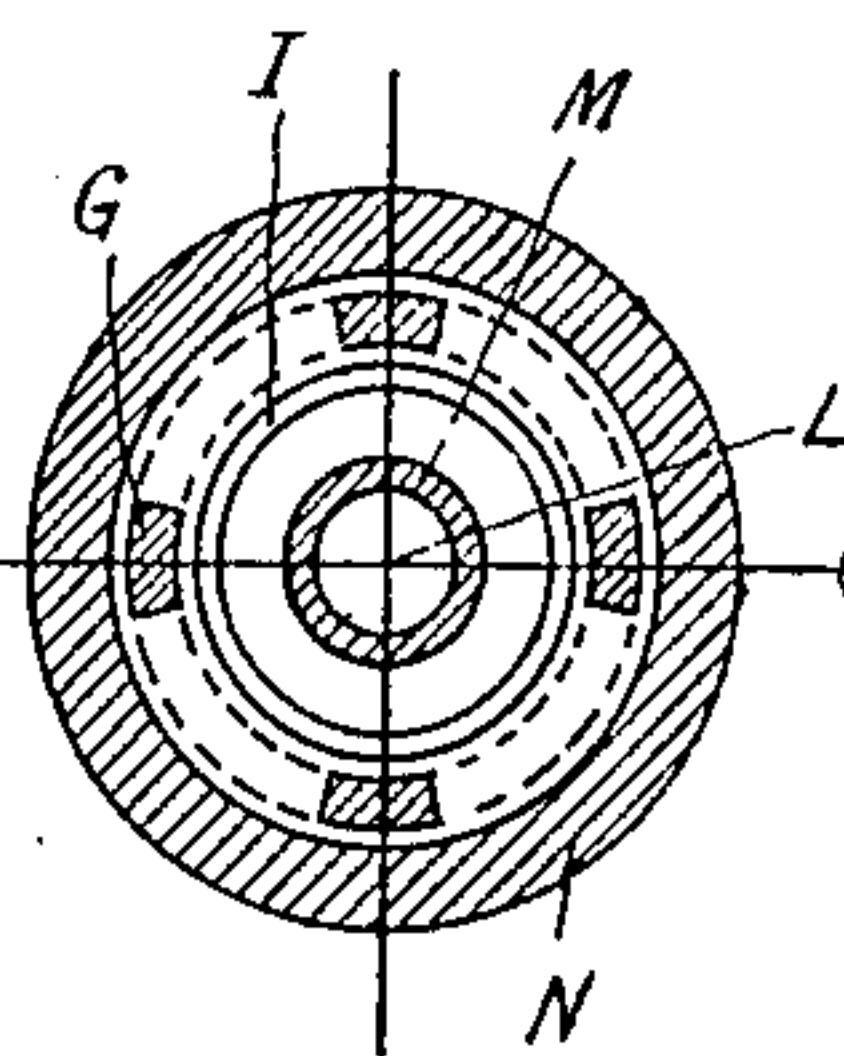
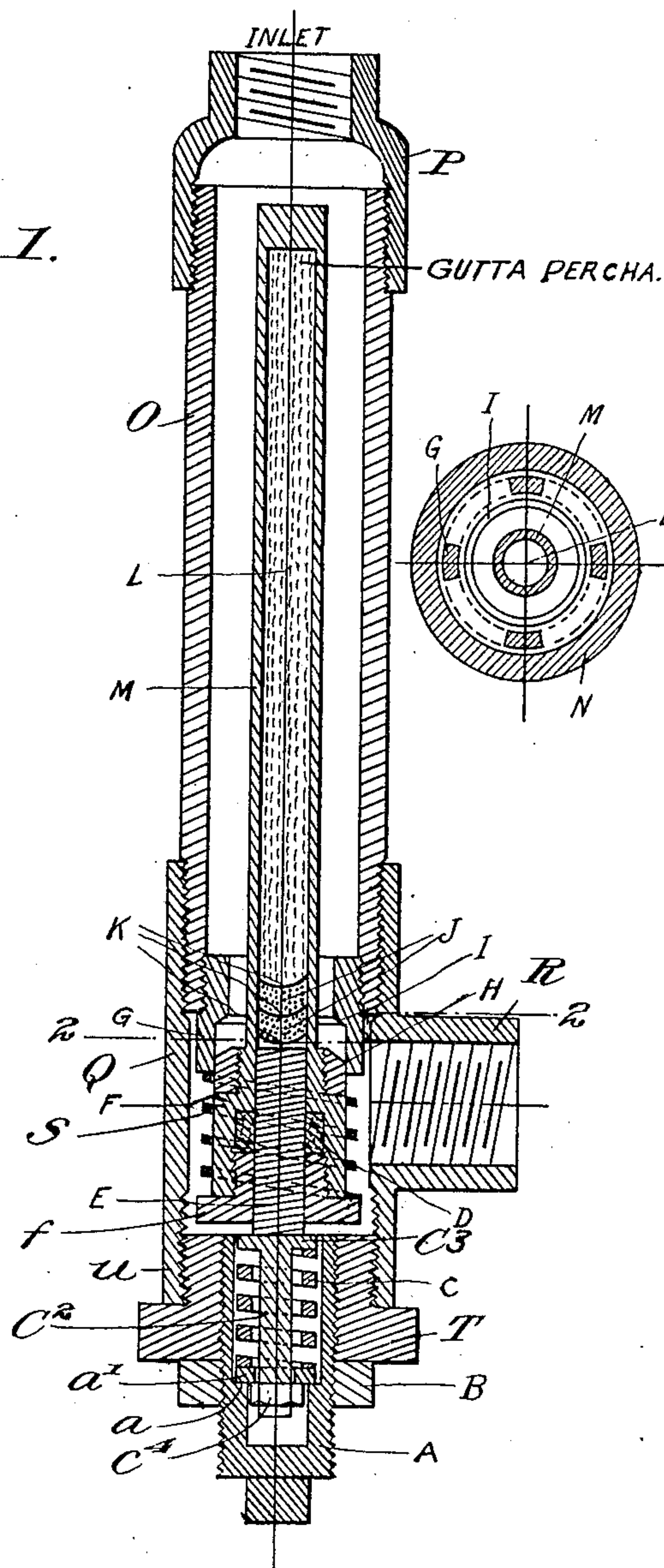


Fig. 2.

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STEAM-TRAP.

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To all whom it may concern:

Be it known that I, ALEXANDER DEWAR HORNE, 145 Bath street, Glasgow, Scotland, engineer, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention relates to improvements in steam traps and the object of the invention is to provide a trap of this nature wherein an expansible medium in the form of a solid material may be used to operate the usual valve interposed between the inlet and the outlet.

The invention will be more fully described in connection with the accompanying drawing and will be more particularly pointed out and ascertained in and by the appended claims.

In the drawing:—Figure 1, is a vertical sectional view of the trap embodying one form of my invention. Fig. 2 is a sectional view on line 2—2 of Fig. 1.

Like letters of reference designate similar parts throughout the different figures of the drawing.

Referring to the specific embodiment shown O designates an outer casing to one end of which is secured a union P indicated as the inlet for said casing. At the other end of said casing O a T-fitting Q is secured, the angular portion or stem R of which forms the outlet for said trap. A valve is interposed in said casing between the inlet and the outlet and as shown the valve seat I is secured to the casing conveniently by threaded connection therewith and is provided with closure guiding members G. The closure of said valve is indicated at H and as shown is in the form of a nut threaded onto a hollow member or container M. Said container M extends into or is located in the casing O in the path of the steam and water of condensation entering through the inlet in a manner to be subjected to varying temperatures for the purposes hereinafter set forth. Said container M is filled with an expansible medium in the form of a solid material L which preferably consists of gutta-percha and said container M is preferably closed at one end and open at the other end. The gutta-percha is retained in the container M at the open end thereof by means which preferably consists of a plurality of superposed cups K, preferably formed of metal and asbestos or other material interposed therebetween as indicated at J.

A device is provided against which the expansible material acts to operate the closure H and as shown said device consists of a piston E which projects into the container M in a manner to engage the lowermost cup K with its upper end. The container M may conveniently be provided with a packing gland which may consist of an extension F formed on the container and a gland member f having threaded engagement with said extension to compress the packing D around the piston. In the embodiment shown the expansible material L, in the performance of its function, serves to engage the closure H upon its seat I and in order to normally maintain the closure unseated or in other words to normally maintain the valve open means are provided which may consist of a spring S of a relatively light tension which may be interposed between the part f or flange thereon and the closure guiding member G as shown.

Means are provided for varying the action of the expansible medium L so that the latter will act in connection with the parts described to open the valve quickly and close it slowly or open the valve slowly and close it quickly as conditions may require. As shown said means consists of a plug T threaded into the lower end U of the T-fitting and having an internally threaded bore. A hollow adjusting member A has threaded engagement with said plug T and may be locked in any desired position. Said adjusting member A is provided with a shoulder a upon which a washer a' is supported. A bolt C² is provided with a head C³ and a tension nut C⁴ is disposed in said adjusting member A and the shank of the bolt extends through said washer a'. A relatively strong spring c is interposed between the head C³ and the washer a' and may be tensioned by adjustment of the nut c⁴. The head C³ is adapted for engagement with the lower end of the piston E.

The operation is as follows:—Assuming that the valve is closed the spring S will serve to open the valve as shown in Fig. 1 so that the inlet will be in communication with the outlet. In this position of the parts water of condensation can flow through the inlet and be discharged through the outlet. When steam enters the inlet the temperature of the container M and the expansible material L will be raised and the expansible material L will expand. Now

as the upper end of the container is closed the material will expand against the piston E thereby serving to elevate the container M and the closure H for the purpose of seating the latter at I and trapping the steam. When the temperature of the container M and the material L is reduced by the subsequent entrance of water of condensation, contraction of the material L will permit the spring S to open the valve depressing the closure H. When it is desired to have the trap opened quickly and closed slowly the member A will be adjusted lower in the plug T so that when the valve is closed the material L will have reached the maximum expansion. In this adjustment the slightest decrease in temperature will serve to quickly open the valve and the spring c will not perform any active function in the operation and the bolt C² will act merely as a solid abutment for the piston E.

Should it be desired to obtain a relatively slow opening and a relatively quick closing movement of the valve the member A will be adjusted upwardly in the plug T so as to elevate the bolt C² and piston E from the position shown in Fig. 1 to a normally higher position. This adjustment will result in the valve closing before the material has attained its maximum expansion and as the material continues to expand it will press the piston and place the strong spring C under tension. It will be seen that in this adjustment the valve will close relatively quickly whereas its opening movement must first be preceded by a release of the tension of the spring C before the material L has contracted sufficiently to permit the spring S to unseat the closure H.

It will be seen from the foregoing that

means are provided for obtaining a variable closing and opening action of the valve.

I claim:—

1. In a steam trap, the combination of a casing provided with an inlet and an outlet, a valve interposed in said casing between said inlet and outlet, a container in said casing connected with said valve and containing a suitable expansible material, and adjustable means coöperating with said expansible material and serving, after adjustment, to cause the material to either close the valve relatively quickly and open slowly or close relatively slowly and open quickly.

2. In a steam trap, the combination of a casing provided with an inlet and an outlet, a valve interposed in said casing between said inlet and outlet, a container in said casing connected with said valve and provided with a suitable expansible material, an element against which said material acts to operate said valve, and means composed of metallic and non-metallic material interposed between said solid expansible material and said element.

3. A thermostatic element for expansible traps comprising a closed container having a wall movable relatively thereto and a thermostatic body of gutta percha therein adapted to cause an outward movement of said wall upon a rise in temperature of the medium to which said element is exposed.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER DEWAR HORNE.

Witnesses:

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