

(No Model.)

C. F. BRIGHAM.

STEAM TRAP.

No. 401,772.

Patented Apr. 23, 1889.

Fig:1.

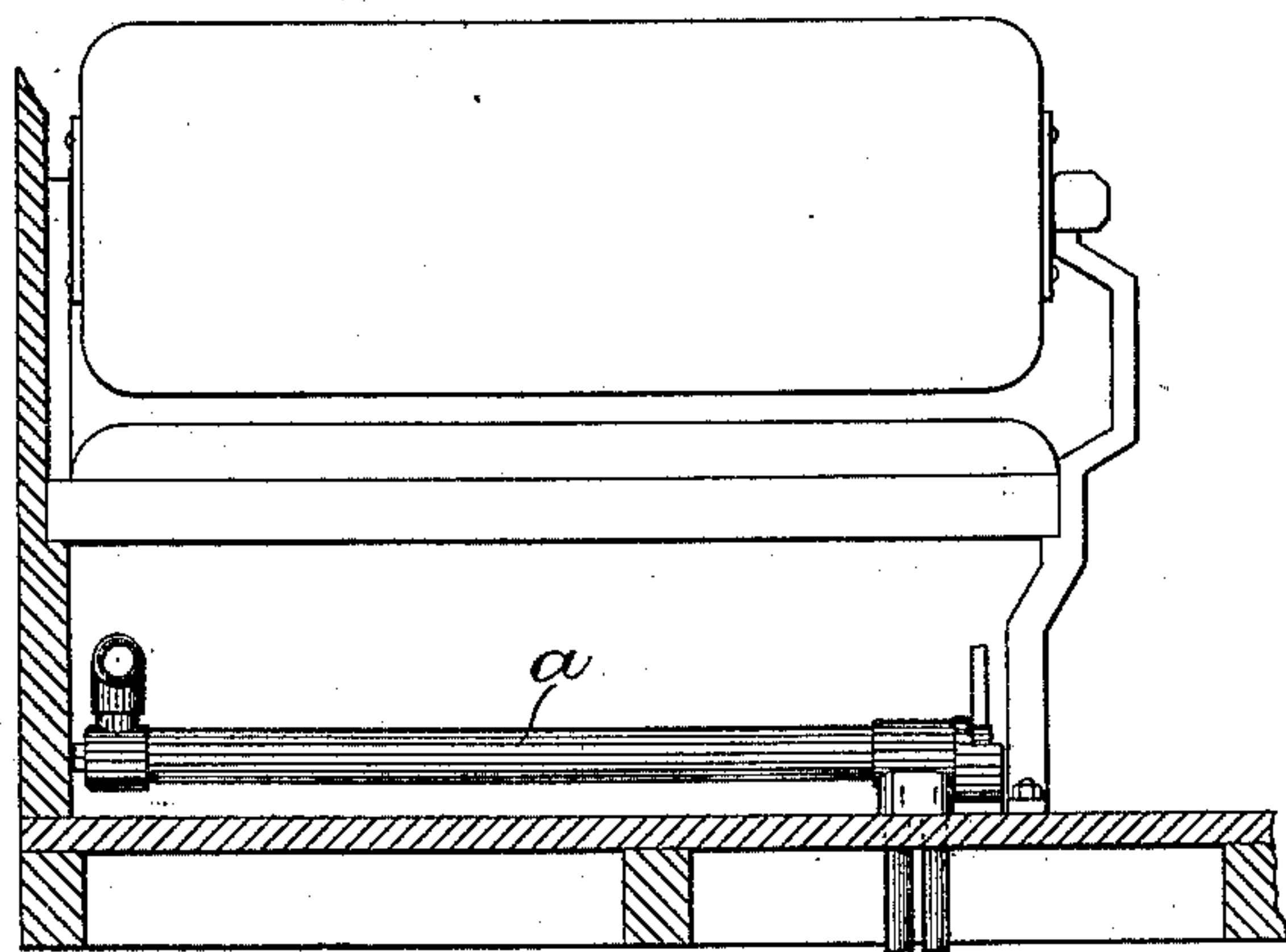


Fig:4.

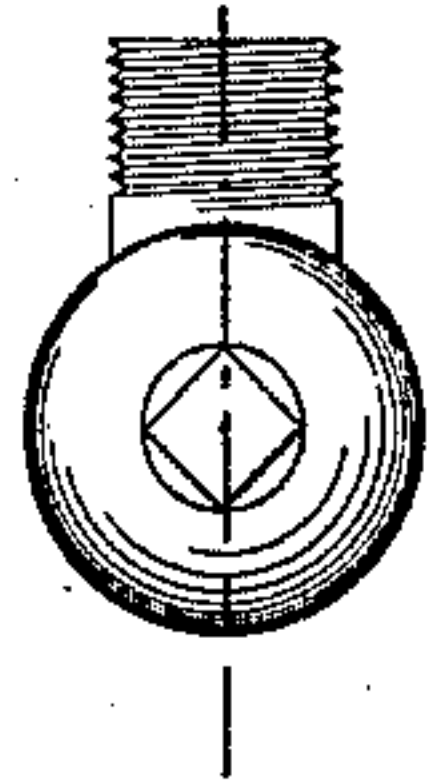


Fig:3

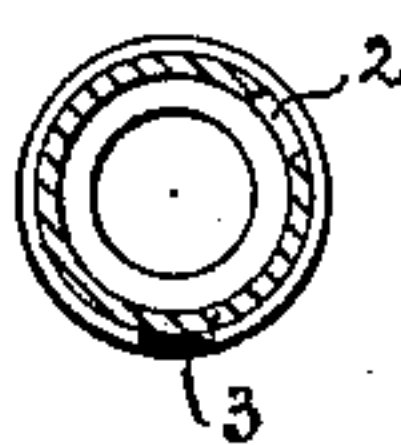


Fig:5.

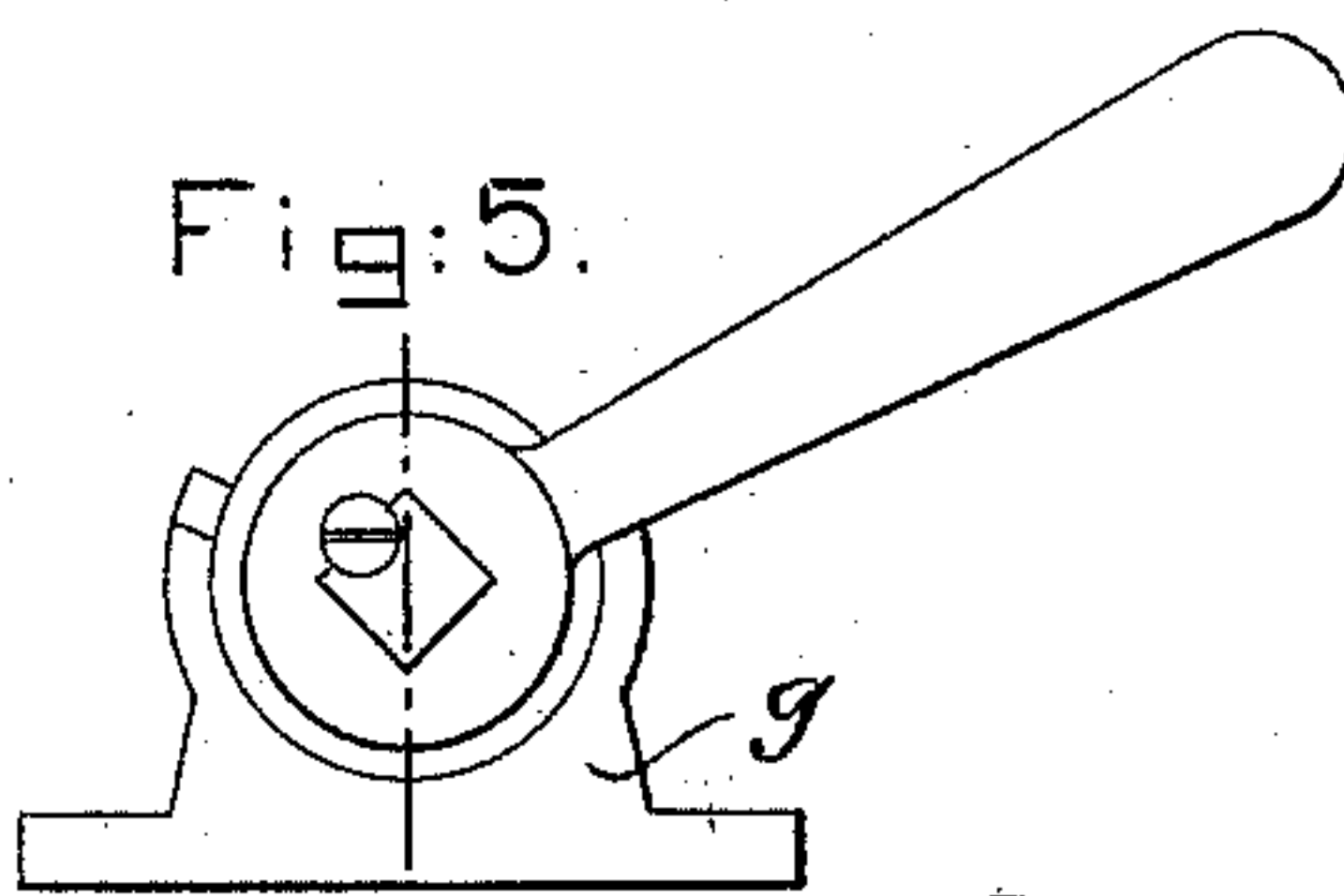
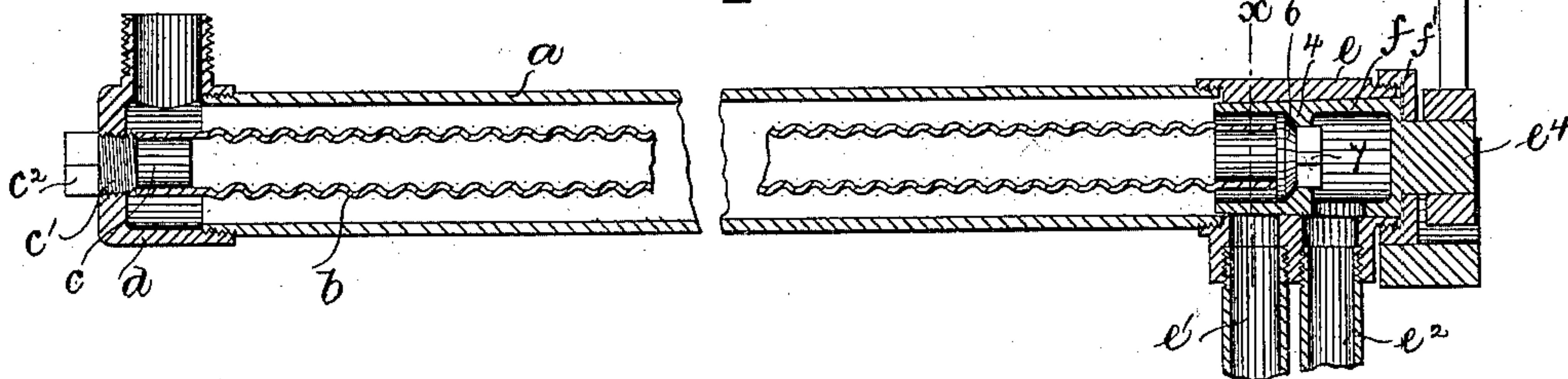


Fig:2.



Witnesses:

Fred. S. Gurnea
Frederick L. Emery

Inventor.

Charles F. Brigham
by Leroy S. Gregory

UNITED STATES PATENT OFFICE.

CHARLES F. BRIGHAM, OF BOSTON, MASSACHUSETTS.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 401,772, dated April 23, 1889.

Application filed July 20, 1888. Serial No. 280,539. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. BRIGHAM, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Steam-Traps, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to construct a steam-trap more especially designed for use in connection with steam-heating apparatus of cars.

In accordance with this invention a corrugated tube having closed ends is placed in an elongated tube or case, which is designed to be placed beneath one of the seats in the car, said tube or case receiving the steam. A valve is secured to one end of the corrugated tube, which engages with a valve-seat to automatically control the exit for the water of condensation. The valve-seat is formed within the cylindrical plug, which latter may be rotated in a suitable bearing or valve-case, and the said cylindrical plug and the case in which it moves each have two ports or passages arranged one at each side of the valve-seat, formed within said plug, and a suitable hand-lever, or equivalent, will be employed to rotate the said cylindrical plug, that one or the other of its ports may register with the ports or passages formed in the case in which said plug moves. The said cylindrical plug and its case serves as a plug-valve with two passages or outlets, one or the other of which may be opened at will.

Figure 1 shows in front elevation a steam-trap embodying this invention, it being shown as connected with the pipes of the steam-heating apparatus or system, and arranged beneath the car-seat; Fig. 2, a longitudinal section of the steam-trap shown in Fig. 1, it being broken away to save space on the drawings; Fig. 3, a vertical or cross section of the cylindrical plug or "plug-valve," as it may be called, taken on the dotted line xx , looking toward the right; Fig. 4, a left-hand end view of the steam-trap shown in Figs. 1 and 2; Fig. 5, a right-hand end view of the steam-trap shown in Figs. 1 and 2, the hand-lever being moved to one extreme position.

The tube or casing a is of any suitable

length and shape in cross-section, it preferably being made substantially the length of any ordinary car-seat. A corrugated tube, b , of substantially the same length as the tube or case a , but of much less diameter, is placed in said case a .

At one end of the corrugated tube b a plug, c , is driven or brazed, said plug being screw-threaded for a portion of its length, as at c' , and having a squared end c^2 . The screw-threaded portion of said plug c turns in a screw-threaded hole cut centrally in the end piece or connection d . The tube or case a is also screwed to said end piece d , and the said end piece has a connected nozzle, which enters or may be secured to the steam-pipes, said nozzle establishing communication between the case a and the said steam-pipes.

At the opposite end of the case a a tubular end piece or portion e is screwed, it serving as a valve-case and having two ports or outlet-passages, e' e^2 , leading from it. The valve-case a receives within it a cylindrical plug-valve, f , which is formed with two ports or passages, 2 3, (see Figs. 2 and 3,) one or the other of which, as the said plug is rotated, being brought to register, respectively, with the ports e' e^2 . The plug-valve f has preferably a squared end, e^4 , to which may be applied or attached a wrench or hand-lever, by which the said plug may be rotated. A cap, f' , incloses the plug-valve f , and is screwed onto the end of the piece e , thereby holding the said plug-valve in proper relative position.

A frame or casing, g , adapted to be secured to the floor of the car, is applied to the end piece e , serving as a support for one end of the case a , and being recessed or formed to receive the squared end e^4 , and the valve-operating lever, and also formed to present at each side a stop or abutment, against which the lever will strike or bear when moved into one or its other extreme position. As shown in Fig. 5, the lever is in such position that the port 3 of the plug-valve registers with the outlet e^2 while the port 2 is closed, and when the lever is moved into its opposite extreme position the port 2 will register with the port e' and the port 3 will be closed.

The plug-valve e is hollowed out or recessed to present a passage which communicates

with the case *a*, and said plug-valve *e* has formed within it at or near the middle a valve, herein shown as an internally-projecting annular flange arranged between the outlet ports or passages *e'* *e*².

A valve, herein shown as a plug driven into place, or otherwise attached to the end of the corrugated tube *b*, has a guide portion, 7, which passes through the opening formed in the valve-seat 4. The corrugated tube *b* is adjusted by the screw-threaded plug *c*, so that the valve 6 normally rests adjacent to, but does not touch, its seat, and as the steam enters the case *a* the tube *b* expands longitudinally, so that the valve 6 closes against its seat, and as at such time the port 3 registers with the outlet-passage *e*² the said valve remains closed until the temperature is reduced by the collection of the water of condensation, after which the said tube *b* slightly contracts, withdrawing its valve 6 from its seat and allowing the water of condensation to escape through the passage *e*².

It will be observed that for automatic action the hand-lever will be placed in position shown in Fig. 5, or in such position that the port 3 will register with the port *e*². When the hand-lever is in its vertical position, both ports 2 and 3 will be closed, so that the steam-trap will be made tight against the escape of steam or water therefrom. When the hand-lever is in its extreme position toward the left, the port 2 will register with the port *e'*, when it will be observed that an exit-passage is presented at the left of the valve 6, and hence an open passage is allowed, so that any movement of the valve 6 caused by the tube *b* will be ineffectual in accomplishing any result. The lever will be placed in this position only when desired to permit the steam to blow out the trap or when it is desired to free the circulation-pipes of all their contents.

I have herein shown a valve 6 as rigidly connected with the tube *b*; but I do not desire to limit myself to such construction, as it is obvious that any other form of valve might be used, either rigidly or loosely connected with the said tube.

In the present instance of my invention the tube *b* is made quite long, and hence there will be sufficient longitudinal expansion to move the valve 6 to desired distances; but for a tube made somewhat shorter an expansive liquid may be employed to aid the tube in its longitudinal expansion.

By employing a steam-trap of the kind herein described, and located as shown and described, it cannot freeze, and it also serves the purpose of a radiating-pipe.

I claim—

1. In a steam-trap, the external elongated case, *a*, and end pieces having inlet and outlet passages, and the longitudinally-expansible tube *b*, combined with a valve moved by said tube *b*, the rotatable plug *f*, and the valve-seat within it, substantially as described.

2. In a steam-trap, the external case, *a*, and longitudinally-expansible tube *b*, held adjustably within it, and the valve moved by said tube, combined with the end piece *e*, having the outlet-passages *e'* *e*², and the plug-valve *f*, contained in said end piece, it having the ports 2 3 and the valve-seat formed within it between said ports, substantially as described.

3. In a steam-trap, the external case, *a*, adapted to be placed beneath a car-seat and made substantially as long as the said seat to serve as a radiating and discharge pipe, and the end pieces connected with said case having inlet and outlet passages, the expansible tube held in said case, and the valve controlled by the longitudinal expansion of said tube, combined with the rotatable plug controlling the outlet-passages, and the valve-seat formed within said plug, substantially as described.

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

CHARLES F. BRIGHAM.

Witnesses:

BERNICE J. NOYES,
F. L. EMERY.