

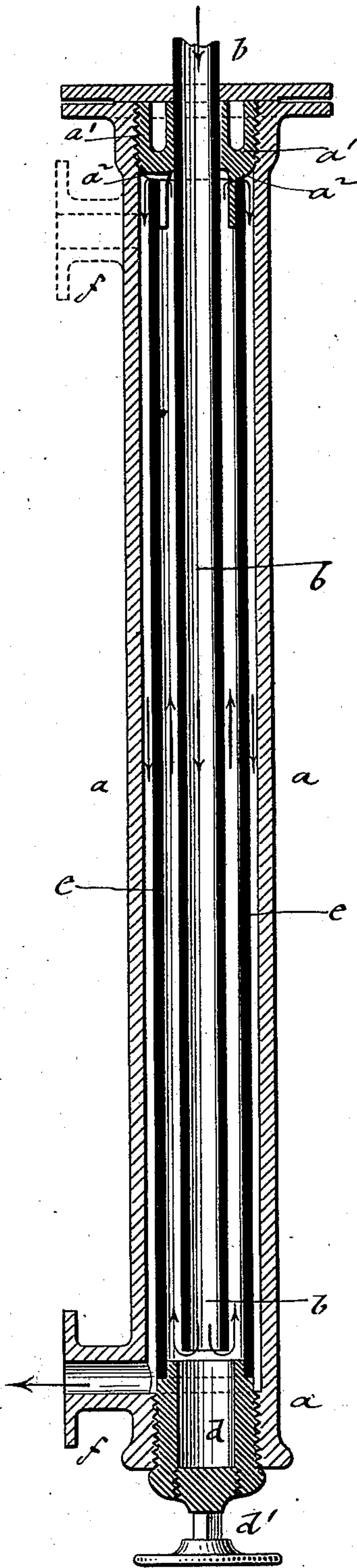
(No Model.)

J. KEIDEL.

STEAM TRAP.

No. 308,676.

Patented Dec. 2, 1884.



WITNESSES:

*Frederick H. Rosenbaum.*  
*Otto Rieck.*

INVENTOR

*John Keidel*

BY

*Joseph R. Rogers*  
ATTORNEY

# UNITED STATES PATENT OFFICE.

JOHN KEIDEL, OF BERLIN, GERMANY.

## STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 308,676, dated December 2, 1884.

Application filed July 10, 1884. (No model.) Patented in France December 6, 1883, No. 159,007; in Germany December 14, 1883, 207,269, and in England January 29, 1884, No. 995.

*To all whom it may concern:*

Be it known that I, JOHN KEIDEL, of Berlin, in the Empire of Germany, have invented certain new and useful Improvements in Steam-Traps, (and which has been patented to me in France under date of December 6, 1883, No. 159,007, in Germany under date of December 14, 1883, No. 207,269, and in England under date of January 29, 1884, No. 995,) of which the following is a specification.

This invention has reference to improvements in steam-traps or apparatus for collecting the condense-water from steam in pipes and other conduits and vessels; and the invention consists of an exterior tube having a screw-plug and a valve-seat at the upper end, a steam-inlet pipe passing through said plug through the exterior tube, and an expansion-pipe that is attached to an adjustable plug at the bottom of the exterior tube, and made of such a length that by its contraction and expansion it forms a valve with said valve-seat, so as to discharge intermittently the water of condensation collected in the trap.

The accompanying drawing represents a vertical central section of my improved trap for collecting the condense-water from steam-pipes and other conduits.

*a* in the drawing represents a tubular iron pipe, which is provided at its upper end with a screw-plug, *a'*, having valve-seat *a<sup>2</sup>*. The valve-seat *a<sup>2</sup>* is arranged at the lower end of the screw-plug *a'*. Through the pipe *a* extends a steam-inlet pipe, *b*, which I call the "dip-pipe," through which the steam is conducted to the interior of the trap. The dip-pipe *b* extends centrally through the exterior tube until within a short distance from the bottom of the tube *a*, which is closed by a hollow screw-plug, *d*, having a detachable screw-stopper, *d'*.

To the inner end of the bottom screw-plug *d* is securely attached an expansion-pipe, *e*, that is of greater diameter than the dip-pipe, and which extends in the space between the tube *a* and inlet-pipe *b* in upward direction, it being guided along guides of the screw-plug *a'* below the valve-seat *a<sup>2</sup>*. The exterior tube *a* is provided with one or more lateral water-

outlets, *f f*, at one or both ends. The steam, with the water of condensation and mud, passes down through the inlet or dip pipe *b*, and deposits the muddy parts and sediments in the hollow space or recess of the bottom plug, *d*. The steam then rises in the annular space between the dip-pipe and the expansion-pipe, whereby it heats the latter, so that the same expands and bears tightly against the valve-seat *a<sup>2</sup>*. According as the steam condenses and the annular space becomes more or less charged with condense-water the expansion-pipe is contracted because of the lowering of the temperature, so that it recedes from the valve-seat *a<sup>2</sup>*, and admits the escape of the condense-water into the space between the expansion-pipe *e* and the exterior tube, *a*. By means of the adjustable bottom plug, *d*, the proper position of the expansion-pipe relatively to its valve-seat *a<sup>2</sup>* can be regulated as required for the different temperatures of the steam.

In steam-traps of this class heretofore in use no dip-pipe was employed, so that the steam or condense-water entered directly into the expansion-pipe, which has the disadvantage that the steam overtakes the condense-water in the expansion-pipe, and causes the forcing back of the water and steam from the trap into the steam-conduits, whereby the proper regulation of the trap for the difference of temperatures of the steam and water and the reliable working of the apparatus is prevented. By the employment of the dip-pipe inside of the expansion-pipe the forcing back of the water of condensation into the conduit is prevented, as the water is retained in the annular space between the dip-pipe and the expansion-pipe until the valve formed by the expansion-pipe and its seat is opened, when the steam will drive the water through the valve-opening until the valve is closed again by the rising of the temperature.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of an exterior tube, *a*, having a lateral exit pipe or pipes *f f*, a valve-seat, *a<sup>2</sup>*, located at the upper end of the tube *a*, a hollow screw-plug, *d*, at the lower end of said tube, an expansion-pipe, *e*, attached to the



bottom plug, *d*, and a dip-pipe, *b*, inside of the expansion-pipe, substantially as set forth.

2. The combination of an exterior tube, *a*,  
5 having a lateral exit pipe or pipes *ff*, a screw-  
plug, *a'*, having a valve-seat, *a<sup>2</sup>*, at the upper  
end of said tube, a hollow adjustable screw-  
plug, *d*, at the lower end of said tube, a dip-  
pipe, *b*, passing through the upper screw-plug  
downward to some distance from the bottom  
10 plug, and an expansion-pipe, *e*, secured to the  
bottom plug and extending upward to the

valve-seat, so as to bear on the valve-seat or  
recede therefrom by the difference of temper-  
ature in the trap, substantially as set forth.

In testimony that I claim the foregoing as my 15  
invention I have signed my name in presence  
of two witnesses.

JOHN KEIDEL.

Witnesses:

CHAPMAN COLEMAN,  
CHARLES C. MORE.