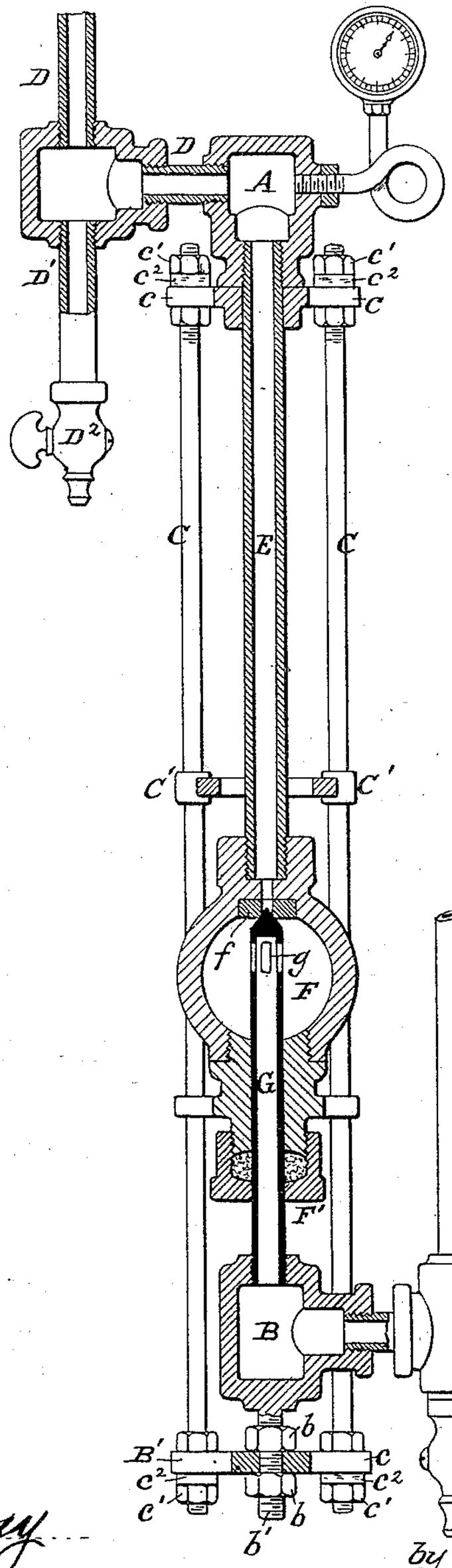
(No Model.)

J. McD. STUART.

STEAM TRAP.

No. 430,594. Patented June 17, 1890.



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STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 430,594, dated June 17, 1890.

Application filed September 9, 1889. Serial No. 323,447. (No model.)

To all whom it may concern:

Be it known that I, JOHN McD. STUART, a citizen of the United State, residing in the city of St. Louis and State of Missouri, have invented a certain new and useful Improved Steam-Trap; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification.

This invention relates to certain improvements in that type of steam-traps in which an expansion tube or pipe is employed to automatically open and close the outlet-valve from the trap, said tube, when filled with water of condensation, contracting to open the outlet-valve and permit the passing away of the water collected in the trap, and, when filled with steam, expanding to close said outlet-valve and hold it closed until the trap again refills with water of condensation; and the present improvement has for its objects, first, to provide a simple and effective means to prevent buckling or bending of the expansion-tube as the same attains an undue limit of expansion; second, to afford a simple and durable construction of valve-stem, whereby the water is carried off through an axial passage in the said stem, and, third, to afford means for adjusting the valve to its seat in "setting" the apparatus in a simple and ready manner; and I attain such objects by the construction and arrangement of parts illustrated in the accompanying drawing, which represents in axial section a steam-trap constructed in accordance with my present invention.

As represented in the drawing, the trap consists of an upper fixed head or receiving-chamber A and a lower or discharge head or chamber B, connected together by tie-rods C, that pass through ears or lugs *c* on the sides of the upper head, and the arms of the spider B′, that carry the lower head B and are provided with adjusting-nuts *c′*, as shown.

The upper head or chamber A is in communication with the steam-coil or other appliance that it is intended to drain through the pipe-connection D, which may be provided with the usual sediment-chamber D′ and sediment blow-off cock D^2, while the lower head or chamber B is connected to the discharge-pipe B^2, extending to a tank or other receiver arranged at any suitable point.

From the bottom of the chamber A depends the expansion-tube E, at the lower end of which is fixedly attached the vertically-moving valve chamber or casing F, adapted to slide on the tie-rods C, and having at its lower end a stuffing-box F′, through which passes in a steam-tight manner the tubular valve-stem G, which is fixedly connected to the lower or discharge head or chamber B. In practice the usual rod-brace C′ will be employed to brace the rods C to prevent any accidental bending of the same.

The novel features of my present improvement consists, first, in the provision of stiff spring-washers c^2 beneath the adjusting-nuts *c′*, so as to allow of a slight vertical movement or spreading apart of the heads A and B when the expansion-tube is unduly expanded by an excessive temperature or pressure of steam; secondly, in making the valve-stem G of a tubular form, opening at its lower end into the chamber B, and having near its upper end lateral openings *g*, that communicate with the interior of the valve-casing F, so as to form a water-passage between the same and the discharge head or chamber B, and, thirdly, in attaching the lower head B to its carrying-spider B′ by means of adjusting-nuts *b* on each side of the spider, that screw upon the stem *b′*, projecting downwardly from such head to effect a vertical adjustment of said chamber in setting the apparatus.

In the construction of my improved trap it is preferable to use a removable composition valve-seat *f*, arranged in an axial recess in the upper end of the valve-chamber F, which is capable of ready removal and replacement, so as to avoid the necessity of grinding the valve to its seat when worn.

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

1. In a steam-trap of the type herein described, the combination of the heads A B, expansion-tube E, valve-chamber F, valve-stem G, and tie-rods C with the spring-washers c^2, arranged beneath the adjusting-nuts *c′*, essentially as set forth.

2. In a steam-trap of the type herein de-

scribed, the combination of the heads A B, tie-rods C, expansion-tube E, valve-chamber F, and valve-stem G, made tubular with lateral openings near its top, and at its lower end opening into the chamber B, essentially as set forth.

3. In a steam-trap of the type herein described, the combination of the heads A B, tie-rods C, expansion-tube E, valve-chamber F, and valve-stem G with the spider B′, adjusting-nuts *b*, and downwardly-projecting stem *b′* on the bottom of the head or chamber B, essentially as set forth.

In testimony whereof witness my hand this 29th day of August, 1889.

JOHN McD. STUART.

In presence of—
ROBERT BURNS,
GEO. H. ARTHUR.