

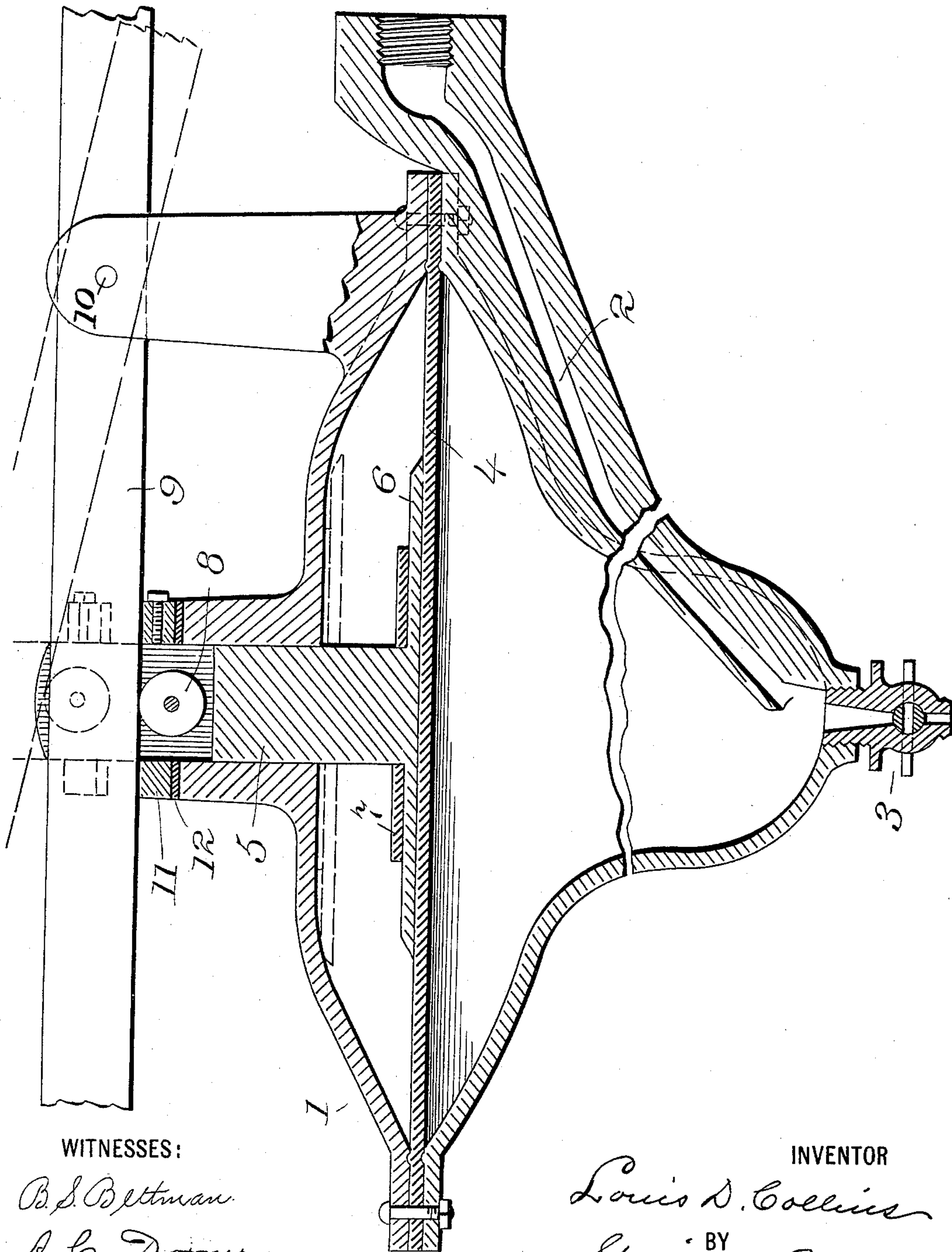
No. 613,005.

Patented Oct. 25, 1898.

L. D. COLLINS.  
DAMPER REGULATOR.

(Application filed Apr. 22, 1898.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

LOUIS D. COLLINS, OF GENEVA, NEW YORK, ASSIGNOR TO THE NEW YORK  
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## DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 613,005, dated October 25, 1898.

Application filed April 22, 1898. Serial No. 678,448. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS D. COLLINS, residing at Geneva, in the county of Ontario and State of New York, have invented a new and useful Improvement in Damper-Regulators, of which the following is a specification.

My invention relates generally to damper-regulators of a type especially adapted for use in connection with low-pressure steam-heaters.

The object of my invention is to protect the diaphragm ordinarily employed in devices of this class against unnecessary wear or fracture, as well as high temperatures and consequent vulcanization, and, furthermore, to provide a plunger operating under the influence of the diaphragm in a well-known manner and so arranged as to automatically close the casing to prevent leakage or the escape of steam or water in the event of accidental rupture of the diaphragm.

The novelty of the invention consists, first, in an adjustable stop for limiting the downward movement of the plunger, and thereby entirely relieving the diaphragm of all weight, and, second, in interposing packing-rings between the casing and the head and annular stop of the plunger, so that the latter will become self-packing in forming a steam-tight joint when raised or lowered, and, finally, the invention embraces various minor features, to be hereinafter described and claimed.

In the accompanying drawing one embodiment of the invention is illustrated by a view in central vertical section.

Referring thereto, 1 represents a diaphragm-casing, the lower portion of which is approximately bottle-shaped and provided with an inlet-pipe 2, entered near the bottom thereof, and a drain-cock 3. The upper portion or cover is concaved to provide a hollow chamber above the diaphragm 4, which latter is interposed and clamped between the upper and lower members of the casing by a series of bolts which serve to secure the members together.

5 represents a plunger adapted for vertical movement in a central tubular projection of the upper portion of the casing. At its lower end the plunger is flanged, as at 6, to provide

an enlarged bearing-surface against which the diaphragm acts. Encircling the plunger and upon the upper side of this flange a packing-ring 7, preferably of rubber, is placed, its purpose being to form a steam-tight joint at the central opening of the cover when the plunger is elevated. At its upper end the plunger is grooved for the reception of an anti-friction-roller 8, upon which a main lever 9 rests, it being fulcrumed at 10 upon a pivot-pin carried by a vertical stud or standard of the cover.

11 represents an adjustable stop by means of which the downward movement of the plunger is limited as may be desired, and consists of a ring encircling the plunger and held thereon by a set-screw.

12 represents a packing-ring encircling the plunger and interposed between the annular stop and the upper end of the tubular projection, the same being adapted to form a steam-tight joint at the latter point when the plunger is lowered.

From the foregoing it will be apparent that as the plunger is elevated the lower packing will come into contact with a faced inner surface of the cover and make a tight joint, thereby preventing the escape of steam or water should the diaphragm become ruptured. Further, a similar joint will be made by the upper packing-ring when the plunger is lowered owing to the weight of the lever, which is supported indirectly by the plunger, as above described.

In operation the diaphragm will at all times be in contact with water at a moderate temperature, which fills the lower chamber, and, as designed, the cubic capacity of the inlet-tube will slightly exceed that of the upper chamber. Therefore to fully distend the diaphragm would not exhaust the tube, and by reason of this fact steam is prevented from entering in quantity sufficient to raise the temperature and vulcanize the rubber, as will be obvious.

Having thus fully described my invention, what I claim as new is—

1. In a damper-regulator, the combination with a diaphragm and its casing, of a plunger operating under the influence of the dia-

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phragm, and an adjustable stop limiting the movement of the plunger, and supporting the latter at the extremity of its downward stroke for the purpose specified.

5 2. In a damper-regulator, the combination with a diaphragm and its casing, of a plunger operating under the influence of the diaphragm, and an annular stop adjustably secured upon the plunger to limit its downward movement, for the purpose specified.

10 3. In a damper-regulator, the combination with a diaphragm and its casing, of a plunger operating under the influence of the diaphragm and movable in bearings of the casing, packing-rings arranged in a manner to be engaged by the plunger at the extremities of its movement, and an adjustable stop normally supporting the plunger and limiting its downward stroke for the purpose specified.

20 4. In a damper-regulator, the combination with a diaphragm and its casing, of a plunger movable in bearings of the casing and provided with a lower, integral, terminal flange and an upper adjustable flange, the latter

serving as a stop in limiting the downward stroke of the plunger and packing-rings arranged to be compressed between said flanges and the casing at the extremities of the movement of the plunger, for the purpose specified.

5. A damper-regulator, comprising a casing consisting of a lower bottle-shaped member having requisite inlet and drainage connections, and an upper interiorly-concaved member serving as a cover therefor, an interposed yielding diaphragm sustained normally by the body of liquid contained in the lower member, and a self-packing plunger operating under the influence of the diaphragm, and an adjustable stop supporting said plunger at the limit of its downward stroke, for the purpose specified.

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

LOUIS D. COLLINS.

Witnesses:

JNO. W. MELLEN,  
CHARLES E. WILLIAMS.