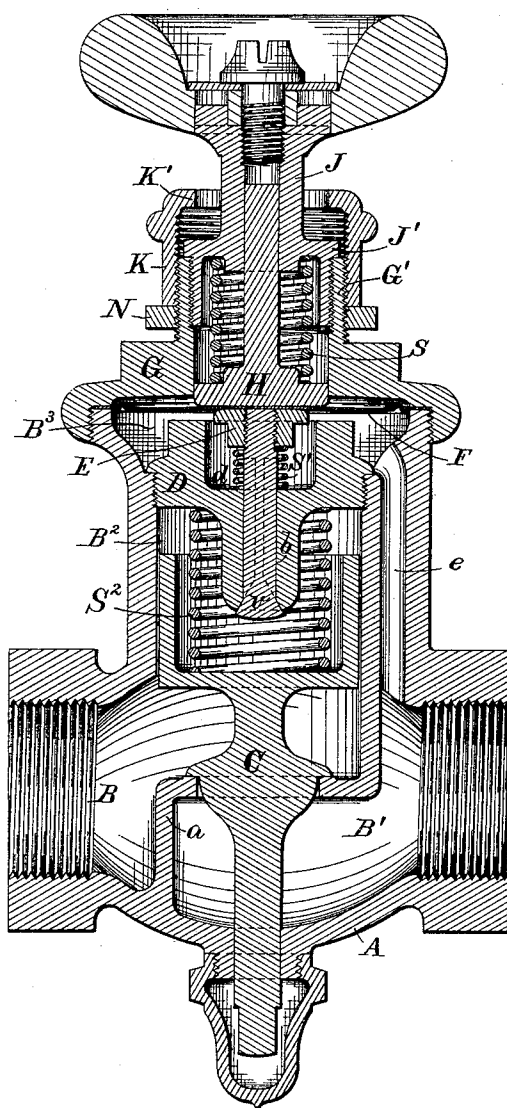


(No Model.)

N. CURTIS.
STEAM PRESSURE REGULATOR.

No. 406,029.

Patented July 2, 1889.



Witnesses

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NELSON CURTIS, OF BOSTON, MASSACHUSETTS.

STEAM-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 406,029, dated July 2, 1889.

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To all whom it may concern:

Be it known that I, NELSON CURTIS, of Boston, Massachusetts, have invented a new and useful Improvement in Steam-Pressure Regulators, of which the following is a specification.

The invention is applicable to steam-pressure regulators having a steam passage-way with a piston-valve therein, which is operated in one direction by steam, while in the other it is operated or controlled by a compression-spring located in a cap or in a prolongation of the shell of the regulator and provided with a screw-handle or screw-rod screwing into said cap or prolongation to compress said compression-spring more or less.

The object of the invention is to limit the movement in either direction of the ordinary regulating device of the apparatus and to lock such regulating device at its extreme limit of movement, or, in other words, to set or determine limits of steam-pressure in both directions—*i. e.*, high and low—within which the operator may set the apparatus to work as a whole, and to furnish a lock for the same when so set by simply turning the screw rod or handle in the ordinary manner; and the invention consists in a collar upon said screw-rod screwing into the cap of the shell against the compression-spring, a shoulder in said cap below said collar as a stop for said collar in one direction, and an adjustable sleeve internally threaded to work in threads upon the outside of said cap and provided with a shoulder above said collar as a stop therefor in the other direction.

Steam-pressure regulators of this class are much used for taking from boilers under the high-steam pressure required to work the engines in factories and similar buildings and in steam-ships and locomotives the small amount of steam required for steam-heating systems, and it often happens that owing to the condensation that takes place in the steam-pipes when steam is first turned into the steam-heating system the steam-gage near the regulator does not correctly show the pressure of the steam passing into the system, and that after such condensation ceases the steam-pressure within the system is altogether too high, and, again, the engineer being aware of this condensation, but not estimating its

amount correctly, may unguardedly in first heating up turn on enough steam to burst the pipes or other steam-conductors of the heating-system. My invention is a remedy for these difficulties. Moreover, my apparatus can be worked in the dark as well as in the light. The engineer, knowing the pressure required in the heating system connected with his boilers, can set the pressure-regulator to furnish steam at that pressure by simply turning the regulating-handle or screw-rod in one direction back against a stop, and desiring to heat up quickly in the first place a second stop prevents his turning the handle or screw-rod in the other direction sufficiently far to produce pressure enough to damage the heating system, and after heating up quickly he can readily put the system in its normal working condition by turning the handle or screw-rod back against the first-mentioned stop.

There are different classes of steam-pressure regulators to which the present invention is applicable. In one the regulator is a shell containing a main steam passage-way with a piston-valve therein, a small passage-way opening into said main passage-way on both sides of the seat of said piston-valve, and an auxiliary valve in said smaller passage-way controlling said piston-valve, the said auxiliary valve being provided with the compression-spring and screw-rod, located in the cap of the shell, as aforesaid, while in another less sensitive form of regulator the piston-valve in the main steam passage-way is itself directly provided with, and in one direction controlled by, a compression-spring located in a cap or projection of the shell, and in turn provided with a screw-handle or screw-rod screwing into said cap or projection to compress said compression-spring more or less. In the drawing, I represent the invention as applied to one of the more delicate class.

The figure is a sectional elevation of a pressure-regulator to which my invention has been applied; but the invention is not limited to the precise form of regulator shown.

A is the shell of the regulator, having an inlet passage-way B and an outlet passage-way B', the two forming the main steam passage-way.

C is a piston-valve in said main passage-way, having its seat and port formed in a rib

a, cast in said shell. Its piston is hollow and works loosely in a cylindrical chamber B², in the top of the shell A.

D is a casting screwed into the top of the chamber B².

It is bored through the center, forming a passage-way *b*, the lower end of which forms a seat for the conical auxiliary valve *v*, the upper end of whose stem, passing through said passage-way *b*, is screwed into a nut E, which is held up to normally close valve *v* upon its seat by a coiled spring S', lying in a recess *d* in casting D.

F is a flexible diaphragm, closing at the top a chamber B³ in the upper part of the shell A above casting D, and held in place by cap G. The shell A at one side has a passage-way *e*, which, with recess *d*, passage-way *b*, and chamber B², (the piston of piston-valve C working loosely therein,) forms the smaller passage-way above mentioned as entering the main passage-way on both sides of the main valve-port.

S is a compression-spring located in cap G and pressing upon the diaphragm F through an intervening follower H, and having its operating tension regulated by screw rod or handle J.

S² is a spring tending to keep piston-valve C on its seat.

The apparatus thus far described operates in the ordinary well-known manner, and there remains to be given but a brief description of the modification in which the new invention consists.

The cap G is made with an upright ring or shoulder G', threaded on the inside and outside, as shown. The screw rod or handle J, bored out to receive follower H and pressing upon the spring S, as shown, terminates, as shown, in a ring or cylinder threaded on the outside to take into the threads on the inside of ring or shoulder G', and is provided with a collar J', to which shoulder G' serves as a stop when the screw rod or handle is screwed down.

K is a sleeve threaded to take upon the out-

side of the ring or shoulder G'. The sleeve K has at the top a shoulder K', and it is obvious that the sleeve can be screwed upon the ring or shoulder G' to adjust and determine the distance between the two shoulders G' and K', and it is also obvious that that distance thus adjusted and determined in turn determines the limits within which collar J' can travel and within which the screw rod or handle J can be turned to affect compression-spring S. When the sleeve K has been set, it can be held firmly in position by turning a lock-nut N up against the bottom of the sleeve K. In operation an efficient lock is produced by turning the handle hard back against the upper stop or hard down against the lower stop.

The auxiliary valve with the diaphragm is in effect a small valve with a large piston controlling the main piston-valve, and it is obvious that if the compression-spring in the cap and its regulating screw rod or handle were made to operate directly upon and in one direction control a main piston-valve the apparatus might within my invention readily be provided with the collar J', sleeve K, and shoulders G' and K'.

I claim—

In a steam-pressure regulator containing a steam passage-way and a piston-valve therein and provided with a regulating device consisting, essentially, of a compression-spring and screw-rod therefor located in a cap or projection of the shell of said regulator, in combination with said compression-spring and screw-rod, the collar J' on said screw-rod, the ring or shoulder G', projecting from said cap beneath said collar, the internally-threaded sleeve K on the outside of said ring or shoulder G', provided with a shoulder K' above said collar J', and nut N, substantially as described, for the purpose specified.

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Witnesses:

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