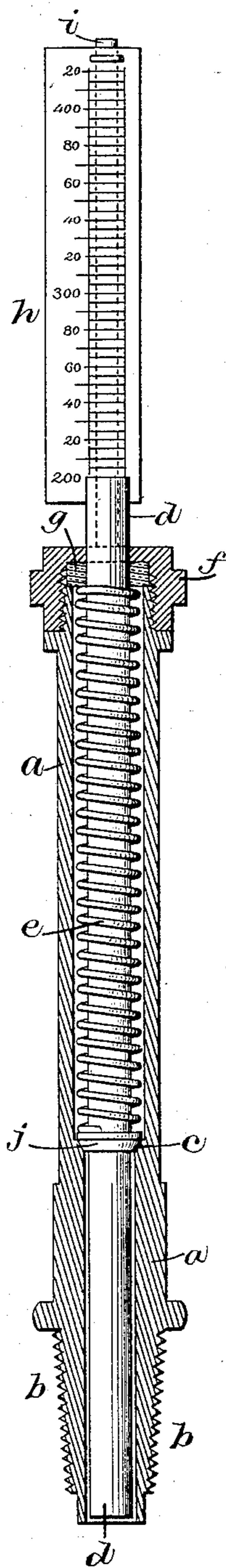


(No Model.)

A. T. WILLARD.
HIGH PRESSURE INDICATOR.

No. 318,152.

Patented May 19, 1885.



WITNESSES

A. O. Orne

Eugene Humphrey

INVENTOR

Alexander T. Willard
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UNITED STATES PATENT OFFICE.

ALEXANDER T. WILLARD, OF CHELSEA, MASSACHUSETTS.

HIGH-PRESSURE INDICATOR.

SPECIFICATION forming part of Letters Patent No. 318,152, dated May 19, 1885.

Application filed May 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER T. WILLARD, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in High-Pressure Indicators, which will, in connection with the accompanying drawing, be hereinafter fully described, and specifically defined in the appended claims.

This invention has for its object the providing of an accurate, durable, and low-cost gage or indicator adapted to indicate the pressure of steam or fluids in confined space; and it will, in connection with the accompanying drawing, be hereinafter more particularly and fully described and claimed.

In said drawing my invention is shown in sectional elevation, in which *a* represents a cylinder having a screw-threaded shank, *b*, adapted to be secured in a steam-chest or other body in which is confined steam, water, or other fluid under pressure. An axial passage extends through said cylinder, and being of a greater diameter in its upper section and of a lesser diameter in its lower section a shoulder, *c*, is thereby produced. A piston-rod or plunger, *d*, is arranged to slide loosely and freely in cylinder *a*, and is provided or formed with a collar, *j*, which, by engaging shoulder *c* in the cylinder, determines the descent of the plunger. A helical spring, *e*, is arranged on plunger *d* above its collar *j*. A cap, *f*, is screw-threaded on the top of the cylinder, and between said cap and the end face of the cylinder is arranged the ring-packing *g*, which renders steam-tight the joint between plunger *d* and said cap. A properly-spaced and numbered scale or tablet, *h*, is secured to and supported by rod *i*, secured in cap *f*.

In practical operation, when cylinder *a* is secured in the top of any receptacle in which steam or any fluid or liquid is confined under pressure, such pressure will be exerted upon plunger *d* in the ratio of the area of its cross-section, which will force it upward, thereby compressing spring *e*, which latter exerts its force between collar *j* and packing *g*. As the plunger rises it indicates the pressure exerted upon it by the relation of its upper end to the marks and figures on tablet *h*, and when the pressure upon the plunger abates spring *e* forces it correspondingly downward.

I am aware that it is old, common, and well known to employ for the purpose described a cylinder, a piston-rod, with a piston thereon, fitting the bore of the cylinder closely, a spring on the plunger, and an indicating scale or tablet, upon which the plunger indicates the pressure; but my invention differs therefrom, in that I employ no piston as such, the steam acting on the lower end of the plunger only, and I freely admit the steam into the cylinder in its entire length by arranging my packing-joint at the top thereof, whereby I also reduce the consequent friction to the least possible amount, and the force of the spring exerted upon the packing presses the latter against the rod. While in said older device the piston must be of a diameter greater than the coiled spring, in order that the latter may move freely in the bore of the cylinder, and the friction resulting from the close fitting of the piston in the cylinder is of such degree as to require a spring of such great strength in order to properly resist the steam-pressure and depress the plunger, that the device must lack the requisite sensitiveness to properly indicate the actual pressure to which the piston is being subjected. If desired, a differentiated indicator may be arranged in any of the well-known methods, whereby the lesser movement of the plunger will move an indicating-finger through an augmented space over the tablet.

My invention is of great utility in connection with vulcanizing-boxes for dental purposes, where it has been thoroughly tested, as it is inexpensive, indestructible by proper use, and is compact in size, and always reliable in its action.

I claim as my invention—

The combination of cylinder *a*, having shoulder *c*, formed by the larger and smaller bore therein, plunger *d*, fitting loosely in the smaller bore in said cylinder and provided with collar *j*, to be engaged by said shoulder, cap *f*, packing *g*, and spring *e*, arranged on said plunger between shoulder *c* and said packing, substantially as specified.

ALEXANDER T. WILLARD.

Witnesses:

T. W. PORTER,
EUGENE HUMPHREY.