

J. D. INGRAM.
Steam Pressure Gage.

No. 49,033.

Patented July 25, 1865.

FIG. 2.

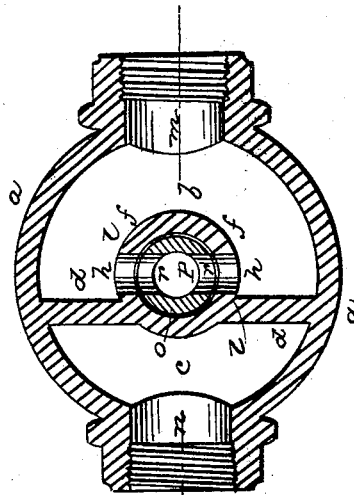
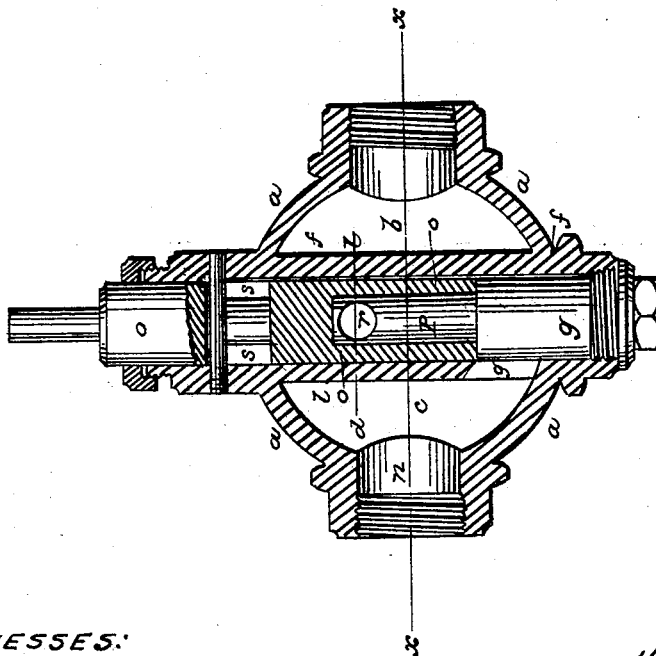


FIG. 1.



WITNESSES:

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INVENTOR.

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UNITED STATES PATENT OFFICE.

JAS. D. INGRAM, OF NEW YORK, N. Y., ASSIGNOR TO GEO. M. RICE, GEO. P. BARTON, AND JAS. E. FALES, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN STEAM-PRESSURE GAGES.

Specification forming part of Letters Patent No. **49,033**, dated July 23, 1865.

To all whom it may concern:

Be it known that I, J. D. INGRAM, in the city, county, and State of New York, have invented a new and useful Improvement in Steam-Pressure Gages; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

In drying paper by passing it over and around a series of hollow rollers to which steam is admitted for the purpose of heating them, the necessity and importance of preserving a uniform heat to the same and of so regulating the pressure of the steam admitted thereto as to always keep it at the desired degree, notwithstanding the variations of its pressure within the boiler, are well known to all conversant with the manufacture of paper.

To secure the above result is the object of the present invention, which consists in the use of a hollow cylindrical plug, closed at one end and open at the other, placed and moving steam-tight within a vertical guiding-tube, through the sides of which tube and the plug, in the same positions thereof, are one or more openings, forming communication between the steam-boiler through any suitable connecting pipe or pipes and the interior of the plug, the drying-rollers being connected with the lower open end of the plug by any suitable pipe attached thereto at one end and to the rollers at the other, so that the steam entering the hollow plug shall pass therefrom to the rollers to heat the same, the plug being so arranged within its tube that if the pressure of steam passing thereto from the boiler, as described, shall be in excess of the desired and requisite amount, whether in a small or great degree, it shall be thereby raised, thus closing its ports sufficiently to allow only such a quantity of steam to pass through the same as is necessary to preserve the heat desired to be given to the rollers, the plug falling or rising according as the pressure of steam therein decreases or increases, and it being first adjusted, by means of weights attached thereto, in any proper manner to the degree of pressure desired.

In accompanying plate of drawings my improvement is represented, Figure 1 being a

central vertical section of the same, showing the inlet orifice for the steam from the boiler to the hollow plug and the outlet-opening therefor to the rollers to be heated; Fig. 2, a horizontal section of the same in the plane of the line *x x*, Fig. 1.

a a in the drawings represent a hollow globe, divided into two chambers, *b* and *c*, by a partition-plate, *d*, extending vertically across the same, to which plate is attached or formed therewith, and in a vertical position within the globe *a*, a hollow tube, *f*, having an aperture, *g*, at or near its lower end, communicating with the chamber *c* of the globe, and an aperture, *h*, upon each side of the same at points diametrically opposite to each other, communicating with the chamber *b*. The apertures *h* are at or near the top portion, *l*, of the tube.

m and *n* represent orifices in the globe *a*, respectively opening into each of its chambers *b* and *c*, which orifices are connected by any suitable pipes to and with the steam-boiler and the drying-rollers, the one, *m*, with the former and the other, *n*, with the latter.

In tube *f*, and fitting steam-tight within the same, is a hollow plug, *o*, opened at its lower end and closed at its upper, in the side of which plug, and extending entirely through the same to the interior chamber, *p*, are two apertures, *r r*, corresponding in position to those of the tube *f*, and opposite to and in the same line with the same, forming direct communication between the interior of the plug and the chamber *b*, connected with the steam-boiler, as described. The plug *o*, at or near its upper end, is hung by a short vertical slot, *s*, upon a pin, *t*, inserted within and across the tube *f*, on which pin, as the plug plays up and down within its guiding-tube, as will be presently described, it moves and is guided.

Steam being admitted to the chamber *b* through its orifice connected with the boiler in any proper manner, and passing through the same, enters through the apertures *h* and *r* the interior of the plug, from whence it passes through the aperture *g* to the chamber *c*, and out at its orifice into the rollers connected therewith, to which its heat is imparted, first, however, having adjusted the plug, by means of weights or other proper devices attached to or placed upon its upper end, to the pressure

of steam necessary to impart the desired degree of heat to the rollers, the plug, in case of any increase in the pressure of the steam passing through it, as described, being thereby raised within its outer tube, guided by its cross-pin, closing the ports by which the steam enters it in direct proportion to such increase, thus correspondingly decreasing the amount of steam passing through the plug to the rollers, and consequently causing a uniform heat to be maintained therein, as is evident without further description, the plug thus rising or lowering within its tube, according as the pressure of steam in it is more or less, and closing its ports in direct proportion thereto.

In lieu of only two ports in the plug, more may be used, or only one; but I deem two sufficient, and the open end of the plug may be connected directly with the rollers, as at *y*. There are also other alterations which might be made in the general construction and arrangement of the parts composing my improved steam-gage without departing from the prin-

ciple of my invention, as hereinbefore stated; and also, although I have particularly described my gage as applied to the regulation of the pressure of steam for drying-roller, it is evident that they can be as well adapted to various other purposes, and therefore I do not intend to limit myself to the precise form and construction, or to its particular application, herein described.

What I claim as new, and desire to secure by Letters Patent, is—

The combination of the hollow cylindrical or other suitable shaped plug *o* with its guiding-tube *f*, arranged together and having steam inlet and outlet ports, substantially as and for the purposes described.

The above specification of my invention signed by me this 26th day of April, A. D., 1865.

JAMES D. INGRAM.

Witnesses:

ALBERT W. BROWN,
M. M. LIVINGSTON.