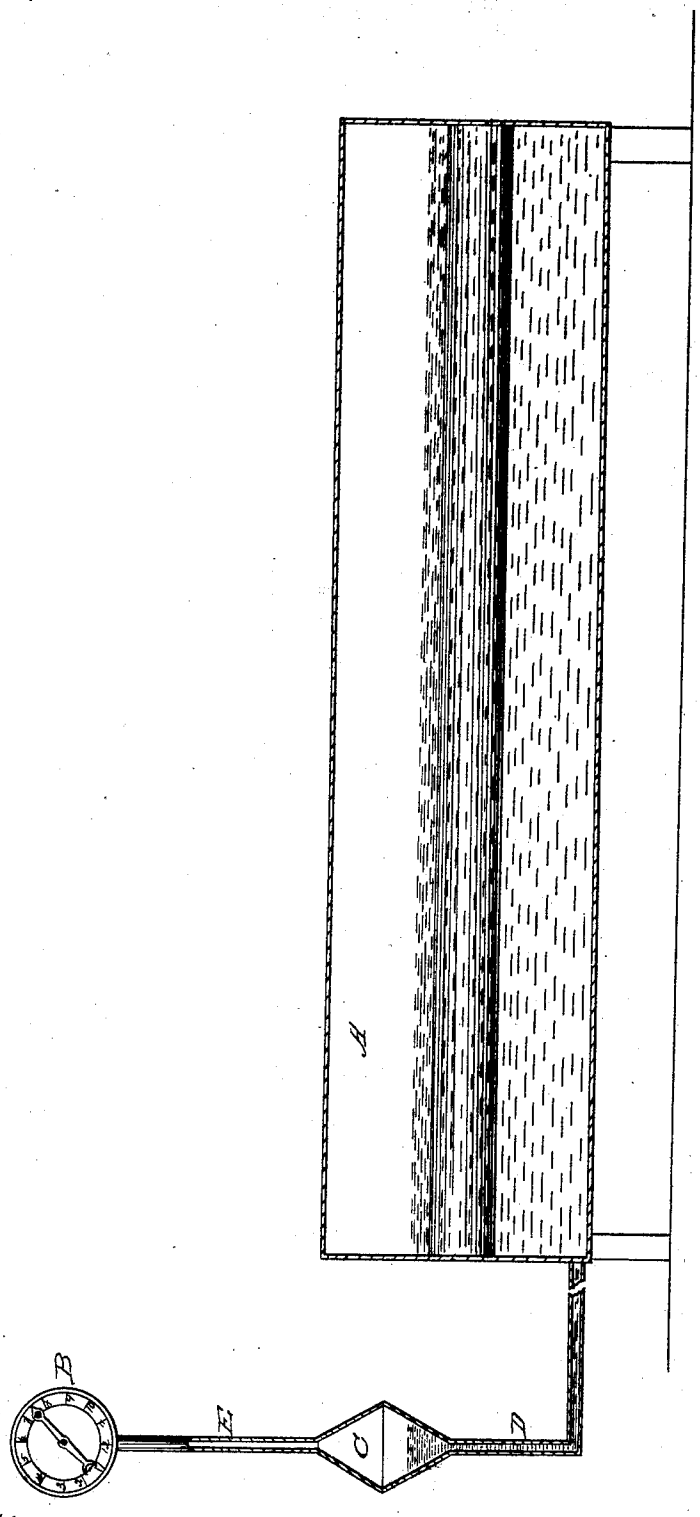
GRADER & WURZBACH.

Applying Pressure Gages.

No. 30,312. Patented Oct. 9, 1860.



Witnesses:

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UNITED STATES PATENT OFFICE.

G. W. GRADER AND A. C. WURZBACH, OF MEMPHIS, TENNESSEE.

STEAM-GAGE.

Specification of Letters Patent No. 30,312, dated October 9, 1860.

To all whom it may concern:

Be it known that we, GEORGE W. GRADER and A. C. WURZBACH, both of Memphis, in the county of Shelby and State of Tennessee, have invented a new and Improved Mode of Applying Pressure-Gages to Steam-Boilers and other Apparatus; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, said drawing representing a vertical section of a steam-boiler with a pressure-gage applied according to our invention.

Our invention relates to pressure gages for steam or water. Its object is to prevent the steam or water ever coming in contact with the gage, thereby preventing its ever being overheated or frozen and preventing the deposit of sedimentary matter within it.

It consists in the employment of an air chamber connected with the water space of the boiler and interposed between it and the gage so that the gage is acted upon through the medium of air instead of directly by the steam or water.

A, is the boiler, and B, the gage which may be of any well known or suitable kind.

C, is an air chamber arranged at any distance from the boiler, either entirely or for the most part above the highest water level. The bottom of this air chamber is connected by a pipe D, with the water space of the boiler, and the top is connected with the gage by a pipe E. When there is no pressure in the boiler beyond that of the atmosphere the water is at the same level in the air chamber C, or in the pipe D, as in the boiler and the pipe E, and the air chamber or as much of the latter as is not filled with water are filled with air at the atmospheric pressure, but as steam is generated in the boiler it forces the water through the pipe D, into the air chamber and so causes compression of the column of air in the air chamber and pipe E, to the same pressure as the steam, and so causes the steam pressure to be indicated by the gage.

The capacity of the air chamber is intended to be sufficient to contain such a volume of air at the atmospheric pressure as will be sufficient to keep the pipe E, full when it is compressed equal to the highest pressure of steam, the object of the said chamber being to prevent more than an inconsiderable variation between the level of the water in the boiler and the water in the air chamber or gage pipe. The air in the pipe E, being a non-conductor of heat keeps the gage cool. It is obvious also that the water cannot rise above the air, and so cannot come in contact with the gage to deposit sediment or to be frozen therein.

Instead of the pipe D, being connected with the water space of the boiler outside, it may be connected with the boiler above the water level and dip down into the water, but it should in any case not open to the steam space as it is desirable to have water interposed between the steam and the column of air. The air chamber may also be within the boiler.

In applying the invention to the pressure gage of a hydrostatic press or other apparatus to indicate the pressure of water, the air chamber C, should be arranged wholly or partly above the highest level of the water and connected by the pipe D, with the cylinder or water chamber in the same manner as to a boiler.

What we claim as our invention and desire to secure by Letters Patent is:

The employment of an air chamber connected with the water space of the boiler and interposed between it and the indicating gage substantially as and for the purpose herein shown and described.

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Witnesses:
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