No. 698,452. Patented Apr. 29, 1902.

# A. DE CLAIRMONT.

## HOLLOW OR DOUBLE WALLED STRUCTURE.

(Application filed Aug. 30, 1901.)

(No Model.)

FIG. 1.

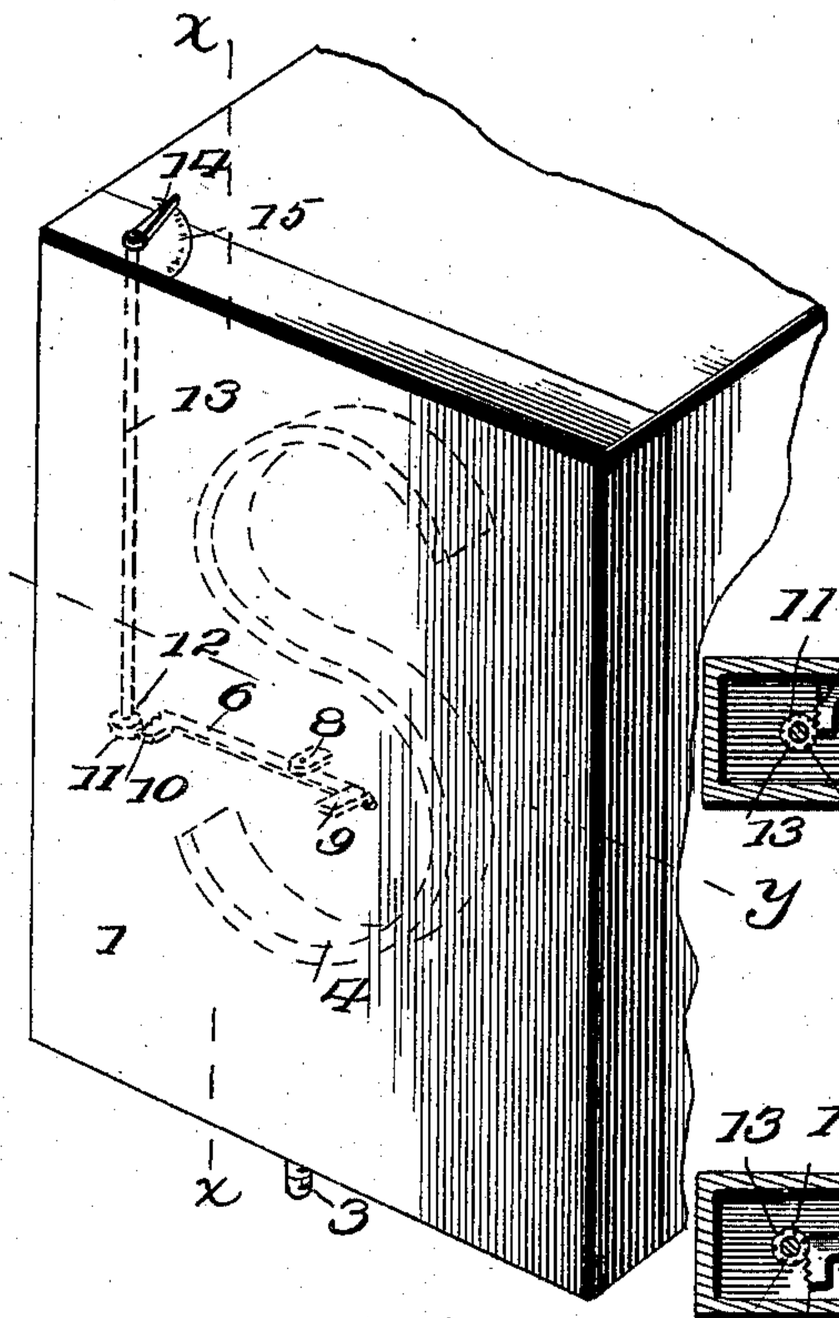



FIG. 3.

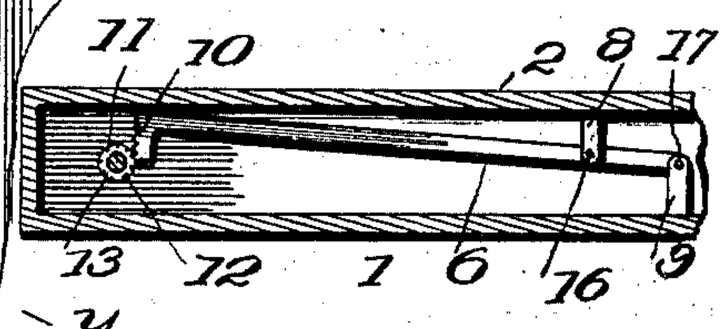



FIG. 4.

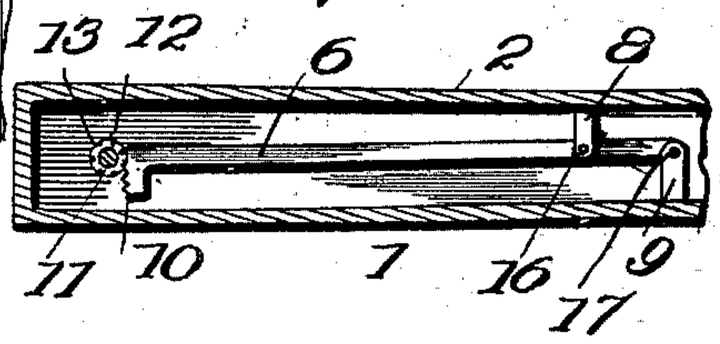



FIG. 2.

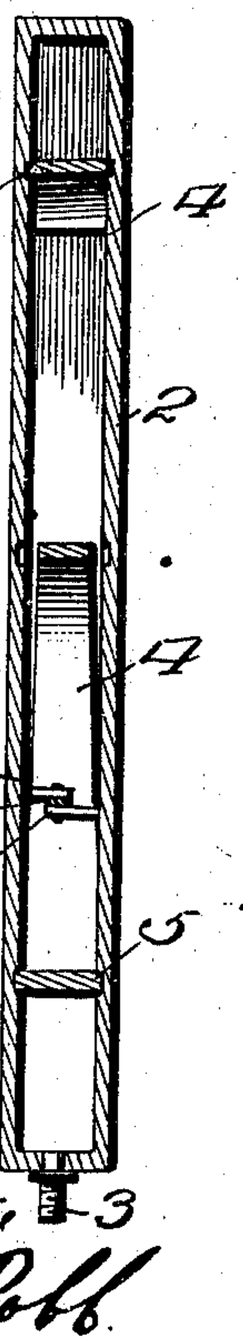



FIG. 5.

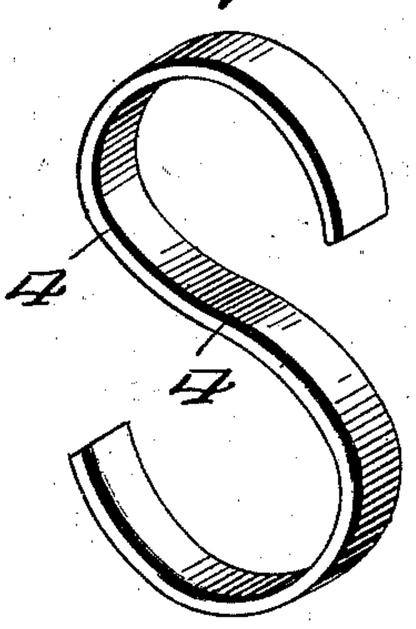
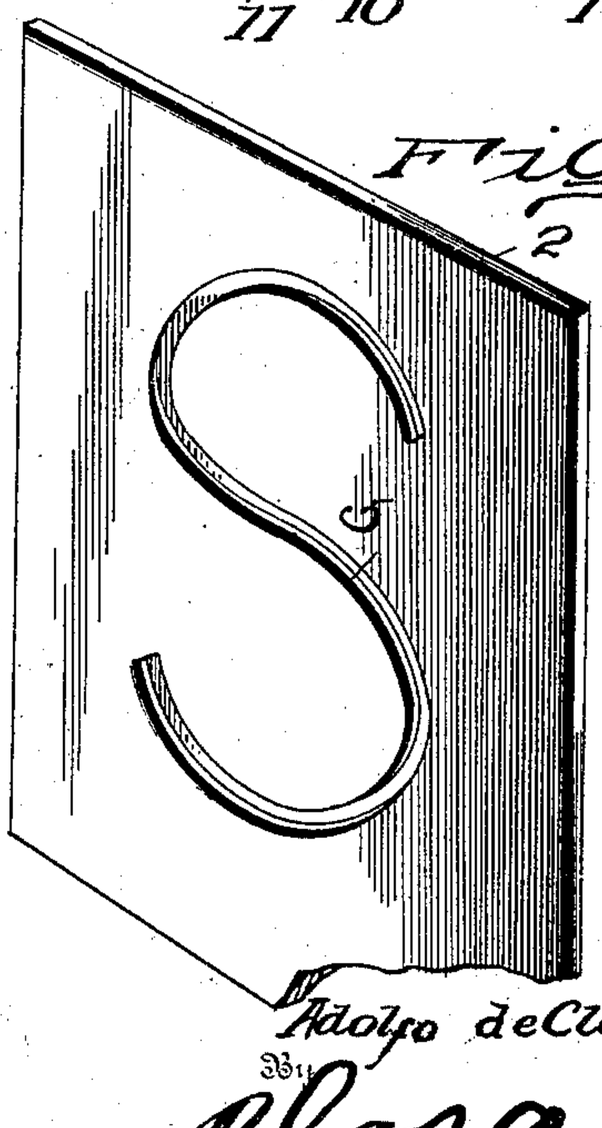



FIG. 6.




Witnesses

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# UNITED STATES PATENT OFFICE.

ADOLFO DE CLAIRMONT, OF TOPEKA, KANSAS, ASSIGNOR OF ONE-FOURTH TO T. D. HUMPHREYS, OF TOPEKA, KANSAS.

## HOLLOW OR DOUBLE WALLED STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 698,452, dated April 29, 1902.

Application filed August 30, 1901. Serial No. 73,810. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLFO DE CLAIRMONT, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Hollow or Double Walled Structures; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to hollow or double walled structures having the air exhausted from the hollow space to retard the penetration of heat-rays. As the exhaustion of the air is effected the walls tend to move inward by the excess of external atmospheric pressure. To prevent collapse of the walls and to indicate the degree of rarefaction of the air in the space between the walls are the chief characteristic features of the present invention.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a hollow or double wall, showing the application of the invention. Fig. 2 is a vertical section about on the line X X of Fig. 1 looking to the right, as indicated by the arrow. Fig. 3 is a horizontal section about on the line Y Y of Fig. 1, showing the relation of the parts prior to exhaustion of the air from the space inclosed between the walls. Fig. 4 is a view similar to Fig. 3, showing the relation of the parts after the air has been exhausted. Fig. 5 is a perspective view of the **S**-shaped brace interposed between the walls for preventing collapse thereof. Fig. 6 is a perspective view of a wall, showing the seat provided therein for the reception of an edge portion of the **S**-shaped brace.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The hollow wall may be of any shape, size, and relative position, and the space inclosed between the walls may be of any transverse extent, according to the specific purpose of the structure. The walls 1 and 2 are connected at their respective edges in any substantial and selected way, so as to hermetically seal the space inclosed therebetween, and in order to admit of exhaustion of the air from the space a valved nipple or pipe 3 is provided for attachment therewith of a pump or other air-exhausting contrivance. To prevent collapse of the walls under atmospheric pressure when the air in the space is rarefied by exhaustion, a brace 4 is provided, and this brace is of **S** form and is of a size proportionate to the extent of the hollow wall, so as to stiffen the sides thereof. The **S**-shaped brace by reason of its peculiar form admits of a minimum amount of material entering into its formation and of the walls being braced at the points subjected to greatest strain and pressure. Provision is had for an appreciable movement of the walls or sides of the hollow wall at a central point for the purpose presently to be explained by reducing the width of the **S**-shaped brace intermediate of its ends, the reduction in width being greatest centrally of the brace and diminishing from a central point toward the ends of the said brace. While it is contemplated to secure the brace to the walls or sides in any desired way, said walls are shown as provided upon their inner faces with **S**-shaped grooves 5, corresponding in size and outline to the brace 4, so as to receive the edge portions thereof, as clearly indicated in Fig. 2. This construction allows for a lateral movement of the walls or sides, according to the condition of the air confined in the space. When the air is rarefied by exhaustion, the sides or walls 1 and 2 move inward, and as the air approaches normal atmospheric pressure the walls or sides 1 and 2 move outward to normal position. Advantage is taken of the lateral movements of the sides or walls 1 and 2 to indicate the

degree of rarefaction of the air in the space, and for this purpose the means illustrated have been devised.

A lever 6 is located in the space 7 formed between the sides or walls 1 and 2 and is pivotally connected to inwardly-extending studs 8 and 9, attached, respectively, to the sides or walls 1 and 2 and located a short distance apart. The free end of the lever 6 is provided with a toothed segment 10, in mesh with a pinion 11, attached to or forming a part of a shaft 13, provided upon its outer end with a pointer 14, which in conjunction with a dial 15 indicates the degree of rarefaction of the air in the space 7. An inward movement of the wall or side 1 carries the stud 8 inward and moves the pivot connection 16 between said stud and the lever 6 toward the wall or side 2, thereby turning the lever 6 upon the pivot connection 17 between it and the stud 9 and carrying the toothed segment 10 toward the said wall 2 and imparting a rotary movement to the shaft 13 and pointer 14. An inward movement of the side or wall 2 causes the pivot connection 17 to move inward or toward the wall 1 and the lever 6 to turn upon the pivot-fastening 16, whereby the toothed segment 10 is advanced toward the said wall 2. As the air is exhausted from the space 7 both walls or sides 1 and 2 move in simultaneously, and the degree of movement of each combines to throw the segment 10 in the same direction. Hence a very small movement of the walls 1 and 2 will effect an appreciable movement of the lever 6 and toothed segment 10 and can be determined by reference to the pointer 14 and dial 15, so as to make known the degree of exhaustion in the space 7. Should air enter the space 7 from any cause, the density of the rarefied air will be increased, and the sides or walls 1 and 2 being relieved in a measure from external pressure will move outward and effect retrograde movement of the pointer 14, so as to indicate the exact condition of the air confined in the space 7.

Having thus described the invention, what is claimed as new is—

1. A hollow wall having **S**-shaped grooves or seats in the inner faces of its sides, and a brace of corresponding **S** shape having its edge portions fitted in the grooves or seats of the said sides of the wall, substantially as set forth.

2. In combination with a hollow wall adapted to have the air exhausted from its space, indicating mechanism for determining the degree of rarefaction of the air inclosed within the space of the said wall and controlled by the lateral movement of the sides of the said wall, substantially as set forth.

3. In combination with a hollow wall adapted to have the air exhausted from the space thereof, studs spaced apart and extended inward from the sides of the said wall, a lever pivotally connected to the inner ends of said studs, and an indicating mechanism actuated by the said lever to determine the degree of rarefaction of the air in the space of the said wall, substantially as described.

4. In combination with a hollow wall adapted to have the air exhausted from the space thereof, studs extended inwardly from the sides of the said wall, a lever pivotally connected to the inner ends of said studs, and having a toothed segment at its outer end, a shaft provided with a pinion in mesh with the said toothed segment, a pointer applied to said shaft, and a dial for coöperation with the pointer, substantially as set forth.

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

ADOLFO DE CLAIRMONT. [L. S.]

Witnesses:

H. C. POHLMAN,

ANNA POHLMAN.