

(No Model.)

G. T. THOMPSON.  
GAS HOLDER.

No. 460,898.

Patented Oct. 6, 1891.

Fig. 1.

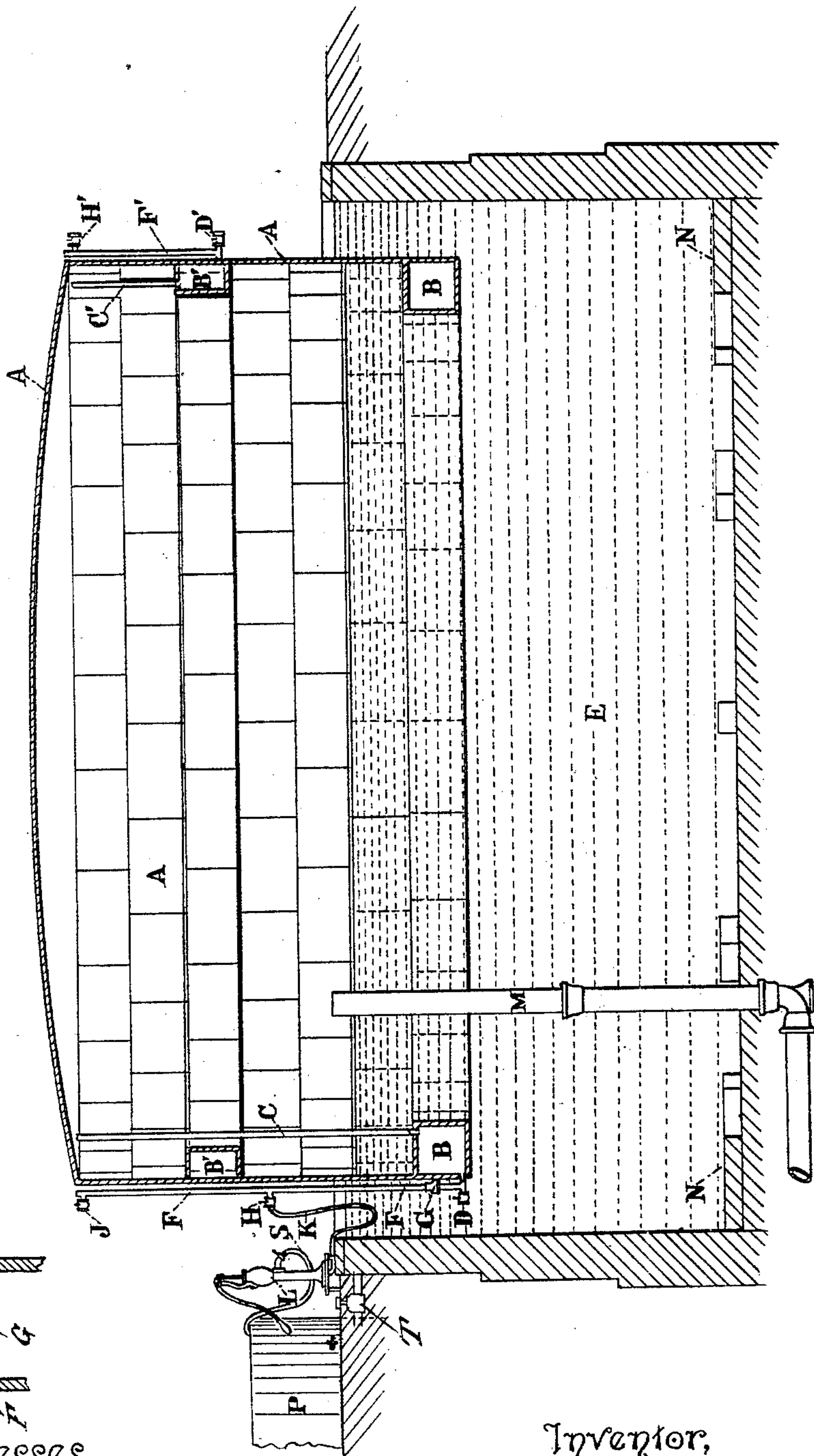
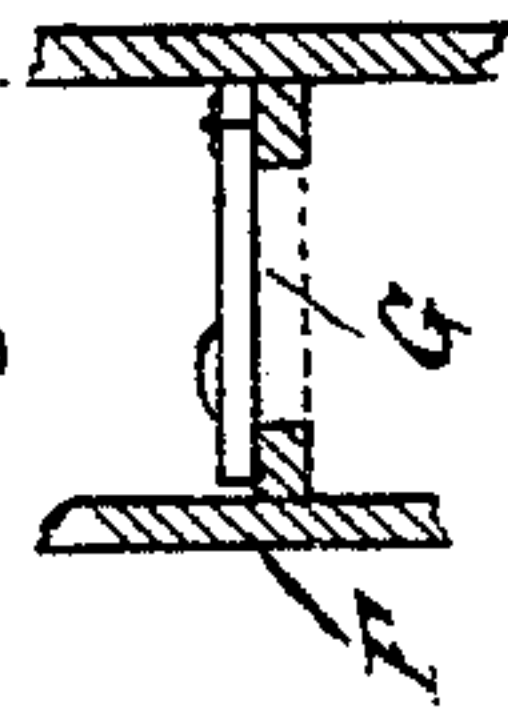


Fig. 2.



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# UNITED STATES PATENT OFFICE.

GEORGE T. THOMPSON, OF ST. LOUIS, MISSOURI.

## GAS-HOLDER.

SPECIFICATION forming part of Letters Patent No. 460,898, dated October 6, 1891.

Application filed February 27, 1891. Serial No. 383,097. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE T. THOMPSON, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful  
5 Improvement in Gas-Holders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain new and  
10 useful improvements in that class of gas-holders or gasometers which consists of an inverted bowl or bell whose lower edges dip into a seal or cistern of water or other liquid, said holder being adapted to rise within the cis-  
15 tern as the gas enters it and to fall as the gas is released to the main pipes or apparatus which follows.

It has hitherto been customary when fill-  
20 ing a holder to overcome the resistance caused by its weight by propelling the gas into said holder by pressure given to said gas by a blower, exhauster, or similar apparatus, or by the force of the additional gas freshly evolved behind it. Then, when desirable, the gas is  
25 expelled from said holder by the weight of the holder itself, regulated by proper means. The gas in the apparatus preceding the holder is thus constantly under a pressure at least equal to that imparted by the holder, and  
30 where said weight has been excessive, it has been customary to overcome it in part by the application of "counter-weights" attached by chains to the holder, said chains passing over pulleys or sheave-wheels carried by the fram-  
35 ing which usually surrounds said holder and maintains it in vertical position. Moreover, by the system hitherto in use, a greater pressure than that given by the weight of the iron in the holder could not be imparted to the  
40 out-going gas without considerable difficulty consequent upon the necessity of removing such counter-weights or of placing additional weight upon the top of the holder, and in holder constructions in which the guide-fram-  
45 ing is dispensed with it has hitherto been impossible to counterweight the holder, by reason of the absence of the necessary supports. It is the object of my invention to provide means whereby the pressure exerted by a  
50 holder may be increased or diminished at will, without loss of time, and in a simple, conven-

ient, and economical manner, whether or not said holder is provided with guide-framing.

In the accompanying drawings, Figure 1 represents a vertical sectional view through 55 the center of a holder embodying my invention. Fig. 1<sup>a</sup> represents an enlarged sectional view of the foot-valve G.

A represents the shell or sheeting of the holder as ordinarily built of iron, rising and 60 falling within the cistern or tank E.

B represents a box or vessel (here shown as rectangular in section, but annular in plan) firmly attached to the holder. A portion of said box may be formed from the side of the 65 holder.

C is a pipe or tube supported within the shell or holder A, communicating at bottom with the interior of the box B and having its upper end open within the holder A, near its 70 top.

D is a valve or cock connected at one outlet with the interior of the box B close to its bottom, and at the other outlet communicating with the liquid in the tank E. An ordi- 75 nary long-shanked key or other means is provided for controlling the valve D from the top or side of the holder A at any point in its rise or fall.

F is a pipe or tube communicating with the 80 box B close to its bottom and provided with a foot-valve G and with two or more outlet-valves, such as H and J, secured to the outside of the sheeting. The foot-valve G may be of any desired form which will allow the 85 water to pass up into the pipe F and prevent it from flowing back, its object being to support the column of water in the pipe F and thus materially assist the pump L in removing the water from the box B. 90

K is a pipe or flexible connection extending from the valves H or J to the pump L, so arranged that attachment between the pump L and the pipe F may be made at any posi- 95 tion of the holder A as it rises or falls.

M is the pipe for supplying gas to the holder A or for withdrawing it therefrom.

N N are landing-stones, upon which the holder A rests when emptied of gas.

P is a small tank or cistern into which 100 water may be forced by the pump L through the connecting-pipe S, the water being dis-



charged from the cistern P into the cistern E by means of the valve T.

As ordinarily operated the valves H and J would be closed and the valve D opened from above. Water from the tank E would then enter the box B, filling it and the tube C to a height equal to that of the water in the tank E itself. The box B would then exert no influence whatever; but if it were desired to decrease the pressure exerted by the holder A the valve D would be closed and attachment would be made by the tube K to the pump L from any convenient valve H or J, which valve would then be opened and the pump L started. The water in the box B would thus be gradually withdrawn, gas entering the box B from the holder A by the pipe C to take its place. The decrease of pressure could thus be obtained by the increased buoyancy of the box B, (and consequently of the holder A to which it is attached) by the removal of the requisite quantity of water, the capacity of the holder being at the same time increased to the precise degree determined by the quantity of water removed. If the water withdrawn from the box B is forced from the pump L through the tube S into the cistern P, its quantity may be readily noted. When the desired decrease of pressure is accomplished, the valve H or J is closed and the tube K detached. If the holder A is then to be emptied and for that purpose the former pressure is required to force the gas to a distance or against resistance, the valve D is opened and water enters the box B, expelling the gas therein, which passes up the pipe C to the holder A, as before. If the water removed from the box B had been discharged into the cistern P, it is of course important when opening the valve D to likewise open the outlet-valve T from the cistern P and direct the water therefrom into the tank E, whose water-level might otherwise be too much reduced.

If still greater pressure is desired, it is obtained by means of another annular chamber or box B', attached to the holder A at some point above the box B. Said box B' is fitted with a tube C', a valve D', a pipe F', (containing a foot-valve, if necessary or desirable,) and outlet-valve H', similarly arranged and for similar purposes with the corresponding parts to the chamber B. When additional pressure is required to that given by the iron alone of the holder A, water may be supplied to the chamber B' by any of the valves there-to until the required make-weighting is accomplished, and when desired the water may

be discharged through the valve D'. The chamber B' also gives additional buoyancy to the holder A when below the level of the water in the tank E; and in no wise diminishes the capacity of the holder A, except when used for making weight, as described.

The cistern P may be dispensed with and the water drawn from or discharged into the tank E. I prefer, however, to employ the said cistern P, as its use prevents the level of water in the tank E from being affected by the filling or emptying of the boxes B and B', besides affording a ready method of ascertaining the additional capacity of the holder A when the chamber B is in use as a buoy, as previously described.

It will be readily seen that an annulus, such as the one above described, will greatly strengthen the curb of a holder, and increase the holder capacity in addition to its other uses.

I prefer to make the vessels or boxes B and B' annular in form and extending around the inner circumference of the holder A; but it is obvious the same principle would be involved if the receptacles were of other form or placed outside the holder.

The box or vessel B' may be dispensed with; but I prefer to use it, as it gives a very ready means of increasing the weight of the holder A.

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

1. The combination, with a gas-holder A, of a box B and a box B' at different elevations on the holder, both in communication with the interior of the holder, and means for filling the boxes with liquid and removing the liquid from the boxes, substantially as and for the purpose set forth and described.

2. The combination of the shell A of a gas-holder, supported in the tank E, the box B, secured thereto, the pipe C, forming a communication between the box B and shell A, means for filling the box B with water, and means for removing the liquid from said box, said means for removing the liquid from the box consisting of a pipe F, communicating therewith and provided with a series of valves, such as H J, and a pump L, adapted to be connected to any one of said valves, whereby the water can be removed from the box B irrespective of the height of the shell A in the tank E, substantially as described, and for the purpose set forth.

GEO. T. THOMPSON.

In presence of—

SAML. KNIGHT,  
E. S. KNIGHT.