

(No Model.)

J. E. LEWIS.  
SECTIONAL STEAM BOILER.

No. 307,476.

Patented Nov. 4, 1884.

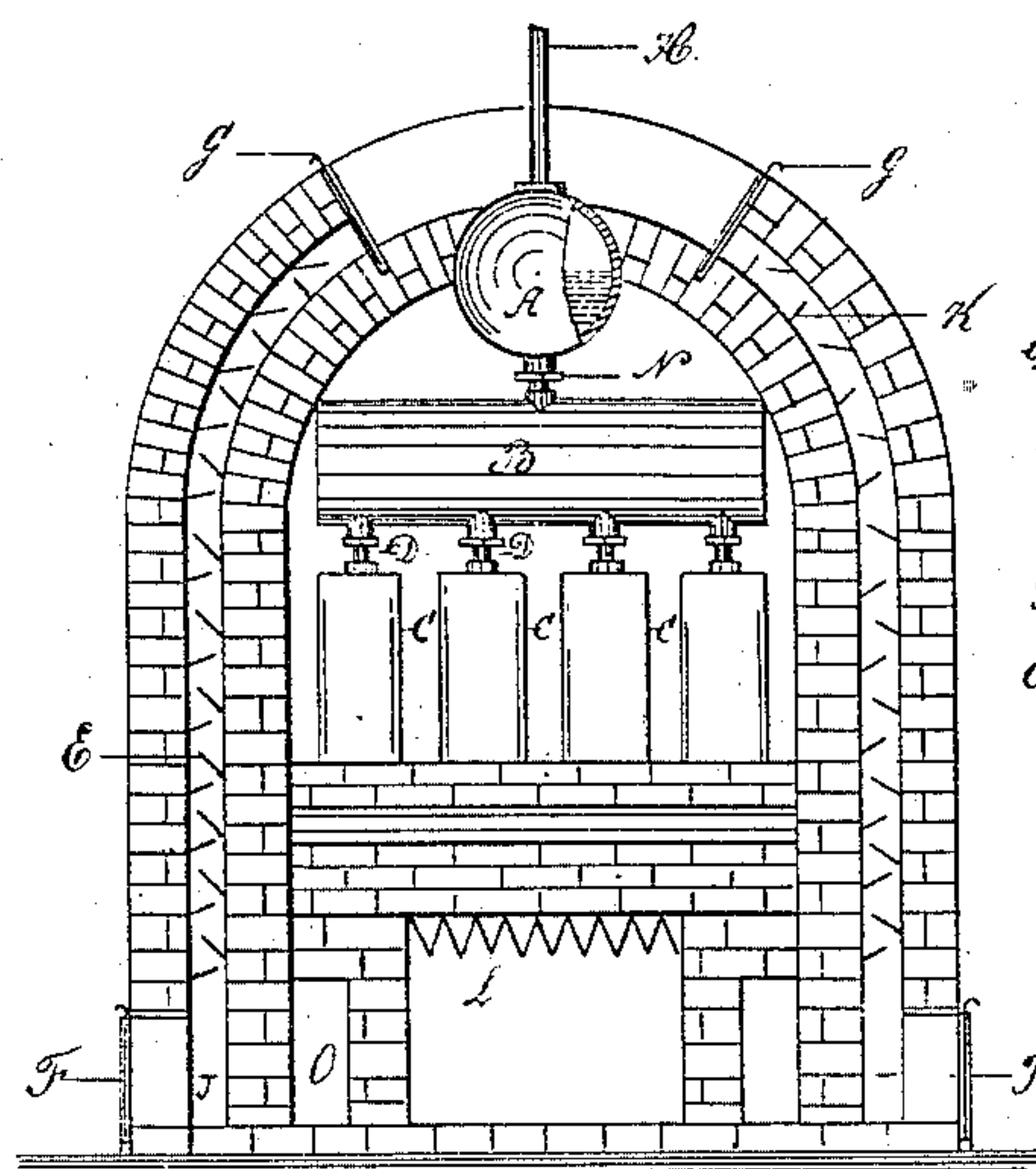


Fig 1.

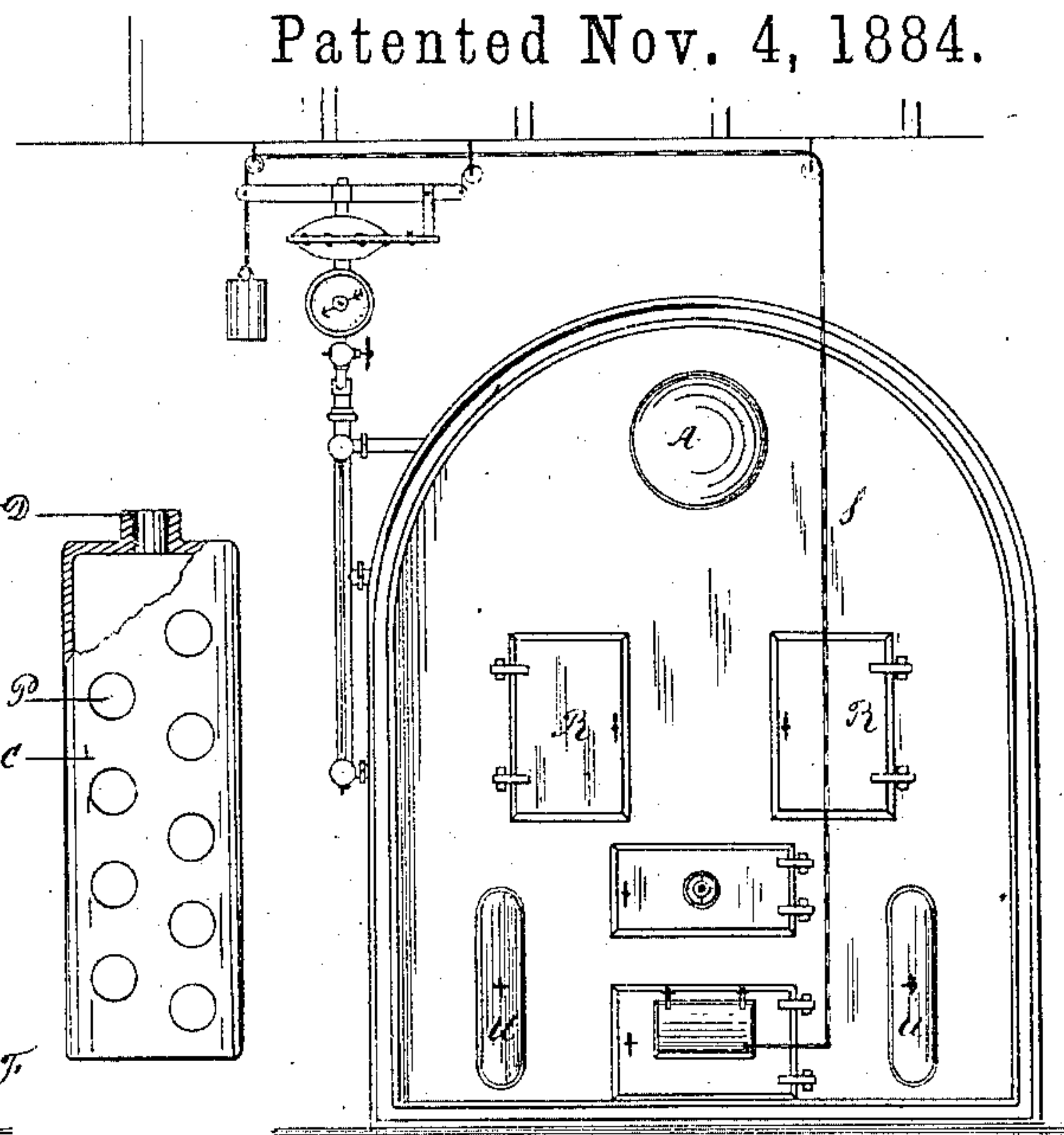


Fig 2.

Fig 3.

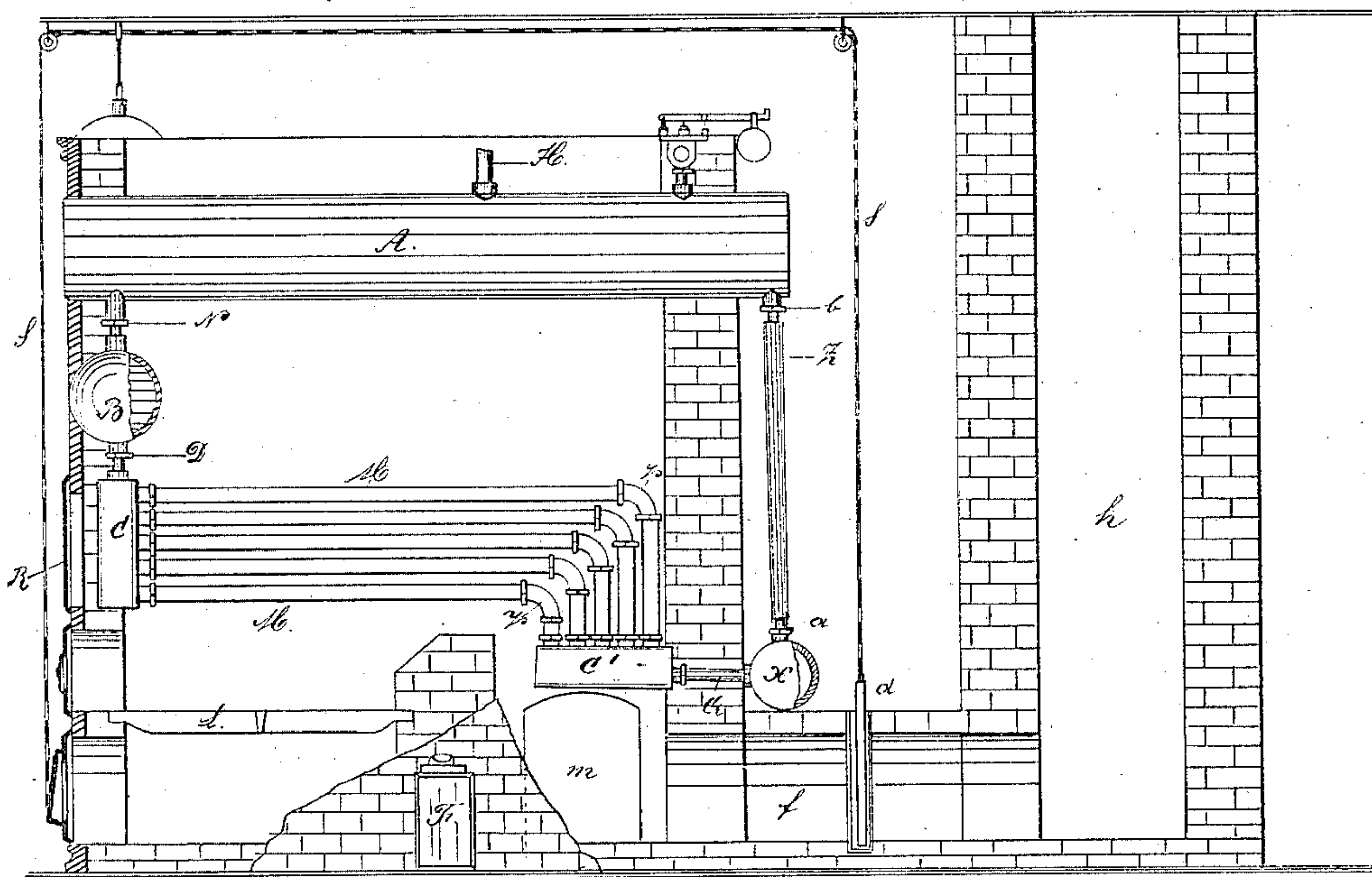


Fig 4.

WITNESSES:

*J. E. Dwyer*  
*P. M. Magrath*

INVENTOR,  
*J. E. Lewis*  
BY *J. C. Higdon*  
ATTORNEY.



# UNITED STATES PATENT OFFICE.

JOSEPH E. LEWIS, OF KANSAS CITY, MISSOURI.

## SECTIONAL STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 307,476, dated November 4, 1884.

Application filed May 5, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH E. LEWIS, of Kansas City, Jackson county, Missouri, have invented a new and useful Sectional Boiler and Setting therefor, of which the following is a full, clear, and exact description.

My invention relates to such improvements upon sectional water-tube steam-generators that the same may readily be constructed at any desired location by the aid of only common steam-fitters' tools; but it is especially designed for use in steam-heating operations, as all its parts, excepting the castings and the drums, may be cut from ordinary steam or gas pipe, and threaded with the simple tools used for such purposes.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in each figure.

Figure 1 is an end view of my improved boiler with the front removed. Fig. 2 is an elevation of one of the flasks, showing the tube side thereof sectioned to exhibit the screw-threaded neck. Fig. 3 is an elevation of the boiler-front as arranged for steam heating. Fig. 4 is a side elevation showing the general position of the connections.

Each section of the boiler consists, essentially, of either a single or double row of horizontal tubes, M, preferably the latter, as shown, placed in a vertical line with each other, and having their front ends screwed or otherwise fixed within a vertical cast-iron flask, C, that is attached by means of the threaded nipples D to the intermediate drum, B, situated transversely to the lines of tubes and directly above the said flasks, and to which each vertical flask is connected, as before described.

The intermediate drum, B, is provided with the vertical threaded connection N, by which it is placed in communication with the main steam-drum A.

The before-mentioned horizontal tubes M are cut to such length that the lower and the ones of shorter dimensions will, when provided with an elbow, V, be of the desired length for attachment by means of a short vertical pipe or nipple to one of the threaded openings, P, in the horizontal flasks C', near

the end opposite the threaded neck thereof, and the following upper rows progress rearwardly in length the distance between the centers of the openings in the said horizontal flasks. Each horizontal flask C' is preferably slightly inclined toward the transverse mud-drum X, to which each section-flask C' is connected by the threaded nipples or tubes Q. The said mud-drum X is connected with the lower surface of the main steam-drum A by means of the single vertical tube Z, threaded at *a* and at *b*.

The elbows V, if so desired, may be dispensed with by bending the tubes M downward at the rear ends to the horizontal flasks C', to which they may be directly attached by any approved means.

In operation, the tubes and the main steam-drum being filled with water to the center-line of the latter, the water in the tubes when heated rises in the vertical ends thereof, and moves forward and upward through the vertical flasks C and the intermediate drum to the main steam-drum A, thence rearward therein to the vertical tube Z, thence downward to the mud-drum X, at which point a considerable quantity of the impurities of the water is deposited.

In setting my boiler for steam-heating purposes the walls of the furnace are constructed with an air-space, J, within which project the deflecting-plates E K, built in the walls, for the purpose of detaining upwardly-moving air that is admitted at the registers F near the floor, and controlled by the upper registers, G, from which point, after being heated by contact with the walls of the furnace, it is conducted to the rooms above the boiler, as desired. Steam is taken from the top of the steam-drum at H.

The openings O, covered by the doors *u*, and the opening *m*, beneath the flasks C' at the rear of the furnace, are provided for cleaning-out purposes.

The horizontal brick-flue *f*, opening into the chimney *h*, has its area controlled by the damper *d*, operated by the damper-regulator chains S.

I am aware that boilers have been constructed with vertical flasks connected at each ex-

tremity with a transversely-situated drum, therefore I do not claim such an arrangement; but

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

1. In a sectional steam-generator, the combination of the vertical cast-iron flasks situated below and connected to the bottom of the transverse drum, as described, and vertical rows of horizontal tubes having their front ends threaded to the inner side of the before-mentioned flasks, and having their opposite extremity turned downward to a right angle and threaded, as described, to the horizontal flasks that are separately connected to the transversely-situated mud-drum, the latter be-

ing provided with a vertical connection with the bottom of the main steam-drum, substantially as shown, and for the purposes designated.

2. In a sectional steam-generator, the combination of the hot-air chamber J, formed as shown, and the upwardly-inclined deflectors, E K, arranged substantially as and for the purpose set forth.

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

JOSEPH E. LEWIS.

Witnesses:

HENRY D. ASHLEY,  
EDWARD O. MARA.