

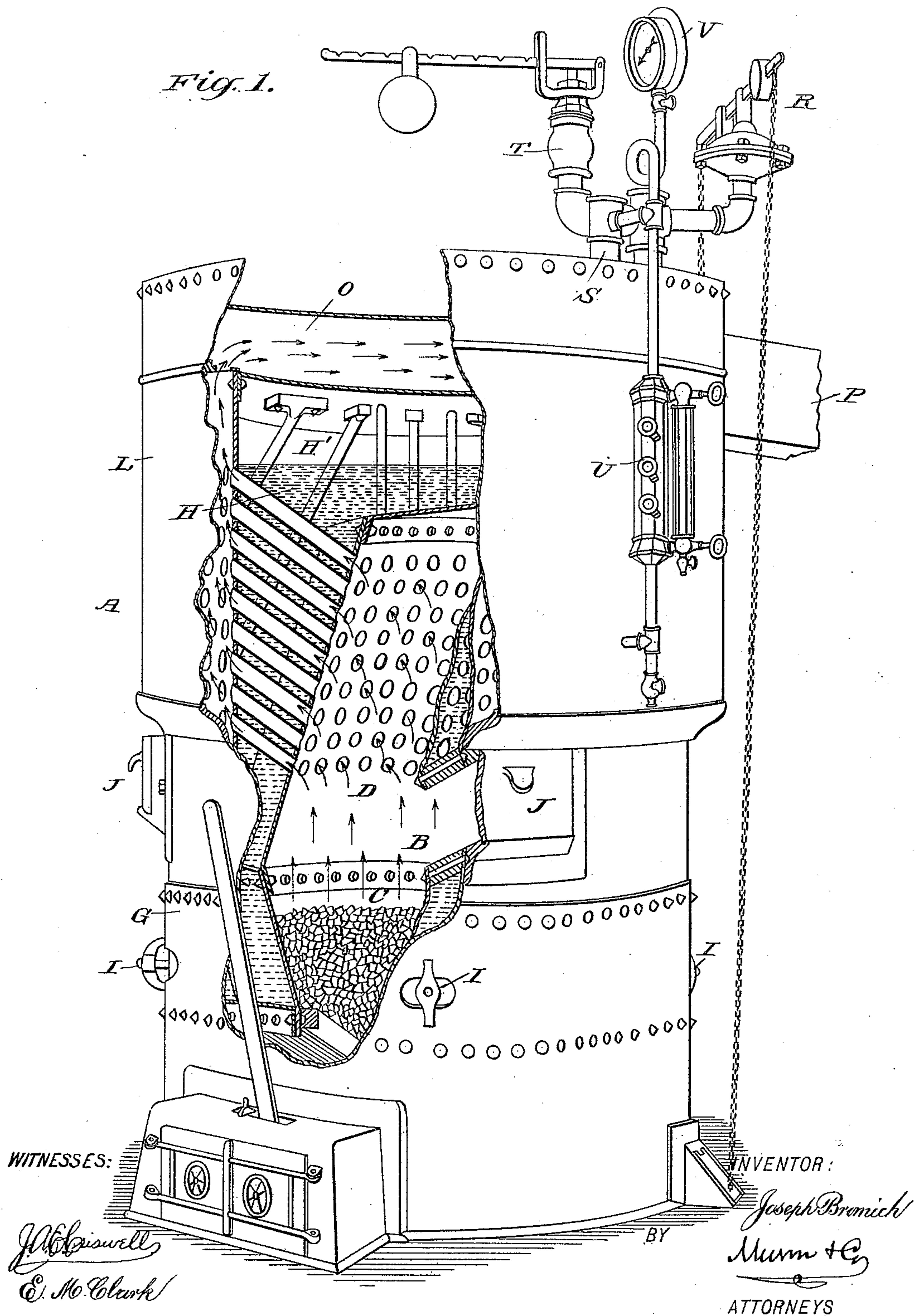
(No Model.)

3 Sheets—Sheet 1.

J. BROMICH.
BOILER.

No. 438,057.

Patented Oct. 7, 1890.



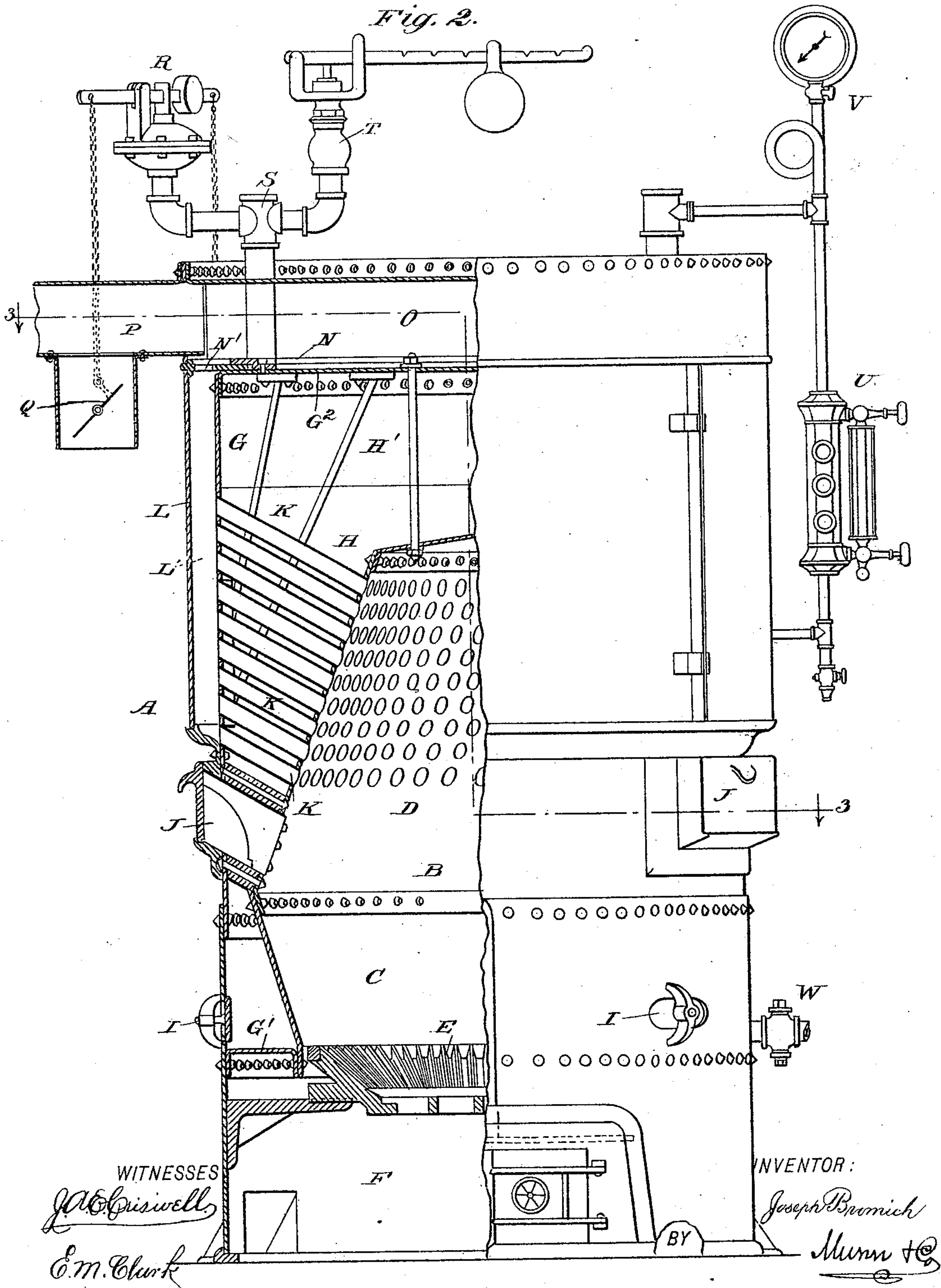
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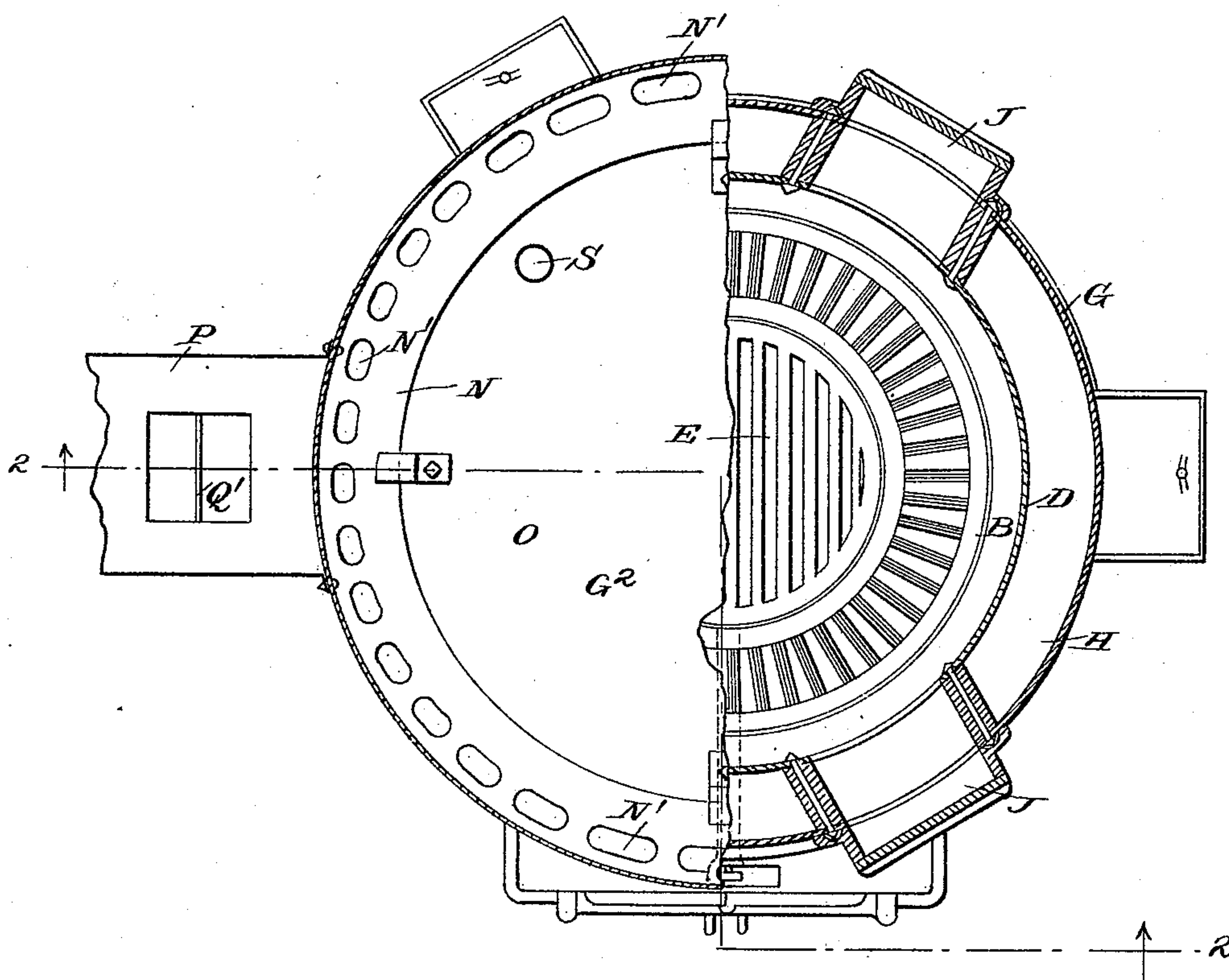
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Patented Oct. 7, 1890.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH BROMICH, OF TOPEKA, KANSAS.

BOILER.

SPECIFICATION forming part of Letters Patent No. 438,057, dated October 7, 1890.

Application filed February 1, 1890. Serial No. 338,878. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BROMICH, of Topeka, in the county of Shawnee and State of Kansas, have invented a new and Improved Boiler, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved boiler, which is simple and durable in construction and can be employed to generate steam at high or low pressure or used as a hot-water boiler for heating buildings, &c.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter more fully described, and then pointed out in the claims.

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

Figure 1 is a perspective view of the improvement with parts broken out. Fig. 2 is a sectional side elevation of the same on the line 2 2 of Fig. 3, and Fig. 3 is a sectional plan view of the improvement on the line 3 3 of Fig. 2.

The improved boiler A is provided with a fire-box and combustion-chamber B, made in two parts C and D, of which the lower one C is in the shape of an inverted truncated cone and the upper one in the shape of a truncated cone, and the two parts C and D are fitted together at their bases. In the bottom of the lower part C are arranged the grate-bars E, below which is formed the usual ash-pit F.

The fire-box and combustion-chamber B is surrounded by the boiler G proper, having its bottom G' secured to the lower end of the fire-box B, while its top G² extends a suitable distance above the top of the fire-box B. A water-space H is thus formed around the entire outer surface of the fire-box B, and a steam-space H' is formed in the upper end of the boiler G. Any sediment in the water contained in the water-space H can settle on the bottom G' of the boiler G, and can be removed from the latter through hand-holes I, arranged in the shell of the boiler G, near the bottom G'.

Feed-channels J are arranged in the upper

part D of the fire-box B, and lead from the latter through the water-space and the shell of the boiler G to the outside, and have on their outer ends the usual doors. The feed-channels J are inclined downward, so that the fuel introduced readily passes onto the grate-bars E.

From the upper part D of the combustion-chamber B lead a series of tubes K, which are inclined upward, extend through the water-space H, and pass through the shell of the boiler G into an annular space L', formed by a shell L, secured to the outside of the shell of the boiler G. The top of this annular space L' is formed by a ring N, having a series of elongated openings N', arranged in a circle and establishing communication between the annular space L' and the interior of the bonnet O, which is held on top of the boiler G. From one side of the bonnet O leads the smoke-flue P, provided with the usual damper Q, automatically operated from the damper-regulating device R, of any approved construction, and connected with the pipe S, leading to the steam-space H' in the boiler G. The apertures N' in the ring N increase in size the farther they extend from the smoke-flue P, so that the draft in the annular space L' is equalized, as the draft nearest the smoke-flue P is greatest; but less smoke can pass up into the bonnet O by the smaller-sized apertures N' near the said smoke-flue P. The steam-pipe S, previously referred to, is also connected with the safety-valve T, and is of any approved construction. The usual water-gage U and the steam-gage V are also connected with the interior of the boiler G, and the feed-water inlet W is arranged in the lower part of the boiler G in the usual manner. The grate E may be of any approved construction, but is preferably, however, circular in shape, so as to be conveniently shaken from the outside by the usual devices.

It will be understood that the exterior shell of the boiler G extends sufficiently below its bottom G' to form a cover for the ash-pit F. The shell L, forming the smoke-space L', is made in sections, which can be conveniently removed to enable the operator to clean the flues K whenever necessary. The fire-box B

is braced from the top plate G² of the boiler G, and the said top plate is also connected by stays or braces with the shell of the boiler G.

It will be seen that this boiler can be readily used for generating steam for high or low pressure, or can be used entirely as a hot-water boiler for heating buildings, &c.

By arranging the tubes K in the manner shown in connection with the cone-shaped part D of the fire-box, a large number of tubes can be employed, so that the heating capacity of the boiler is greatly increased. The tubes K increase in length from the bottom upward, so that a better distribution of heat in the water-space takes place, as the principal heat is in the upper part of the fire-box B and passes through the uppermost tubes K, which are longest.

It will be understood that the heat is somewhat concentrated in the upper part D of the fire-box B on account of the peculiar shape of the said upper section of the fire-box. The fire-box B is entirely surrounded by water, as is plainly indicated in Fig. 1, so that the fire-box does not readily burn out, and the tubes K, which are also covered by water, last so much the longer.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a boiler, the combination, with a boiler-shell provided with an annular space at its upper end and grate-bars secured in the center of the bottom of the shell, of a fire-box and combustion-chamber formed of two truncated cones secured together at their bases and arranged in a shell with the lower cone-section secured to the bottom of the shell and surrounding the grate-bars, and with its upper section extending to within a short distance of the top of the shell, and inclined

tubes extending from the upper cone-section to the annular space, substantially as described.

2. In a boiler, the combination, with the boiler-shell provided with an annular space surrounding its upper part and grate-bars secured in the bottom of the said shell, of a fire-box and combustion-chamber formed of two truncated cones secured together at their bases, the lower cone-section being secured to the bottom of the shell around the grate-bars and the upper cone-section extending to within a short distance of the top of the shell, inclined tubes extending from the upper cone-section to the said annular space, and a bonnet with which the annular space communicates, substantially as herein shown and described.

3. In a boiler, the combination, with a conical fire-box surrounded by a boiler-shell forming a water and steam space therewith, and tubes passing through the said water-space from the fire-box to and through the shell of said boiler, a smoke and gas shell surrounding the upper part of the said boiler and which forms a space into which open the said tubes, and a bonnet held on top of the said boiler and communicating with the gas and smoke space, substantially as shown and described.

4. In a boiler, the combination, with a bonnet and a smoke-flue leading therefrom, of a ring held in the bottom of the said bonnet and provided with apertures increasing in size as they recede from the opening of the said smoke-flue, substantially as shown and described.

JOSEPH BROMICH.

Witnesses:

CHRISTIAN STATES,
EDWARD MCGINNIS.