

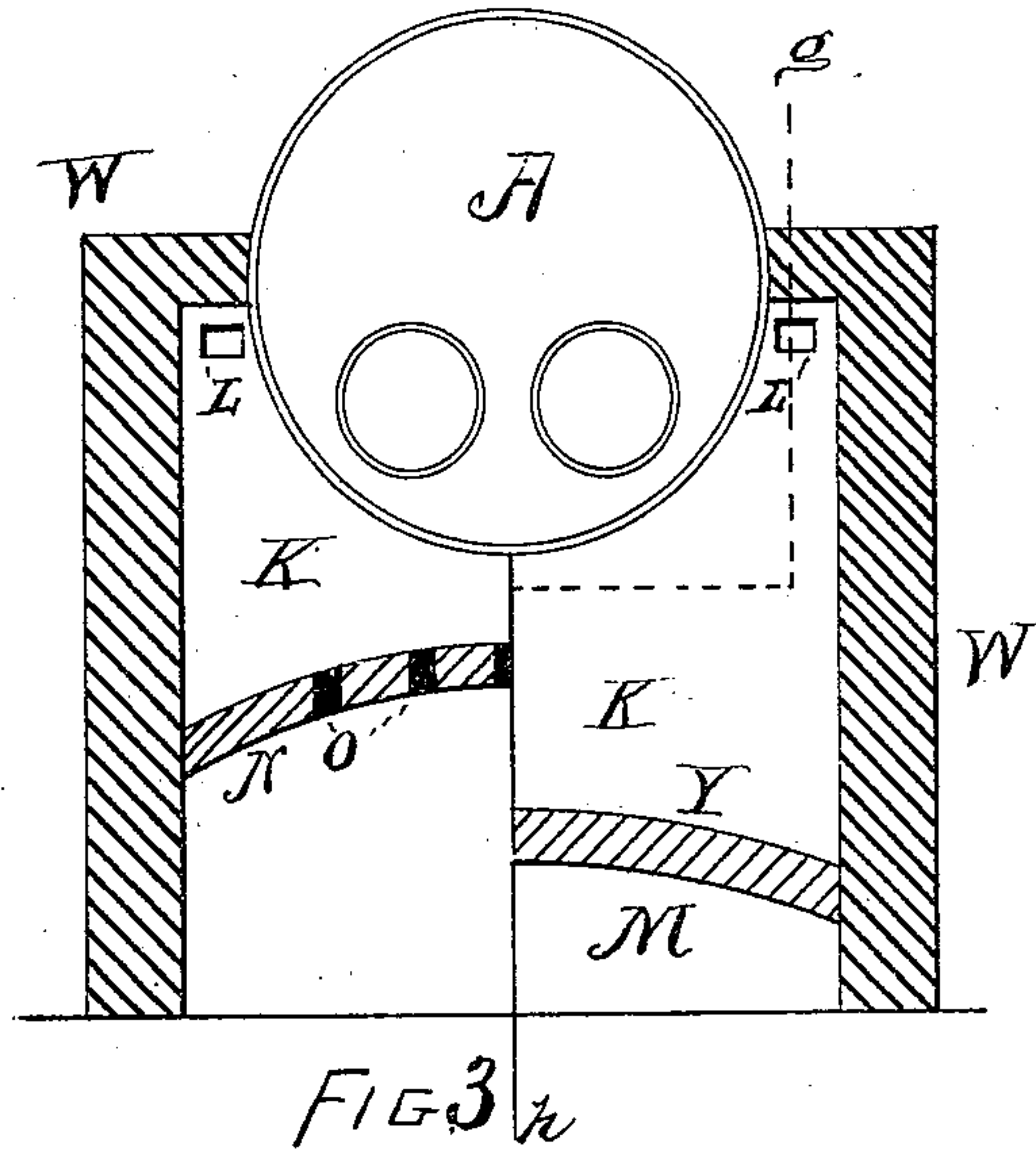
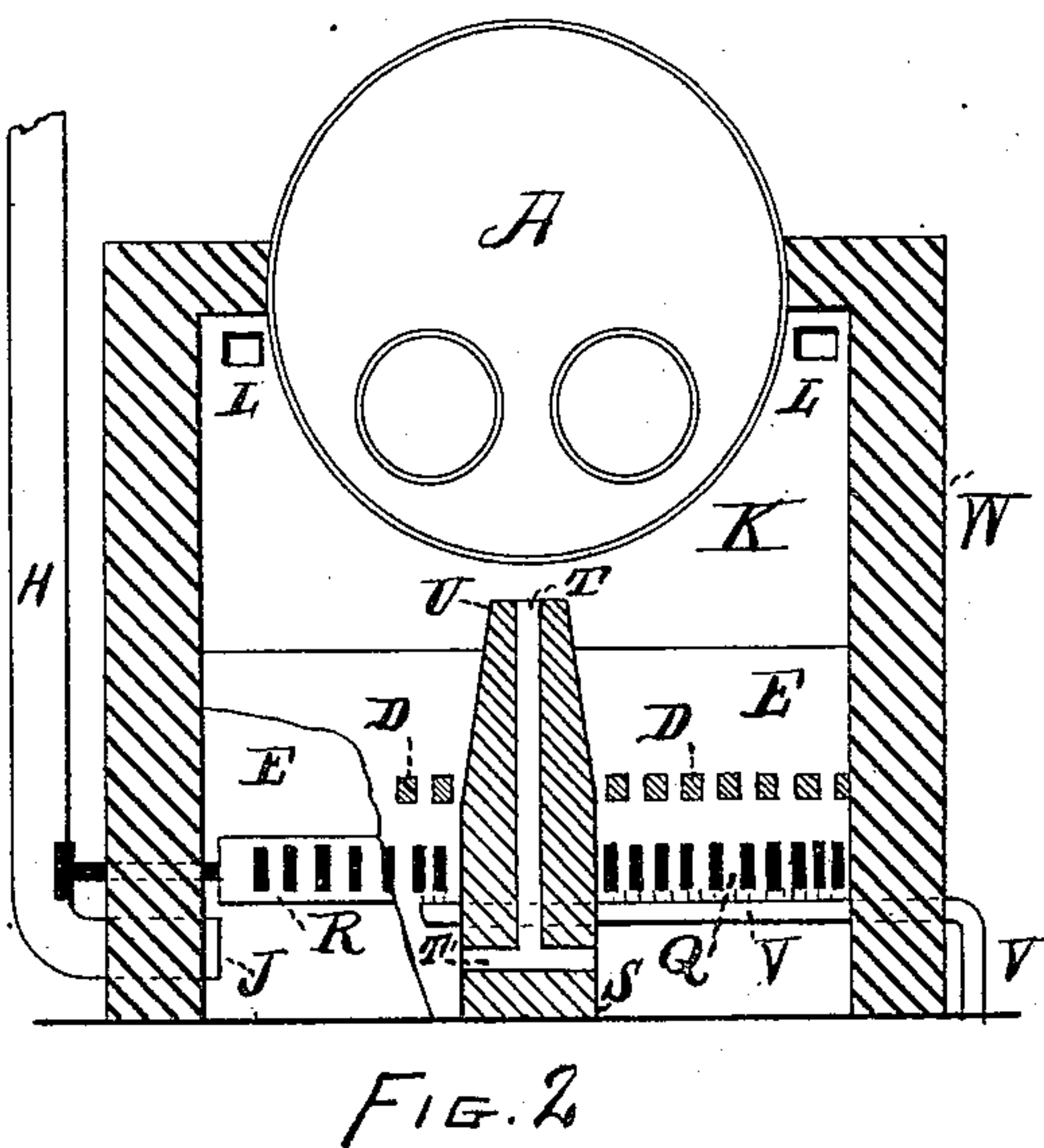
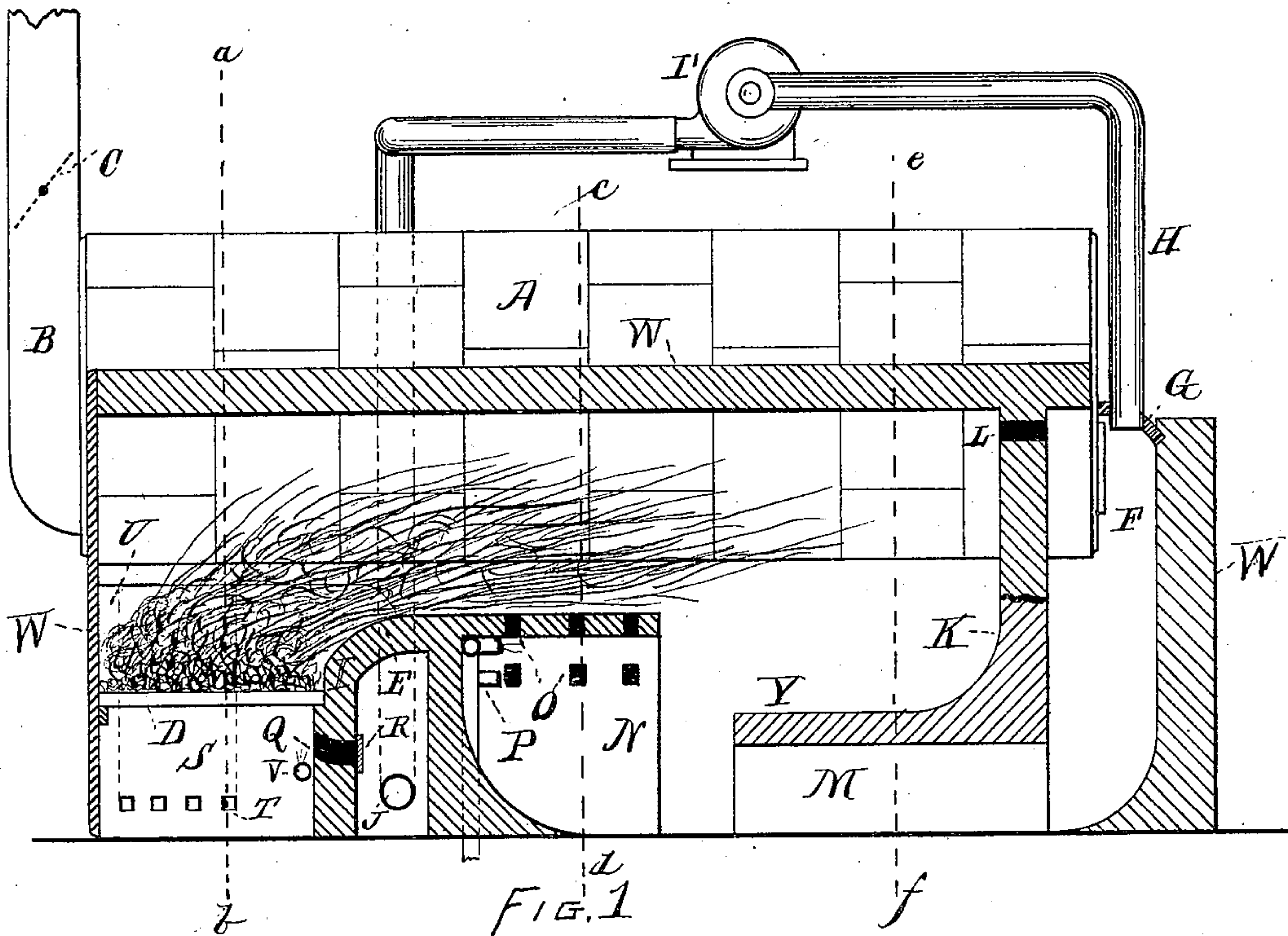
(No Model.)

G. BLACKBURN.

BOILER FURNACE.

No. 258,527.

Patented May 23, 1882.



WITNESSES:

John Loring.  
John Alwoods

George Blackburn INVENTOR

by James W. See

ATTORNEY



# UNITED STATES PATENT OFFICE.

GEORGE BLACKBURN, OF COLUMBUS, ASSIGNOR OF THREE-FOURTHS TO  
LEMUEL R. HARTMANN, OF CINCINNATI, OHIO.

## BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 258,527, dated May 23, 1882.

Application filed February 23, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE BLACKBURN, of Columbus, Franklin county, Ohio, have invented certain new and useful Improvements in Boiler-Furnaces, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section; Fig. 2, a vertical transverse section at *a b*, and Fig. 3 a vertical transverse section at *c d* and *e f*.

In Fig. 1 the wall K is sectional upon the line *g h* of Fig. 3.

The objects of this invention are the economy of fuel and the consumption of smoke.

A is a flue boiler, B the smoke-stack, D the grate, and W the furnace walls and casing, constructed substantially as usual.

U is a wall built in the furnace parallel with the grate, and dividing the furnace into right and left compartments, each of which should have a firing-door. The wall U is hollow, the open-topped passage T located well toward the front of the grate, and having inlets T', allowing air from the ash-pit to mingle with the hot gases rising from the fires and aiding combustion. The wall U, instead of starting from the foundation, as is shown, may start at the grate level if properly supported, and in such case the passage T would be a plain vertical one, opening downward into the ash-pit.

Back of the hollow bridge-wall I is built an arch, N, about as high as the bridge-wall, and having through it the numerous perforations O. An air-pipe, P, issues at several places in line with the several rows of perforations O.

F is the usual passage to the boiler-flues, covered by a flue-plate, G. K is a dead-wall cutting off the usual communications to passage F. At the base of this wall is an arched opening, M, whose roof Y is best when extended well forward toward the perforated arch N. Small top holes, L, are made through the wall K by leaving out one brick in the locality shown. The gases from the fires, whose current is in some measure maintained close up to the boiler by the arch N, impinge against the dead-wall K, impelled in this direction by their initial forces and by a slight draft through the open-

ings L. On striking the dead-wall K the gases rebound and seek their outlet under the arch M into the passage F. The rebounding action, aided by the arch roof Y, causes the reacting current to set well in under the perforated arch N, which is thus kept full of gases slightly compressed by the force of the current. Much of this gas mingles with oxygen issuing from pipes P, and goes up through the perforations O in among the burning gases, just crossing the bridge-wall, where in their revived condition they are largely consumed. A pipe, I, leads from the passage F, being connected into the plate G, to the interior of the hollow bridge-wall E, at J. A suction-fan, I', in this pipe draws much of the unconsumed gas from the passage F, and before it enters the boiler-flues, and forces it into the hollow bridge-wall. Openings Q permit these gases, which become more heated while in the chamber of the hot bridge-wall, to enter the ash-pit and pass directly up through the fire at extreme rear ends of the grate, an air-pipe, V, jetting under the openings Q, diffusing oxygen among them. A slide, R, with an outside handle, serves to regulate or close the openings Q. While the fan I' is being used the damper C should be more or less closed, and when the fan is idle the bridge-wall empty itself of gas and smoke into the stack through pipe I and the boiler-flues without passing over the fire, whereby the temperatures may be regulated without extra waste of fuel.

I claim as my invention—

1. The combination of the boiler-furnace, the bridge-wall, the arch N, extending rearwardly from the bridge-wall and having parallel rows of perforations O, and the jet-pipes P, arranged to issue under the arch along said rows of perforations.

2. The combination of the boiler-furnace, the dead-wall K, opening M under wall K Y, perforated arch N, and air-pipes P.

3. The combination of the boiler-furnace, the dead-wall K, opening M thereunder, roof Y, extending forward therefrom, and perforated arch N, with air-pipes P.

4. The combination of the boiler-furnace, perforated arch N, air-pipes P, dead-wall K,

opening M thereunder, and top openings, L, in said dead-wall.

5 5. The combination of the boiler-furnace, perforated arch N, air-pipe P, dead-wall K, opening M, top openings, L, and roof Y.

6. The combination of the boiler-furnace, the hollow bridge-wall E, slitted openings Q

in the front of the bridge-wall, jetted pipe V below the openings Q, fan I', and pipe H.

GEO. BLACKBURN.

Witnesses:

H. REEVES,

E. R. NORTHCUT.