

(No Model.)

E. V. HUTCHENS.  
BOILER.

No. 350,592.

Patented Oct. 12, 1886.

Fig 1.

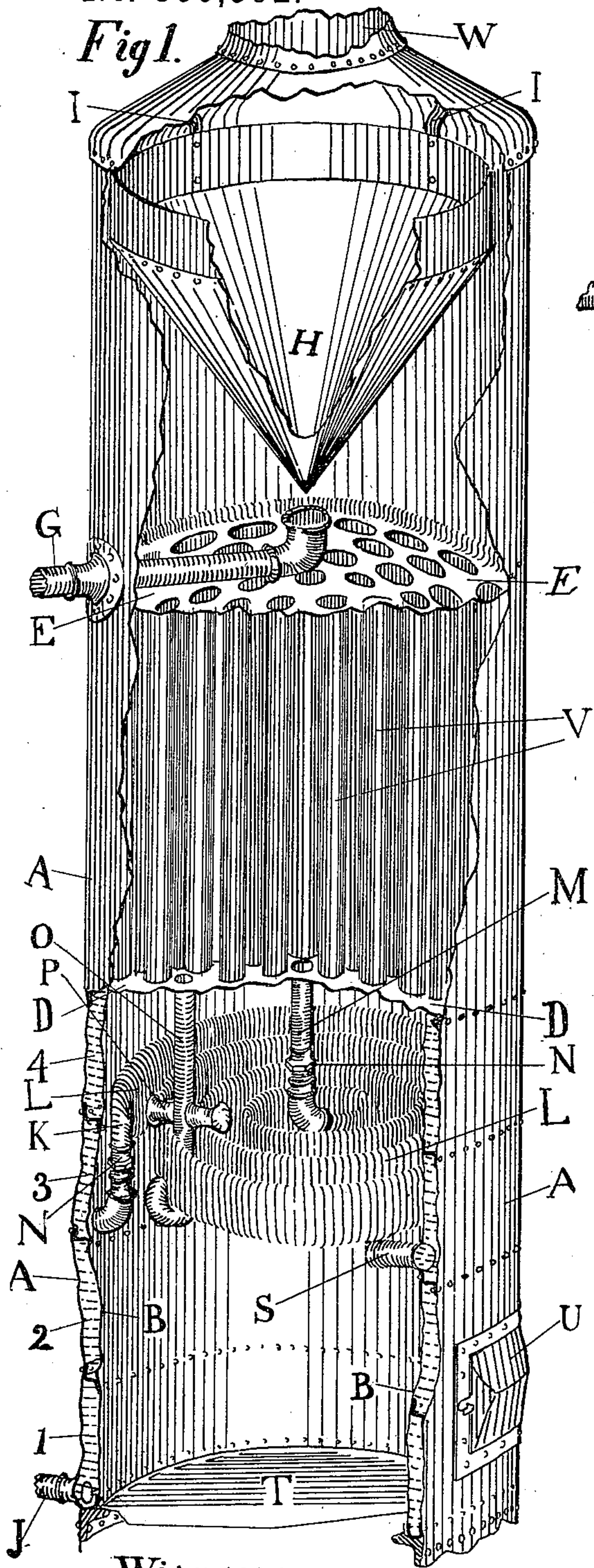


Fig 3.

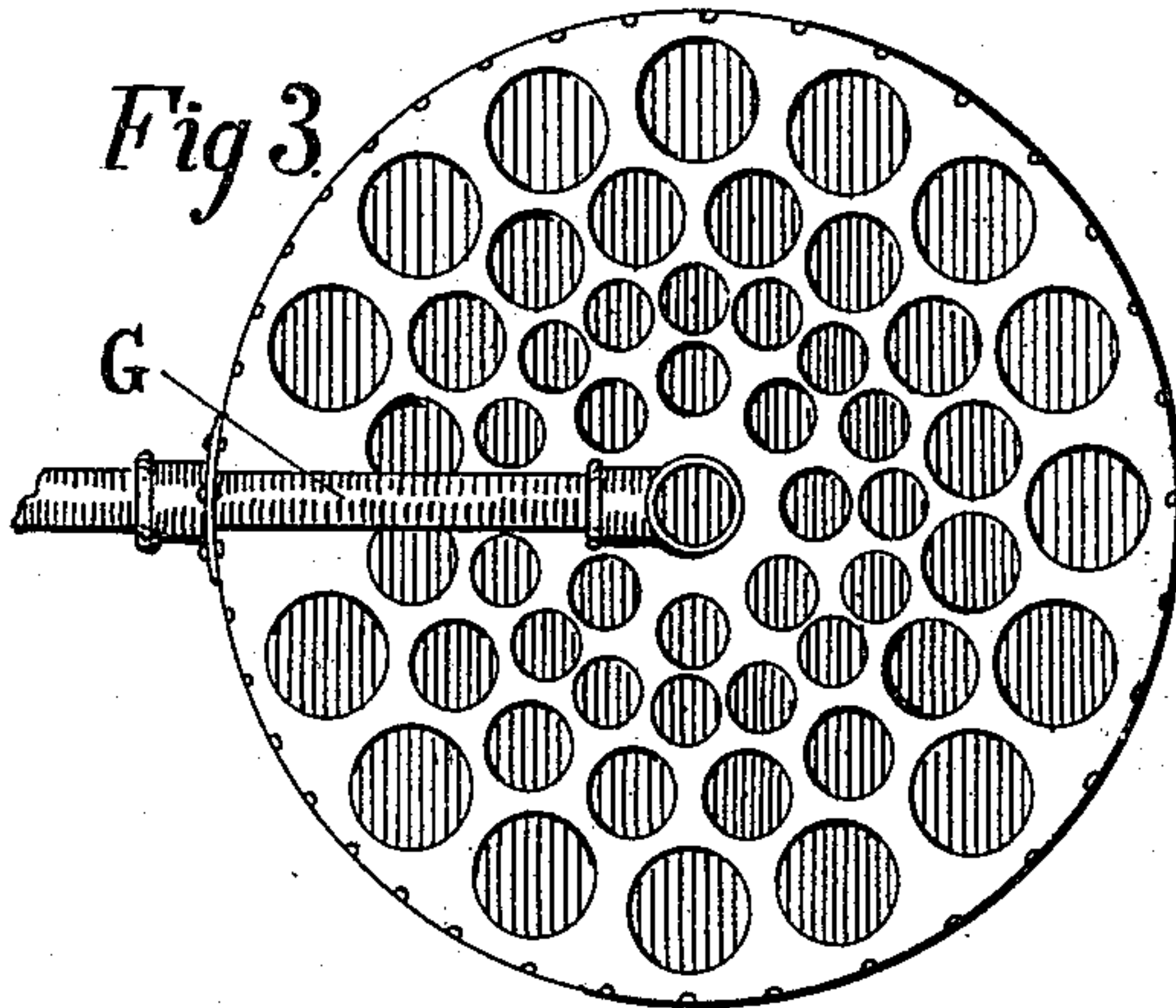
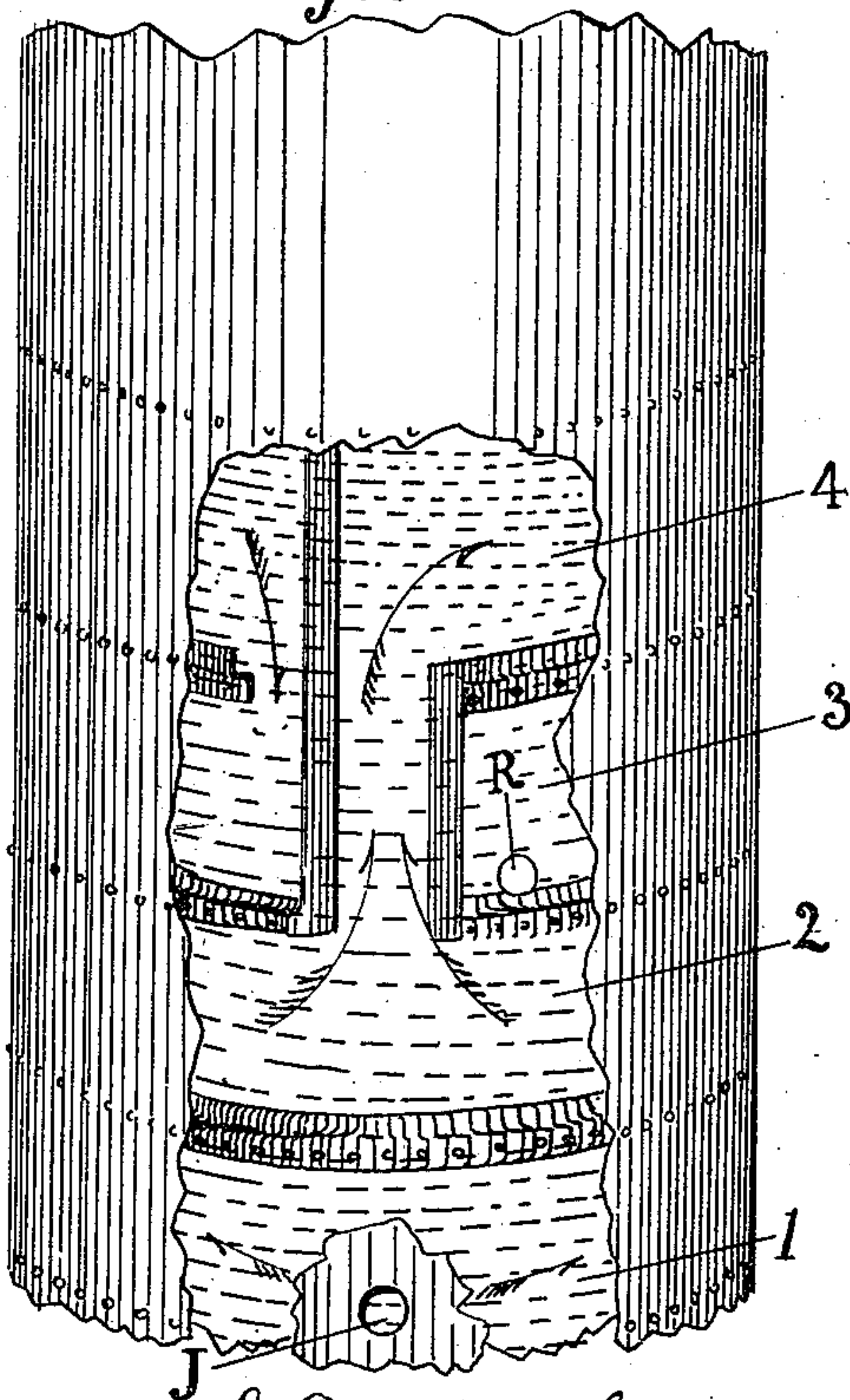


Fig 2.



Witnesses.

J. E. Wheeler  
L. B. Clarke.

Inventor.

E. V. Hutchens  
per George R. Pyne. Attorney



# UNITED STATES PATENT OFFICE.

ERASMUS V. HUTCHENS, OF EVANSVILLE, INDIANA.

## BOILER.

SPECIFICATION forming part of Letters Patent No. 350,592, dated October 12, 1886.

Application filed March 6, 1886. Serial No. 194,383. (No model.)

*To all whom it may concern:*

Be it known that I, ERASMUS V. HUTCHENS, a citizen of the United States, residing at Evansville, in the county of Vanderburg, State of Indiana, have invented a new and useful Improvement in Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in steam-boilers in which the water-supply is brought to a thoroughly heated condition before it enters the boiler by passing around the fire-box and through a flattened spiral coil over the fire, thence into the boiler. The boiler itself is also to contain tubes of various sizes, thereby affording greater heating-surface and a more rapid generation of steam. The exhaust pipe also bears the improvement of discharging directly above the head of the boiler upward against the apex of a cone, thereby distributing the exhaust and causing a more uniform draft. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view with the shell of the boiler broken off, exposing the various parts. Fig. 2 shows back view of boiler, part in section. Fig. 3 is a horizontal section, referred to as follows: A A A is the shell of the boiler. B B is the inner shell of the fire-box, which is divided into annular sections 1 2 3 4 by separators C C C. D D is the crown-sheet of the boiler, from which the tubes extend upward to the head of the boiler E E, the tubes varying in size, as shown. G is the exhaust-pipe; H, the cone to distribute the steam in its upward tendency. This cone is supported and held in position by braces or stays I I. The water-supply, being taken in at the base of the boiler through pipe at J, passes around the boiler to the doors of the fire-box, thence upward inside the jambs of the door, then returning around the fire-box, thence upward to the annular section 4 at the top of the fire-box, around the same, then downward into the third section, thence around the fire-box into pipe K, running into the flattened spiral coil L L, continuing around in this coil, then pass-

ing upward through the pipe M into the boiler. The connections of pipes K and M are made with "unions" at N N. O is a hanger with projections P to sustain and hold the spiral in a secure manner, also the support at S, for the same purpose. The number of these hangers is not to be limited. They are to be made hollow and to be filled with water. T are the grate-bars; U, the doors; V, the tubes; W, the smoke stack.

Fig. 2 shows the back view of the boiler, J being the inlet for the water, which passes around the boiler, in the direction of the arrows, into the flattened spiral at R.

Fig. 3 is a top view of the boiler, showing the various sizes of the tubes, the large ones to be contained in the outer circle, then decrease in size toward the center.

I am aware that prior to my invention boilers have been made with a fire-box surrounded by water, and with tubes that vary in size, and with an exhaust-pipe turning upward. I therefore do not claim such a combination, broadly; but

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

1. In a steam-boiler, the combination of a water fire-box having partitions, whereby the water is caused to circulate through the same, with the spiral coils located in the fire box or furnace.

2. In a steam boiler, the combination of a water fire-box having partitions, whereby the water is caused to circulate through the same, with the spiral coil located in the fire-box or furnace, and the fire-tubes of different diameter, substantially as shown and described.

3. In a steam-boiler, the combination, with an inverted cone located over the fire tubes of the boiler, of an exhaust-pipe discharging the steam on the apex of the cone, whereby a uniform draft is produced, substantially as shown and described.

E. V. HUTCHENS.

Witnesses:

L. S. CLARKE,  
T. E. WHEELER.