

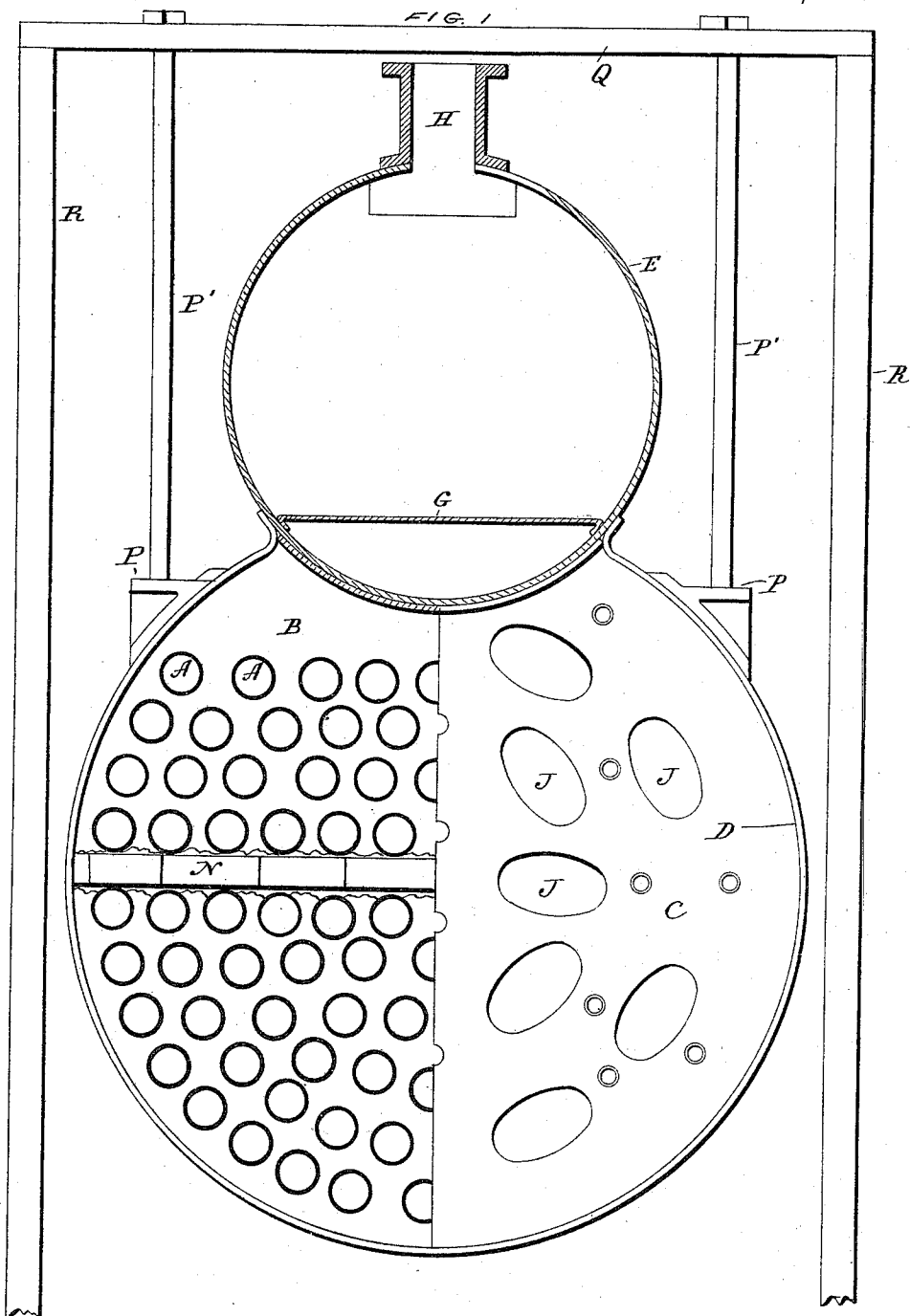
(No Model.)

2 Sheets—Sheet 1.

F. H. ELSON.
STEAM BOILER.

No. 585,433.

Patented June 29, 1897.



Witness
J. H. Murray
Lillian D. Kelby.

Frank H. Elson
Inventor
By atty Earle Seymour

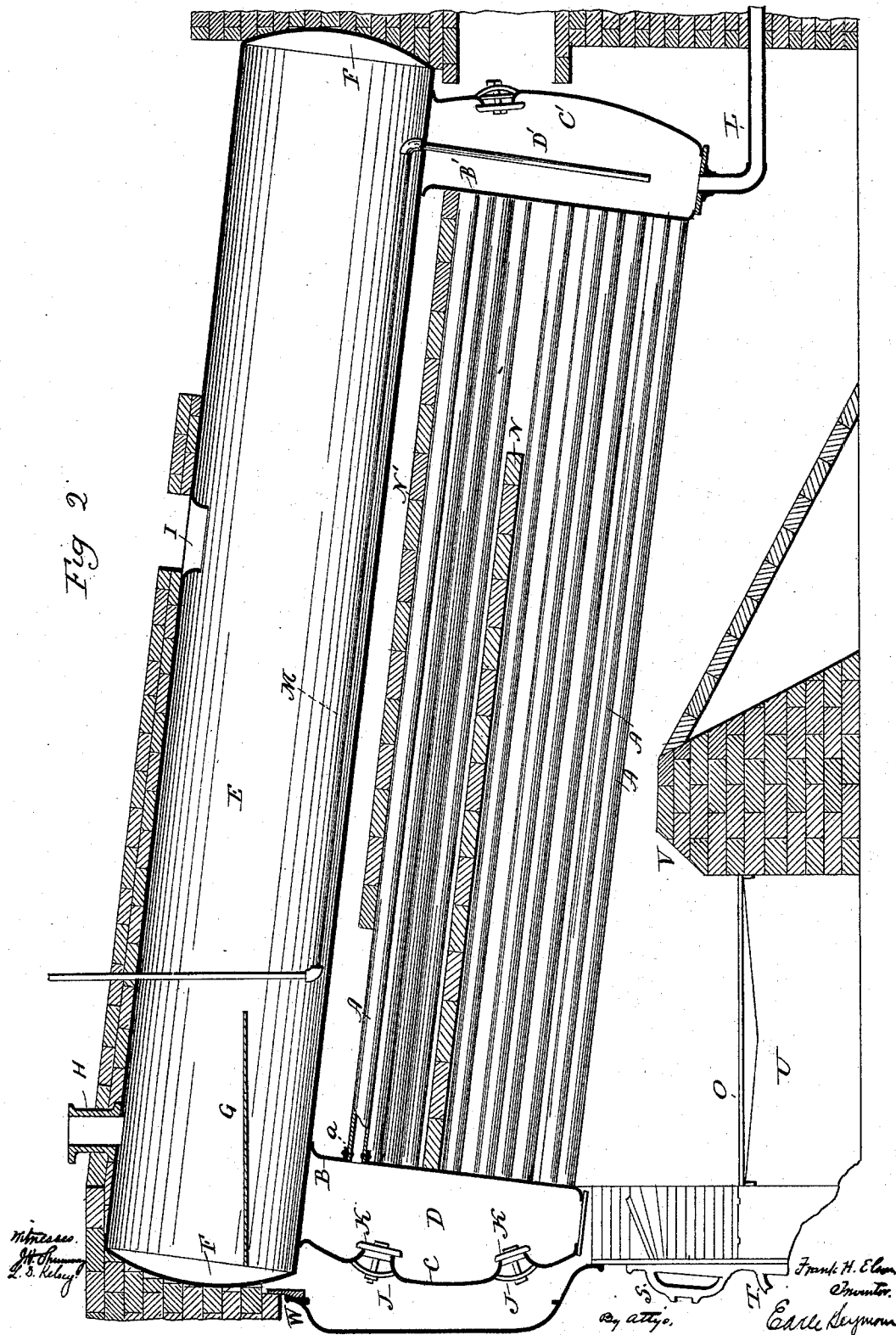
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UNITED STATES PATENT OFFICE.

FRANK H. ELSON, OF NEW HAVEN, CONNECTICUT.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 585,433, dated June 29, 1897.

Application filed February 1, 1897. Serial No. 621,413. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. ELSON, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Steam-Boilers; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, an end view, with the front removed, of a boiler constructed in accordance with my invention; Fig. 2, a sectional side view of a boiler as arranged and supported within a shell of masonry.

This invention relates to an improvement in steam-boilers, and particularly to that class which are known as "water-tube" boilers—that is, in which a series of tubes are arranged below a drum, and so that water may circulate from the drum through the tubes, between which tubes the gases or heat from the fire are caused to pass.

The object of the invention is to simplify the arrangement of the drums and pipes and at the same time produce a boiler as strong or stronger than water-tube boilers as at present on the market; and it consists in the details of construction and combinations of parts, as hereinafter described, and particularly recited in the claims.

The tubular portion of the body of the boiler consists of a series of tubes A, more or less in number, and extending between tube-sheets B B', through which they project and to which they may be secured in any well-known manner; but preferably the sheets will be formed with inwardly-projecting flanges *a* around a portion of the openings, which flanges project over the outer surfaces of the ends of the pipes A and through which rivets extend into the said pipes, and so that the ends of a portion of the pipes will be riveted to the said plates, the remaining portion of the pipes being joined thereto in the usual manner. Instead of arranging the pipes one over the other I preferably arrange them in staggered vertical series—that is, so that those on one row are between those of the lower row, a common arrangement in water-tube boilers. Secured to the plates B B' are

convex heads C C', arranged to form a chamber D D' outside of each plate and into which the pipes A open. These chambers 55 open at their upper ends into a circular drum E, made up of a number of plates and formed with convex heads F, in the usual manner of steam-boilers. The metal of the heads C C' overlaps the adjacent surfaces of the drum E and is riveted thereto. Within 60 the drum and extending over the opening into the chamber D is a deflecting-plate G, the purpose of which will hereinafter appear, and in the top of the shell is the usual outlet 65 H for steam and a boiler-manhole I. In the heads C C' are clearing-openings commonly called "hand-holes" or "manholes" J J, closed by caps K in the usual manner. From the lower end of the chamber D' extends a blow-off pipe L, and opening near the bottom thereof is a feed-pipe M. Between the series of pipes are transverse series of tiles N N', the series N extending transversely between the pipes from their forward end toward the rear 75 and the series N' arranged above the series N and extending from the rear end forward beyond the rear end of the lower series, and so that the products of combustion from the fire-box O must pass rearward beyond the end of the tiles N and forward around the ends of the tiles N', from whence they escape into a flue 80 in the usual manner. The water-tubes A and drum E incline downward from the forward end and are supported from brackets 85 P, secured to the sides of the chamber D D', held by bolts P', held at their upper ends by a beam Q, which is supported by the usual brickwork R, within which the boilers are inclosed. 90

S indicates the door into the fire-box O, T the door into the ash-box U, and V the bridge-wall, all constructed in the usual manner.

In the front wall in line with the head C is a door W, which may be removed for access 95 to the clearing-holes J, which are preferably of sufficient size to admit a man into the chamber D for convenience in cleaning the drum E or the tubes A.

By rigidly connecting the pipes A with the 100 bolts B and employing the convex heads C C' I am enabled to dispense with stay-rods between the said heads or plates, and by arranging the drum E in close proximity to the

tubes A, I obtain a better result than when they are some distance apart. When the tubes are filled with water and the drum partially so, the water, when it becomes heated, will circulate through the tubes into the chambers D D', and as the chamber D is higher the heated water will flow into that chamber and rise into the drum E, the current being deflected by the plate G and so as to flow toward the rear end of the drum, from whence it passes into the chamber D', and so on through the pipes, keeping up a constant circulation therein.

It will be understood from the foregoing that I am aware that combined water-tube and steam-drum boilers are old and that such boilers have been arranged in an inclined position. I therefore do not wish to be understood as claiming, broadly, such as my invention.

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

1. In a steam-boiler, the combination of water-tubes arranged in inclined parallel rows, and opening into chambers at each end, an independent drum superposed upon and directly secured to said chambers parallel with said water-tubes, openings in the under side of said drum into the upper ends of said chamber, the ends of said chamber and drum being convexed, and clearing-holes in the outer walls of the said chambers, substantially as described.

2. In a steam-boiler, the combination of water-tubes, of plates formed with inwardly-extending flanges through which said tubes extend, and to which they are riveted, chambers secured to said plates, and open at their upper ends, an independent drum superposed directly upon and secured to said chambers, openings in the under side of said drum into said chambers, clearing-holes in the outer walls of said chambers, a series of transversely-arranged tiles between said tubes, one series above the other, the lower series extending from the forward end rearward, and the upper series from the rear end forward beyond the end of the lower series, said tubes and drums being arranged in a position inclined downward from their forward ends, substantially as described.

3. In a steam-boiler, the combination with water-tubes arranged in inclined parallel rows, and opening into chambers at each end, an independent drum superposed upon and directly secured to said chambers and located at a right angle thereto and parallel with said water-tubes, openings in the under side of said drum into the upper ends of said chambers, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK H. ELSON.

Witnesses:

FRED. C. EARLE,
LILLIAN D. KELSEY.