

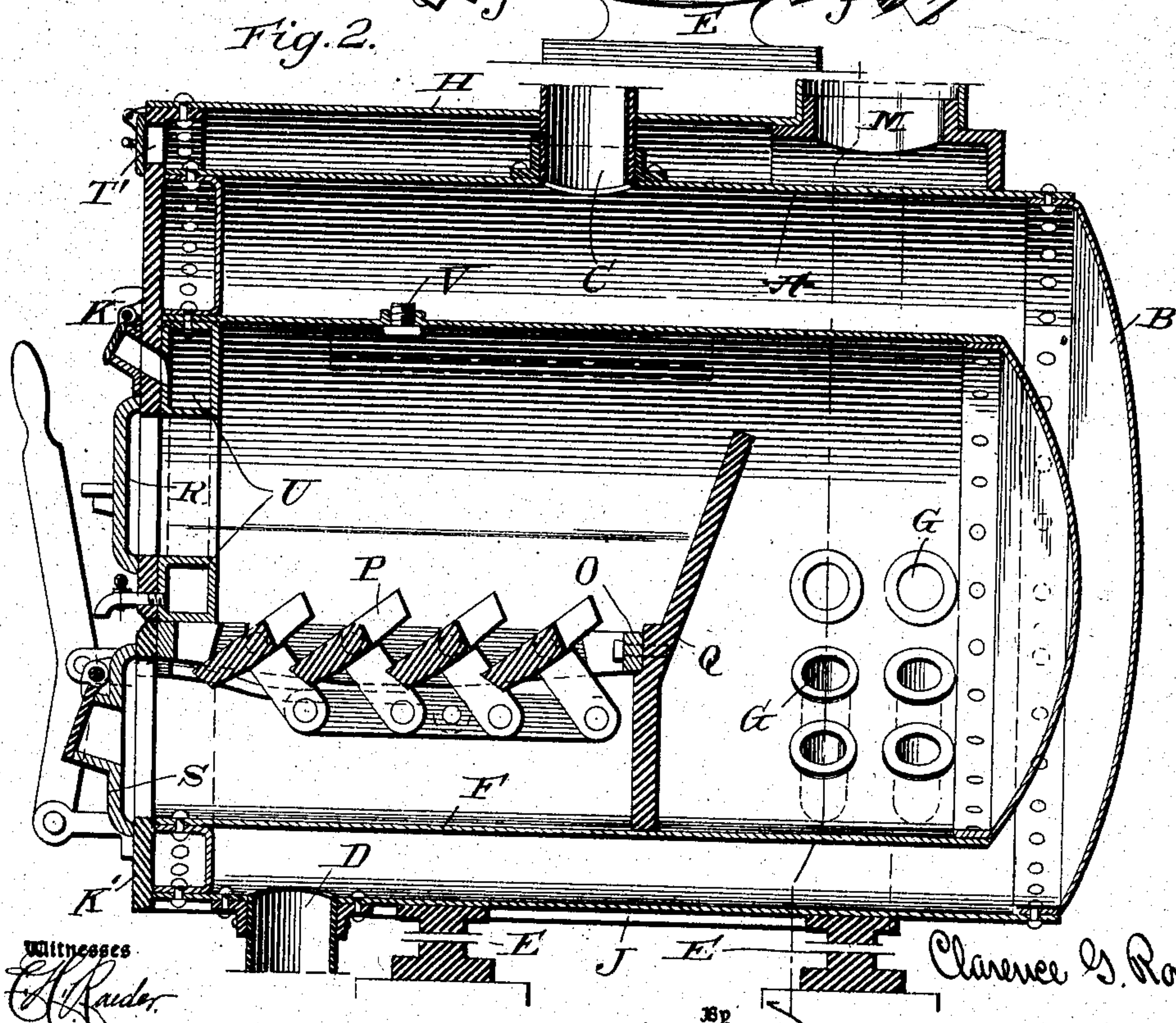
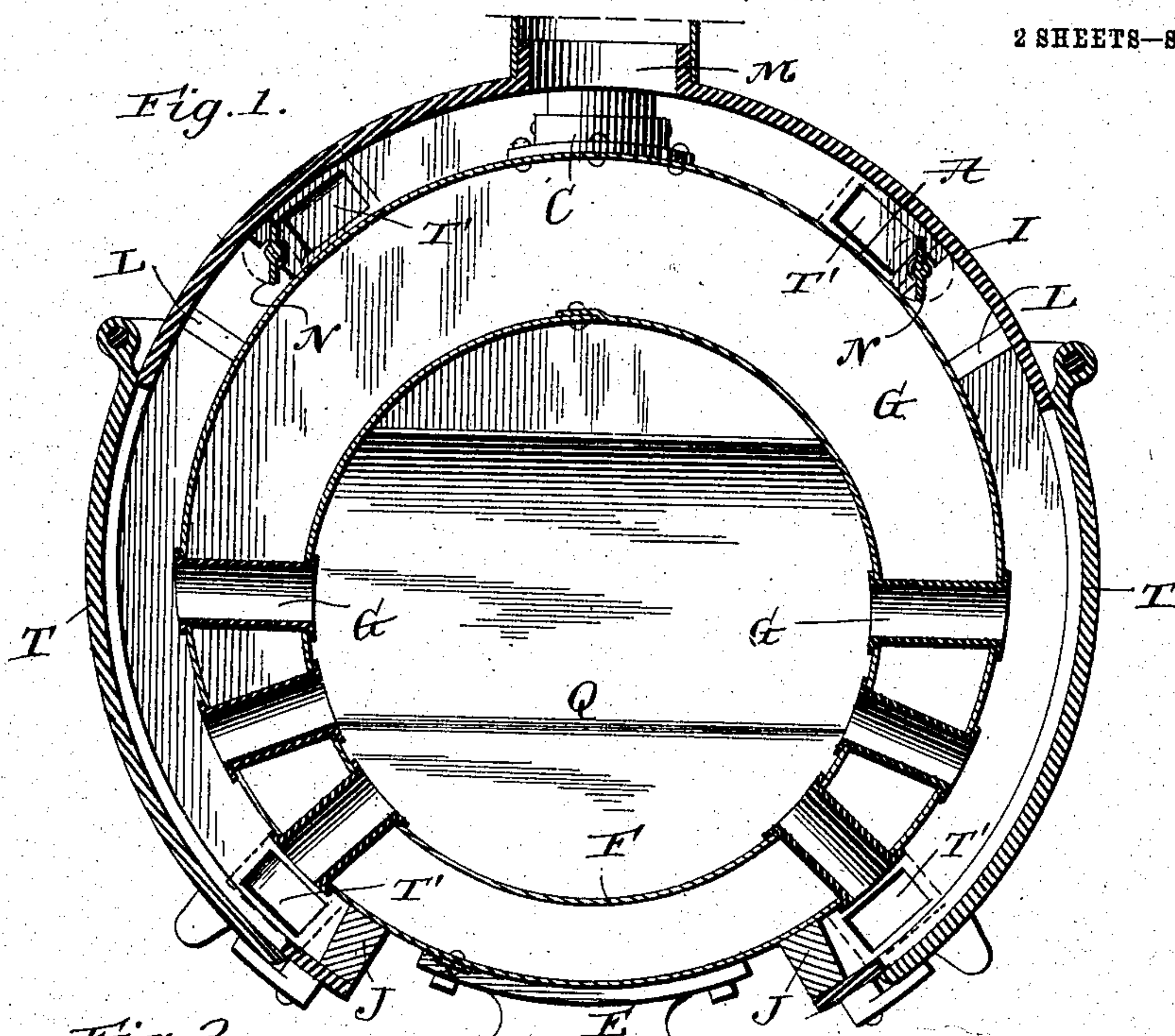
No. 796,018.

PATENTED AUG. 1, 1905.

C. G. ROWLEY.
BOILER.

APPLICATION FILED APR. 20, 1905.

2 SHEETS—SHEET 1.



Inventory

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Attorney N.

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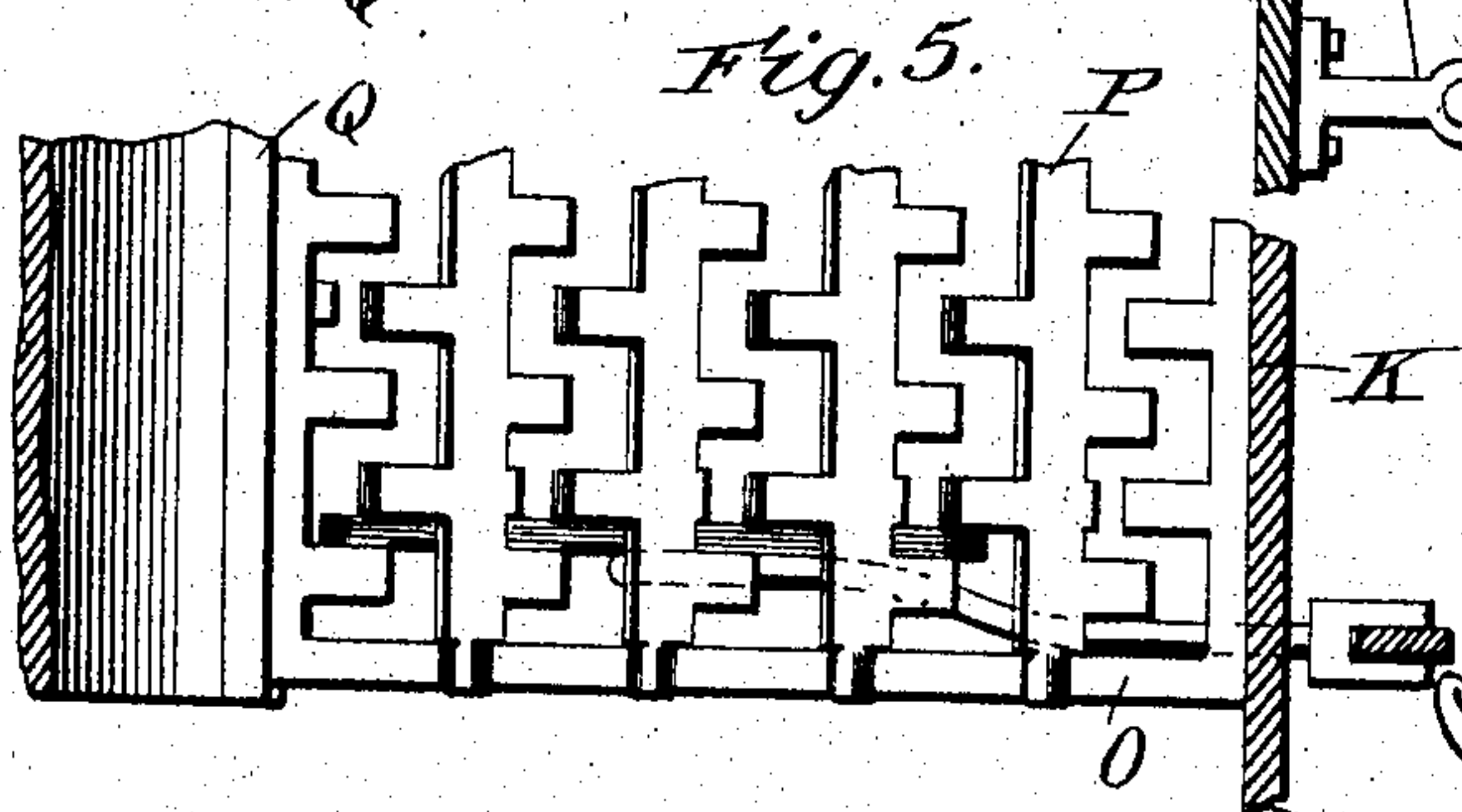
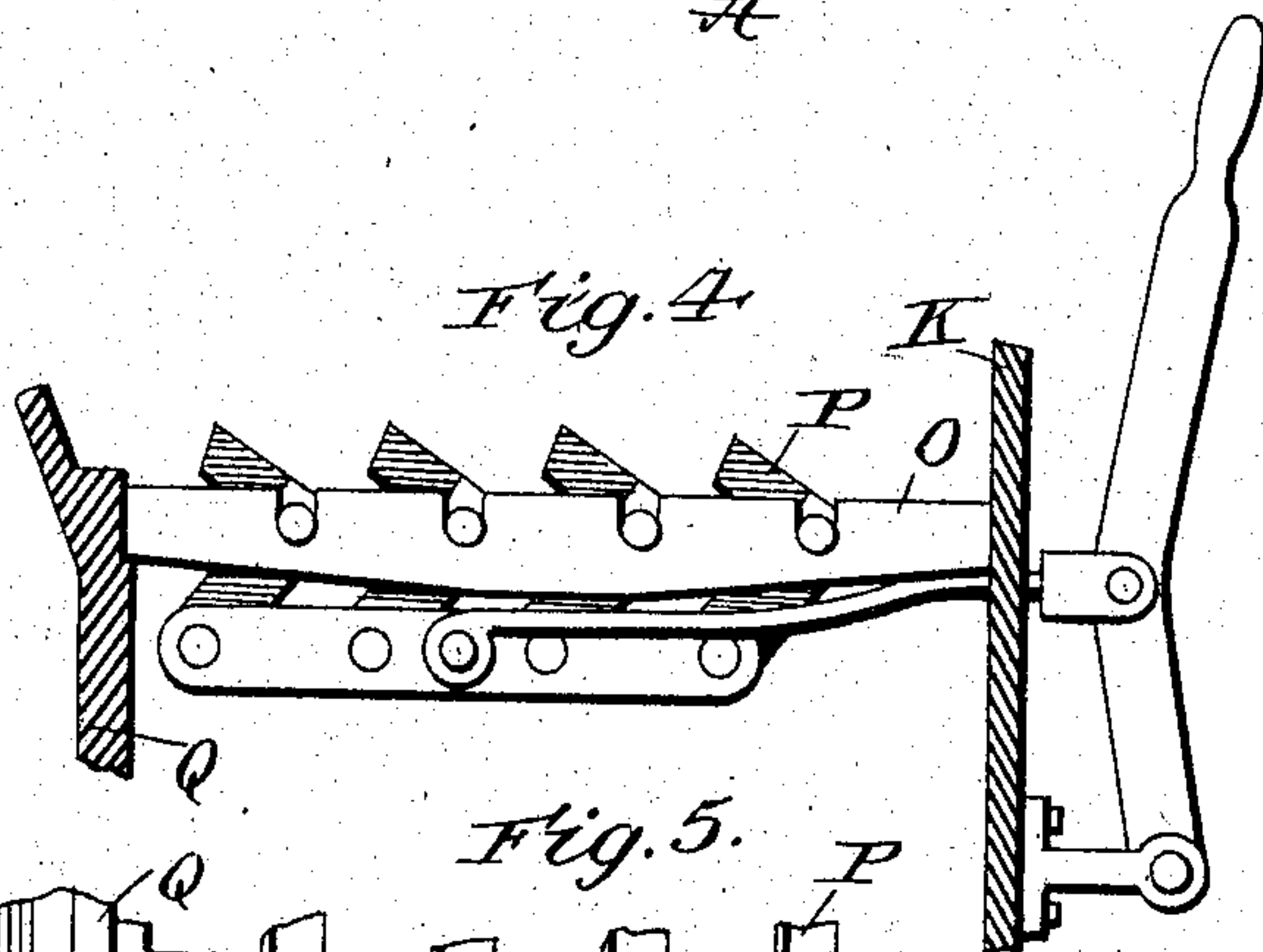
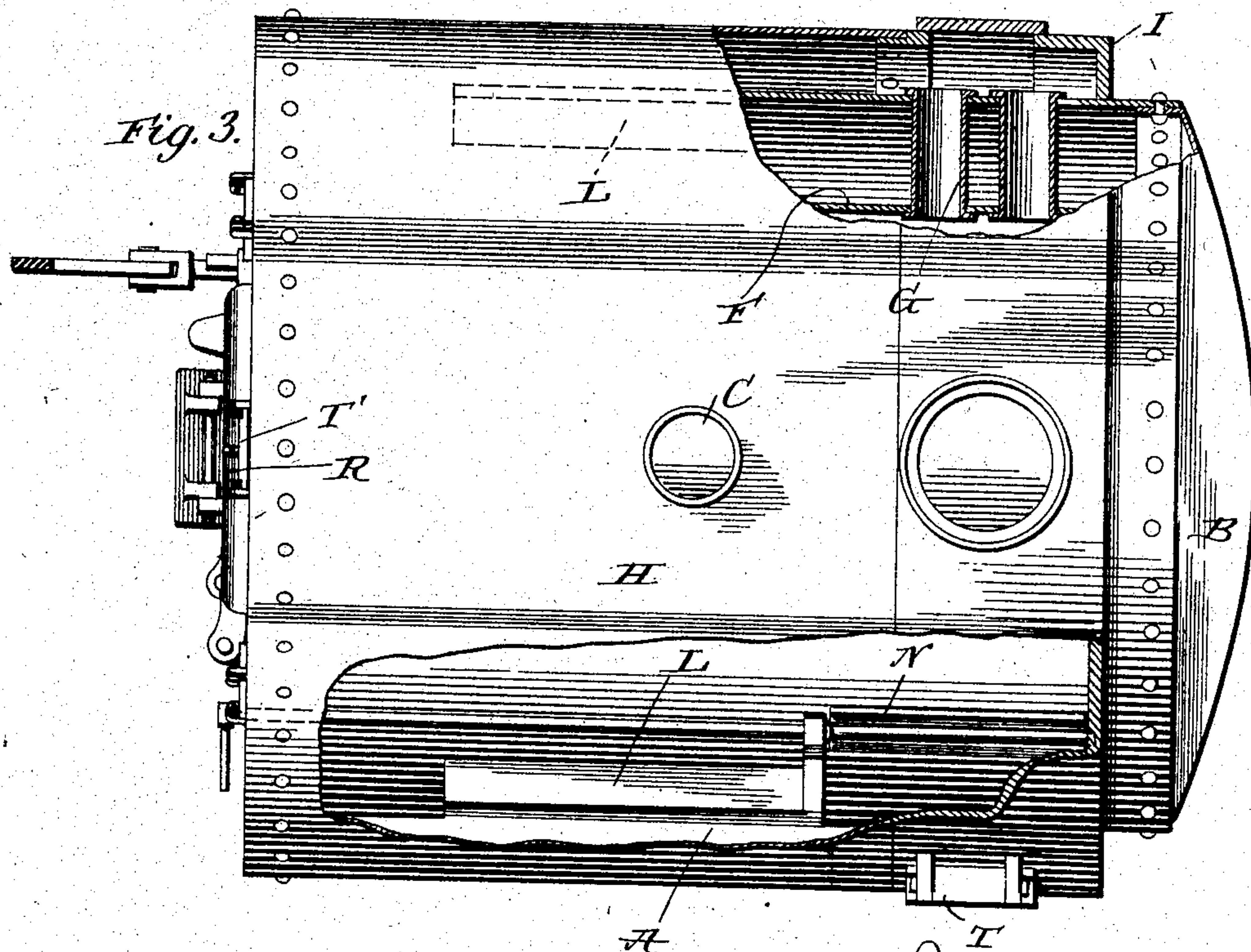
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CLARENCE G. ROWLEY, OF GENEVA, NEW YORK, ASSIGNOR TO NEW YORK CENTRAL IRON WORKS COMPANY, OF GENEVA, NEW YORK, A CORPORATION OF NEW YORK.

BOILER.

No. 796,018.

Specification of Letters Patent.

Patented Aug. 1, 1905.

Application filed April 20, 1905. Serial No. 256,526.

To all whom it may concern:

Be it known that I, CLARENCE G. ROWLEY, a citizen of the United States, residing at Geneva, in the county of Ontario and State of New York, have invented certain new and useful Improvements in Boilers, of which the following is a specification.

My present invention pertains to improvements in boilers, the construction and advantages of which will be hereinafter set forth, reference being had to the annexed drawings, wherein—

Figure 1 is a vertical sectional view on the line 1 1 of Fig. 2; Fig. 2, a longitudinal sectional view; Fig. 3, a top plan view, partly broken away, to more clearly show certain portions of the structure; and Figs. 4 and 5, detail views of the grate.

The object of the present invention is to produce a simple and efficient boiler, one which contains but few structural parts, and in which the products of combustion are caused to traverse through various passages to such an extent as to utilize substantially all the heat units given off by the fuel. Provision is also made for affording a direct draft when necessary.

In the drawings, A designates the main body or shell, closed at its rear end by a head B and provided with ports or openings C D, located, by preference, as shown in Fig. 2. The body is supported upon suitable saddles E or in any approved manner.

Located within the boiler, and, in fact, forming the innermost wall thereof, is a fire drum or chamber F. The drum is shorter than the outer member of the boiler, so that a space is left intermediate the head B and the corresponding head of the drum. Preferably the drum will occupy a position in the lower portion of the shell A or, in other words, is placed eccentrically thereto, as shown in Figs. 1 and 2.

Flues or tubes G extend out from each side of the rear portion of the fire-drum, said tubes passing through the outer wall of the main body and communicating with the space formed between said body and a shell or jacket H.

The jacket is maintained in proper place by frame or casting I, which supports the rear end of the jacket, and by plates J, secured to the lower end of the jacket and which extend

forwardly from the ends of casting or frame I to the front plate of the boiler. Said plate, comprising upper and lower sections K K', closes the forward end of the fire-drum, affords a support for the forward end of the jacket, and likewise closes the space between said forward end and the main body A.

A baffle-plate L is located on each side of the boiler just above the uppermost tubes or flues G, the plates extending forwardly between the jacket and the body A to an extent sufficient to cause the products of combustion to pass twice over that portion of the body covered or encompassed by the jacket. To prevent the products of combustion from passing directly out of the flues or tubes G to the smoke-outlet M, dampers N are mounted between the rear end of each baffle-plate and the frame L, the dampers when closed causing the products of combustion to pass along the lower portion of the body of the boiler below the baffle-plates to the forward end, thence back over the upper portion of the boiler to the smoke-outlet M. When the valves or dampers are opened, the products may pass directly from the tubes or flues about the rear end of boiler and to the smoke-exit M.

A grate of any suitable form is located within the fire-chamber. In that illustrated it comprises a rectangular frame O, carrying a series of rock-grate bars P. The forward end of the frame O is secured to the lower section K' of front frame and is likewise connected to a plate or casting Q. The lower and side portions of said plate fit closely against the inner wall of the fire-pot, thus forming the rear wall of the ash-chamber. The upper portion of the plate, as will be seen upon reference to Fig. 2, is inclined rearwardly and forms the bridge or fire-wall, causing the products of combustion to be deflected upwardly and away from the inner ends of the flues or tubes G and directly against the crown of the fire-pot. The grate may be removed by removing the upper section K of the front.

Suitable doors R and S are provided in the front plate to afford access to the fire-pot and the ash-chamber beneath the grate. Casting or frame I is formed with elongated openings one at each side in line with the flues or tubes G, and suitable doors T are provided to normally close said openings. The tubes may

be readily cleaned through these openings, and any soot or ash which may accumulate between the jacket and the outer shell of the boiler may likewise be removed through said openings. Other clean-out doors T' are provided in front face of the furnace.

Preferably a water box or chamber U will be provided at the forward end of the furnace, said box surrounding the door R and serving to keep the front from burning out and likewise to afford a supply of hot water for domestic purposes.

From the foregoing description it will be seen that the products of combustion are caused to pass approximately three times over the longitudinal surfaces of the boiler. First, along the inner surface or along the crown of the fire-pot, thence through the tubes or flues which extend directly through the boiler, thence over the outer face of the boiler below the baffle-plates, and then above the baffle-plates to the smoke-outlet.

By having the flues or tubes pass directly through the water-space of the boiler much heat is imparted thereby to the water which surrounds the tubes. Much heat is also imparted to the water through the head of the fire-drum and the walls thereof located in rear of the bridge. It will thus be seen that the heat units are utilized to the greatest possible extent by a construction which is simple and all parts of which are easy of access.

A safety-plug V, Fig. 2, will be employed, as usual.

Having thus described my invention, what I claim is—

1. In combination with a boiler, a fire-chamber located within the same; a jacket extending about the boiler, at a distance therefrom; a series of laterally-radiating flues or tubes extending from the rear portion of the fire-chamber, through the boiler and communicating with the space formed between the jacket and the boiler; and means, substantially as described, for controlling the course of travel of the products through said space to the smoke-outlet.

2. In combination with a horizontally-disposed boiler, a fire-chamber located within the same; a jacket extending about the boiler at a distance therefrom; a series of flues, extending laterally from the rear end of the fire-chamber through the boiler and communicating with the space formed between the jacket and the boiler; and baffle-plates mounted in said space and extending forwardly from a point above the uppermost tube of the series toward the front of the boiler, whereby the products of combustion are caused to traverse forward and back upon the outside of the boiler before they reach the smoke-outlet which is located at the rear of the jacket.

3. In combination with a horizontally-dis-

posed boiler, a fire-chamber located within the same; a jacket extending about the boiler at a distance therefrom; a series of flues extending laterally from the rear end of the fire-chamber and communicating with the rear portion of the space formed by the jacket; baffle-plates extending forwardly in said space at a point above the flues; and dampers located intermediate the tubes and the smoke-outlet, whereby a direct course of travel is provided for the products of combustion.

4. In combination with a horizontally-disposed boiler, a fire-chamber located within the same; a jacket extending about the boiler at a distance therefrom; a series of flues extending laterally from each side of the rear end of the fire-chamber through the boiler and opening into the space formed between the jacket and the boiler; a bridge or fire-wall located within the fire-chamber, said wall extending upwardly therein and serving to deflect the products of combustion against the crown of the fire-chamber; a forwardly-extending baffle-plate located in the space between the jacket and the boiler above the opening of each of the uppermost tubes of each of the series; and a damper working in conjunction with each of said baffle-plates.

5. In combination with a horizontally-disposed boiler, a fire-chamber located eccentrically within the same; a series of tubes extending from each side of the rear portion of the fire-chamber through the boiler; a grate; a fire-wall located in rear of the grate, the upper edge of the wall standing in proximity to the upper tube of each series; a frame or casting extending partially about the boiler in line with the tubes; clean-out doors carried by said frame; bars extending from the lower ends of the frame to the front plate of the boiler; a jacket secured to said frame, bars and front plate; baffle-plates extending forwardly from a point adjacent to each of the uppermost tubes of each of the series; and dampers acting in conjunction with said plates.

6. In combination with a horizontally-disposed boiler, a fire-chamber located therein; a fire-wall fitting within the fire-chamber said wall extending across the entire width of the fire-chamber and terminating at a point below the crown thereof; a grate-frame connected to the wall and likewise connected to the front plate of the boiler; a series of tubes extending laterally from the fire-chamber in rear of the fire-wall through the boiler; a jacket extending about the boiler at a distance therefrom; and means for controlling the passage of the products of combustion through the space formed by the jacket.

7. In combination with a boiler, a fire-chamber located therein, said chamber being of a length less than that of the boiler whereby a space is formed intermediate the end of said chamber and the rear end of the boiler; a fire-wall located at substantially the mid-length of

said chamber and extending from side to side thereof; a series of tubes extending laterally from the fire-chamber at a point in rear of the fire-wall through the boiler; a jacket extending about the boiler; and means for controlling the passage of the products of combustion through the space or chamber formed by the jacket.

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

CLARENCE G. ROWLEY.

Witnesses:

STUART F. DEY,
LEWIS W. KEYES.