

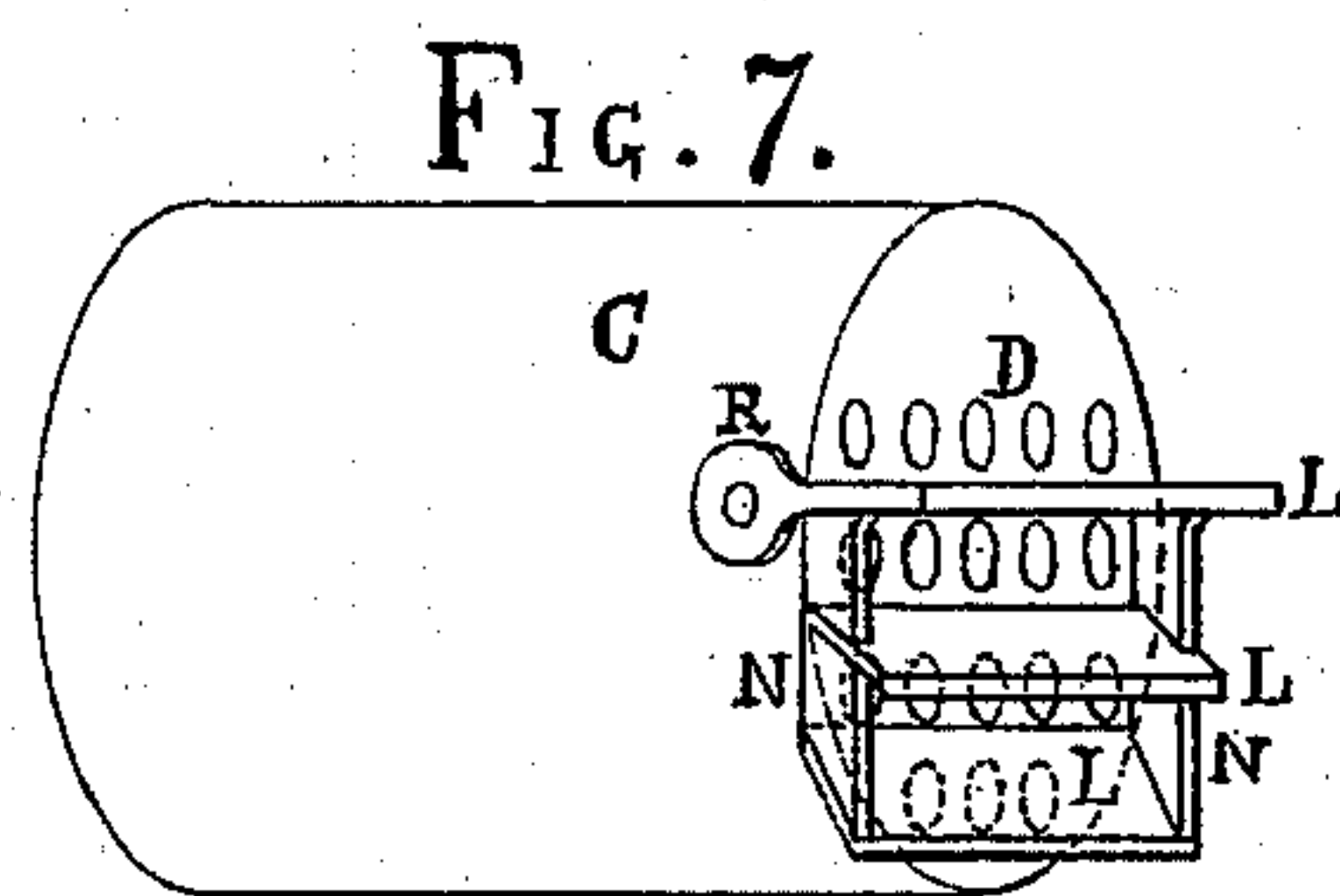
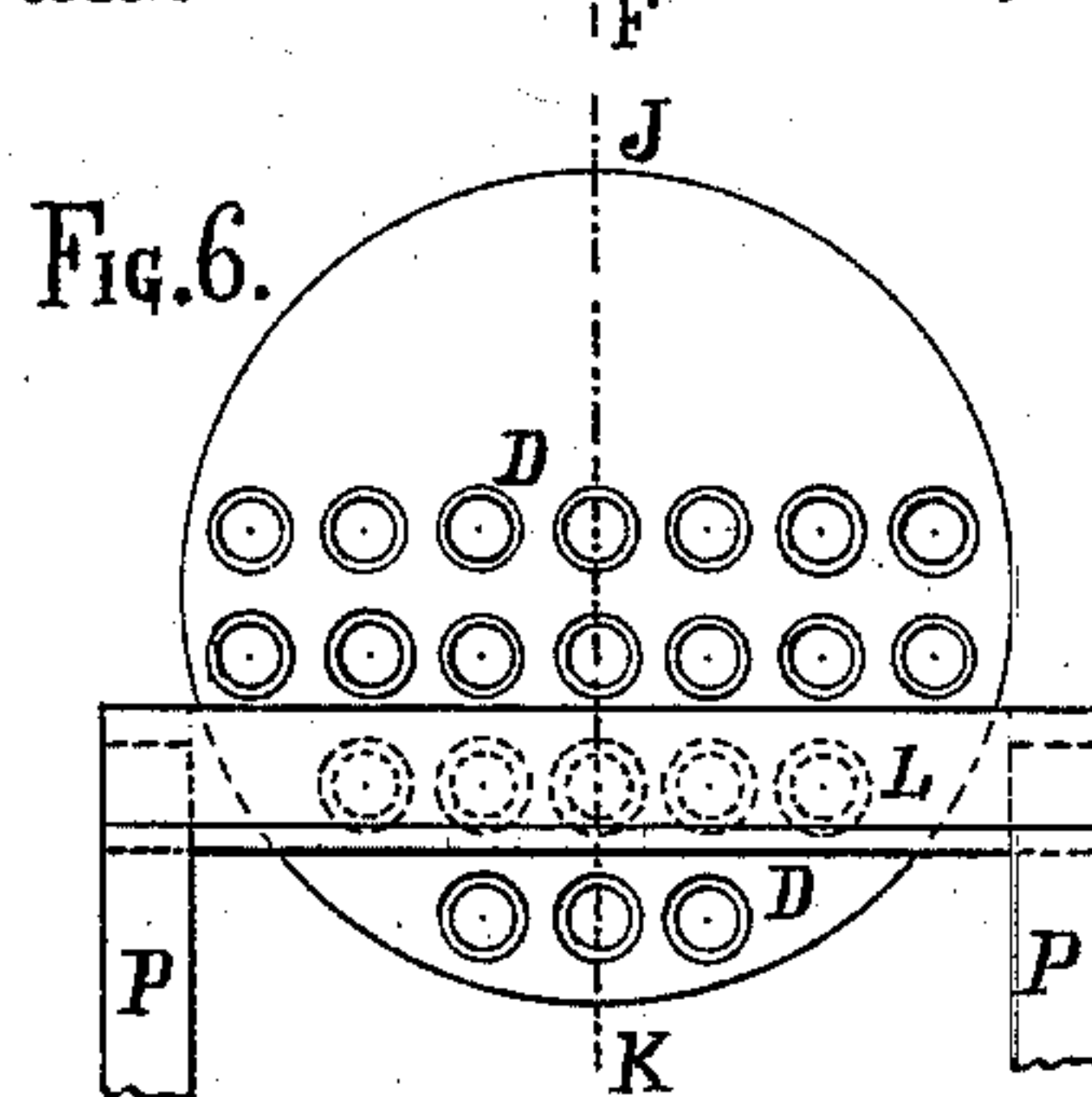
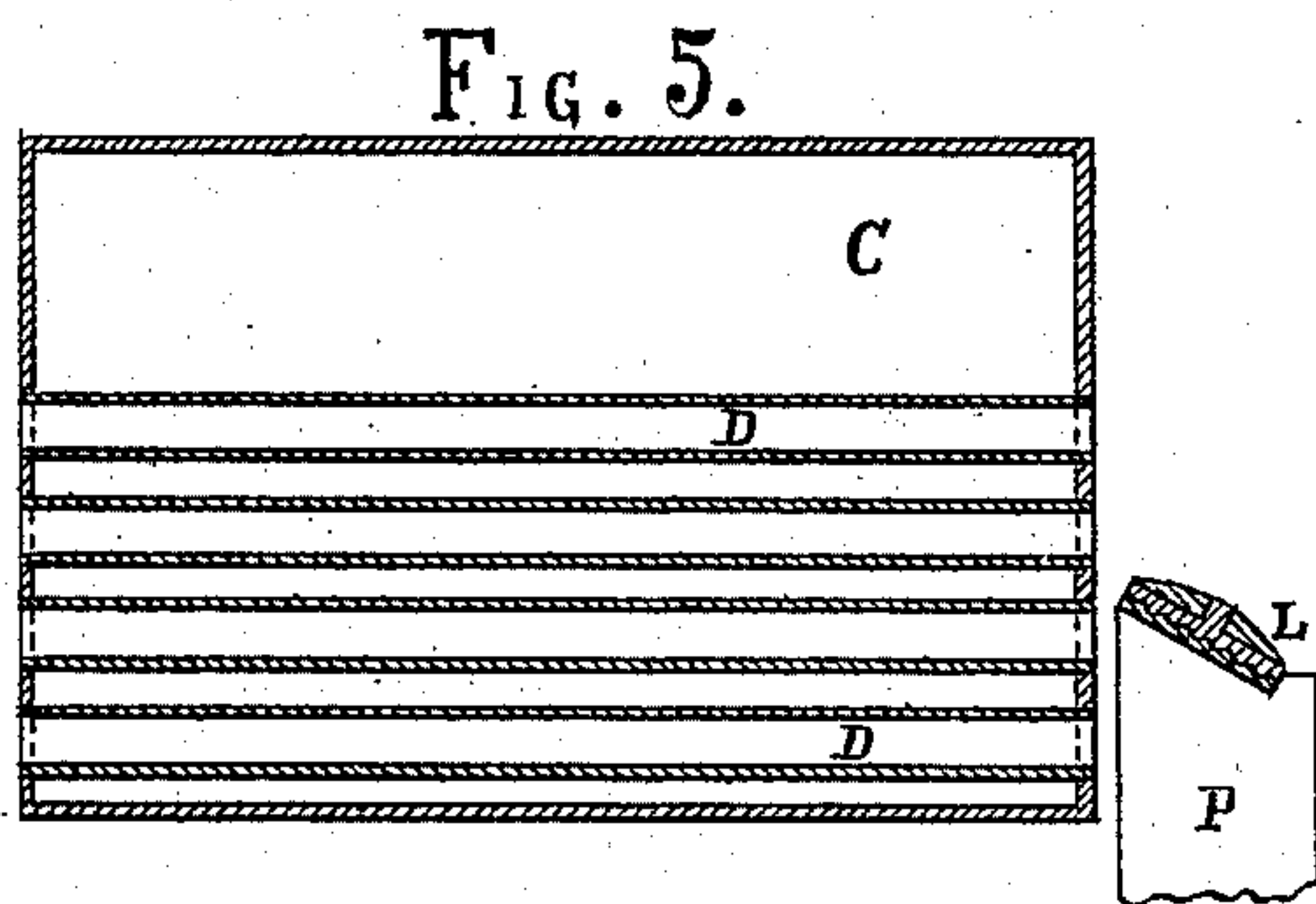
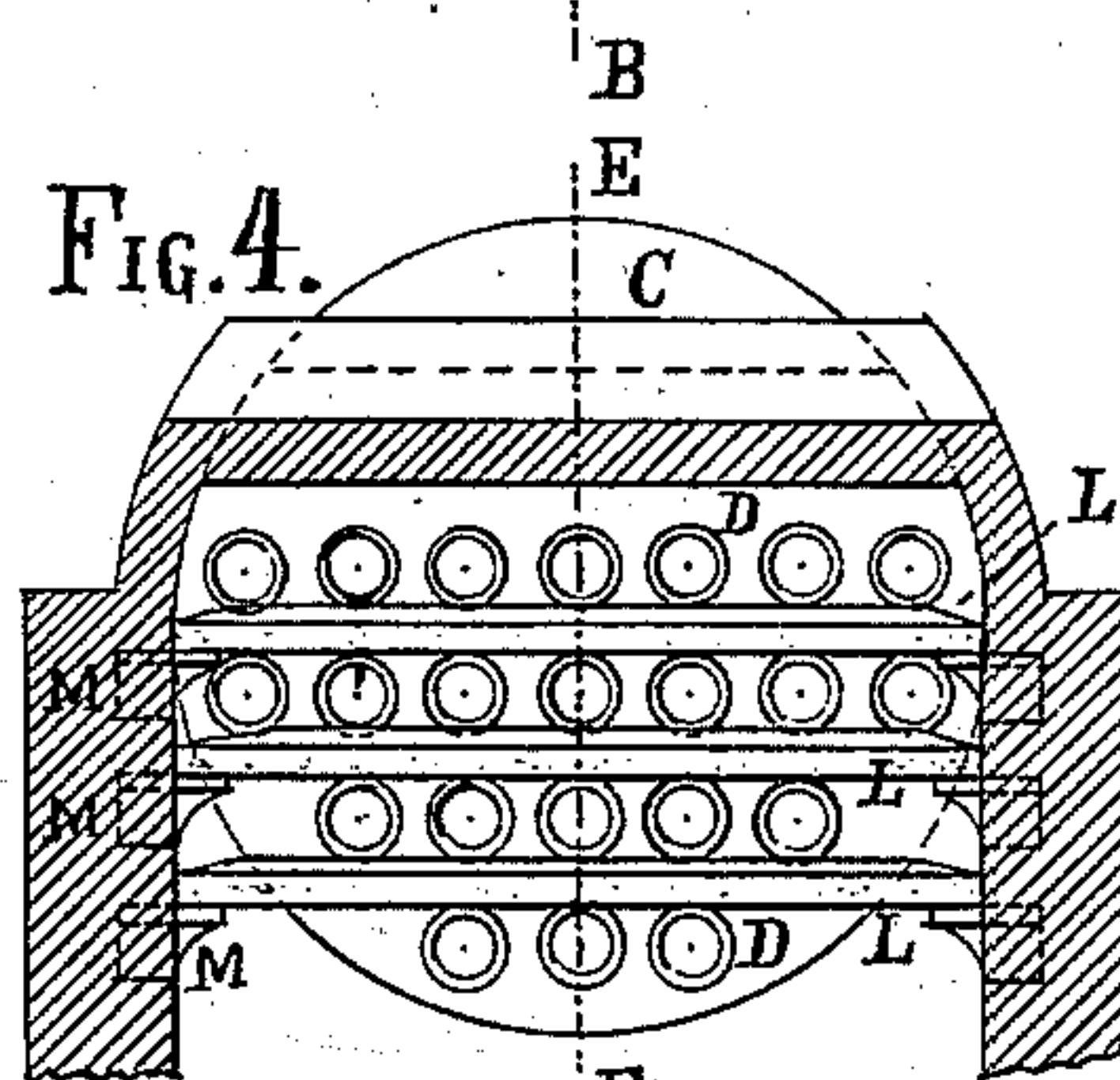
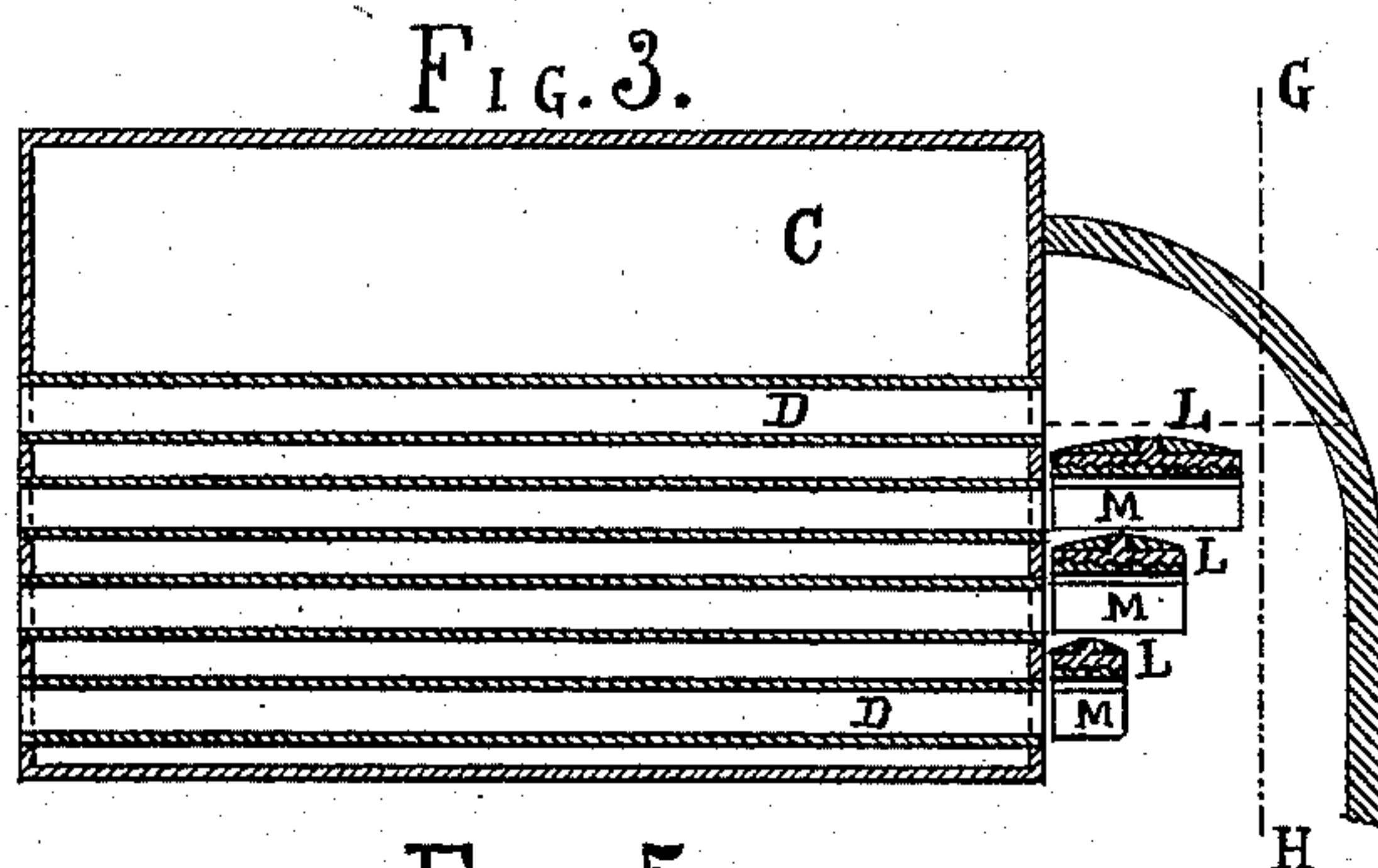
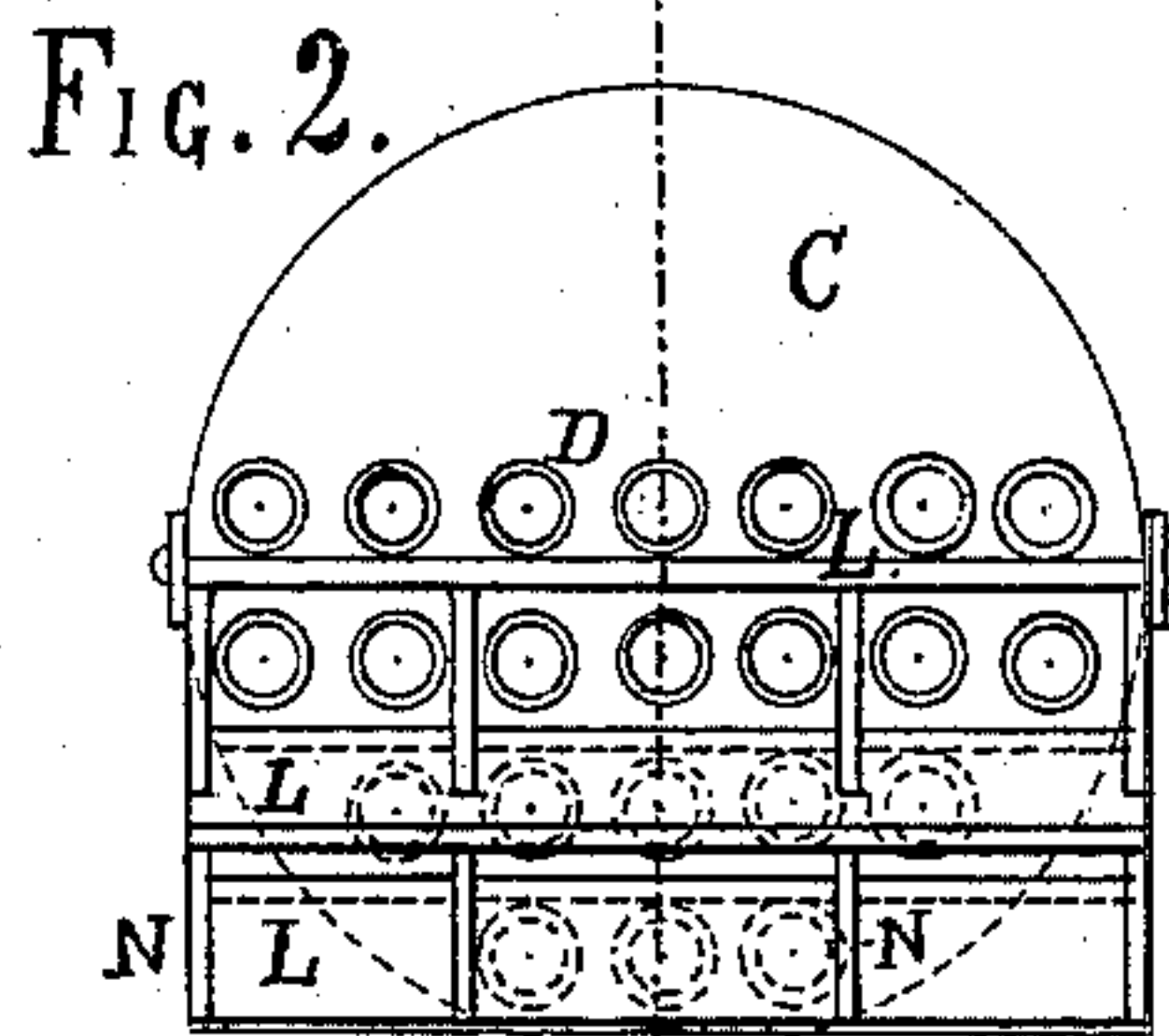
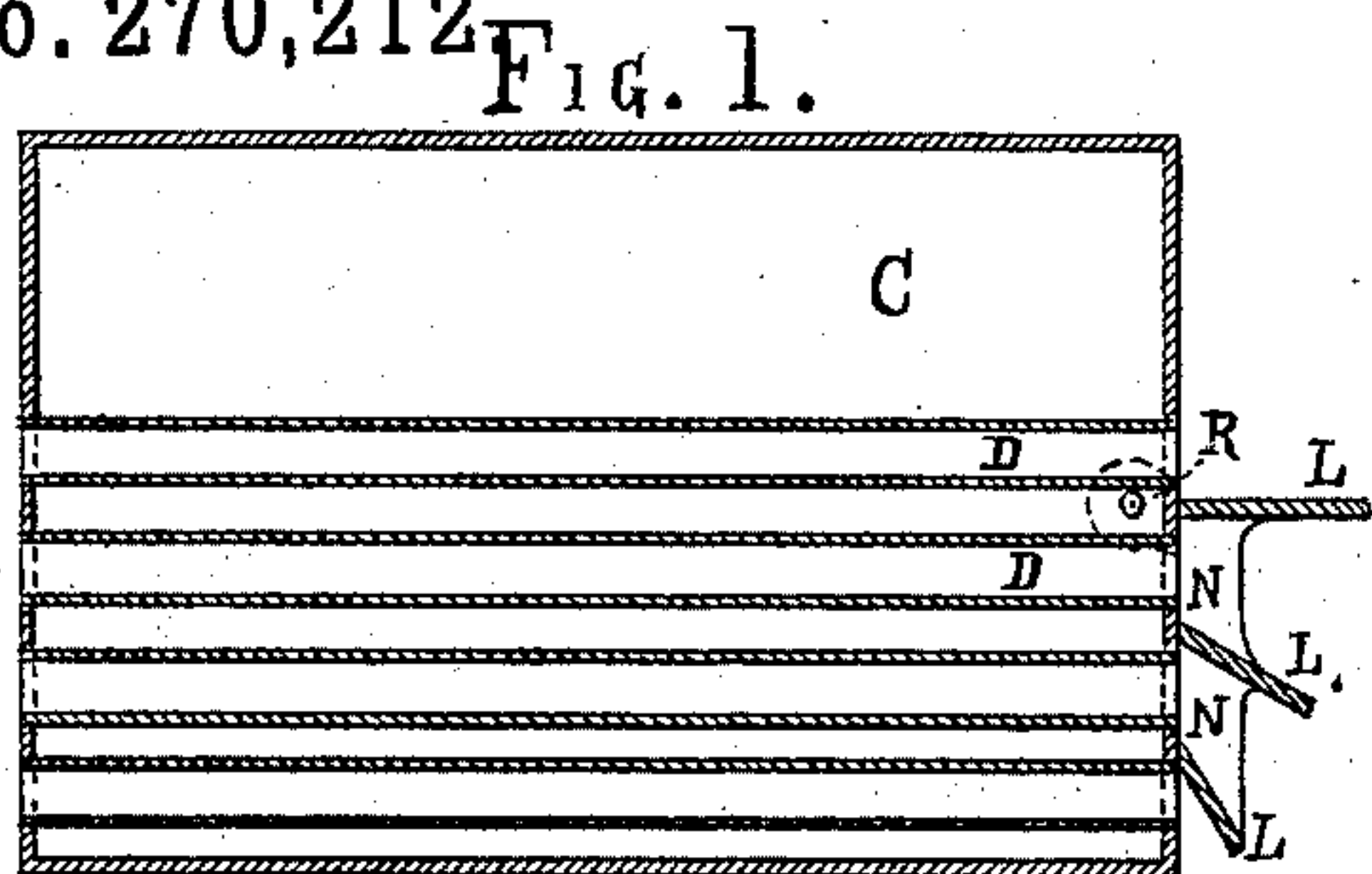
(No Model.)

2 Sheets—Sheet 1.

C. H. FITCH.
RETURN FLUE BOILER.

No. 270,212

Patented Jan. 9, 1883.



WITNESSES:

Samuel Diller
Abel B. Jacobs.

INVENTOR

Charles Howard Fitch.

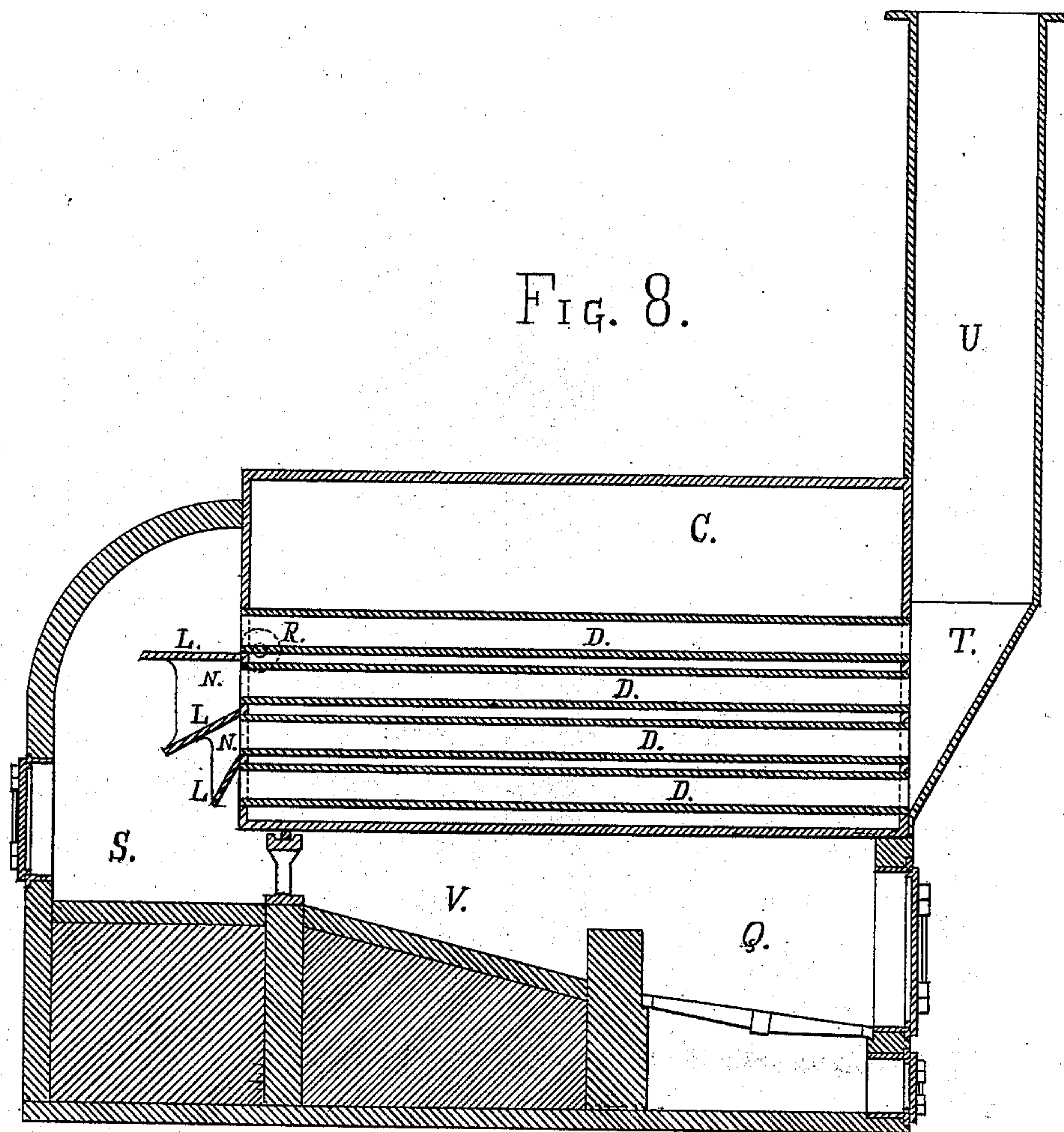
(No Model.)

2 Sheets—Sheet 2.

C. H. FITCH.
RETURN FLUE BOILER.

No. 270,212.

Patented Jan. 9, 1883.



WITNESSES:

Samuel Loeck
Abel B. Jacobs.

INVENTOR

Charles Howard Fitch.

UNITED STATES PATENT OFFICE.

CHARLES H. FITCH, OF NEW HAVEN, CONNECTICUT.

RETURN-FLUE BOILER.

SPECIFICATION forming part of Letters Patent No. 270,212, dated January 9, 1883.

Application filed November 13, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HOWARD FITCH, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Return-Flue Boilers, of which the following is a specification.

My invention relates to a device for distributing the products of combustion from the furnace more uniformly among the tubes of a return tubular boiler.

In return-flue boilers as now ordinarily constructed the great volume of the products of combustion passes through the upper rows of tubes and comparatively little through the lower rows of tubes, so that the heating-surface of the lower tubes is much less efficient and serviceable than the heating-surface of the upper tubes. My device is designed to afford the products of combustion easier access to the lower than to the upper tubes, so as to distribute them more uniformly among the several rows of tubes, and thus to increase the efficiency of the boiler. This I do by means of deflecting-plates placed at the rear end of the boiler, between the horizontal rows of tubes, the said plates being in direction either perpendicular or inclined to the surface of the end of the boiler, and being supported either by attachment to the boiler or by supports independent of the boiler.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a longitudinal sectional view, and Fig. 2 an end view, of a boiler with a frame-work of projecting plates fastened to the boiler. Fig. 3 is a longitudinal sectional view, and Fig. 4 a transverse sectional view, of a boiler with horizontal plates supported by wall-brackets exterior to the boiler and separate from it. Fig. 5 is a longitudinal sectional view, and Fig. 6 an end view, of a boiler with a single inclined plate supported at the ends by piers independent of the boiler. Fig. 7 exhibits in a single view a boiler with plates arranged as in Figs. 1 and 2.

Similar letters refer to similar parts in the several views.

In Figs. 1, 2, and 7, between the tube-rows D of the boiler C are placed the plates L, which are supported by bolting or riveting to the sides of the boiler, as shown at R, and

which are stiffened and sustained by the vertical webs N. Fig. 1 is a section through the plane A B of Fig. 2.

In Figs. 3 and 4 the horizontal plates L are shown supported by wall-brackets M. Fig. 3 is a section of the boiler on the plane E and F, and Fig. 4 a section of the boiler on the plane G H.

In Figs. 5 and 6 a single inclined plate L is shown supported by the piers P. Fig. 5 is a section through the plane J K of Fig. 6. The plates L are of wrought or cast iron, and in Figs. 3 and 5 they are shown in section, stiffened by small ribs on top and covered by another material designed to be fire-brick or fire-clay to protect the iron from being burned out.

Fig. 8 is a longitudinal section through the center of a return tubular boiler and boiler-setting. It exhibits the position of the deflecting-plates L L L in respect to the tubes D D D of the boiler C, and in respect to the furnace or fire-box Q, the main flue V, the back box, S, the smoke-box or breeching T, and the chimney U.

The application and effect of the invention are as follows: The furnace-gases or products of combustion pass under the boiler longitudinally from the forward to the back end, and, rising at the back of the boiler, flow forward through the tubes. The levity of the gases causes the hottest and lightest gases to pass through the upper tubes; but a plate L placed over the lower tube-rows checks the upward flow of a considerable portion of the hottest gases and causes them to enter at once into the lower tubes. In like manner successive plates L L L being placed between the tube-rows, the upper plates being wider and projecting farther from the face of the boiler than the lower plates, it will be seen that the readiness of access to the several rows of tubes may be so graduated as to secure a comparatively-uniform flow of the hot gases through them, and in consequence a more uniform and greater efficiency of the heating-surface of the tubes.

The application of the invention is thus generally and fully explained; but the methods of supporting the plates, as shown, by riveting or bolting them to the boiler or by resting them upon independent supports are not claimed as inventions; nor is the furnishing

of the plates with stiffening-ribs or with coverings of fire-clay or other refractory material so claimed, because these features are not new; but that which is claimed is simply—

- 5 A return tubular boiler furnished with horizontal or inclined shelves or plates, of cast or wrought iron or other suitable material, placed between the horizontal rows of tubes at the

back end of the boiler and determining by their breadth or angular position the ease of access of the products of combustion to the several rows of tubes.

CHARLES HOWARD FITCH.

Witnesses:

SAMUEL TOLLES,
ABEL B. JACOBS.