

No. 690,870.

Patented Jan. 7, 1902.

G. L. NORRMAN.  
BOILER SETTING.

(Application filed May 1, 1901.)

(No Model.)

2 Sheets—Sheet 1.

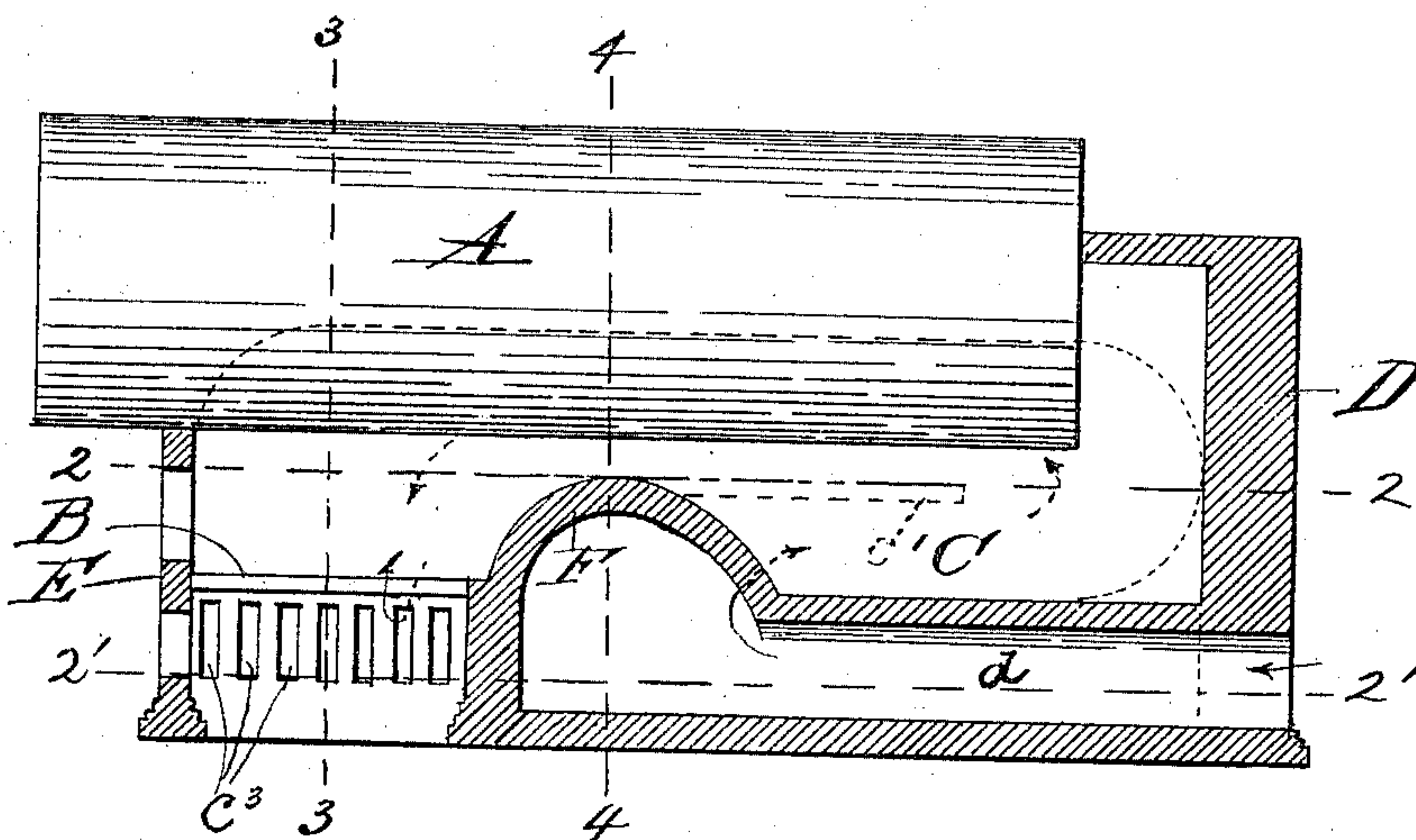


Fig. 1.

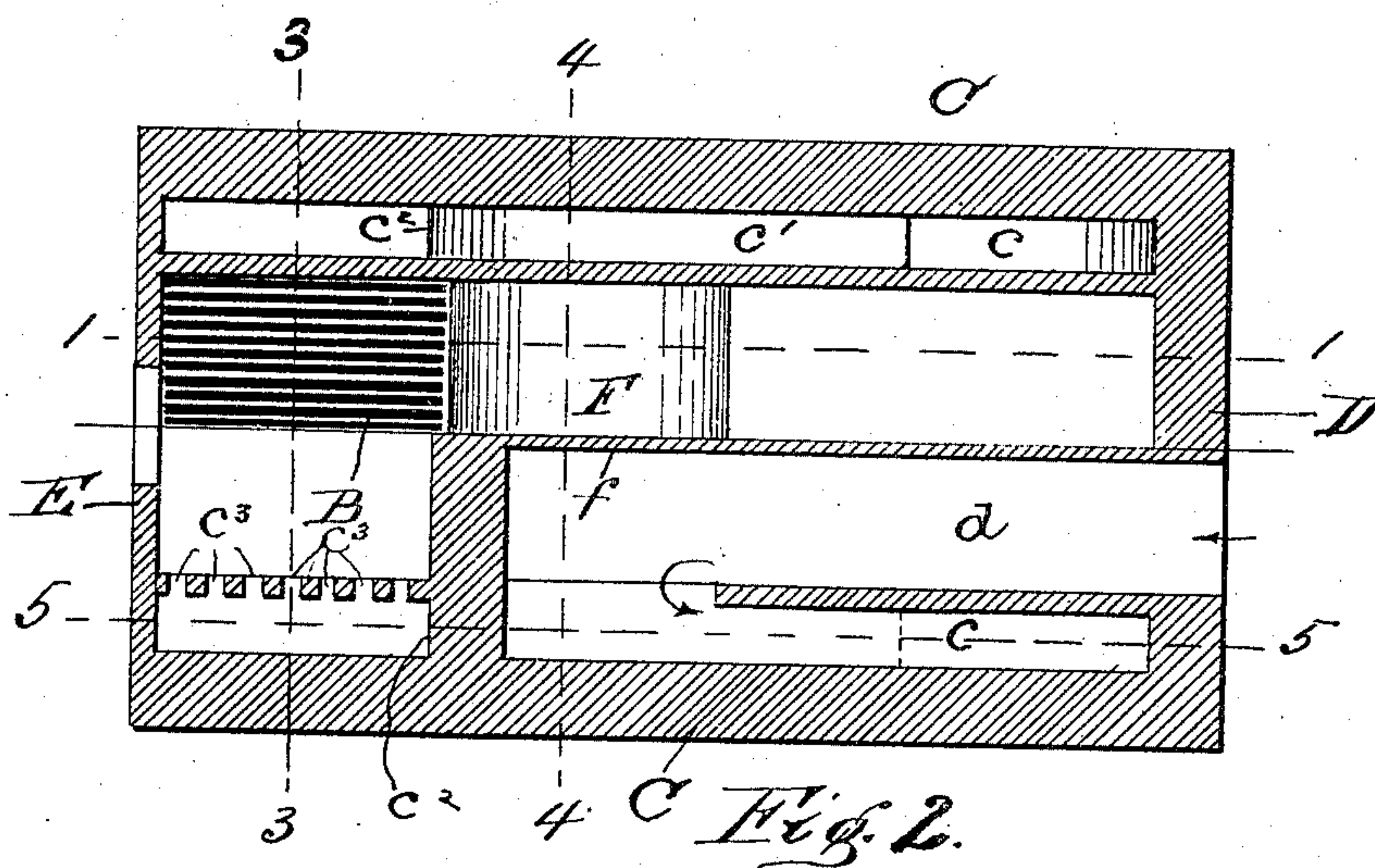


Fig. 2.

WITNESSES

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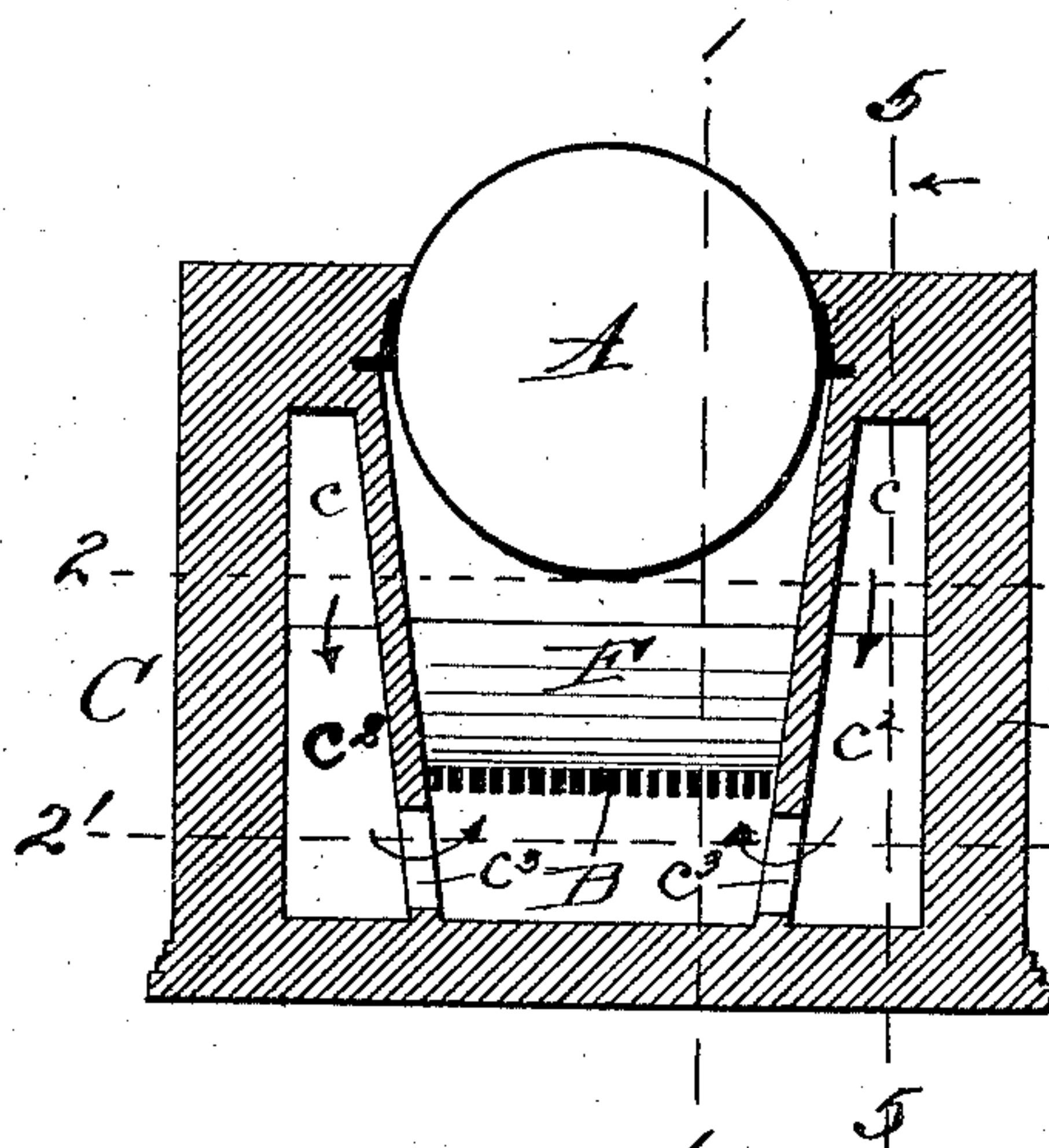


Fig. 3.

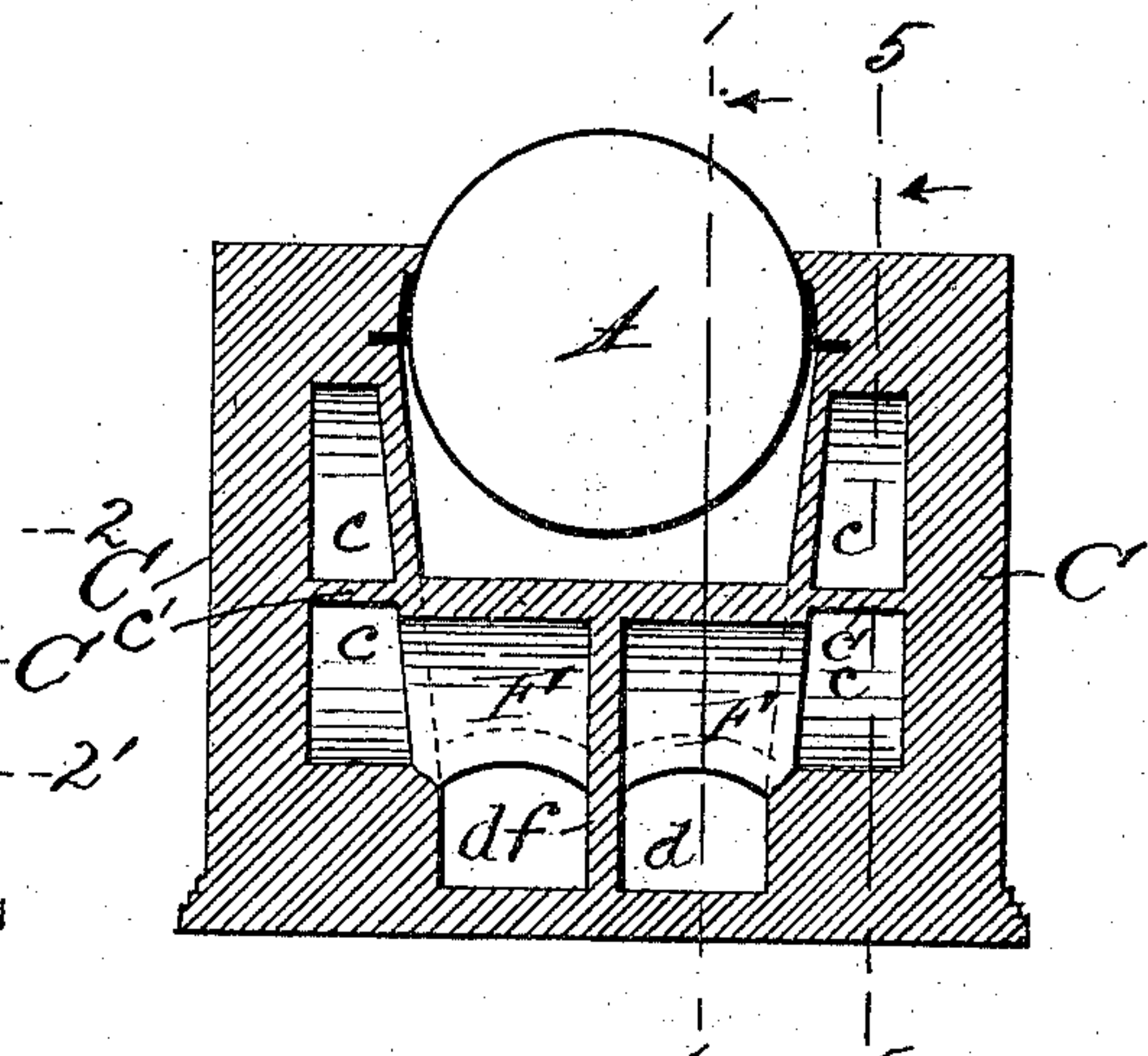


Fig. 4.

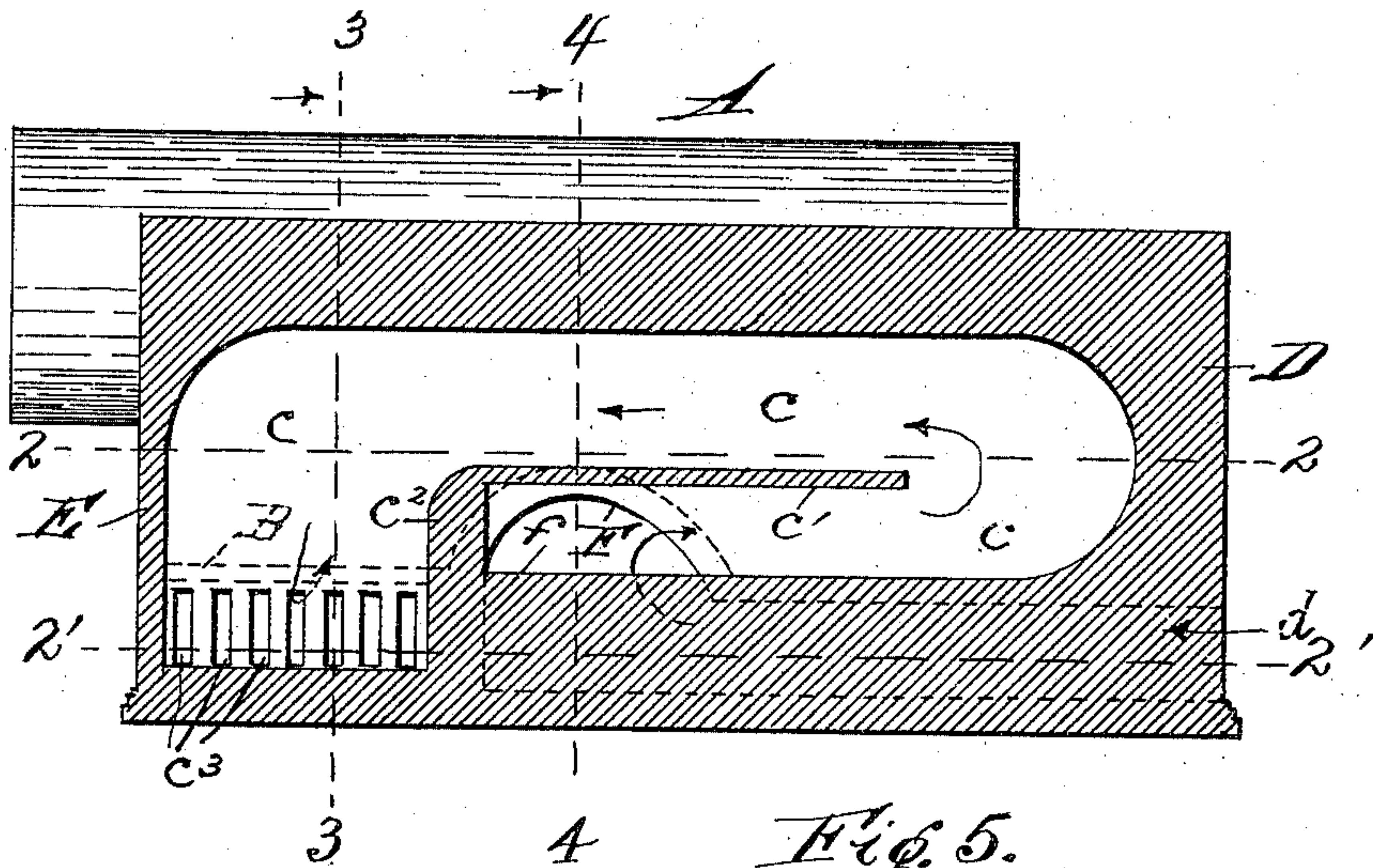


Fig. 5.

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# UNITED STATES PATENT OFFICE.

GODFREY L. NORRMAN, OF ATLANTA, GEORGIA.

## BOILER-SETTING.

SPECIFICATION forming part of Letters Patent No. 690,870, dated January 7, 1902.

Application filed May 1, 1901. Serial No. 58,326. (No model.)

*To all whom it may concern:*

Be it known that I, GODFREY L. NORRMAN, a citizen of the United States of America, and a resident of Atlanta, in the county of Fulton and State of Georgia, have made a certain new and useful Improvement in Boiler-Settings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of this invention is the protection of the fire-box lining, the bridge-wall, and all linings of the boiler-setting from burning out by excessive heating and the resultant furnishing to the combustion-chamber of heated air as a superior supporter of combustion, by reason of which results the life of the setting is very greatly increased and a comparatively great heat obtained with a minimum consumption of fuel.

The invention consists of the novel arrangement of certain flues and ports, all of which is hereinafter fully set forth.

The invention is shown in the accompanying drawings, as follows:

Figure 1 is a central longitudinal section of the setting, being on the lines 1 1, Figs. 2, 3, and 4. Fig. 2 is a section on the line 2 2 and 2' 2', Figs. 1 and 5. Fig. 3 is a vertical section on the line 3 3, Fig. 5. Fig. 4 is a vertical section on the line 4 4, Fig. 5. Fig. 5 is a section on the line 5 5, Figs. 3 and 4.

In the figures like reference characters are uniformly employed in the designation of corresponding elements of construction in all the views.

A is the boiler.

B is the grate.

C is the side walls; D, the back end wall, and E the front end wall, F being the bridge-arch. This bridge-arch consists of a hollow arch structure extending transversely of the center and along the floor thereof, just at the back of the grate and combustion-chamber, the chamber under said arch opening into the chambered side walls C, near the bottom of the chambers c therein. These chambers c are practically coextensive with the exposed

portions of the said side walls—that is, the portions exposed to the action of the fire and heat—and each chamber is divided into a convoluted flue, as shown in Fig. 5, by a horizontally-disposed partition  $c'$ , joining its end near the fire-box with a vertical partition  $c^2$  in the side-wall chamber on each side and about even with the breast of the bridge-arch, one end of which flue is thus connected to the bridge-arch, while its other end is extended downwardly in the side walls C to a point below the level of the grate B, where it opens out into the ash-pit through a series of ports  $c^3$ . As shown in Figs. 2 and 4, the chamber under the bridge-arch is divided in its center by a wall or partition  $f$  into two chambers or flues, each of which opens into the correlative side-wall flue just described. Flues  $d$  in the floor of the boiler-setting open into these two chambers near the inner ends thereof and also outwardly through the back end wall D near its bottom, whereby air entering through the flues  $d$  passes through the chambers under the bridge-arch into the side walls, where it circulates in contact with the heated surfaces, and is thus heated, passing thence out through the ports  $c^3$ , and passes upwardly through the grate and fire, where it mixes with the products of combustion and is consumed, and by reason of its carried heat and chemical character supports combustion in the best possible manner, being fed to the fire in such excess quantities that following and commingling with the products of combustion it causes their consumption, and thus provides a practical “smoke-consumer” and provides for the better combustion of the fuel on the grate.

Suitable dampers may be employed where required to control the flues and openings.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a boiler-setting, a bridge-arch having a laterally-extending chamber therein, a flue lying along the floor communicating exteriorly at one end and with said bridge-arch chamber at the other end, convoluted flues in the side walls each connected at one end with said bridge-arch chamber and at the other end through ports with the ash-pit below the grate.

2. In a boiler-setting, chambered side walls,

5 a horizontal partition dividing the said chambers into convolutions, ports below the plane of the grate opening into said chambers, a hollow bridge-arch having internal connection with said chambered walls and a flue leading from said bridge-arch exteriorly of the setting.

10 3. In a boiler-setting a hollow bridge-wall having its interior divided into two compartments by a central partition, a fresh-air flue leading from the outside into each of said compartments, convoluted flues in the side

walls leading from the bridge-wall compartments respectively along each side wall to a point in said side walls below the plane of the grate and ports opening into the ash-pit just below said grate and connecting said convolute flues therewith. 15

In testimony whereof I hereunto affix my signature in presence of two witnesses.

G. L. NORRMAN.

Witnesses:

A. P. WOOD,

EDWD. P. WOOD.