

No. 786,886.

PATENTED APR. 11, 1905.

J. F. FLAHERTY.

RADIATOR.

APPLICATION FILED DEC. 9, 1903.

Fig. 1

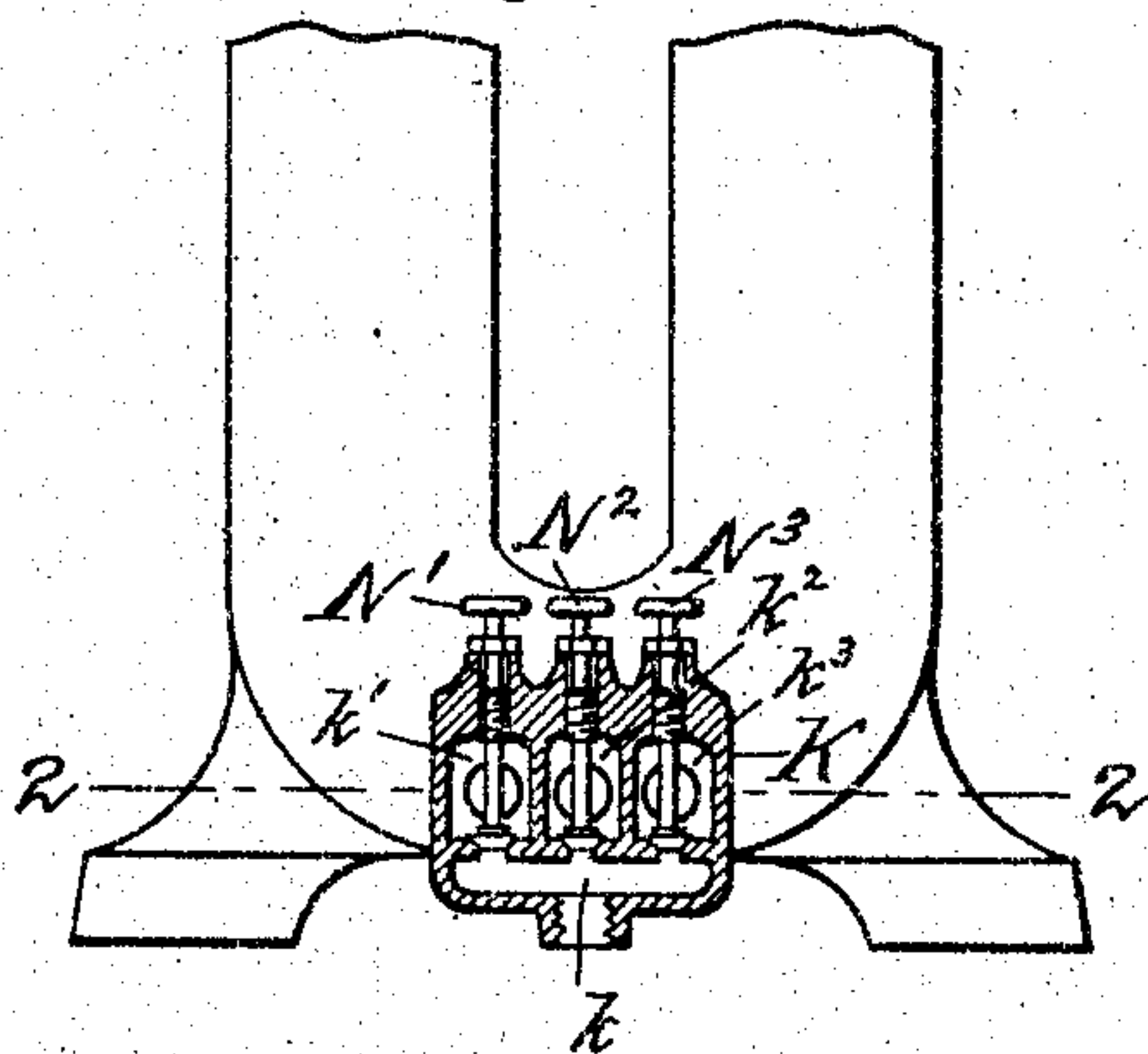


Fig. 6

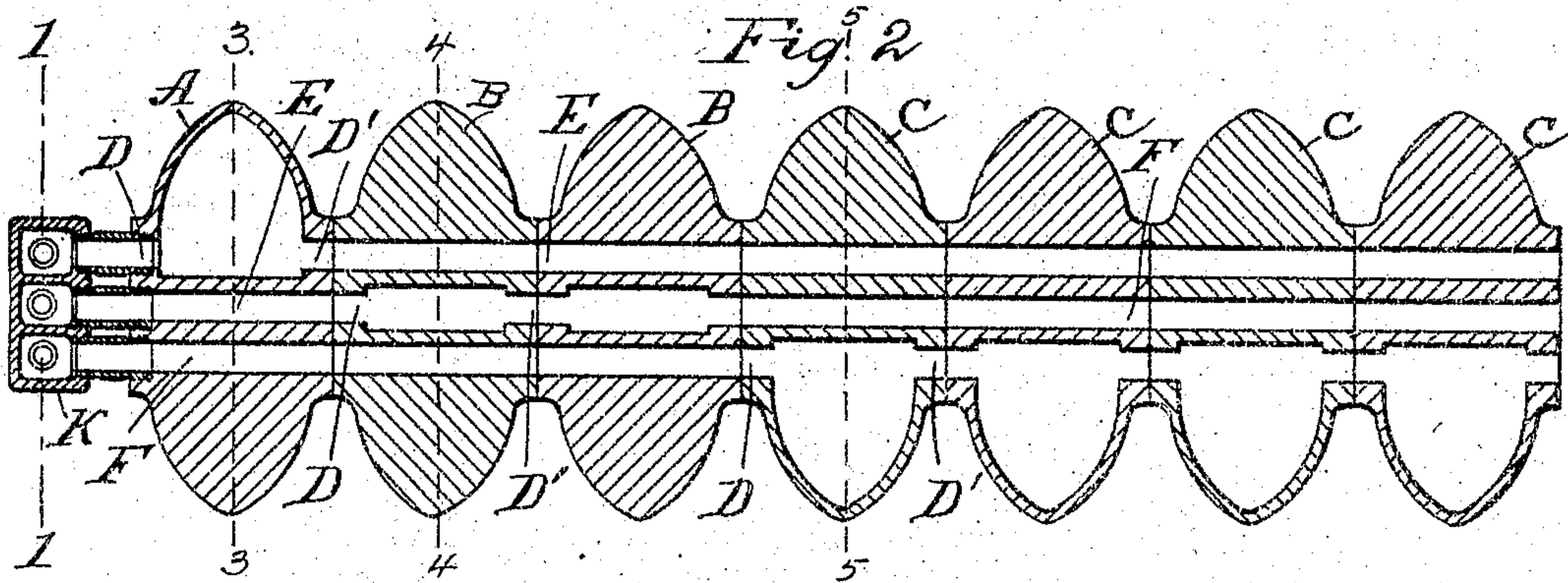
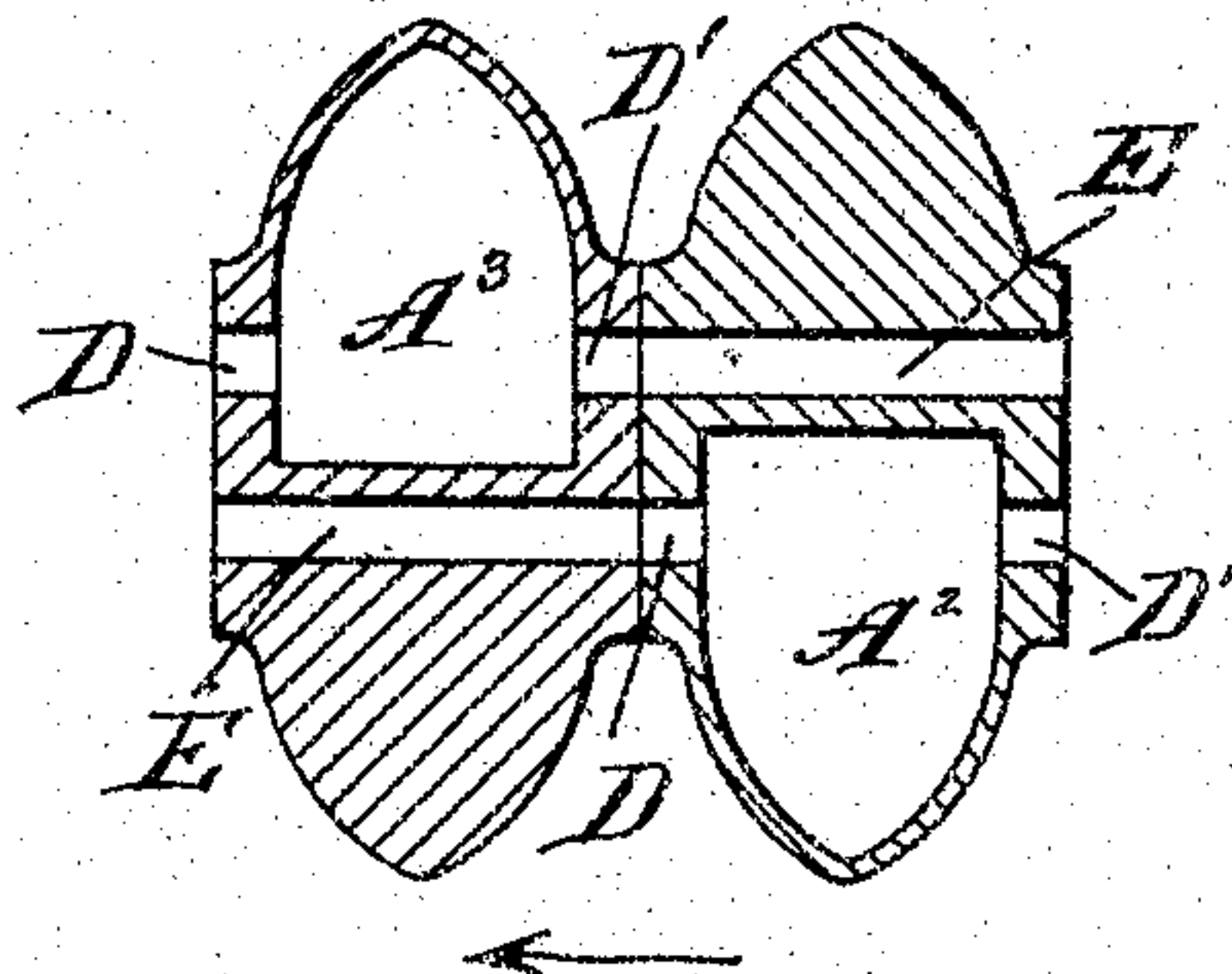


Fig. 3

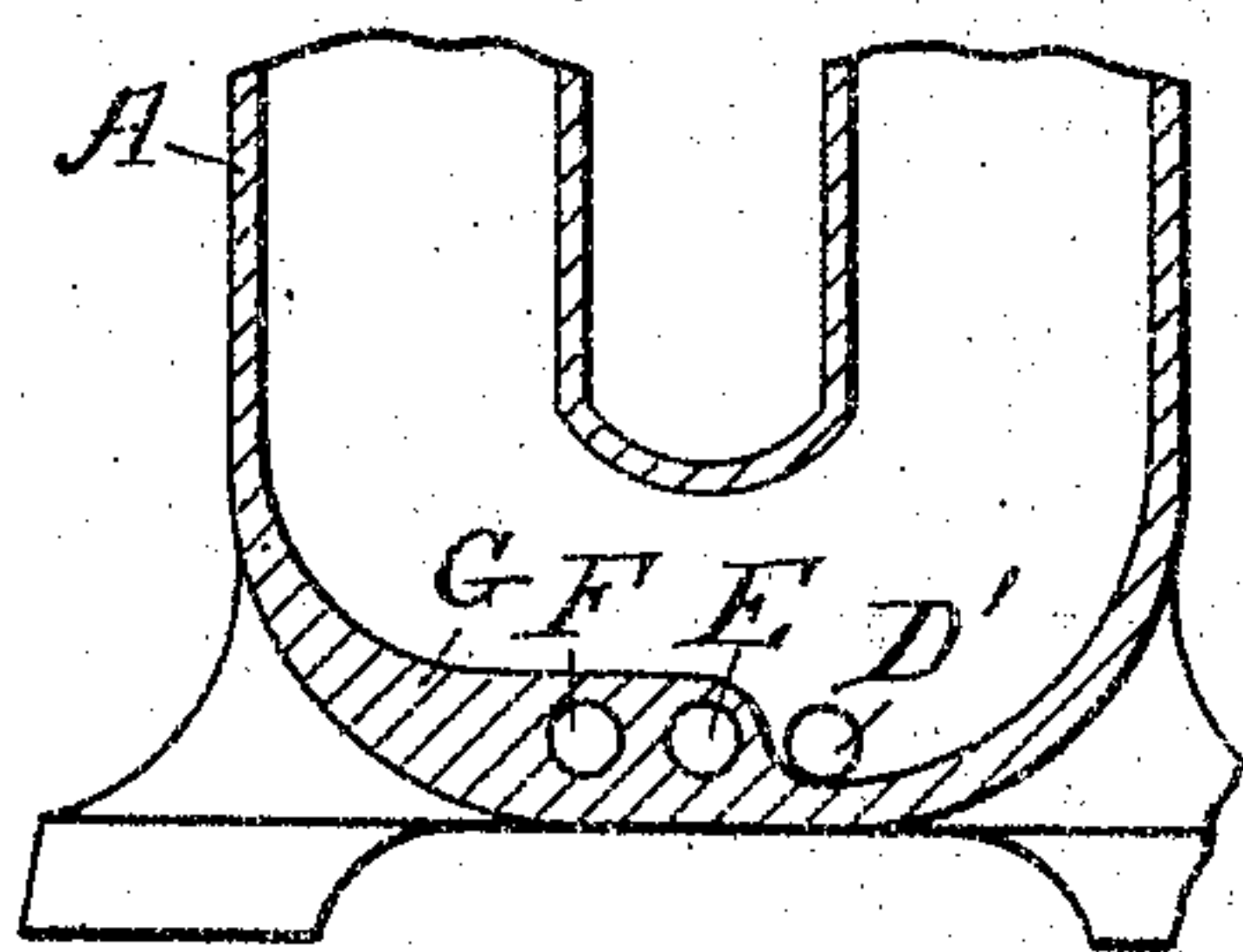


Fig. 4

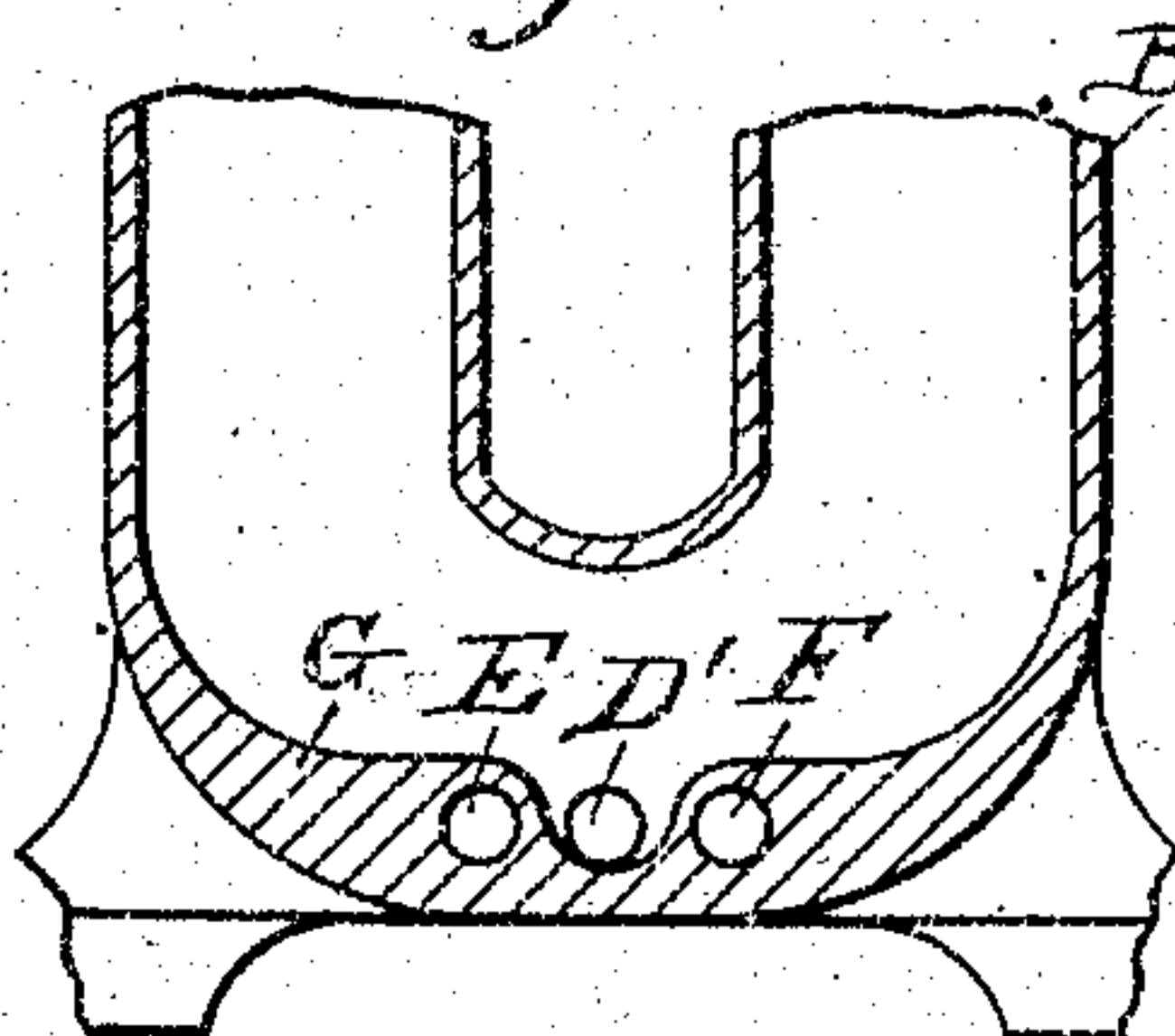
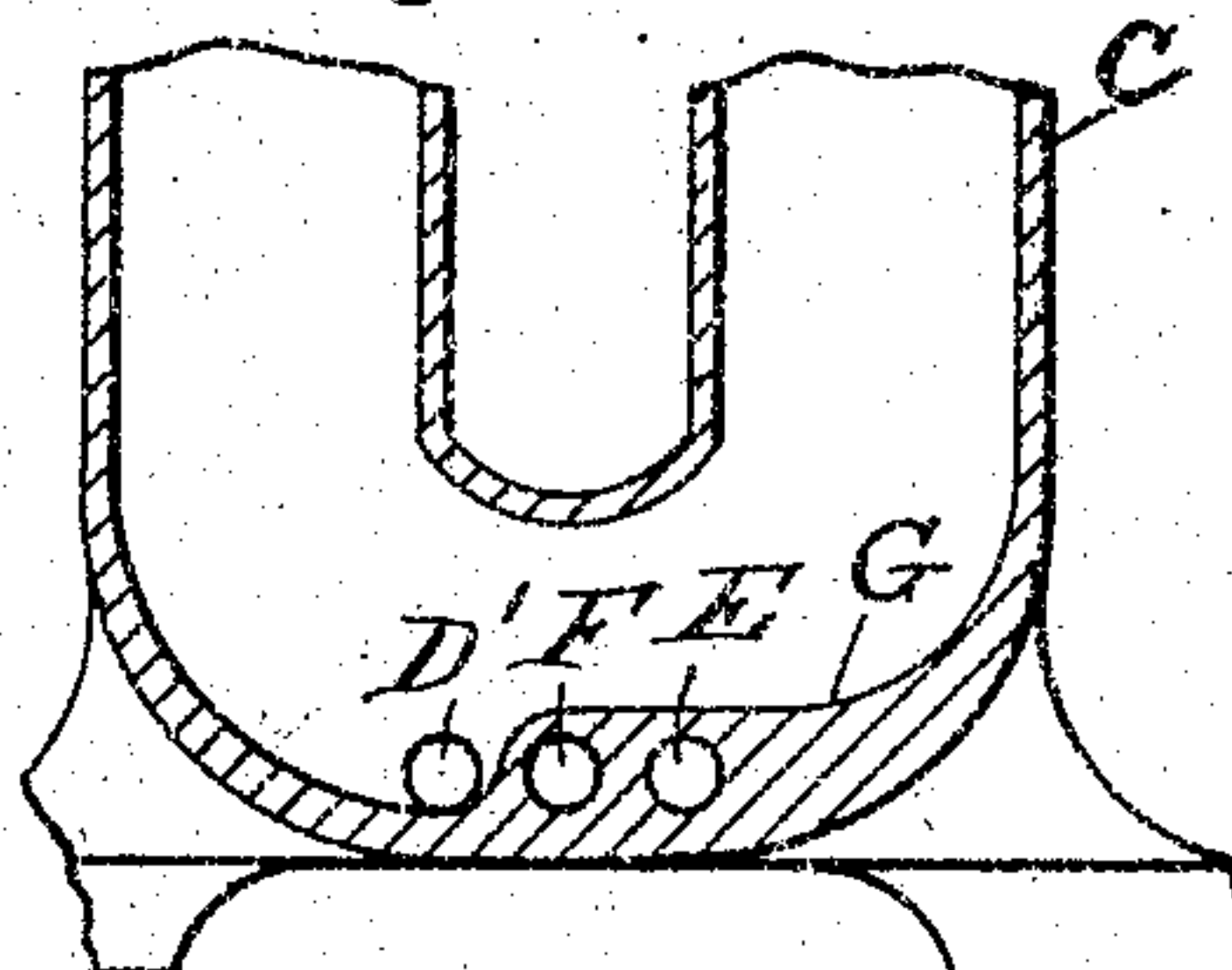


Fig. 5



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## RADIATOR.

SPECIFICATION forming part of Letters Patent No. 786,886, dated April 11, 1905.

Application filed December 9, 1903. Serial No. 184,390.

*To all whom it may concern:*

Be it known that I, JOHN F. FLAHERTY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Radiators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to that class of radiators which are composed of independently-constructed sections secured together.

The object of the invention is to construct such radiators in a manner which will enable one to turn heating fluid—for example, steam—into one or more or all of said sections, as desired.

The invention consists in the construction of the independent sections, in their relative construction and combination, and in the means combined therewith for controlling the flow of steam to them, all of which will be definitely pointed out in the claims.

In the drawings, Figure 1 is a sectional end view of a radiator embodying my invention, the section being in the plane of line 1 1 of Fig. 2. Fig. 2 is a sectional plan view in the plane of line 2 2 of Fig. 1. Fig. 3 is a section upon line 3 3 of Fig. 2. Fig. 4 is a section upon line 4 4 of Fig. 2. Fig. 5 is a section upon line 5 5 of Fig. 2; and Fig. 6 is a sectional view of a two-section radiator whose sections are structurally alike, but are differentiated by turning one section around.

In constructing radiators according to this invention one must employ sections of two or more specific varieties, the differences being in the arrangement of the alined inlet and outlet ports relative to the through-ports to be presently explained. Three varieties of sections (indicated by A, B, and C) are shown in the drawings. Each section is hollow and may be of any convenient shape, being in these respects of familiar construction. Each section has an inlet-port D and an alined outlet-port D' and two through-ports E and F, which are formed in the thickened portion G of the base of the radiator-section. These ports are all in the same horizontal plane, so that as

two or more sections are secured together in any well-known or convenient way the ports of one section will register and communicate with ports in the adjacent sections. It will be understood that if four varieties of sections are to be employed each should be provided with three through-ports and that if only two varieties are employed only one through-port is required. In that event the two varieties which are indicated by A<sup>2</sup> and A<sup>3</sup> need not be at all different in actual construction, the differentiation being effected by turning some of the sections around, so that the through-ports in some sections shall be alined with the inlet and outlet ports of other sections. In assembling these sections one may employ as many of each kind as desired, although, preferably, all of those of one kind will be grouped together. In the construction shown in Fig. 2 the radiator includes one of the A sections, two of the B sections, and four of the C-sections. It is possible with this radiator to actively employ—that is to say, fill with steam—any number of said sections from one to seven. If the heating system with which the radiators are to be employed includes independent return-pipes, such pipes may be connected over the open ends of the ports of that section which is most remote from the inlet end of the radiator. If the heating system does not employ independent return-pipes, said open ends of said ports may be plugged up. It is of course desirable that the bottom edges of the inlet-ports and outlet-ports shall be as low as the lowest inner surface of said sections, so that the water of condensation cannot accumulate in said sections, but may drain out through said ports. The lower edges of the through-ports should also be in the same plane for the same reason. A valve-casing K is connected with the first or inlet-section. This valve-casing has one chamber, *k*, into which steam from the generator may be admitted, and the casing also contains three other chambers, *k'* *k*<sup>2</sup> *k*<sup>3</sup>, which communicate with the chamber *k* through ports which are controlled by the three valves N' N<sup>2</sup> N<sup>3</sup>. These several chambers *k'* *k*<sup>2</sup> *k*<sup>3</sup> communicate directly with the three ports of the adjacent



section. By opening the valve N' only, steam is admitted to the first radiator-section, which is of the A variety. It of course fills the channels formed by the through-ports E in the other sections. By opening valve N<sup>2</sup> only, steam is admitted to the two radiator-sections B, passing thereto through the through-port E in section A. By opening valve N<sup>3</sup> only, steam is admitted to the four radiator-sections C, passing thereto through the through-ports F in the radiator-sections A and B. By opening two or more of these valves one may admit steam to three, five, six, or seven of these sections, as desired.

As appears from the drawings, in Fig. 2, looking in the direction of the arrow beneath said figure, the ports DD' in the A sections are at the left of the through-ports thereof. In the B sections they are between the through-ports thereof, and in the C sections they are at the right of the through-ports. Except for these differences the sections are similar, and the several ports thereof are placed so that as the sections are connected together the ports will communicate. In the embodiment of the invention shown in Fig. 6 the through-port is at the right of the through-port in the A section and at the left of the through-port in the A' section when said sections are viewed in the direction indicated by the arrow beneath said figure.

Having described my invention, I claim—

1. A hollow radiator-section having alined ports in opposite sides thereof and close to the lower end of the inclosed fluid-space, and having also a horizontal through-port, which does not communicate with said fluid-space, but which is in substantially the same horizontal plane as said alined ports.

2. A radiator composed of independently-constructed hollow sections or units, each having alined ports in opposite sides thereof and close to the lower end of the inclosed fluid-space, and having also a horizontal through-port which does not communicate with said fluid-space, but which is in substantially the same horizontal plane as said alined ports, said sections being assembled with the through-ports of some sections in communication with the other ports of adjacent sections.

3. A radiator composed of a plurality of independently-constructed hollow radiator-sections, each having inlet and outlet ports in opposite sides, which ports communicate with the fluid-space within said sections, and having also a through-port which extends from one side of the section to the other, but does not communicate with said fluid-space, said sections being connected together with the through-port in at least one section, communicating with one of the other ports in an ad-

acent section, substantially as and for the purpose specified.

4. A hollow radiator-section having an alined port through opposite sides thereof and close to the lower end of the inclosed fluid-space, and having a thickened base adjacent to the said ports, which thickened base contains a port which extends from one side of the section to the other and is in substantially the same horizontal plane as the other ports mentioned, but is in a different vertical plane.

5. A radiator-section having an inlet-port in one side, and an alined outlet-port in the opposite side, and a thickened base in which are a plurality of through-ports which are in the same horizontal plane as are the inlet and outlet ports, substantially as and for the purpose specified.

6. A radiator made up of sections each having an inlet-port through one side, an alined outlet-port through the opposite side, and a thickened base in which is a through-port in the same horizontal plane, said sections differing when they are assembled in respect to the arrangement of said ports of some sections relative to the ports of other sections, substantially as and for the purpose specified.

7. A radiator made up of sections each having an inlet-port through one side, an alined outlet-port through the opposite side, and a thickened base in which are a plurality of through-ports, said sections differing in respect to the relative arrangement of said ports, and one more independently-operable valves than there are through-ports in the sections, said valves being arranged to control the flow of steam to the ports in the adjacent radiator-section, substantially as and for the purpose specified.

8. A radiator made up of sections each having an inlet-port through one side, an alined outlet-port through the opposite side, and a thickened base in which is a through-port, said sections differing in respect to the arrangement of the ports of some sections relative to those of other sections, and a valve-casing containing chambers which severally communicate with the ports of the outside radiator-section, and containing also a single chamber to which steam may be admitted, and being provided with independently-operable valves controlling the passage of steam from said last-mentioned chamber to the first-mentioned chambers, substantially as and for the purpose specified.

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

JOHN F. FLAHERTY.

Witnesses:

E. L. THURSTON,  
E. B. GILCHRIST.