

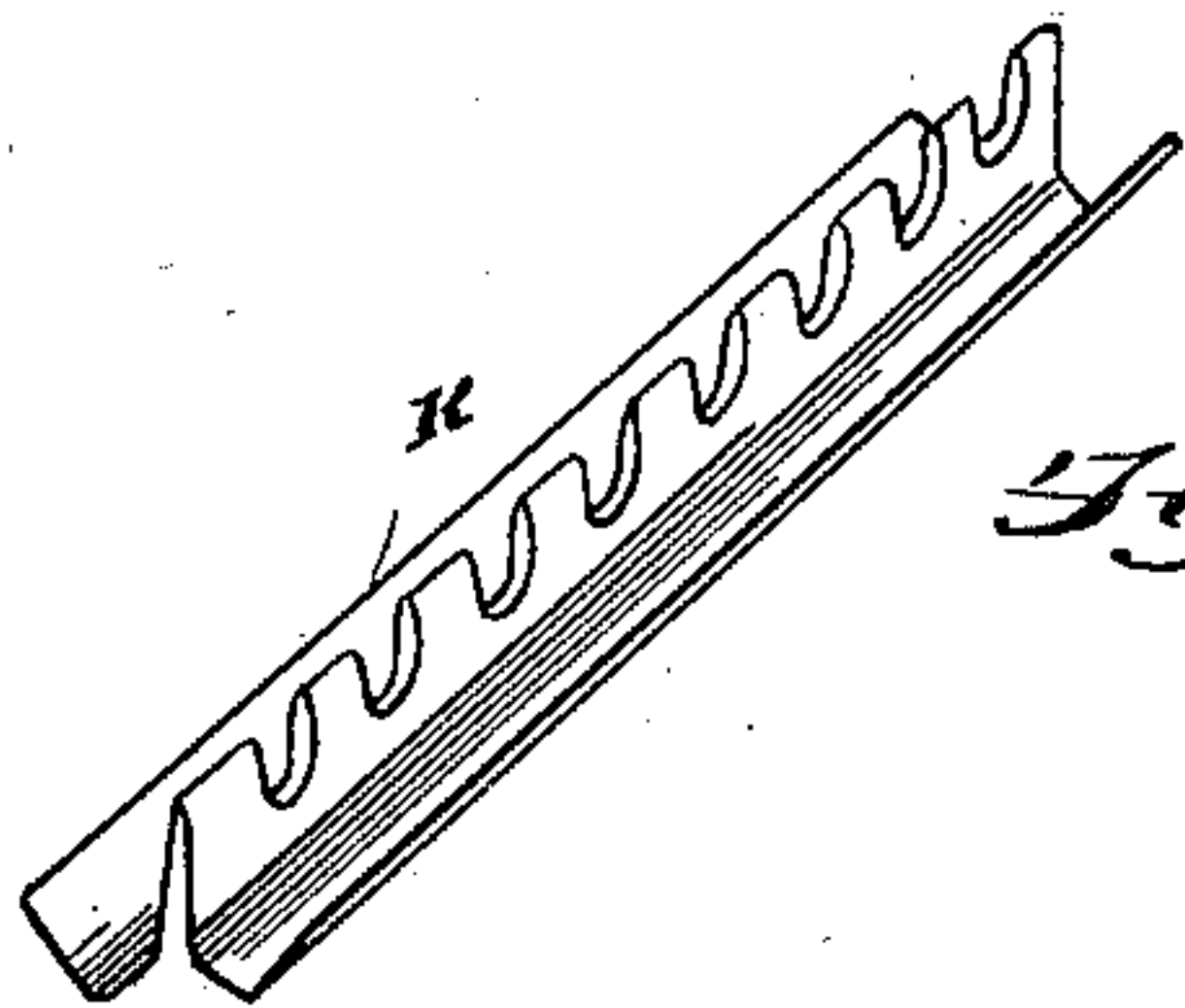
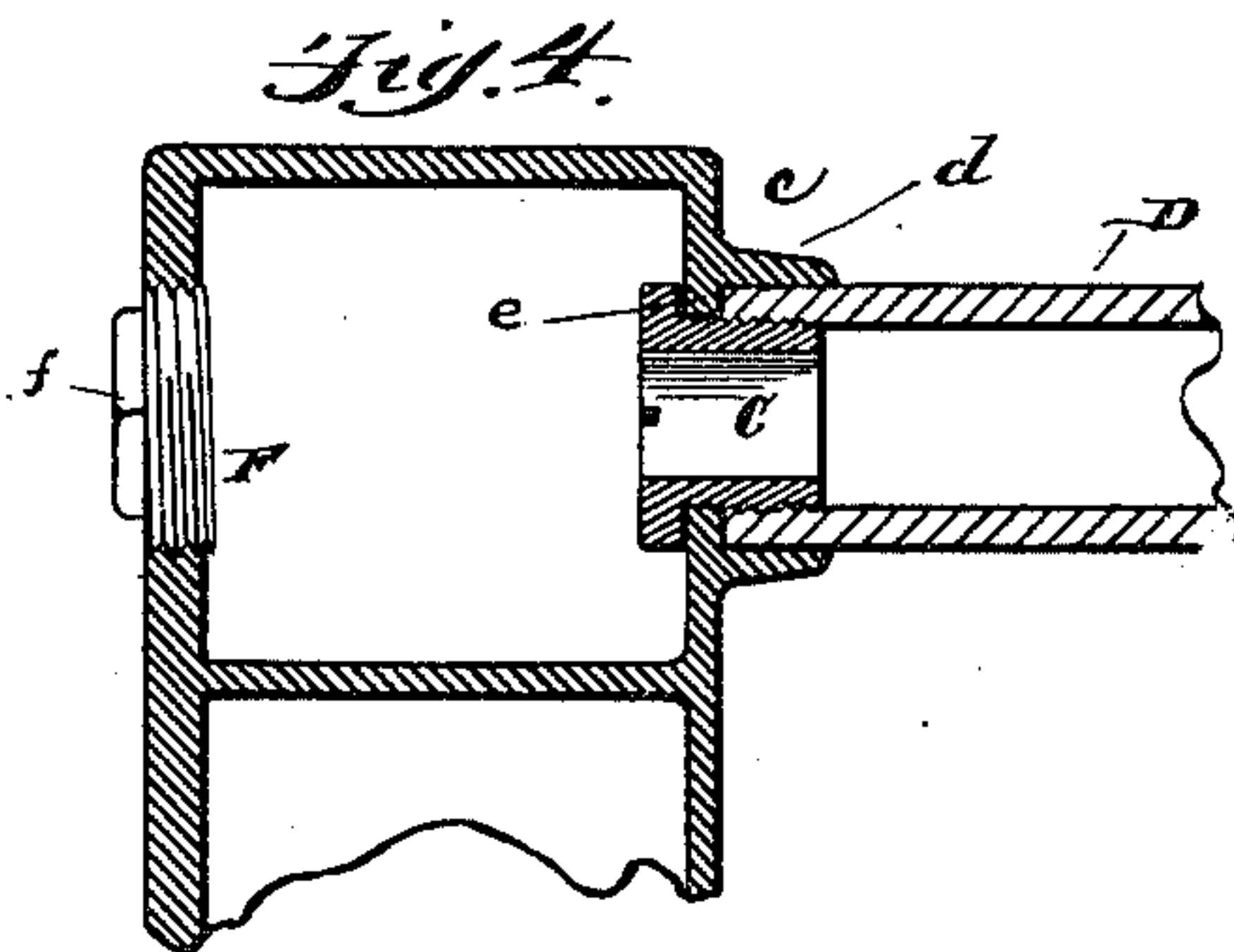
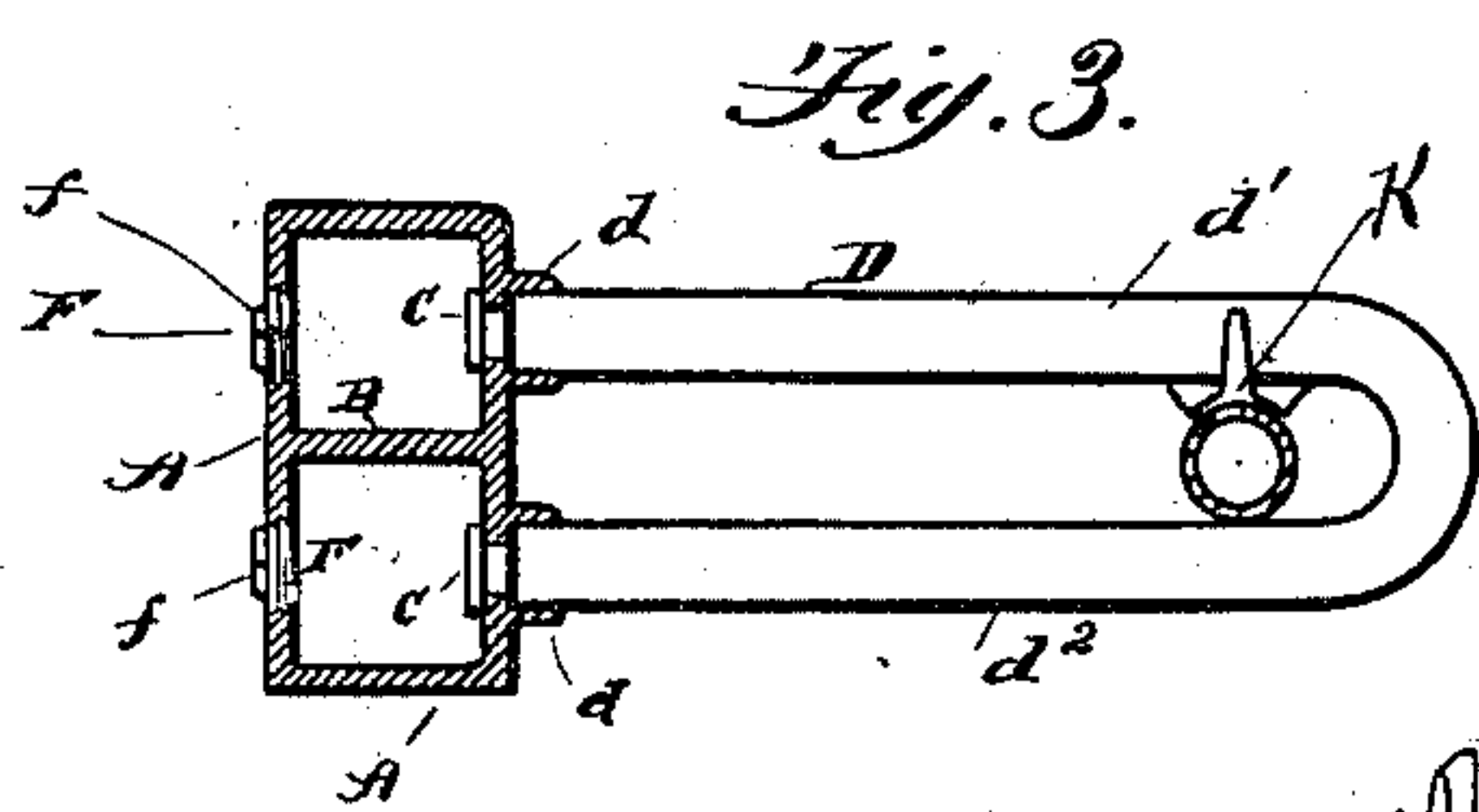
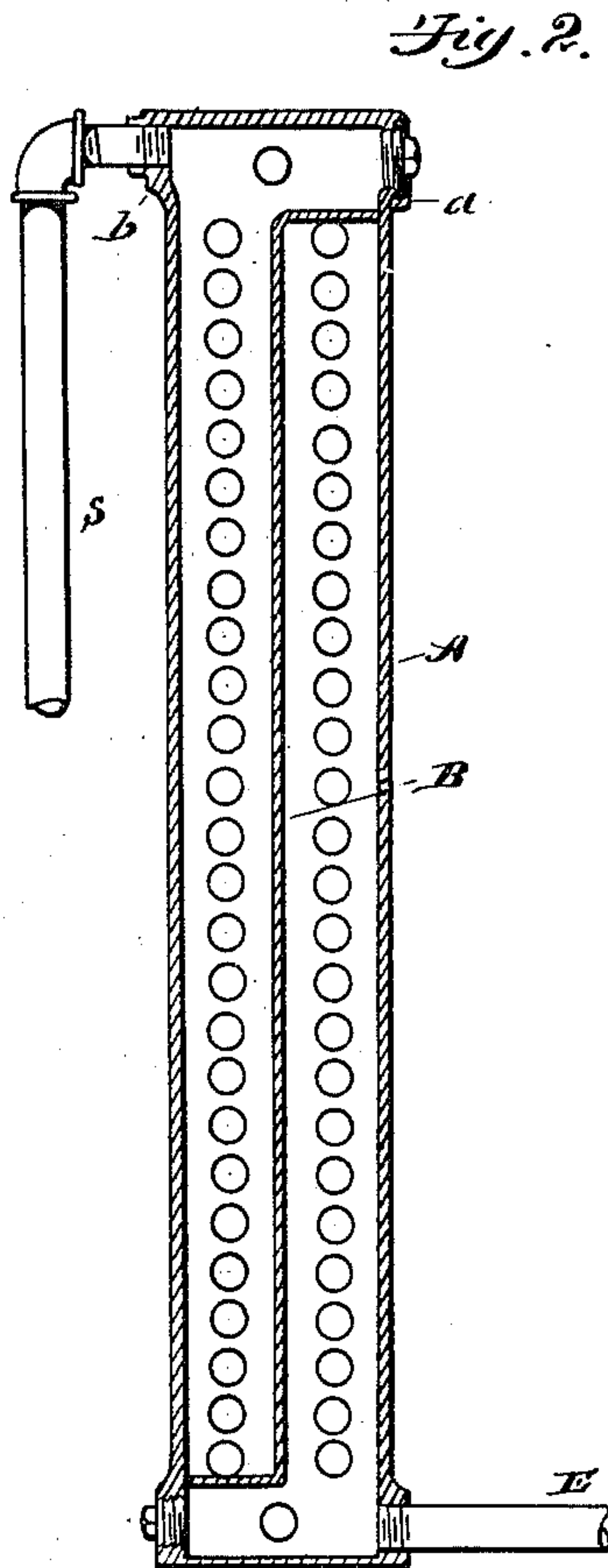
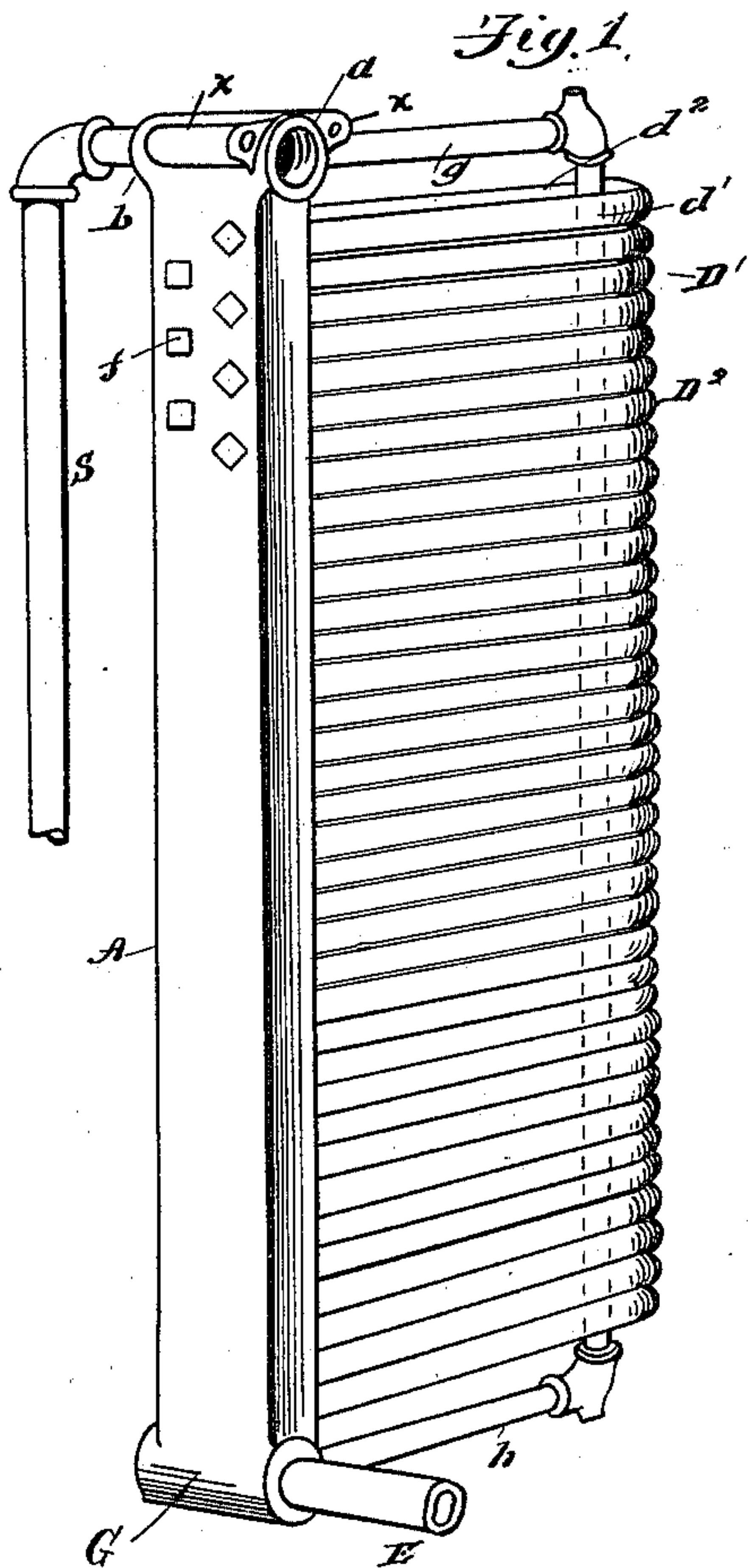
(No Model.)

2 Sheets—Sheet 1.

H. HOLMES.
RADIATOR.

No. 566,396.

Patented Aug. 25, 1896.



WITNESSES
H. Clough.

Virginia M. Clough

By

INVENTOR
Horace Holmes

Parker & Burton

Attorneys.

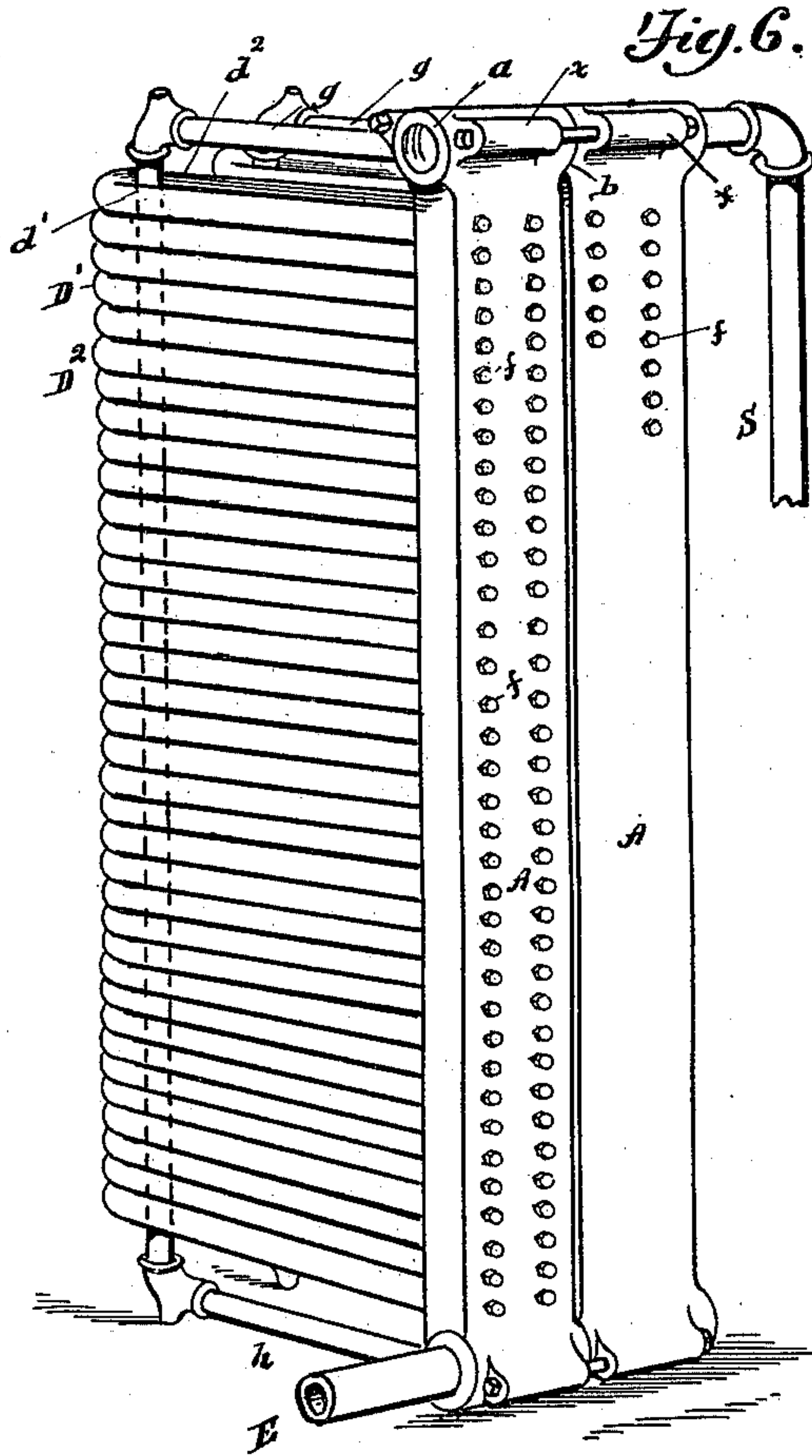
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2 Sheets—Sheet 2.

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WITNESSES

J. M. Bradford
J. R. Bradford

INVENTOR

Horace Holmes

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Attorneys.

UNITED STATES PATENT OFFICE.

HORACE HOLMES, OF DETROIT, MICHIGAN.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 566,396, dated August 25, 1896.

Application filed March 1, 1895. Serial No. 540,223. (No model.)

To all whom it may concern:

Be it known that I, HORACE HOLMES, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have
5 invented a certain new and useful Improvement in Radiators; and I 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 pertains to make
10 and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to radiators, and has for its object an improvement in that class of
15 radiators which are especially intended to be used for heating by indirect radiation.

It consists in the novel arrangement and combination of the various parts, as hereinafter described, and pointed out in the claims.
20 In the drawings, Figure 1 shows in perspective a stack of radiator tubes or loops. Fig. 2 is a section through the manifold. Fig. 3 is a horizontal section showing the connection of one loop with the manifold. Fig.
25 4 is an enlarged detail showing the means of securing the end of the pipe to the manifold. Fig. 5 is an enlarged perspective view of a spacing-support used at the curve of the loops. Fig. 6 shows in perspective two of my
30 radiators, illustrating the method of connecting them in series.

The manifold A, which forms one side of the stack, is rectangular in cross-section and is divided longitudinally into two parts by an
35 interposed diaphragm B, which is preferably cast integral with the walls of the manifold. At each end of the manifold is a header or coupling section, which is preferably circular in cross section, considering the cross-section
40 in this case as in a line parallel with the long axis of the manifold A. This form produces circular faces *a b*, which can be placed in close juxtaposition to the similar face of a similar stack of tubes or similar manifold
45 from which the tubes spring, and in order to insure a tight joint between consecutive stacks so placed I prefer to make on one of the faces, as, for example, *a*, a socket, and on the other face a nipple corresponding to the
50 raised circular face on the face *a*, and around the header-section, near each of the faces *a*

b, are placed lugs *x*, through which can be passed the bolts that secure the two adjacent stacks together. Along one side of the manifold, as the side *c*, are two lines of holes, one
55 line being located on each side of the separating-diaphragm B. Each hole is surrounded by a collar *d*, that projects downward, and within the walls of the collar *d* is a seat *e*, against which the end of the loop D rests.
60 The loop D is screw-threaded on its interior, and is trimmed to rest snugly against the seat *e*. A nipple C, having a flange or collar at one end and screw-threaded at its other end on the outside to engage with the interior
65 threads of the loop D, is passed through a hole F at the back of the manifold and into the hole that registers with the interior of the loop D, and there engaging with the threaded interior of the loop D holds the loop in place
70 against the seat *e* and within the walls of the collar *d*. The other end of the loop is secured in a similar manner to register with the corresponding hole on the opposite side of the diaphragm B, as is shown in Fig. 3. The
75 holes F are stopped by plugs *f*.

One of the headers, G, is connected with the other header, H, by a loop *g h*, the ends of which are secured in the manifold in the way already described, but the loop itself extends
80 from one end to the other of the manifold, and at its bend is elongated so as to be substantially of the same length as the manifold, and the bend or connection between the two branches *g h* lies through the various loops
85 D' D², &c. On the elongated part of this loop *g h* is a sheet-metal support *k*, (shown in detail in Fig. 5,) which rests upon the elongated part of the pipe and is provided with
90 rests which lie between the coils *d' d²*, &c., and hold them at their proper distance apart and support them when the manifold is placed vertically in the position shown in the drawings. If a manifold be placed on its side, the support is not so necessary, but the piece K
95 then acts as a spreader to hold the loops in their proper position and prevent them from being strained or twisted on their bearings. The steam is admitted into the manifold at one end through the steam-pipe S and escapes
100 at the other end through the pipe E, the pipe E forming also a drip-pipe for the escape of

the waters of condensation. If more than a single manifold and stack are used in conjunction, the several stacks are placed together so that the rabbeted faces of the headers of
5 one section shall engage with the grooved faces of those of the next, a gasket of any suitable material being introduced between the several faces, and the fastening together thereof is effected by means of bolts passing
10 through the lugs $x x$.

What I claim is—

1. In a radiator, the combination of a manifold divided by a diaphragm into two chambers, a stack of looped pipes connecting one
15 chamber with the other, with a loop of pipe acting both as an element of radiating-surface and as a brace or stiffener to prevent

accidental or functional distortions of the stack, substantially as described.

2. In a radiator, the combination of a manifold divided by a diaphragm into two chambers, a stack of looped pipes connecting one chamber to the other, a loop of pipe acting both as an element of radiating-surface and as a brace, with a sheet-metal brace arranged
25 to combine with the loop of pipe to prevent accidental or functional distortion of the stack, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

HORACE HOLMES.

Witnesses:

F. CLOUGH,

VIRGINIA M. CLOUGH.