

J. L. HARLEY.  
Steam-Heating Apparatus.

No. 226,745.

Patented April 20, 1880.

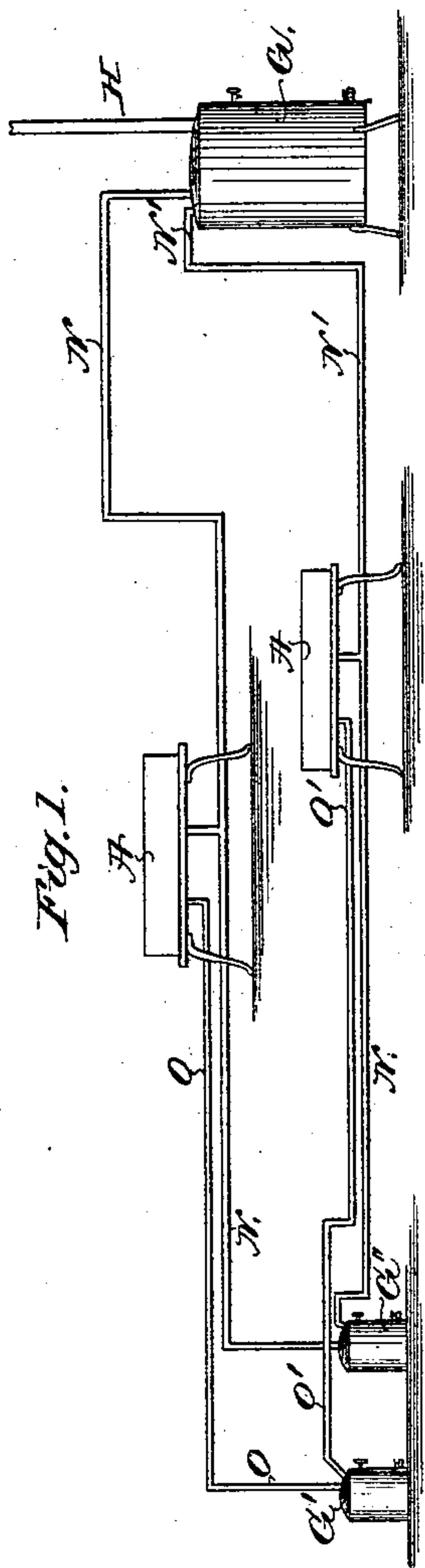


Fig. 2.

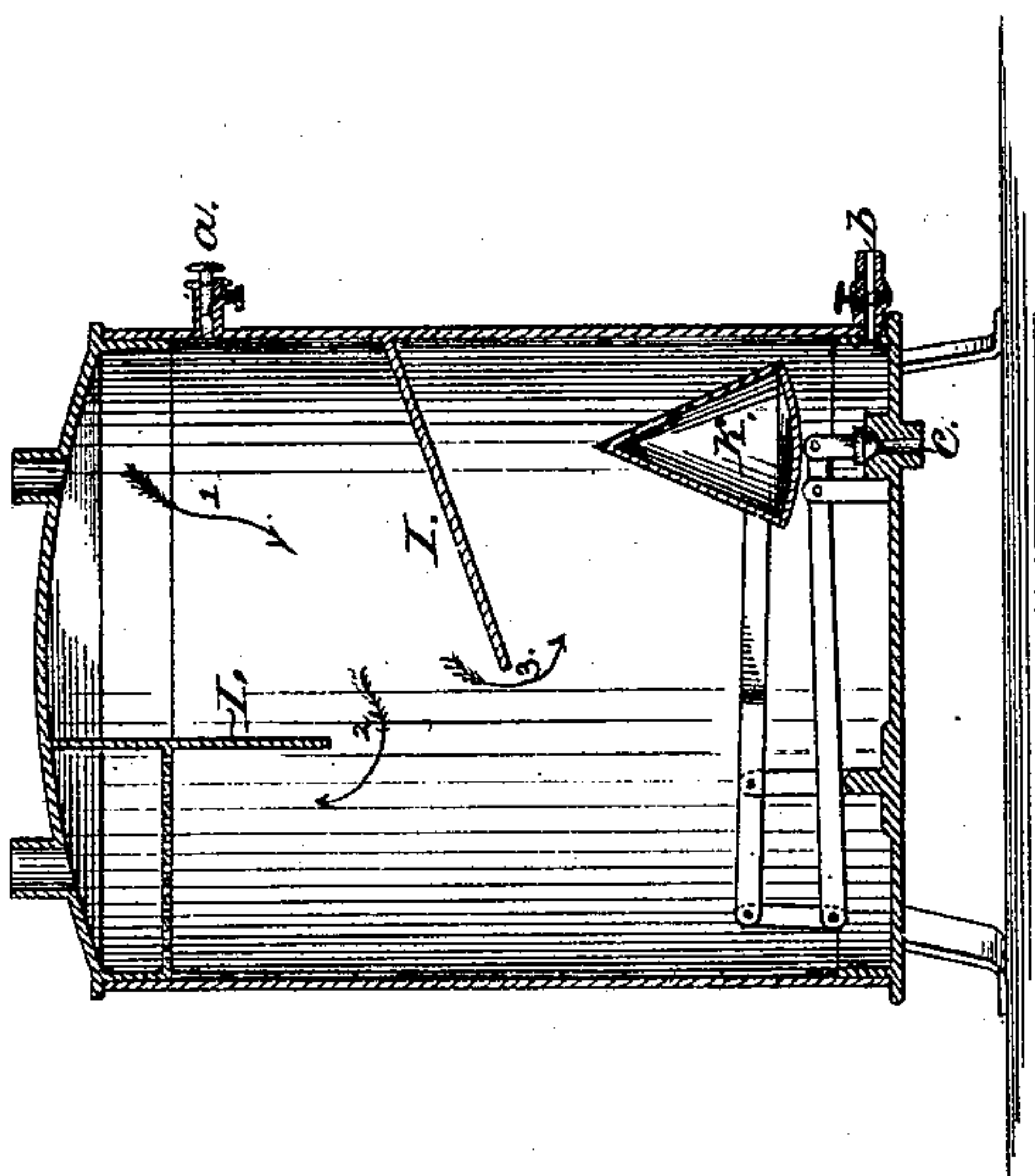
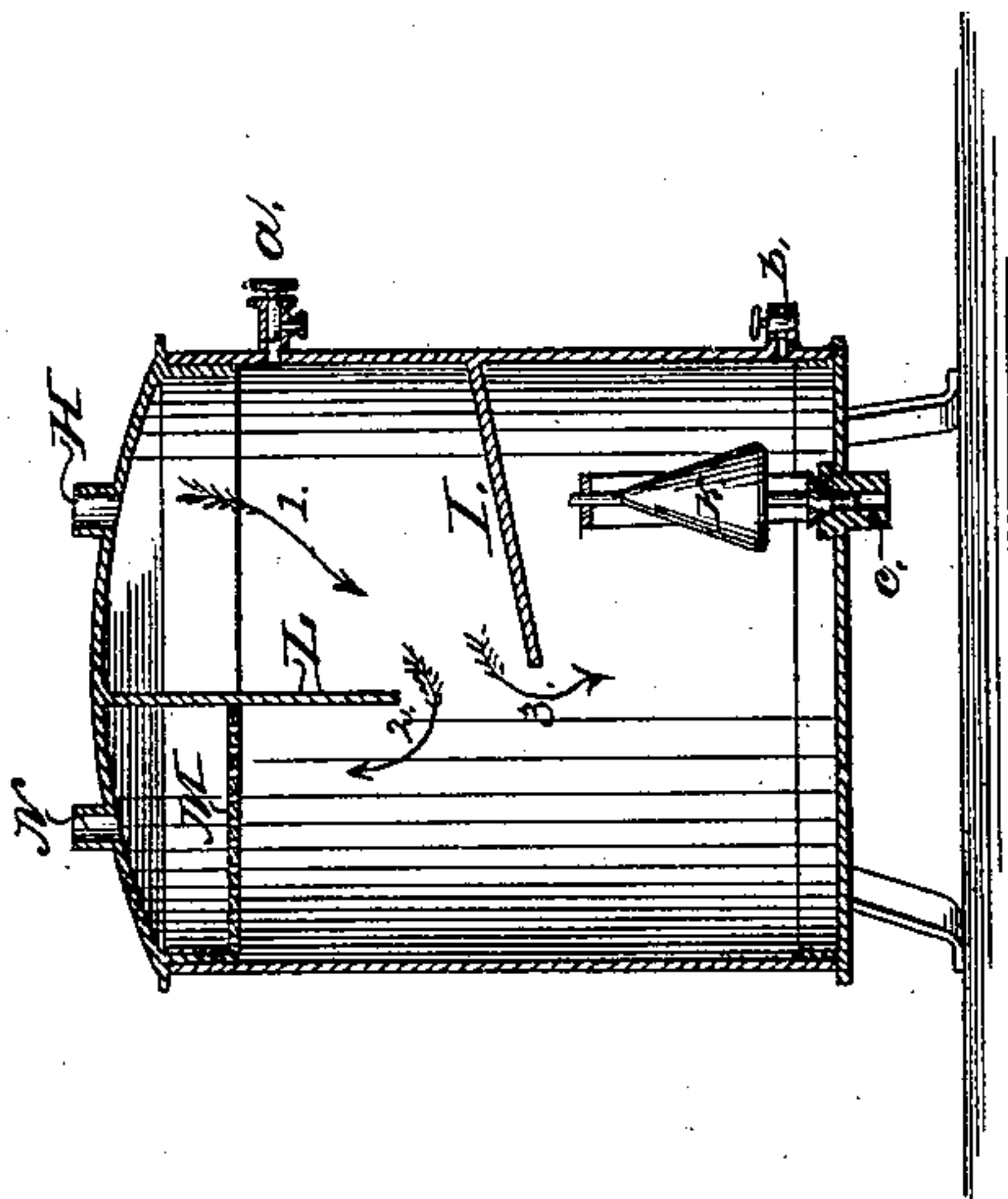


Fig. 3.



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Fig. 4.

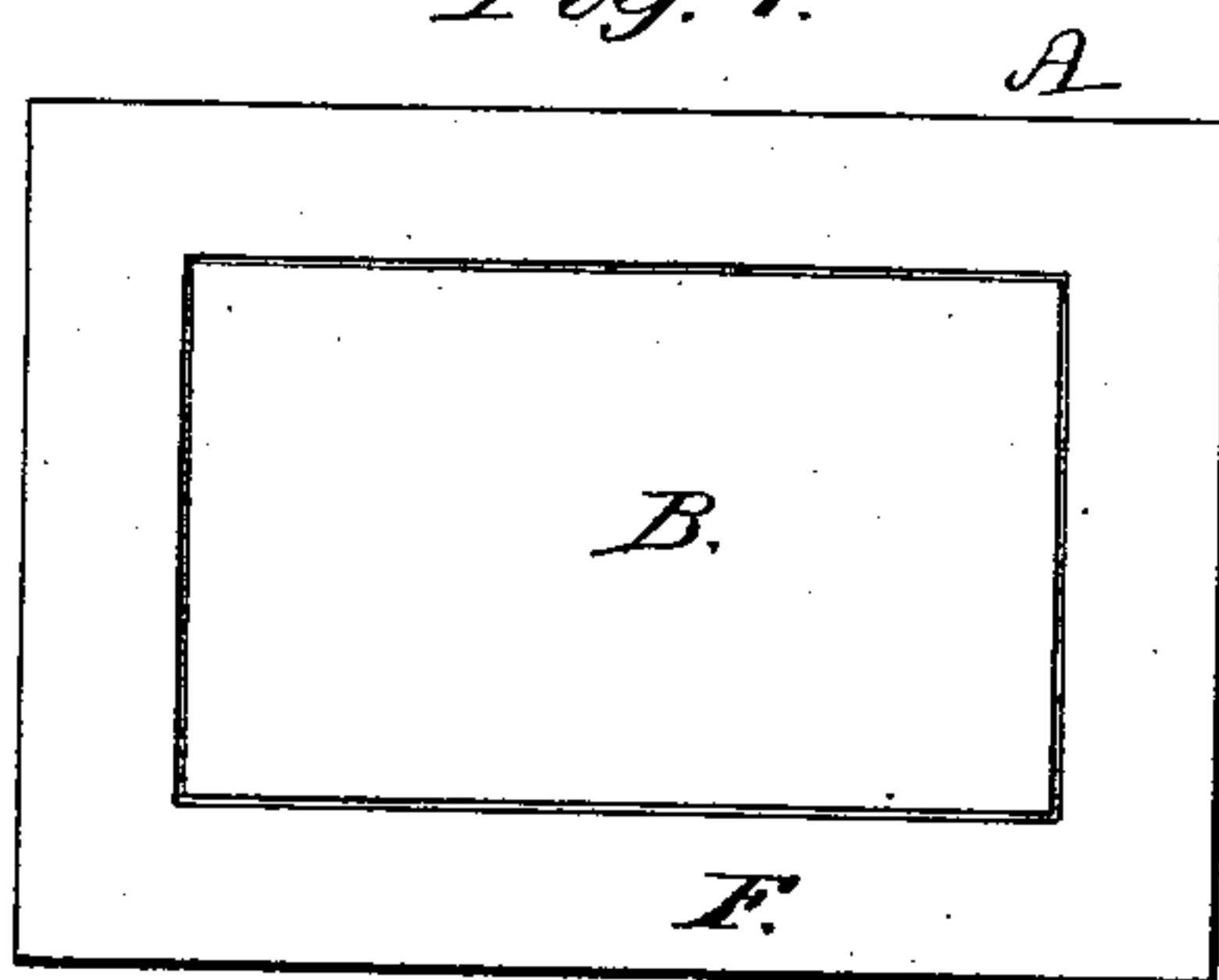


Fig. 5.

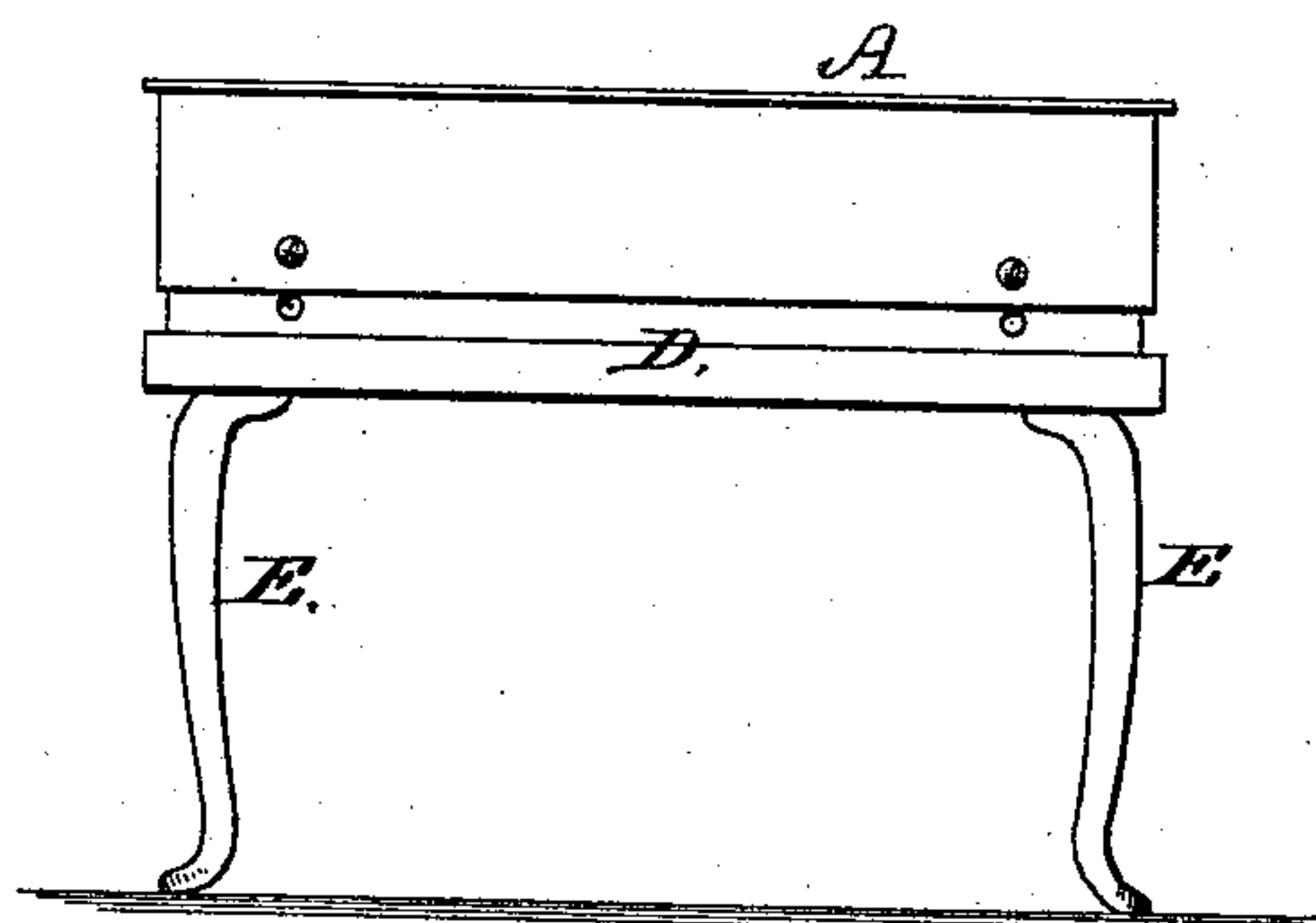
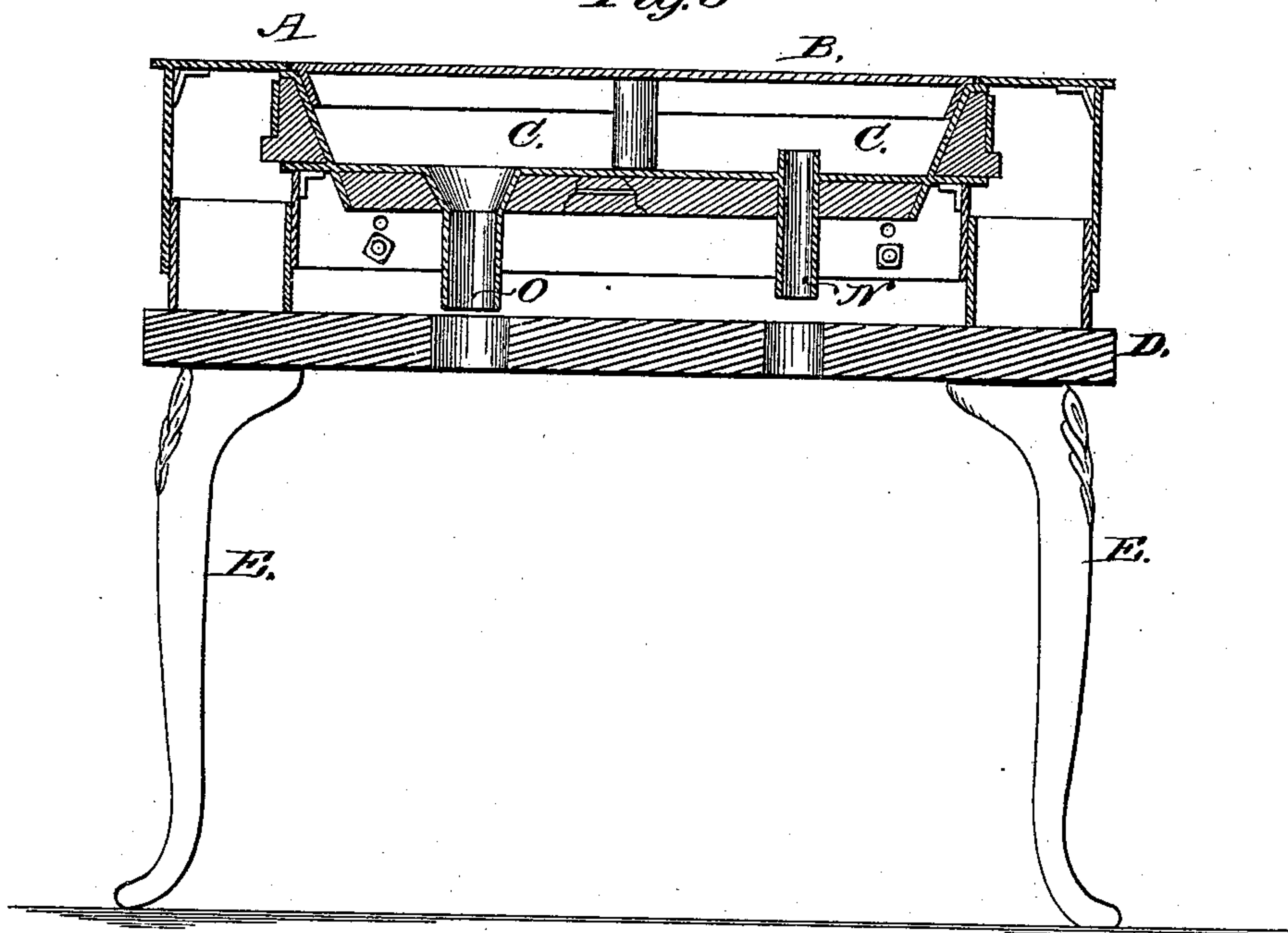


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## STEAM-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 226,745, dated April 20, 1880.

Application filed January 17, 1880.

*To all whom it may concern :*

Be it known that I, JOS. L. HARLEY, of the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Steam-Heating Apparatus; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

My invention relates to certain improvements in apparatus for heating one or more stoves by steam, more particularly such as are designed for the use of plate-printers, and especially such as are described in another application for Letters Patent filed by me simultaneously with this.

My present invention has for its object to furnish a continuous supply of dry steam or steam stripped of any excess of moisture to one or more stoves in such manner that a continuous circulation may be kept up and all the products of condensation be deposited at a point or points outside of the stoves; and with this end in view my invention consists of two or more steam-caskets and a system of pipes for connection with one or a series of heating-stoves, whereby a continuous circulation of dry steam may be kept up, as will be hereinafter and in detail explained.

In order that those skilled may fully understand my invention and know how to practice the same, I will proceed to describe the construction and operation, referring by letters to the accompanying drawings, in which—

Figure 1 is a perspective view of two heating-stoves connected with my improved steam-caskets and a series of pipes, whereby a free circulation is maintained. Fig. 2 is a central vertical section of one of my improved caskets; Fig. 3, a similar view of the same with a modified form of float-valve for the escape of the products of condensation. Fig. 4 is a top view of one of my improved stoves which I intend using; Fig. 5, a side elevation of the same, and Fig. 6 a central longitudinal section of the same on increased scale.

Similar letters of reference denote like parts in the several figures.

A A represent two heating-stoves, such as

are shown more particularly at Figs. 4, 5, and 6, and which, in a slightly modified form, are more fully explained in my application hereinbefore alluded to, it simply being necessary here to say that top plate, B, of the stove, being the portion designed to be heated, has a steam-space or chamber, C, underneath the same. The stoves are mounted upon a suitable base, D, and supported by legs E or otherwise. F is an extension-frame of the stove, which adapts it to being enlarged for printers' plates of larger size. G is a steam-tight cylinder connected with the steam-boiler or other source of supply by a pipe, H, which enters the cylinder or casket at the top over an inclined semi-diaphragm or plate, I, arranged, as shown at Figs. 3 and 4, to protect the float K from any water which may be carried with the incoming steam.

L is a transverse vertical partition projecting downwardly past a horizontal perforated steam-stripping shelf, M, the arrangement of the several plates K, L, and M being such that the steam entering the casket by the pipe H will be compelled to travel in the direction of the arrows 1 2, while the excess of moisture which may be held in suspension is dropped onto the diaphragm I, and falls by gravity, as indicated by the arrow 3, to the bottom of the casket. The steam passing through the perforated shelf M is stripped of any excess of moisture it may have thus far retained, and enters a pipe, N, by which it passes to the under side of one or any number of the stoves A and within the heating-chamber C, where it may circulate at will, passing thence to an exhaust-pipe, O, the other end of which is connected with the top of another casket, G', similar to the one already described. From the top or dome of this exhaust-casket another pipe, O', may lead to a second stove to exhaust it in a like manner to that already explained; and another live-steam pipe, N', may proceed from the dome of casket G to another stove, and thence to another casket, G'', (see Fig. 1,) so that a continuous circulation of live steam may be carried through any number of stoves.

Any number of supply-pipes may radiate



from the dome of the supply-casket G, and the casket G'' may be dispensed with, and all the exhaust-pipes radiate from the dome of casket G', so that casket G would supply the whole series of stoves, and casket G' exhaust all.

One of the great advantages of the arrangement of the caskets and the partition is that the steam diffuses itself on entering the casket, and is at liberty to seek one or more exit-pipes, N, with equal pressure, so that a given supply of steam would be equally distributed among a number of stoves.

Each casket is provided with two puppet-cocks, *a b*, to try the steam and condensation. The bottom of each casket is supplied with a valve, *c*, which is connected directly or through a compound lever, as shown at Figs. 4 and 3, respectively, with a float, K, which is caused to rise when the waters of condensation accumulate to a sufficient degree, and as the water escapes the valves drop again to their seats, thus maintaining the water at about a given level, and at the same time trapping the steam.

The same principle of circulation and trapping may with great advantage be applied to the ordinary steam-heating apparatus employed for heating dwellings, as the trapping at both ends prevents the accidental or careless waste of steam in producing a circulation of the same, or in the effort to discharge the products of condensation from the heaters.

I am, of course, aware that it is not new to utilize steam for heating purposes, and do not wish to lay claim, broadly, to a steam-stove or any and all means of heating the same; but

What I do claim as new, and desire to secure by Letters Patent, is—

1. In combination with one or more stoves or other heating apparatus and a supply and an exhaust casket, such as described, a series of supply and exhaust pipes arranged as described, whereby a continuous circulation of stripped steam may be supplied to the heating apparatus, and the products of condensation may be deposited outside of the stoves, as hereinbefore set forth.

2. A steam-tight casket, G, provided with an inlet and an exit for the passage of steam, and a float or other similar valve at the bottom, and provided with deflecting and steam-stripping shelves, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand and seal this 8th day of January, A. D. 1880.

JOS. L. HARLEY. [L. S.]

In presence of—

JNO. A. HAYWARD,  
WM. C. MCINTIRE.