

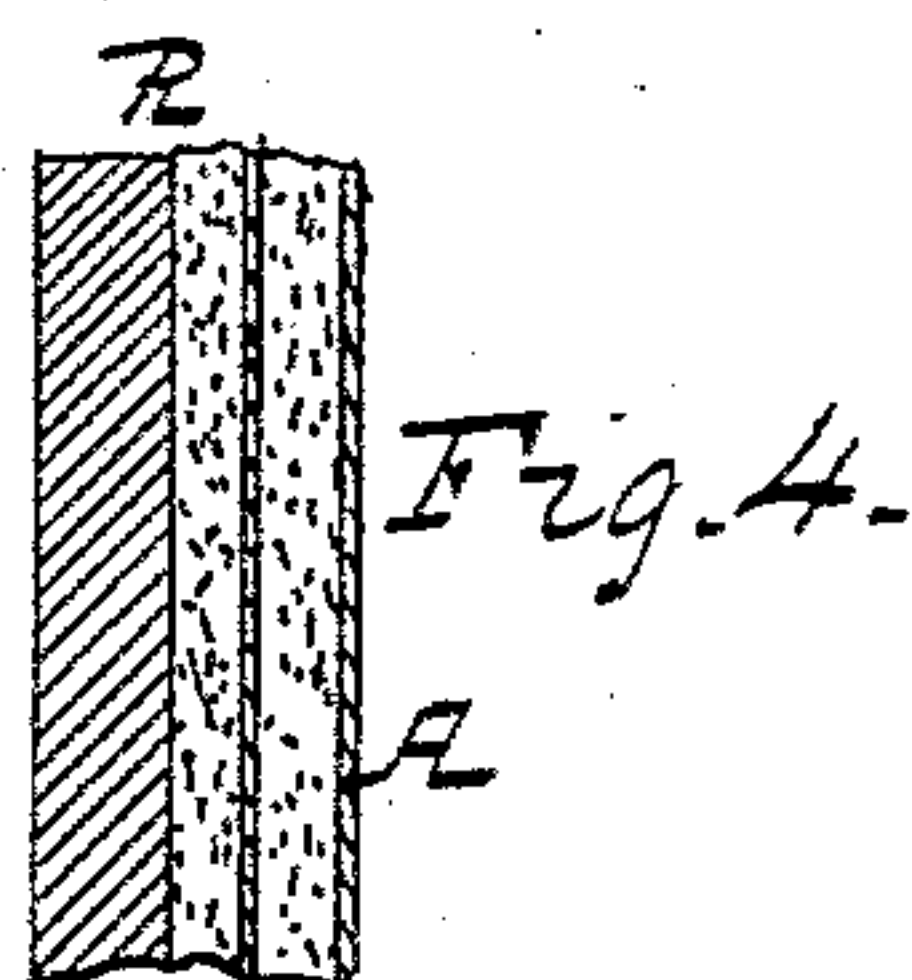
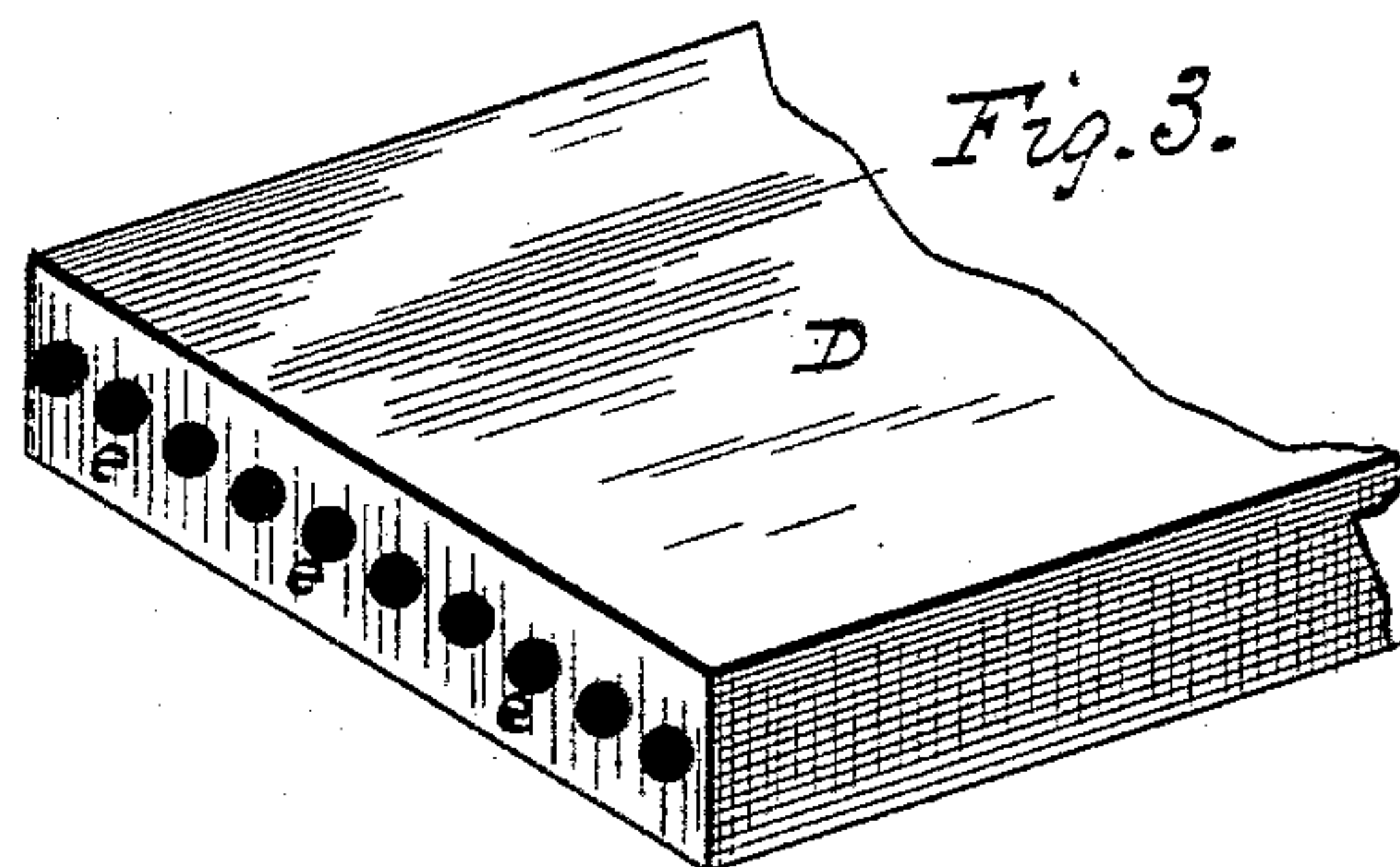
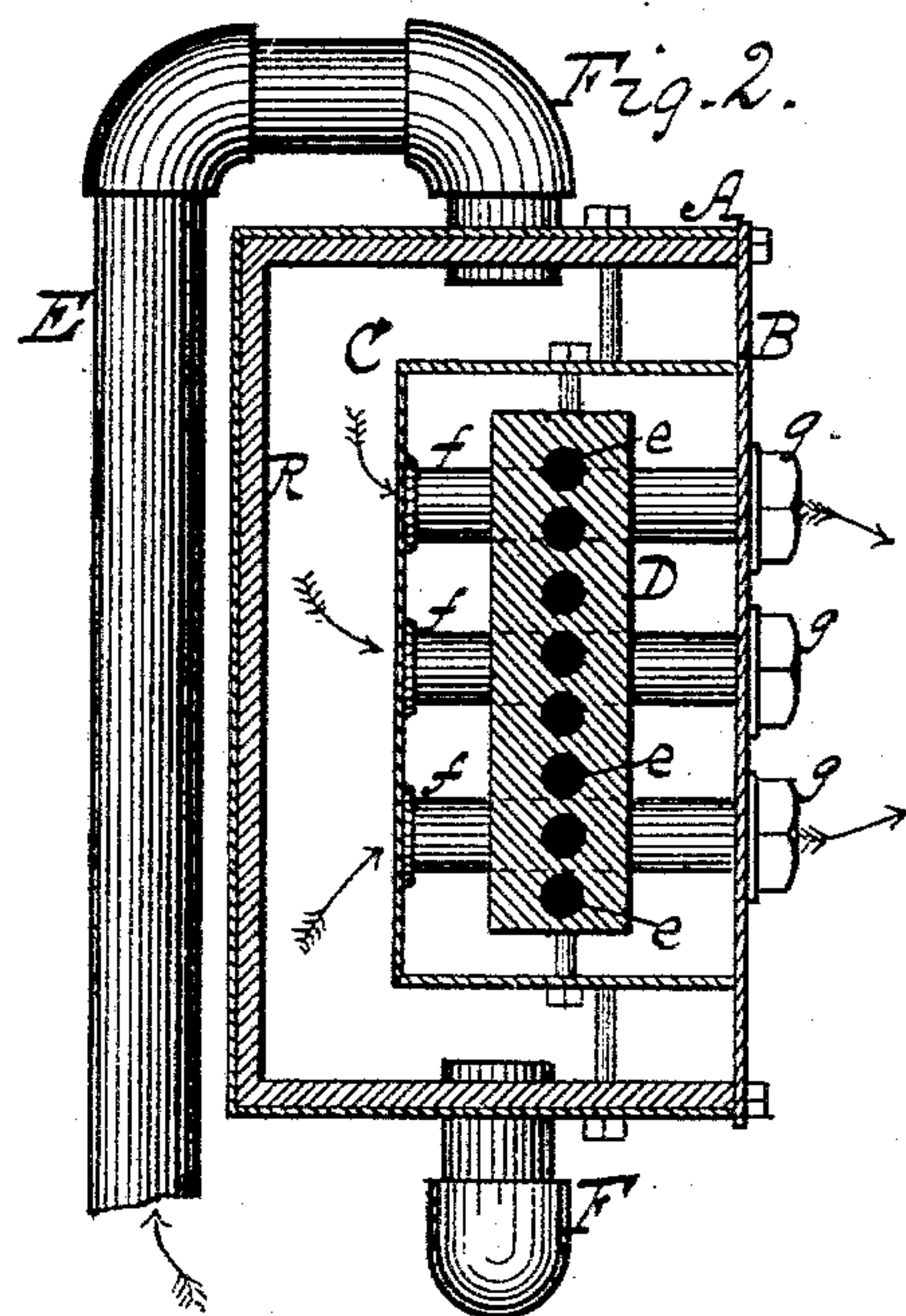
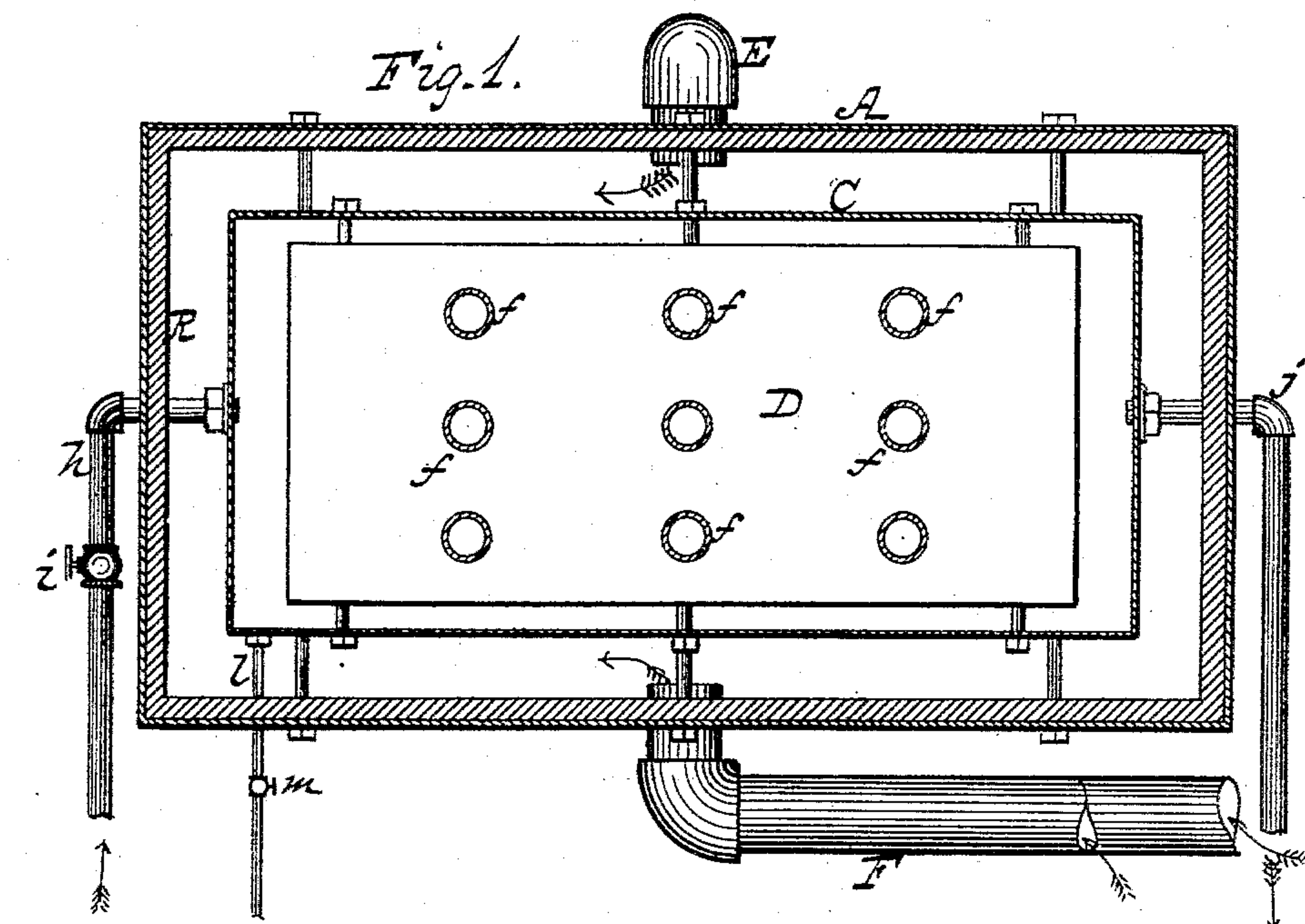
(No Model.)

T. M. MORTON.

STEAM RADIATOR AND HEATER.

No. 315,818.

Patented Apr. 14, 1885.



Witnesses:  
R. H. Mahaffey  
H. E. Harrison.

Inventor:  
Thomas M. Morton  
Per. O. D. Lewis  
Atty.



# UNITED STATES PATENT OFFICE.

THOMAS M. MORTON, OF PITTSBURG, PENNSYLVANIA.

## STEAM RADIATOR AND HEATER.

SPECIFICATION forming part of Letters Patent No. 315,818, dated April 14, 1885.

Application filed January 10, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS M. MORTON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have made a new and useful improvement in that class of steam-heated chests through which one or more currents of air are caused to pass on their way to and within dwellings, store-houses, halls, and manufacturing for the purpose of warming the same; and my invention consists of a steam-chest provided with a heavy lining of some heat-retaining material, and with one or more air-passages leading into and out of the same, in combination with an inner and smaller chest or chamber provided with a pipe for admitting steam thereinto, and a cock or valve for its proper control and regulation, and a pipe leading therefrom, whereby the steam may be caused to circulate and escape, a means for the withdrawal of such water as shall accumulate by the condensation of steam, and within said inner chest or chamber a large perforated block of terra-cotta, or any other material or substance that shall retain for a long time such heat as may be imparted thereto by a surrounding and circulating body or current of steam under reasonable pressure, together with a system of short tubes affording a number of direct passage-ways for the air transversely through said steam-chamber and its perforated non-metallic block to the outside of the main chest, whereby said air becomes highly heated, and in that condition flows into the apartment or place designed for its reception or use.

For the purpose of enabling others to fully understand my invention, I will proceed to describe it by reference to the accompanying drawings, wherein—

Figure 1 represents a vertical section of the main chest, showing its form and construction, in combination with such pipes as are connected therewith, together with its interiorly-arranged steam-box and the several essential parts thereof; Fig. 2, a transverse vertical section of the same; Fig. 3, a perspective view of a perforated non-metallic block or slab; Fig. 4, a sectional view, on an enlarged scale, of the walls of the hot-air chamber and its compound lining.

To construct an air-heating apparatus in ac-

cordance with my invention, I prepare a suitable sheet-iron box or chest, A, which by preference is made rectangular in form, and line such parts of the same as are deemed useful or necessary with one or more layers of steatite, gypsum, terra-cotta, or any other durable and heat-retaining material. The front B of this chest A is left without lining, being a simple plate of iron so bolted thereto as will admit of easy removal. Within this large chest A, and attached to the front plate, B, thereof, is arranged a smaller chest, C, containing a centrally-located terra-cotta or earthenware slab or rectangular block, D, through which extend a number of longitudinal holes, *e*, one above the other in a vertical plane. Transversely through this smaller chest C and its centrally-located block or slab D are a series of short stout tubes, *f*, open at both ends, that reach a short distance outside the front plate, B, each projecting tube *f* being fitted with a suitable screw-nut, *g*, by means of which they are firmly held in position and the intervening joint made tight.

Extending into one end of the main chest A and its interior box, C, is a steam-inlet pipe, *h*, that is fitted with a suitable cock or valve, *i*, whereby the flow of steam thereinto may be properly admitted, regulated, or shut off, and from the opposite end of the inner chest, C, an outlet-pipe, *j*, for the escape of steam, is led by a continuation thereof to any suitable or convenient place.

Downwardly from the lowermost portion of the inner steam-chest, C, a small pipe, *l*, fitted with a cock, *m*, is carried below the main chest A, for the purpose of drawing off from time to time any water that may accumulate in the inner chest by the condensation of steam.

Connected with the interior of the large outer chest, A, at its top and bottom, are air-supplying pipes E F, the ends whereof are extended as much below the chest as may be found necessary to effect a proper draft.

In operation the steam is conducted from a generator, by means of the pipe *h*, into the inner chamber, C, where it circulates around the transverse tubes *f* and perforated earthenware block or slab D, which soon becomes heated thereby. The steam eventually escapes through the pipe *j* at the opposite end of the chest, and by this means a fresh and continued



supply of live steam is afforded and brought in contact with those parts designed for the transmission of heat. When the inner chamber, C, becomes sufficiently hot by the action of the ingoing steam, the air will rush up and through the large exterior pipes, EF, into the outer or main chest, A, and from thence pass onward through the several transverse tubes *f* in a mildly-heated condition, sufficient, however, to warm a great extent of space, and which operation will continue for several hours after the steam is shut off, by reason of the large earthenware slab being able to retain so much heat around the transverse tubes *f*, which the air-space and non-conducting lining R of the outer chamber, A, keep from escaping only through the tubes *f*, whether the same be made single or double.

Having thus briefly described my improved heating apparatus, I claim—

1. An air-chamber containing a lining of non-conducting material, with pipes leading thereinto for the supply of air, in combina-

tion with an inner steam-chest provided with inlet and outlet pipes, and provided interiorly with a large and perforated non-metallic slab, and transverse tubes extending from the air-space in the main chamber into and through the steam-chest.

2. In combination with the air-chamber and lining of non-conducting material, the inner steam-chest provided with inlet and outlet pipes, and a cock for regulating the flow of steam therein, a pipe for drawing off the water of condensation, a series of transverse tubes extending from the air-space in the main chamber and through the steam-chest, and a large slab of earthenware or non-metallic substance within said steam-chest and around the transverse tubes, for the purpose of keeping the heat thereto.

THOMAS M. MORTON.

Attest:

H. F. McGRADY,  
C. M. CARNAHAN.