

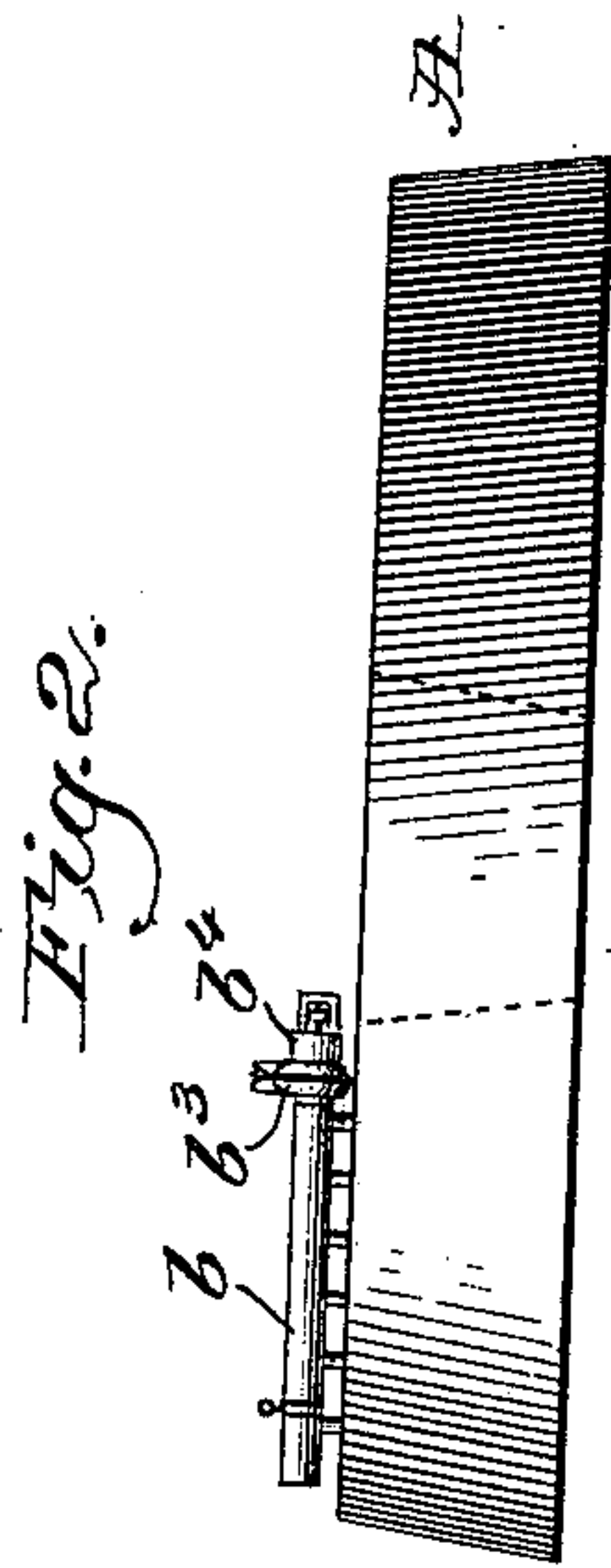
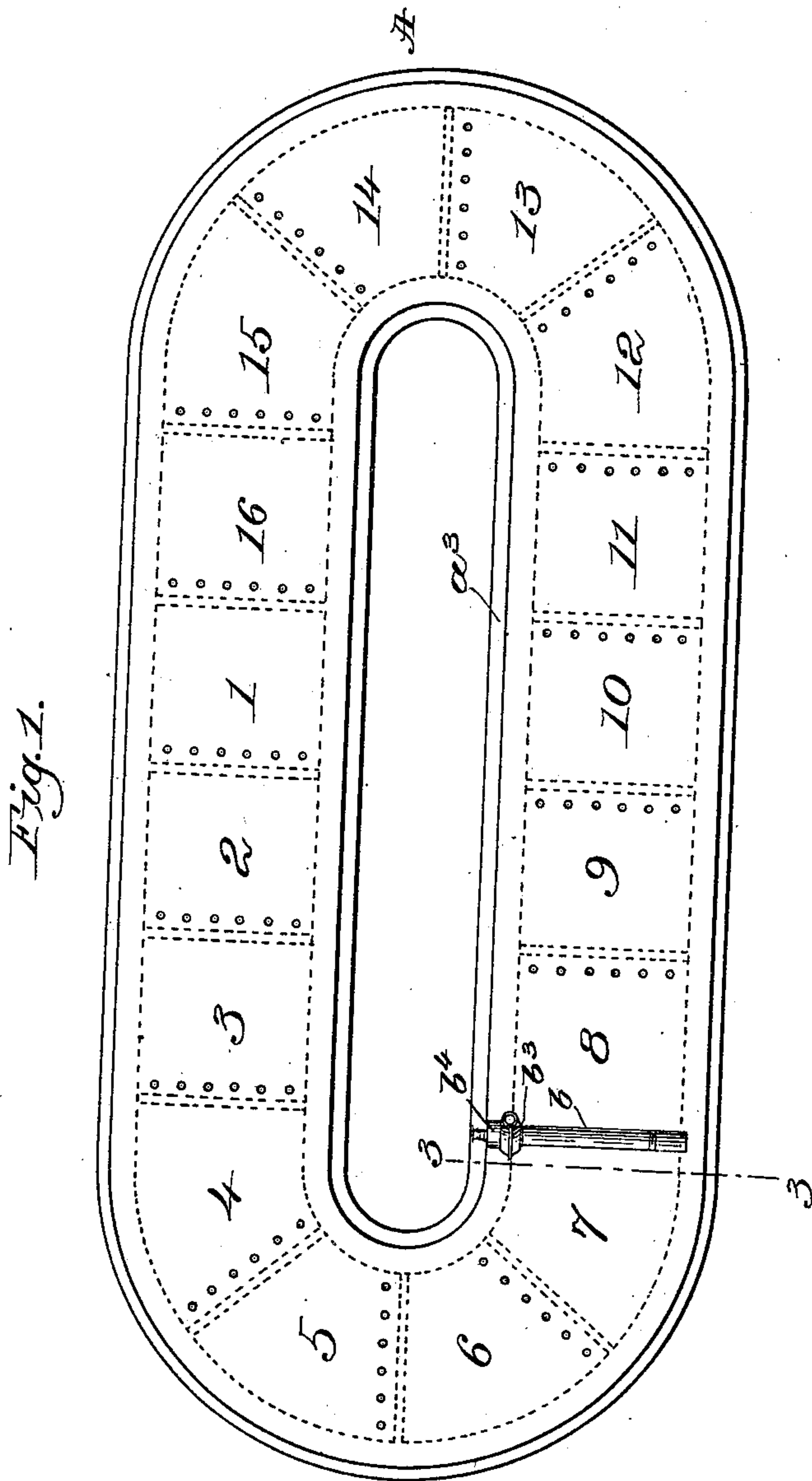
No. 665,419.

Patented Jan. 8, 1901.

J. P. B. FISKE.
BURNING KILN FOR BRICKS, &c.
(Application filed Aug. 20, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.

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Gerald P. Kirwan

Inventor:
Jonathan P. B. Fiske,
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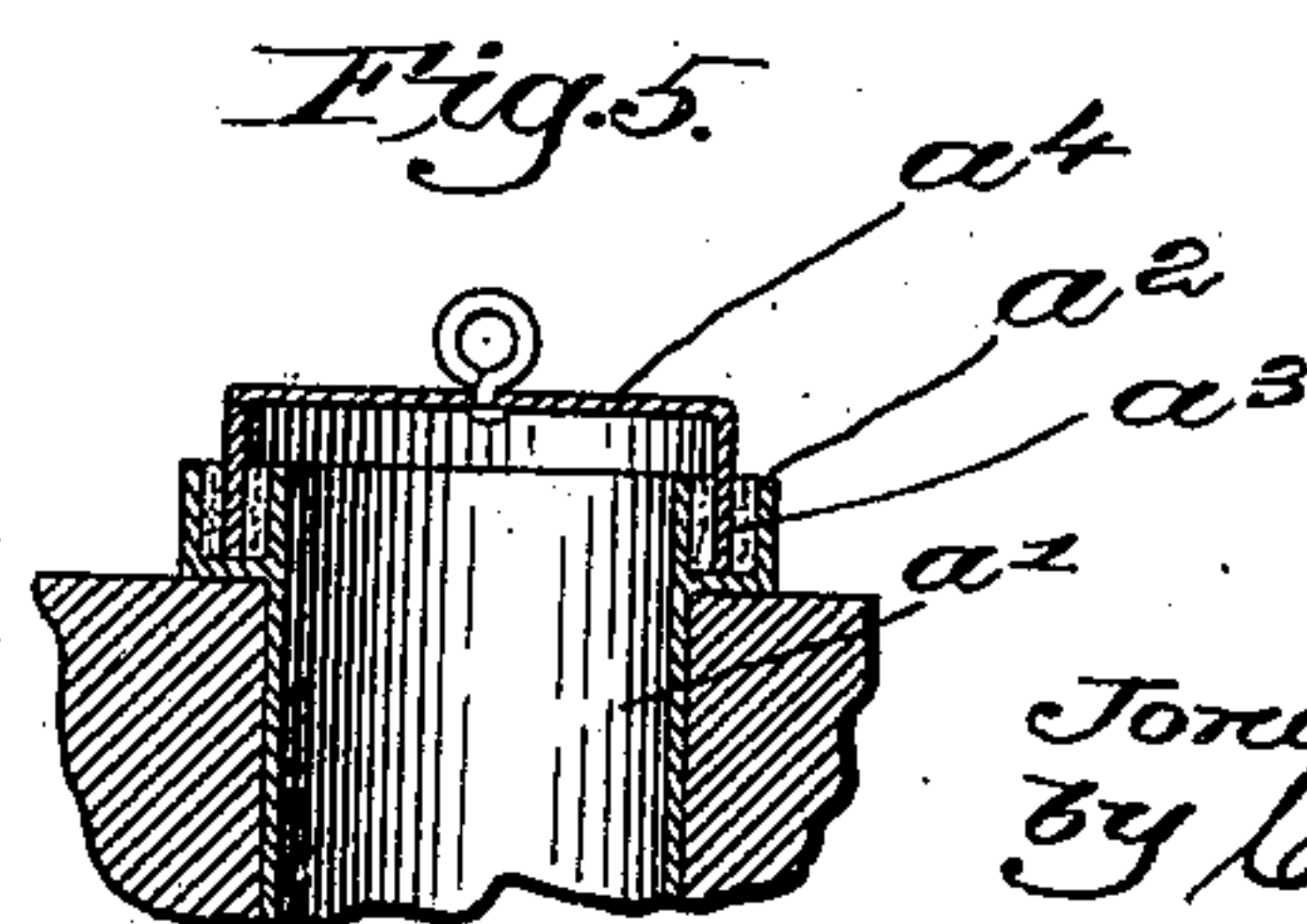
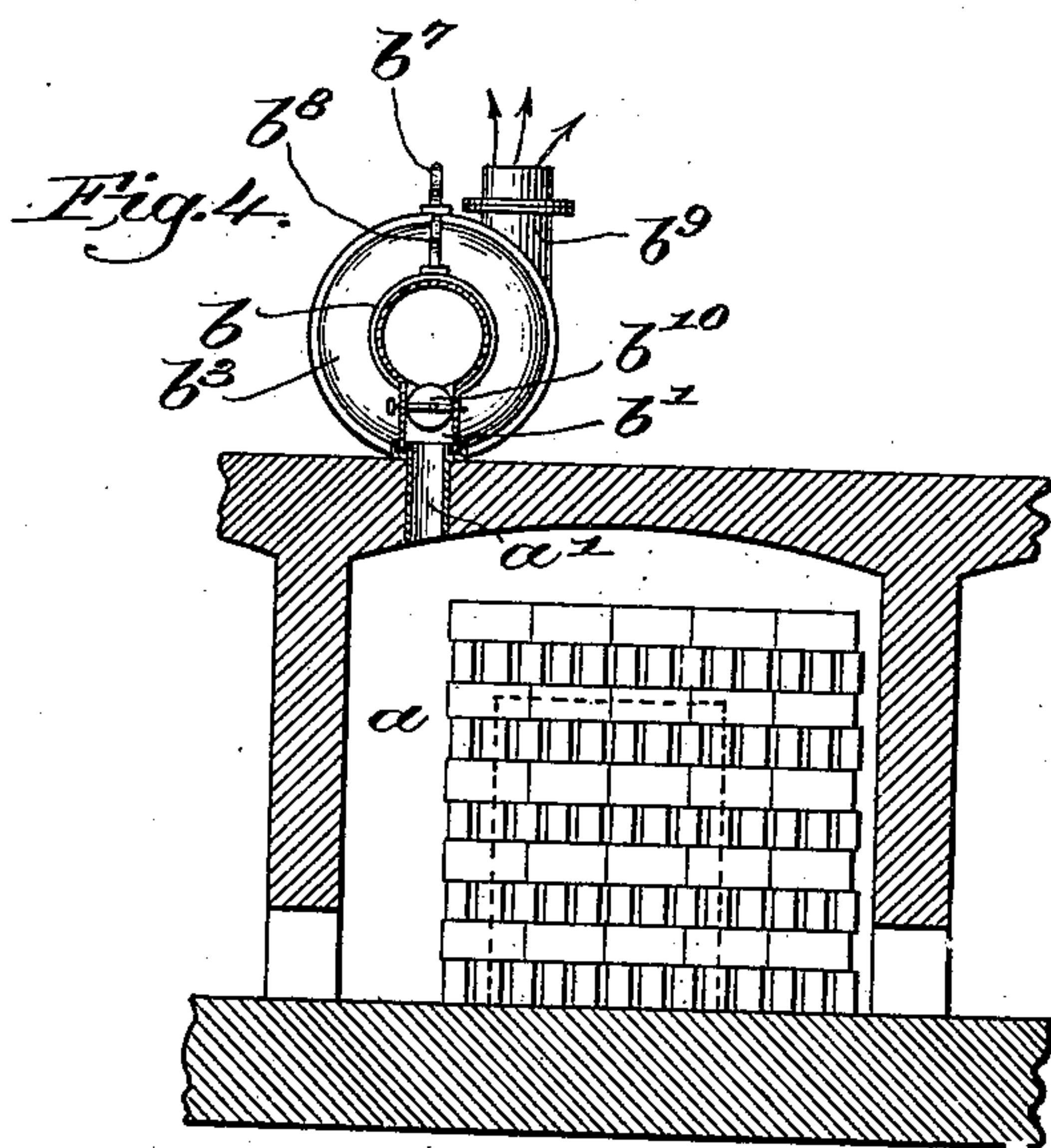
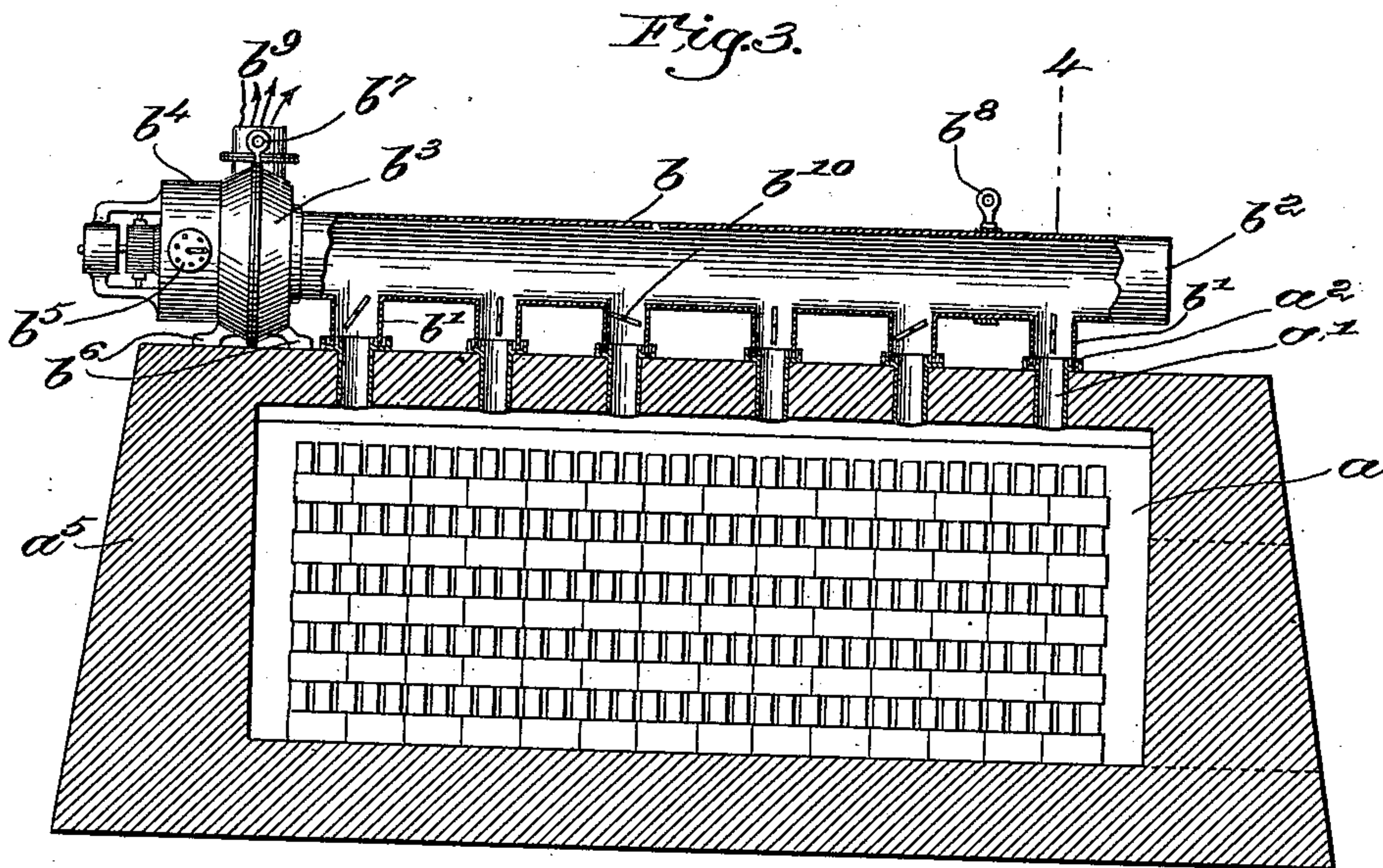
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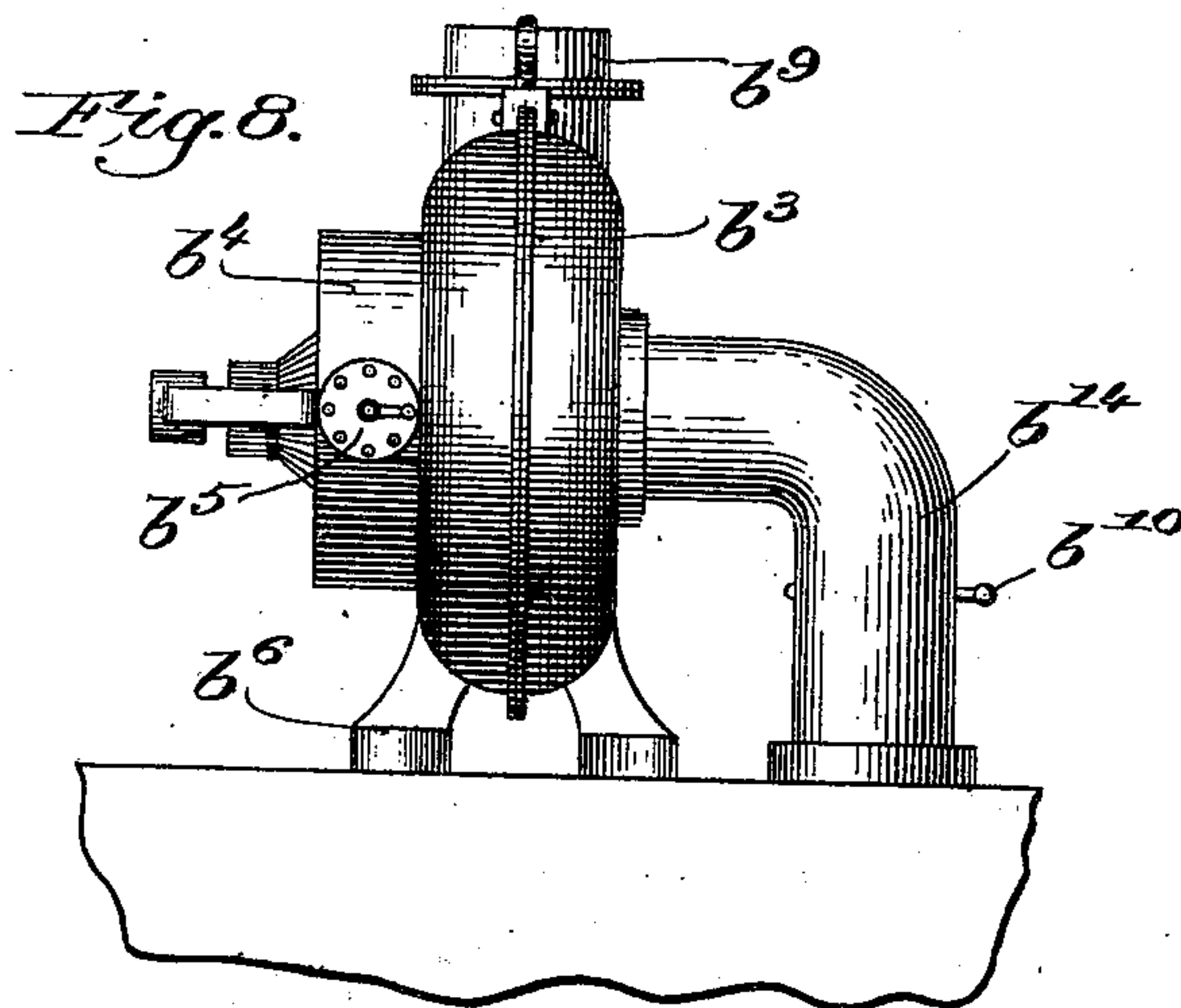
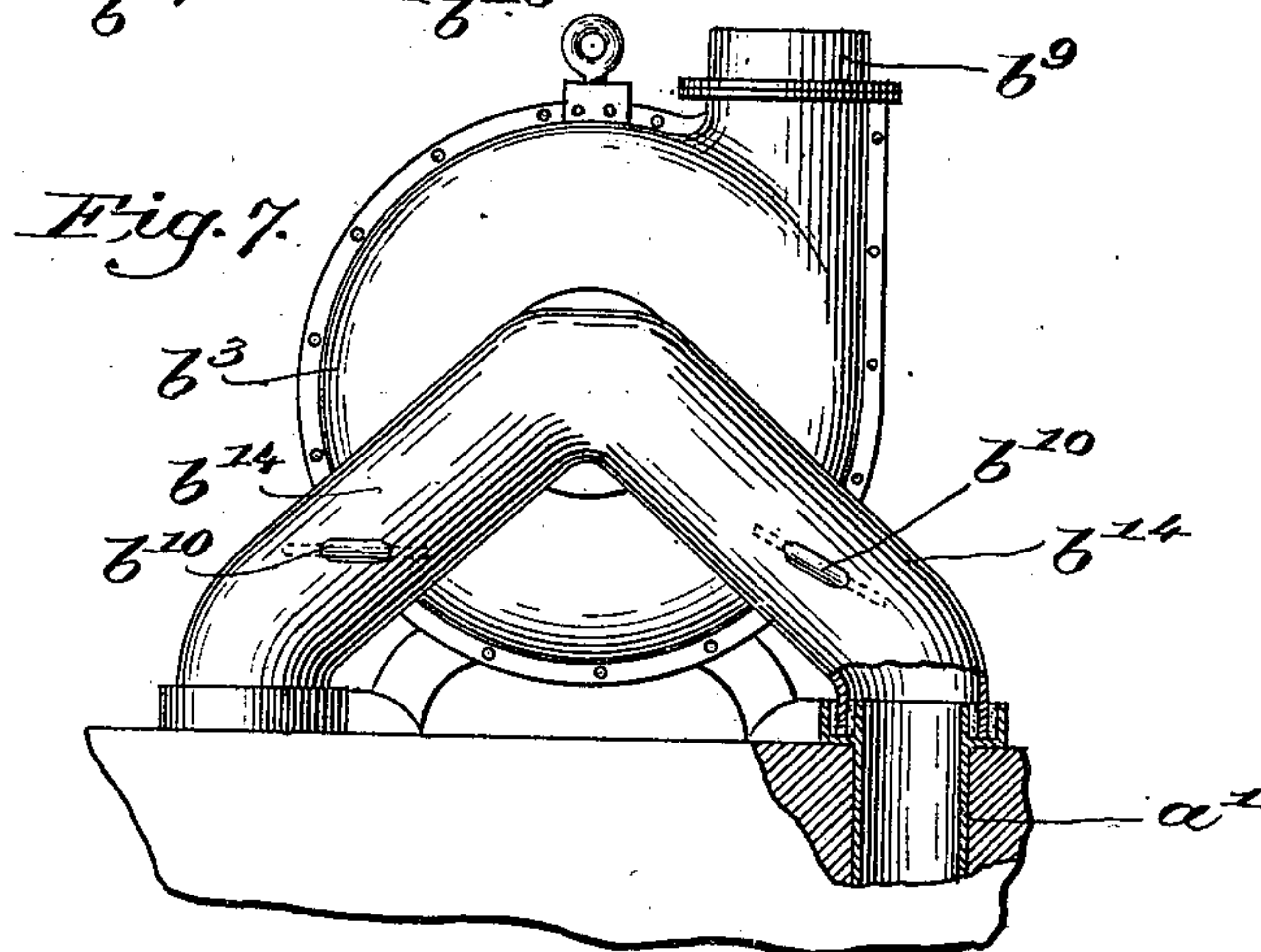
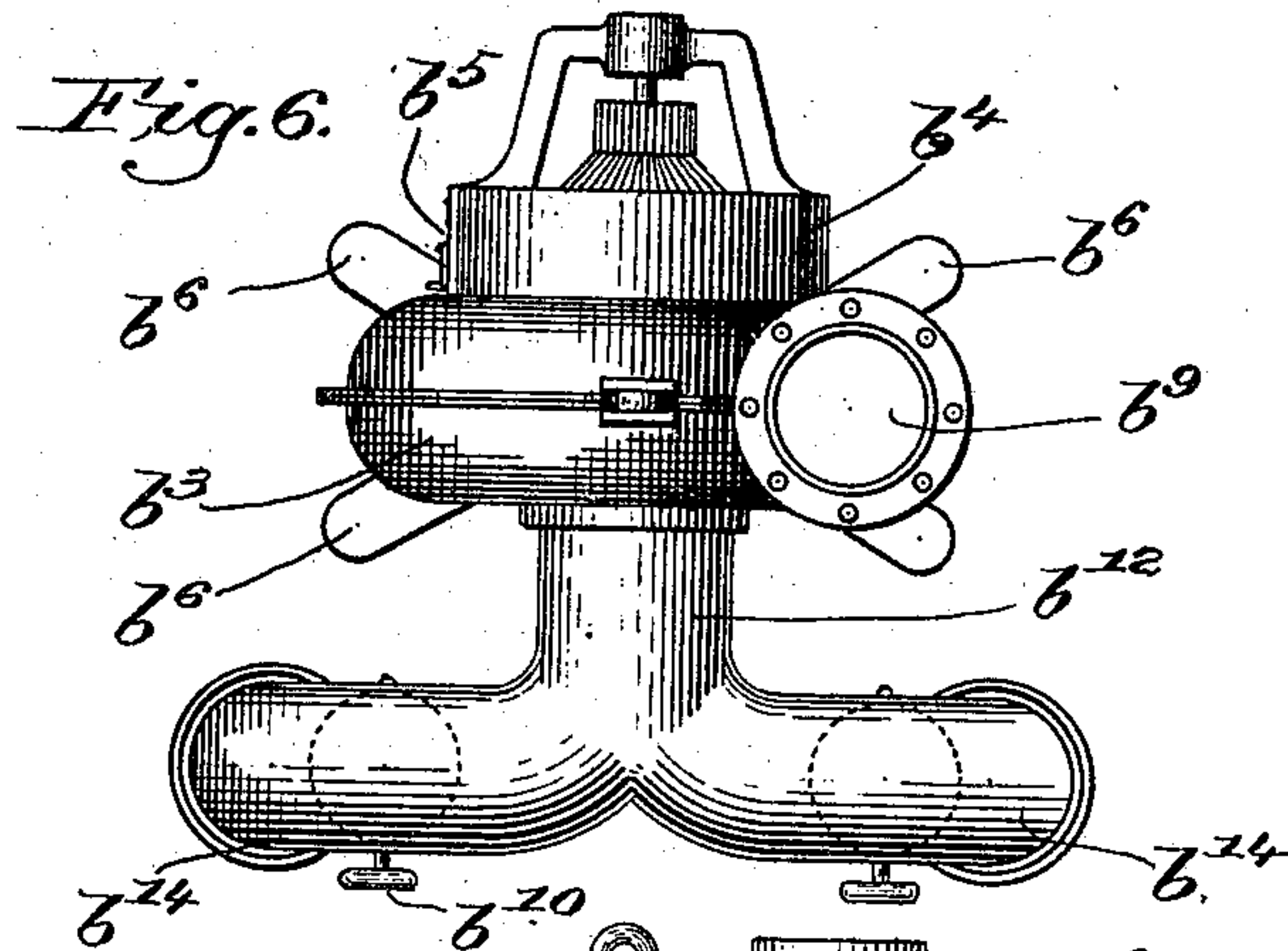
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3 Sheets—Sheet 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

JONATHAN P. B. FISKE, OF NEWTON, MASSACHUSETTS.

BURNING-KILN FOR BRICKS, &c.

SPECIFICATION forming part of Letters Patent No. 665,419, dated January 8, 1901.

Application filed August 20, 1900. Serial No. 27,404. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN P. B. FISKE, a citizen of the United States, and a resident of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in Burning-Kilns for Bricks, &c., of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My present invention is a brick-kiln or burning-kiln for bricks, tiles, &c., and has for its principal object the avoidance of the expensive construction of the usual stack and permanent flues commonly provided in ordinary burning-kilns.

The common kiln as heretofore employed in the manufacture of bricks is very expensive, especially continuous kilns, the expense being in part due to the provision of a more or less elaborate system of permanent flues usually placed low down, and hence requiring comparatively large and costly walls to contain them, and because of these permanent features the deterioration of the kiln, as well as the stack and flues themselves, is a material factor in the expense of the average kiln. The flues require arches or crowns, which settle, due to the alternate heating and cooling which is continually taking place and also because of the construction just mentioned. One serious disadvantage of the common continuous burning-kiln is the poor and inefficient control of the draft, due in part to the fact that the flues are at times cold and damp and that the stack is necessarily at a long distance from the fire, which distance varies from time to time, as the burning is done at different points in the kiln. Moreover, great irregularity in the draft is caused by the varying condition of the difference between the temperature of the stack and the outside atmosphere, which difference varies greatly from time to time. A further objection to the common kiln is the difficulty experienced in regulating the draft in certain parts of the individual chambers, inasmuch as usually there are only one or two connections between each chamber and the flue, and hence the draft in the stacked bricks is frequently too great in the immediate vicinity of these flue connections and is inadequate in the remaining portions of the kiln-cham-

ber, and finally it is almost impossible to keep tight the bell-dampers usually employed in controlling the connections between the various chambers and the flue because of the warping of the iron, due to the intense heat of burning, these dampers being each fixed in position in or near the burning-chamber with which it coöperates. My present invention aims to do away with all the above-named disadvantages by eliminating the stack and fixed flues and fixed dampers, and I have provided instead thereof flues and dampers which are never subjected to a high temperature and provided a portable draft apparatus, whereby not only the expense of the permanent flue and stack construction is eliminated, but the disadvantages of the remoteness of the stack and the deterioration and poor control of draft above explained are obviated.

The structural features of my invention and the various details thereof and the mode of operation and the further advantages thereof will be pointed out more fully in the course of the following description, reference being had to the accompanying drawings, in which I have illustrated one form or embodiment of my invention.

In the drawings, Figure 1 illustrates in top plan one form of continuous kiln built according to my invention. Fig. 2 is an end elevation thereof. Fig. 3 is an enlarged vertical transverse section taken on the line 3 3, Fig. 1. Fig. 4 is a vertical section taken on the line 4 4, Fig. 3. Fig. 5 is a longitudinal transverse section through one of the feed-chutes and smoke-flues provided with a closing-cover. Figs. 6, 7, and 8 are respectively views in top plan and front and side elevation, partly broken out for clearness, showing a modified construction of the portable draft apparatus.

It will be understood that the general plan of the kiln may be varied indefinitely to suit the requirements of the particular plant or purpose in view and that the kiln may be of any kind or construction whatever, although being preferably a continuous kiln, as herein shown, of an oval or elongated arrangement having sixteen chambers for convenience of illustration.

Referring more particularly to Figs. 3 to 5, it will be seen that the chamber α is provided with combined feed-chutes and smoke-holes α' , six thereof being herein shown, and each

terminating at its upper end in an annular groove, recess, or sealing-flange a^2 , which groove may contain sand a^3 , as indicated in Fig. 5, cooperating with a bell-shaped cover a^4 when it is desired to close the chutes or holes a' . Each chamber is similarly constructed, and the feed-chutes and smoke-holes a' extend across the same in a convenient location, as indicated, in order to properly distribute the heat and to cooperate with what I term my "portable draft apparatus." Said draft apparatus may be of a construction capable of cooperating simultaneously with all the draft-holes or combined feed-chutes and smoke-holes of the chamber or it may be of such form and construction as to cooperate only with one or more of said holes.

Before proceeding to describe the further details of construction it may be well to explain that I consider the most radical departure or feature of novelty of my present invention to reside in the provision of means capable of transportation from chamber to chamber or from one portion of the kiln to another for delivering the smoke (whether water-smoke or products of combustion, or both) from the chamber or from a series of chambers, and in its preferred form this portable apparatus consists of an electric exhaust-fan or other form of device for producing a forced draft at any required point, said draft apparatus being connected with any hole or series of holes required, and then when the bricks are at the proper stage of burning said draft apparatus is moved to the next or some other chamber, where the process is repeated, and so on indefinitely. My invention in its simplest aspect is seen, therefore, to reside in the provision of a portable mechanism cooperating with a suitably-constructed kiln or chamber constituting a substitute for the elaborate and expensive and unsatisfactory stack and flues heretofore employed.

Referring to Figs. 3 and 4, it will be seen that I provide a portable smoke pipe or flue b , having elbows or lateral connections b' cooperating with the holes a' of the chamber, said pipe being closed at its ends b^2 and provided at its opposite ends with an exhaust-fan b^3 of any suitable construction, preferably electrical, being run, as herein indicated, by a motor b^4 , and controlled by rheostat b^5 . The fan end of the portable apparatus is provided with legs b^6 , adapted to rest on one of the walls, herein shown as the inner wall a^5 , of the kiln, and the apparatus is provided with eyes b^7 b^8 to be engaged by hooks from an overhead track or other convenient lifting device, whereby the whole device may be conveniently transported as required. The smoke passes out, as indicated by the arrows, Fig. 4, from the outlet b^9 , and preferably each connection b' is provided with a damper b^{10} , said dampers being preferably independently operable, whereby the draft and heating effects within the chamber or chambers con-

trolled may be regulated to any degree of nicety required.

For some purposes it will be advisable to employ a smaller draft apparatus, and I have illustrated one form thereof in Figs. 6 to 8, where it will be seen that said apparatus has a pipe b^{12} , provided with two branches b^{14} , capable of cooperating with two holes a' , each branch being preferably provided with a damper b^{10} and the exhaust apparatus being the same as before.

It will be understood that the kiln is located, as usual, either in a large building or under a shed, or it may be out in the open air.

I am aware that it has been proposed heretofore to provide a pipe somewhat like the pipe b , which, however, was not intended to serve my purpose, but, on the contrary, served simply as a connection between the kiln-chamber and an ordinary system of flues leading to the usual stack, whereas in my invention the said pipe constitutes a draft device discharging the products of combustion directly into the atmosphere instead of into the kiln-flues contained in the walls or structure of the kiln and terminating in a stack.

In operation we will suppose that chamber No. 1 (I have numbered all the chambers for convenience of description) is being fired, in which case chamber 2 will be white-hot, chamber 3 red-hot, chamber 4 very hot, chamber 5 hot, chamber 6 warm, and chamber 7, therefore, cold, while at the same time chamber 8 is being filled, chamber 9 is empty, chamber 10 is being emptied, chamber 11 is becoming cold, chamber 12 is warm, chamber 13 is hot, and the remaining chambers are still very hot, each hotter than the preceding one, although cooling down, or, in other words, chambers 11 to 16, inclusive, (shown in Fig. 1,) are cooling down and chambers 2 to 7 are heating. This will be readily understood by those versed in the construction and operation of the ordinary continuous kiln. The portable draft apparatus will be placed, as shown, on chamber 7, and the remaining holes, at least back to chamber 1, will be closed by caps or covers a^4 , as indicated in Fig. 5, the holes in the firing-chamber 1 being opened only as it may be required to deposit fresh coal through the openings. The apparatus having been put in place with the necks or connections b' properly sealed in the sealing-recesses a^2 , the fan is started, thereupon creating a powerful draft, the equivalent of the usual stack when located to the best advantage and under the most favorable conditions of weather, direction of wind, &c., and immediately upon the starting of said fan the fire in chamber No. 1 proceeds to the best advantage, and the burning of the bricks in No. 1 and the heating up of the bricks in the succeeding chambers, which must be done evenly and regularly, is accomplished with even draft distributed to the best advantage, while at the same time the draft apparatus is located out of the di-

rect influence of the heat and may be changed whenever and as quickly as expedient to do so. If it is observed that the bricks are burning or are heating up more rapidly on one side or in any portion of the kiln than in another portion, the operator will adjust any or all of the dampers in the portable apparatus as may be required in order to get the best results. When the chamber 8 has been filled, the draft apparatus will be moved forward thereto, and the holes of the chamber 7 will be closed by caps a^4 , whereupon the burning will be started in chamber 2 and will proceed as before, and so on progressively around the kiln, the draft apparatus being preferably connected with the successive chambers as they become ready for it.

The products of combustion and water-smoke are simply driven off into the roof of the kiln-shed or out into the open air, and the kiln may be run in all kinds of weather with a certainty that the draft will be steady and uniform irrespective of outside conditions, and, moreover, the draft will be precisely the same for one chamber as for another.

It will be understood that very many changes in details may be resorted to without departing from my invention.

The fans may be located otherwise than as shown, and any kind of exhaust apparatus may be employed, although I prefer electric fans, and they may be provided individually for the holes or in a series for each chamber, and it will be understood that when several fans are used for a chamber they may be run at variable speeds, and thereby constitute means for varying or regulating the draft at different points the same as the dampers do, as shown in Figs. 3 and 7.

It will be understood that my invention broadly resides in providing a draft apparatus without fixed flues capable of operating directly on the various chambers in succession with uniform effect on each chamber as distinguished from the provision of an expensive separate stack at some point incapable of operating uniformly on all the chambers.

In view of the many variations in arrangement and combination of parts which are possible without departing from the spirit and scope of my invention I wish it understood that I do not limit myself otherwise than as hereinafter expressed in the claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A kiln for burning bricks and the like, and a portable draft apparatus for conducting away the products of combustion from said kiln, said kiln having smoke-holes coöperating with said draft apparatus, and the latter being movable to various positions about the kiln in coöperation with said holes and discharging the smoke directly into the atmosphere at the roof of the kiln without the intervention of fixed draft-flues, substantially as described.

2. A kiln provided with burning-chambers and smoke-holes for discharging smoke therefrom, combined with a portable draft apparatus arranged to coöperate with said holes, said draft apparatus including portable means for producing therein a forced draft, substantially as described.

3. A kiln for burning bricks, and the like, said kiln having a plurality of holes for discharging smoke, and a pipe for receiving smoke from said holes, said pipe having a free discharge-outlet discharging said smoke directly into the atmosphere, and being movable to various positions about the kiln in coöperation with said holes, substantially as described.

4. A kiln provided with a plurality of chambers, certain thereof each having a plurality of smoke-holes, means for opening and closing said holes, and a draft apparatus for coöperating with the holes of one and then another of said chambers, said draft apparatus having means for discharging the smoke directly into the atmosphere at the top of the kiln without the intervention of fixed draft-flues or stack, substantially as described.

5. A kiln provided with burning-chambers and smoke-holes therefrom, combined with a portable draft apparatus arranged to coöperate with said holes, means for independently regulating the draft at each of said holes, said draft apparatus including means portable therewith for producing therein a forced draft, substantially as described.

6. A kiln whose chambers are provided with holes through the roof, a portable draft apparatus provided with connections fitting said holes, and an exhaust-fan forming a part of said portable apparatus for creating a forced draft in said apparatus, substantially as described.

7. In a burning-kiln, a chamber provided in its roof with holes for the escape of smoke, said holes having at their outer ends sealing-recesses, combined with a portable draft apparatus including a pipe adapted to fit within said recesses and be sealed therein, and means connected and movable with said portable apparatus for producing a forced draft therein, substantially as described.

8. In a burning-kiln, a chamber having a plurality of smoke-holes, a portable draft apparatus including a smoke-pipe, said pipe having a plurality of lateral connections arranged to coöperate with said holes, portable means for producing a draft in said pipe, and a damper in each of said lateral connections for regulating the draft in the chamber, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JONATHAN P. B. FISKE.

Witnesses:

GEO. H. MAXWELL,
GEO. W. GREGORY.