

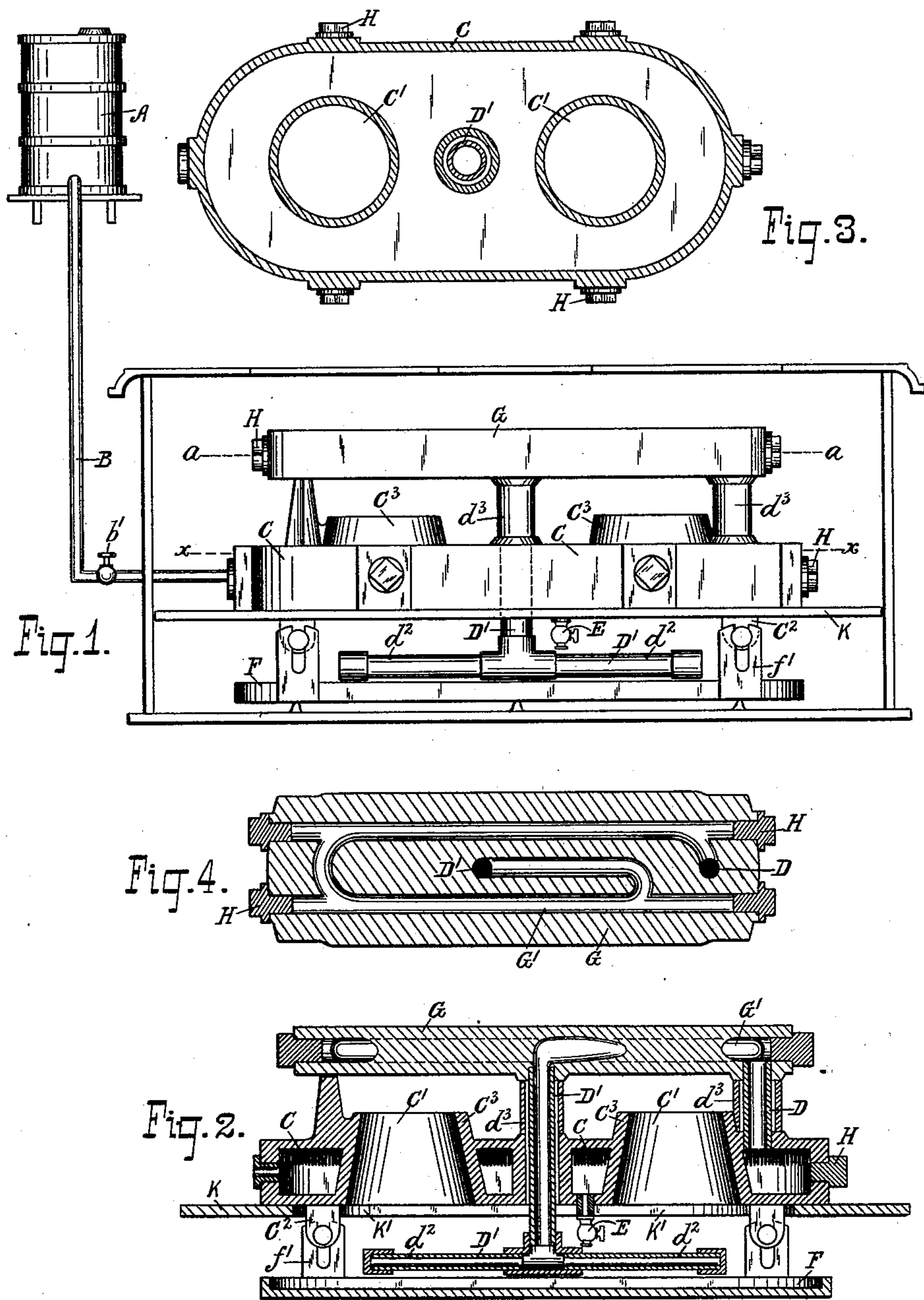
(No Model.)

2 Sheets—Sheet 1.

E. T. WIGG.  
BURNER.

No. 482,145.

Patented Sept. 6, 1892.



Witnesses  
A. Edmunds  
Jas. E. Edmunds

Inventor  
Edmund T. Wigg  
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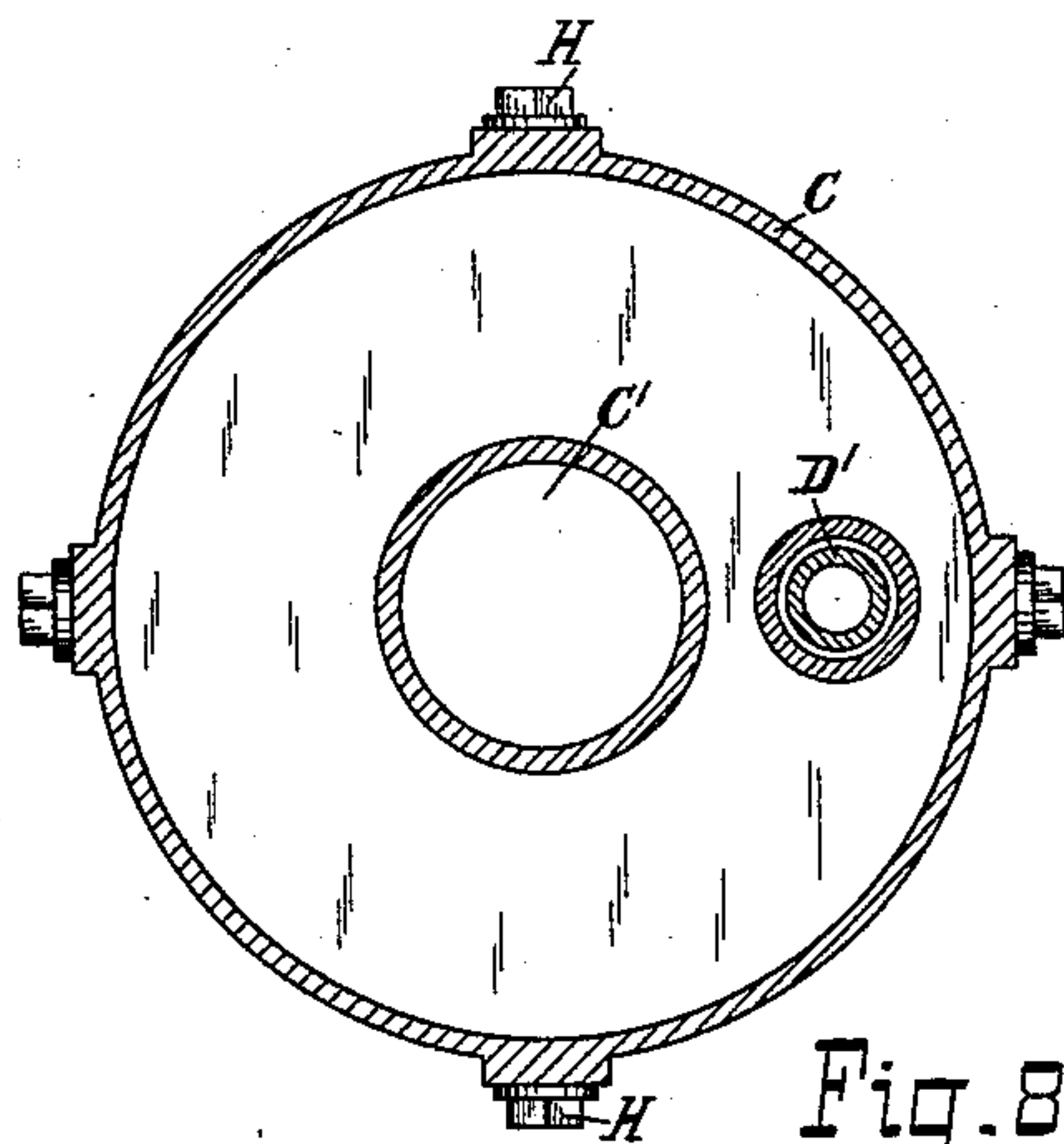
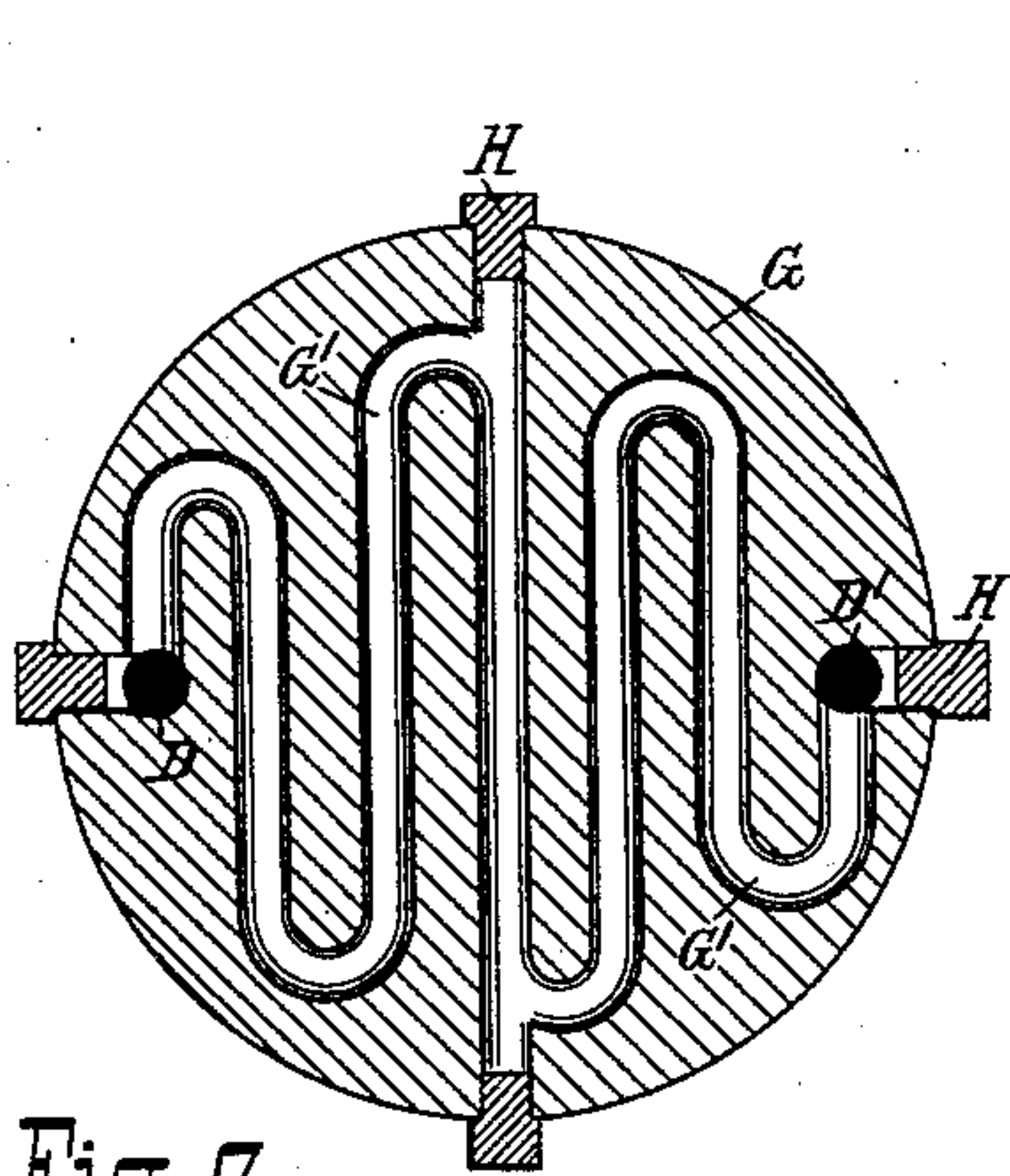
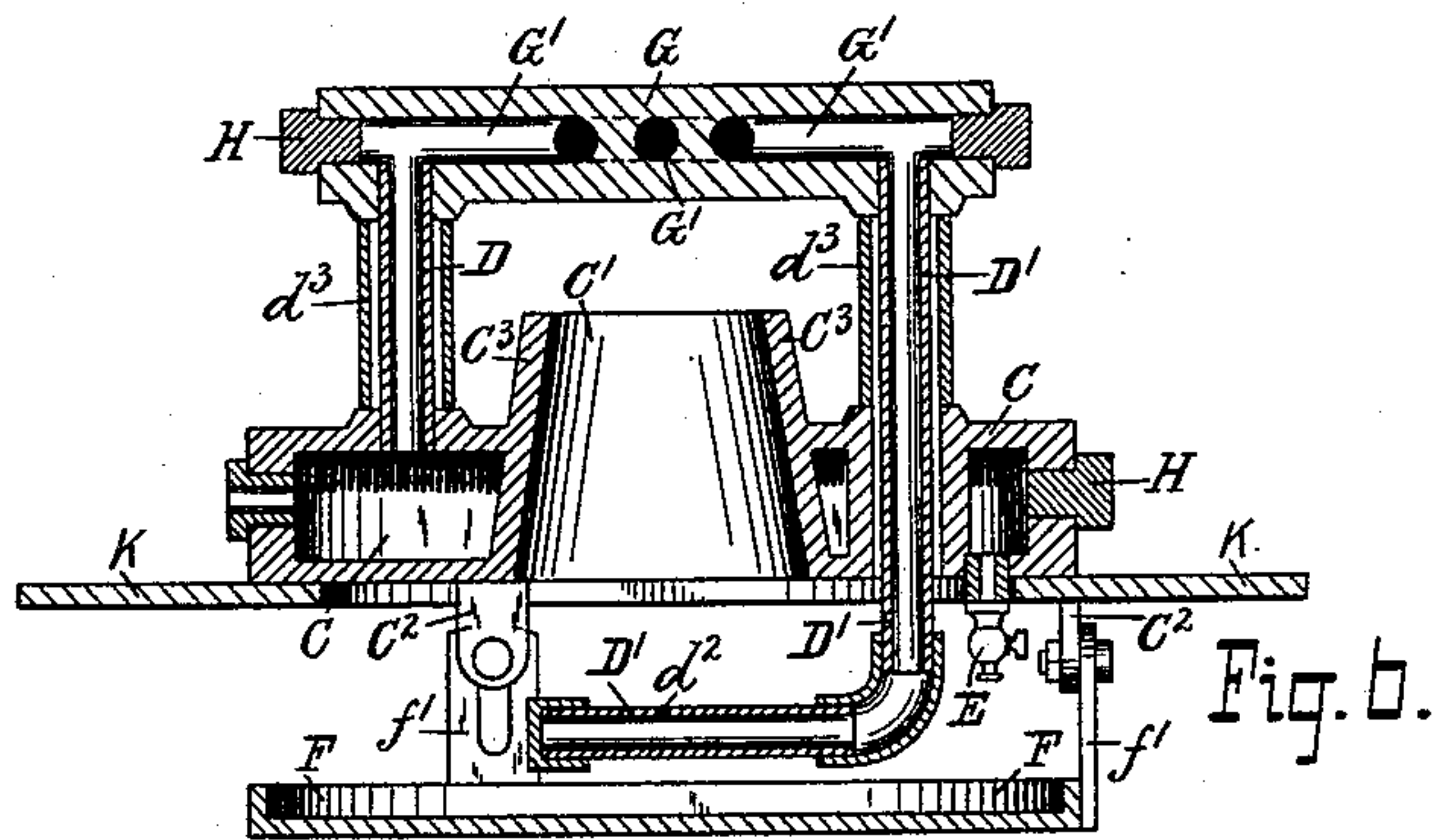
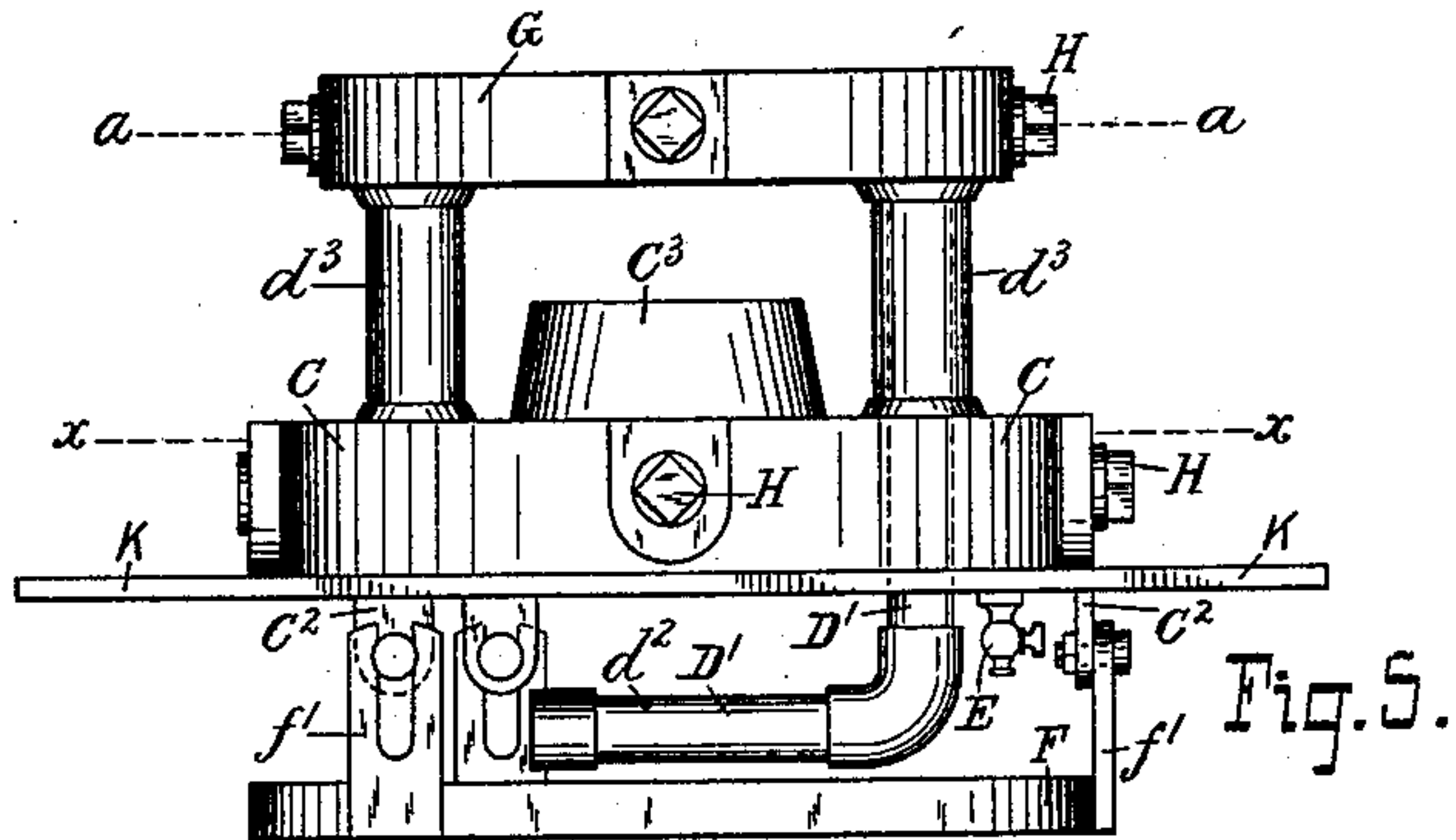
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# UNITED STATES PATENT OFFICE.

EDMUND T. WIGG, OF LONDON, CANADA, ASSIGNOR OF ONE-FOURTH TO  
THOMAS H. ROBINSON, OF SAME PLACE.

## BURNER.

SPECIFICATION forming part of Letters Patent No. 482,145, dated September 6, 1892.

Application filed January 4, 1892. Serial No. 417,032. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND T. WIGG, a subject of the Queen of Great Britain, and a resident of the city of London, in the Province  
5 of Ontario, Canada, have invented certain new and useful Improvements in Burners, of which the following is a specification.

The object of this invention is to provide  
10 an improved apparatus by means of which heat is obtained from the combustion of the combination of the surrounding atmosphere with the vapor generated from gas-oil (a low grade of petroleum) or other liquid hydrocarbon and the perfect combustion of the same  
15 by oxygen taken up and combined therewith from the surrounding atmosphere; and it consists of the improved construction and combination of parts of the same, all of which will be hereinafter first fully set forth and described, and then pointed out in the claims.

Reference is had to the accompanying drawings, which form a part of this specification, wherein—

Figure 1 is a side elevation of an apparatus  
25 having a double burner embodying my invention and shown in a stove or furnace, with the front plate of the latter removed to show the apparatus therein. Fig. 2 is a central longitudinal sectional view of the apparatus  
30 shown in Fig. 1. Fig. 3 is a sectional view of the retort on the line  $x x$  of Fig. 1. Fig. 4 is a sectional view of the combined superheater and abutment on the line  $a a$  of Fig. 1. Fig. 5 is a side elevation of an apparatus  
35 having a single burner embodying my invention. Fig. 6 is a central longitudinal sectional view of the same. Fig. 7 is a sectional view of the combined superheater and abutment on the line  $a a$  of Fig. 5. Fig. 8 is a sectional view of the retort on the line  $x x$  of  
40 Fig. 5.

Any liquid hydrocarbon may be used with perfect safety in this apparatus; but from the particular construction and operation of  
45 an apparatus embodying my improvements I am enabled not only to burn a large portion of the surrounding atmosphere as fuel, but to form a perfect and complete combustion of gas-oil, (a low grade of petroleum,) which  
50 from its low price enables me to provide an apparatus the fuel for which can be supplied

at very little expense, and not only this, but when the burner is once started it will continue burning without the necessity of continual supervision which ordinary furnaces  
55 require in the person of an engineer or fireman, so that an apparatus embodying my improvements effects a large saving in running expenses over those where a more expensive fuel is used and where continued supervision  
60 is required.

This gas-oil or other liquid hydrocarbon is piped from the tank A to the retort C through pipe B, a valve  $b'$  in the latter regulating the supply to said retort C. This tank A is placed  
65 in an elevated position, as shown in Fig. 1, in which case the oil is intended to be fed by its own gravity. This retort C is formed with the openings  $C'$ , the sides of which are walled, as shown in Fig. 2, to prevent the escape of  
70 the contents of said retort at this point, and communicating with the interior of said retort C is the pipe D and the petcock E, and this retort is also provided with the lugs  $C^2$  and flanges  $C^3$ . The latter extend around the  
75 openings  $C'$  and increase the length and draft and direct the flame against the solid under side of the superheater G, the under side of which forms the abutment.

F designates a fire-pan provided with the  
80 slotted standards  $f'$ , in the slots of which standards the shanks of the screw-bolts which bind the lugs  $C^2$  and the standards  $f'$  together may be vertically adjusted to support the retort and attachments at any desired position  
85 or elevation in the furnace-chamber.

G designates a combined abutment and superheater, within which is formed the winding passage  $G'$ , and the pipe D from the retort C communicates with this passage  $G'$   
90 near one end, and with the other end of this passage the pipe  $D'$  communicates, and the latter extends down through the retort, and an opening or openings  $d^2$  are formed in this pipe  $D'$ , at which point the vapor escapes and  
95 is ignited, and where this pipe  $D'$  extends through the retort the latter is walled to prevent the escape of its contents at this point, and  $d^3$  are shields surrounding the pipes D  $D'$  between the retort C and superheater G  
100 to prevent said pipes from being injured by the action of the heat as the flame rebounds



from the under side or abutment of the superheater G.

The petcock E is used in connection with the retort C in order to draw off any impurities or refuse which may remain in said retort after the oil is vaporized and also to supply a little oil to the fire-pan, which is ignited and heats said retort to commence the operation of vaporizing the oil therein, which vaporization is afterward continued by the combustion of the vapor and the surrounding atmosphere as said vapor passes out through the opening  $d^2$  in the pipe D'. By opening this petcock E before shutting down the fire or turning off the supply of liquid hydrocarbon the expanded vapor rushes out of the retort through this petcock E and carries with it every particle of impurity in the retort, thus leaving the latter perfectly clean and in the best condition to again commence the operation of vaporizing the oil. The flame from the combustion of the vapor and the surrounding atmosphere passes through the opening or openings C' and strikes against the under side of the superheater G, which forms a solid abutment and retards the flame and heat at this point, which not only causes a perfect combustion of the gas or vapor and air, but heats to a high degree said superheater G, and as the vapor passes from the retort C through the winding passage G' it is exposed to and passes over a large area of heating-surface in order to become highly superheated and fixed into a gas, which passes down through the pipe D' to the opening or openings  $d^2$ , at which point it is ignited, as before stated.

H H designate screw-plugs in the retort and superheater, which may be removed to extract any large impurities from these parts. They are supplemental, however, and it is only in exceptional cases that they would be removed, the petcock E effectively and practically answering for this purpose.

K designates a partition-wall formed of any suitable non-combustible material, and it is situated about on a line with the retort C, which partition separates the furnace or chamber in which this apparatus is placed into two apartments, and an opening K' is formed in this partition K large enough for the retort C to rest in, or the partition K may be placed immediately under and rest adjacent to said retort, as shown in the accompanying drawings, in which case an opening or openings K' are formed therein opposite the openings C' of the retort C, so that these openings C', extending through the retort C, are the only communicating passages between the two apartments of the furnace. The lower apartment of this furnace only is provided with suitable ample openings (not shown) for the admission of fresh air, and the only opening which it can pass through from the lower to the upper apartment is the opening or openings C', and it is drawn through these in large volumes by the force of the vapor escaping from the opening  $d^2$  in the pipe D' as

it rushes up through said opening C', so that all the air passing through the furnace or chamber in which this apparatus is placed must pass through the openings C'. This brings large volumes of the surrounding atmosphere in direct contact with the burning vapor, which takes up the oxygen therefrom, and this, together with the abutment formed by the solid under side of the superheater G against which the gas or vapor and air strike, causes a complete and perfect combustion of both to take place; and, further, by using this partition-wall as just described all the air entering the furnace or chamber in which this apparatus is placed must pass up through the openings C' in the retort C. This enables the feed of the oil to this apparatus to be wholly accomplished by its gravitation without the assistance of air-pumps or other force.

The operation of the apparatus with a single burner, as shown in Figs. 5, 6, 7, and 8, is identical with that of the double burner shown in Figs. 1, 2, 3, and 4, the only difference being in the number of openings C' through the retort C and the number of branches of the pipe D'; but any number of openings C' and branches may be used in the device shown in Fig. 1, or any number of single burners shown in Fig. 5 may be used to attain the required heating capacity.

Having thus described my invention, I claim—

1. The combination of a partition-wall K, in which the opening K' is formed, and a vaporizing-retort C, in which the centrally-located and inclined or funnel-shaped openings C' are formed, said retort being provided with the flanges C<sup>3</sup>, surrounding said openings C', and said partition-wall and retort dividing the chamber into which this apparatus is placed into two apartments, the openings C' through the retort C forming the only communication between the two apartments into which said chamber is divided, with a superheating-chamber G, the under side of which is solid and forms an abutment, and said chamber G being provided with a curved passage G', which communicates with the retort C, and a pipe D', communicating with said passage and extending down through the retort and within the range of the fire, and openings  $d^2$ , formed in said pipe D' below said retort, substantially as shown and described, and for the purpose specified.

2. The combination of a partition-wall K, in which an opening K' is formed, and a vaporizing-retort C, in which the centrally-located and inclined or funnel-shaped openings C' are formed, said retort being provided with the flanges C<sup>3</sup>, surrounding said openings C', and said partition-wall and retort dividing the chamber into which this apparatus is placed into two apartments, the openings C' through the retort C forming the only communication between the two apartments into which said chamber is divided, a superheating-chamber G, the under side of which is solid



and forms an abutment, and said chamber G being provided with a curved passage G', the pipe D, communicating between the retort C and the passage G', and a pipe D', communicating with the passage G and extending down through the retort C and within the range of the fire, and the openings  $d^2$ , formed in said pipe D' below said retort, and the shields D<sup>3</sup>, surrounding the pipes D and D', substantially as shown and described, and for the purpose specified.

3. The combination of a partition-wall K, formed with the opening K', and the retort C, formed with the openings C' and the flanges C<sup>3</sup>, the superheating-chamber G, communicating therewith, and a pipe D', communicating with the said chamber G and extending down through the retort and within the range of the fire and formed with the openings  $d^2$ , and said retort formed with the lugs C<sup>2</sup>, and a fire-pan F, formed with the slotted standards  $f'$  and held at the position to which they are or may be adjusted by suitable means whereby the partition-wall, retort, and connections may be raised or lowered to enlarge, reduce, or vary the size of the apartments, substantially as shown and described, and for the purpose specified.

4. The combination of a partition-wall K, formed with an opening K', and a retort C, formed with the openings C' and flanges C<sup>3</sup>, said partition K closing the space between the retort and the furnace-walls, a superheating-chamber G, the under side of which is solid and forms an abutment and in which the curved passage G' is formed, and the pipes D and D', the latter extending down

through the retort C within the range of the fire and formed with the openings  $d^2$ , substantially as shown and described, and for the purpose specified.

5. The combination of a partition-wall K, formed with an opening K', and a retort C, formed with the openings C' and flanges C<sup>3</sup>, said partition K closing the space between the retort and the furnace-walls, a superheating-chamber G, the under side of which is solid and forms an abutment and in which the curved passage G' is formed, and the pipes D and D', the latter extending down through the retort C within the range of the fire and formed with the openings  $d^2$ , and the shields  $d^3$ , substantially as shown and described, and for the purpose specified.

6. The combination of a partition-wall K, formed with an opening K', and a retort C, formed with the openings C', lugs C<sup>2</sup>, and flanges C<sup>3</sup>, said partition K closing the space between the retort and the furnace-walls, the fire-pan F, formed with the slotted standards  $f'$ , a superheating-chamber G, the under side of which is solid and forms an abutment and in which the curved passage G' is formed, and the pipes D and D', the latter extending down through the retort C within the range of the fire and formed with the openings  $d^2$ , substantially as shown and described, and for the purpose specified.

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

EDMUND T. WIGG.

Witnesses:

P. J. EDMUNDS,

JAS. E. EDMUNDS.