

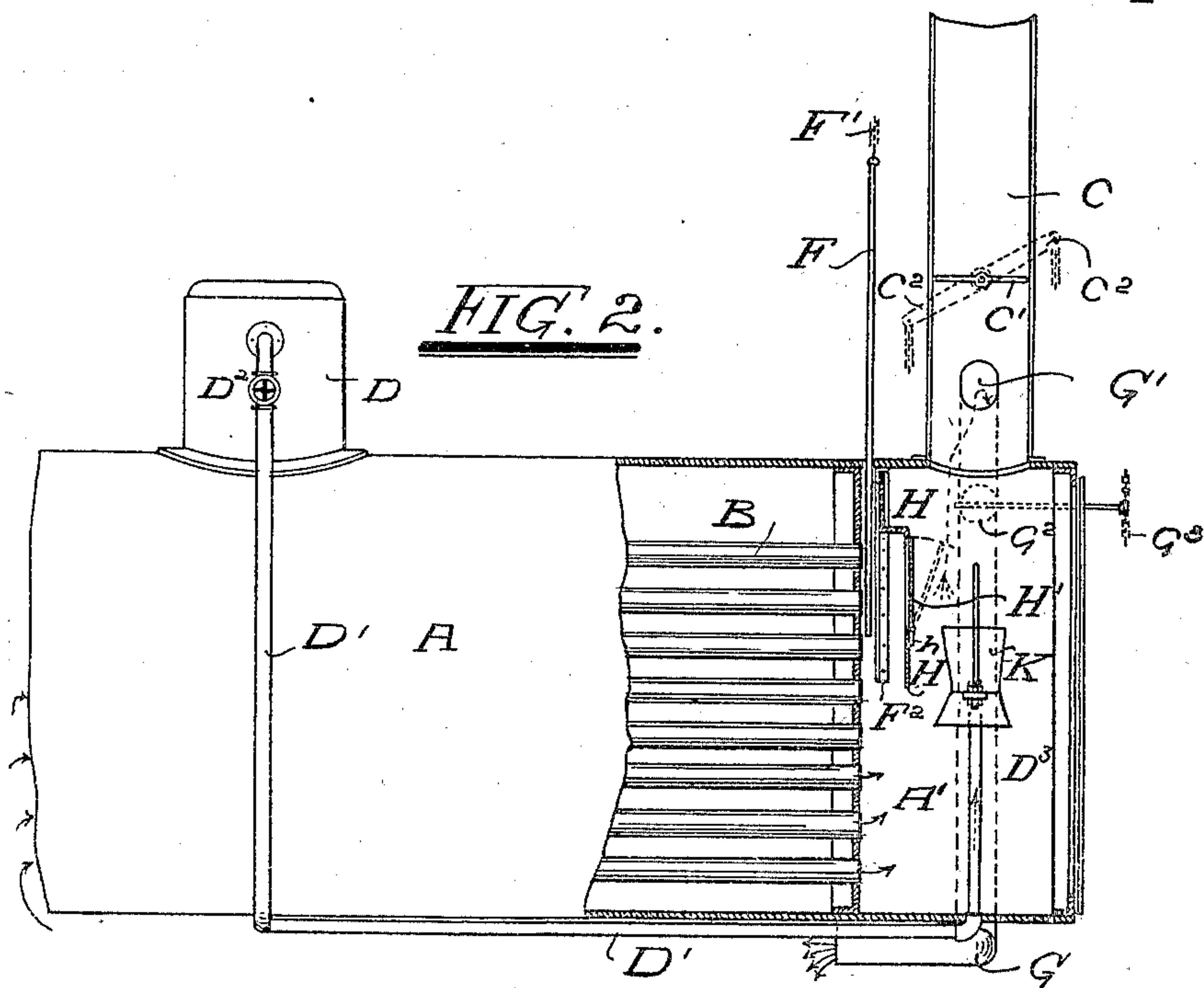
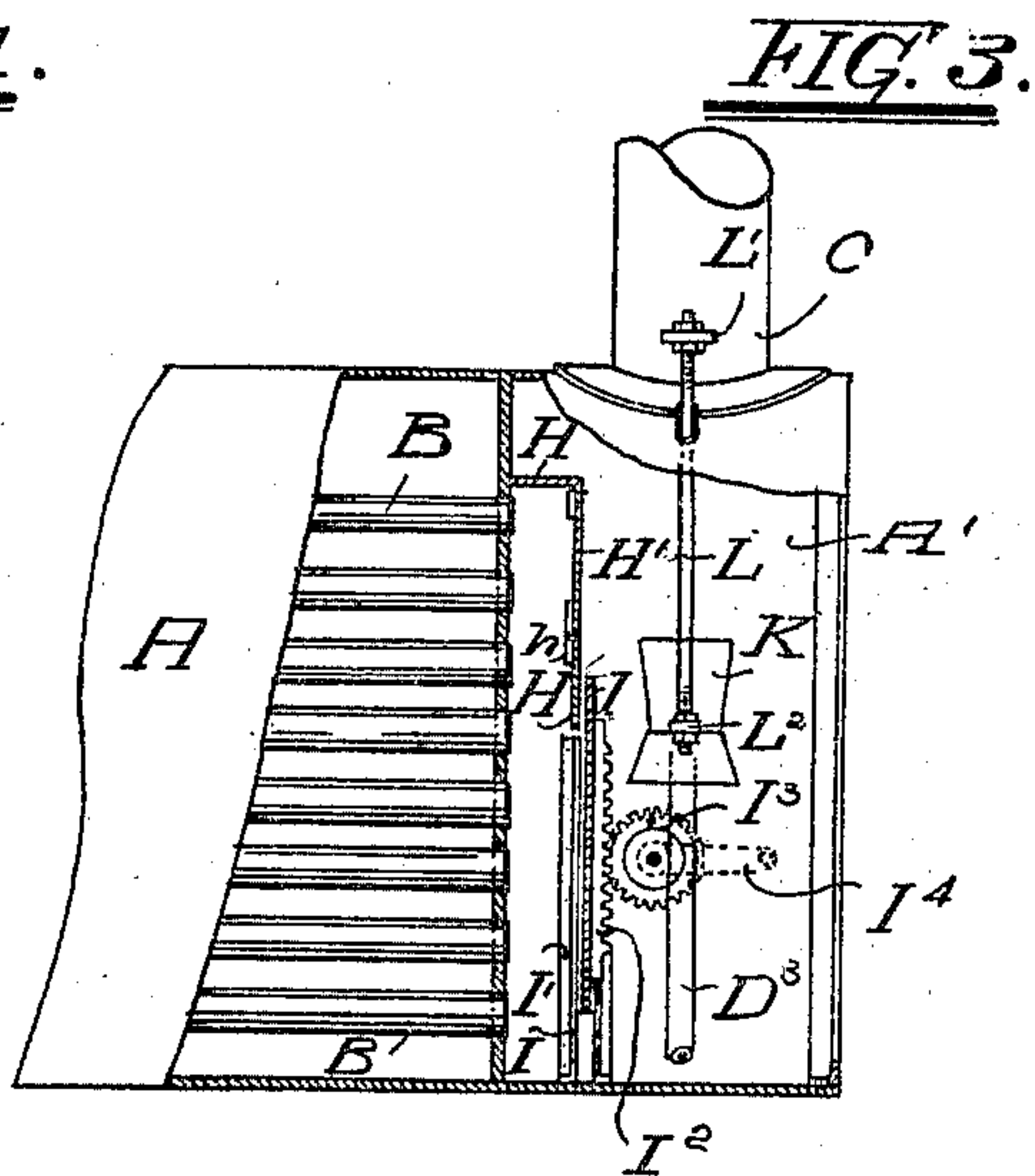
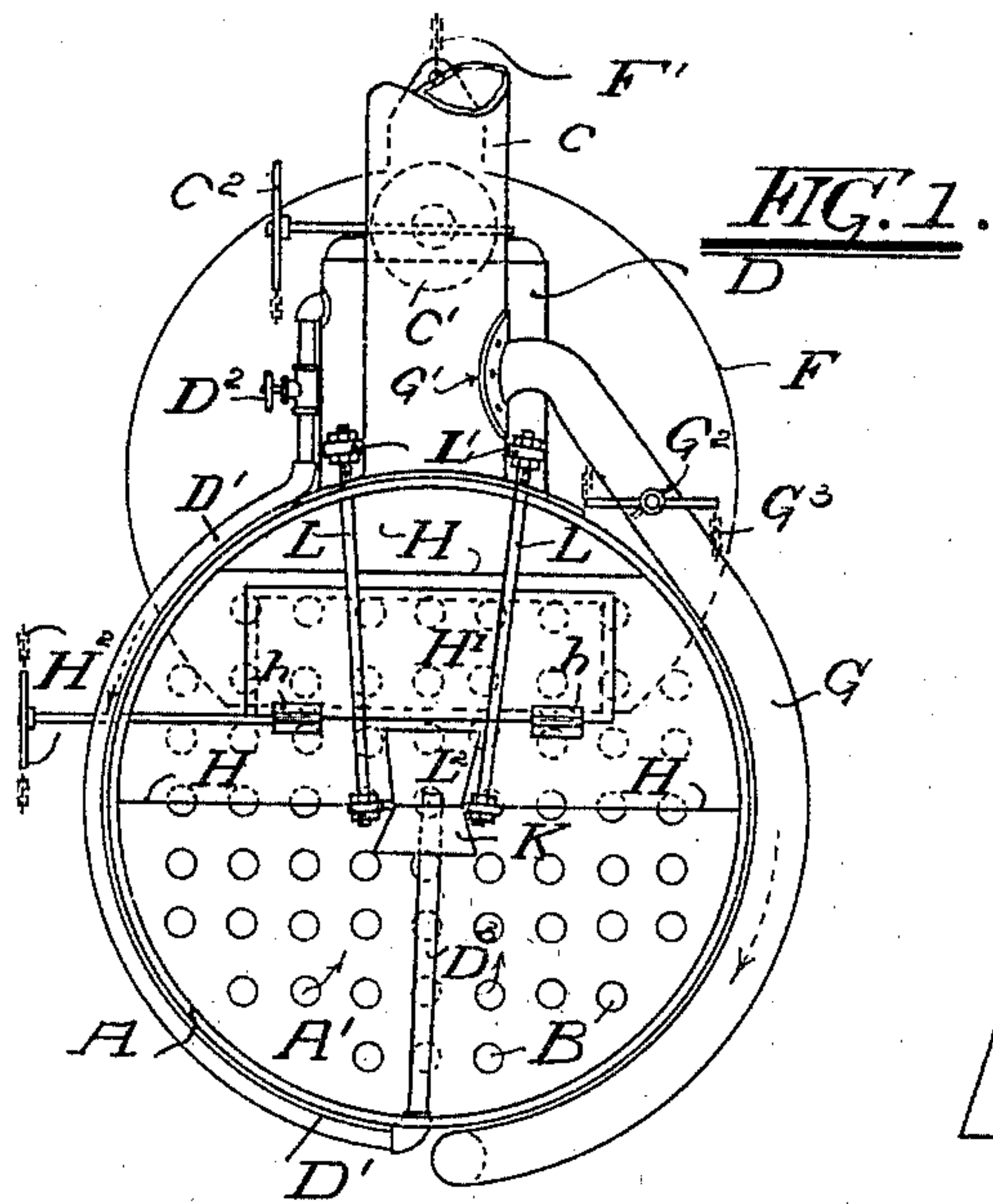
No. 725,045.

PATENTED APR. 14, 1903.

J. T. COYNE.  
SMOKE CONSUMER.

APPLICATION FILED DEC. 20, 1902.

NO MODEL.



WITNESSES.  
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# UNITED STATES PATENT OFFICE.

JOHN T. COYNE, OF ALBANY, NEW YORK.

## SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 725,045, dated April 14, 1903.

Application filed December 20, 1902. Serial No. 135,993. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN T. COYNE, a citizen of the United States of America, and a resident of Albany, in the State of New York, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in smoke-consumers especially adapted for use in connection with locomotives and other steam-boilers for returning the smoke, gases, and other products of combustion to the fire-box and causing the same to be consumed, to effect an economy in fuel, and to utilize to the fullest extent the heating power thereof; and my invention consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

It has been the custom hitherto to consume the smoke and gases by passing them under the fire, while in my invention they are passed over the fire. Furthermore, the draft-pipes in vogue are adjusted on the inner side of the smoke-box, which adjustment cannot be effected while there is a fire in the box, while I can at any time adjust my draft-pipe by means on the outside of the smoke-box.

The objects of my invention are accomplished by the devices illustrated in the accompanying drawings, in which similar letters of reference indicate like parts in the various figures.

Figure 1 is a front elevation of a boiler provided with a smoke-consuming apparatus embodying my improvements. Fig. 2 is a vertical longitudinal view, part sectional, of a boiler and furnace provided with my improvements; and Fig. 3 is a vertical longitudinal sectional view of a boiler provided with damper devices which are modifications of those in Fig. 1.

My boiler A is provided with the smoke-box A', flues B, and smoke-stack C, in which is placed the circular damper C', having an adjusting member C<sup>2</sup>. A steam-pipe D' connects the dome D and smoke-box A' for blowing purposes and has an extended vertical portion D<sup>3</sup> passing into the smoke-box. The steam is regulated by a valve D<sup>2</sup>. A circular vertically-operated sliding damper F is adapt-

ed to be raised and lowered in the smoke-box A' by means of the adjusting device F' in front of the flues B and behind a guide F<sup>2</sup>. A smoke-drain pipe G connects the smoke-stack C and the fire-box E. The smoke and gases pass from the fire-box E among the flues B and to the smoke-box A', as indicated by arrows in Fig. 2, and may be deflected by the damper F as desired and be caused to pass up through the draft-pipe K to the smoke-stack C by the steam from pipe D<sup>3</sup>, when if the damper C' is closed the smoke and gases will enter the inlet G' of the smoke-drain pipe G and pass, as is indicated by arrows in the drawings, to the space above the fire in the fire-box, there to be consumed. The circulation through the pipe G is regulated by the device G<sup>3</sup>.

In the smoke-box A' is a depending partition H, having a door H' pivotally connected therewith by the hinges h and operated by the member H<sup>2</sup>.

I is a modification of the damper F. I' represents guide-rails for same, and I<sup>2</sup>, I<sup>3</sup>, and I<sup>4</sup> are devices for adjusting damper I, consisting of a rack, a gear, and an operating-handle, respectively.

The draft-pipe K is shaped like an hour-glass and is adjusted by the outside rods L L, which are supported by the brackets L' and are connected with the draft-pipe brackets L<sup>2</sup>.

In putting my invention to a practical test it has been proved effectual and more economical than the methods hitherto employed in smoke-consumers directing the smoke, gases, and products of combustion to the ash-pit or space under the grate and thence upwardly through the burning mass of fuel in the fire-box. The space in the fire-box above the burning mass of fuel is converted by my invention into a chamber or resort for the products of combustion, which are there more readily consumed than when they are discharged into the ash-pit. As this is an important and very essential part of my invention, it is obvious that many modifications may be made in the construction shown in the drawings without departing from this essential element of my invention, and I do not, therefore, wish to limit myself strictly to the specific construction shown.

With this description of my invention,



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

1. A smoke-consumer for steam-boiler furnaces, comprising a smoke-box, a stack, a draft-pipe in the smoke-box under the smoke-stack, exterior means for adjustably regulating the draft-pipe, a deflecting mechanism, exterior means for regulating the deflection of the products of combustion in the smoke-box, means for conducting steam from any suitable part of the boiler, to within a suitable distance of the bottom of the smoke-draft pipe, and directly under the same, and means for conducting the products of combustion from the smoke-stack, and into the fire-box, substantially as set forth.

2. A smoke-consumer for steam-boiler furnaces, comprising a smoke-box, a stack, a deflecting mechanism, means exterior of the furnace for adjustably regulating the deflection of the products of combustion in the smoke-box, a draft device in the smoke-box directly under the smoke-stack, means exterior of the furnace for adjustably regulating the same, a steam-pipe adapted to discharge upwardly into said draft device, means for controlling the discharge of the products of combustion from the smoke-box, and a conduit through which the products of combustion may be carried to the space in the top of the fire-box, substantially as set forth.

3. The combination with a boiler having draft-tubes, a smoke-box into which they discharge, a smoke-stack leading from the smoke-box and a steam-pipe discharging upwardly into the smoke-box, of deflecting devices within the smoke-box, means exterior of the furnace for adjustably regulating the same, a smoke-draft device within the smoke-box, means exterior of the furnace for adjustably regulating the same, and means for receiving, conducting and discharging the products of combustion into the space in the fire-box, above the grate, substantially as set forth.

4. In a steam-boiler furnace a device for consuming the products of combustion, comprising the smoke-box, a series of externally-operated dampers, located therein, and an externally-controlled adjustable draft-pipe in said box, in combination with a conduit adapted to convey the products of combustion from the smoke-box, and, to discharge them into the space in the fire-box above the fire, and means for creating a current of air within the smoke-box, substantially as set forth.

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

JOHN T. COYNE.

Witnesses:

JAS. J. PENNEFEATHER,  
FRANK J. MEEGAN.