

No. 864,159.

PATENTED AUG. 27, 1907.

A. B. FERDINAND.  
HEATER.

APPLICATION FILED SEPT. 28, 1906.

Fig. 2.

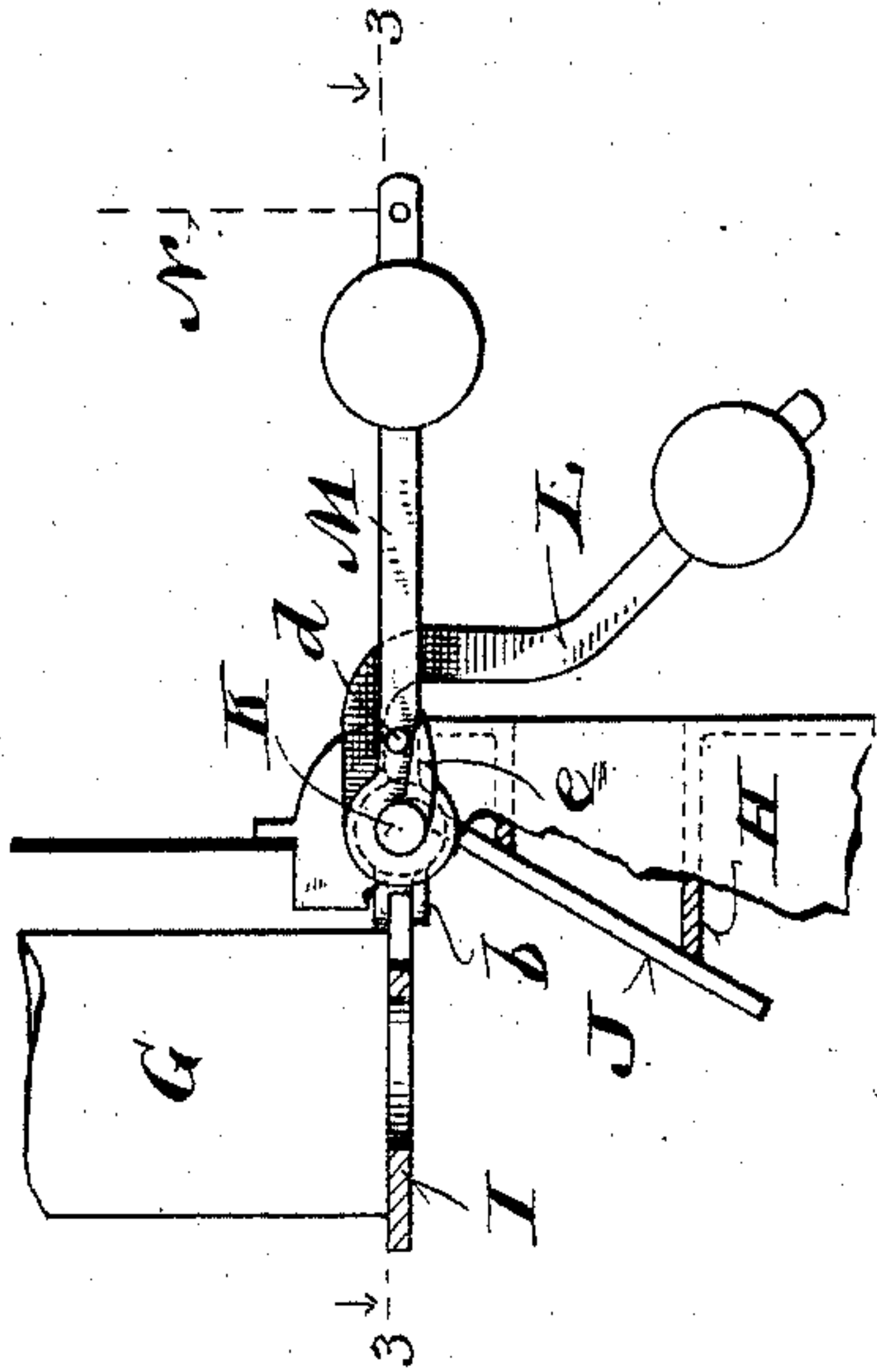


Fig. 3.

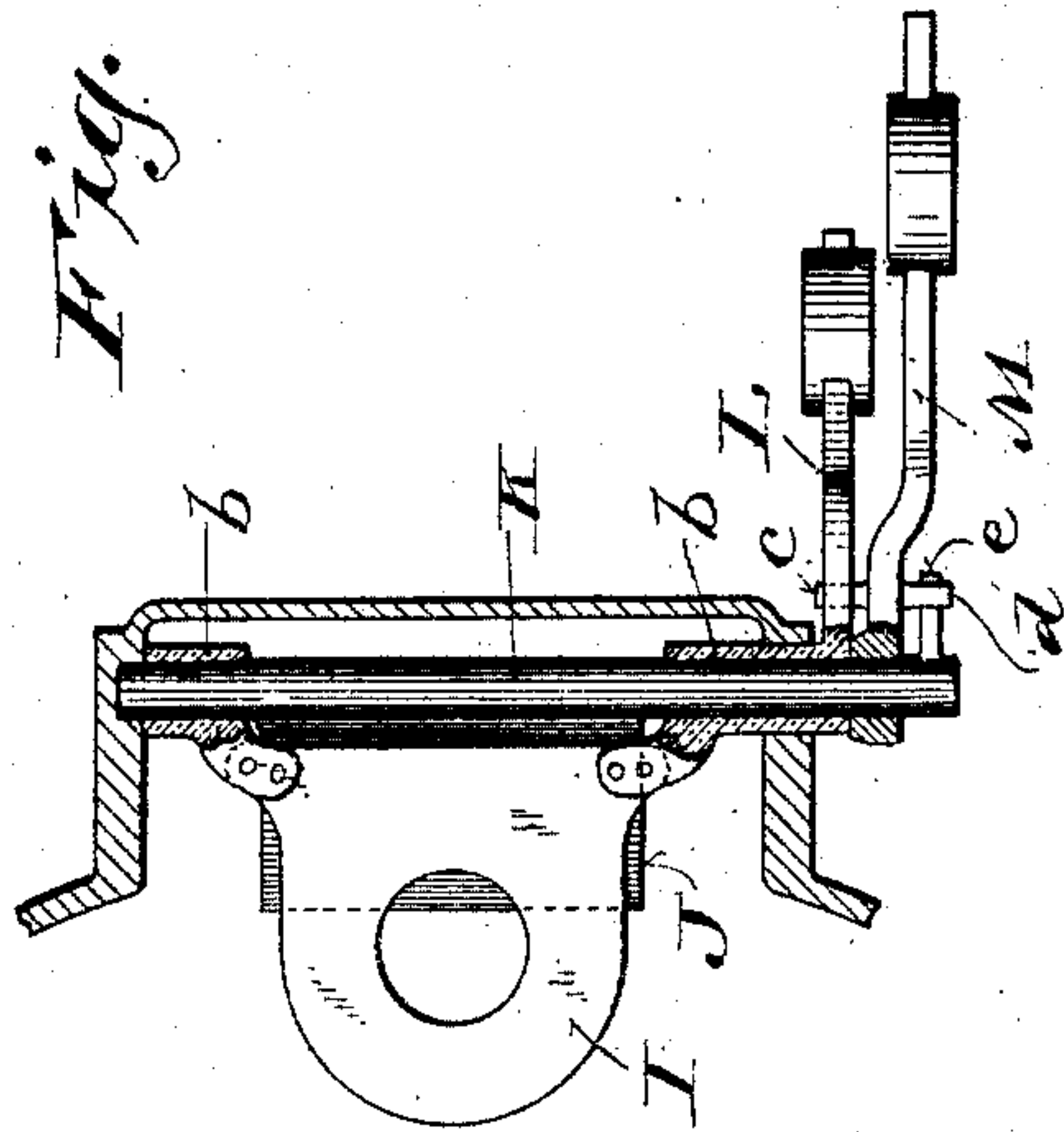
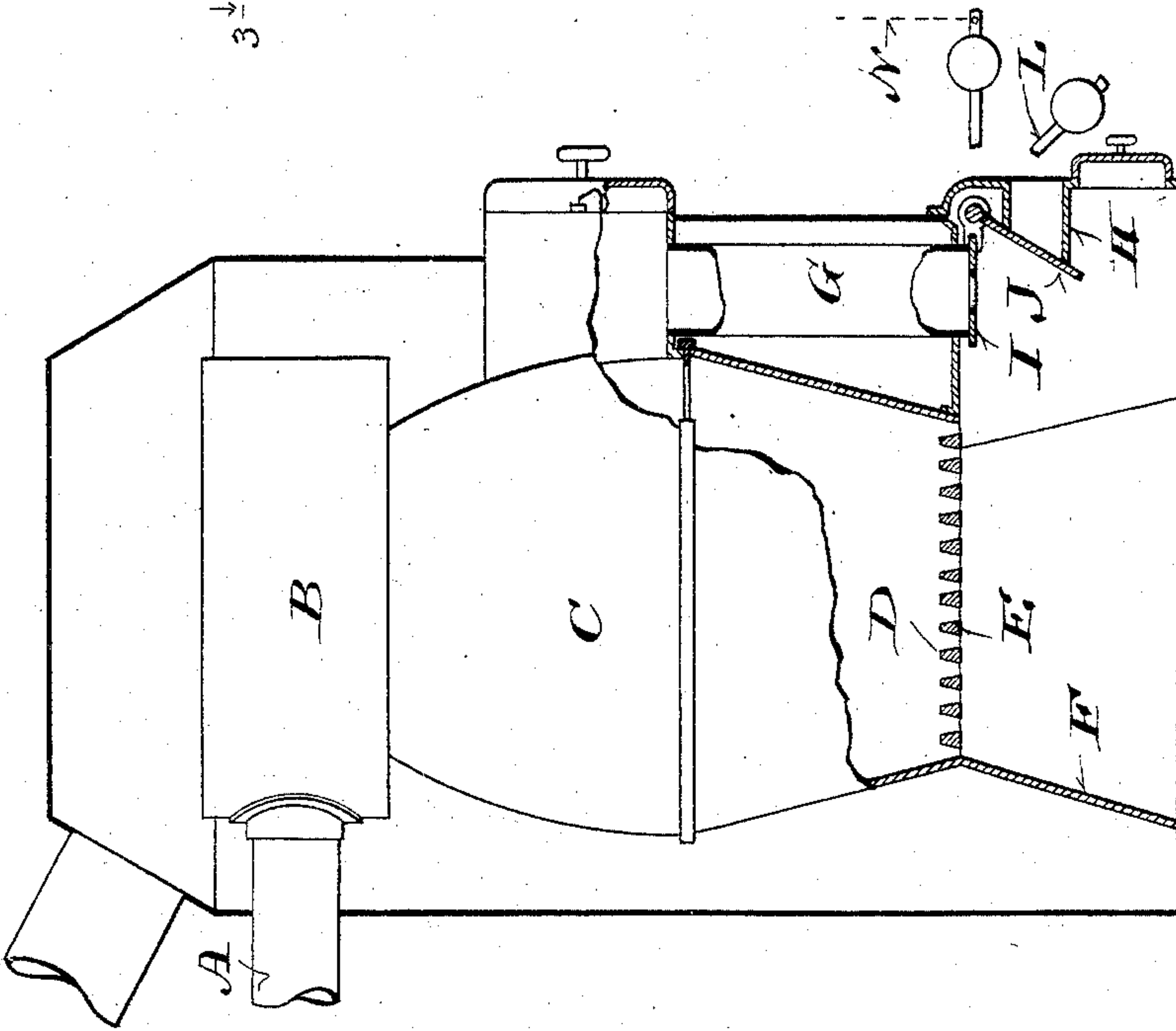


Fig. 1.



Witnesses:  
Fred Palm,  
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Inventor:  
Anthony B. Ferdinand.  
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# UNITED STATES PATENT OFFICE.

ANTHONY B. FERDINAND, OF WAUWATOSA, WISCONSIN.

## HEATER.

No. 864,159.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed September 28, 1906. Serial No. 336,642.

*To all whom it may concern:*

Be it known that I, ANTHONY B. FERDINAND, a citizen of the United States, and a resident of Wauwatosa, in the county of Milwaukee and State of Wisconsin, have in-  
5 vented certain new and useful Improvements in Heaters; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention consists in what is herein shown, described and claimed; its object being to provide for  
10 more effective control of the draft of heaters of various kinds, and to prevent dangerous accumulation of gas in the same or the escape of gas therefrom into apartments in which they are located, a further object of the invention being economy in the consumption of fuel.

15 Figure 1 of the accompanying drawings represents a partly sectional elevation of a heater in the form of a hot-air furnace, embodying my improvements; Fig. 2, a similar view of a fragment of the same, and Fig. 3, a plan view partly in section on the plane indicated by  
20 line 3—3 in Fig. 2.

Referring by letter to the drawings, A indicates the smoke-flue, B the smoke-drum, C the combustion-chamber, D the fire-pot, E the grate and F the ash-pit of a type of hot-air furnace.

25 The smoke-flue and smoke-drum are shown devoid of any direct draft-control or check-draft damper, my invention contemplating a full capacity draft outlet from the combustion-chamber at all times.

Outside of the fire-pot, an air-flue G is shown con-  
30 necting the combustion-chamber with the ash-pit of the heater, and an air-inlet H to said ash-pit is provided above the door of same. A single air-flue G is shown as having a capacity that is preferably approximately equal that of the smoke-flue, but it is  
35 within the scope of my invention to employ a plurality of flues in the same arrangement as the one shown and to have the combined capacity thereof approximately equal that of said smoke-flue, or to otherwise provide for air-passage from ash-pit to combustion-chamber  
40 independent of said fire-pot itself, as an air-passage. Normally closing a portion of the air-flue or passage G is a swing-damper I having an aperture that is controlled by another swing-damper J that also controls the air-inlet H aforesaid. The apertured damper I is  
45 hung, by sleeve-ears *b*, loose on a suitably mounted rocker stem K to which the damper J is rigidly connected, and a weighted arm L extends from one of said ears that projects through a suitable opening for the same in a side of the front extension of the ash-pit of the  
50 heater. Loose on the outwardly projecting end of the stem K is a weighted arm M provided with lateral lugs *c*, *d*, that extend respectively under the weighted arm L and over a crank *e* of said stem. A chain N or other suitable device is employed in connection with the  
55 weighted arm M to extend therefrom to a more or less distant point convenient to the operator of said arm or

to be attached to a time-damper-regulator such as is set forth in my Patent No. 798,771, granted September 5, 1905.

The damper J is normally in position to close the air- 60 inlet H to the ash-pit, and it requires a lowering of the weighted arm M to swing said damper in the direction necessary to open said inlet more or less, but a lift of said arm to a greater elevation than will permit gravity return of the aforesaid damper will result in a propor- 65 tional swing of the damper I out of normal position to which it is automatically returned, by its weighted arm L, whenever there is opportunity. The aforesaid dampers being in their normal position, some of the air from the ash-pit will be drawn up through the combustible 70 material in the fire-pot of the heater and the remainder of said air will be drawn up the flue G, the fire in said heater being then on medium draft. To check the draft, the weighted arm M is lifted from normal position to effect a downward swing of the apertured dam- 75 per I, and thereby permit a greater volume of the air from the ash-pit being drawn up through the flue G and into the combustion chamber of the heater over the fire, a proportionally less amount of air being drawn up through the combustible material in the fire-pot, and 80 if said damper be full open the major portion of the air from the ash-pit will be drawn up said flue, owing to the preferred capacity of the same. The weighted arm M being lowered to swing the damper J away from the air-inlet H and close the aperture in the damper I, then in 85 normal position, the heater will be in full blast, all the air admitted to the ash-pit being drawn up through the combustible material in the fire-pot and carried off with the products of combustion through the smoke-flue. There being full capacity draft at all times from 90 the combustion-chamber, dangerous accumulation of gas in the heater is prevented, and there is no escape of gas therefrom, except through the smoke-outlet, even though, from any cause, said combustion chamber be more or less open to the apartment in which said 95 heater is located, the draft, with reference to more or less consumption of fuel, being regulated entirely by the manipulation of the dampers aforesaid. Owing to the fact that some air is permitted to ascend direct from the ash-pit to the combustion-chamber of the heater, 100 when the dampers aforesaid are in normal position, a ready ignition of gases accumulating in said chamber is effected, and unconsumed gases are carried up through the smoke-outlet with the other products of combustion.

While I have shown and described a preferred con- 105 struction and arrangement of parts for regulating the flow of air, in varying degree, through the combustible material in the fire-pot of the heater, dependent upon a damper-controlled air-flue connecting the ash-pit and combustion-chamber of said heater, and a damper- 110 controlled air-inlet to said ash-pit, the detail of the damper-mechanism and the location of the air-flue or



passage may be indefinitely varied without departure from my invention.

I claim:

1. A heater having full capacity draft at all times from the combustion-chamber thereof, air-passage other than the fire-pot from the ash-pit to said chamber, an air inlet to said pit, dampers controlling said passage and inlet, and means in conjunction with said dampers whereby either of same may be independently adjusted, one damper serving in conjunction with the other damper to close the aforesaid air-passage when the aforesaid inlet is full open.
2. A heater having full capacity draft at all times from the combustion-chamber thereof, air-passage other than the fire-pot from the ash-pit to said chamber, a damper normally reducing the capacity of said passage, another damper normally closing an air-inlet to said pit, and means by which to move either of said dampers out of normal position at will, the air-inlet damper being arranged to cause the aforesaid air-passage to be closed when said air-inlet damper is fully out of normal position.
3. A heater having full capacity draft at all times from the combustion-chamber thereof, air-passage other than the fire-pot from the ash-pit to said chamber, a damper normally closing an air-inlet to said pit and having a suitably mounted rocker-stem, and another damper in independently adjustable connection with said stem, the latter damper in normal position serving to reduce the capacity of said passage which passage is fully closed by the former damper adjusted to effect a full opening of said inlet.
4. A heater having full capacity draft at all times from the combustion-chamber thereof, air-passage other than the fire-pot from the ash-pit to said chamber, an apertured damper normally closing a portion of said passage, another

damper normally closing an air-inlet to said pit, and means by which to move either of said dampers out of normal position at will, the air-inlet damper being arranged to close the aperture in the other damper when full out of said position.

5. A heater having full capacity draft at all times from the combustion-chamber thereof, air-passage other than the fire-pot from the ash-pit to said chamber, a gravity damper normally closing an air-inlet to said pit, a suitably mounted rocker stem rigid with said damper, an apertured damper hung loose on the stem and having a weighted-arm by which it is normally held to partially close said passage, another weighted arm loose on said stem and provided with lateral lugs respectively under the arm first aforesaid and over a crank of the aforesaid stem, and means for controlling the adjustment of the loose weighted-arm, full throw of the gravity valve out of normal position serving to close the apertured valve.

6. A heater having full capacity draft at all times from the combustion chamber thereof, air-passage other than the fire-pot from the ash-pit to said chamber, a damper normally reducing the capacity of said passage, and another damper controlling an air-inlet to said pit and serving to close the aforesaid passage when adjusted to effect a full opening of said inlet.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

ANTHONY B. FERDINAND.

Witnesses:

GEO. W. YOUNG,  
FRED PALM.