

No. 868,299.

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C. H. SMITH.  
HEATING AND VENTILATING SYSTEM.  
APPLICATION FILED DEC. 20, 1905.

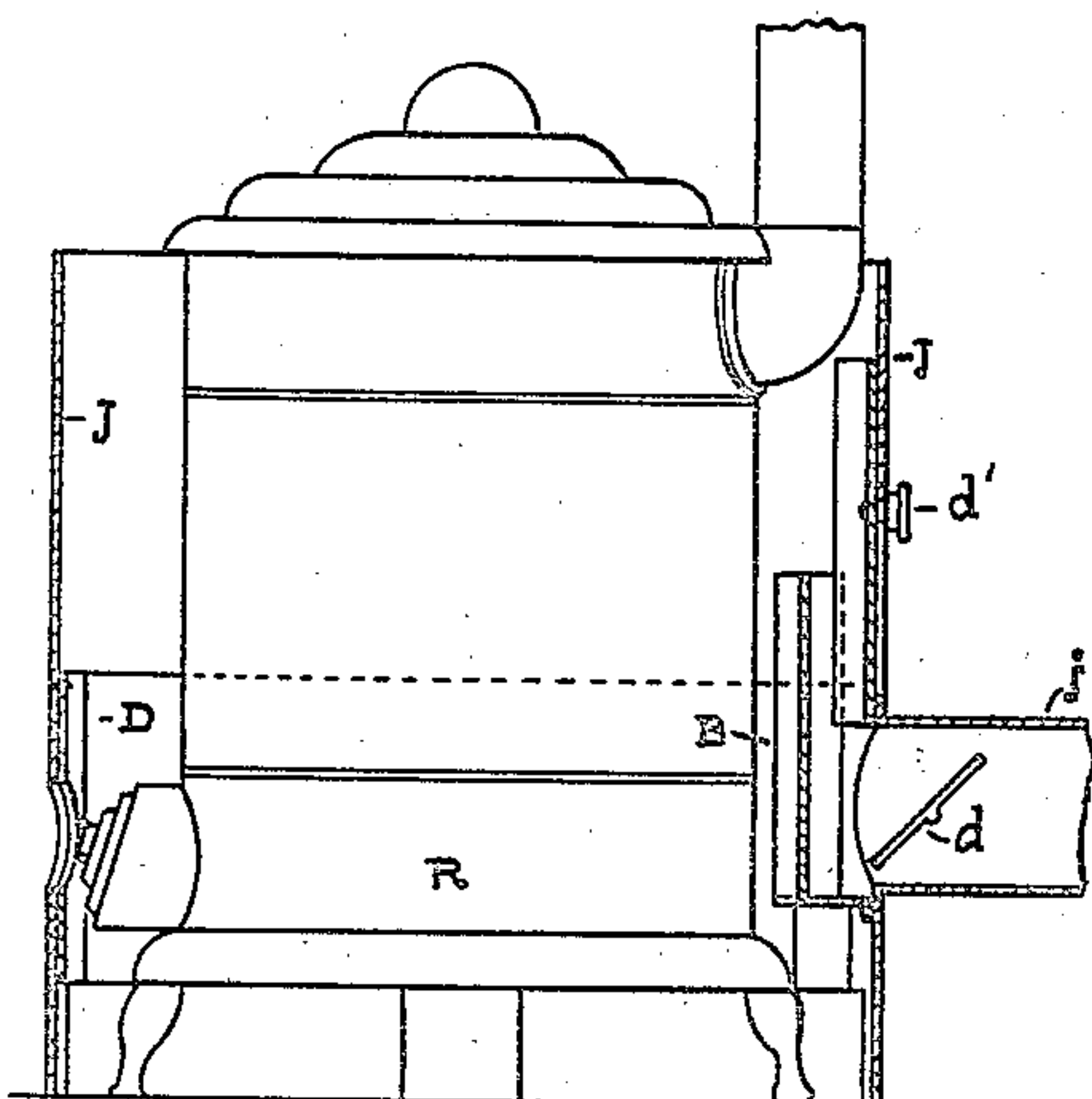


Fig. 1.

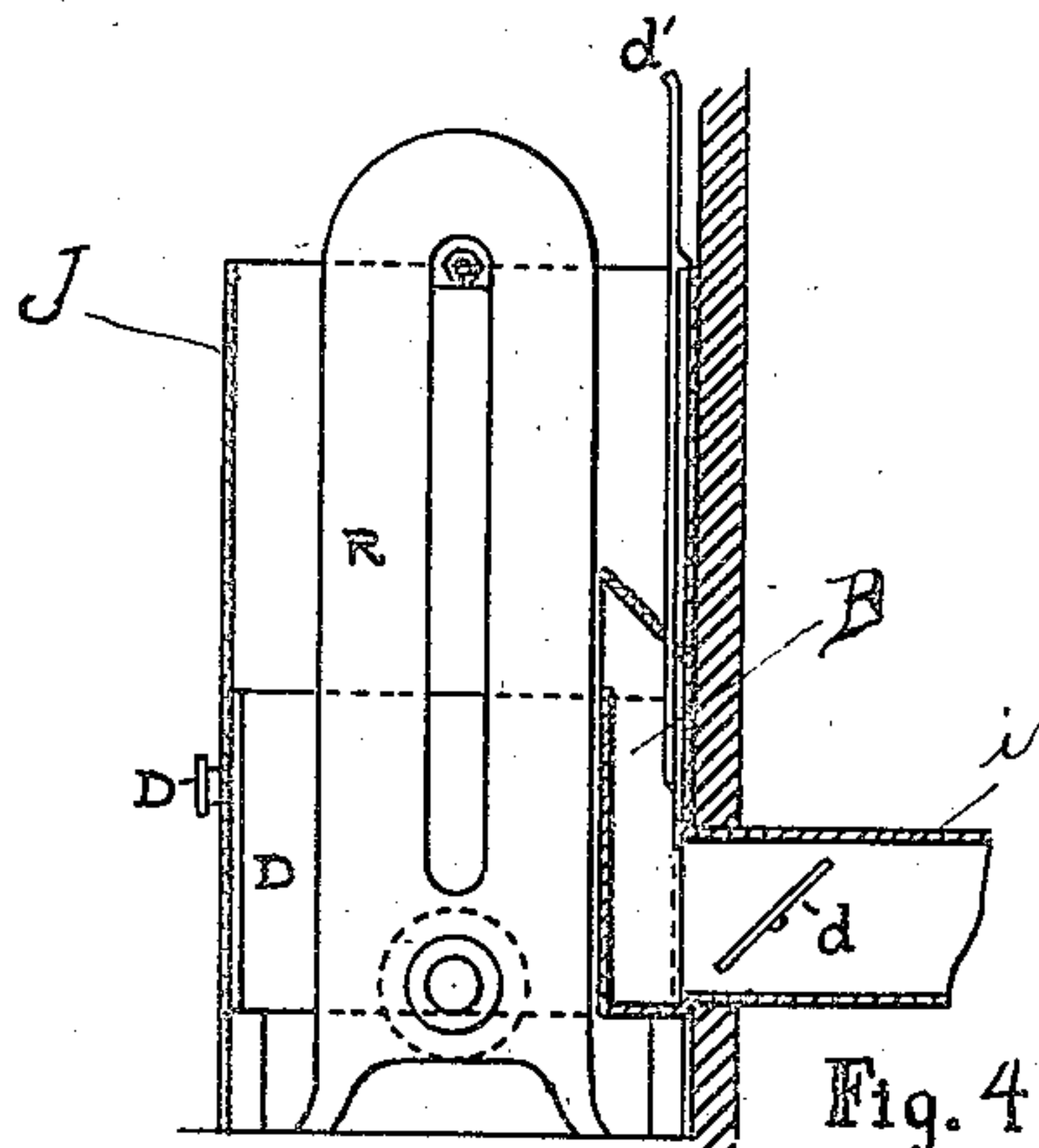


Fig. 4.

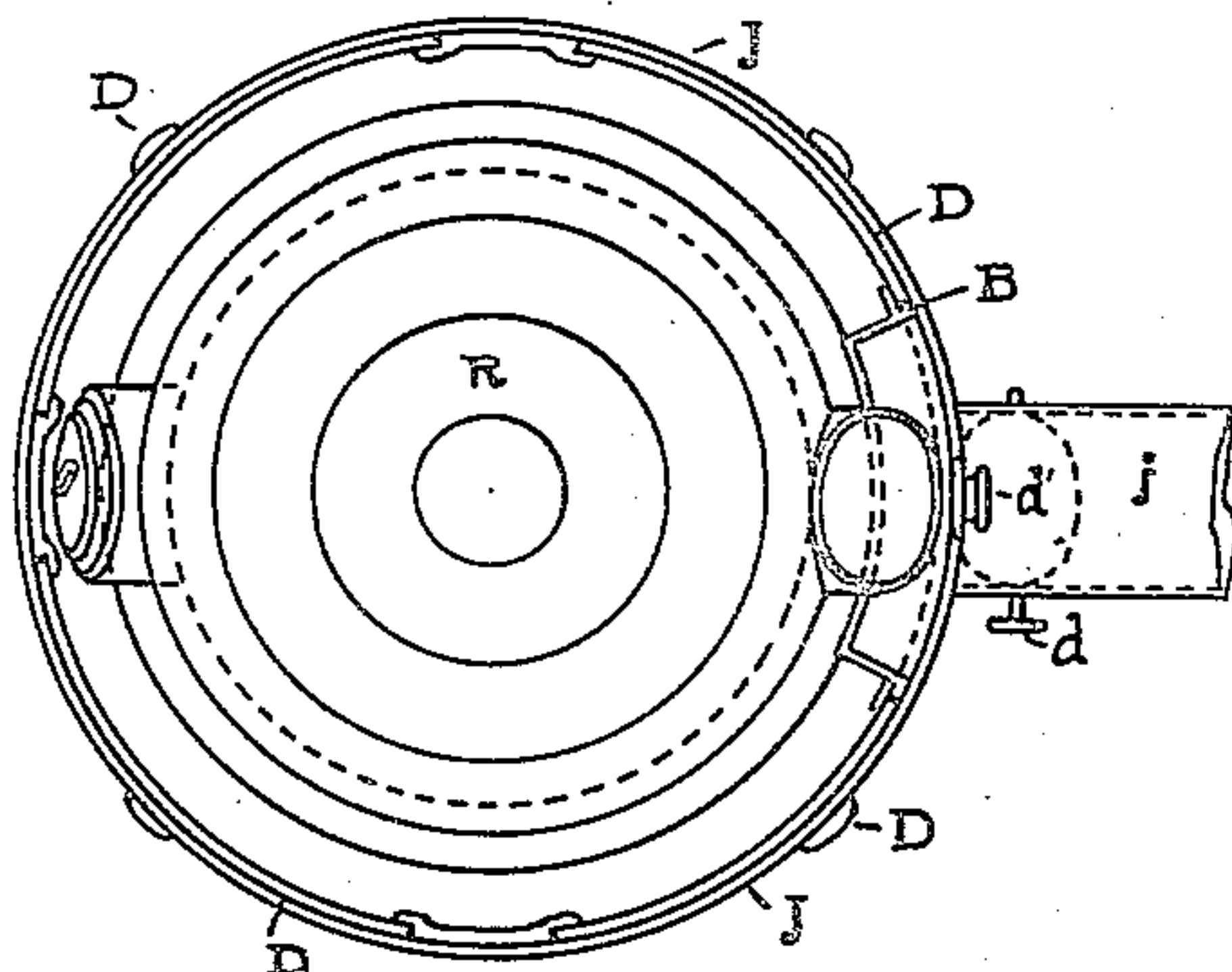


Fig. 2.

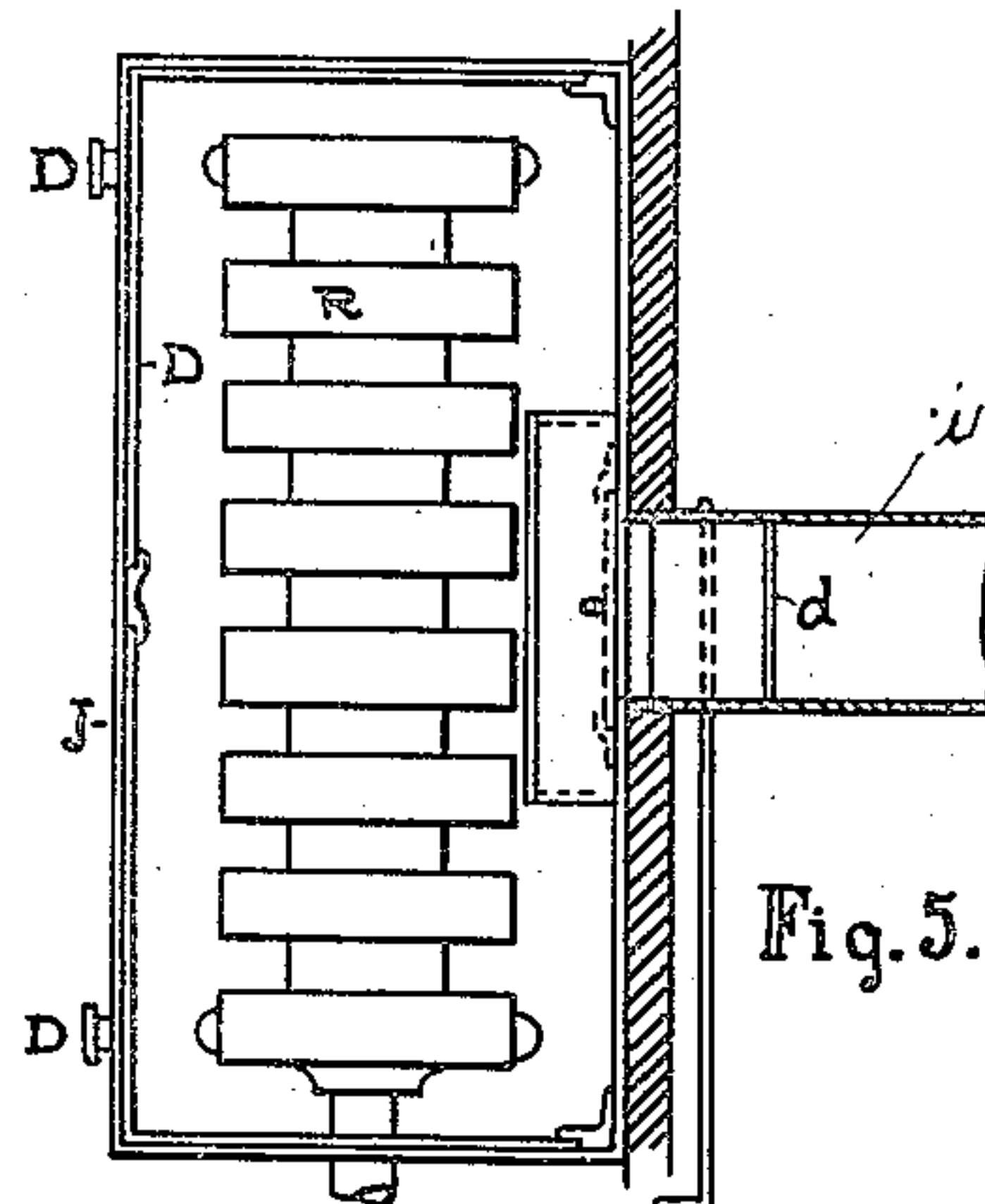


Fig. 5.

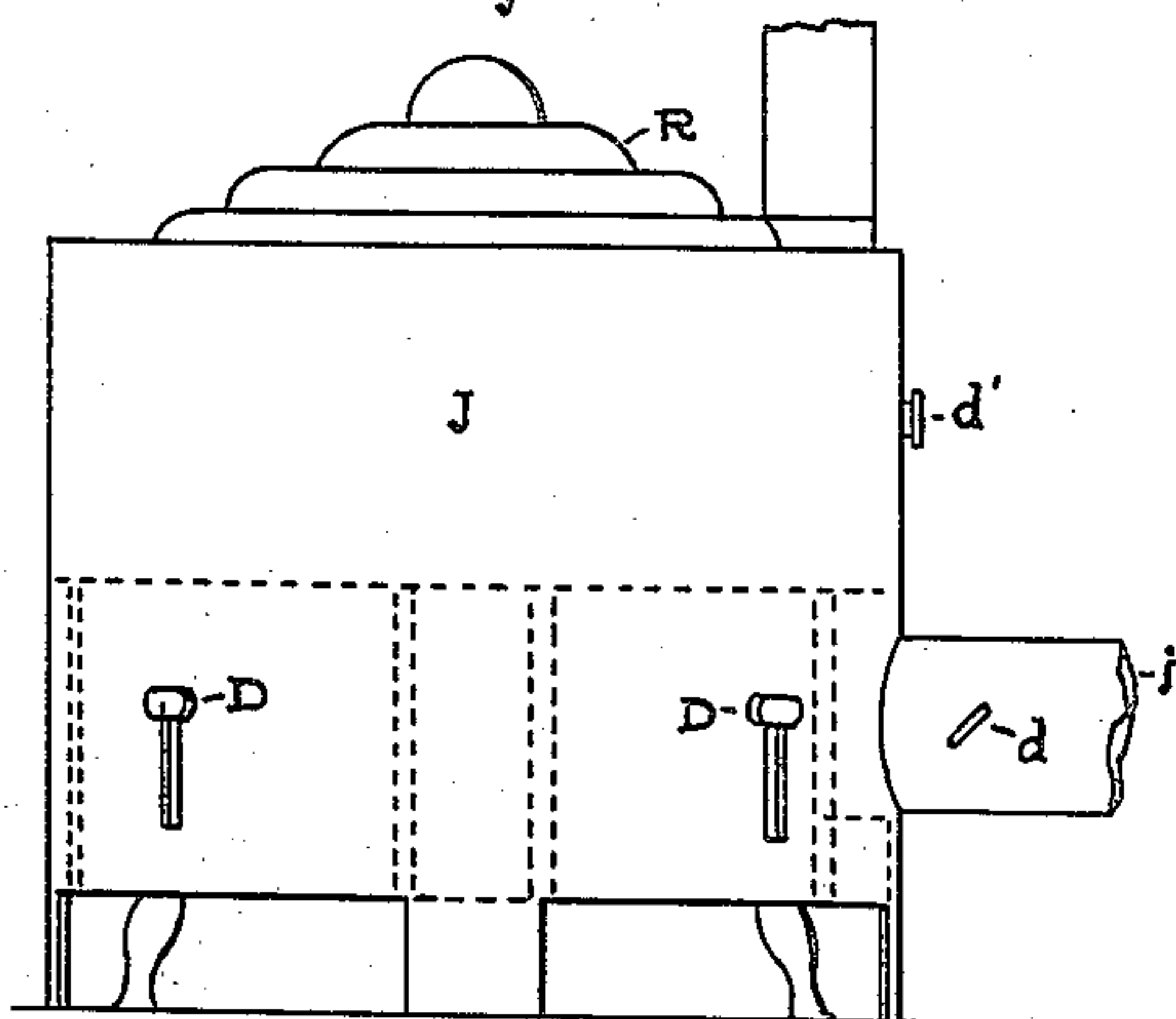


Fig. 3.

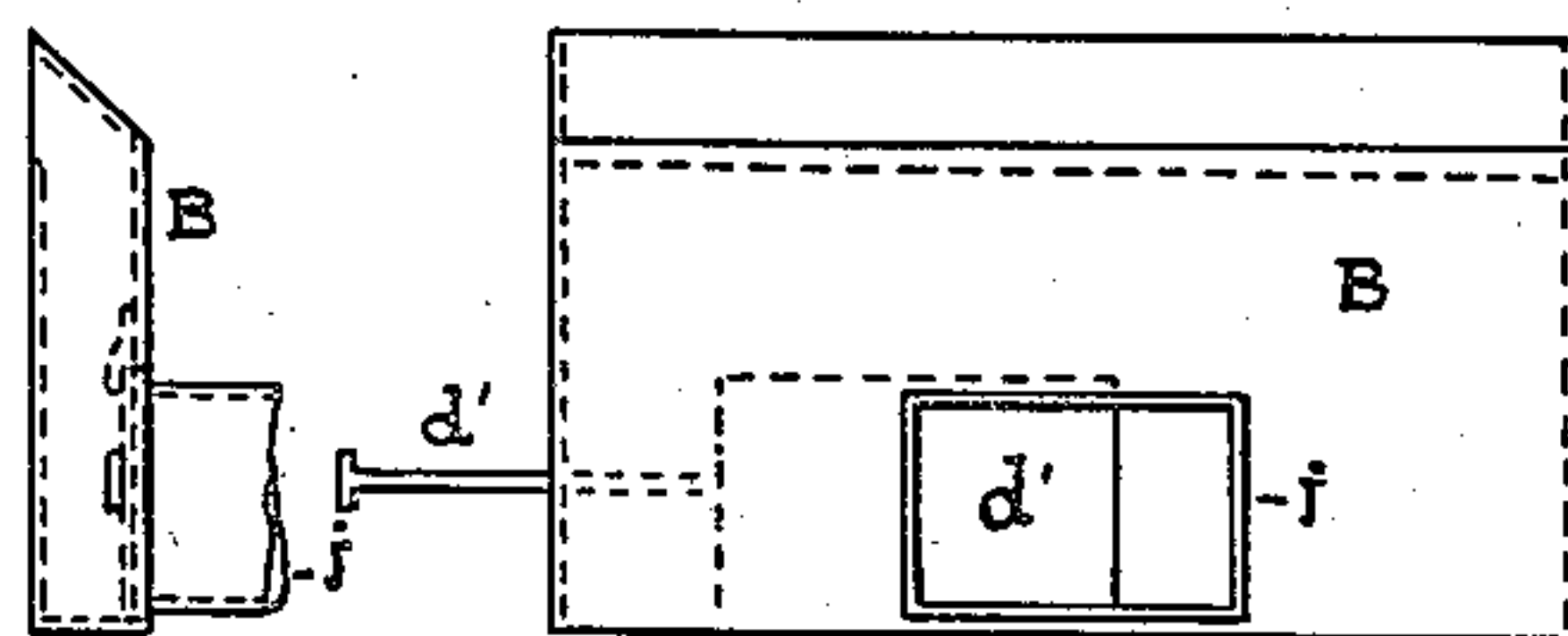


Fig. 6.

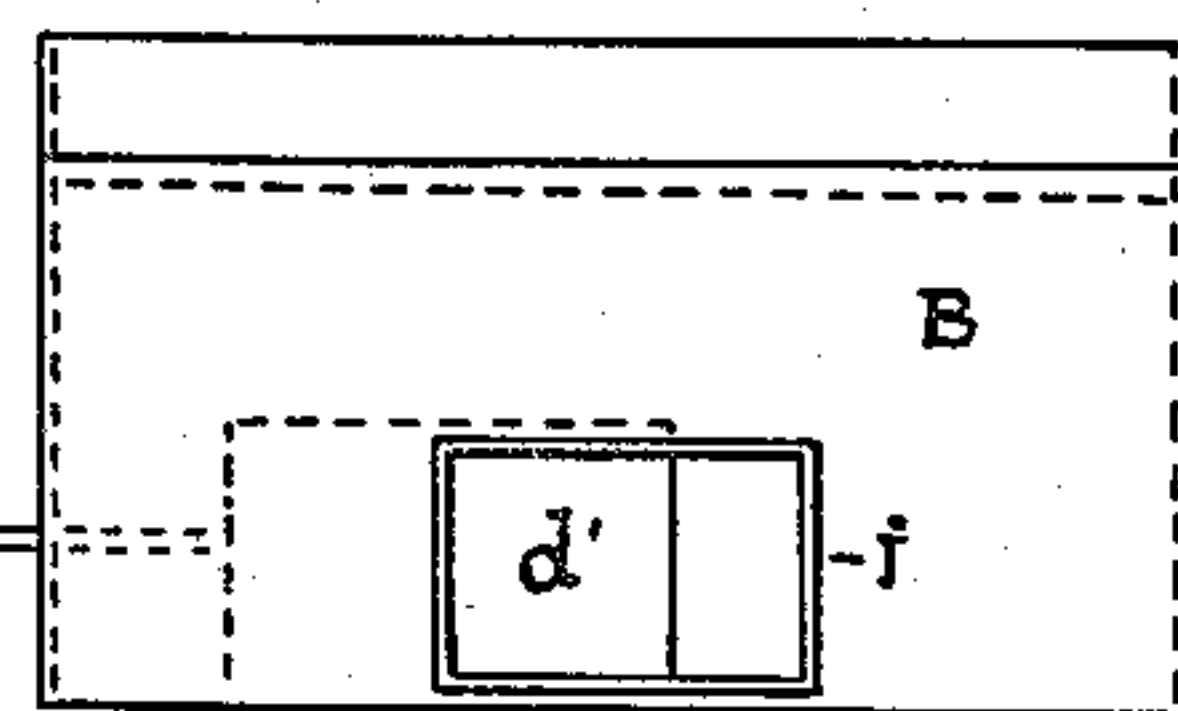


Fig. 7.

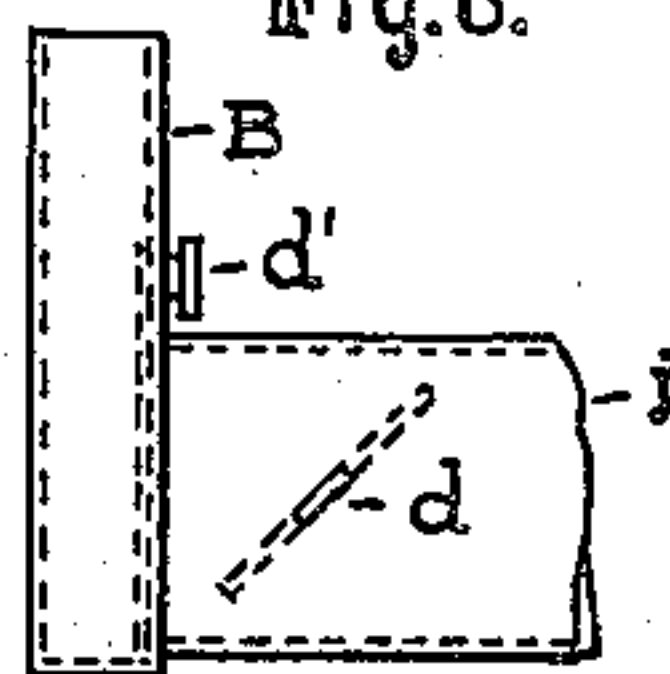


Fig. 8.

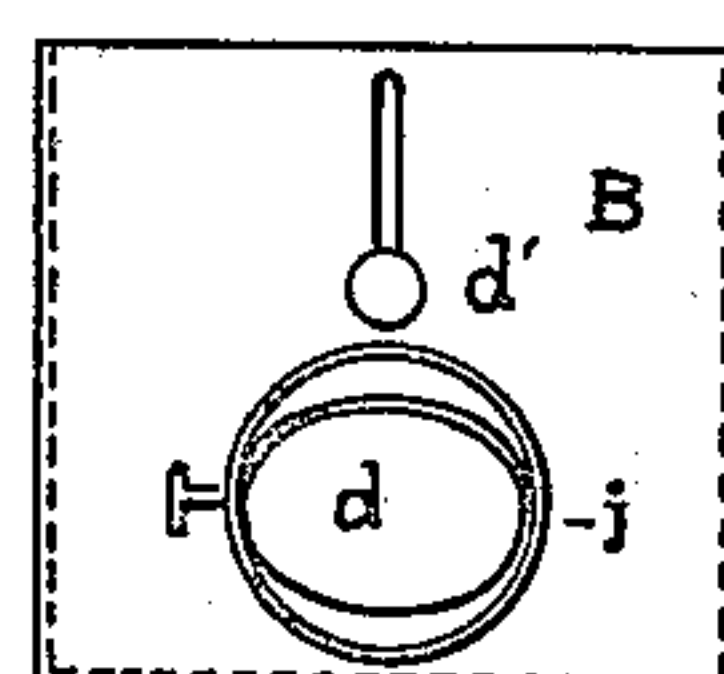


Fig. 9.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## HEATING AND VENTILATING SYSTEM.

No. 868,299.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed December 20, 1905. Serial No. 292,638.

*To all whom it may concern:*

Be it known that I, CHARLES H. SMITH, a citizen of the United States, residing in Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Heating and Ventilating Systems, of which the following is a specification.

This invention relates to a heating and ventilating system, and one object of the invention is to direct cold air into a building and cause it to be passed over a heating means.

Another object resides in the provision of means for association with a heating means embodying such characteristics as to bring fresh air into a building and heat the same prior to its spreading out upon the floor of the building.

A still further object is to draw air from the floor of a building or from the outside thereof, or both independently or simultaneously, and properly warm the air by directing it over any form of heating means, as for example, a furnace, stove, radiator or the like.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and particularly pointed out in the appended claims.

In the drawings:—Figure 1 is an elevation of a stove illustrating my invention in vertical section. Fig. 2 is a plan view. Fig. 3 illustrates my invention in elevation. Fig. 4 illustrates a radiator in elevation and another form of my invention in vertical section. Fig. 5 is a plan view of the structure shown in Fig. 4. Figs. 6 and 7 are end and side elevations, respectively, of the cold air box with its inlet pipe in the form adapted particularly for steam or water radiators. Figs. 8 and 9 are end and side elevations, respectively, of a cold air box adapted for use in connection with hot air radiators or stoves.

In systems of heating buildings by the use of heaters or radiators, it is desirable to warm the coldest air of the room and such cool air is always found close to the floor. In auditorium rooms and school houses, it is always desirable to admit fresh air of a lower temperature than that of the room. The admission of cold air upon the floor of a room causes it to spread out and cool the floor and in the case of school houses and auditorium rooms the cold air tends to and will chill the feet of occupants of the room before it can be drawn by the radiators from the floor and properly heated and distributed through the air in the upper portion of the room. In dwelling houses and other rooms it is desirable to heat the air therein without admitting fresh air except as may be drawn in at the windows and openings of the building.

In carrying out the present invention and for admitting fresh air to stoves, radiators or other heaters

for the heating of the room, I preferably employ a cold air box B provided with an intake pipe *i*, the cold air box being preferably placed against or near the radiator furnishing the heat to the room so as to cause the current of air coming into the cold air box B to take an upward direction and mix with the ascending currents of hot air radiating from the heating means. The cold air box B is opened at its upper end, and when my invention is applied to an ordinary stove, such as shown in Figs. 1, 2 and 3, the cold air box B is preferably formed as shown in these said figures. In application to another form of heater it may have the form shown in Figs. 8 and 9, and as in Figs. 1, 2 and 3, the box is opened at its upper end. When used in connection with steam or water radiators or radiators in section, it is preferably made in the forms shown in Figs. 6 and 7, wherein it will be seen by reference to said figures of the drawings, that the cold air conveyed to the intake pipe *i* will be directed inwardly toward and pass over the radiator.

In connection with any one of the forms of cold air boxes employed, I associate with them, a suitable jacket J which is placed about the heater or radiator R, as shown in the accompanying drawings. This jacket is preferably open at the bottom for the admission of air from the floor or from near the floor, which air, when heated by the heater or radiator R, rises upwardly within the said jacket and mixes with the air of the room. In auditorium rooms and school houses it is sometimes expedient to have the air drawn into the buildings more rapidly than is necessary in certain other buildings, and for this reason, the jacket J is provided with the dampers D to close over the aforesaid openings at the bottom of the jacket, thereby causing a draft calculated to draw the air from the cold air box B rapidly through the cold air inlet *i*, and whereby the room is furnished with a supply of warmed fresh air, causing the air from the floor to circulate about the heater or radiator R. It will be seen that the cold air box B is provided with a damper *d'* and that the intake pipe *i* is provided with a damper *d*. Thus the supply of fresh air may be regulated if desired.

When the rooms are empty and while the air in the room is still fresh, the jacket is left open at the bottom so that air from the floor can circulate about the heater and thereby become warmed in its passage over the heater and displace the cooler air on the floor subsequent to its passage over the heater. As the cool air from the floor is drawn up within the jacket J and circulated about the radiator or heater R, it is preferred that fresh air not enter and the damper *d* or *d'* or both are preferably closed. If the room becomes filled with persons and their breathing befouls the air or whenever fresh air is desirable for any cause, the cold air box may be made to supply the fresh air by the opening of the damper *d* or *d'*, as the case may be.



This fresh air instead of pouring out over the floor is directed by the cold air box B upward and mixes with the air being heated by the heater or radiator R.

The dampers D may be used to close the opening in the bottom of the jacket J and thus force the radiator R to furnish only warmed fresh air from the cold air box B. In the majority of cases, however, the use of the cold air box B with its intake pipe i will furnish sufficient fresh air with the bottom of the jacket J open, so that the heater or radiator R will keep the air of the room in circulation, drawing the cold air from the floor and the warm air from the upper part of the room downward and mixing it with the fresh air through the cold air box B and thereby warm the air of the room and continuously supply the latter with warmed, fresh air.

From the foregoing it will be seen that I provide an unrestricted open-ended jacket adapted to surround any type of heating means in spaced relation to the latter to provide for the creation and maintenance of a continuous circulation of air of the room in which the heating means is located inwardly through one end of the jacket and outwardly through the other end thereof with means whereby cold fresh air may be intermingled with the air of the room as the latter circulates through the space between the heating means and the jacket.

What I claim is:—

1. In a heating and ventilating system, the combination with a heating means; of an open ended jacket surrounding the heating means; a cold air box arranged between the heating means and the jacket, the upper end of the box having an opening and an inclined portion above the opening to deflect air from the box toward the heating means, and a cold air intake communicating with said box.

2. In a heating and ventilating system, the combination with a radiator; of an open ended jacket surrounding the radiator; a cold air box arranged between the radiator and the jacket, the lower end of the box being closed and having an opening in its wall adjacent the radiator and an inclined portion to deflect air from the box toward the radiator, and a cold air intake pipe communicating with said box.

3. In a heating and ventilating system, a heating means surrounded by an air heating chamber which is open at its opposite ends, whereby a continuous circulation of air of the room in which the heating means is located is produced and maintained inwardly through one end of the chamber and outwardly through the other end thereof, a cold air box arranged within the air heating chamber having a closed lower end to exclude the air of the room, and a cold air intake pipe communicating with the cold air box, the latter being constructed to permit the cold air to intermingle with the room air in its passage through the air heating chamber.

4. In a heating and ventilating system, a heating means; an unrestricted open ended jacket surrounding the heating means, whereby a continuous circulation of the air in the structure in which the heating means is located is maintained inwardly through one end of the jacket and outwardly through the opposite end thereof, a cold air deflecting means arranged between the heating means and the jacket; and a cold air intake communicating with the deflecting means, the latter being constructed to exclude the air of the room and to permit of intermingling of the air of the room and the external air in its passage through the jacket.

5. In a heating and ventilating system, the combination with a heating means; of an upright unrestricted open ended jacket surrounding the heating means to provide an air heating chamber; a cold air intake communicating with the air heating chamber, and a deflector arranged within the air heating chamber in line with the intake pipe to direct the air from an external source into intermingling relation with the air of the room in which the heating means is located.

6. In a heating and ventilating system, the combination with a heating means; of an upright unrestricted open ended jacket surrounding the heating means to provide an air heating chamber, the lower end of the jacket receiving the air of the room in which the heating means is located, a cold air intake pipe communicating with the air heating chamber; and means arranged within the latter adapted to exclude the air of the room therefrom and to permit of an intermingling of the internal and external air in their passage through the air heating chamber.

In testimony whereof I have hereunto set my name in the presence of two subscribing witnesses.

CHARLES H. SMITH.

Witnesses:

ISIDORE GERMAN,  
F. E. MITCHELL.