

J. RICE.
Car Heater.

No. 80,505.

Patented July 28, 1868.

Fig. 1.

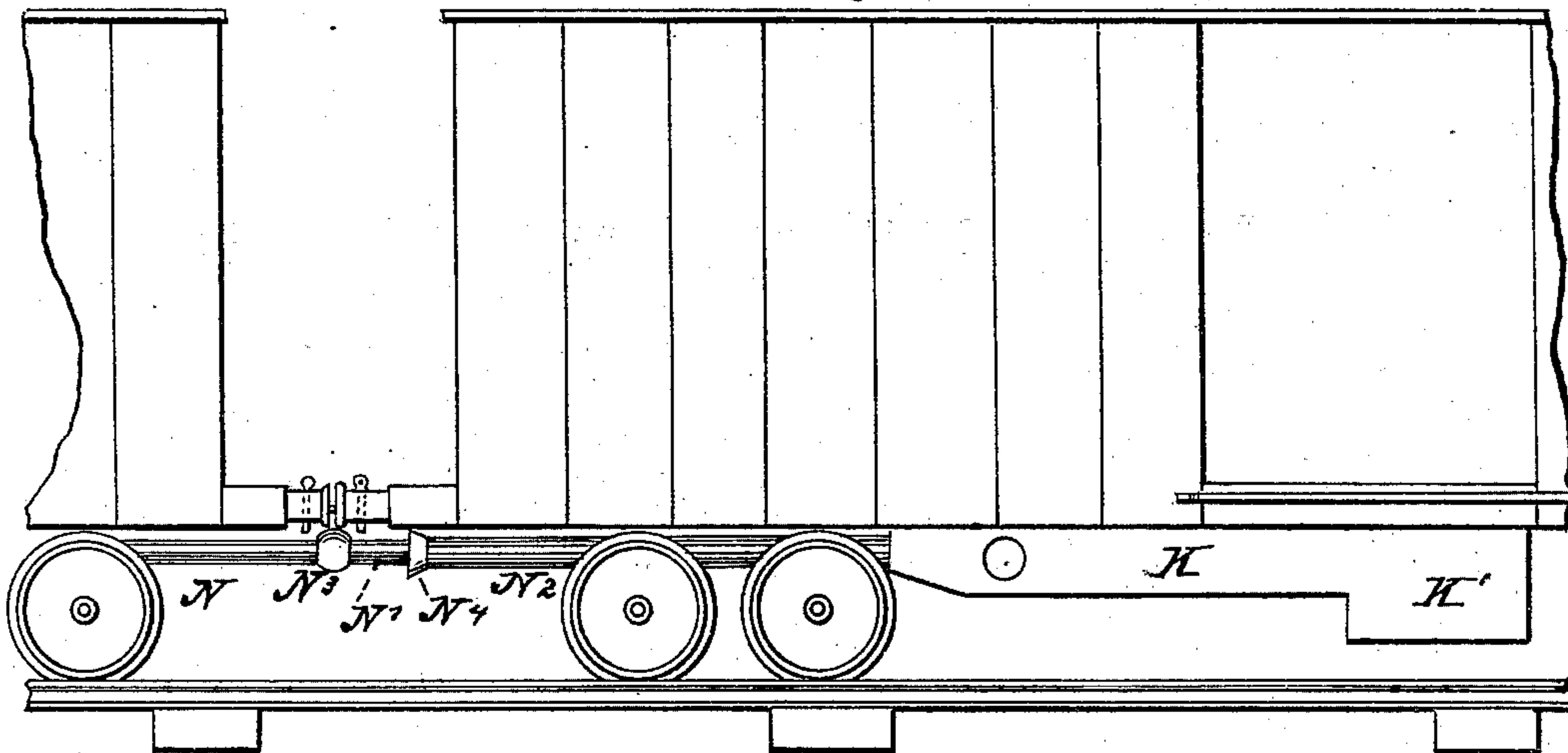


Fig. 2.

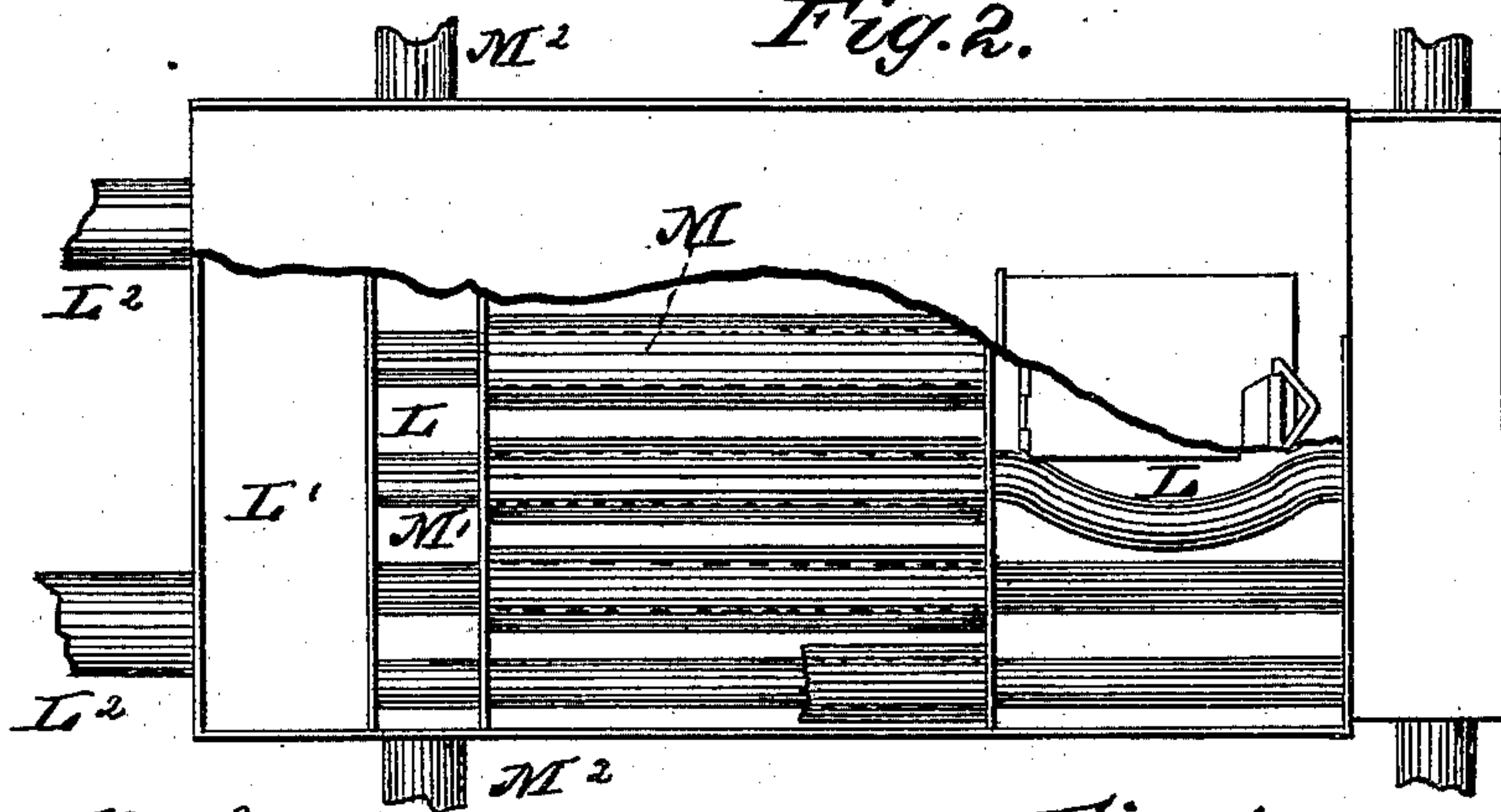


Fig. 3.

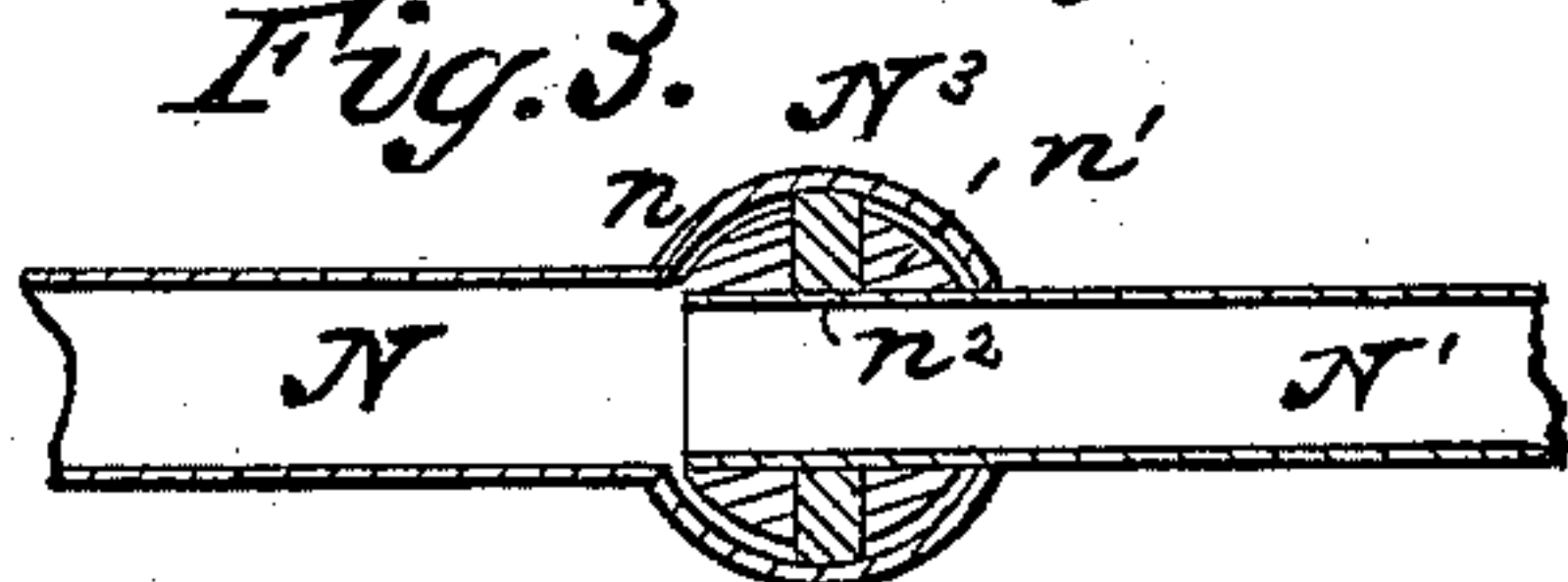
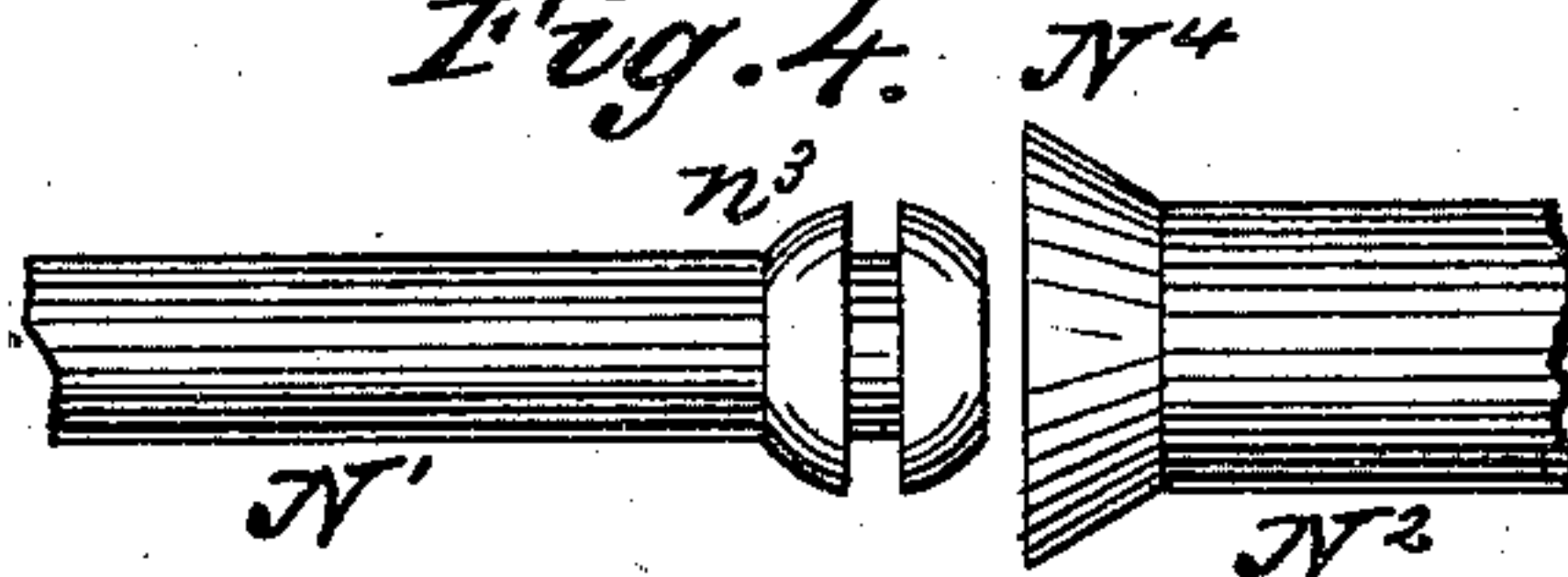


Fig. 4.



Witnesses:
Fred Thomas
H. C. Stumph.

Inventor:
John Rice by
J. W. Beadle atty.

J. RICE.
Car Heater.

No. 80,505.

Patented July 28, 1868.

Fig. 5.

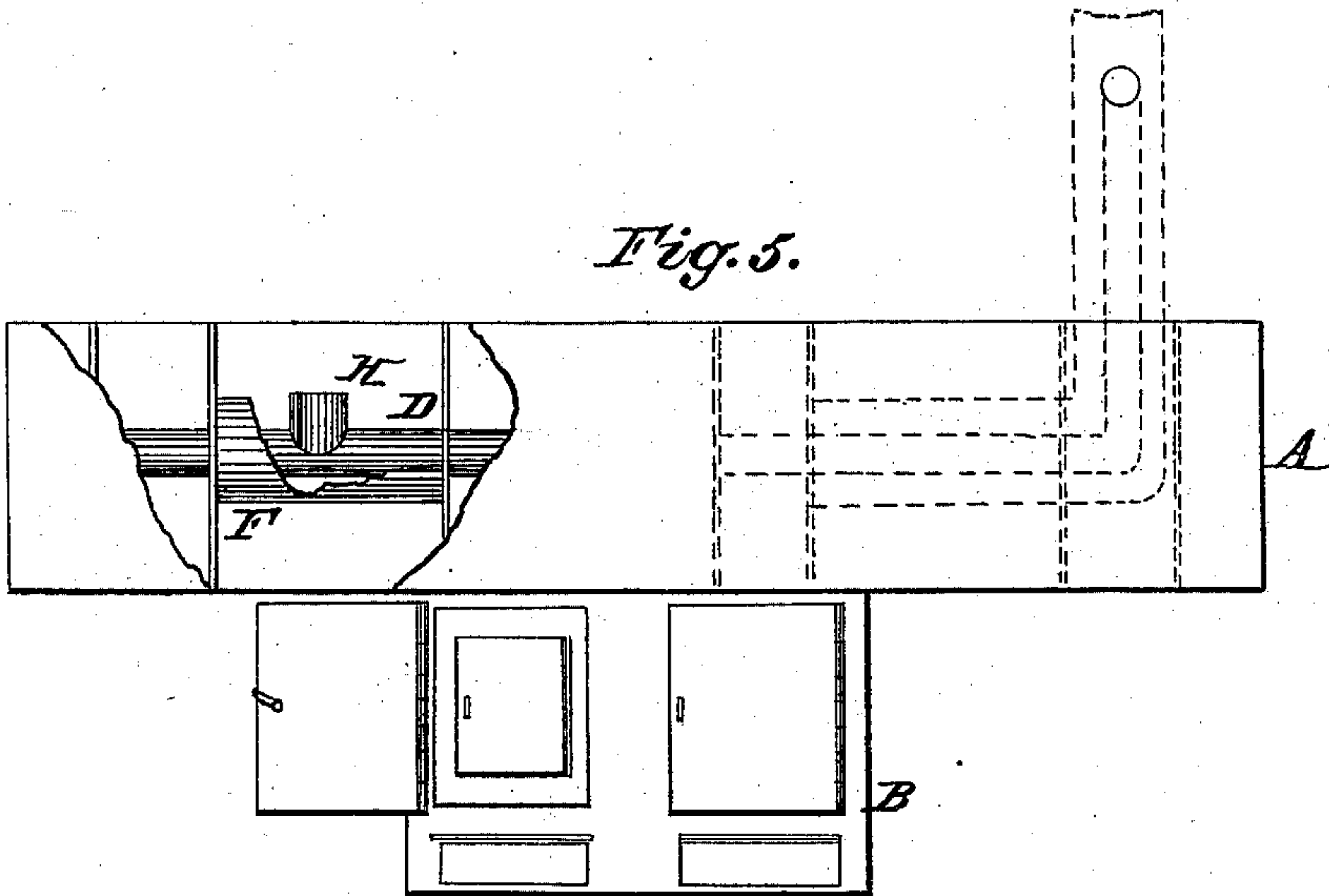
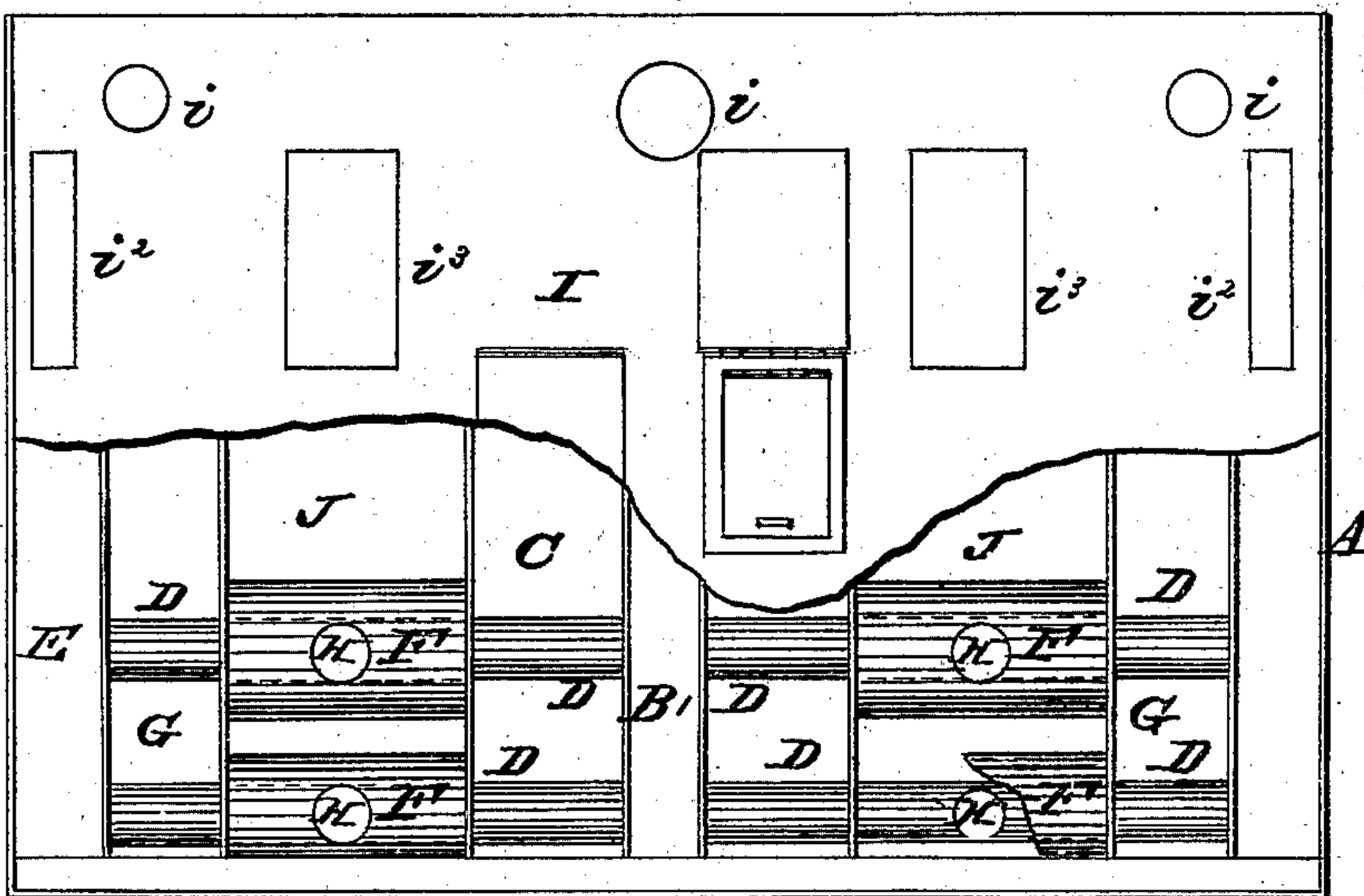


Fig. 6.



Witnesses:
Fred Thomas
W. B. Stump

Inventor:
John Rice by
J. W. Beadle atty

United States Patent Office.

JOHN RICE, OF BLOOMINGTON, INDIANA.

Letters Patent No. 80,505, dated July 28, 1868.

RAILROAD-CAR HEATER.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN RICE, of Bloomington, in the county of Monroe, and State of Indiana, have invented a new and useful Car-Heater; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to certain improvements in heating-apparatus for railroad-cars, and consists principally in the construction and arrangement of the heater, as will be fully described hereinafter.

Figure 1, sheet 1, represents a side elevation of one form of my improved heater.

Figure 2, a plan view of the same.

Figure 3, a sectional view of the flexible joint.

Figure 4, an elevation of the pipe-coupling, uncoupled.

Figure 5, sheet 2, represents a side elevation of another form of my heater, and

Figure 6 a plan view of the same.

In the drawings, sheet 2, A represents an iron box or chamber, which is securely attached beneath the car, above the trucks. This box should be made sufficiently strong to prevent the trucks from forcing themselves up through the floor of the car in case of accident.

B represents the fire-box proper, which is attached below box A, at its centre, as shown. This fire-box is constructed with double walls and doors, for the purpose of shutting in the heat, and preventing the fire-box from being cooled by its rapid motion. It is also provided with suitable openings for draught upon each side, which have, of course, regulating-dampers, which latter may be operated from the car by any proper lever-arrangement. The fire-box is divided into two parts, being separated by the chamber B', in which latter water may be placed for the purpose of giving the heated air proper moisture. This chamber is covered with an iron plate, which separates it suitably from the other parts of the heating-apparatus. Openings, however, should be left, to permit the steam to rise and pass into the other parts.

Opening into it, above the plate, upon either side, are the air-tubes D D, which extend in either direction, and communicate with the hot-air chambers E E, one being located at each end of the car.

C C represent chambers communicating with the chambers of the fire-box below. These are also covered in with iron plates, to shut off communication with other parts of the apparatus. Opening into these also are the smoke-tubes F F, encircling the air-tubes D D, which former communicate with the smoke-chambers G G. It will also be observed that the air-tubes pass across these chambers, and thus receive heat directly from the fire below. Being also surrounded by the tubes which convey away the smoke and products of combustion, they retain the original heat, and constantly receive fresh supplies from this source.

H H represent passages cut through the smoke-tubes into the air-tubes, for the purpose of tapping the latter, and obtaining a supply of heated air at any desired point.

I represents an iron plate covering the entire heating-apparatus.

i represents the smoke-pipe holes communicating with the chamber below.

i' i' represent the cold-air entrances, which open into chambers B' below.

i'' i'' represent registers over the hot-air chambers, and i''' i''', registers over the openings H H.

It will be observed that, by the general arrangement before described, two large chambers are formed, J J, around the smoke-tubes F F. In these also the air must necessarily become very much heated. This may be utilized by simply having a register open into it. The register i'', placed over passages H H, may be set a little distance above the tubes, which arrangement will allow the heat from chambers J J to pass out with the heat from the air-tubes.

In street-railway cars it may be desirable to make and tend the fire within the car, in which case suitable doors should be made in the exterior plate, I, and interior plate over the fire-chambers.

The operation of my invention is as follows:

The fire is built in the fire-box B, either from above or below, as the case may be, and water is placed in chamber B'. Cold air is admitted through the entrances $i^1 i^1$, which open into the chamber B' below. Upon entering this chamber, the cold air unites with the steam rising from the water below, thus receiving proper moisture, and passes into tubes D D, upon either side.

The first part of these tubes passes through the fire-box, and is highly heated thereby, which heat, being communicated to the air, is retained by it in its continued passage through the tube, the air being still further heated by the hot gas and smoke in pipes F, which surround pipes D. These tubes may be extended the entire length of the car, if desired.

By this arrangement the air is heated to a very high temperature by the time it reaches the chambers E E. From there it is drawn off by means of registers. Passages may be cut through the smoke-pipes, and the air-pipes tapped at any desired point, so that, if considered necessary, a register may be placed at every seat. The smoke and products of combustion arising from the fire-box, pass through the smoke-tubes, as described, into smoke-chambers G G, and are discharged finally through the smoke-pipe i^1 .

The air-pipes may be extended with the smoke-pipes, if desired, and be carried with them up the sides of the car, in which case they may be tapped at both top and bottom, if desired. Suitable openings in the outer box may be made, for the purpose of cleaning the tubes, when necessary. If desired, an additional pipe may be placed about the smoke-pipe, to insure a more perfect retaining of the heat. This, however, is not deemed necessary ordinarily. The air and smoke-tubes will necessarily expand more or less under the influence of the heat, and it is therefore proposed to make the partitions free at one end, in order that they may slide forward when the tubes expand, and backward when they contract.

In sheet No. 1 is shown a modification of my invention, and also the manner of conducting the heat from car to car.

In the drawings, K represents an iron box, which may be securely attached beneath the floor of a baggage-car, or other suitable place.

K' represents the fire-box proper, which may be fired from above or below, as desired.

L represents the air-tubes, which may open into a chamber provided with suitable outward openings, or they may communicate with the open air. These tubes pass directly through the fire-box, and also through the smoke-pipes, as previously described.

L^1 represents the hot-air chambers, with conductors L^2 .

M represents the smoke-tubes, M^1 the smoke-chamber, and M^2 the smoke-pipes.

N N^1 N^2 represent the pipes which conduct the heat from car to car. N^3 represents the flexible joint, and N^4 the coupling. The joint is composed of the socket n and ball n^1 , the latter of which is provided with the groove n^2 , in which packing is inserted.

The pipe N^1 is smaller in size than pipe N. This allows the joint to move freely to some extent, without permitting the escape of the heated air.

The coupling consists of the pipe N^1 , which is provided with the grooved and packed head n^3 , which fits snugly into pipe N^2 , the latter being provided with the enlarged opening, as shown, for the purpose of permitting the connection to be easily made. These different pipes are of sufficient length to permit the pipe N^1 to play forward and back in the pipe N^2 without danger of disconnecting.

The disconnection is easily made when the cars uncouple, as the pipe N^1 simply draws out of the pipe N^2 . If deemed necessary, these pipes may be also made double, for the purpose of more perfectly retaining the heat.

The apparatus herein described may be used in summer as a ventilator, for which purpose it is exceedingly well adapted.

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

The heating-apparatus A B, constructed and arranged as described, that is, having the chamber B', air-tubes D in smoke-tubes F, chambers C C, E E, G G, and registers and discharge-pipes, as shown, the whole being attached to and combined with a railroad-car, and operating substantially in the manner described, and for the purpose set forth.

This specification signed and witnessed, this sixteenth day of May, 1868.

JOHN RICE.

Witnesses:

E. R. BEADLE,

FREDERIC THOMAS.