

(No Model.)

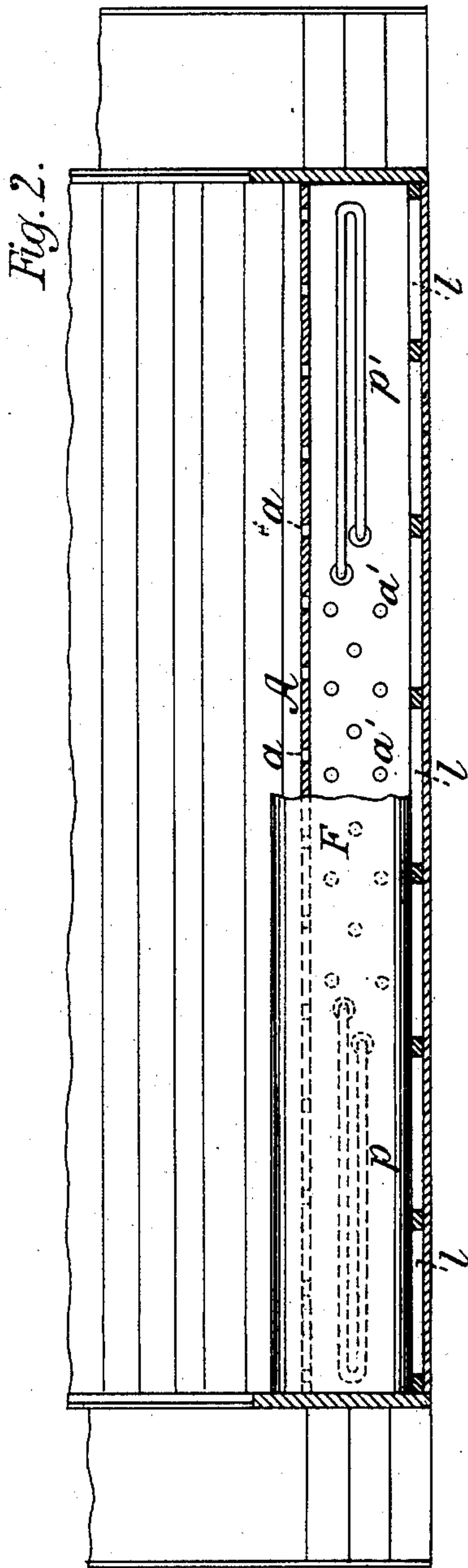
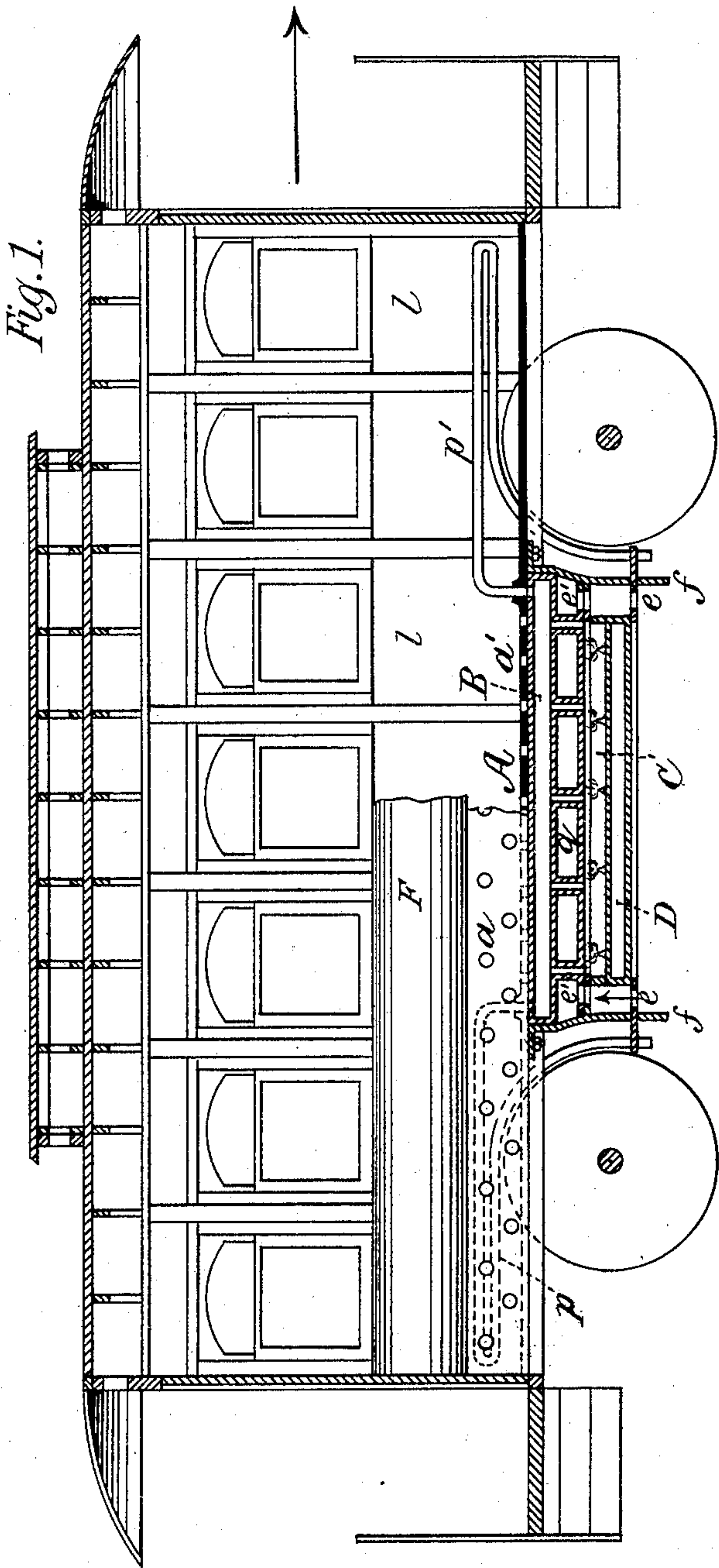
3 Sheets—Sheet 1.

W. FLANAGAN.

APPARATUS FOR HEATING RAILWAY CARS.

No. 375,738.

Patented Jan. 3, 1888.



Witnesses:

A. E. Gamet
C. C. Yates.

Inventor:

William Flanagan
by Fred. Artoz
his Att'y.

(No Model.)

3 Sheets—Sheet 2.

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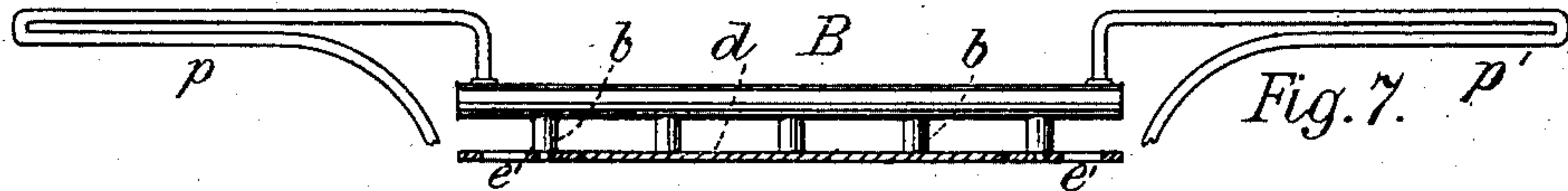


Fig. 7.

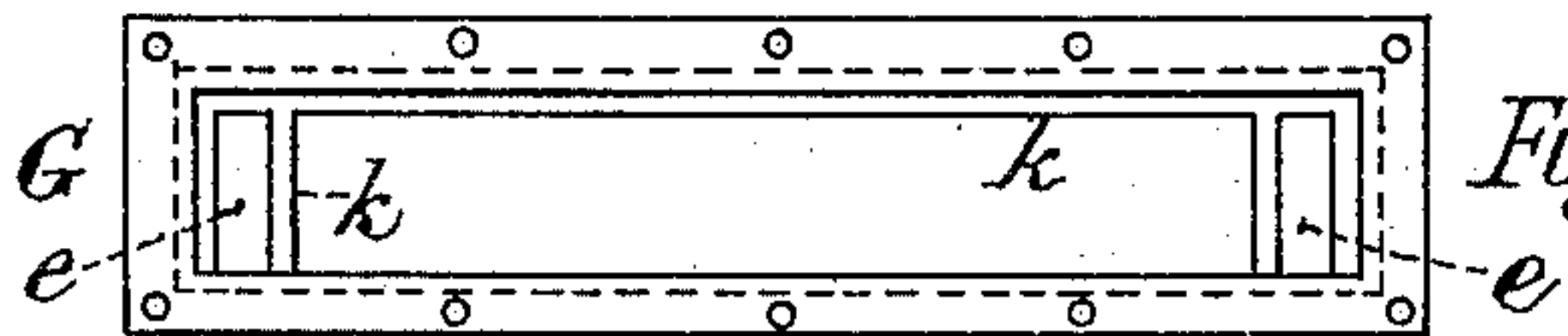


Fig. 6.

Fig. 3.

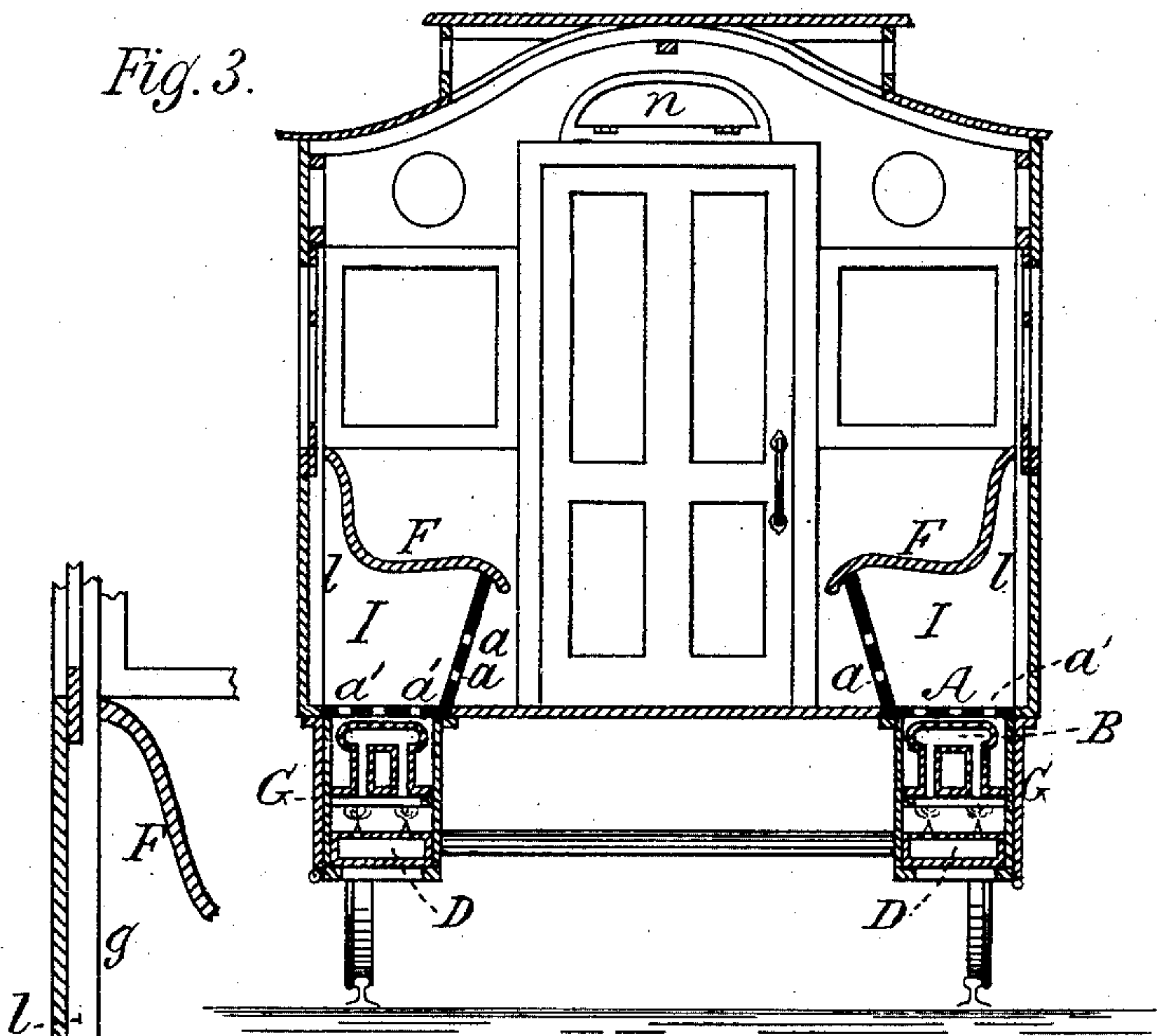


Fig. 4.

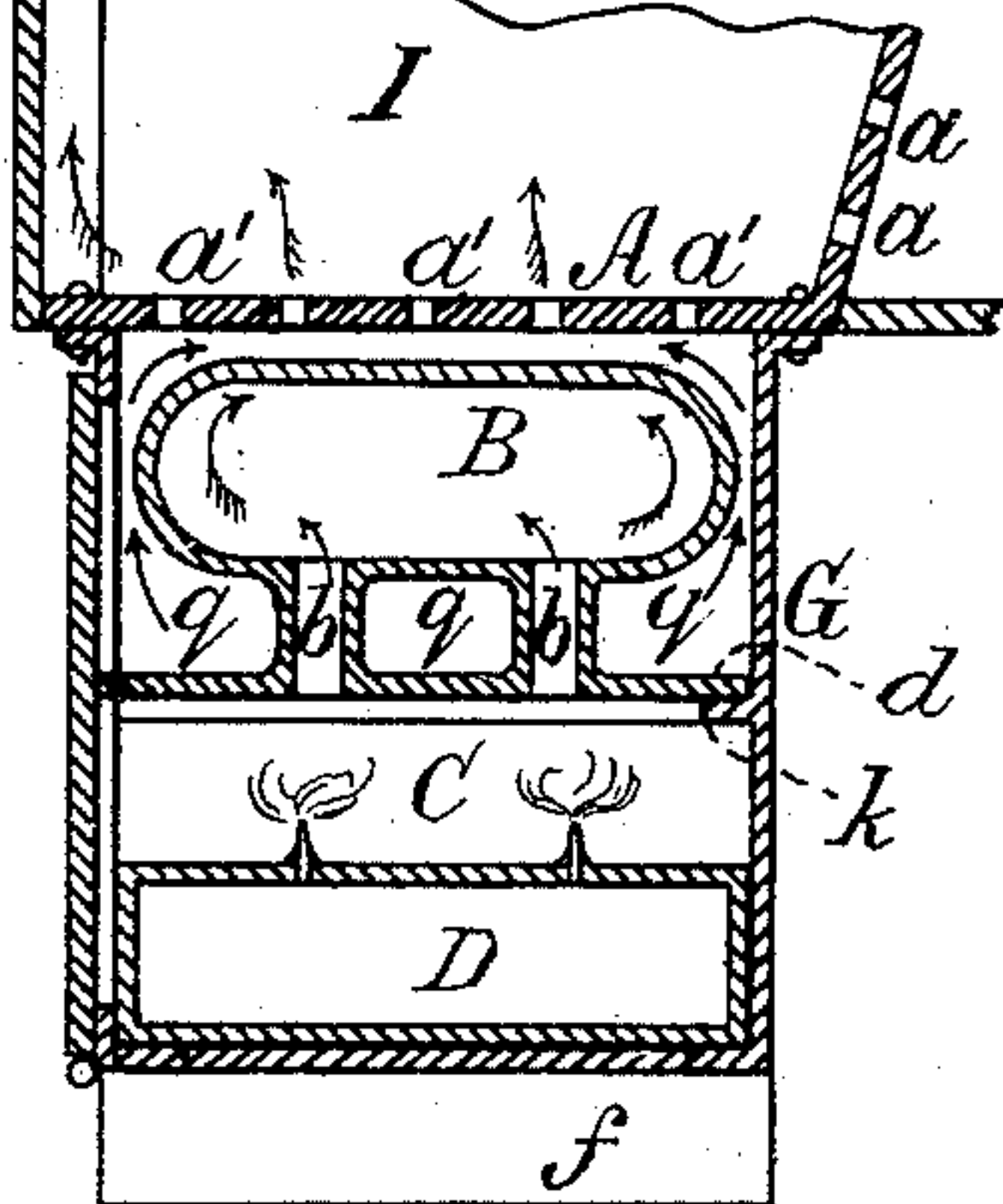
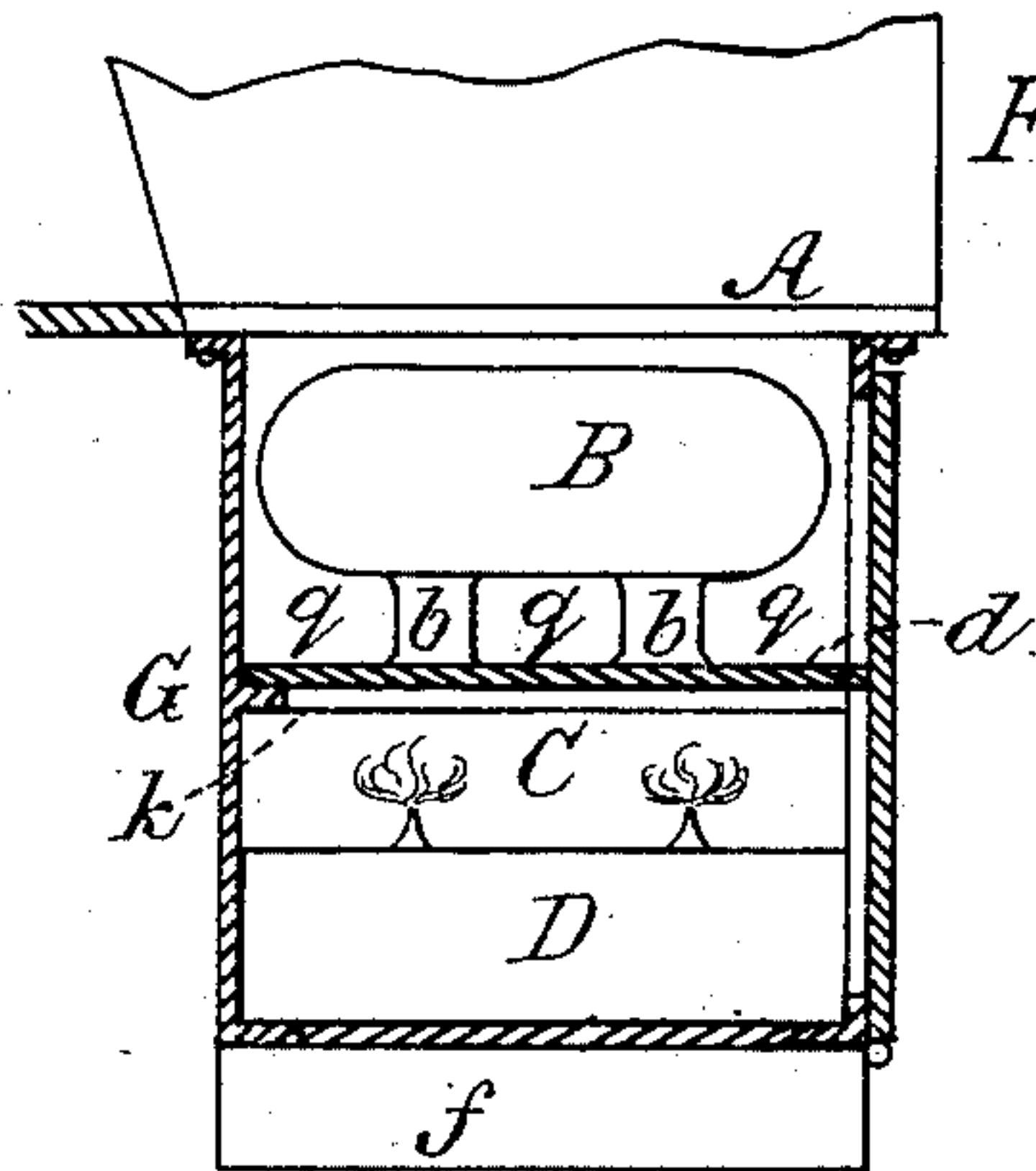


Fig. 5.



Witnesses:

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(No Model.)

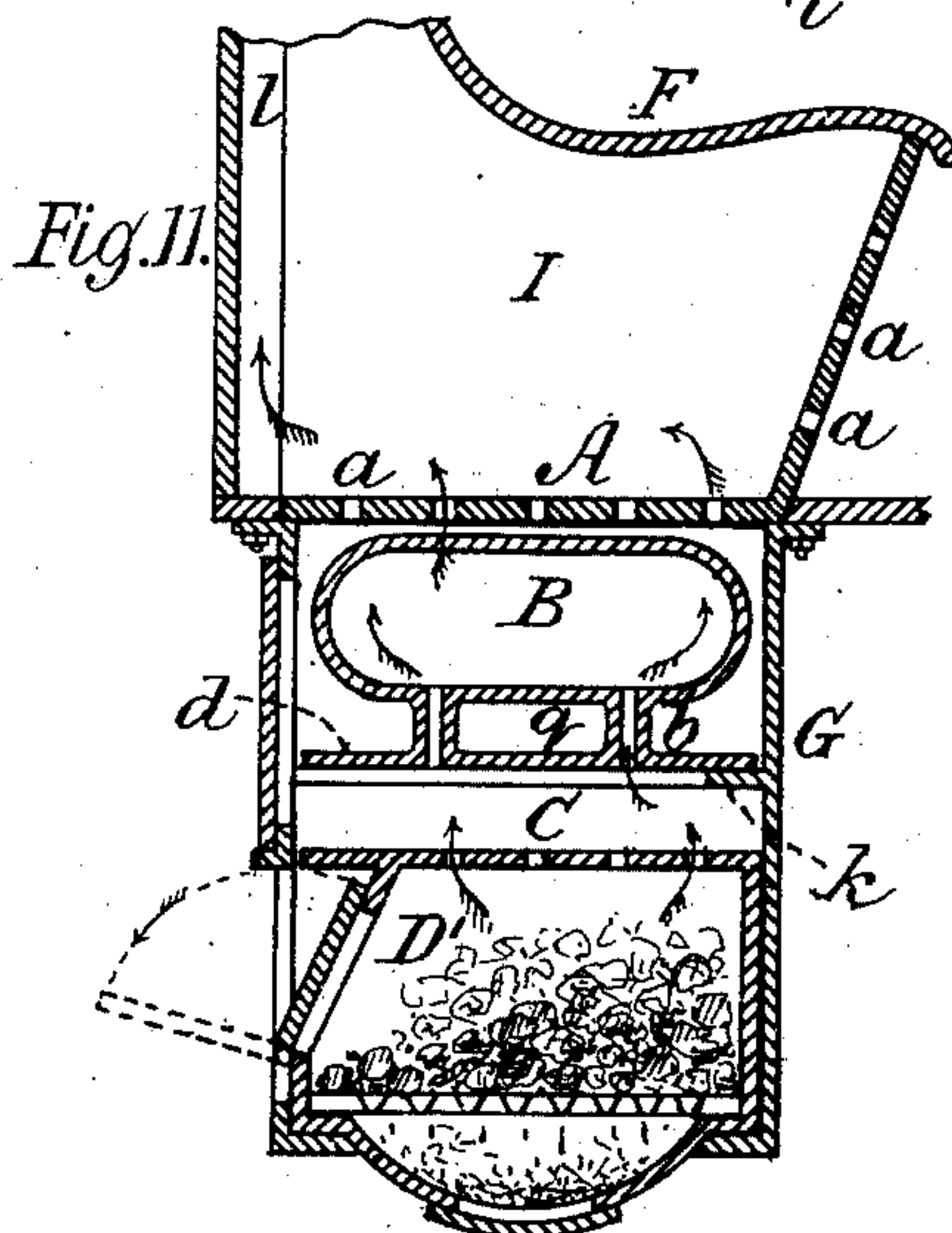
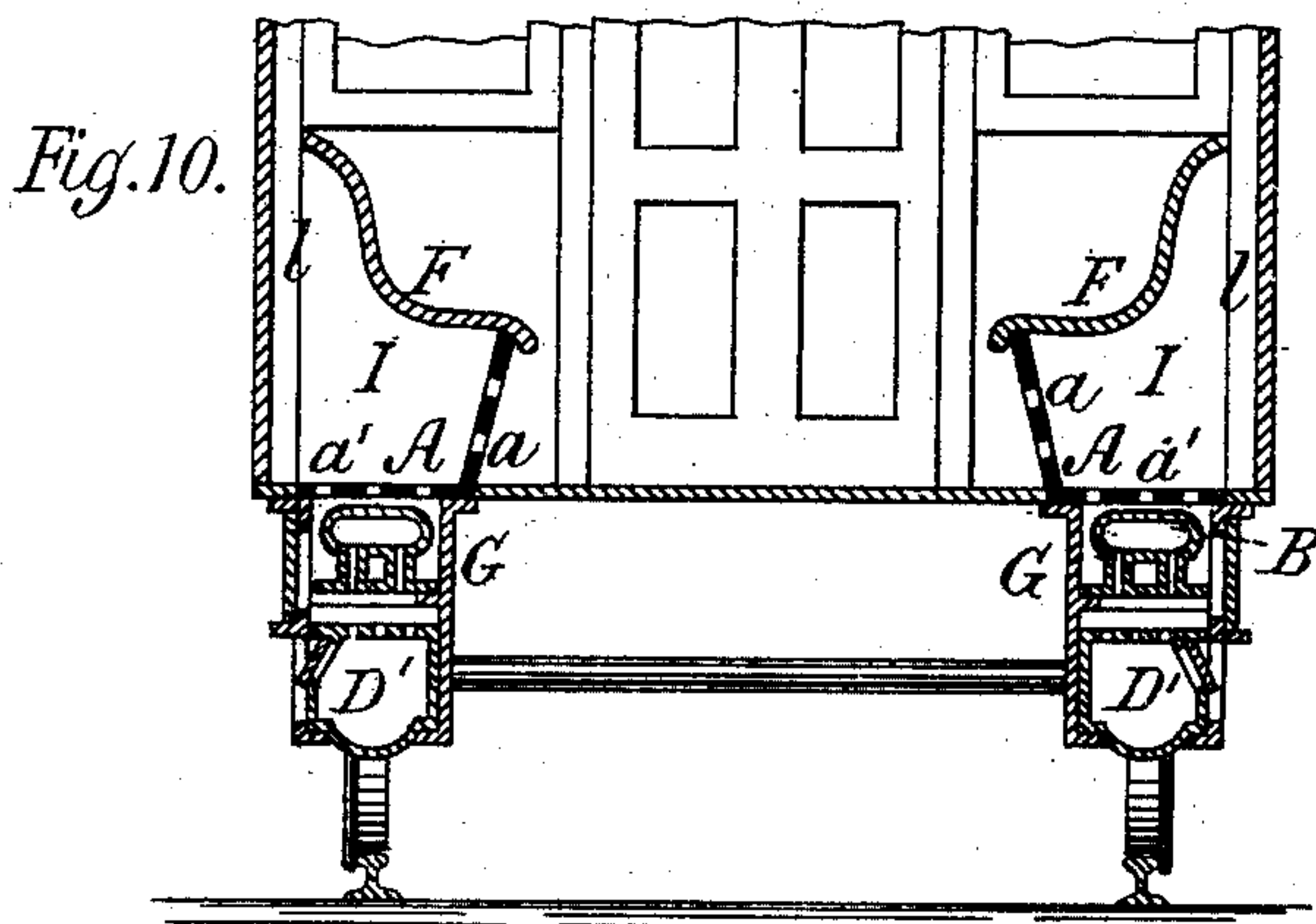
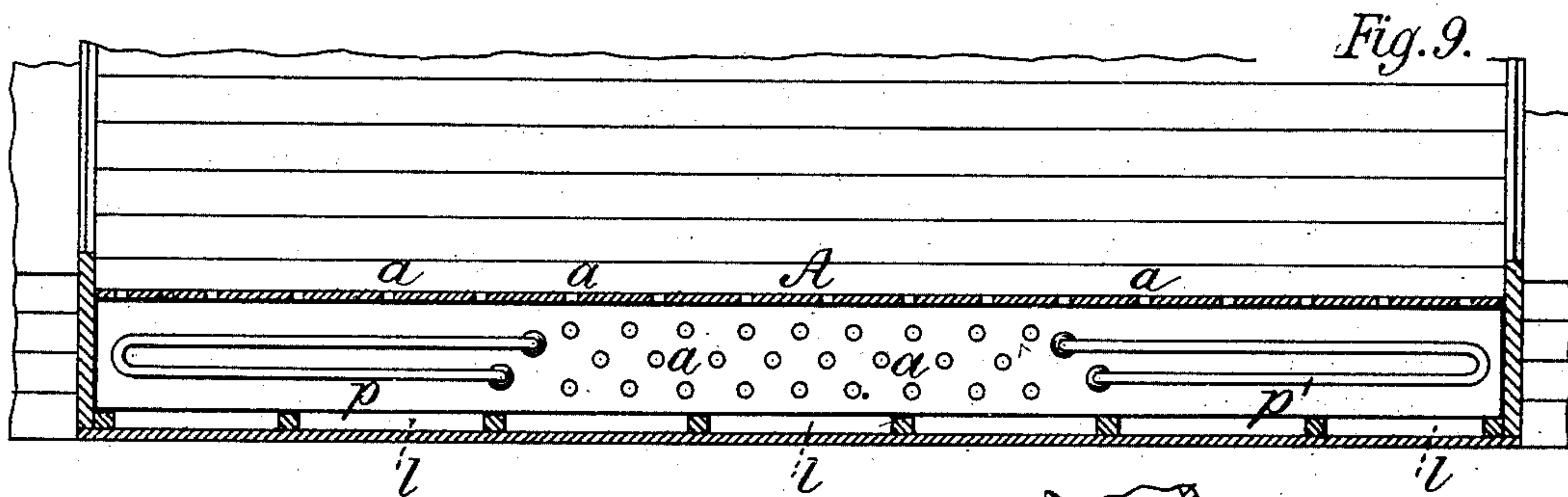
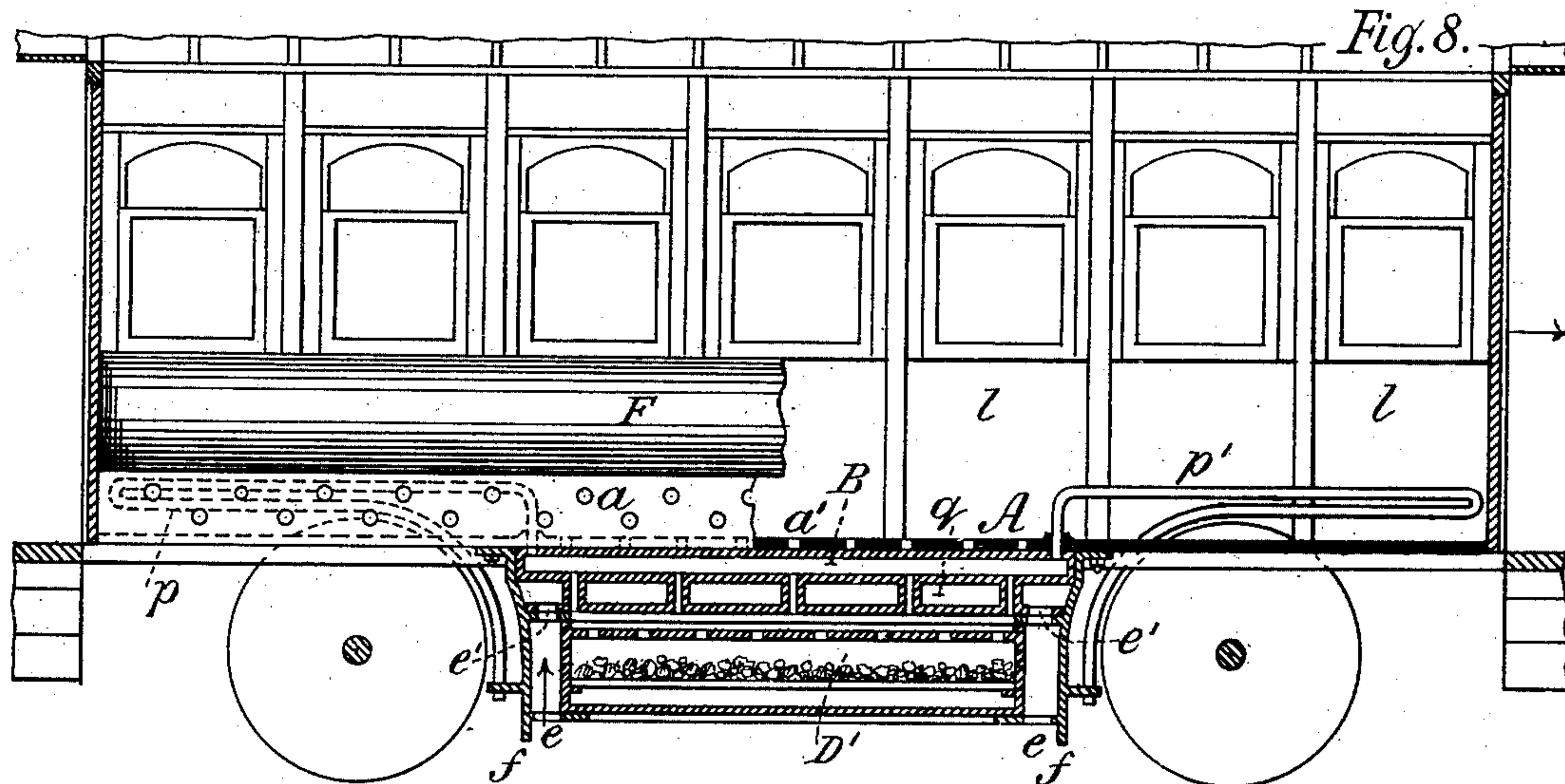
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Witnesses:

J. O. Hamet
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Inventor:
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UNITED STATES PATENT OFFICE.

WILLIAM FLANAGAN, OF CHICAGO, ILLINOIS.

APPARATUS FOR HEATING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 375,738, dated January 3, 1888.

Application filed August 8, 1884. Serial No. 140,042. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FLANAGAN, a citizen of the United States of America, residing in Chicago, county of Cook, and State of Illinois, have invented new and useful Improvements in a Heating Apparatus for Street-Railway Cars, of which the following is a specification.

This invention relates to certain improvements in heating street-cars; and it has for its objects to provide heating devices for the same which will not interfere with the interior of the car, which will supply heated air uniformly throughout the same, and which can be readily controlled and managed, as more fully hereinafter specified.

The above-mentioned objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a longitudinal sectional view of a street-car, showing my invention applied thereto. Fig. 2 represents partly a top view and partly a horizontal section of a portion of the car and heating devices; Fig. 3, a transverse vertical section of the car, showing the heating devices; Figs. 4 and 5, sections on an enlarged scale of the heating devices; Fig. 6, a top view of one of the side compartments in which the heating devices are located. Fig. 7 represents a side elevation of the heating chamber detached. Fig. 8 represents a longitudinal section of a car with a portion broken away, showing a modification of my invention, with solid fuel as employed for heating; Fig. 9 is partly a top view and partly a longitudinal horizontal section of a portion of a car, showing a modification of the heating medium; Fig. 10, a cross-section of the car and heating devices, with the modified form of heater, and Fig. 11 an enlarged cross-section of the modified form of heating devices.

Referring to the drawings, the letter A indicates the seat-supports, which are constructed of metal, each having a flat bottom and an inclined side provided with apertures a' and a , for the emission of hot air to the interior of the car. The said supports extend longitudinally from end to end of the car, and are seated in longitudinal floor-openings at each side of the bottom of the car. Upon the upper edges

of the said supports rest the seats F, which may be of the ordinary or any approved construction.

Below the car-floor, at each side, are secured the metallic casings G, which extend longitudinally between the wheels, being flanged at their upper edges and bolted or otherwise secured to the bottom plate of the seat-supports.

The casings G are provided with bottom openings, e , Figs. 1 and 8, at each end, for the admission of the air to be heated into the heating-spaces q , and for this purpose these inlet-openings are provided with deflectors f , depending from the bottom at each end of said casing, so as to catch the air as the car is moving and direct it upward through said opening into the heating-spaces q . These openings and deflectors are provided at each end of the heat-producing chamber, so as to act with the car running either end foremost. The heating-spaces q are formed within the casing and extend all around the heating-drum B, and open into the seat-space I by the perforations a' in the bottom of said seat-support, as shown in Fig. 4. The casing is provided with longitudinal ribs k , Figs. 4 and 11, to strengthen it, and with a suitable door, so that access may be had to the interior and to supply air to chamber C for combustion. Within the upper part of the casing is secured a longitudinal chamber, B, which is oval in cross-section, and connects with the fire chamber C by means of a series of tubes, b , which extend to a horizontal partition-plate, d .

The chamber B at its upper part, near each end, has connected to it the air-pipes $p p'$, Fig. 7, which extend to near each end of the car, and are bent backward and carried out through the floor of the car over the wheels, as shown in Fig. 1 of the drawings.

The fire-chamber is preferably heated by a lamp, D, having numerous burners; but instead of such lamp the chamber may be provided with a grate and ash-pit, as shown in Figs. 8, 10, and 11, so that solid fuel may be employed, the casing in this instance being provided with an inclined door for the insertion of the fuel.

The operation of my invention is as follows: Heat being applied in the chamber C, either by the lamp D or furnace D', a current of hot

air is established through openings *e e'*, Figs. 1 and 8, into and through the air-spaces *q*, and into the car through the seat-openings *a a'*. The heated products of combustion pass into the chamber B and out through the pipes *p p'*, thus effectually heating the car.

The heating devices are removable, so that they may be taken out in warm weather, the apertures in the floor and seat-supports in this instance serving for the admission of fresh air to ventilate the car.

Referring to Fig. 7, the pipes for the escape of the products of combustion are seen as connected with and extending from each end of the heating-drum B under the seat and returning upon itself within the seat-space, and passes down through the floor of the car for the escape of the products of combustion and for the necessary draft for the chamber of the heating device, so that the escaping heat is utilized to heat the incoming air beneath the seats. The heating-drum B is supported within the heating-chamber by the flue pipes *b*, so that the air to be heated is brought in contact with the outer wall of the heating-drum as it passes through the air-heating spaces to the outlet-openings. The escape-pipes are arranged, as described, to adapt them to cars running either end foremost and to correspond with the air-inlet openings.

I claim—

1. In a car-warming apparatus, the combination of the seat-support having bottom and side perforations, *a' a*, with the casing G, forming an air-heating chamber open to the outer air, communicating with said bottom opening, the heating-drum B, located within said chamber, having suitable escape-pipes, the chamber C, containing a heat-producing device, the partition *d*, dividing the said chambers, and the flue-pipes *b*, connecting the interior of the heating-drum with the chamber containing the heat-producing device, substantially as described.

2. In a car-warming apparatus, the combination, with seat supports having bottom and side perforations, *a' a*, of a casing, G, divided by a horizontal partition, *d*, to form a lower chamber for containing a heating device and an upper chamber for heating air, and

a heating-drum arranged within the upper chamber, supported by the partition flue-pipes *b*, and having suitable escape-pipes arranged within the seat-supports and opening beneath the car-floor, the said air-heating chamber having suitable air-inlets, substantially as described.

3. In a warming apparatus for street-cars, the heating-drum B, having an escape-pipe at each end, a heating device therefor, and a divided metal inclosing-case for these parts, forming a lower chamber for the heating device and forming an upper chamber surrounding the heating-drum, open at each end at *e*, in combination with iron seat-supports having the perforations *a a'*, the said iron seat-supports being fitted in floor-openings of the car and forming the tops of the air-heating chambers, and the said escape-pipes coiled within the seat-supports, substantially as described.

4. The heating apparatus consisting of the flanged casing G, having interior horizontal ledges or ribs *k*, the heating-drum forming the chamber B, mounted upon a plate, *d*, seated upon said ledges, and a bottom heating-lamp, said casing G constituting a removable closure for said heating devices, in combination with metallic car seat supports having a perforated bottom forming a cover for the top of said casing G, and the pipes *p p'*, for the escape of the products of combustion, arranged within the said seat-supports and terminating beneath the car-floor, substantially as described.

5. The improved car-heater herein described, consisting of the oblong casing G, having a top air-heating chamber or spaces, *q*, opening at each end at *e e'* in the bottom of said casing, each opening *e* having a deflector, *f*, the heating-drum B, its flue-tubes *b* and plate *d*, and the heating-lamp D, in combination with the perforated metallic seat-supports forming the top of said casing, and the pipes *p p'*, connecting each end of said heating-drum B within the seat-supports and terminating at the bottom of said car, all as shown and described.

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Witnesses:

JOHN O. BECK,
H. N. ROACH.