

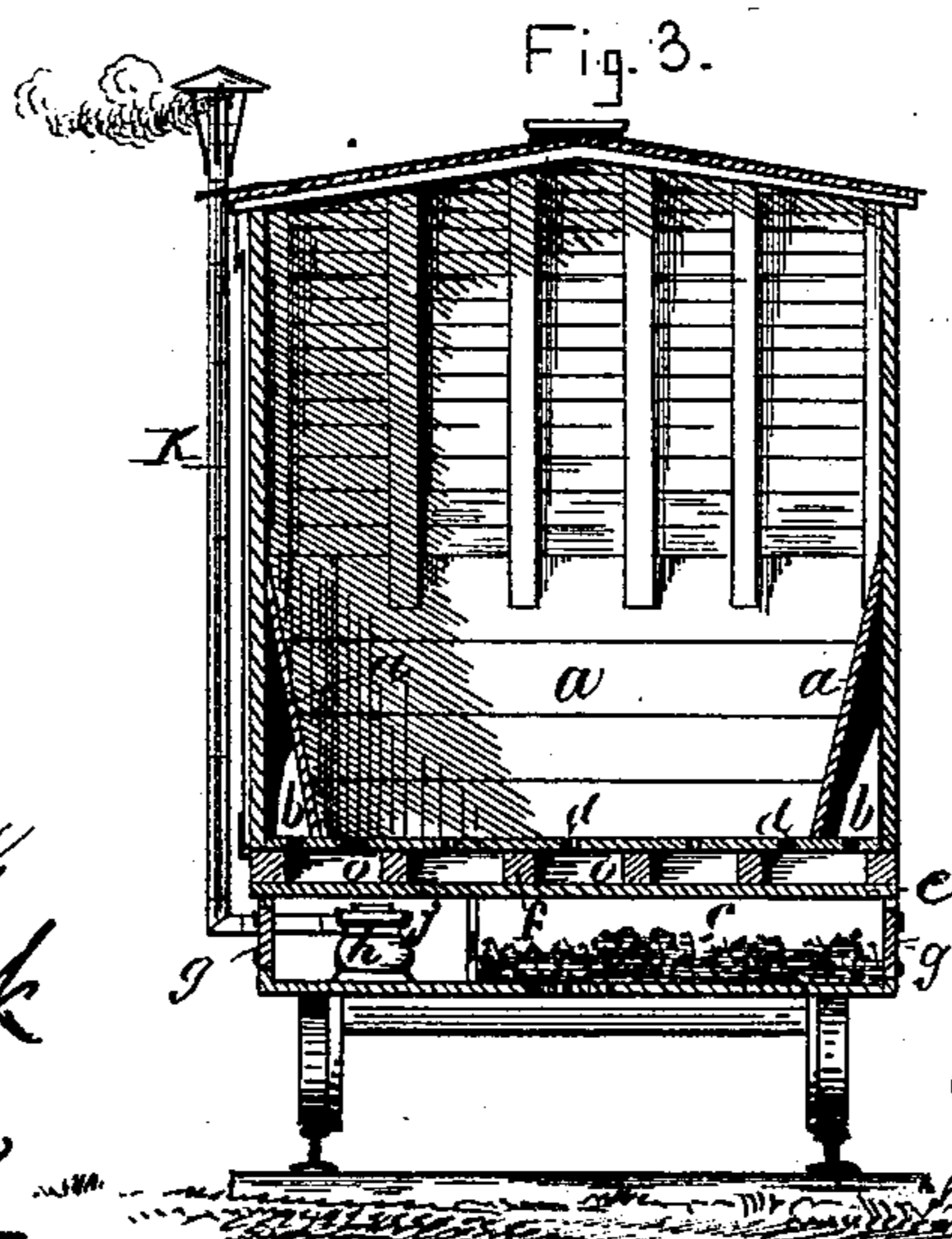
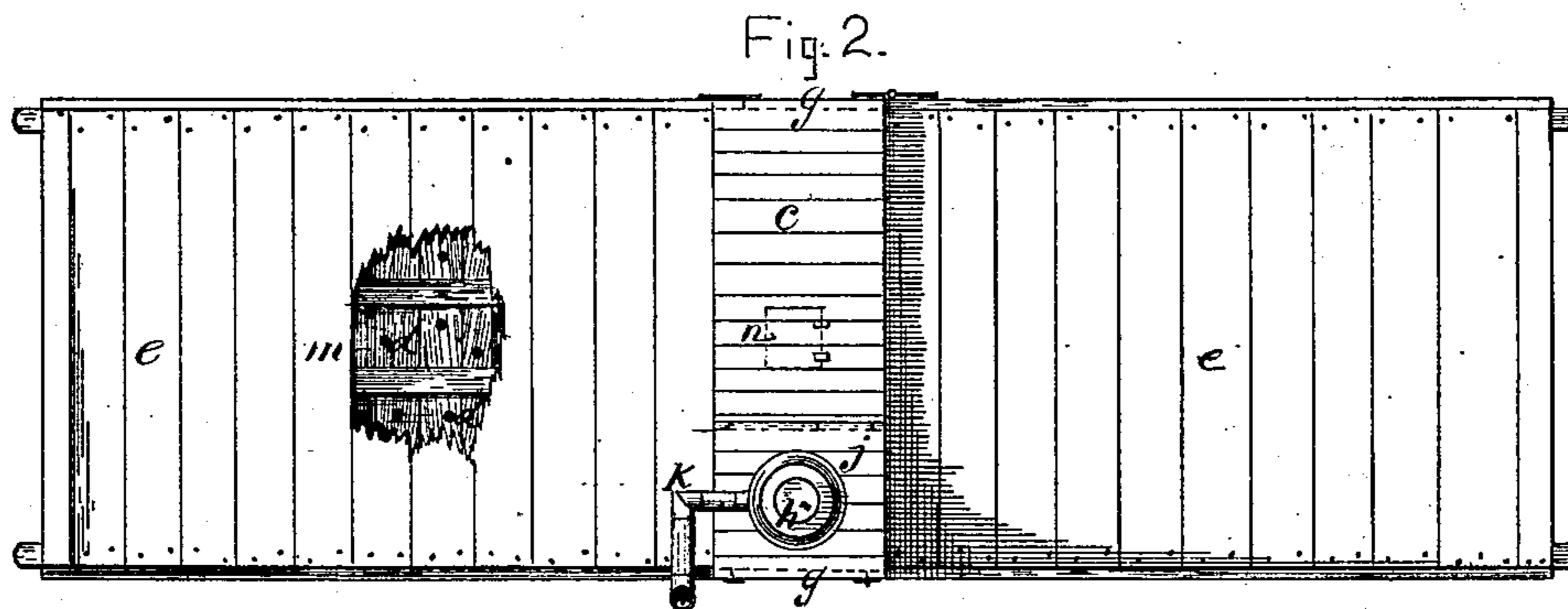
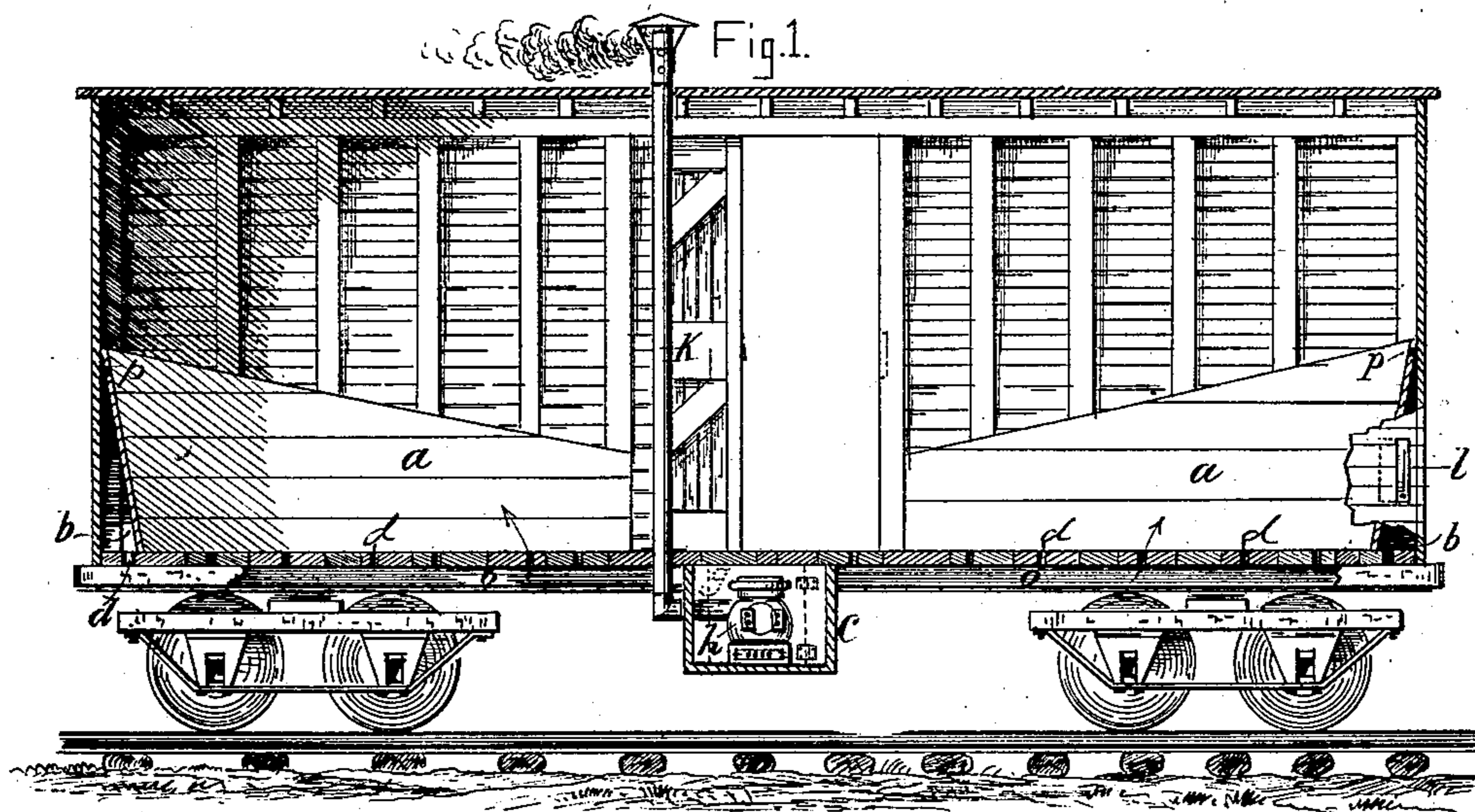
(No Model.)

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APPARATUS FOR HEATING FREIGHT CARS.

No. 247,028.

Patented Sept. 13, 1881.



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APPARATUS FOR HEATING FREIGHT-CARS.

SPECIFICATION forming part of Letters Patent No. 247,028, dated September 13, 1881.
Application filed June 28, 1881. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM E. EASTMAN, C. HENRY KIMBALL, and CHARLES H. MURCH, citizens of the United States, all residing in Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement for Heating Freight-Cars, of which the following is a specification.

Our invention relates to an apparatus for heating freight-cars, which can be applied to cars as ordinarily constructed without interfering with their usefulness for that class of freight which does not require heat, access to the heater being had without entering the car for regulating the heat. We attain these objects by the arrangement and construction illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section, showing the arrangement as it appears when looking at the car's side. Fig. 2 is a bottom plan. Fig. 3 is a transverse vertical section, showing the arrangement near the middle of the car.

Similar parts are indicated by similar letters throughout the several views.

In Fig. 1, *a a* are linings extending from the car-doors to and across the ends of the car, forming a space between the inner and outward walls of the car about three and one-half inches wide at the bottom and narrower at the top. This lining extends up the sides of the car as high as potatoes or other freight for which it is useful will fill the car, so that when the space *b* is filled with heated air from below the freight will be surrounded on three sides by hot-air chambers.

The under side or bottom of the car's sills is sealed up, forming air-spaces between the under and upper sides of the sills, extending from the fire-box *c* to the ends of the car, with openings at suitable intervals through the floor and into the air-space *b*, as shown at *d*.

The ceiling *e* is made to form a box near the middle of the car, which drops considerably below the sills *f* for the purpose of forming a support for the heater, a hot-air chamber, and fuel-bin combined. The box *c* has openings at each of its ends, as shown in Fig. 2 at *g g*, to give access to the heater and fuel without opening the car-doors, and also to give ingress to

sufficient air to sustain combustion and supply the hot-air flues with air for circulation under the floor and around the linings *a a*.

The heater *h* is securely fastened to the box *c*, with its smoke-stack *k* extending through the side, with elbow-joints to give it an upward direction where it is fastened to the outside of the car, so that it may always be entirely out of the way when loading the car.

In Fig. 1, *l* shows a small portion of the outside of the car, with an opening, in which a thermometer is placed for the purpose of indicating the inside temperature to a person outside of the car by removing a small covering from the opening.

In Fig. 2, *m* shows part of the car-floor broken away to give a view of the air-chamber and sills. In Fig. 2, *n* is a trap-door or opening to the fuel-bin.

Now, it will be seen that as heat is generated from the heater *h* heated air will pass into the spaces *o* between the sills shown in Fig. 3, that part of the sills immediately above the box *c* not being covered with ceiling, as shown in Fig. 1, and form a hot-air chamber under the whole car. It will also pass through the openings *d* to the air-spaces formed on the sides and ends of the car by the lining *a*, as shown in Fig. 1.

A current of air may be induced toward the ends of the car by making small openings in the lining *a a* at *p p*, which allows the heated air to escape into the open car.

In practice it is found that potatoes will, while in a car, generate heat themselves, and never freeze at the top, thus leaving it only necessary to apply heat at the sides, ends, and bottom of the car. This arrangement reduces the amount of space to be heated to about one-tenth of the amount heated by the old method, which is to place a heater inside the car near the middle, with its smoke-stack through the car-top. Freight such as potatoes will occupy each end of the car, filling the same to a position fairly indicated by the lining *a a* in Fig. 1, three hundred and fifty bushels being the limit allowed to each car by railroad corporations.

The old method for heating is objectionable for the following reasons:

First. Potatoes nearest to the heater will often be spoiled by heat and others be frozen at the ends and sides of the car at the same time.

5 Second. The cars are rendered almost useless for transporting many kinds of merchandise, particularly heavy freight—such as iron, molasses, and the like—when fitted, as is the practice, with an inner flooring of thin boards raised above the true floor of the car, and for 10 this reason are nearly always returned empty after the delivery of a load of potatoes.

Third. The heating arrangement has to be removed from the cars during the summer months 15 to make them available for all classes of freight, and by so doing it is usually destroyed, and a new one has to be substituted each season at considerable cost.

Fourth. The cars cannot be sealed, as is usually 20 done with other classes of freight, as the doors have to be frequently opened to fire up, leaving them specially liable to loss of freight.

Fifth. Car-doors are often frozen in position 25 with ice and snow, and considerable injury is done them by being frequently opened to fire up. It is a common thing to find cars very badly injured by the use of some sharp instrument like an ax to open the doors when frozen in position.

30 Sixth. A large amount of unnecessary fuel is used for heating.

Seventh. Potatoes are injured by either too much or too little heat, the heat not being evenly distributed.

35 We do not confine ourselves to the particular construction here set forth, but describe it as best in our opinion.

Our principal object is to apply an arrangement to freight-cars as ordinarily constructed 40 so that the bottom and sides may be heated without entering the car to fire up, with a thermometer placed in the car, so that it may be seen from the outside.

With the arrangement herein shown by the 45 annexed drawings all the above-mentioned difficulties are avoided, and a great saving and convenience is secured to both the railroad corporation and shippers alike.

Having thus fully described our invention, 50 what we claim, and desire to secure by Letters Patent, is—

1. The heater or stove *h*, inclosed in the box or chamber *c*, as described, so that it can be supplied with fuel without entering the car, 55 and having its smoke-pipe *k* passing up outside the car, in combination with the hot-air flues formed by the flooring, the sills, and the

ceiling, as described, and the air-spaces *b b* between the sides and ends of the car, and the linings *a a*, having the openings *p p*, for the 60 purpose specified.

2. The box *c*, having the threefold office of a hot-air chamber, a fuel-bin, and a support for the heater or stove *h*, in combination with the hot-air flues formed by the flooring, sills, and 65 ceiling, and the openings *d d*, for the purpose specified.

3. In combination with the heater *h*, the ceiling *e* and the openings *d* and *p*, for the purpose of producing warm air and conducting 70 the currents to the ends and sides of the car from the heater, as shown and described.

4. The smoke-pipe *k*, passing up outside the car, in combination with the heater or stove *h*, box *c*, lining *a a*, and ceiling *e*, for the purpose 75 specified.

5. The combination of the openings *d* and *p*, for producing an air-current from the heater toward the car ends.

6. The combination of the heater or stove *h*, 80 ceiling *e*, and openings *d* and *p*, for producing air-currents at the ends and sides of the car, in the manner described.

7. The combination of the heater or stove *h*, ceiling *e*, linings *a a*, and openings *d* and *p*, for 85 the purpose of entirely surrounding the contents of the car with warm air, in the manner described.

8. The combination of the heater or stove *h* with smoke-pipe carried up on the outside of 90 the car, the fuel-bin in box *c*, the ceiling *e*, and linings *a a*, for the purpose set forth.

9. The construction herein set forth of a heating apparatus for freight-cars, consisting, substantially, of a heater or stove, *h*, inclosed 95 in a box, *c*, secured beneath the floor of a car, said box being open at its top to the sills and floor of the said car and in direct communication with hot-air flues formed by the sills, the floor and a ceiling covering all the under side 100 of the sills except that part immediately above the box *c*, the linings *a a* at the sides and ends of the car, forming therewith air-spaces *b b* and the openings *d* and *p*, for producing a circulation of air in and through said flues and 105 air-spaces, all operating substantially as described.

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