

(No Model.)

W. E. EASTMAN, C. H. KIMBALL & C. H. MURCH.  
APPARATUS FOR HEATING FREIGHT CARS.

No. 248,924.

Patented Nov. 1, 1881.

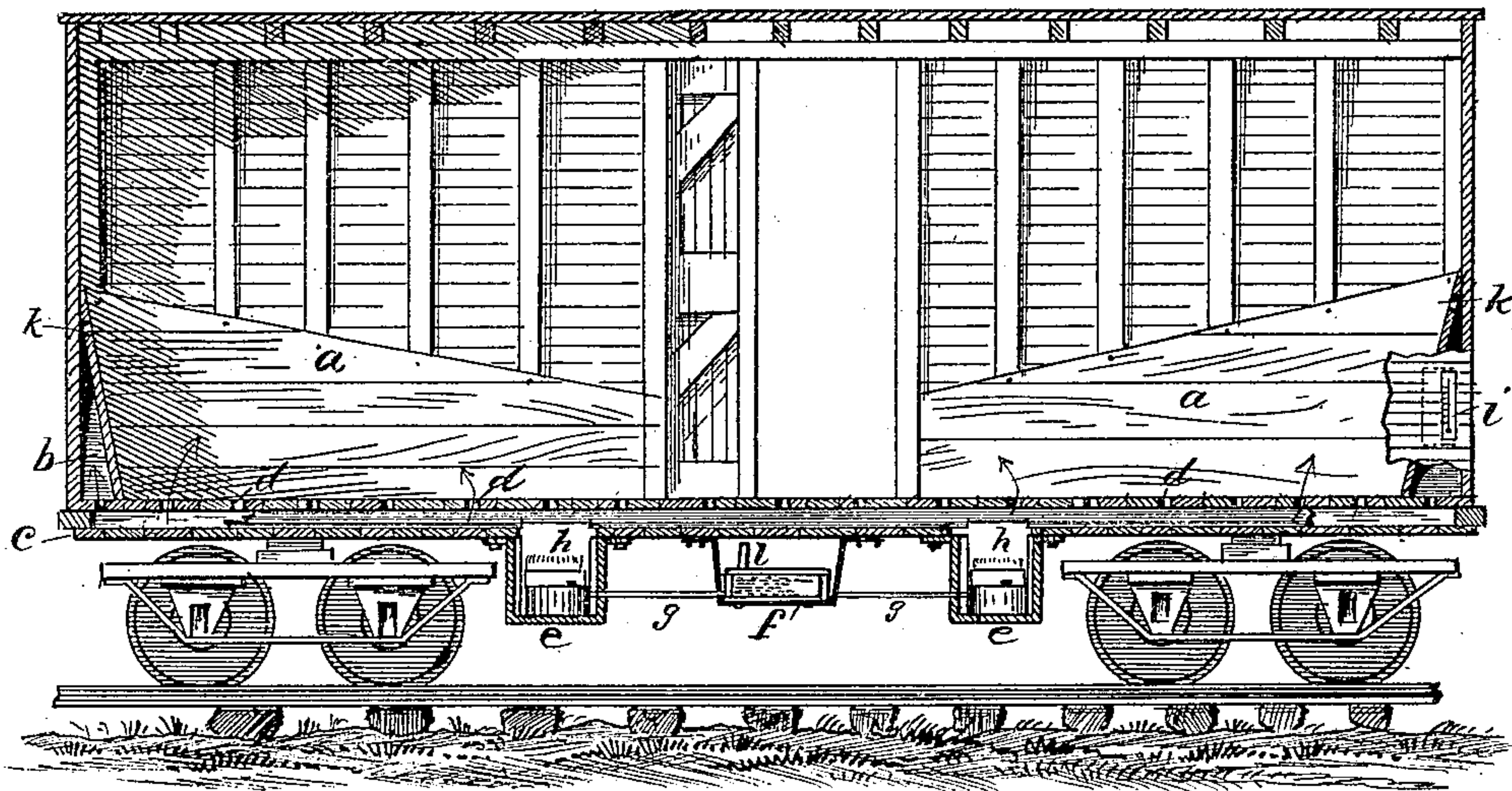


Fig. 1.

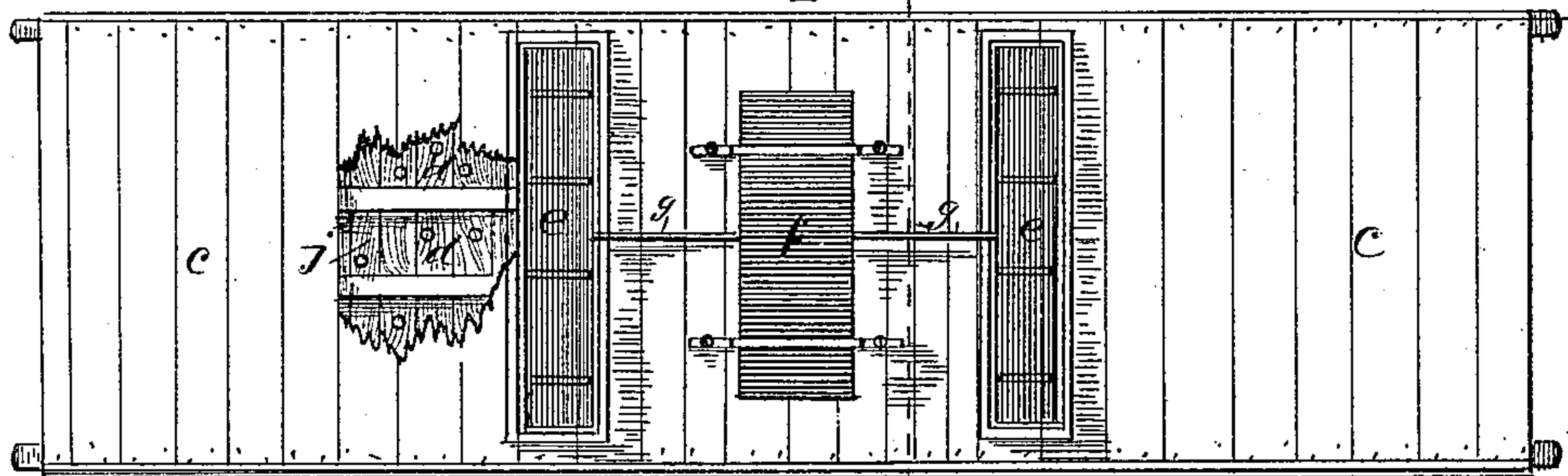


Fig. 2.

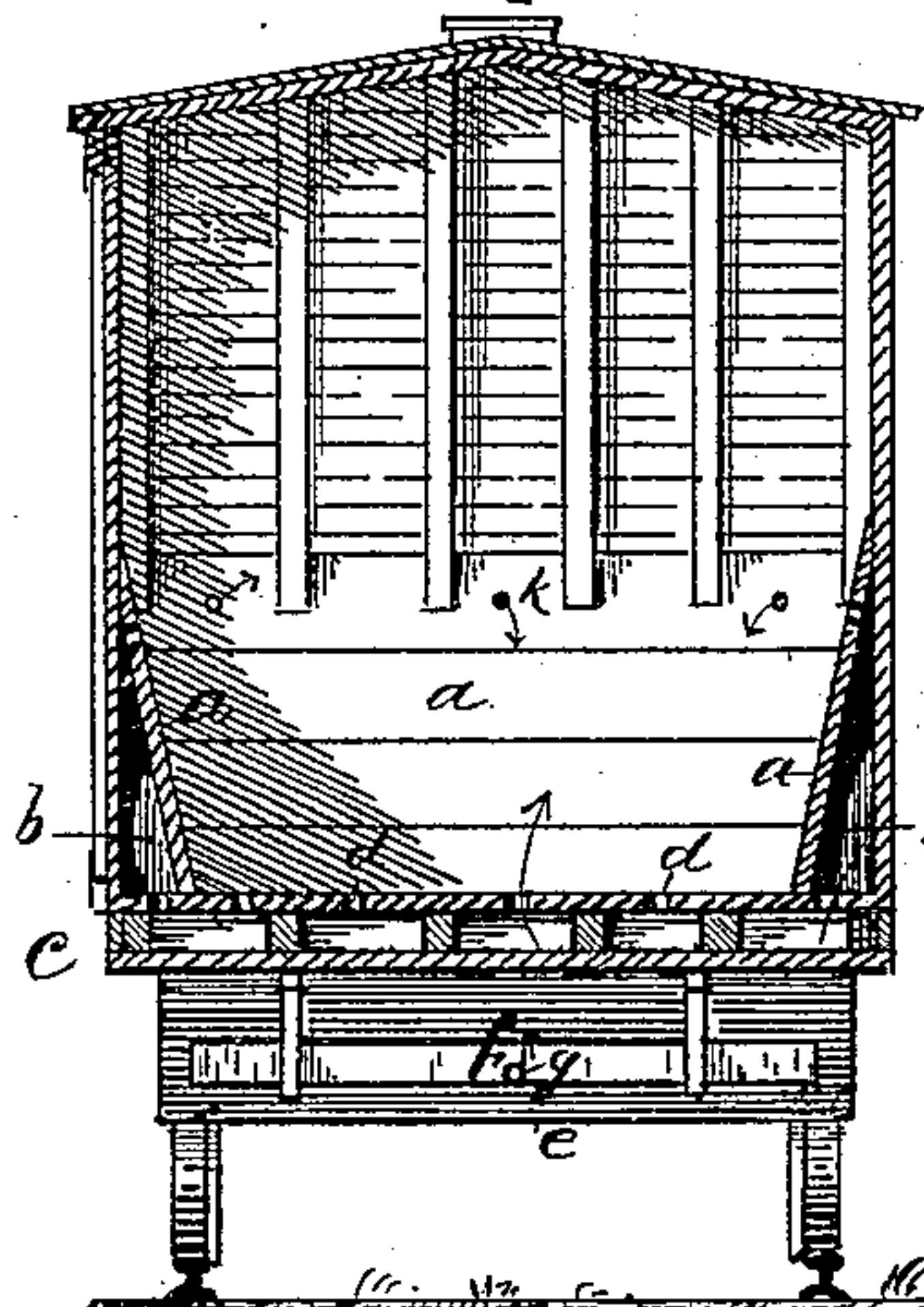


Fig. 3.

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## APPARATUS FOR HEATING FREIGHT-CARS.

SPECIFICATION forming part of Letters Patent No. 248,924, dated November 1, 1881.

Application filed July 7, 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, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Heating Freight-Cars, of which the following is a specification.

Our invention relates to a device for heating cars from beneath the floor, which device is so arranged that the cars may be run a long distance without the aid of firemen, the same being so constructed that the heat may be regulated without entering the car. We attain these objects by the arrangement and construction illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section. Fig. 2 is a bottom plan. Fig. 3 is a vertical transverse section through the car at the point where the furnaces are attached.

Similar letters refer to similar parts throughout the several views.

In Fig. 1, *a a* are inside linings extending from the car-doors to and across the car ends, about three and one-half feet high, and forming an air-space between the linings and the outer walls of the car, to receive heated air from the furnace, as shown at *b*.

*c* is a ceiling placed upon the under side of the floor-sills, extending over the entire bottom of the car, except those portions immediately above the furnaces or heaters *h h*, and forming an air-space under the car in addition to those at the sides and ends, as described. The heated air passes from this lower chamber to the upper chamber through holes in the car-floor, as shown at *d*.

*e e* are oil-furnaces attached to the ceiling beneath the car, and inclosed in air-boxes open at the top with suitable openings for admitting cold air for circulation and combustion.

*f* is an oil-tank with pipes leading to the furnaces *e e* to keep them supplied. The tank is made very shallow, so that the rise and fall of oil will be very little between a full and nearly-empty tank. This prevents the oil from falling and rising very much upon the burner-

wicks, while the width and length of the tank may be of such dimensions as will be found necessary to carry any required quantity of oil.

The furnaces *e e* are long and narrow, and occupy the position shown in Fig. 2. They are provided with sufficient burners, as shown at *h h*, and are supplied with oil from the pipes *g g* as fast as it is consumed, no unnecessary amount of oil being held around the wicks to form gas, thus making the apparatus less liable to explosion.

In Fig. 1, *i* is a thermometer placed in the car's side, to determine the amount of heat inside without entering the car.

In Fig. 2, *j* shows the ceiling upon the bottom of the car broken away to show the air-chamber.

In Fig. 1, at *k k*, holes are made in the inside lining, near the top, so that the heated air will pass from the furnaces to the car ends and there escape into the car, the object being to convey heat equally around the car.

*l* is a small tube extending considerably above and from the top of oil-tank to allow the entrance of air, so that the oil will flow out freely through the pipes *g g* without being liable to be forced out of the vent-hole while the car is in motion.

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

Our invention is particularly arranged for freight-cars, and will be used more largely for shipping potatoes than for other uses, but may be used for all classes of freight which are liable to be frozen.

Our principal object is to produce or provide a common freight-car with heating appliances, so that the heat can at any time be instantly applied, at the same time leaving the car unobjectionable for all freight which does not require heat; and we desire to distribute the heat evenly and use as little as possible, especially when shipping potatoes, as they are often injured by too much heat.

The object in using or applying an oil-stove is because the cars can make long trips without a fireman, while with wood or coal frequent attention would be necessary. Another object



is access to the furnaces without entering the car, as it is desirable to seal the car to insure safe delivery of freight.

5 In our application filed June 28, 1881, we more fully set forth the advantages of our invention, the invention therein described being nearly the same as this, except a coal-furnace was shown instead of oil-furnaces.

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

15 1. The heaters *h h* and tank *f*, with tubes *g g* and the tube *l*, constructed and operating together as described, in combination with the hot-air flues formed by the flooring, the sills, and the ceiling, and the openings *d*, for producing hot-air currents and conducting the same to the inside of the car, substantially as and in the manner described.

20 2. The heaters *h h* and tank *f*, with tubes *g g* and the tube *l*, constructed and operating together as described, in combination with the hot-air flues formed by the floor, the sills, and the ceiling of the car, the air spaces *b b*, and  
25 the openings *d* and *k*, for producing and conducting hot-air currents to the ends and sides of the car in the manner described.

3. The heaters *h h* and tank *f*, with tubes *g g* and the tube *l*, constructed and operating together as described, in combination with the 30 ceiling *c*, linings *a a*, and openings *d* and *k*, for the purpose of entirely surrounding the contents of the car with warm air, substantially as described.

4. The construction herein set forth of an 35 apparatus consisting substantially of a heater or heaters, *h h*, for burning liquid fuel, inclosed in the boxes or chambers *e e*, attached to the bottom of a car, the tank *f*, the tubes *g g*, the tube *l*, constructed and operating together as 40 described, the lining or ceiling *c*, forming, with the sills and floor of the car, air passages or flues for conducting heated air from the heaters, the linings *a a*, and the openings *d* and *k*, all operating in the manner and for the pur- 45 pose specified.

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