

(No Model.)

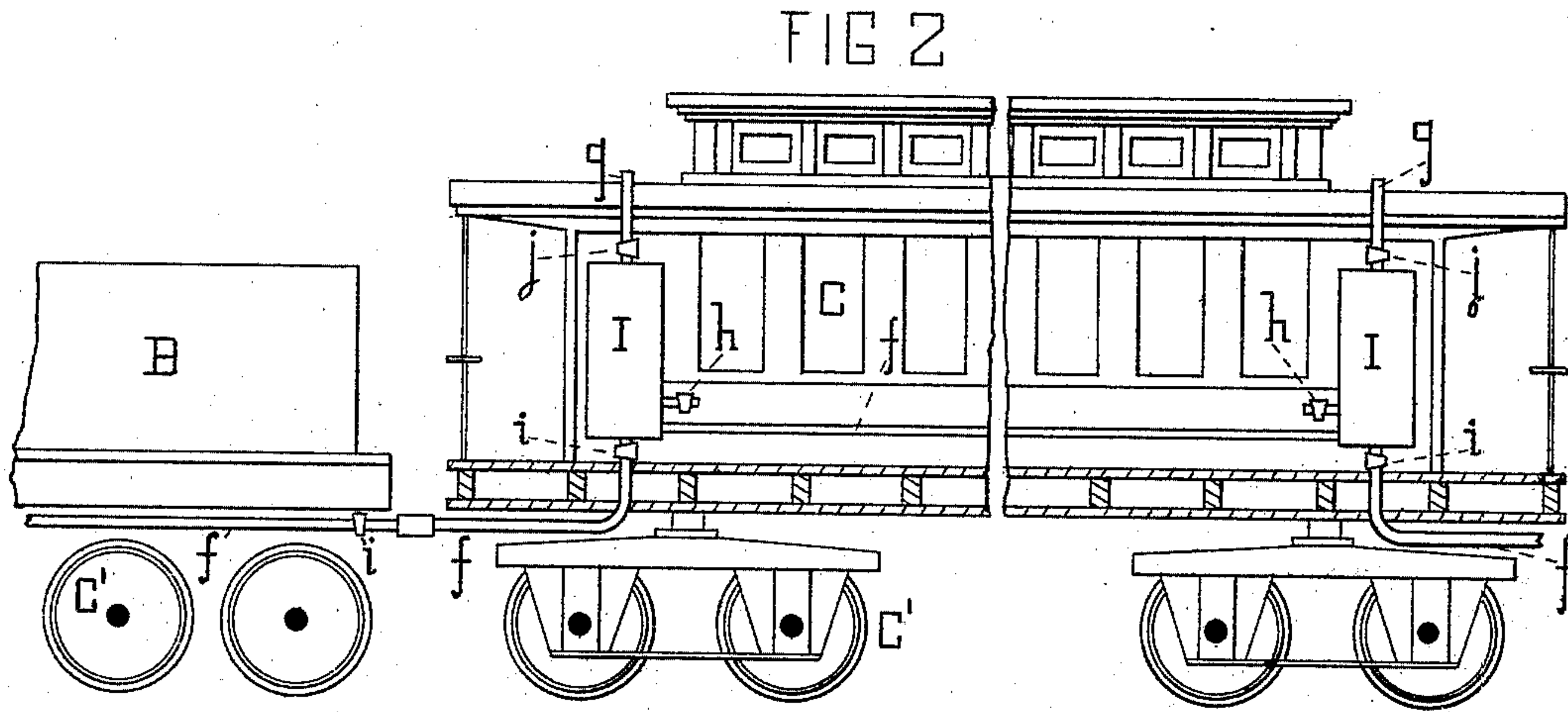
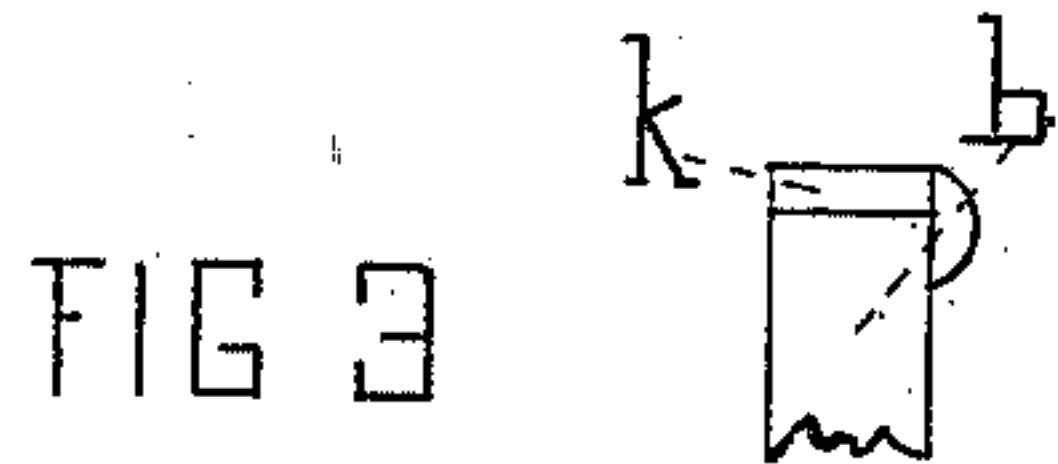
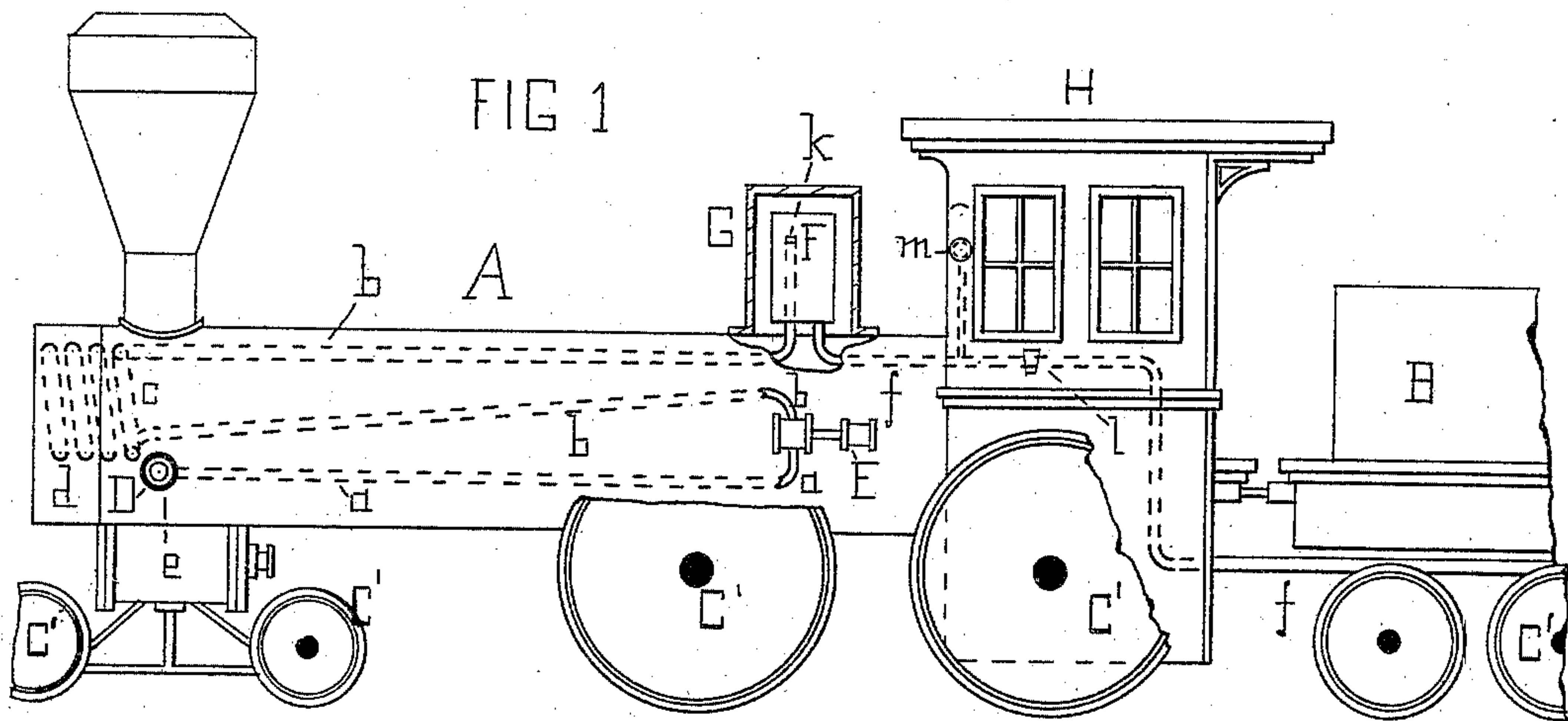
2 Sheets—Sheet 1.

J. S. ALSTON.

APPARATUS FOR HEATING RAILWAY CARS.

No. 445,709.

Patented Feb. 3, 1891.



WITNESSES

Wm. S. Hoffman
Peter A. Gallagher

INVENTOR

John S. Alston
by *Francis D. Pastoreus*
Schmitt

(No Model.)

2 Sheets—Sheet 2.

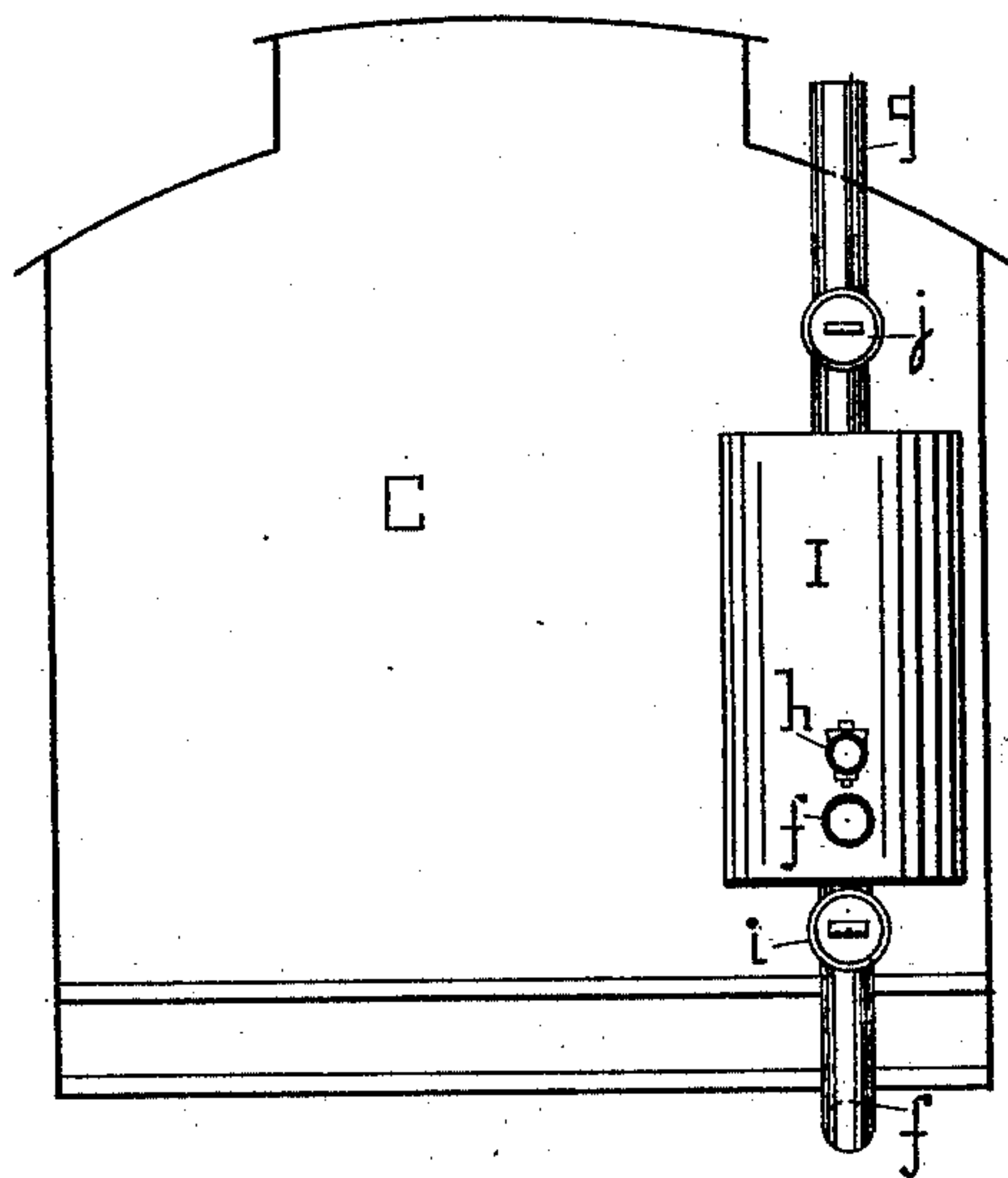
J. S. ALSTON.

APPARATUS FOR HEATING RAILWAY CARS.

No. 445,709.

Patented Feb. 3, 1891.

FIG 4



WITNESSES

Wm. J. Hoffman,
Peter A. Gallagher

INVENTOR

John S. Alston
by Francis D. Pastorius
Solicitor

UNITED STATES PATENT OFFICE.

JOHN S. ALSTON, OF DOVER, NEW JERSEY.

APPARATUS FOR HEATING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 445,709, dated February 3, 1891.

Application filed August 19, 1890. Serial No. 362,414. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. ALSTON, a citizen of the United States, residing in Dover, in the county of Ocean, and State of New Jersey, have invented a new and useful Apparatus for Heating Railway-Cars, of which the following is a specification.

My invention relates to utilizing the products of combustion of a locomotive-engine for heating air for warming a railway-train, whether the train is in motion, standing, or one or more cars are side-tracked, which is attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a locomotive-engine, part of its tender, and the sectional steam-drum. Fig. 2 is a side view of a part of the same tender and a passenger-car which has its side removed, showing the interior arrangement. Fig. 3 is a view of the top end of the pipe *b* and its back-pressure valve; and Fig. 4 is a vertical and end view of the hot-air-conducting pipe, hot-air-storage reservoir, escape-pipe, stop-cocks, and the petcock of the air-storage reservoir for immediate warming when the train has been just coupled to the locomotive or side-tracked. The car is shown in skeleton for exhibiting the relative position of the several parts.

Similar letters refer to similar parts in the two views.

A is a locomotive-engine, B its tender, and C a passenger-car. The wheels C' are cut off or shortened to show the piping.

D is an opening which communicates with a pump E of the locomotive by a pipe *a*, which is optionally laid between the shell of the boiler and its sheathing or passed through the boiler. (Shown by dotted lines, Fig. 1.)

F is an air-holder in the steam-dome G. A pipe *b* extends from the pump E to a coil *c* or other air-heating device in the spark-catcher *d* or smoke-box *e*, and thence to the air-holder F, which is tapped by another pipe *f*, passing the cab H under the tender B and entering a hot-air-storage reservoir I, conveniently located on the inside and at one or both ends of each car. In this instance two are used. An escape-pipe *g* extends from each through the top of the car, and a petcock *h* for immediate warming opens into the interior. From the reservoir I the pipe *f* extends the

length of the car, either straight, coiled, or otherwise formed and located for perfect warming to the other reservoir at the opposite end of the car, and is taken from it through the bottom of the car. There are stop-cocks *i* in the pipe *f* at both ends of the car or in the bends of the same leading to the air-reservoirs, put there with the object of stopping the pipe when the car is to be taken from the train and side-tracked, and so save emptying the air-reservoir of its contained heat. The escape-pipe *g* of each reservoir I must be similarly supplied with a cock *j*; also, the end of the pipe *b*, which leads into the air-holder F, may be provided with a back-pressure valve *k* for shutting off the back-pressure against the pump. An escape-cock *l* is suitably located in the pipe *f* for hand-testing the air-blast.

It is the radiation of heat from the pipes that gives the useful effect, and it is only necessary to know what temperature is required. To that end an indicator *m*, in communication with the pipe *f*, indicates to the engineer the temperature of the hot-air blast, so that he can increase the speed of or slow down the pump.

In putting my invention into operation the first duty is to charge the system with air. This is done through the pump E. All the cocks are opened but the cocks *j* of the escape-pipes *g*, which are closed, with the exception of the last one of the train, they being open for the purpose of circulation. The pump E is run merely fast enough to make a blast sufficient to overcome the friction of the heated air in the pipes *f* and flow just as rapidly as is required to make a good radiation and no cooling down. Air is drawn through the opening D and conducted by the pipe *a* to the pump and forced by it through the pipe *b* to the coil *c*, where it is heated and carried to the air-holder. From the holder F the heated air flows through the pipe *f* into the storage and air reservoir I, thence along the same pipe within the car to the reservoir at its other end, and out at the bottom bend to the flexible connection and the following car, and so on until it reaches the end reservoir of the last car of a train, from which it is expelled through the pipe *g*.

As will be seen, the flow-pipe *f* is taken di-

rectly from the holder F in the steam-dome G and carried to the end of the train, when its heated air, after circulating through the air-reservoir of each car, is allowed to escape
5 into the atmosphere by means of the pipe *g* of the rear reservoir, whereby the circulation is perfected.

The air-reservoirs I are generally for storing heat for side-tracking a car of a train, and
10 for heating a car, when the locomotive is first attached to a train, through the medium of the petcocks *h*, which are opened on the starting of the pump E for blowing heated air directly to the interior of a car without wait-
15 ing for the slow process of radiation of the hot-air-conducting pipes. When a car is to be side-tracked—that is, taken out of a train and run on a siding—there must be means to shut off the outside circulation of air from the car
20 and keep the heat in its system. This is done by providing the pipe *f* with the aforesaid stop-cocks *i* near the platforms or in the bends leading to the reservoirs, that the whole heating service contained in the car may be kept

filled with heated air after it is cut out and 25 side-tracked, for it is necessary when a following train takes up that car so side-tracked it should be warm and ready for the occupancy by passengers.

I claim as my invention— 30

In an apparatus for heating railway-cars, the combination of a heating device in which the air is heated by the products of combustion of a locomotive, a pump, hot-air-conducting pipes provided with regulating-cocks, 35 hot-air reservoirs connecting with the hot-air-conducting pipes, escape-pipes for the hot-air reservoirs, and a petcock for blowing heated air from each hot-air reservoir into its car without waiting for the conducting-pipes to 40 heat sufficiently for the purpose of radiation.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN S. ALSTON.

Witnesses:

MARTIN V. BERGEN,
FRANCIS D. PASTORIUS.