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J. R. LANNING & J. YOUNG.

RAILWAY CAR HEATER.

No. 387,956. Patented Aug. 14, 1888.

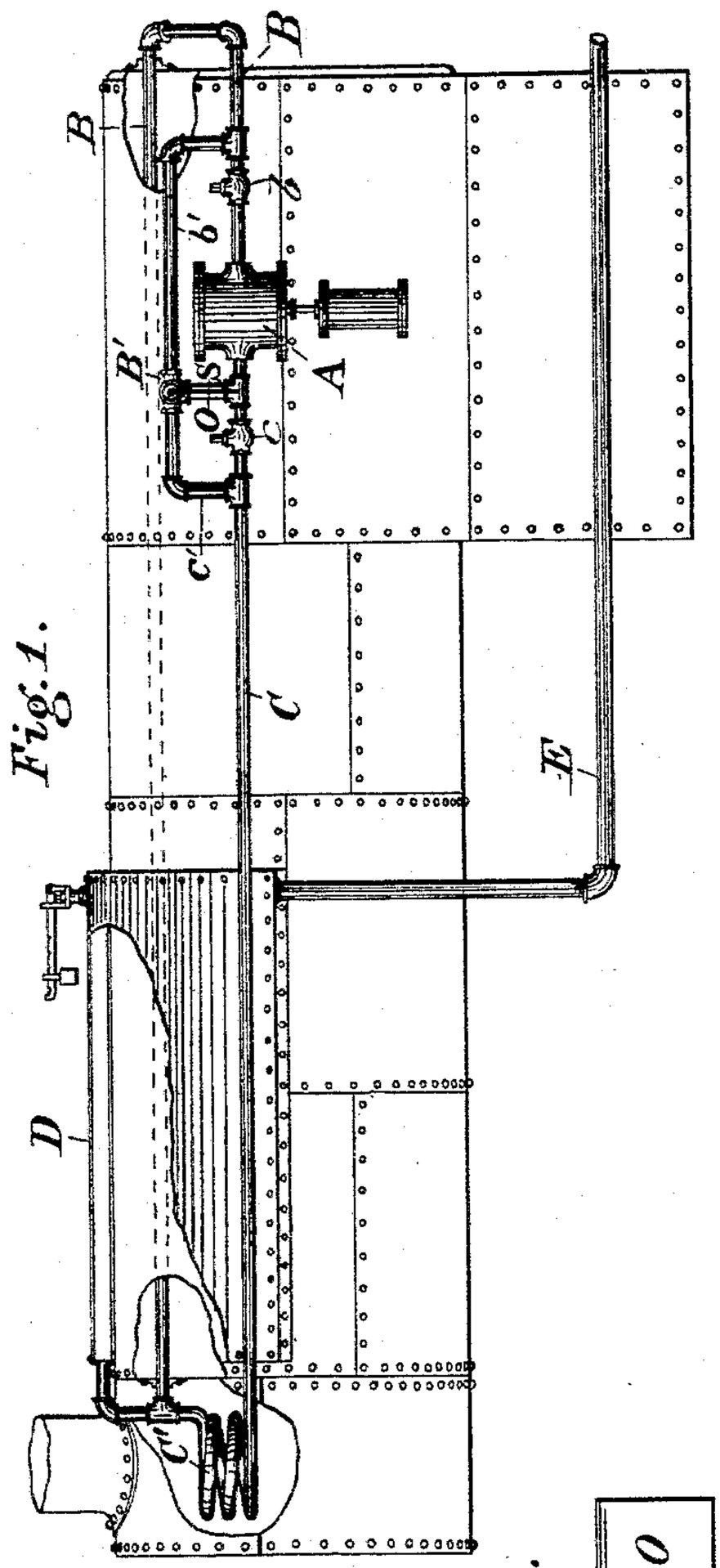

Fig. 1.

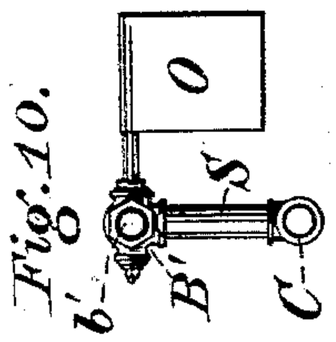

Fig. 10.

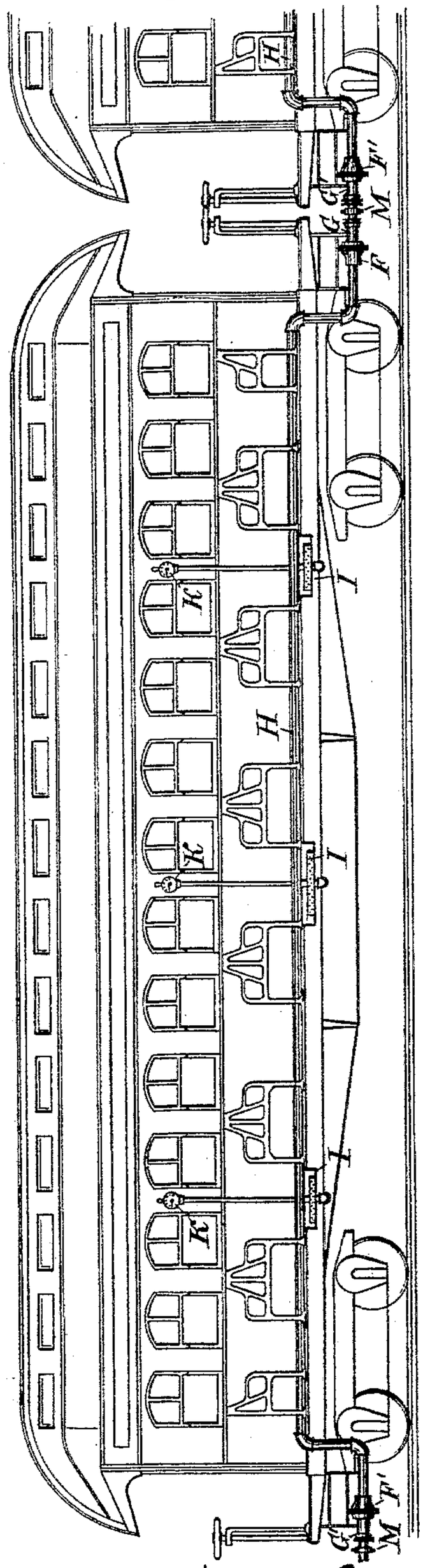

Fig. 2.

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Fig. 3.

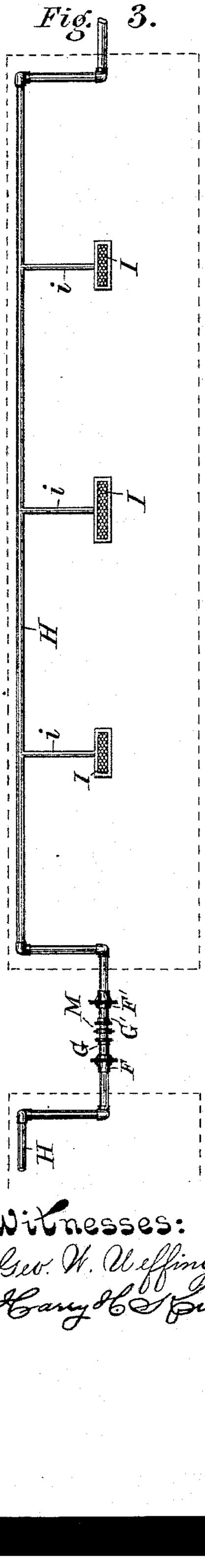


Fig. 4.

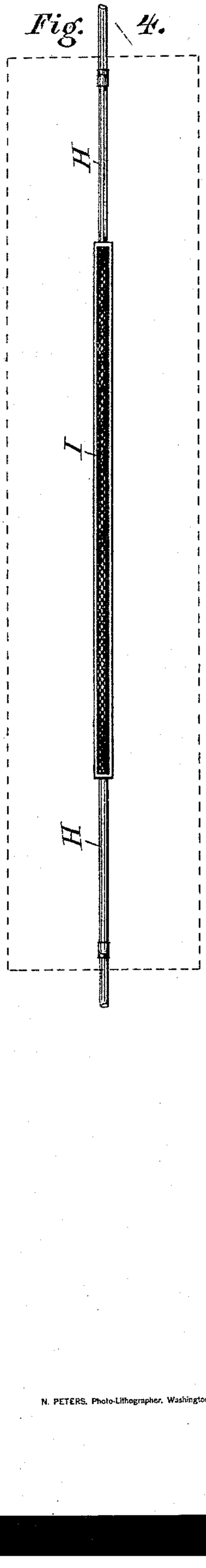
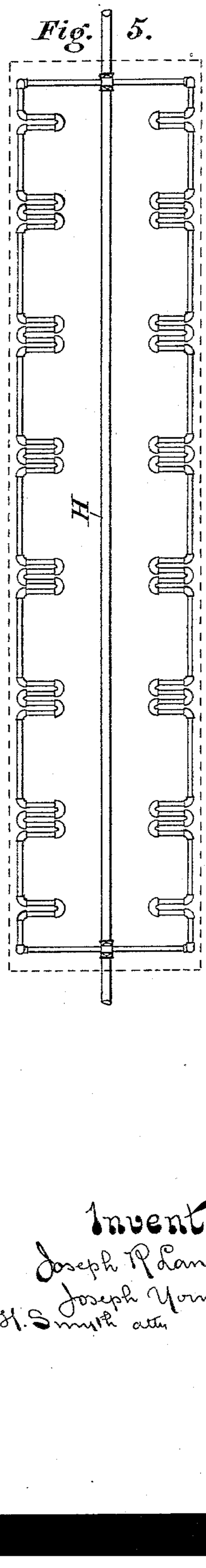


Fig. 5.



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J. R. LANNING & J. YOUNG.

RAILWAY CAR HEATER.

No. 387,956. Patented Aug. 14, 1888.

Fig. 6.

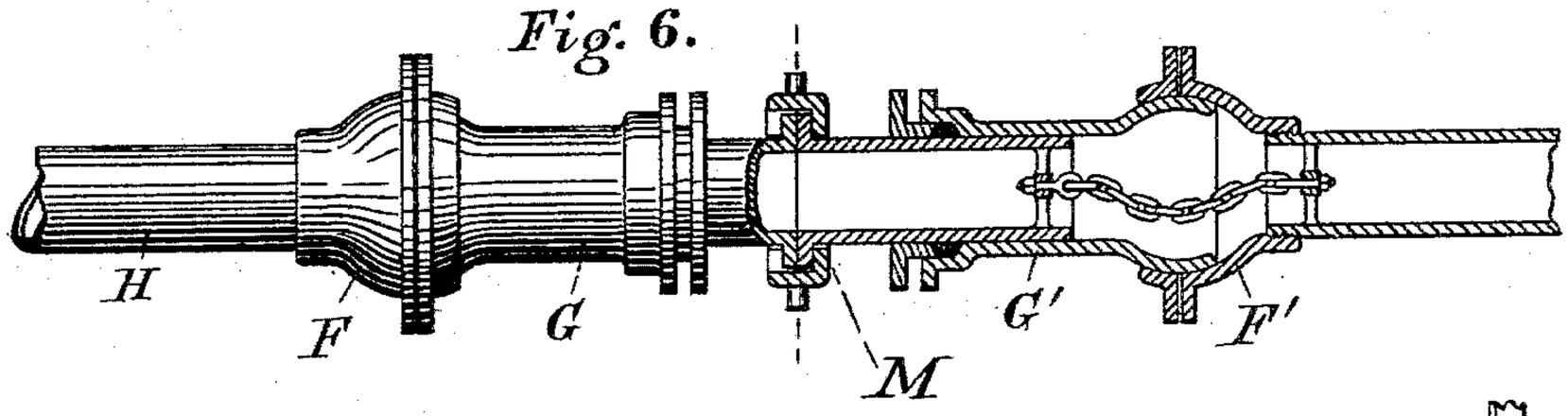

Fig. 7.

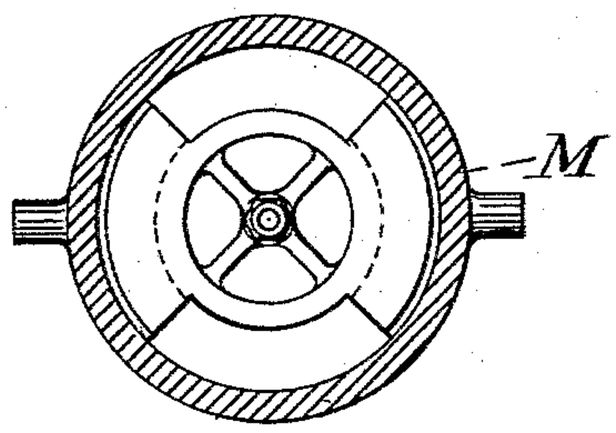

Fig. 9.

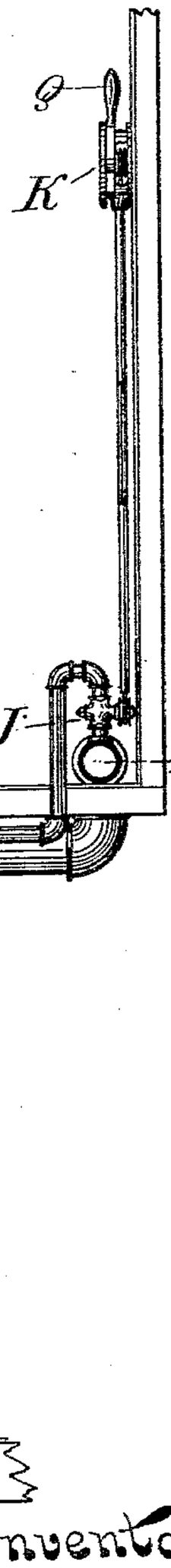

Fig. 8.

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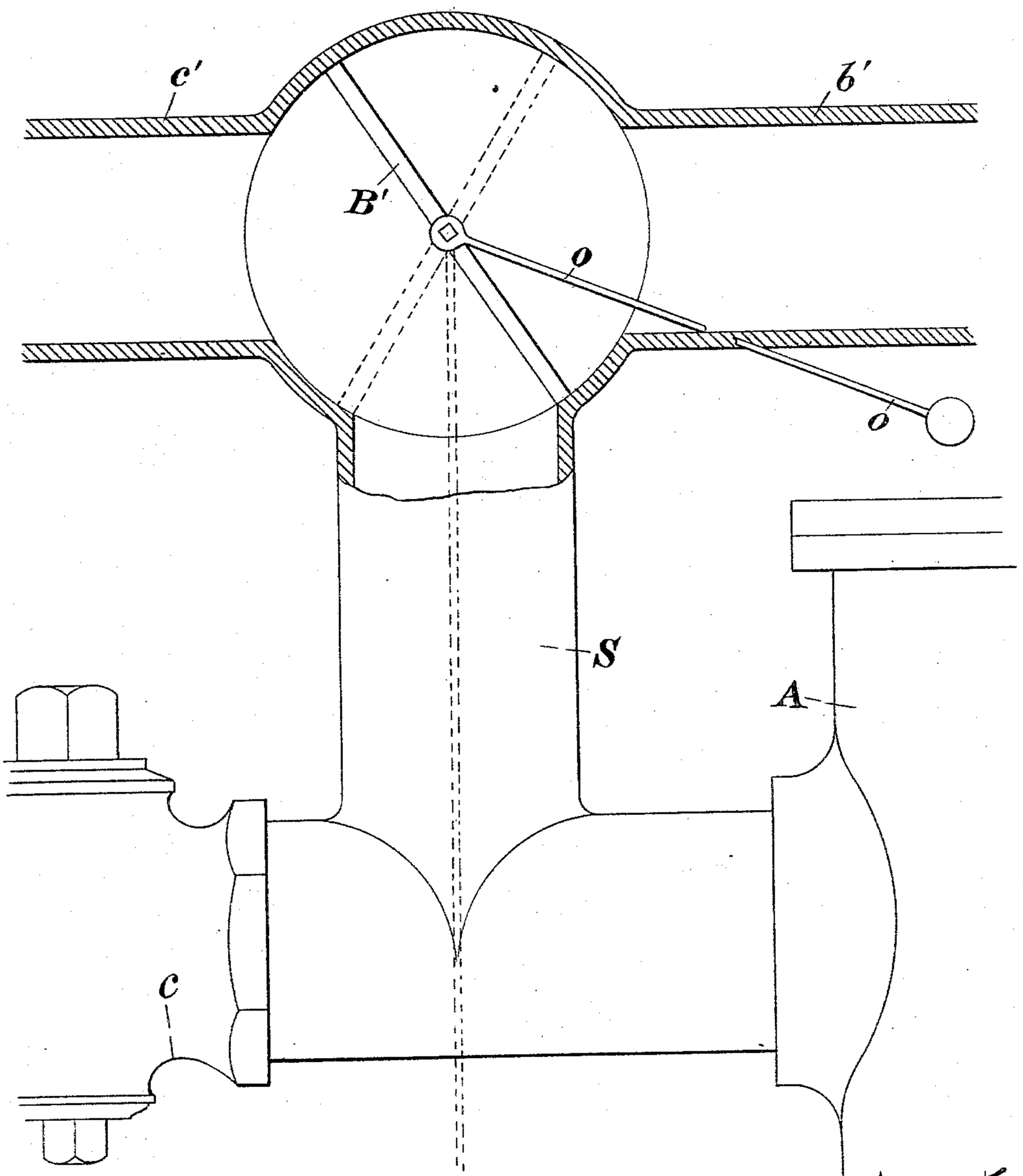
(No Model.) 4 Sheets—Sheet 4.

J. R. LANNING & J. YOUNG.

RAILWAY CAR HEATER.

No. 387,956. Patented Aug. 14, 1888.

Fig. 11.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOSEPH R. LANNING AND JOSEPH YOUNG, OF OAKLAND, CALIFORNIA.

RAILWAY-CAR HEATER.

SPECIFICATION forming part of Letters Patent No. 387,956, dated August 14, 1888.

Application filed July 6, 1887. Serial No. 243,486. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH R. LANNING and JOSEPH YOUNG, citizens of the United States, residing at Oakland, in the county of Alameda and State of California, have invented a new and useful Railway-Car Heater, of which the following is a specification.

Our invention relates to improvements in railway-car heaters in which a portion of the heat generated in the boiler-furnace is utilized in heating the train.

The objects of our invention are, first, to provide an efficient and economical means of utilizing a portion of the heat generated in the furnace of the locomotive in heating a train of cars attached thereto; second, to so arrange the apparatus that the control of it shall be primarily with the engineer and secondarily with those on the train; third, to so construct and arrange the apparatus that while the train is in motion the heat abstracted for the purpose of warming shall be taken from waste heat which would otherwise be dissipated in the atmosphere, and only while the train is stationary shall the heat be used for warming which could otherwise be used for motive purposes, and that the changing from one to the other mode of abstracting heat shall be automatic; fourth, to so arrange the apparatus that the heating can be accomplished either by radiation from suitable surfaces or by dissemination of the heated air directly into the cars; fifth, to provide means for regulating the amount of heat so radiated or disseminated in each car. We accomplish these objects by means of the devices illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a locomotive-boiler with portions broken away to more clearly illustrate our device. Fig. 2 is a diagrammatic elevation of a car, showing the heat-disseminating appliance in position. Figs. 3, 4, 5 are plan views of various modifications of heat-distributing-pipe systems which can be employed in cars. Fig. 6 is an enlarged view of coupling device. Fig. 7 is an end view of coupling device. Fig. 8 is a front view of indicator. Fig. 9 is a side view of indicator. Fig. 10 is an end view of three-way valve, showing the vane or wing attached to its spindle. Fig. 11 is a section of three-way valve, showing the relation of the ports to the vane or wing O.

Like letters refer to similar parts in the various views.

A is an air-compressor attached to and actuated by the locomotive.

B and C are air-conducting pipes.

C′ is a coil of pipe located in the smoke-box of the locomotive.

D is a saddle-shaped air-receiver attached to the boiler; E, a pipe conducting the heated air to the train.

F F′ are ball-and-socket joints.

G G′ are telescopic joints.

M is a coupling for connecting the pipes of two cars.

H is the main conducting-pipe running through the cars.

I is a disseminator, consisting of a short piece of pipe perforated all over its surface with small holes for the escape of hot air. It is attached to and receives its supply of hot air from the main pipe by the connecting-pipe *i*.

J is a regulating-valve.

K is an indicator, and L a thermometer. The indicator shows the amount of opening in the regulating-valve which admits the heated air into the radiators or disseminators.

b and *c* are stop-valves on the air-conducting pipes B and C.

B′ is a three-way valve for changing the course of air from the compressor into pipe B or into pipe C.

O is a vane or flag-shaped plate attached to the spindle of the three-way cock by one of its edges, being free to be moved by the resistance of the air while the train is in motion, thereby operating the three-way cock; S, an air-supply pipe; *b′*, pipe for conducting air into B; *c′*, pipe for conducting air into C.

The operation of our device is as follows: We make use of atmospheric air for the purpose of abstracting and carrying the heat from the locomotive to the cars. We use an independent compressor for storing and forcing the air through the pipes which abstract and distribute the heat. While the engine is in motion our apparatus abstracts the heat from the smoke-box; but as this heat practically ceases when the engine is at rest we have recourse to the heat of the live steam in the

boiler, and should for any reason one or other of these sources prove inefficient we can draw upon both simultaneously.

The following detailed description will make our device thoroughly understood.

The compressor A forces air into either of the pipes B or C, its course being determined by the position of the three-way valve B′. One position of it causes the air to flow into pipe C, and so into the coil C′ in the smoke-box, where it is surrounded and heated by the hot products of combustion issuing from the tubes of the boiler while the engine is in motion. The other position of valve B′ causes the air to flow into pipe B, and so through the steam-space of the boiler in contact with the live steam. Both pipes discharge air into the receiver D, from whence it passes through E to train. It is evidently desirable to utilize the heat of the smoke-box in preference to that of the live steam, as the former is practically waste heat; so the three-way cock is provided with a vane or wing, O, which, as soon as the engine gets into motion, is forced backward by the resistance of the atmosphere, thereby turning the three-way valve so that the course is opened for the air from the compressor to pass to the receiver by way of the coil in the smoke-box; but when the locomotive comes to rest the pressure upon the vane or wing ceases, and so by its own gravity the vane or wing assumes the position in which the three-way valve is open for the air to pass through the steam to the receiver. While this automatic device is in operation the valves *b* and *c* are closed. By opening *b* and *c* air is allowed to pass both ways to receiver. The telescopic and ball-and-socket joints form a flexible connection where needed in the pipe through which the hot air is conveyed. Coupling M connects the pipe between the cars, the slack chain N allowing the telescopic joint to work without admitting of its being pulled out entirely except in case of breakage of the car-coupler, when this chain parts and the telescopic piece on one side is drawn out, thereby avoiding all damage to important parts of the device.

The indicator K consists of a reel or spindle around which an endless cord is wound, this cord being extended down and being similarly wound around a like reel secured upon the plug of the regulating-valve, so that motion given to the upper reel will be transmitted exactly to the lower reel and regulating valve-plug. To the upper reel is attached a pointer, P, and handle Q, so that as the handle Q is moved the pointer indicates the amount of movement upon the face of the dial R. The dial R is divided and marked to correspond with the amount of opening of the valve J, showing when it is closed and when it is opened one-eighth, one-fourth, three-eighths, one-half, &c., to full open.

In Fig. 3 the heated air is driven through the pipe H into the small pipes *i i*, which lead it into the disseminators I I, the amount being regulated by the regulating-valve. Above the disseminators are gratings or registers to allow the hot air to pass readily into the car.

In Fig. 4 the heat is distributed both by dissemination and radiation, the main pipe being laid in a channel closed on all sides but the top, where it is covered for nearly its whole length by a grating or register. It is also supplied at intervals with the perforated disseminators.

In Fig. 5 heat is distributed entirely by radiation, the heated air being forced from the engine to the end of the train through the exposed coils, and is allowed to escape by a suitable valve.

We do not confine ourselves to the modes of distributing heat shown in the drawings or the manner of coupling illustrated, as it is evident that the apparatus is adapted to utilize any style of piping for distributing heat which may be in cars at the present time or may be considered most desirable.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a railway-car heater, a three-way valve to the spindle of which is attached a wing or vane, in combination with pipes *b′* and *c′*, which lead into and are connected, respectively, with the pipes B and C, and the pipe S, connecting the inlet of the three-way valve with the outlet of the compressor, said three-way valve being located at the junction of the pipes *b′ c′* S, and being suitably connected to the three pipes to receive air from the compressor and convey it into pipes B C, according to the position of the wing or vane, substantially as described.

2. In a railway-car heater, the compressor A, actuated by steam from the locomotive, the pipes B and C, for conducting air from the compressor, and the pipes *b′*, *c′*, and S, connecting the pipes B and C to the compressor, in combination with a three-way valve, to the spindle of which is attached a wing or vane, located at the junction of the pipes *b′ c′* S, substantially as described.

3. In a railway-car heater, an air-compressor actuated by the locomotive to which it is attached, having pipes C B, for conveying air into and through the smoke-box and steam-space of the boiler, and a discharge-pipe, E, suitably connected to the pipes B C to receive the heated air and convey it to the train, in combination with a three-way valve to the spindle of which is attached a wing or vane, and the pipes *b′ c′*, which connect the three-way valve, respectively, with the pipes B C, the pipe S, connecting the discharge of the compressor with the inlet of the three-way valve, the three-way valve being located at the junction of the pipes *b′*, *c′*, and S, and suitably connected to the three pipes for conveying air from the compressor through the three-way valve and pipes *b′ c′* into pipe B or pipe C, substantially as described.

4. In a railway-car heater, a receiver provided with a suitable discharge-pipe, a pipe

or coil of pipes located in the smoke-box, connected to the receiver, and suitably connecting the coil with the compressor, and a pipe or coil of pipes located in and passing through the boiler and suitably connected to the compressor for conveying air from the compressor through the boiler to the receiver, in combination with a three-way valve to the spindle of which is attached a wing or vane, and the pipes *b' c'*, which connect the three-way valve, respectively, with the pipes B C, the pipe S, connecting the discharge of the compressor with the inlet of the three-way valve, the three-way valve being located at the junction of the pipes *b'*, *c'*, and S, and suitably connected to the three pipes for conveying air from the compressor through the three-way valve to the pipes B and C, substantially as described.

5. In a railway-car heater, the combination of an air-compressor, a receiver having a suitable discharge-pipe, the smoke-box of a locomotive, pipes or coils of pipes located in and passing through the smoke-box, the boiler of a locomotive, and pipes or coils of pipes located in and passing through the boiler, the pipes and coils located in the smoke-box and boiler being suitably connected to the compressor for conveying air through the smoke-box and boiler to the receiver, in combination with a three-way valve to the spindle of which is attached a wing or vane, and the pipes *b' c'*, which connect the three-way valve, respectively, with the pipes B C, the pipe S, connecting the discharge of the compressor with the inlet of the three-way valve, the three-way valve being located at the junction of the pipes *b'*, *c'*, and S, and suitably connected to the three pipes for conveying air from the compressor through the three-way valve to the pipes B C, and a stop cock or valve located on the pipe B between pipe *b'* and the compressor, and another stop cock or valve located on pipe C between its connection with pipe *c'* and the compressor, substantially as described.

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