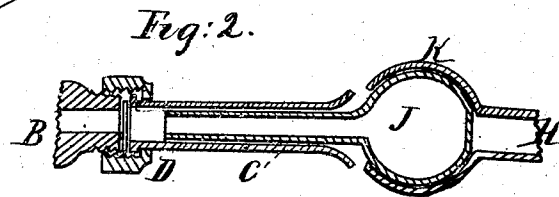
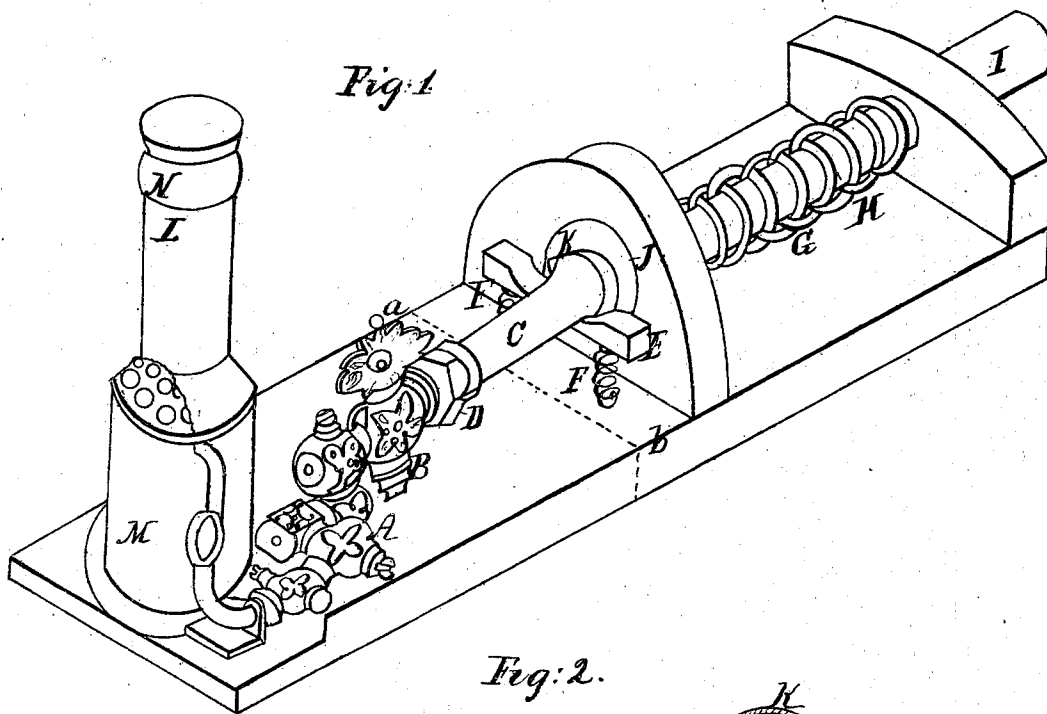


A. C. CRARY.
HEATING RAILROAD CARS.

No. 77,871.

Patented May 12, 1868.



Witnesses,
William Krum Jr.
John S. Krum
Thos. J. Bain

Inventor;
Archibald C. Crary

United States Patent Office.

ARCHIBALD C. CRARY, OF UTICA, NEW YORK.

Letters Patent No. 77,871, dated May 12, 1868.

IMPROVEMENT IN HEATING RAILROAD-CARS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ARCHIBALD C. CRARY, a resident of the city of Utica, in the State of New York, have invented a new and useful Mode of Heating Railroad-Cars, by means of the residuum heat from the fire in the furnace or from the boiler of the locomotive which propels a train of cars.

The nature of my invention consists in the application or use of a second boiler or heater, which may be placed in a horizontal or other convenient position, and so combined with the boiler of the locomotive as to cause the smoke and heat, which pass from the furnace or the boiler of the locomotive, to pass through the smoke-pipes of this second boiler, and thus to generate steam in the second boiler, for the purpose of heating the cars attached to the said locomotive, and in the mode of conveying and of distributing the steam for heating cars; and I hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of a smoke-stack or smoke-pipe of a locomotive, and of the series of steam-pipes, with their union or coupler, compound joint, and universal joint.

Figure 2 represents a sectional view of the same steam-pipes and the union and universal joint.

The smoke-stack L has in its lower section the heater, M, designed to generate steam for the purpose of heating the cars connected with the locomotive. A portion of the smoke-stack is removed, for the exhibition of the upper ends of several steam-pipes, which pass through the second heater or boiler. The top of the smoke-stack N is in the usual form of smoke-stacks, the steam-pipe O extending from the said heater above the water which it contains, and passing through the side of the enclosing smoke-stack, extends to the series of horizontal steam-pipes, through which the steam designed for heating the cars is driven. Near the insertion of steam-pipe O is the compound joint A, and immediately back of the joint A is the cock B, intended to stop the escape of steam when the cars are uncoupled, and to regulate the quantity of steam passing into said steam-pipes. The union or coupler, D, near the said compound joint, is designed to connect flexible steam-pipes with the steam-pipe O, when metallic-pipes are not used. Pipe C, which is at its front end connected with the compound joint by the union D, is supported at its hind part by rest or prop E. This prop is supported by two spiral springs, F F, and is, by said springs, permitted to conform to the motions of the cars, which terminate at the line *a b*.

The funnel-shaped end of steam-pipe C, when two cars are united, in making up a train, receives a steam-pipe, projected from the spherical zone of the universal joint J, and thus forming steam-tight connections, which conform to all the motions of the cars. The bracket K is at the termination of the car, and determines the space which the universal joint J shall move forward. The universal joint J is formed, as shown by fig. 2, by a spherical zone, contained in a similar zone. These zones are of such relative diameters as to form a steam-tight union, and to permit the inner surface of the one zone to move freely over the external surface of the other zone. The steam-pipe H is connected with the largest zone, at its back end, and the pipe which slides into the pipe C is connected with the front end of the smallest zone. The segments cut off of the spheres, in forming the zones, are regulated in number of degrees by the probable deflection of the steam-pipes with which they are connected. Enclosing the steam-pipe H is the spiral spring G. This spring permits the ball-and-socket or universal joint J to be pressed back, when the cars are to be uncoupled, and thus allows the pipe C to be raised to a vertical position, and presses the universal joint J firmly against the ends of steam-pipe C, when the cars are united, and the steam is being driven into radiators, and various steam-chambers and steam-pipes placed in each car for the receipt of steam and the radiation of heat. The large steam-pipe I forms the connection between steam-pipe H and the radiators and steam-pipes within the cars.

This series of steam-pipes, with its various connections, may be placed above or below the passages into the several cars. These steam-pipes may be united by the universal joints alone, or with the compound joint. The compound joint being composed of two right-angle joints, admits of the vertical and lateral motions of the cars. The insertion of the steam-pipe which is a continuance of the inner zone, into steam-pipe C, provides for

the lateral motions of the cars, for the instantaneous disruption of a train, and coupling and uncoupling the cars, without injury to the steam-pipes.

In case of the steam generated by the heat of the steam-boiler being insufficient to warm a train of cars, a second steam-pipe, similar in all respects to the pipe O, may be connected with the pipe of the boiler of the locomotive, and also to steam-pipe O, and the escape steam be passed with said pipes, and radiators, in aid of or in lieu of the steam of the second boiler.

Having described my invention, what I claim, is—

The separate steam-generator M on the locomotive, heated by the waste heat of the smoke or of the exhaust steam, for the purpose of heating the train of cars, and constructed substantially as herein described.

I also claim, in combination with a separate steam-generator, M, constructed as above specified, the use of pipes O, H, and I, in the manner as herein set forth and described.

I also claim, in combination with a separate steam-generator, M, and pipes O, H, and I, as above specified, the use of universal or compound joints, in the manner substantially as herein set forth and described.

City of Utica, New York, March 4, 1868.

ARCHIBALD C. CRARY.

Witnesses:

WILLIAM KEMAN, Jr.,
JOHN D. KEMAN,
WM. J. BACON.