

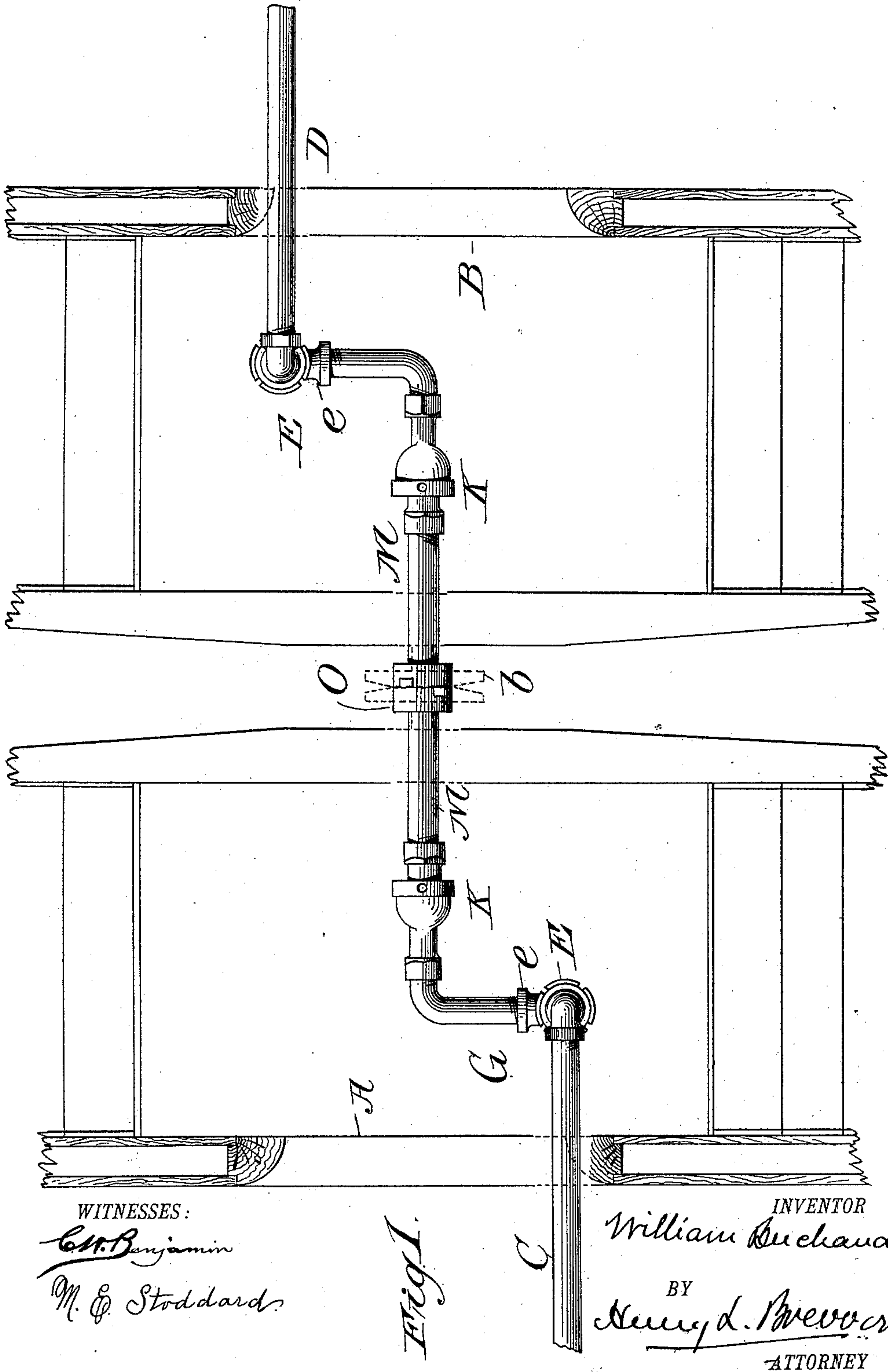
(No Model.)

3 Sheets—Sheet 1.

W. BUCHANAN.
CAR HEATING APPARATUS.

No. 424,459.

Patented Apr. 1, 1890.



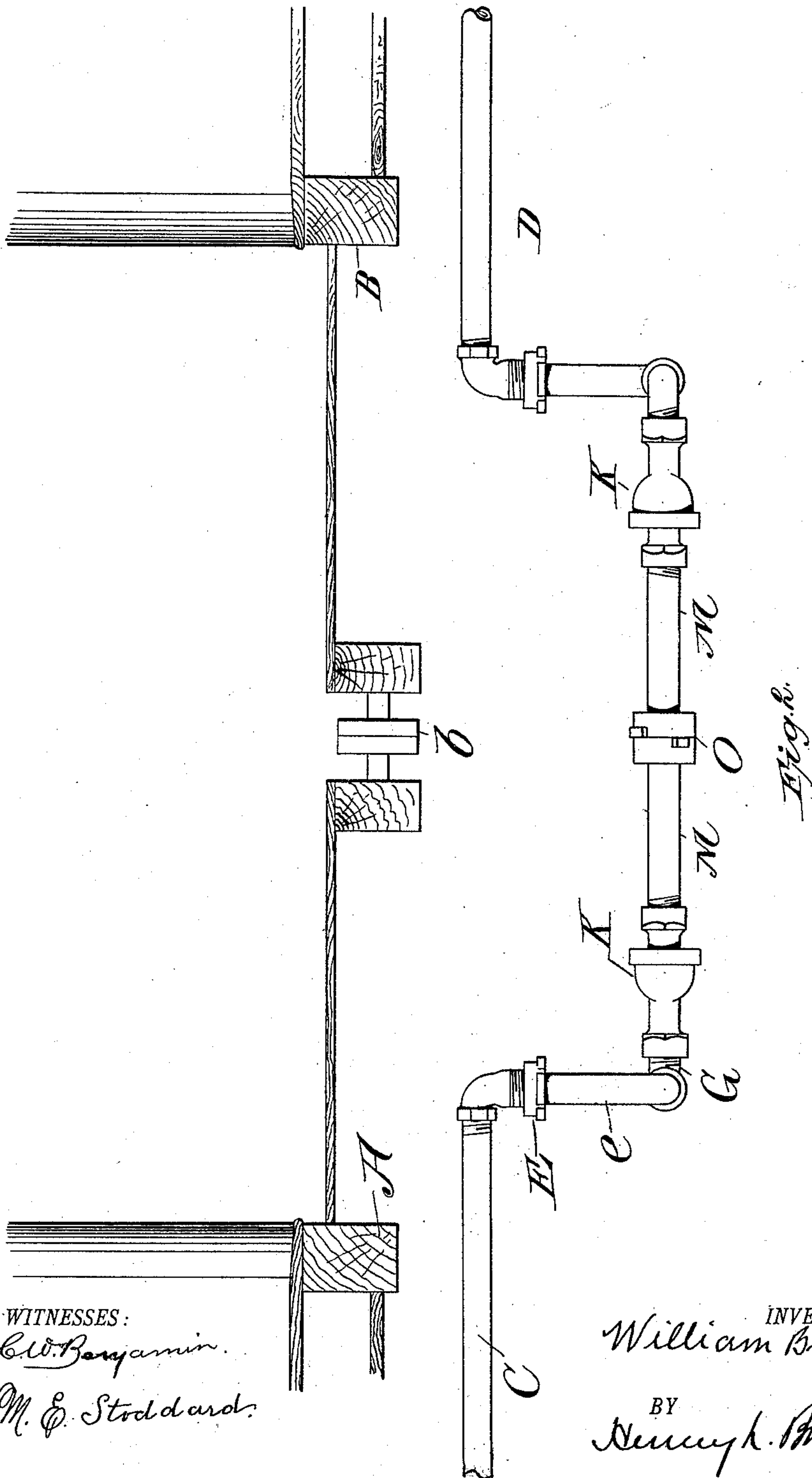
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CAR HEATING APPARATUS.

No. 424,459.

Patented Apr. 1, 1890.



WITNESSES:

Chas. Benjamin.

M. E. Stoddard.

INVENTOR
William Buchanan
BY
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ATTORNEY

(No Model.)

3 Sheets—Sheet 3.

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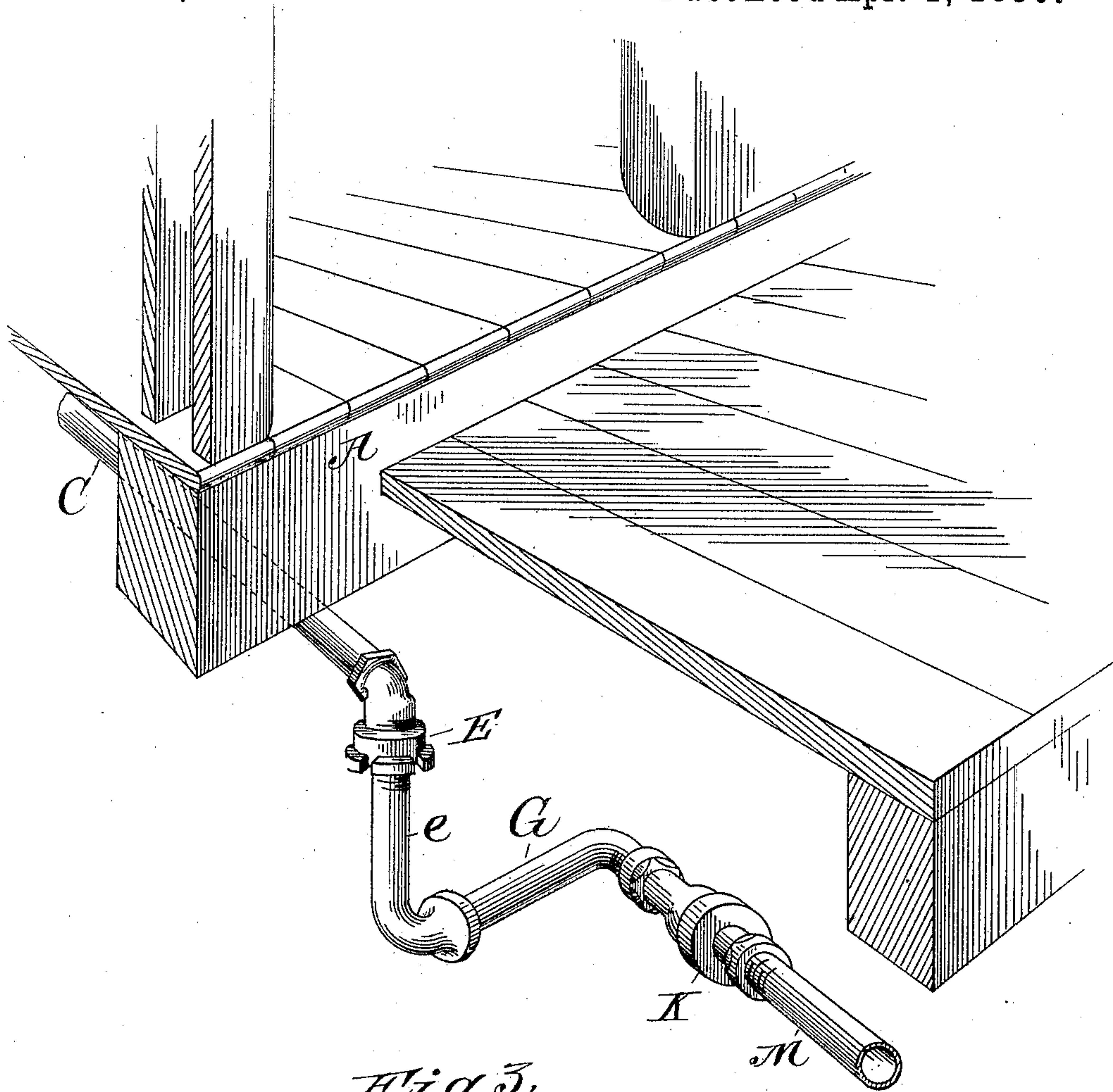


Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM BUCHANAN, OF NEW YORK, N. Y.

CAR-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 424,459, dated April 1, 1890.

Application filed September 25, 1889. Serial No. 325,027. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BUCHANAN, a resident of the city of New York, county of New York, and State of New York, and a citizen of the United States, have made a new and useful Improvement in Car-Heating Apparatus, of which the following is a full, clear, and accurate description, and which, when taken in connection with the accompanying drawings, will enable others to practice the same.

In heating cars by steam it is usual to convey the steam underneath the car-body in metal pipes, and it is also desirable to make the connecting mechanism between the cars also of metal. As the cars move in relation to one another, this connection must be capable of yielding, so that the cars may move freely and the pipes remain intact.

My invention consists in an arrangement of pipes and joints under the end of each car, which are adapted to convey the steam, and which permits the car-bodies to move in relation to each other without obstruction.

My invention consists in combining with the necessary pipes a swivel-joint and a ball-joint in such a way that the swivel-joint supports the ball-joint and some of the pipes.

Referring to the accompanying drawings, Figure 1 represents a bottom view of the ends of cars having my invention attached thereto. Fig. 2 is a side view showing my invention applied to the ends of two cars. Fig. 3 is a perspective view of one end of a car.

Like letters refer to the same parts in all the figures.

A and B represent the sill-beams and platforms of two cars, and *b* represents the buffers.

The drawings illustrating the ends of the cars are merely diagrammatic, and do not purport to be working drawings.

At C and D are shown the main line of steam-pipes, which are supported under each car and which run generally in about a horizontal plane. I have not here shown the supports; but any suitable supporting devices can be used. The pipes C and D are placed, as shown, one on each side of the central line of the car. This is the most convenient position, and it also assists me in carrying out the arrangement of parts which I am about to describe.

I will describe the device under one end of

a car, as the device under the adjoining end of the next car is identical in structure.

At E and *e* are shown a swivel-joint and the downwardly-extending pipe thereof. The swivel-joint E is firmly fastened to the pipe C or D, and is preferably made in accordance with an application for a patent filed by me September 6, 1889, Serial No. 323,117. The pipe *e* can swivel on its axis; but it can have no other motion.

It will be noticed that the swivel-joint is placed approximately vertical. This is done to give stiffness to the pipe *e* and enable it to serve as a stiff support for the rest of the parts, as will be described farther on. Any form of swivel-joint can be employed which will allow the pipe *e* to turn on its axis and prevent it from having any other appreciable motion.

At G is shown what I will call the "cross-pipe." This pipe runs approximately at right angles to the pipe *e*, and in the operation of the parts it turns and the pipe *e* acts as its pivot.

The swivel-joint E and the downwardly-depending pipe *e*, I will speak of hereinafter as the swivel-joint mechanism.

Attached to the cross-pipe G, and projecting from it approximately at right angles and in a horizontal plane preferably, is a ball-and-socket-joint mechanism K. The socket is attached to the elbow or turn of the pipe G, and the ball is firmly attached to one of the connecting-pipes M. This pipe M terminates in a coupling O, which couples rigidly to the like coupling of the duplicate pipe M under the other car.

In referring to the ball-and-socket-joint mechanism I include in the term the socket K and the ball within it, and I will refer to the pipe M as the connecting-pipe. It will be observed that the swivel-joint mechanism is arranged vertically, the cross-pipe is at right angles and placed horizontally, and the ball-and-socket-joint mechanism is at right angles to the cross-pipe, but is preferably in the same horizontal plane. By reason of the ball-and-socket-joint mechanism the connecting-pipe M can be adjusted at any desired angle, so that its coupling can be attached to the one of the other car without difficulty, and when the cars are in motion the coupling-pipe can

assume all necessary angles. The motion between the cars, due to their approaching and receding from one another, is allowed for by the swivel-joint and the cross-pipe G. As the cars approach, the swivel-joint comes into play, the cross-pipe moves in an arc, and the motion of the car is thus allowed for. As the cars recede, the same thing takes place, only the cross-pipe moves in the opposite direction.

It will be seen that the swivel-joint mechanism supports the cross-pipe and the ball-and-socket-joint mechanism without requiring special supports for these parts from the car-body, which is a difficult matter to accomplish. When the cars are separated, the only part of the apparatus which hangs down toward the ground is the connecting-pipe M, and this cannot drop to any great extent.

The gist of my invention lies in allowing for all the various motions using a swivel-joint and a ball-and-socket joint, the swivel-joint being so related to the rest of the apparatus that it supports and carries the pipes and connections between itself and the coupling O. A ball-and-socket joint in place of the swivel-joint would allow for all the movements; but when the cars were separated the parts would not be held positively, and some of them would fall toward the ground. Thus a ball-and-socket joint would not be the equivalent for the swivel-joint here shown if it occupied the same position in the combination.

I am well aware that both ball-and-socket

joints and swivel-joints are old; but I believe myself to be the first to so arrange them under a car that all the necessary motion can be made by the coupling. When the cars are uncoupled, the swivel-joint supports all the parts between itself and the coupling. In this way the attendant in coupling the cars has only to lift the coupling-pipes, and, if necessary, to turn the swivel-joint to effect the union.

The ball-and-socket joint which I prefer to use is one patented to me in patent No. 406,561, dated July 9, 1889; but any other suitable ball-and-socket joint can be used.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with the main supply-pipe, of a cross-pipe united thereto by a vertically-arranged swivel-joint, so as to swing in a horizontal plane, and a connecting-pipe jointed to the free end of the cross-pipe, substantially as described.

2. The combination, with the main supply-pipe, of a cross-pipe united thereto by a vertically-arranged swivel-joint, so as to swing in a horizontal plane, and a connecting-pipe united to the free end of the cross-pipe by a universal joint and having a coupling upon its outer end, substantially as described.

WM. BUCHANAN.

Witnesses:

ARTHUR G. LEONARD,
L. F. TAYLOR.