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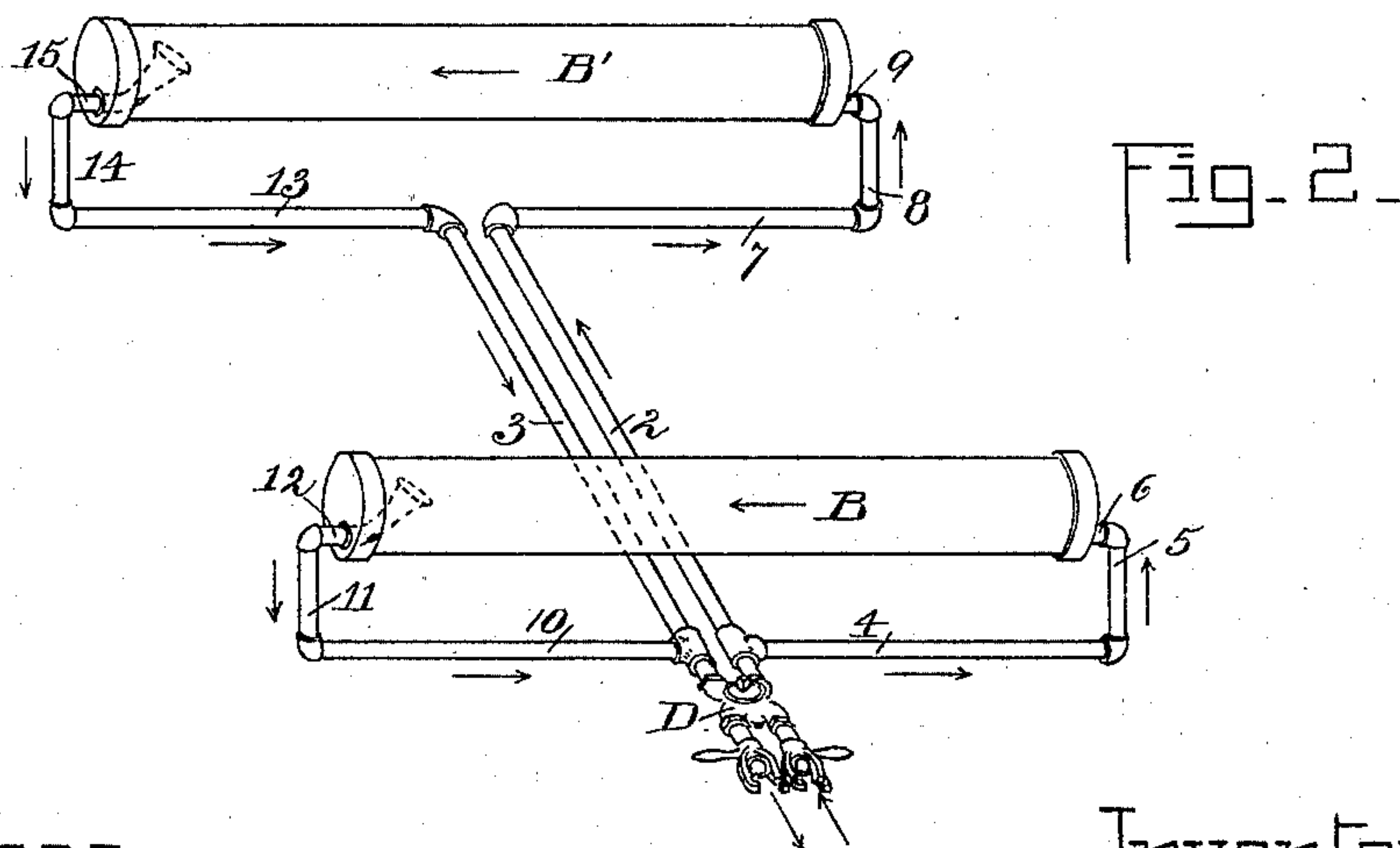
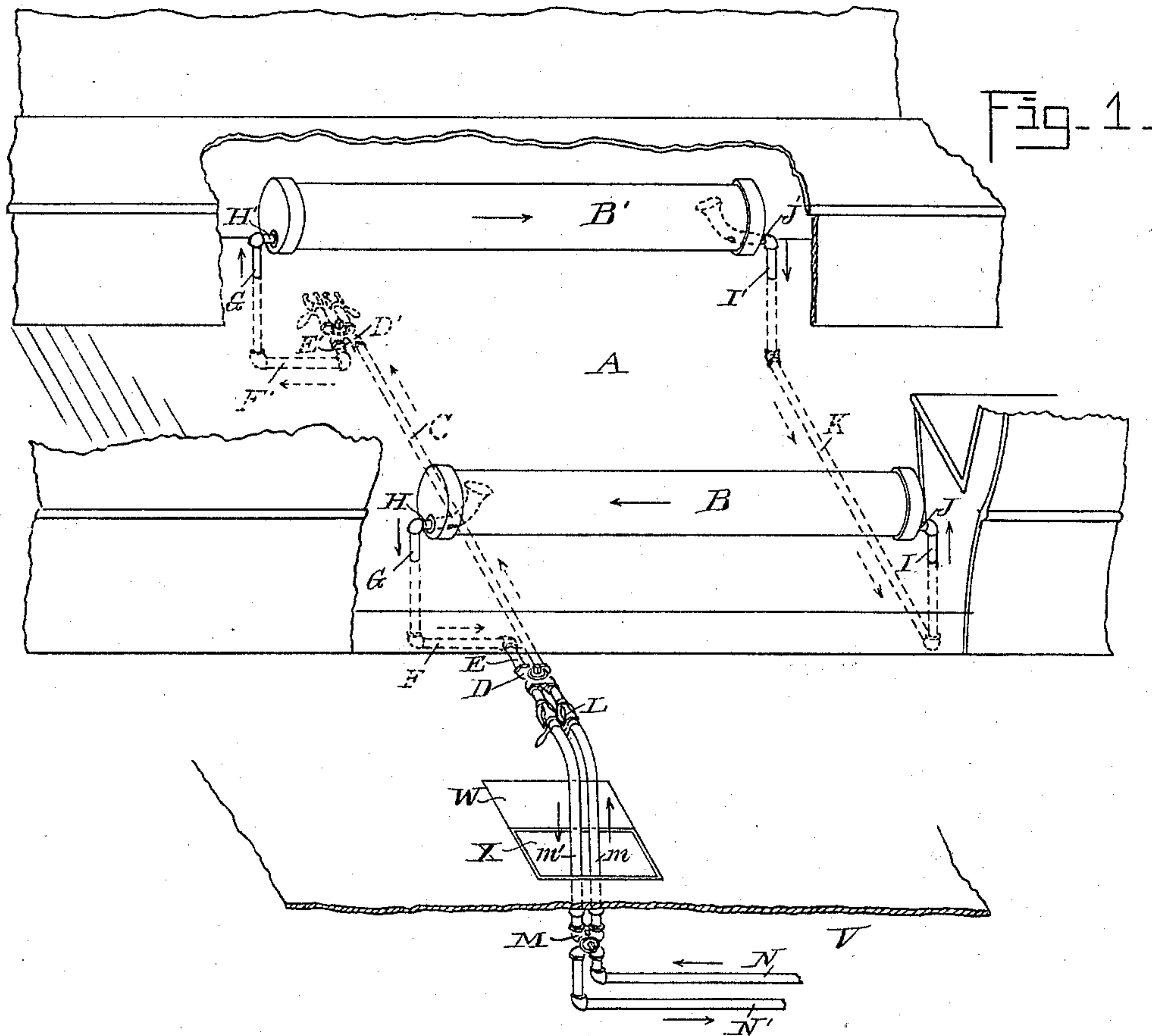
2 Sheets—Sheet 1.

J. F. McELROY.

APPARATUS FOR SUPPLYING STORAGE HEATERS WITH HOT WATER.

No. 540,215.

Patented May 28, 1895.



Witnesses:  
Frederick W. Cameron.  
John W. Fisher.

by

Inventor,  
James F. McElroy,  
Ward & Cameron  
Attorneys

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Fig. 3.

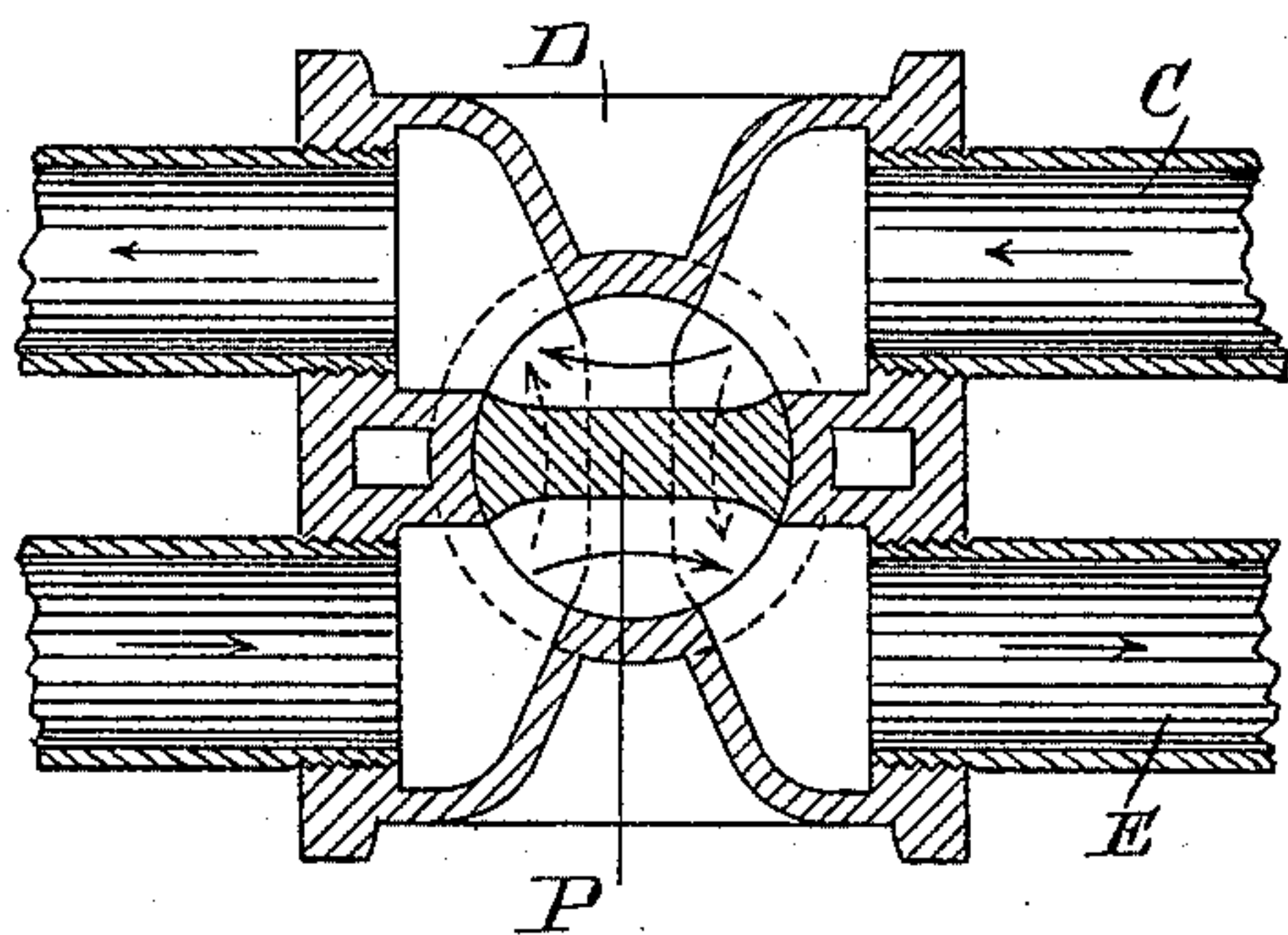


Fig. 4.

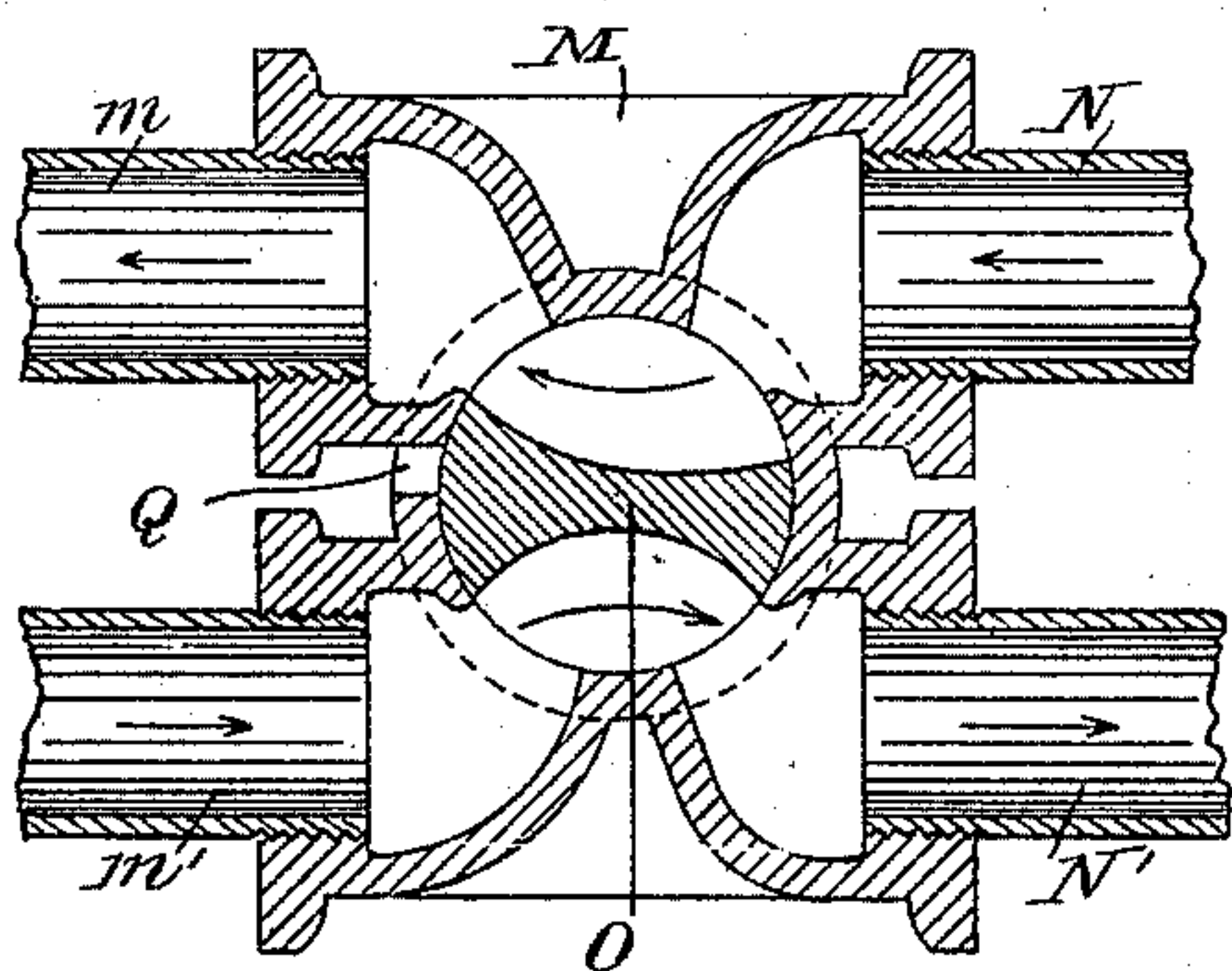
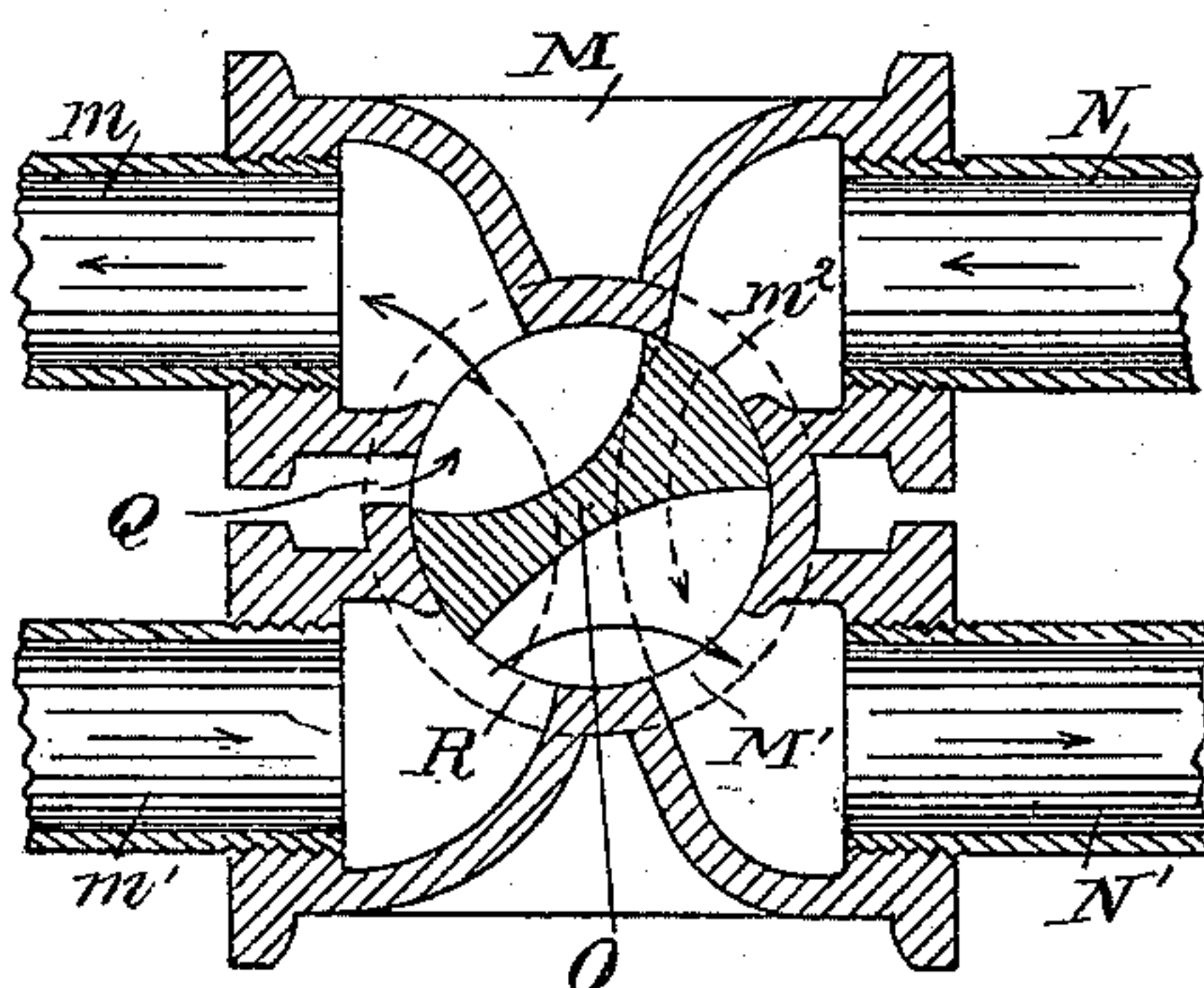


Fig. 5.



Witnesses =  
Frederick W. Cameron  
John W. Fisher

by

Inventor,  
James F. McElroy.  
Ward & Cameron  
Attorneys



# UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO THE CONSOLIDATED  
CAR-HEATING COMPANY, OF SAME PLACE.

APPARATUS FOR SUPPLYING STORAGE-HEATERS WITH HOT WATER.

SPECIFICATION forming part of Letters Patent No. 540,215, dated May 28, 1895.

Application filed August 11, 1893. Serial No. 482,909. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at the city and county of Albany, State of New York, have invented a new and useful Apparatus for Supplying Storage-Heaters with Hot Water, of which the following is a specification.

My invention relates to mechanism for heating railway cars; and the object of my invention is to produce a means for storing radiators placed upon a car with hot water, and so arranged that the connections between the supply pipes at the station may be broken without allowing water to escape at the time of the severing of the coupling. I accomplish this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of one method of arranging my apparatus. Fig. 2 is a modified arrangement of my invention in perspective. Fig. 3 is a section through the four-way valve, and Figs. 4 and 5 are sections through the five-way valve.

Similar letters and figures refer to similar parts throughout the several views.

Within the car A and on each side thereof, I arrange the drums B B', which may be connected up to provide for the storage thereof with hot water from either side of the car, as shown in Fig. 1, or from but one side, as shown in Fig. 2.

I will proceed to describe the connections providing for the charging of the drums from each side of the car. I arrange a pipe C, Fig. 1, extending across the car beneath the floor connected at each end with four-way valves D D'. Each four-way valve extends beyond the side of the car. I also connect to the four-way valves D D' respectively, the pipes E E' extending beneath the car, which connect with the pipes F F' extending a short distance parallel to the sides of the car beneath the floor and which are connected with the pipes G G', which pipes G G' are connected with the pipes H H' which enter the drums at one end thereof. The corresponding ends of the drums opposite to those entered by the pipes H H' have the pipes J J' entering therein connected with the pipes I I' extending beneath the floor of the car, each of which connects with the pipe K extending

across the car. The pipe H which enters the drum B is curved upwardly communicating with the drum near the top thereof. The pipe J' is also curved within the drum opening near the top thereof. As thus arranged, the water entering the four-way valve D passes through the pipe C to the four-way valve D' on the opposite side of the car and passes through the pipe E' to the pipes F', G' and H' and enters the drum B' near the bottom thereof. When the drum B' is nearly full, the water passes out through pipe J' into pipe I' into pipes K, I and J entering the drum B near the bottom thereof. When the drum B is filled up to the top of pipe H, the water passes out through pipes G, F and E into valve D.

The four-way valve D shown in Fig. 3, is provided with a plug P arranged in such a manner that it may be placed in the position shown by full lines in Fig. 3, when the water is entering the car as indicated by the arrows. The plug may be placed in the position shown by dotted lines in Fig. 3, in which position the water coming from the pipes E will pass through the valve and out at pipe C. As thus arranged, when the coupling is broken at L and the plug is placed in the position shown by dotted lines the water within the drums and piping within the car will circulate freely therein.

For the purpose of preventing the escape of the water when the coupling is broken, I arrange a five-way valve M usually placed in a vault V below the surface of the earth, to which valve M I connect the hose pipes m m' which are provided with couplings L, which unite with the four-way valve D. The five-way valve M is also connected with the water supply pipe N and return pipe N'.

The five-way valve shown in Figs. 4 and 5 is provided with a plug O arranged in such a manner that the water may pass directly through the valve, as shown in Fig. 4, the air port Q being closed; or the plug O may be placed in the position shown by full lines in Fig. 5, in which the air port Q and return ports R and M' are open allowing the water to leave the car, the port m<sup>2</sup> being closed preventing the water from entering the valve. By this arrangement of the five-way valve after the four-way valve has been placed in the posi-



tion shown by dotted lines in Fig. 3, the water in the hose pipes *m* and *m'* will be expelled therefrom, air passing through port Q into hose *m*, which will cause the water to pass out of hose *m'* into return pipe N' and the coupling at L may be broken without danger of hot water escaping.

It will be noticed that the water in the pipe N is under pressure, which causes the water passing through the pipe *m* and into the car to move with rapidity and force. So great is the pressure upon the water thus entering the storage drums from the supply pipe N, that the contents of the storage drums are forced out through the four-way valve D and five-way valve M, the plug in each of which valves is in the position shown by full lines in Figs. 3 and 4, and this is done with a rush, all of the pipes and drums in the car being completely emptied of their cold water in an extremely short period of time. When this is accomplished and the drums and pipes are filled hot water begins to escape through the return pipe. The five-way valve is then placed in the position shown by full lines in Fig. 5. The plug P in the four-way valve D is then placed in the position shown by dotted lines in Fig. 3, and the water within the car circulates therein, and that in the hose pipes *m* and *m'* passes into the return pipe N' and the couplings L are broken, and the hose passes into the vault through the opening X, which opening X is covered by the door W. At the breaking of the coupling L, there will be no escaping of hot water and no damage can possibly accrue to the operator.

When I use the device shown in Fig. 2, I place a four-way valve D on one side of the car as already described, connecting said valve with the two pipes 2 and 3 extending across the car beneath the floor. The pipe 2 on the side of the car nearest the valve D is connected with the pipe 4 running parallel to the side of the car, the pipe 4 at its end being connected with pipe 5, which in turn connects with pipe 6, pipe 6 entering the drum B near the bottom thereof. The pipe 2 on the side of the car opposite that occupied by the valve is connected with pipe 7 running parallel to the side of the car which connects at its end with pipe 8 passing up through the floor into the car and is connected with pipe 9 which enters the drum B' near the bottom thereof. Pipe 3 on the side of the car nearest the valve is connected with pipe 10 which runs parallel to the side of the car and at its end is connected with pipe 11, which passes up through the floor into the car and is connected with pipe 12 which enters the drum B and is curved to open near the top of the drum. The pipe 3 at the side of the car opposite the valve D is connected with pipe 13, which is connected at its end with pipe 14, and communicates with pipe 15 which enters the drum B' and is provided with a curved portion which extends to near the upper part of the drum.

The operation of the valve D is the same

as already described. The water entering the car passes from pipes 4 and 2 from which it enters the drums B and B' simultaneously, charging those drums. It returns through pipes 3 and 10.

The connections at the station with the hose pipes provided with a five-way valve, are the same as already described. It will be noticed that by this latter method, both drums are charged at the same time.

I do not limit myself to the exact position of the pipes as minutely described herein.

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

1. In a street car-heating system, the combination with a continuous and complete circulatory system, which consists of a flow pipe from the water space of a hot water boiler, a return pipe thereto, a multi-chambered cock at the junction of said flow and return pipes, and tubes from said cock adapted to be connected with corresponding pipes from a water cylinder in a car, substantially as described and for the purpose set forth.

2. In a street car-heating system, the combination with a hot water cylinder in a car, of flow and return pipes leading thereto and therefrom, a four-way cock connected with said pipes, tubes adapted to connect with said cock and leading to a five-way valve, which is connected with the flow and return pipes of a continuous circulatory system, the main ports in said five-way valve adapted to connect the tubes with said flow and return pipes, and a blow off port in said valve adapted to connect the tubes with the atmosphere, said flow and return pipes connected with a hot water boiler, substantially as described and for the purpose set forth.

3. In a street car-heating system, and in combination with a constant forced hot water circulation and with tubes leading to a hot water cylinder in a car, a five-way cock having four main ports adapted to alternate the circulation either directly between the branches of said constant forced circulation, or indirectly between the same through the said cylinder on the car, and a blow off port adapted to communicate with said tubes so as to reduce the pressure therein to atmosphere, substantially as described and for the purpose set forth.

4. In a street car-heating system, of a continuous and complete circulatory system, which consists of a flow pipe from the water space of a hot water boiler, a return pipe thereto, a multi-chambered cock at the junction of said flow and return pipes, and a hot water cylinder in a car adapted to be connected with said cock by flow and return tubes, substantially as described and for the purpose set forth.

JAMES F. McELROY.

Witnesses:

RALPH W. KIRKHAM,  
S. A. MEDARY.