

No. 785,081.

PATENTED MAR. 21, 1905.

L. H. BRINKMAN.  
RADIATOR FOR MOTOR VEHICLES.

APPLICATION FILED JULY 23, 1904.

Fig. 1.

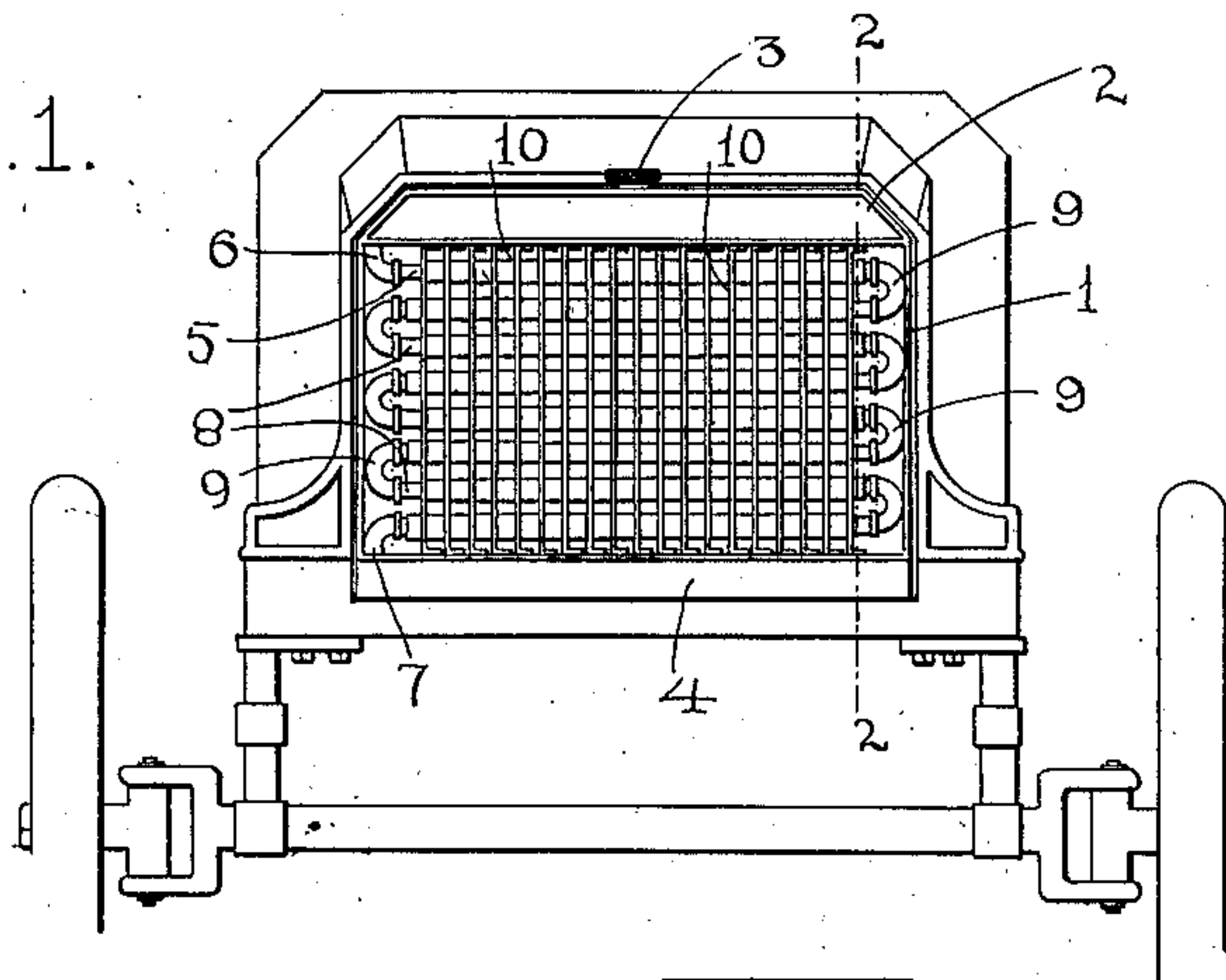


Fig. 3.

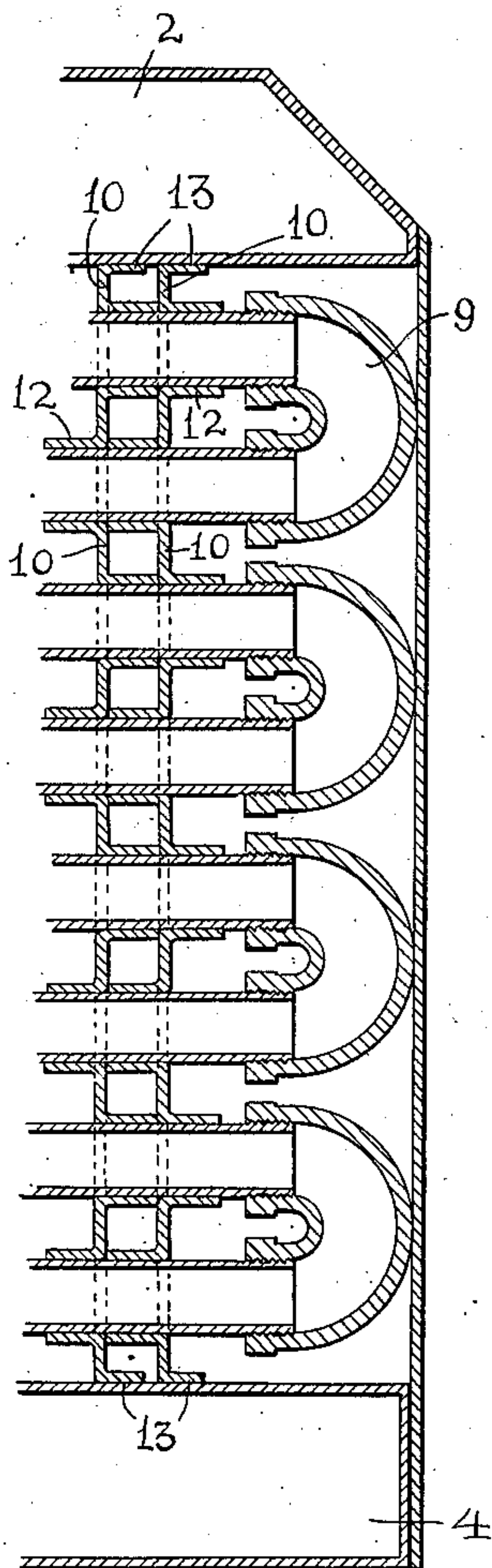
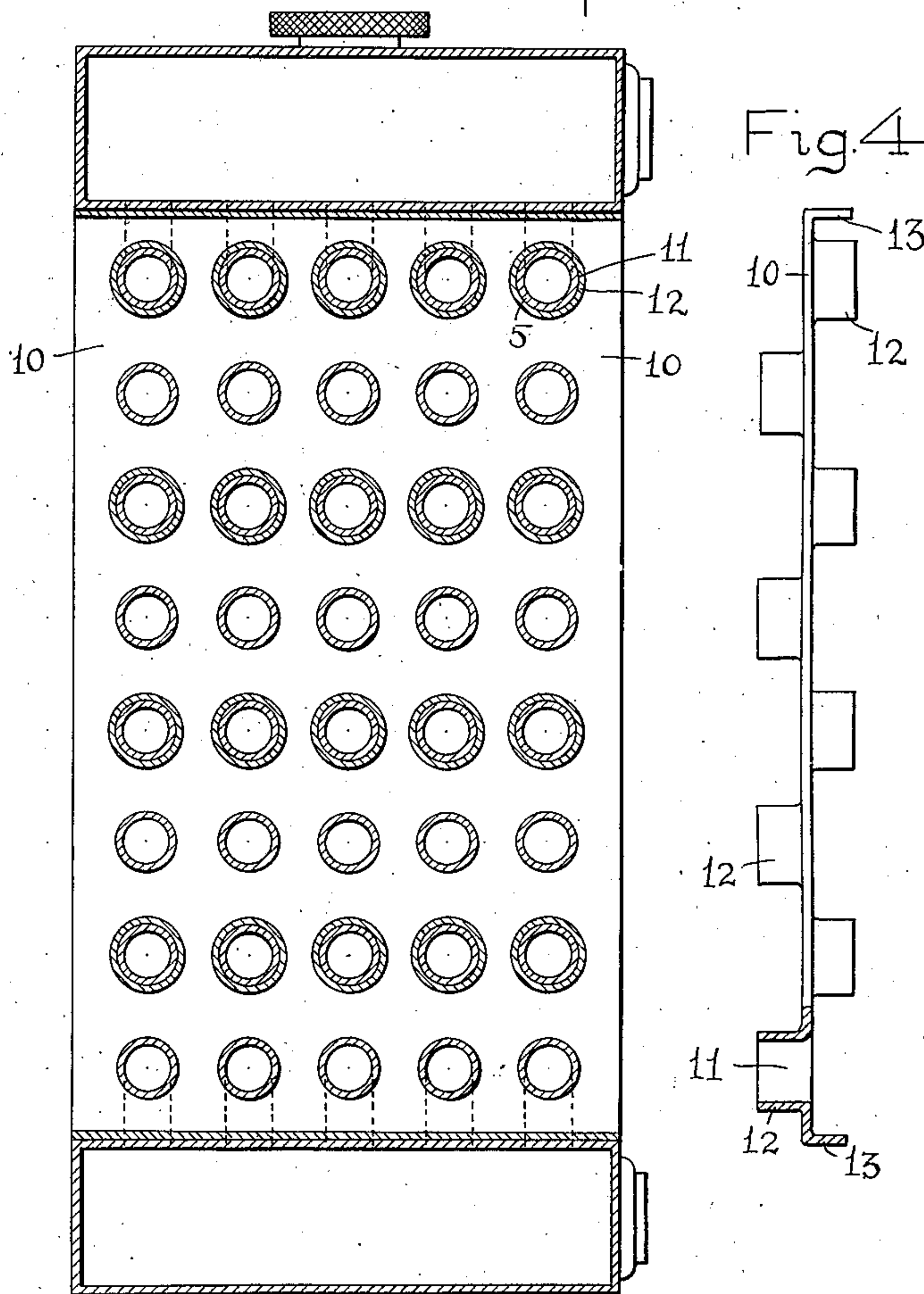


Fig. 4.



Witnesses  
Roy D. Tolman.  
*Penelope Comberbach.*

Fig. 2. Inventor  
Louis H. Brinkman.  
By *Rufus B. Fowler*  
Attorney



# UNITED STATES PATENT OFFICE.

LOUIS H. BRINKMAN, OF WEST HARTFORD, CONNECTICUT, ASSIGNOR  
TO THE WHITLOCK COIL PIPE COMPANY, OF WEST HARTFORD, CON-  
NECTICUT, A CORPORATION OF CONNECTICUT.

## RADIATOR FOR MOTOR-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 785,081, dated March 21, 1905.

Application filed July 23, 1904. Serial No. 217,787.

*To all whom it may concern:*

Be it known that I, LOUIS H. BRINKMAN, a citizen of the United States, residing at West Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Radiators for Motor-Vehicles, of which the following is a specification accompanied by drawings forming a part of the same, in which—

Figure 1 is a front view of my improved radiator represented as applied to a motor-vehicle. Fig. 2 is a vertical sectional view on line 2-2, Fig. 1. Fig. 3 is a vertical sectional view through one end of the radiating-pipes, taken on a plane at right angles to that shown in Fig. 2; and Fig. 4 is a detached view of one of the radiating-plates.

Similar reference-figures refer to similar parts in the different views.

My invention relates to that class of radiators which comprises upper and lower water-chambers, between which the water to be cooled is caused to circulate by gravity or a forced circulation through a series of serpentine pipes or restricted water-conduits, said pipes being in contact with a series of radiating-plates, by which the radiating-surface exposed to the air is enlarged and the efficiency of the apparatus increased; and my invention consists in the construction and arrangement of parts, as hereinafter described, and pointed out in the annexed claims.

Referring to the accompanying drawings, 1 denotes one of my improved radiators mounted upon a motor-vehicle and comprising an upper water-chamber 2, having an opening at the top by which the apparatus may be filled covered with a cap 3. 4 is a lower water-chamber, said chambers 2 and 4 being connected in the usual manner with a water-circulating system which includes the jacketed cylinder of an explosion-engine, and may also include, if desired, a centrifugal pump or other means for maintaining an active circulation through the radiating system.

5 denotes one of a series of pipes communicating at 6 with the upper water-chamber 2

and at 7 with the lower water-chamber 4, said pipe being returned upon itself in a series of parallel horizontal sections 8, preferably connected at their ends by return-bends 9. The several pipes 5 are preferably arranged side by side in the same horizontal plane, as shown in Fig. 2, each being connected at its opposite ends with the upper and lower water-chambers 2 and 4. Strung upon the horizontal sections 8 of the pipes are a series of parallel vertical radiating-plates 10, one of which is represented in detached view in Fig. 4. Each of the radiating-plates 10 consists of a piece of sheet metal whose length equals the vertical distance between the water-chambers 2 and 4 and whose width equals the depth of the water-chambers. These radiating-plates 10 also serve as a reinforcement or stiffening of the pipes 5, which are otherwise held only at their ends, and these plates also unite all the pipes of the water-circulatory system into a more or less rigid framework. This function of increasing the rigidity of the pipes 5 is assisted by the fact that the plates 10 are fastened at top and bottom to the water-chambers. The plates 10 are provided with openings 11 to receive the pipes 5, and the openings 11 are provided with annular flanges 12, integral with the plate 10 and formed by drawing a portion of the plate in the operation of forming the opening 11. By so drawing the annular flanges a complete ring is formed in contact with the pipe, thus increasing the area of radiation between the flanges and the pipe and materially assisting the cooling of the water. The annular flanges 12 are preferably punched from the plate 10 alternately in opposite directions from the top to the bottom of the plate, the upper series of openings for the water-pipes having their annular flanges upon one side of the plate and the next lower series of openings having their flanges upon the opposite sides of the plate. The length of the annular flanges 12 is equal to the desired distance between the plates 10, so that when the plates are strung upon the water-pipes the flanges upon the plates are brought into contact with the next adjacent



plate, as represented in Fig. 3. The upper and lower ends of the plates are preferably turned over to form flanges 13 13, which may be soldered to the surfaces of the water-chambers 2 and 4, and the flanges 12 may likewise be soldered, if desired, to the water-pipes 5, thereby forming a single integral rigid structure.

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

1. In a radiator for motor-vehicles, the combination with a series of water-pipes fastened at their opposite ends to water-chambers and bent into serpentine convolutions, said serpentine convolutions being arranged in vertical and horizontal rows, of a series of plates extending from top to bottom of the water-pipes, each plate uniting all the serpentine convolutions in said horizontal and vertical rows, thereby securing said pipes in position.

2. In a radiator for motor-vehicles, the combination with a series of water-pipes forming part of a water-circulatory system, of a series of radiating-plates provided with openings to receive said series of pipes, each plate having annular flanges surrounding said pipes and in

contact therewith, said annular flanges being arranged on opposite sides of said plate.

3. In a radiator for motor-vehicles, the combination with a serpentine pipe forming part of a water-circulatory system, of a radiating-plate having openings for separate convolutions of the pipe, said opening provided with complete annular flanges integral with the plate and in contact with said pipe.

4. In a radiator, the combination of an upper and a lower water-chamber, a series of pipes connecting said chambers, said pipes being bent into serpentine convolutions interposed between said water-chambers, and a series of radiating-plates extending from the upper to the lower water-chamber and having their ends attached thereto, said plates having a series of openings for said pipes and a series of annular flanges integral with the plates and inclosing said pipes.

Dated this 12th day of July, 1904.

LOUIS H. BRINKMAN.

Witnesses:

EDWARD D. REDFIELD,  
EDWIN H. TUCKER.