No. 829,625. PATENTED AUG. 28, 1906.

L. H. BRINKMAN.

RADIATOR.

APPLICATION FILED NOV. 18, 1904.

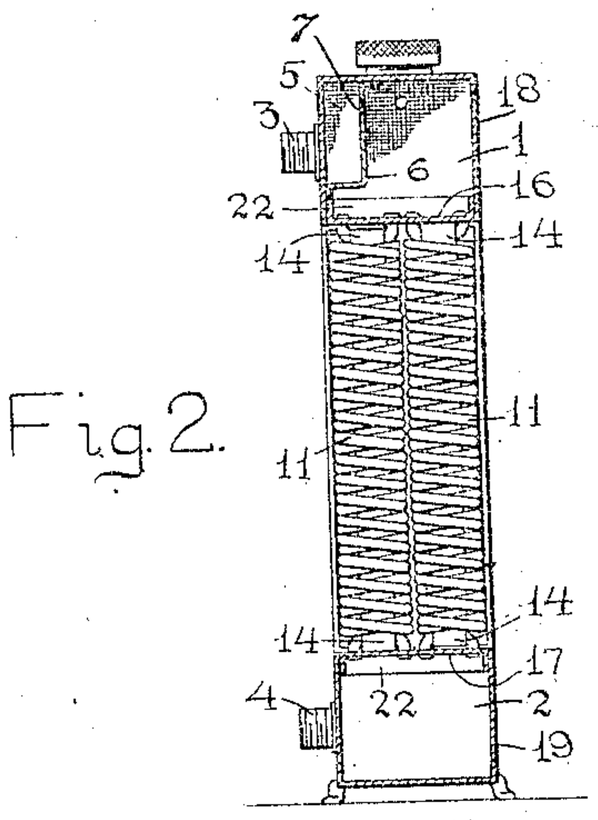

Fig. 2.

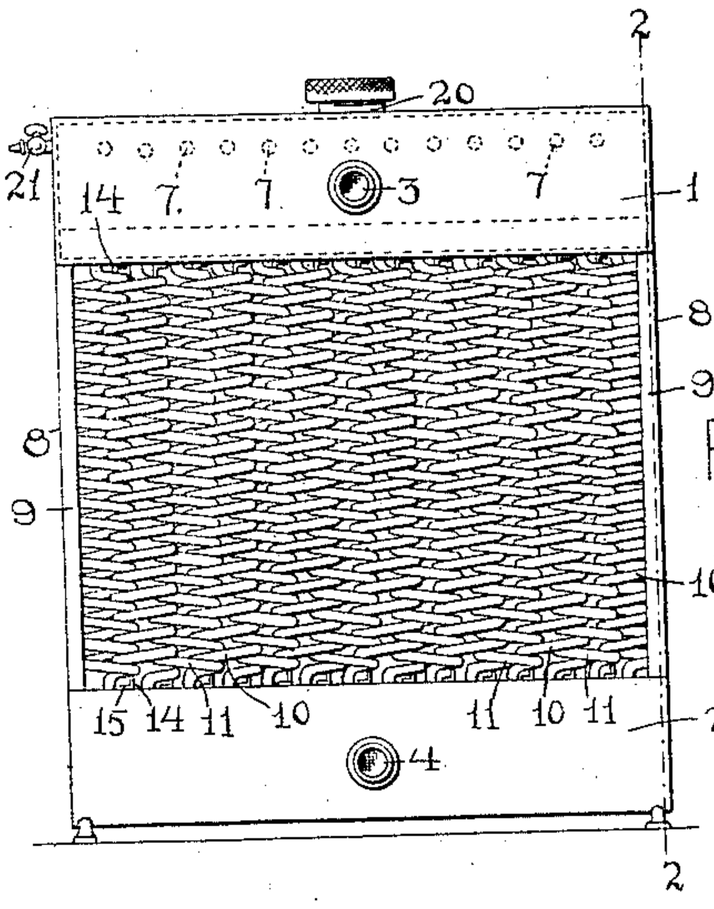

Fig. 1.

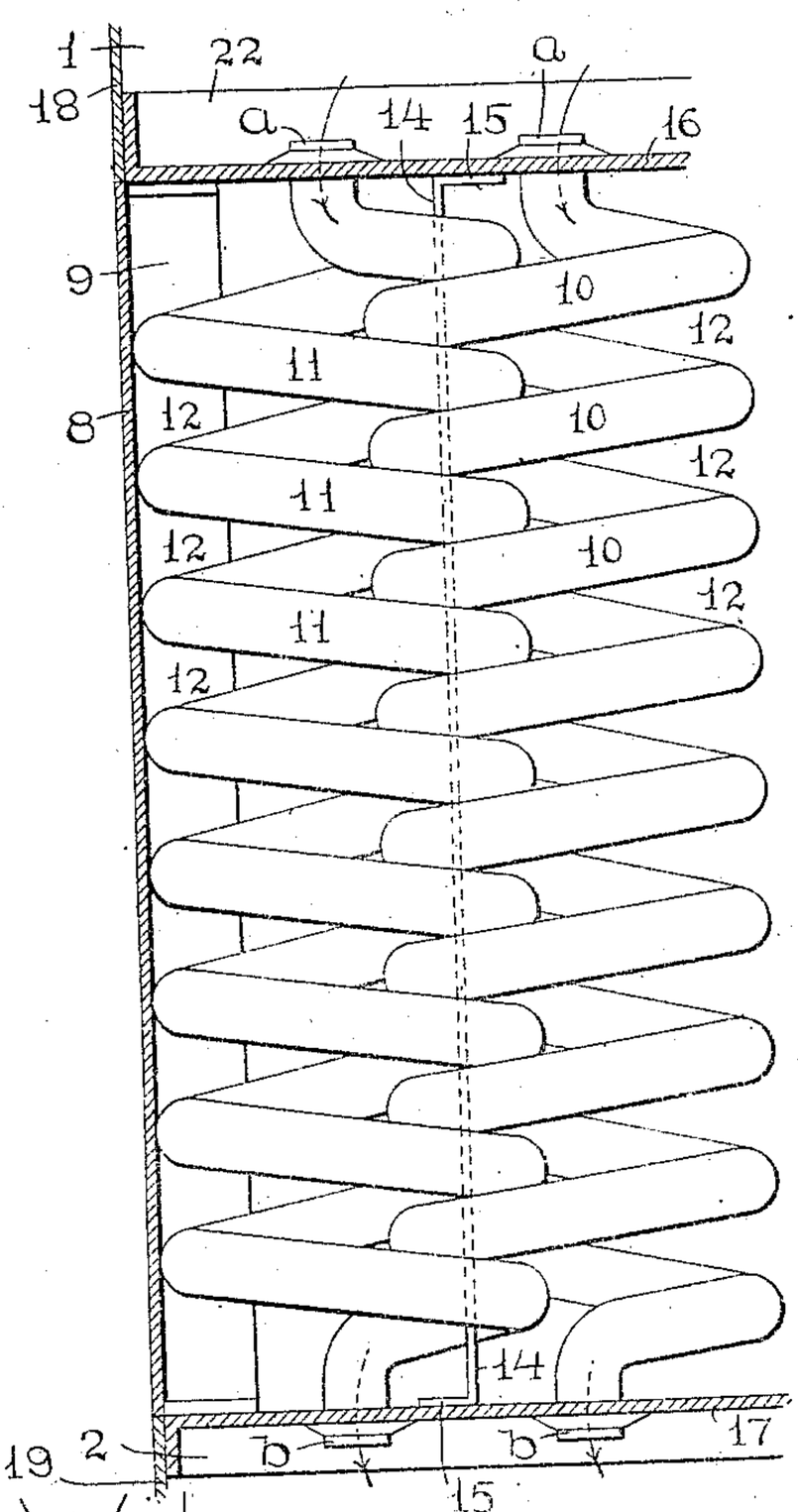

Fig. 3.

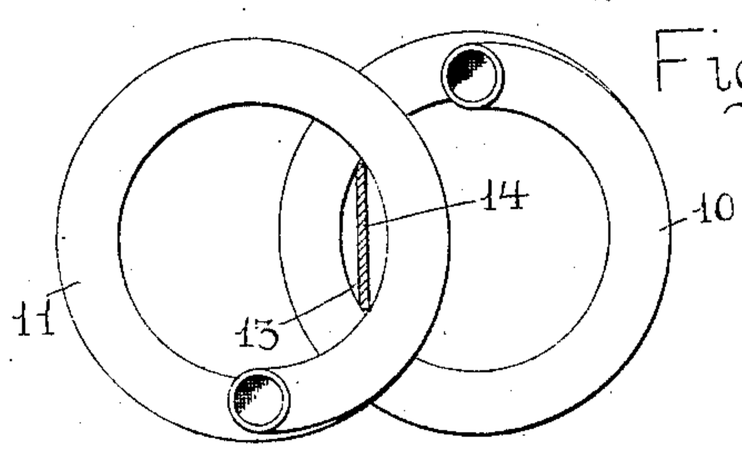

Fig. 5.

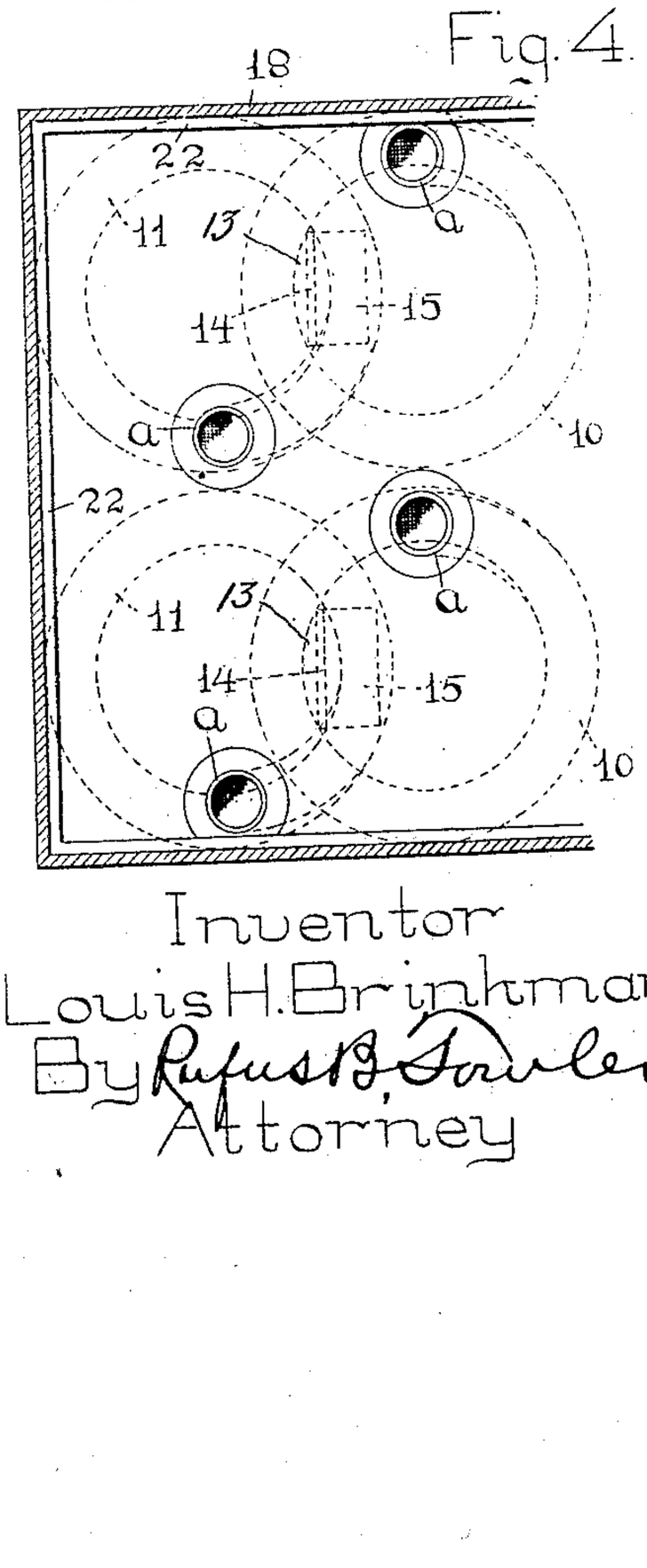

Fig. 4.

Witnesses

Roy D. Tolman.

Penelope Lombierbach.

Inventor

Louis H. Brinkman

By Rufus B. Fowler

Attorney

UNITED STATES PATENT OFFICE.

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

RADIATOR.

No. 829,625. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed November 18, 1904. Serial No. 233,263.

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, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a front elevation of a radiator embodying my invention. Fig. 2 is an end view shown in section on line 2 2, Fig. 1. Fig. 3 is an enlarged view of a portion of the radiator, showing two of the radiating-coils connecting the upper and lower water-chambers. Fig. 4 is an enlarged top view of a portion of the radiator with the upper water-chamber removed, and Fig. 5 is a detached and top view of two pipes having overlapping coils.

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

The radiator forming the subject of my present invention is designed to be used with either hot water or steam for heating purposes or for cooling water heated by the cylinder of an explosive-engine—such, for example, as the gosolene-engines employed in automobiles; and the objects of my invention are to increase the radiating efficiency in a device of this class, to simplify its construction, and reduce the cost; 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 and 2 denote upper and lower chambers, having pipe connections 3 and 4 for the admission of either steam or water, as may be required. Pipe 4 communicates directly with chamber 2; but pipe 3 communicates with a compartment 5, separated from the chamber 1 by a partition 6, having a series of holes 7, (represented by broken lines in Fig. 1,) forming a communication between the compartment 5 and the chamber 1. The area of said holes 7 is substantially equal to that of the pipe 3, so that water admitted through the pipe 3 will first be received in the compartment 5 and pass through the holes 7 into the chamber 1. The purpose of the holes 7 is to secure a more uniform distribution of water received through the pipe 3 in the chamber 1. The chambers 1 and 2 are connected at their ends by plates 8, having narrow flanges 9. The chamber 1 communicates with chamber 2 by means of a series of spirally-wound sheet-metal pipes 10 and 11, alternately wound in reverse spirals, the pipes 10 being wound with a right-hand spiral and the alternating pipes 11 being wound with a left-hand spiral.

The spaces 12 12 between the successive coils of pipe are slightly greater than the diameter of the pipe, and the coils of each spirally-wound pipe are inserted between the coils of the adjacent spirally-wound pipes, thereby causing the several coils of the right and left hand spirally-wound pipes to overlap, as shown in Figs. 1 and 3, with the coils of each pipe 10 in contact with the coils of the adjacent pipe 11. The coils of adjacent pipes are overlapped sufficiently to provide an intervening space 13, through which is longitudinally inserted a metallic strip 14, provided with flanges 15 at its upper and lower ends, by which it is attached to the bottom of chamber 1 and the top of chamber 2. The strip 14 is of sufficient width to bring its opposite edges into contact with the overlapping coils of both pipes 10 and 11, so it will become heated by its contact with the pipes.

The upper ends *a* of the coiled pipes are inserted in the bottom 16 of chamber 1 and securely soldered thereto, and the lower ends *b* of the pipes are similarly inserted in the top 17 of chamber 2 and are soldered thereto. The sheet-metal plates forming the bottom 16 and top 17 of the chambers 1 and 2, together with the ends of the coiled pipes soldered thereto, having metal strips 14 inserted as described, are then submerged bodily in a bath of liquid metal, such as tin or solder, by which the contacting surfaces of all the coiled pipes and metal strips 14 become soldered together, forming a rigid structure. The sheet-metal shells 18 and 19 are then attached to the plates 16 and 17 to inclose the chambers 1 and 2. The upper chamber 1 is provided with a capped nozzle 20 to allow the radiator to be filled with water, if desired, and when the radiator is to be used with steam a vent-cock 21 may be provided, if desired, for the escape of air.

When my improved radiator is used in

cooling the water in connection with an explosion-engine—such as the engine of an automobile, for example—the pipes 3 and 4 are connected with the water circulatory system which comprises the jacket of the engine in the usual and well-known manner, the hot water from the engine flowing to the radiator through the pipe 3 in the compartment 5 and from the compartment 5 into the chamber 1 through the series of restricted openings 7, by which the proper distribution of the heated water throughout the chamber 1 is secured. The heated water from chamber 1 flows downward through the series of coiled pipes 10 and 11 into the lower chamber 2, from which it is returned to the engine through the pipe 4. The plates 16 and 17 are preferably flanged at 22 to facilitate the attachment of the shells 18 and 19, which inclose the chambers 1 and 2. The entire radiator may be made from sheet metal, like copper or brass, which will permit the rapid radiation of heat, and all the joints are united by soldering or brazing, thereby rendering the inclosed spaces for steam or water absolutely tight without packing. The series of coiled pipes are repeated across the front of the radiator in sufficient number to give the desired width to the radiator, and the rows of coiled pipes may be multiplied to any extent desired, two of such rows being shown in Fig. 2 of the drawings, the number of coiled pipes and the number of rows being determined by the amount of radiating-surface required.

By overlapping the coils of adjacent pipes the space required for the several rows of pipes and each row of pipes is considerably lessened, and as the overlapping coils are brought closely together and each coil is soldered to the adjacent contacting coil the radiator is rendered extremely rigid. I also increase the rigidity of the radiator and resist any strains which would break the soldered joints between the adjacent coils of pipe by the insertion of the metal strips 4. The metal strips 14 also increase the area of radiating-surface, as the edges of the metal strips 14 are brought into contact with and soldered to the inside of their inclosing coils.

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

1. In a radiator, the combination with upper and lower chambers, of a series of coiled pipes communicating at their ends with said chambers, and having coils of adjacent pipes overlapping each other and a metal strip inserted longitudinally through said overlapping coils.

2. In a radiator, the combination with upper and lower chambers, of a series of coiled pipes communicating at their ends with said chambers, and having the coils of adjacent pipes overlapping, and a metal strip inserted longitudinally through said overlapping coils with its edges attached thereto.

3. In a radiator, the combination with upper and lower chambers, of a series of coiled pipes communicating at their ends with said chambers, with the coils of adjacent pipes overlapping each other, and a metal strip inserted between said overlapping coils, with its ends attached to said chambers.

4. In a radiator, the combination of a series of spirally-wound pipes having the coils of adjacent pipes overlapping each other, and a metal strip inserted longitudinally through said overlapping coils.

5. In a radiator, the combination of a series of spirally-wound pipes alternately wound in reverse order with the coils of adjacent pipes overlapping each other, and metal strips inserted through said overlapping coils and in contact therewith.

6. In a radiator, the combination with an upper and a lower chamber, and a series of connecting-pipes btween said chambers, of a separate compartment in said upper chamber and extending the entire length of said chamber and at the upper corner thereof, and having a series of restricted openings leading from said compartment to the upper part of said upper chamber, and an admission-pipe leading to said compartment.

Dated this 15th day of November, 1904.

LOUIS H. BRINKMAN.

Witnesses:
EDWARD D. REDFIELD,
EDWIN H. TUCKER.