No. 705,614. Patented July 29, 1902.

C. W. ROGERS.

RADIATOR.

(Application filed Mar. 1, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

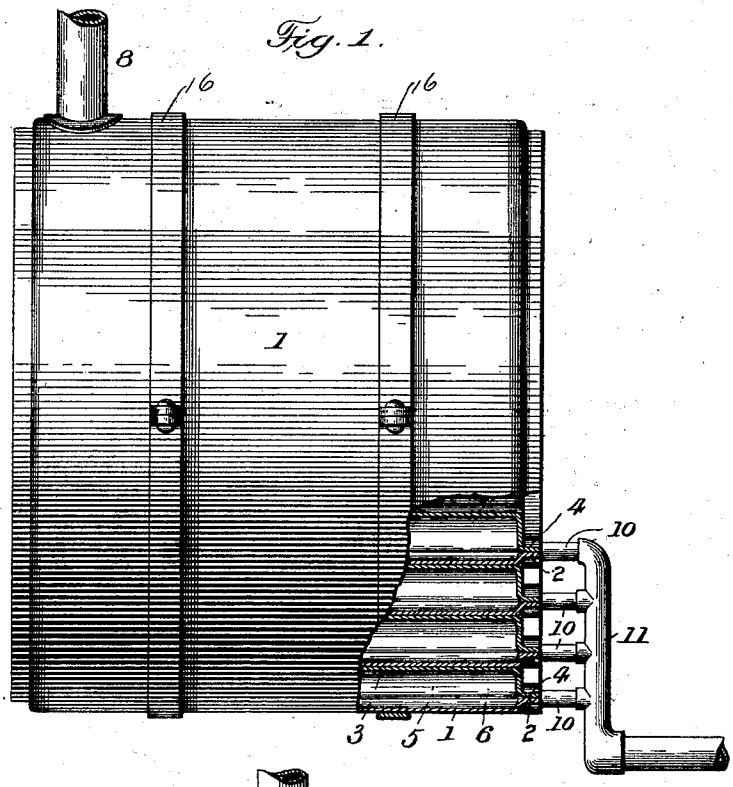


Fig. 3.

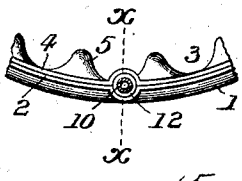


Fig. 4.

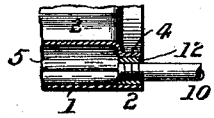


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 5

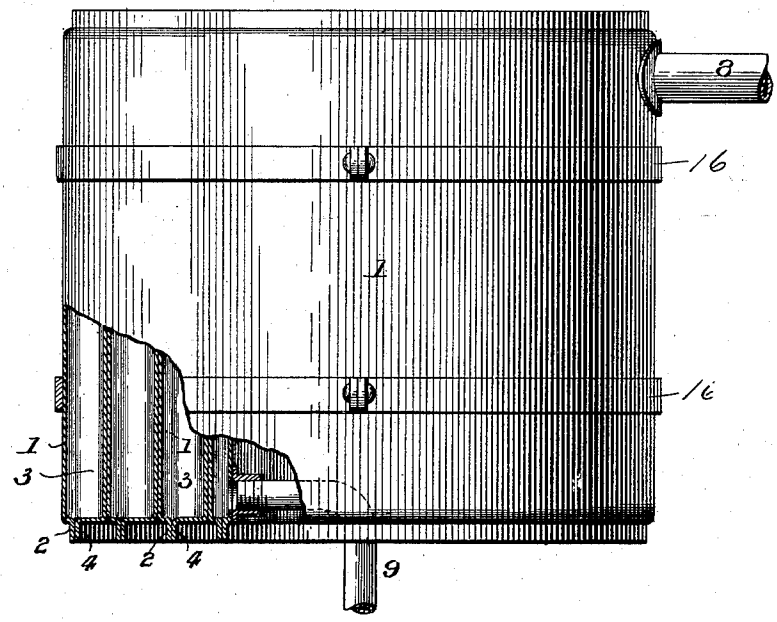
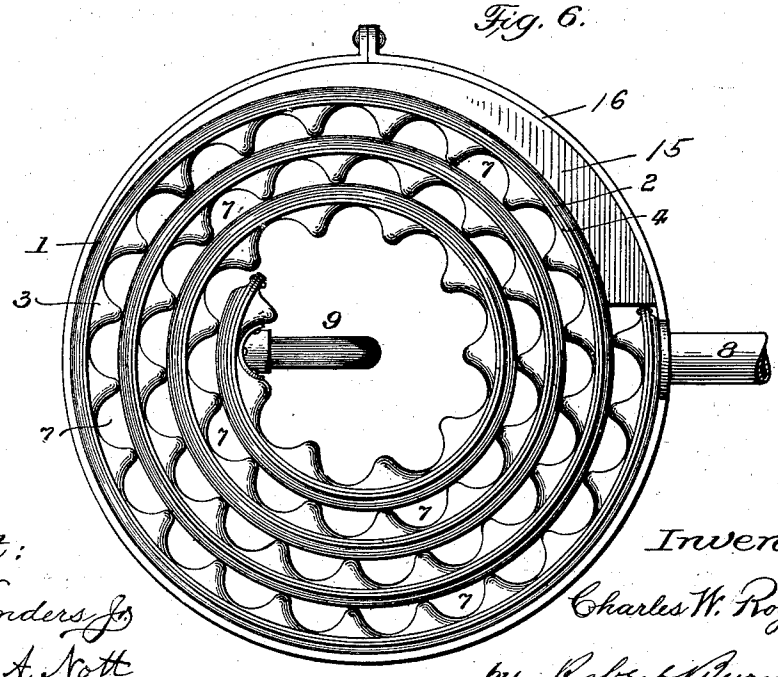


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES W. ROGERS, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWELVE TWENTY-FIFTHS TO JULIEN W. MATHIS AND EUGENE WORTHING, OF CHICAGO, ILLINOIS.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 705,614, dated July 29, 1902.

Application filed March 1, 1901. Serial No. 49,431. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. ROGERS, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Radiators, of which the following is a specification.

The present invention relates to that type of radiators in which the shell is formed with corrugated surfaces to increase the radiating-surface and nature of the apparatus.

The object of the present improvement is to provide a simple and efficient construction of a sheet or plate metal radiator more especially adapted for use in connection with what is generally known as the "indirect" system of steam-heating, and which construction is adapted with a minimum amount of sheet or plate metal and with a minimum amount of space occupied to afford a very extended amount of effective heating-surface; second, to provide a simple and efficient means for removing the water of condensation from different portions of the lower end of the radiator during the continued active use of the apparatus; third, to provide a durable and efficient construction of parts whereby an attachment of the outlets or other pipe connections can be made with the present construction of radiator, all as will hereinafter more fully appear and be more particularly pointed out in the claims. I attain such objects by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of a radiator embodying the present invention and illustrating the horizontal arrangement of the same; Fig. 2, a view one-half in end elevation and one-half in transverse section of the same. Fig. 3 is a fragmentary elevation illustrating the connection of the drain-pipe to the radiator; Fig. 4, a fragmentary section of the same at line $x\,x$, Fig. 3. Fig. 5 is a side elevation, partly in section, of a vertically-arranged radiator embodying the present improvements; Fig. 6, a top plan of the same.

Similar numerals of reference indicate like parts in the several views.

As represented in the drawings, the present improvements involve a convolute or scroll-shaped radiator in which the body portion is formed of two single sheets of sheet or plate metal rolled into a volute or scroll form, preferably of a substantially annular form in transverse section. The present invention involves the formation of the one sheet or plate 1 with end flanges 2, which are disposed in any suitable manner in a plane to one side of the main body of the sheet, so that such sheet after its formation will be of a channel form having projecting end flanges extending in a plane removed from but parallel with the surface of the body portion. In connection with the above-described construction of the plate 1, the present invention involves the formation of the companion sheet or plate 3 with corresponding end flanges 4 and with corrugations 5 in the main body of the sheet or plate and extending from flange to flange, said corrugations merging or fading into the plane surface of said flanges and arranged wholly to one side of the same, as shown.

The pair of sheets 1 and 3, formed as above described, will be secured together at all four edges in a steam-tight manner by rivets or other suitable attaching means and curved or rolled into the convolute or scroll form of the present invention.

With the described arrangement of parts the point or crown of each individual corrugation of the one sheet will be supported and sustained by the adjacent flat surface or sheet of the next adjacent convolution of the radiator-body, and this regardless of the gradual and varying curvature of such convolutions. With a radiator so formed the receiving-chamber 6 for the steam will have a volute form and with a lengthy area in one direction, and in the direction transverse thereto will have a narrow form, indented or engrailed at one side, while the air-heating passages 7 will be in the form of a multiplicity of separate passages of a lengthy nature and individual to each corrugation or indentation of the steam-receiving chamber 6 and each formed by the indented or engrailed wall of one convolution of the steam-chamber and the plane wall of the next adjacent convolu-

tion of said chamber, as clearly illustrated in Figs. 2 and 6 of the drawings.

8 is the steam-inlet pipe or duct for introducing the supply of steam to the radiator, and which is preferably connected with the exterior end of the convolute-shaped radiator casing or housing of the present invention, as illustrated in Figs. 1, 2, 5, and 6 of the drawings, in which case the outlet pipe or pipes for the exhaust-steam and water of condensation from the radiator will preferably connect with the casing or housing at an opposite end or side to that at which the steam-inlet pipe is connected. It is, however, within the province of the present invention to reverse such arrangement of the inlet and outlet pipes where the judgment of the constructor or the requirements of a particular use may suggest such an arrangement.

While in the case of a vertically-arranged radiator constructed in accordance with the present invention and in some other instances a single outlet-pipe 9, as illustrated in Figs. 5 and 6, may serve all practical purposes, I prefer a duplex arrangement of such outlet-pipes, as shown in Figs. 1, 2, 3, and 4 of the drawings, as affording more perfect results in an extended use or operation of the apparatus. In this 10 represents a series of branch pipes communicating with the lower end of each convolution of the steam-receiving chamber 6 and each individual to its particular convolution of such chamber. 11 is a manifold connection to which the branch pipes are connected, and which manifold is connected in any suitable manner with a receiving-tank for the water of condensation discharged from the radiator through such branch pipes and manifold. 12 represents a series of bushings in the ends of the convolutions of the housing or casing of the radiator and into which screw the branch pipes 10 to effect a substantial and steam-tight attachment. In the present improvement these bushings 12 will be secured between the attaching-flanges 2 and 4 of the respective sheets or plates composing the casing or housing of the radiator, and said flanges will be formed with semicircular offsets, so as to form a circular cavity for receiving said bushings, the bushings being secured in said cavities in a substantial and steam-tight manner by welding, brazing, or other well-known and suitable means.

13 is a section of tubing adapted to form a cylindrical support or core around which the convolute radiator-body is rolled up.

14 is a filling-block of a substantially triangular shape fitting the space left at the inner end of the convolute radiator-body, as shown in Fig. 2.

15 is a filling-block of a substantially triangular shape fitting the space left at the other end of the convolute radiator-body, as shown in Figs. 2 and 5.

16 represents confining hoops or bands surrounding the radiator-body and adapted to prevent any tendency of the same to unfold.

The scope of the present invention involves the use of the present novel and improved construction for use as a condenser and other analogous applications.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A radiator or the like, comprising a pair of metal sheets attached together at their ends or borders, one of said sheets being formed with an attaching-border, and a corrugated main body the corrugations of which are at right angles to the direction of the longest dimension of the body and lie wholly to one side of the sheet, the other of said sheets being formed with an attaching border portion and a main body portion disposed in a plane away from such border portion, substantially as set forth.

2. A radiator or the like, comprising a pair of metal sheets attached together at their ends or borders and rolled or shaped into a convolute or helicoidal form, one of said sheets being formed with an attaching-border and a corrugated main body the corrugations of which are at right angles to the direction of the longest dimension of the body and lie wholly to one side of the sheet, substantially as set forth.

3. A radiator or the like, comprising a pair of metal sheets attached together at their ends or borders and rolled or shaped into a convolute or helicoidal form, one of said sheets being formed with an attaching-border and a corrugated main body the corrugations of which are at right angles to the direction of the longest dimensions of the body, and lie wholly to one side of the sheet, the other of said sheets being formed with an attaching-border and a main body disposed in a plane away from such border, substantially as set forth.

4. A radiator or the like, comprising a pair of metal sheets attached together at their ends or borders, one of said sheets being formed with an attaching-border, and a corrugated main body the corrugations of which are at right angles to the direction of the longest dimension of the body, and lie wholly to one side of the sheet, the other of said sheets being formed with an attaching-border and a main body disposed in a plane away from such border, and a bushing arranged in depressions in said borders to constitute an outlet for the radiator, substantially as set forth.

5. A radiator or the like, comprising a pair of metal sheets attached together at their ends or borders and rolled or shaped into a convolute or helicoidal form, one of said sheets being formed with an attaching-border and a corrugated main body the corrugations of which are at right angles to the direction of the longest dimensions of the body and lie wholly to one side of the sheet, the other of

said sheets being formed with an attaching-border and a main body disposed in a plane away from such border, and a series of bushings arranged in depressions in said borders, to constitute outlets from the different convolutions of the radiator, substantially as set forth.

Signed at Chicago, Illinois, this 27th day of February, 1901.

CHARLES W. ROGERS.

Witnesses:
ROBERT BURNS,
HENRY A. NOTT.