

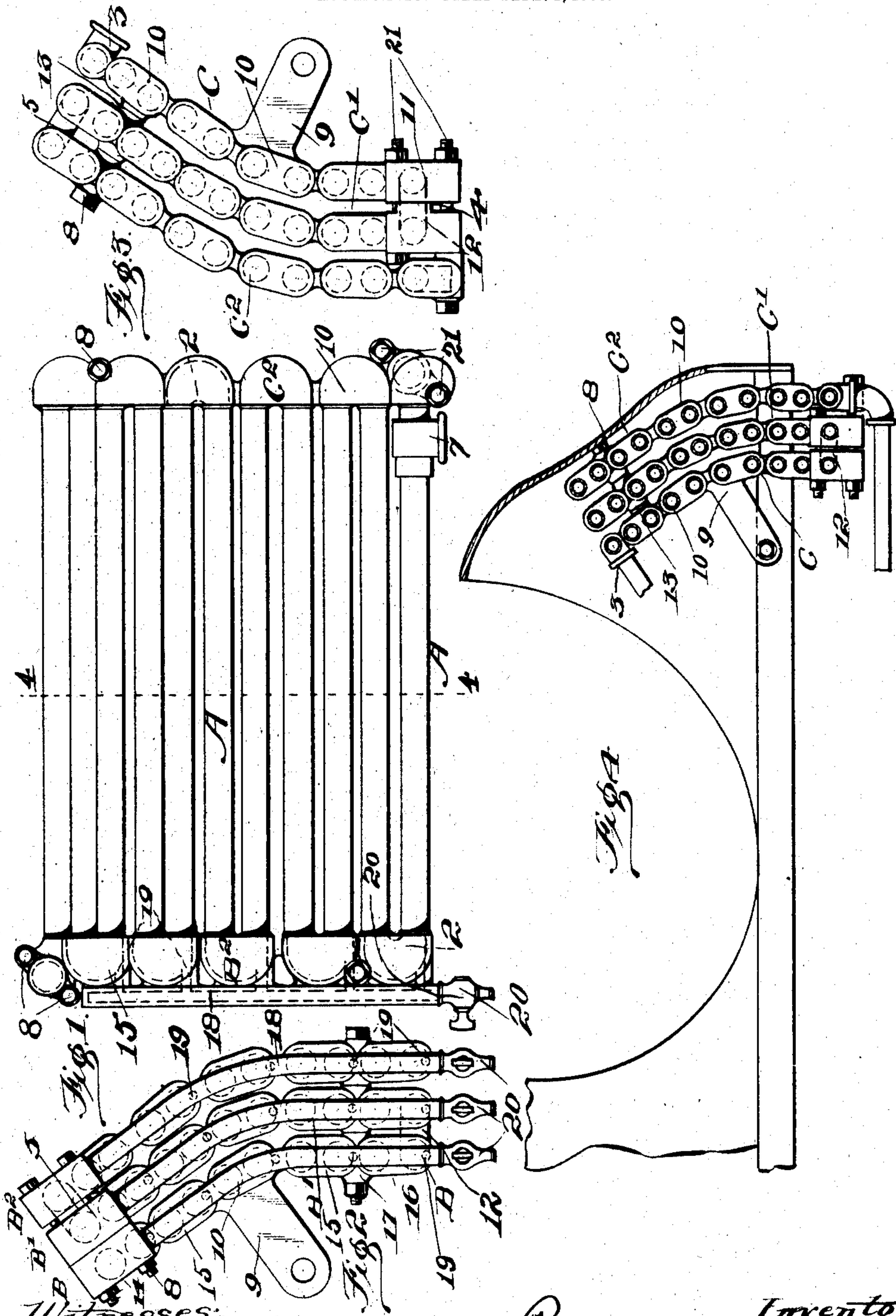
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R. O. STUTSMAN.

RADIATOR.

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Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## RADIATOR.

No. 864,871.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed September 1, 1903. Serial No. 171,528.

*To all whom it may concern:*

Be it known that I, REUBEN O. STUTSMAN, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Radiators, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a radiating apparatus, it being particularly intended for use as a water cooler in automobiles, though in its application it is not limited to that particular purpose.

It has for its object to provide a radiator that may be cheaply and easily constructed, the several parts of which may be readily and easily assembled at the time of construction and which may be readily separated when repair, cleansing or the like is desired.

Another purpose is to have a radiator from which the water can be quickly, easily and entirely drained.

Figure 1 is a front view of a radiator embodying my improvements. Fig. 2 is an elevation of the left hand end as seen in Fig. 1. Fig. 3 is an elevation of the right hand end. Fig. 4 is a cross section on the line 4—4 of Fig. 1, also indicating the position of a radiator on the frame of the motor vehicle.

I have shown a radiator composed of three sections. Each section has at each end a manifold. The manifolds at the ends of the inner section are indicated by B and C, those of the next section by B' and C', and those of the third section by B<sup>2</sup> and C<sup>2</sup>.

The manifold C is preferably made as a casting extending from the top to the bottom of the radiator. This casting comprises a coupling or union at 3, a series of U-couplings 10, and a coupling 11 at the bottom. The union at 3 is adapted to receive the end of the water supplying pipe. Those at 10 are each adapted to receive the ends of cooling pipes, the U-shaped chambers each enabling one pipe to communicate with the next. The union at 11 at the bottom has a lateral duct or water passage at 12 by which communication is provided with the next section of the radiator. At 13 the casting has a boss or projection by means of which it is properly spaced in relation to the next section and which permits the bolting of them together.

It will be understood that all of the parts that have just been referred to constituting this manifold are cast integrally together. And with them there is cast a fastening arm 9 by which the radiator is secured in place.

The manifold B at the other end of this section of the radiator is cast with a top coupling or union 14, and below with a series of U-shaped unions 15 terminating in one at 16. This manifold B is also formed with a drain pipe 18. It is parallel to the series of unions 15

and 16, and by means of a small aperture 19 it communicates with the water chambers in each of the unions. The lower end of this drain pipe is provided with a closing device of any suitable sort, as, for instance, a threaded cap, a drip cock 20, or the like. At 17 there are spaced projections or bosses which hold this manifold in proper relation to the next and which permit the securing of the different sections together by bolts. With the series of unions 14, 15 and 16 just described which are cast integrally, there is also formed a fastening arm 9 to rigidly secure this end of the radiator in place. The manifolds are joined together by straight sections of tubing or pipes A which are screw-threaded at their ends and fitted into threads in the U-shaped sockets of the manifolds.

The manifolds B' C' of the next section of the radiator are so approximately similar in construction to those above described more in detail that it is not necessary to repeat the description. It will be noted, however, that the bottom coupling or union of the manifold C' has a boss 4 with a duct alining with that at 12 in the bottom union of the manifold C through which the water passes to this section. And it will also be observed that the upper coupling of the manifold B' is provided with a similar boss 5 with a water duct communicating with the top union of the other manifold B<sup>2</sup>. This latter manifold and its companion manifold at C<sup>2</sup> are also substantially similar to those that have been described above more in detail, the differences being that the uppermost union of the one at B<sup>2</sup> has a lateral water duct to communicate with the lateral duct in the uppermost union of the adjacent section B', and, secondly, that the lower union part of the manifold C<sup>2</sup> has an inward projecting extension formed with the pipe coupling at 7 to which is attached the water escape pipe.

The manifolds of the second and third sections that have been referred to are connected by straight pipe sections A similar to those used in the first section.

Through the spacing and bracing bosses at 13 and through the lugs or ears formed on the upper union of the manifold parts B B' B<sup>2</sup> are passed bolts 8 to bind the several sections together. And through the bracing projections at 17 bolts are similarly passed. The bottom sections of the manifolds C C' are secured together by bolts at 21.

When the sections are connected together there is a continuous, serpentine passage commencing at the inlet union 3 and extending first through the top pipe A of the inner section, then through the U-shaped bend 2 at the top of the manifold B to the next lower pipe A, and so on back and forth until it reaches the cross passage at 5 through which the water passes to



the top of the third section. It traverses the pipes of the third section until it reaches the bottom and then escapes at the union 7.

By employing three sections as illustrated in the 5 drawings, the water is fed into and withdrawn from the radiator at one and the same end. The same principle of building up a radiator could be followed with a greater number of sections.

As before stated, the device herein presented is 10 more particularly intended for use as a water cooler in automobiles, and I have devised the peculiar shape of radiator section which I have shown in order to adapt it to this use. That is to say, each section has its pipes arranged in planes that are inclined to 15 each other, or the pipes are arranged in such way as to lie in a curved surface conforming to the shape of the prow generally formed at the front ends of vehicles of this class.

What I claim is:

20 1. In a radiator for cooling water and the like, an independent section, comprising a series of substantially

horizontal pipes, an upright manifold at one end of the series of pipes having unions for the pipe ends and the union at the delivery end of the series having a lateral connection for communication with another section, another upright manifold at the other end of the series of 25 pipes having a series of unions for the pipe ends, and a drain pipe having separate communication with each of the unions of one of the manifolds, substantially as set forth.

2. In a radiator for cooling water and the like, the combination of a series of independent and separable sections each comprising a series of substantially parallel pipes, upright manifolds at the ends of the said series of pipes, the manifolds having unions for the pipe ends, and the 30 unions at the inlet and delivery ends respectively of each series of pipes having a lateral connection, means for uniting a plurality of the sections together to constitute a radiator, and an independent drain pipe for each radiator section having separate communication with each of the 35 unions of one of the manifolds, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

REUBEN O. STUTSMAN.

Witnesses:

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