No. 868,012. PATENTED OCT. 15, 1907.

A. L. RIKER.

FLASH BOILER.

APPLICATION FILED JAN. 5, 1903.

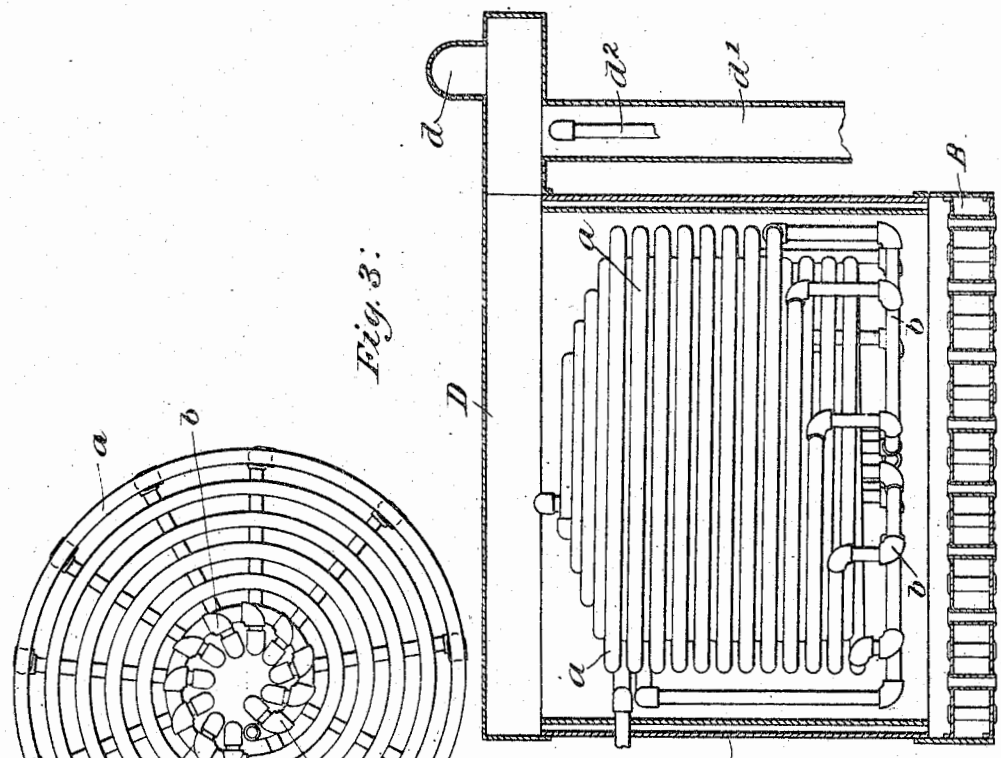

Fig. 3.

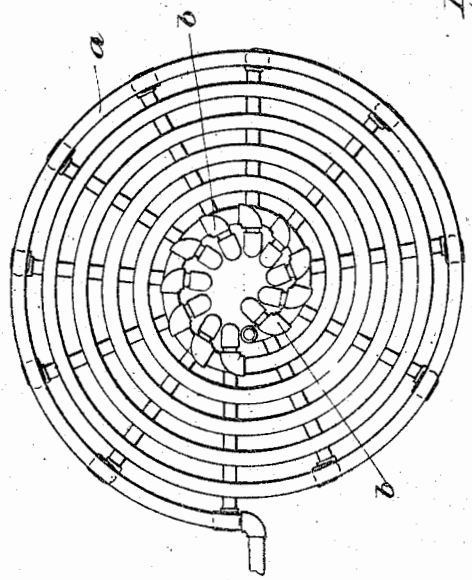

Fig. 2.

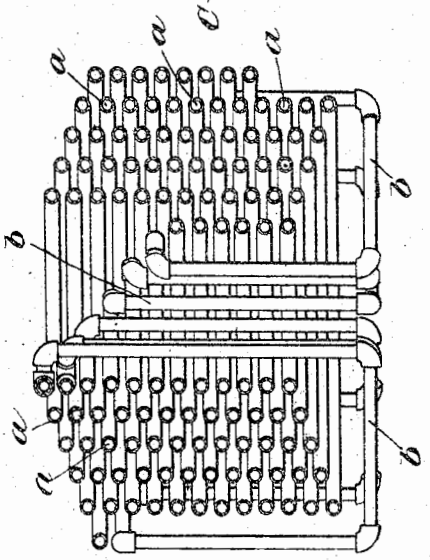

Fig. 1.

Witnesses,
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UNITED STATES PATENT OFFICE.

ANDREW L. RIKER, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO STANLEY MOTOR CARRIAGE COMPANY, A CORPORATION OF MASSACHUSETTS.

FLASH-BOILER.

No. 868,012. Specification of Letters Patent. Patented Oct. 15, 1907.

Application filed January 5, 1903. Serial No. 137,785.

To all whom it may concern:

Be it known that I, ANDREW L. RIKER, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented an Improvement in Flash-Boilers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to coil boilers of the flash type the object of my invention being to provide novel means for preventing gravitation of water through a coil or coils thereof.

In the drawings illustrating one embodiment of my invention, Figure 1 is a vertical section of a generator or boiler illustrating my invention; Fig. 2 is a top or plan view of said boiler; Fig. 3 is a side elevation thereof, the casing being shown in section.

In the embodiment of my invention selected for illustration herein and shown in the drawings, my improved boiler or generator comprises a series of superposed coils or grids *a*, *a*, each preferably formed of a single piece of pipe, coiled as many times as desired, the several coils being suitably connected whereby the incoming water entering preferably at the outermost convolution of the topmost coil may flow downwardly through the several coils and towards the source of heat, namely the burner, B, at the bottom of the boiler. Obviously, at some point in its travel, ordinarily about midway the height of the boiler, the water is converted into steam and in the further flow thereof, becomes superheated, issuing in the latter condition from and at the bottom of the boiler in the region of greatest heat.

To prevent gravitation of the water down through the several coils, I have formed the latter respectively much like so many truncated cones; in other words, each convolution of a coil from the outermost convolution inward, is slightly higher than the preceding convolution with the highest point preferably at the smallest or innermost convolution, so that the water or steam as the case may be, which in each case in the boiler shown enters the outermost convolution of a coil, must travel gradually upward towards and until it reaches the innermost, highest convolution of the coil before it may pass to the next coil below. By this construction, each coil becomes, as it were, a trap in itself, to prevent the gravitation of water therethrough; so that even though the connections between successive coils be direct and free from any trapping effect, gravitation of water down through the boiler is nevertheless, prevented.

The innermost convolution of one coil may be connected with the outermost convolution of the coil below, whereby water or steam may flow from the former to the latter, in any convenient manner, but, I prefer that such connection in each case be by a pipe, *b*, which descends within the central cylindrical space or chamber at the middle of the boiler and within the circle of the smallest convolutions of the several coils, said descending pipe connection being carried outward at the bottom of the boiler, and upward at the outside of the boiler, to the outermost convolution of the coil to which it is to be connected. By this arrangement, namely, the carrying of the several connections in every instance to the bottom of the boiler, and upward at the outside thereof, said connections may be made direct, that is, free from any trapping effect, such as would prevent gravitation of water from one coil to the next below, and also permits the several coils to be nested one within and close to the other, thus to provide in a given height a maximum number of coils, which must greatly exceed the number possible in the same height, were the coils to be separated sufficiently to permit the connection between one coil and the next below to be carried outward between said coils, instead of to the bottom of the boiler and then outward. It will be observed also that the trapping effect of the several coils is uniform throughout the entire coil; that is, at no point in a coil, does the trapping effect differ from any other point, excepting insofar as may result from the differences in diameter of the several convolutions of the coil.

My boiler is thus peculiarly adapted for automobile service, where, as will be evident from Fig. 4 of the drawings the boiler is apt to be inclined first to one and then to the opposite side, as upon an uneven roadway or first tipped forward and then rearward, as when descending and ascending hills.

In Fig. 3, I have shown the boiler arranged within a suitable inclosing case, C, surmounted by a hood, D, provided with suitable or usual up-draft outlet, *d*, and down draft outlet, *d'*, with the engine exhaust pipe, d^2, arranged in the latter. This is shown as typical of the arrangement for motor vehicle use; but obviously, any other suitable arrangement may be used in lieu thereof.

My invention obviously is not limited to the particular embodiment thereof here illustrated, but may be varied within the spirit and scope of the invention.

Claim.

1. A boiler comprising a plurality of superposed coils connected in series, successive convolutions of each of said coils rising gradually and continuously from the inlet to the outlet end thereof, the connections between successive coils extending closely adjacent the source of heat.

2. A steam generator comprising a plurality of superposed coils connected in series, each coil presenting a general shape of a truncated cone and connections from a high point of one coil to a low point in a coil below.

3. A steam generator comprising a series of adjacent coils and connections between one end of one coil and the opposite end of a succeeding coil said connections extending in each case towards and around the end of the boiler adjacent its source of heat.

4. A steam generator comprising a plurality of superposed coils connected in series one with another, at least

one of said connections dropping below the lowermost coil.

5. A steam generator comprising a series of superposed coils connected one with another, all said connections dropping below the lowermost coil.

6. A steam generator comprising a plurality of superposed coils connected in series, each coil having a general shape of a truncated cone with a central opening or flue, and connections carried through said opening from a high point of one coil to a low point in a coil below.

7. A generator comprising a plurality of superposed coils each presenting a general shape of a truncated cone with a central opening therethrough, and connections between said coils carried through said opening.

8. A generator comprising a plurality of superposed coils each presenting a general shape of a truncated cone with a central opening therethrough, and connections between said coils carried through said opening, said opening constituting a flue to facilitate heating said connections.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ANDREW L. RIKER.

Witnesses:

FREDERICK L. EMERY,

THOS. W. THOMAS.