

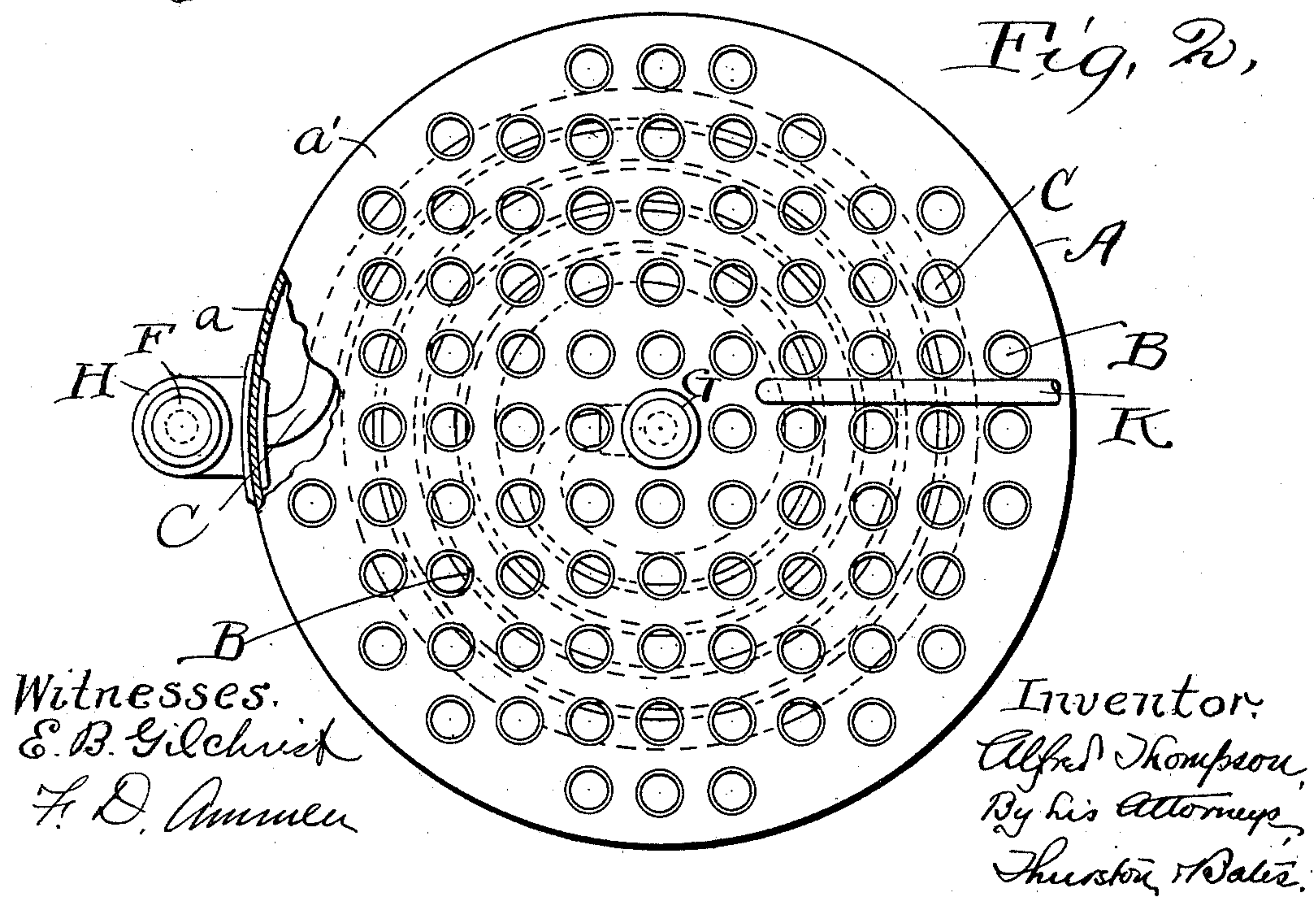
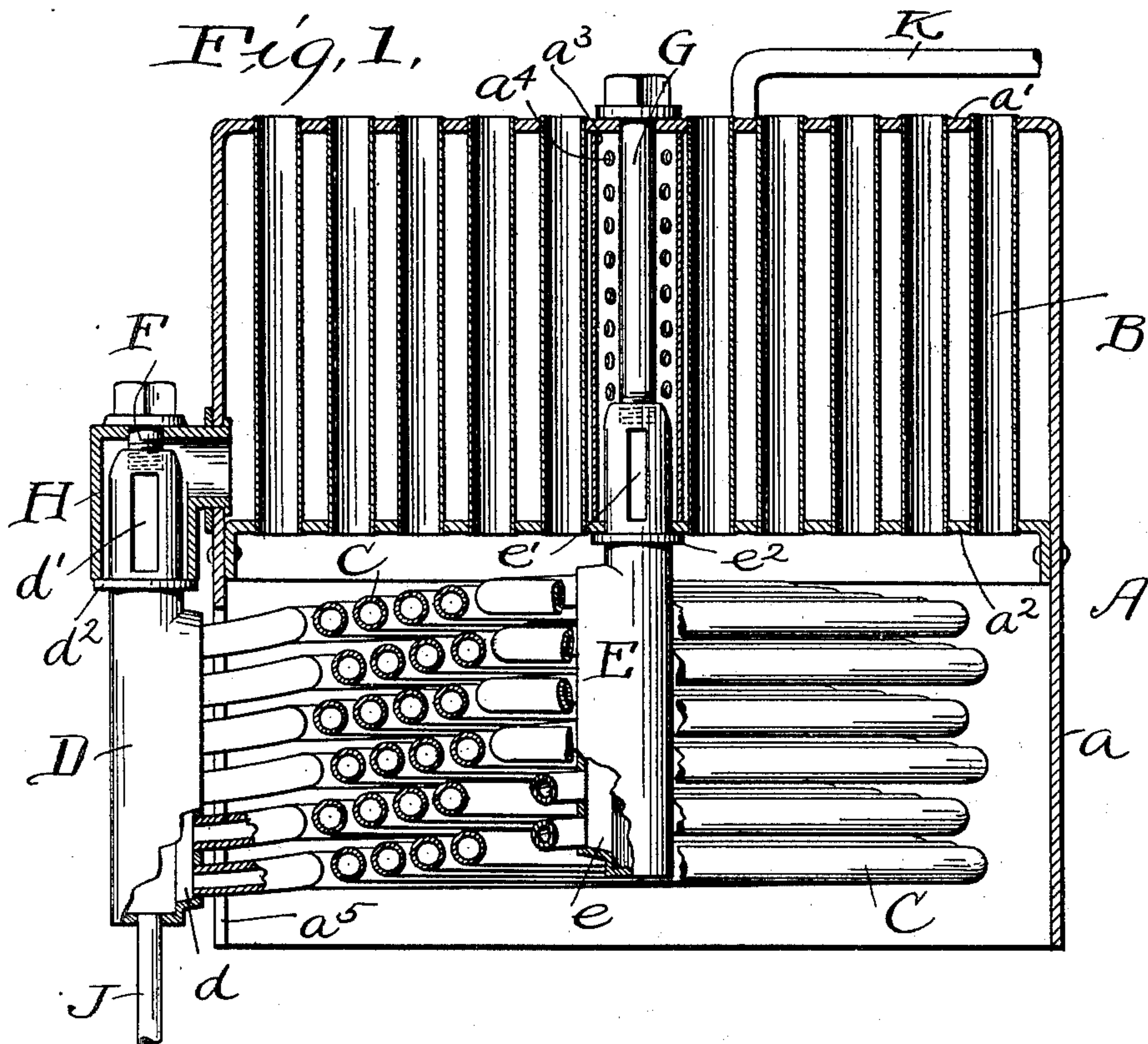
No. 675,074.

Patented May 28, 1901.

A. THOMPSON.
STEAM GENERATOR.

(Application filed Feb. 8, 1901.)

(No Model.)



Witnesses.
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UNITED STATES PATENT OFFICE.

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AUTOMOBILE AND MANUFACTURING COMPANY, OF SAME PLACE.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 675,074, dated May 28, 1901.

Application filed February 8, 1901. Serial No. 46,482. (No model.)

To all whom it may concern:

Be it known that I, ALFRED THOMPSON, a citizen of the United States, residing at Geneva, in the county of Ashtabula and State of Ohio, have invented a certain new and useful Improvement in Steam-Generators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide a very cheap and simple steam-generator which while being adapted to efficiently and rapidly produce steam at the desired temperature and pressure shall not be liable to be burned out if the water-supply stops and is also adapted to be easily taken apart.

My improved boiler is a combination of the water-tube and tubular systems so arranged as to attain the above ends, as hereinafter explained.

The invention which comprises this arrangement and the construction which allows it may be best summarized as consisting of the combinations of parts hereinafter described, and definitely set out in the claims.

The drawings clearly disclose my invention in an approved form especially adaptable for automobile use.

Figure 1 is a sectional side elevation thereof, and Fig. 2 is a plan.

Referring to the parts by letters, A represents a casing consisting of a cylindrical wall a and the head a' . Intermediate of this casing is secured, preferably by rivets, the crown-sheet a^2 . Numerous flue-tubes B extend vertically from the crown-sheet to the head, being secured thereto by having their ends flanged over in the usual manner. The space between the head and crown-sheet and around these tubes constitutes a water and steam drum. Below the crown-sheet are numerous coiled or spiral water-pipes C. These connect at their outer ends with the hollow header D and at their inner ends with the hollow header E, which headers, as hereinafter explained, are in open communication with the drum. Below the coils is the burner or other source of heat. (Not shown.) The heat after acting upon the spiral pipes passes up

through the flues B, further heating the contents of the drum.

Each of the headers D E consists of a substantially cylindrical body having on one side the elongated boss, as $d e$. At their upper ends these headers are provided with lateral openings $d' e'$, above which openings they carry screw-threads adapted to take the bolts F and G. These bolts clamp the headers, respectively, to the elbow H, which leads into the water-drum, and to the crown-sheet a^2 , a collar $d^2 e^2$ in each case abutting against the lower side of the cooperating member.

Water is admitted to the header D through the inlet-pipe J and passes through the various spirals C into the header E, thence up into the central tube a^3 of the drum, which surrounds the upper end of the header E and the bolt G, and thence through holes a^4 in this tube into the drum and back into the header D. A perfect circulation is thus provided, the water traveling continuously through the coils and some water being maintained in the drum with sufficient steam-space above it, the steam being taken through an outlet-pipe K at the head of the casing.

With my arrangement of coils acted upon directly by the heating means the water is very readily vaporized, while the drum adds capacity to the generator and does not make the rate of steam-outlet so absolutely dependent on the rate of water-inlet as if it were simply a coil-boiler. This is a particularly valuable feature for automobile use where the demand is very uneven. Moreover, the flues and crown-sheet are so far removed from the fire that there is no danger of their burning out even if through carelessness or otherwise the water should become entirely evaporated. I have found that such evaporation will not interfere with the coil-tubes themselves, and the boiler may run entirely dry without burning out.

By making the part of my boiler which is next to the fire in this tubular form I thus obtain the efficient heating qualities and the adaptability for expansion and contraction inherent in spiral tubes, while by placing a flued drum far enough from the fire so that

it will not burn out I obtain also the accumulator effect which comes from it without in any wise endangering the enduring qualities of the boiler.

5 Another of the advantages of my boiler is its ready separability for cleaning or repairing purposes. The spiral tubes C where they pass through the shell to the header D occupy a vertical slot a^5 , which is open at the
10 lower end. By simply removing the two bolts F and G the two headers are freed, and they, together with the spiral tubes, may be taken out as a unit from the lower end of the casing. It will also be observed that by making
15 the two headers just alike economy in construction is obtained.

Having described my invention, I claim—

1. In a steam-generator, in combination, a metal shell having a head and a continuous
20 sheet-metal wall, a crown-sheet within the shell intermediate of its ends which has an edge flange engaging the inner surface of said wall and secured to it, flues connecting the crown-sheet and head, and a coiled pipe with-
25 in the shell beneath the crown-sheet, and a connection from each end thereof to the drum-space above the crown-sheet, substantially as described.

2. In a steam-generator, the combination of
30 a shell having a head and crown-sheet, a series of coils of pipe one above the other within the shell beneath the crown-sheet, a pair of headers into each of which said coiled pipes take, one header being within the shell and
35 extending through the crown-sheet under the drum-space, and the other header being without the shell and communicating with such drum-space, substantially as described.

3. In a steam-generator, the combination of
40 a series of spirally-coiled pipes one above the other, a pair of headers one located at the center of the spiral and the other at the outer end, a shell surrounding the coils and having a drum-space in its upper part, said central
45 header extending into such drum-space and the other header communicating therewith, substantially as described.

4. In a steam-generator, a shell, a water-drum formed in the upper end thereof, a series of coils of pipe within the shell beneath
50 the drum, said coils terminating in a central header which header extends through the crown-sheet and has an opening above the same, combined with a bolt extending from
55 above the head of the shell into engagement with said header, substantially as described.

5. In a steam-generator, in combination, a shell, a water-drum formed in the upper end thereof, a central perforated tube standing
60 between the heads of said drum, a header whose end projects into the lower end of said tube, a lateral opening in the upper end of said header, and a bolt within said perforated tube and extending through the head of the
65 shell and engaging said header within the tube, substantially as described.

6. In a steam-generator, in combination, a

water-drum, an elbow connecting therewith, a header whose upper end extends into said elbow, there being a lateral opening in said
70 header therein, a bolt passing into said elbow and engaging said header therein, and a series of coils beneath the drum terminating in said header, substantially as described.

7. In a steam-generator, in combination, a
75 shell, a water-drum formed in the upper end thereof, flues passing through said drum, an elbow connecting with said drum through said shell, a pair of headers whose ends project from below upward, respectively into
80 said elbow and into said drum, shoulders on said headers engaging the lower ends of said elbow and drum, there being openings from said headers above said shoulders, and bolts
85 passing from above down into said headers and adapted to seat said shoulders, and pipe-coils connecting said headers, substantially as described.

8. In a steam-generator, in combination, a surrounding shell having a head and a crown-
90 sheet across the same dividing the upper part of the shell into a water-drum, an elbow connecting with said water-drum outside of the shell, a series of coiled pipes within the shell one above the other, a pair of rigid headers
95 one within the shell and one outside thereof, the ends of said pipes terminating within said headers, said headers extending into said elbow and water-drum respectively, and having openings near their upper ends communi-
100 cating therewith, and bolts extending through the head of the shell and through said elbow and holding said headers in place, substantially as described.

9. In a steam-generator, in combination, a
105 shell, a crown-sheet across it dividing a portion into a drum, a slot through the wall of the shell beneath said crown-sheet, a series of pipes within the shell beneath the crown-sheet, a pair of headers one within the shell
110 and one outside the shell, said pipes terminating at said headers and occupying said slot in passing to the outside header, and means for removably holding said headers with their interiors in communication with the interior
115 of the drum, substantially as described.

10. The combination of a series of pipes each coiled into a spiral and arranged one above another, a pair of hollow headers one substantially at the center of the spirals and the other
120 outside, a shell which said spirals occupy, said shell having a slot through which the pipes pass to connect with the outer header, a drum above the spirals, and means for removably holding said headers with their in-
125 teriors in communication with said drum, substantially as described.

11. In a steam-generator, in combination, a water-drum having an upper and a lower head, a vertical perforated tube therein extending
130 between the said heads, a header of smaller diameter than said tube projecting upwardly into the same through said lower head, said header having a lateral opening within said

tube, and a collar taking against said lower head, said upper head having an opening above said header, a bolt passing therethrough and engaging said header, another header
5 communicating with said drum, and pipe-coils uniting said headers, substantially as described.

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

ALFRED THOMPSON.

Witnesses:

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JOHN A. CARTER.