No. 638,415. Patented Dec. 5, 1899.

S. LINDERSMITH.

PORTABLE STEAM BOILER.

(Application filed Jan. 28, 1899.)

(No Model.)

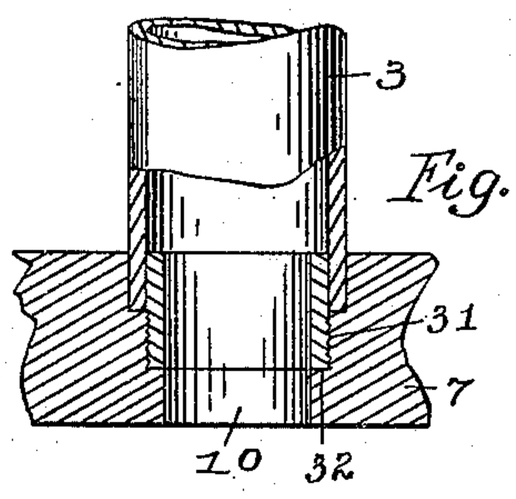

Fig. 5.

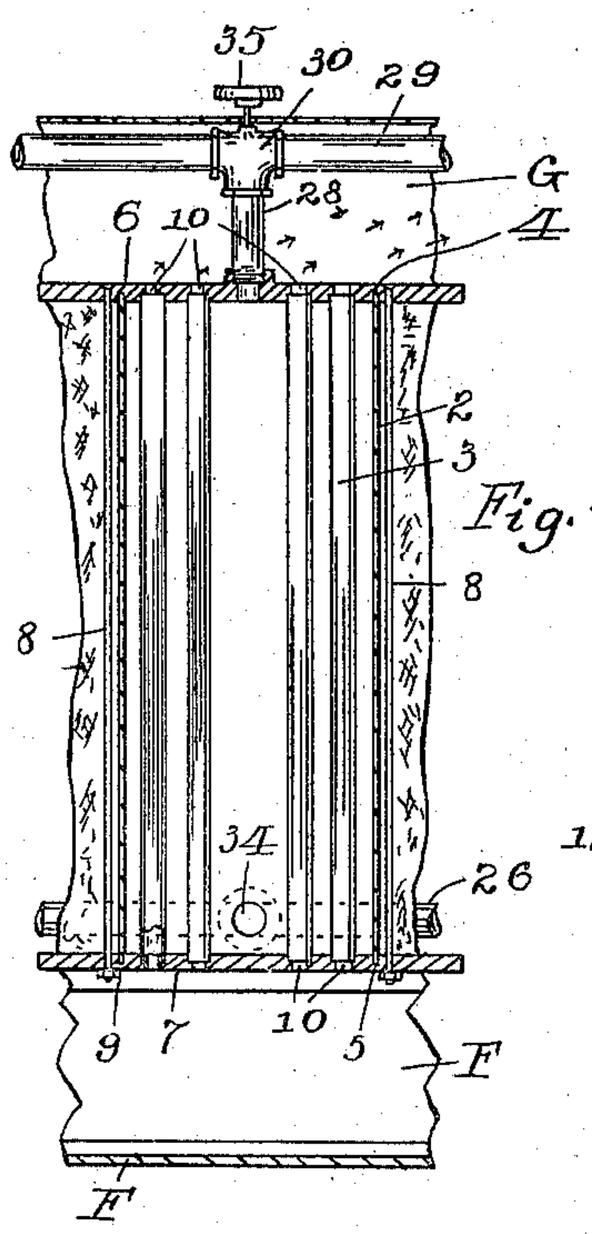

Fig. 3.

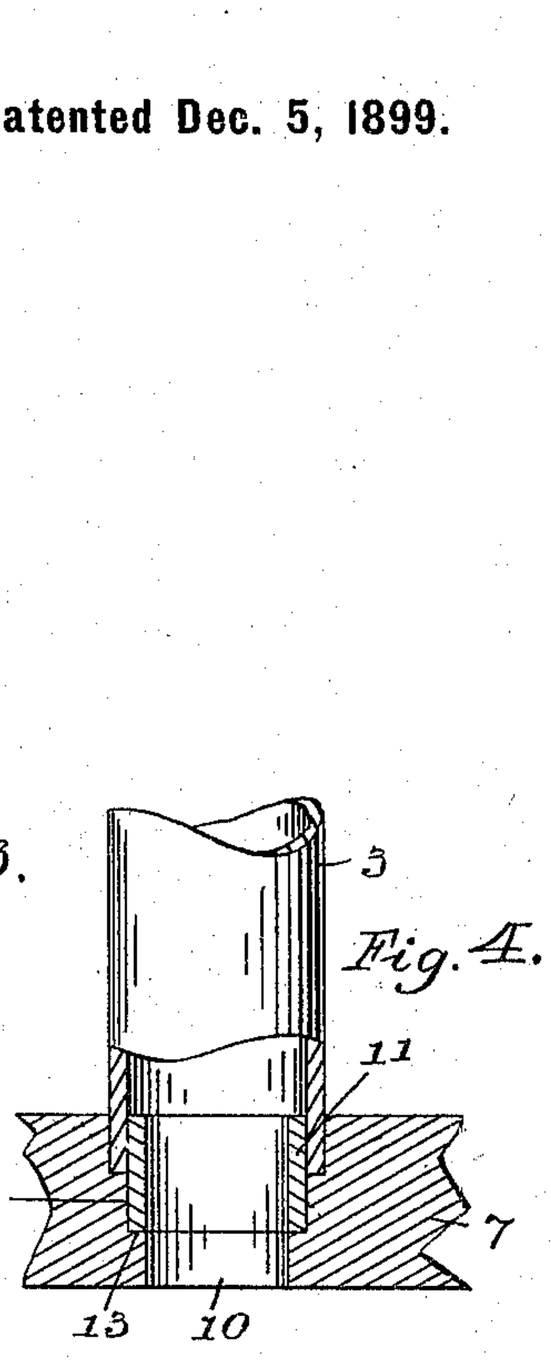

Fig. 4.

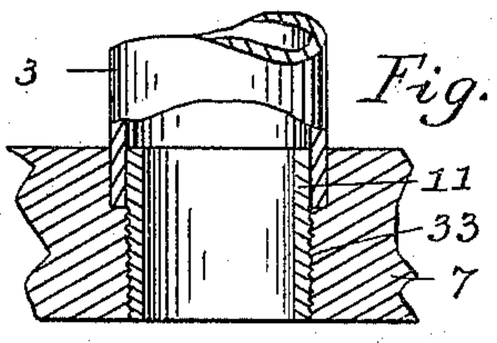

Fig. 6.

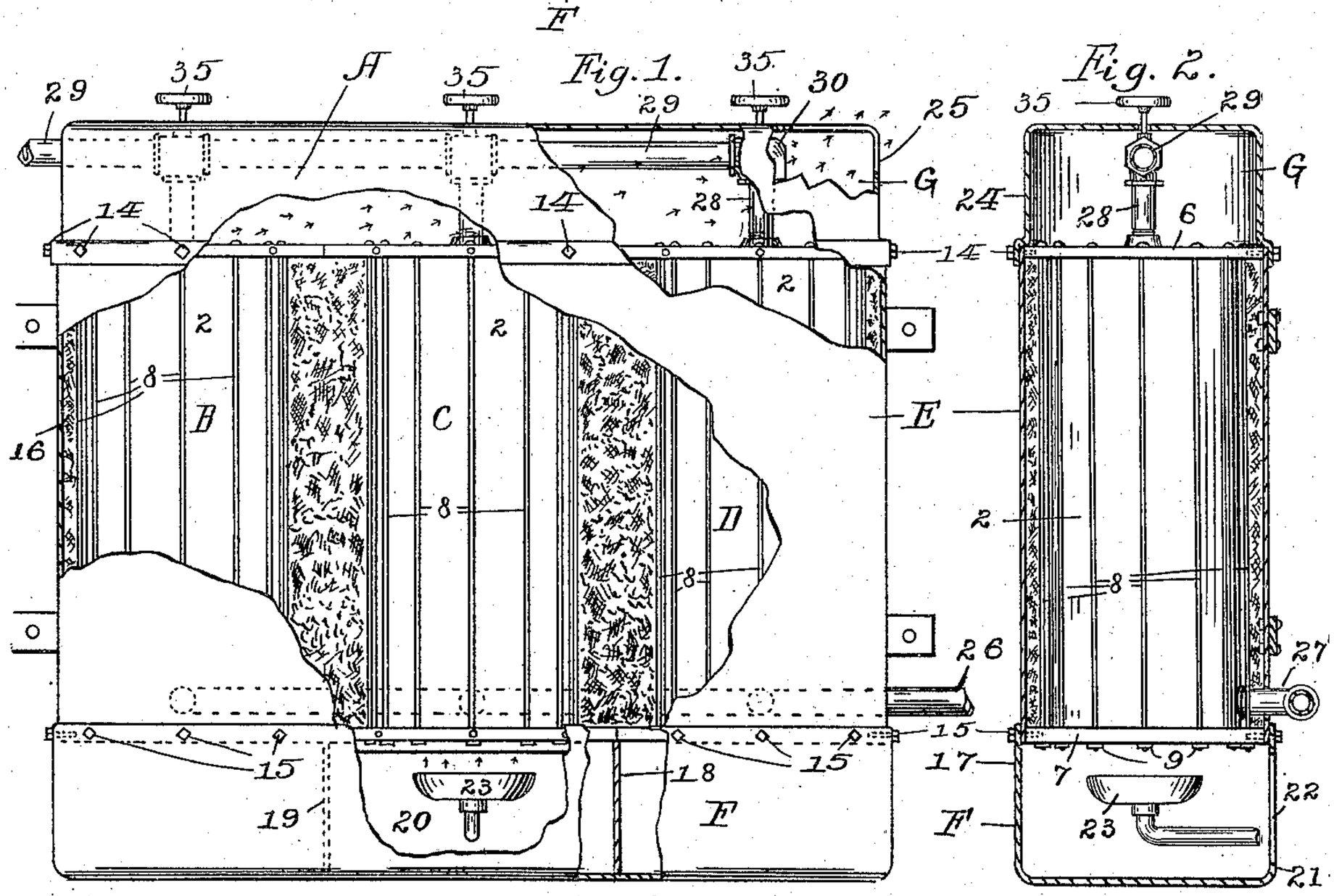

Fig. 1.

Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

STILES LINDERSMITH, OF ST. PAUL, MINNESOTA.

PORTABLE STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 638,415, dated December 5, 1899.

Application filed January 28, 1899. Serial No. 703,661. (No model.)

To all whom it may concern:

Be it known that I, STILES LINDERSMITH, a citizen of the United States of America, and a resident of St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Portable Steam-Boilers, of which the following is a specification.

My invention relates to improvements in portable steam-boilers for use in generating steam having a high pressure, constructed so that it may be easily taken apart and having a comparatively light weight.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation of my improved boiler, parts being broken away to more clearly show the construction of the device. Fig. 2 is an end elevation of Fig. 1, showing the parts in vertical cross-section. Fig. 3 is a vertical cross-section of one of the boiler-drums, showing the mode of fastening the flues in place. Fig. 4 is a vertical cross-section of a detail portion of one of the end plates and boiler-flues, showing the method of constructing the parts steam-tight and so that they may be readily taken apart. Figs. 5 and 6 are each modifications of the constructions shown in Fig. 4.

In the drawings, let A represent the boiler, which is composed of a plurality of boiler-drums B, C, and D. Each boiler-drum is composed of the cylindrical outer casing 2 and flues 3, which are respectively recessed into the annular grooves 4 and 5 in each of the end plates 6 and 7. The end plates are fastened by means of the bolt-rods 8, which pass through the end plates and are fastened by means of nuts 9. Each of the end plates is provided with the openings 10 and the annular collars 11, which are driven in the recesses 12 against the shoulder portions 13, which are formed in said end plates. The collars are constructed so that the flue-pipes 3 fit tightly around the same, and the nuts 9 are turned tight, so as to draw the parts tightly into place. The boiler-drums are each positioned upright and closely adjacent and are surrounded by the casing E and held firmly together by the bolts 14 and 15, which pass into the edges of the end plates. The space between the steam-drums and outer casing E is packed with asbestos 16 or other suitable non-heat-conducting material. Adjacent and below the steam-drum is provided the heating-chamber F, which is constructed of thin iron and formed with sides 17, which overlap the lower edges of the casing E and are fastened by means of the bolts 15. The chamber F is provided with dividing-walls 18 and 19, which are positioned vertically below the steam-chamber, so as to form separate heating-compartments 20 directly below each of the boiler-drums B, C, and D, respectively.

The back wall 21 of the heating-chamber F is provided with the draft-opening 22, through which the gasolene-burners 23 are adapted to pass and be positioned directly below the flue-pipes 3. Adjacent the top of the boiler-drum is the smoke-chamber G, which is constructed of thin iron and formed with side walls 24, which overlap the upper edges of the casing E, and is fastened and supported in position by means of the bolts 14, which fasten the upper end of the casing. One end of the smoke-chamber is provided with the outlet 25, through which the waste gases and smoke are adapted to pass to the outer atmosphere. Water is fed into each of the drums by means of the pipe 26, which is provided with branches 27, which are tapped into each of said boiler-drums. Steam is taken from each of the boiler-drums by means of pipes 28, which connect with the main steam-pipe 29 and are provided, respectively, with the valves 30. In the alternate construction shown in Figs. 5 and 6 the flue-pipes 3 are similarly recessed into the end plates 6, as shown in Fig. 4. The annular rings 11 are screwed into the end plates instead of being driven. In Fig. 5 the ring passes part way through the end plate and is fastened by screw-threads 31 and is set against the shoulder 32, formed in the end plate, and in Fig. 6 the ring passes through the end plate and is fastened by screw-threads 33.

In the operation of my improved device water is injected from the pipes 27 into the boiler-drums through the openings 34 by means of an injector. (Not shown.) The burners are lighted and the heat passes through the openings 10 in the lower end plate, through the flues 3, out through openings 10 in the up-

per end plate, and into the smoke-chamber 29, and from there the gas and smoke escape through the opening 25. Steam is taken from the boiler-drums by opening the respective valves of the drums in operation by turning the handles 35, thus admitting steam to the main conducting steam-pipe.

It is obvious any number of boiler-drums can be used in my improved device, and I do not wish to confine myself to the number shown.

To take the boiler apart, the casing E and the heating and smoke chambers F and G are removed by removing bolts 14 and 15. The steam-drums can then be taken apart by loosening the nuts 9 and removing bolts 8. The end plates can then be removed, leaving the steam-drum cylinder and flues unfastened.

Having described my invention, what I desire to secure by Letters Patent is—

1. In a device of the class described, the combination of the flue-tubes; the steam-drums; the end plates by which said tubes and drums are supported; the bolts, passing through said end plates, adapted to fasten the same; the fuel-chambers fastened to the lower end plates; the smoke-chamber fastened to the upper end plates, and the steam-pipes connected to the upper end plates; said lower end plates being provided with openings for holding said tubes and with annular collars, suitably fastened thereto and projecting in the ends of said tubes so as to form recesses as shown, and for the purposes specified.

2. A portable steam-boiler, consisting of a plurality of steam-drums, heating-chambers and a common smoke-chamber; each of said drums having flue-tubes and end plates which are provided with openings for holding the tubes, and annular rings fastened to said end plates fitting in the tubes and bolts passing through said end plates for strapping them in position for the purposes specified.

3. In combination with a portable steam-boiler; the end plates provided with openings for the flue-pipes and annular collars fastened to said end plates and projecting within the ends of the flue-pipes for the purposes specified.

4. The combination with a portable steam-boiler, and its flue-pipes, of the plates 6 and 7 provided with annular openings in which each of the flue-pipes projects and annular collars which are fastened in the recesses 12 and project within the ends of the flue-pipes so as to form a tight joint between said pipes and end plates, substantially as specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 25th day of January, 1899.

STILES LINDERSMITH.

Witnesses:

L. E. WICKMAN,

F. G. BRADBURY.