S. P. Ruggles,

Steam-Boiler Attachment.

No. 63,431. Patented Apr. 2, 1867.

Fig 1.

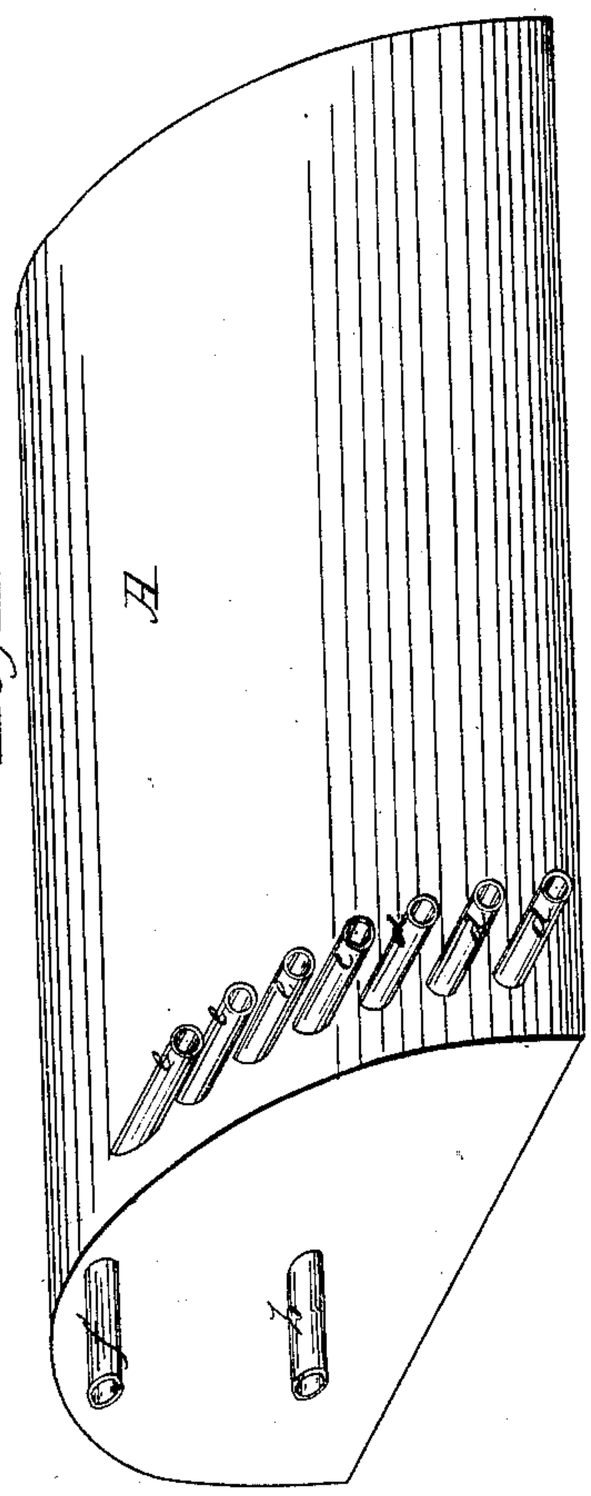


Fig 3.

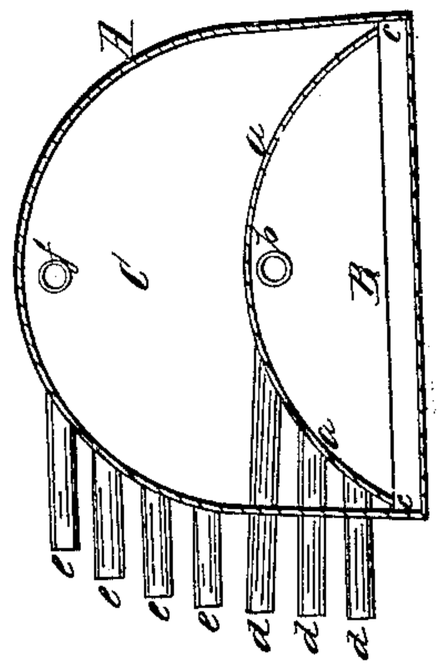
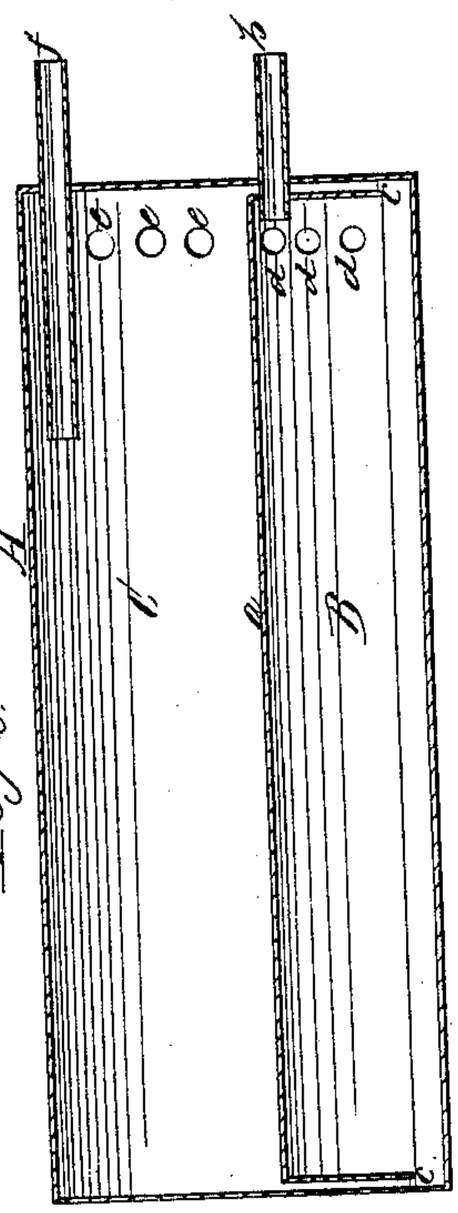


Fig 2.



Witnesses,

Jno. D. Patton

F. J. Chamberlain

Inventor.

Stephen P Ruggles

By A. B. Stoughton atty.

United States Patent Office.

STEPHEN P. RUGGLES, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 63,431, *dated April* 2, 1867.

IMPROVEMENT IN STEAM GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, STEPHEN P. RUGGLES, of Boston, in the county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Steam Boilers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents an external view of a boiler in which my proposed invention is embraced.

Figure 2 represents a longitudinal vertical section through the same; and

Figure 3 represents a vertical cross-section thereof.

Similar letters of reference, where they occur in the separate figures, denote like parts of the boiler in all the drawings.

My invention consists in arranging the steam chamber and generator of a closed steam boiler at or near the bottom of the boiler, so that the steam generated may pass immediately from the point where it is generated into the steam chamber, and without passing up through a column of water, which impairs its elastic force.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A represents the shell of a boiler, which may be of any suitable size, shape, or form, and either horizontal or vertical, as may be preferred. Within the boiler, and at or near the bottom thereof, I arrange a steam generator and chamber B, which is made by a partition plate, *a*, which divides the steam chamber B from the water space C, but still leaves them connected by the narrow openings at *c*, so that the water from C may flow into the steam generator or chamber B, and the steam, as it is formed, rise into the upper part of the chamber B, from whence it may be taken by the pipe *b* to the steam cylinder or other place where it is to be used. *d d d* are series of pipes extending from the outside of the boiler into the steam chamber B, and should be furnished with try-cocks for the purpose of ascertaining the height or condition of the steam or water therein, said pipes entering the steam chamber or generator at different heights therein for that purpose. *e e e* are a series of pipes, extending from the outside of the boiler into the water space, and at varied heights therein, and should be furnished also with try-cocks to ascertain the height and condition of the water therein. *f* is a pipe extending from the outside of the boiler into the upper part of the water space; and this pipe may have a safety-valve applied to it, and a blow-off cock; or the safety-valve may be arranged on top of the boiler in the usual well-known way.

The steam generated in B, where there will be but a thin or shallow film of water, will rise therein to the upper part of the steam chamber, and may be carried off by the pipe *b* as fast as generated, the supply of water being kept up from the water space C through the narrow slots or spaces *c*. By this construction the particles of steam, as they are generated, do not have to rise through the water to enter the steam chamber, or become saturated, or rendered inelastic, by so passing up through the column of water, but are kept dry and in their most effective condition.

In my construction the steam chamber is underneath the water in the boiler, instead of above it, as is usually the case in boilers. So long as the steam is drawn from the chamber B so long will all the steam made be retained therein. But if the engine be stopped and the fires kept up, and the steam continue to be generated, the pressure in the steam generator may become so great as to cause the steam to pass through the openings *c*, and thence rise up through the water, and remain in the upper part of the water chamber C. And when the steam became excessive it would blow off at the safety-valve, or be drawn off through the pipe *f*. But when the engine is again started, and the steam in the chamber B is reduced to its regular working pressure again, it would be necessary to let off enough steam from the upper part of the chamber C to allow the water to rise into the water chamber, and of course it would fall correspondingly in the steam chamber B to the desired elevation, when the boiler would again properly act. But the escape of the steam from the chamber to and above the water can only occur when the engine is stopped, or when the steam is not used as fast as it is made, either of which will cause it to escape up through the water, and thence out by the safety-valve.

What I claim as my invention, and desire to secure by Letters Patent, is—

Arranging a steam chamber and generator at or near the bottom of a closed steam boiler, as and for the purpose substantially as herein described.

STEPHEN P. RUGGLES.

Witnesses:

S. FRANK CROCKETT,

H. L. ROBINSON.