

(No Model.)

G. SEWELL.  
STEAM BOILER.

No. 256,602.

Patented Apr. 18, 1882.

Fig 1.

Fig 2.

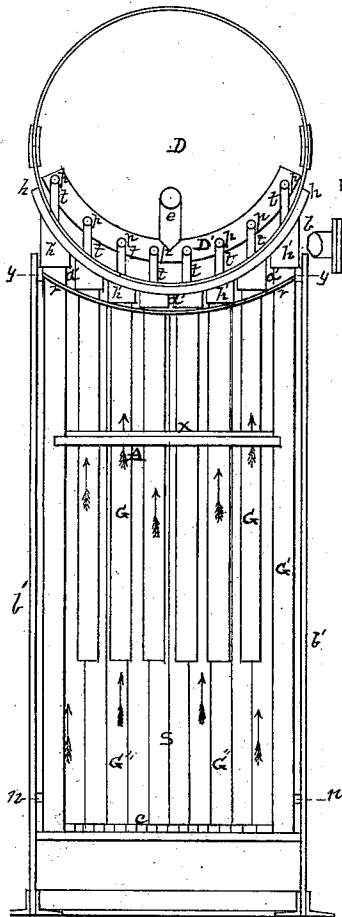


Fig 3.

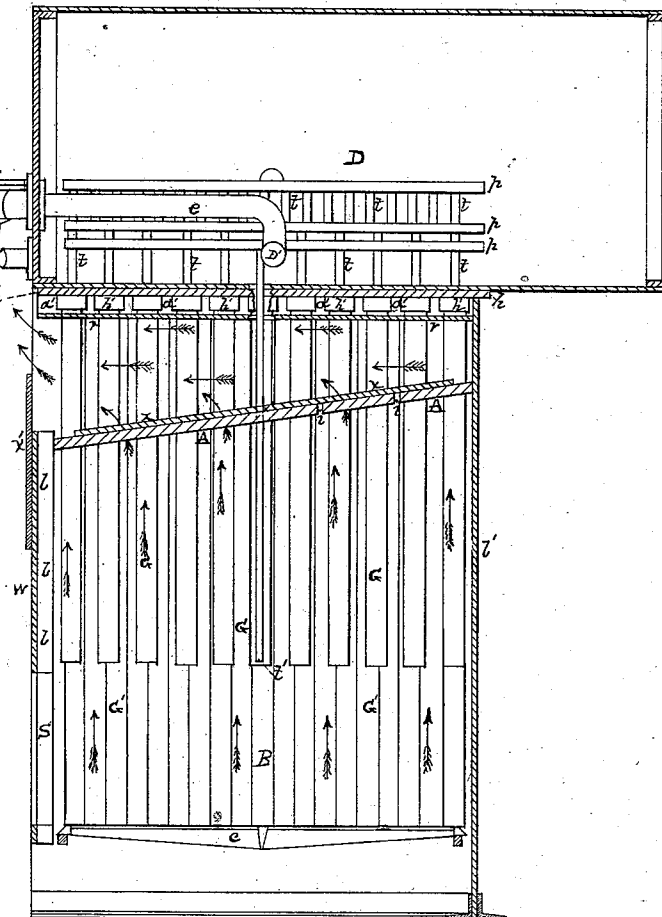
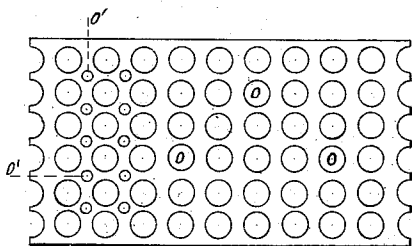
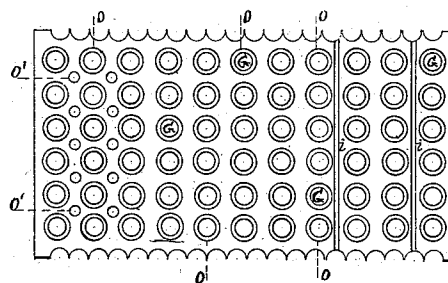


Fig 4.



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# UNITED STATES PATENT OFFICE.

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## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 256,602, dated April 18, 1882.

Application filed July 20, 1881. (No model.)

*To all whom it may concern :*

Be it known that I, GEORGE SEWELL, a citizen of the United States, residing in the city of Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Steam-Boilers or Steam-Generators, which improvement is fully set forth and illustrated in the following specification and accompanying drawings.

10 The object of this invention is to supply a method by which a great number of tubes having their axes in parallel lines one with another can be secured to the convex surface of cylindrical boiler or other vessel constructed of one or more plates of metal.

15 The invention further consists in an arrangement of pipes within the boiler, that will enable an attendant to thoroughly control the circulation of the water within the same. The said pipes will also serve as a means of voiding the boiler of water when desired.

20 In the accompanying drawings, Figure 1 is a front elevation of a cylindrical boiler, the front plate and head of the boiler being dispensed with the better to show my improvement. Fig. 2 is a median longitudinal vertical section through Fig. 1. Fig. 3 is a plan of damper. Fig. 4 is a plan of calorimeter-plate. (See Patent No. 239,348.)

30 The following is a description in detail of the construction and operation of my invention.

Like reference in the several drawings and figures indicate the same parts.

35 Socket-plate *h* and sockets *h'* form one single casting. Socket-plate *h* is designed to be secured to the lower convex surface of a cylindrical boiler, occupying a horizontal plane, and thus afford a practical means of adapting the drop-tube system to a cylindrical vessel or boiler. The sockets *h'* are to receive and hold in position tubes *G*, *G'*, and *G''*. The upper surface of socket-plate *h* must conform to a given radius, as shown on the accompanying drawings, Fig. 1. The form of the said socket-plate practically confines its construction to that of a casting.

40 The thickness of metal of socket-plate *h*, when added to the thickness of metal of the boiler, to which it would be attached, would present a thickness of metal that could not be properly protected from the effect of the direct heat from

the furnace by the water in the boiler. Hence the necessity for some other protection. It is therefore designed to fill space *a*, Figs. 1 and 2 on the accompanying drawings, with fire-clay or other efficient non-conductor of heat, and to protect the fire-clay from disintegration plate *r* is introduced. It will thus be seen that in protecting socket-plate *h* from the direct action of the heat from the furnace the bottom of the boiler will also be completely protected from damage by undue heat under all circumstances. The openings through damper-plate *x* must correspond with the openings in the calorimeter-plate. The movement of the damper will be in a line with the axis of *D*, and will be operated by any suitable mechanical device.

70 *x'*, Fig. 2, is a damper designed to control the connection between the boiler and the smoke-pipe.

75 *D'* is a pipe with either end closed and suitably located within the boiler, as shown in Figs. 1 and 2 on the accompanying drawings, connecting with either side of said pipe *D'*, and extending horizontally over the center of tubes *G*, *G'*, and *G''* are pipes *p*. Pipes *t* connect with pipes *p* and extend down into tubes *G*, *G'*, and *G''* to the lowest point, as shown in section of tube *G* at *t*, Fig. 2. Pipe *e* connects with check-valve *k*. The object of this arrangement or system of pipes *D'* *p* *t* *e* and pipe *b* through check-valve *k* is to deliver the feed-water directly upon the inner surface of the bottom of tubes *G* and the others. The feed-water being forced into these tubes with a pump, it would necessarily be delivered with more or less force upon the inner surface of the bottom of the tubes, which will tend to prevent the formation of scale on the inner bottom of said tubes.

90 When feeding the boiler with saline or other impure water it is designed to circulate the water in the boiler by artificial means by taking the water from the boiler at pipe *m*, Fig. 2, or from any other suitable point, and deliver it into feed-pipe *b*, whence it will be returned to the boiler with the feed-water.

95 This arrangement of pipes *D'*, *p*, *t*, *e*, and *b* through check-valve *k*, (the latter being constructed to lift at will,) will serve (technically speaking) to blow out the boiler.

100 Tubes *G'* form either side wall of the furnace, and tubes *G''* form the back wall of the

same. *b'*, side plates to the furnace, and also support the boiler and tubes.

Cylinder or boiler *D* will be supported by the bearers *Y*, the latter being secured to *b'*.

5 *n*, Fig. 1, is designed to protect tubes *G'* from lateral strain during operations in the furnace; *e*, fire-grate; *S*, furnace-door; *l*, fire-brick to protect plate *w* from the heat from the furnace; *l'*, back plate inclosing back tubes, *G''*, and also  
10 support the boiler *D*.

Having fully described my invention, I claim and desire to secure by Letters Patent—

1. Socket-plate *h*, with drop-tubes *G*, *G'*, and *G''* secured to and within sockets *h'*, in combination with a cylindrical boiler, *D*, substantially as and for the purpose set forth. 15

2. Pipes *D' p t e b* and check-valve *k*, in combination with hanging or pending tubes *G*, *G'*, and *G''*, substantially as described, and for the purpose set forth.

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