G. SELDEN & T. M. NAGLE.

BOILER.

No. 186,762. Patented Jan. 30, 1377.

Fig. 1.

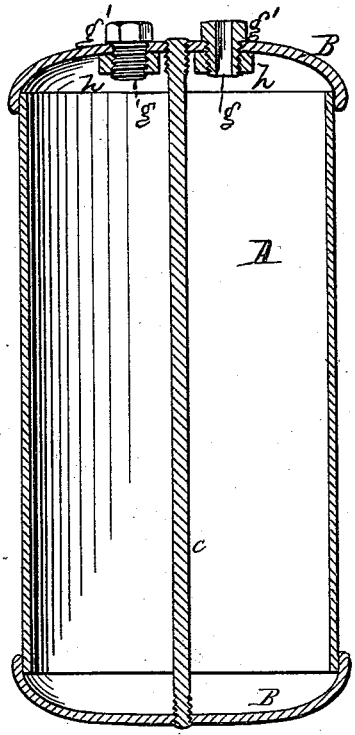


Fig. 3.

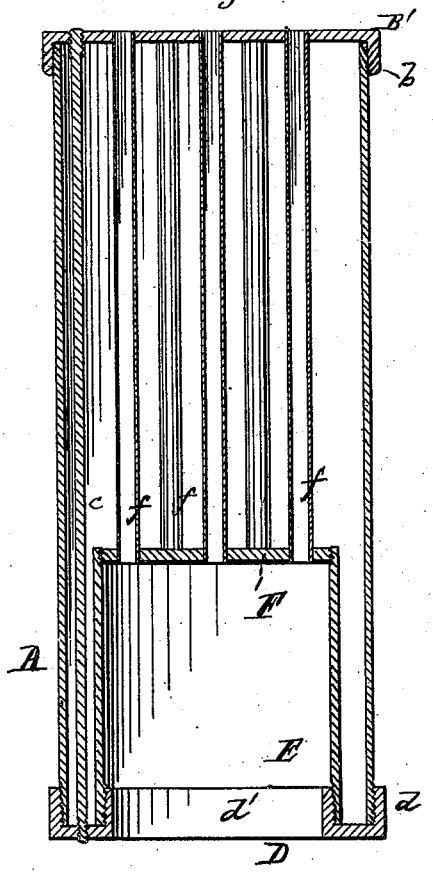


Fig 2.

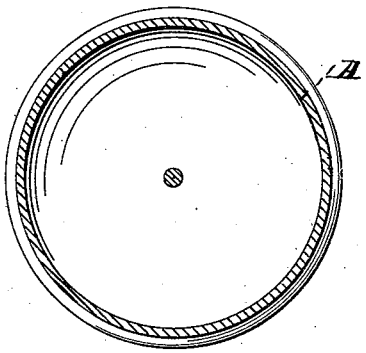
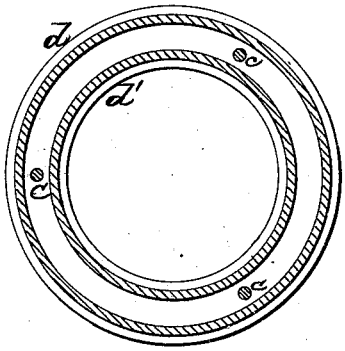


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE SELDEN AND THEODORE M. NAGLE, OF ERIE, PENNSYLVANIA; SAID NAGLE ASSIGNOR TO SAID SELDEN.

IMPROVEMENT IN BOILERS.

Specification forming part of Letters Patent No. **186,762**, dated January 30, 1877; application filed February 28, 1876.

To all whom it may concern:

Be it known that we, GEORGE SELDEN and THEODORE M. NAGLE, both of the city and and county of Erie, State of Pennsylvania, have invented certain new and useful Improvements in Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a vertical section through an upright range or bath-boiler, and Fig. 2 a horizontal section through the same. Fig. 3 represents a vertical section through an upright boiler, and Fig. 4 a horizontal section through the same.

Similar letters of reference denote corresponding parts wherever used.

Our invention relates more particularly to the manner of combining the heads with the cylinder of the boiler, with a view to dispensing with the ordinary unreliable joints formed by riveting these parts together; and consists, first, in uniting the flanged heads with the cylinder, by shrinking them thereon, and, further, securing them in place, where necessary, by the aid of one or more through-bolts; secondly, in combining the fire-pot cylinder in an upright boiler with the boiler-cylinder, by means of a double-flanged ring, with which the two cylinders are united, either by screw-threads or by shrinking, as hereinafter explained; thirdly, in combining the head of the fire-pot, or the disk intermediate between the fire-pot and the boiler, with the fire-pot cylinder, by means of a screw-thread cut upon the periphery of said head or disk, and a corresponding thread cut upon the inner periphery of the upper end of the fire-pot cylinder; and, lastly, in certain details of construction hereinafter described.

In the accompanying drawings, A represents the boiler-cylinder, which, in the case of the range-boiler, where the diameter usually is not great, it is preferred to make of a seamless tube, rolled or otherwise formed in any usual or preferred way. It may be made with a lap-weld extending its whole length, or, in the larger boilers, it may have its edges joined by rivets, and calked in the usual way, except at the ends, where, for the purpose of uniting the heads, as hereinafter described, said edges are united by a lap-weld.

The heads B may be made in the concavo-convex and flanged form shown in Fig. 1, or they may be in the form of flanged disks, as shown at B′, Fig. 3, and the flanged rim of the head together with the periphery of the end of the cylinder being turned or otherwise made accurately to match each other, the heads, or rather the flange *b* thereof, is placed over and shrunk upon the end of the cylinder. For further securing the heads upon the cylinder, longitudinal through bolt or bolts *c* may be employed. With the heads thus applied the joint can be readily calked and made thoroughly tight, in the usual manner.

At the lower end of the upright steam-boiler, Figs. 3 and 4, where it is necessary to partially inclose or surround the fire-pot, a ring, D, is employed, provided with the outer or peripherical flange *d*, and the inner circular flange *d′* upon its inner edge, as shown.

These flanges may be provided with screw-threads, the outer one, *d*, on its inner face, and the inner one, *d′*, upon its outer face or periphery, and the boiler and fire-pot cylinders may be provided on their ends with corresponding screw-threads for uniting them to the ring D, or the flanges *d d′* may be turned or made true on the faces referred to, and the corresponding faces of the cylinders being similarly turned, and made to match the flanges closely, the flange *d* may be shrunk upon the end of the boiler-cylinder, and the lower end of the fire-pot cylinder E, in turn, may be shrunk upon the flange *d′*, and by calking, or otherwise, as may be necessary, a tight joint is formed in either case, between the boiler and fire-pot cylinders and the ring D.

Through-bolt *c*, before referred to, may be employed for further strengthening the union between the ring D and head B, and the boiler-cylinder or transverse bolts passing through both cylinders A and E, and the two flanges, *d d′*, may be employed, if preferred.

The upper end of the fire-pot cylinder E has a screw-thread cut upon its inner face or periphery, and the head or end F, made in disk form, has a corresponding screw-thread cut upon its edge or periphery, and is screwed

tightly into place in the end of the cylinder E, the screw-threads wherever employed being first coated with lead, in the usual manner, for effecting a more perfect union of the parts. In all of the joints referred to it will be seen that reference is had to the direction of pressure of the contents of the boiler. Thus the pressure upon the cylinder A is outward, and its ends are therefore surrounded and strengthened by the flanges *b d*, &c., while the pressure upon the fire-pot cylinder being inward, said cylinder is made to surround the sustaining-head F and flange *d'*, thereby causing the pressure to tend rather to tighten than to open the joints—an important feature in the construction of boilers, as herein described.

The disk form of the head obviates the difficulty experienced in the use of the two thicknesses of metal, as usually employed, and riveted together, viz: the rapid burning out of the inner thickness which is exposed to the fire, and is unprotected by the water. A flange on the periphery of the disk may, however be employed, if desired, for giving a greater extent of holding screw-thread, but this, by preference, will be made upon the upper face of the disk, where it will be protected by the water. The central part of the head F may be dished, or made in the form of a fire-dome, if desired. Tubes or flues *f f* connect the heads B' and F, serving to increase the heating-surface while they carry off the products of combustion. These tubes are joined to the heads in any usual manner, and the pressure upon the heads being in opposite directions, the tubes serve to stiffen them, and to strengthen their connection with the cylinders.

In some cases it may be found desirable to submerge the upper ends of the tubes *f f*, for protecting them from injury from the heat. This is done by employing a cylinder and double-flanged ring, similar to E and D, inverted, and applied to the upper end of the boiler, thereby bringing the upper ends of the tubes *f* below the water-line in the boiler.

In the construction of range-boilers, the metal employed is usually too thin to insure a durable joint with the pipes of cocks. This difficulty is obviated by inserting short headed tubes *g*, (see Fig. 1,) provided with screw-threads, and held firmly in place by nuts *h*, which, in connection with the heads *g'*, clamp and support the metal of the boiler between them, as shown, the tubes *g* themselves forming the points of attachments of the pipes or cocks with the boiler. The coal-chute and the grate may be applied in connection with the upright boiler and the inclosed fire-pot E, in any usual or preferred manner.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The flanged boiler-head, united to the boiler-cylinder by being shrunk thereon, substantially as and for the purpose set forth.

2. The double-flanged ring D, for uniting the ends of the boiler and the inclosed or fire-pot cylinder E applied thereto, substantially as described.

3. The disk or head F, provided on its periphery with the screw-thread matching the screw-thread formed on the inner face of the inclosed cylinder E, substantially as described.

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