

(No Model.)

H. BURGESS.  
STEAM BOILER.

No. 264,621.

Patented Sept. 19, 1882.

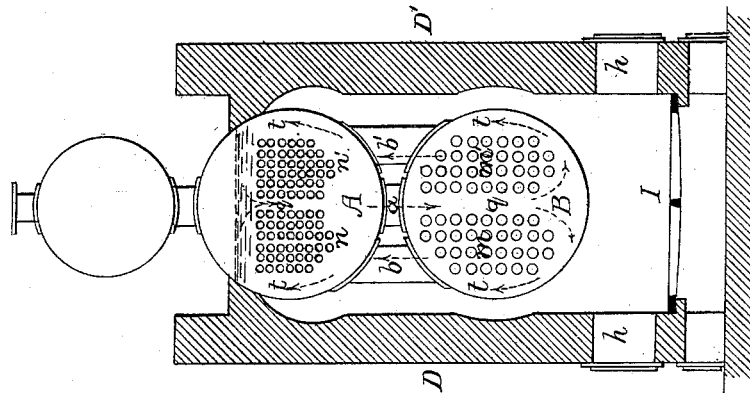
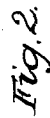
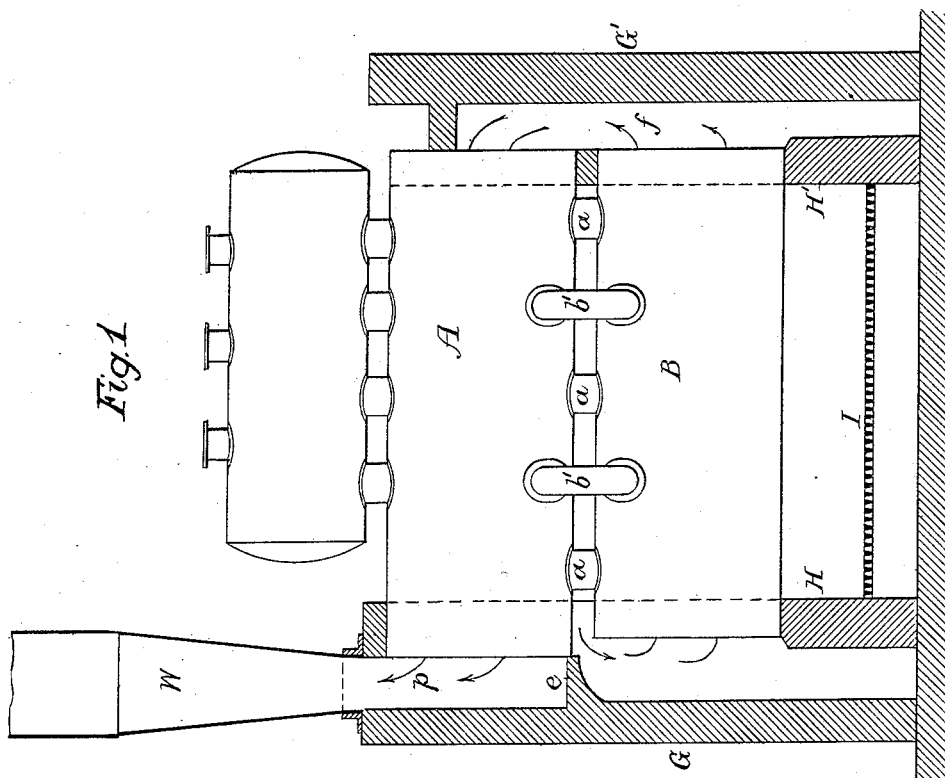


Fig. 1



Witnesses  
James F. Tobin  
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Inventor  
Hugh Burgess  
by his Attorneys  
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# UNITED STATES PATENT OFFICE.

HUGH BURGESS, OF ROYER'S FORD, PENNSYLVANIA.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 264,621, dated September 19, 1882.

Application filed June 2, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, HUGH BURGESS, a subject of the Queen of Great Britain and Ireland, and a resident of Royer's Ford, Montgomery county, Pennsylvania, have invented certain Improvements in Steam-Boilers, of which the following is a specification.

My invention consists of the combination, in a steam-boiler, of two barrels situated one directly above the other, and connected together by a system of tubes, with flue-tubes arranged in each barrel in two sets, so as to leave a central space and two side spaces, as described hereinafter, the object of my invention being to obtain a free circulation of water within the boiler, in contact with the highly-heated sides of the two barrels, and at the same time to avoid violent ebullition and disturbing currents, which cause objectionable foaming.

In the accompanying drawings, Figure 1 is a side view of my improved steam-boiler, the brick-work being in section; and Fig. 2, an end view of the boiler and transverse section of the brick-work.

The boiler is composed mainly of the two barrels or cylindrical bodies A B, the former being situated directly above the latter. The two barrels are connected together by and communicate with each other through central tubes, *a*—three in the present instance—and through two sets of tubes, *b* and *b'*, situated one set on each side of the central tubes, and preferably at equal distances therefrom, and occupying the position shown in Fig. 2 in relation to the upper and lower barrels of the boiler. The number of central connecting-tubes and side tubes will of course depend in a great measure upon the length of the boiler, which in the present instance is comparatively short, so that there are but three central tubes, *a*, and two in each set of side tubes, *b b'*. The object of this combination of three sets of tubes with the two bodies or barrels is to insure that thorough circulation of water which is always desirable, and which, as is well known to engineers, prevents foaming and promotes the rapid and economical generation of steam. The opposite sides of the boiler being exposed to the greatest heat, the water and steam will take the upward course pointed out by the arrows in Fig. 2, through the opposite connecting-tubes *b b'*, and into the upper barrel of the boiler, the water at a lower temperature passing downward from the upper into

the lower barrel in the direction pointed out. It should be here understood, however, that I do not desire to claim this combination of upper and lower barrels with connecting-tubes.

In carrying out my invention I combine with each barrel of the boiler a system of horizontal flue-tubes, and mount the boiler in brick-work, substantially as shown in the drawings, D and D' being the opposite side walls of the structure and G and G' the opposite end walls. The boiler rests on the two foundation-walls H H', and the grate I extends in the present instance longitudinally from one of these walls to the other, and transversely from one side wall, D, to the opposite side wall, D', any desirable number of firing-openings *h* being made in one or both of the said side walls. The lower barrel of the boiler, as well as the greater portion of the upper barrel, is enveloped in the products of combustion, which, owing to the partition *e*, are directed through the system of horizontal flue-tubes *m m'* of the lower barrel, B, to the rear flue, *f*, passing thence through the system of tubes *n n'* of the upper barrel, A, to the flue *p*, and thence to the chimney W. I prefer this brick-work structure because it has proved to be most efficient in practice, and because the exposure of both barrels to the direct action of the products of combustion promotes the desired circulation of water; and in order that the horizontal flue-tubes may facilitate this circulation I arrange them in each barrel in two sets. Thus in the lower barrel there is a vertical space, *g*, between the two sets *m m'* of flue-tubes for the free downward passage of the water, and spaces *t t*—one on each side of the system of tubes—for the upward circulation of water, a similar arrangement of tubes, so as to afford central and side spaces, being adopted in the upper barrel.

I claim as my invention—

The combination, in a steam-boiler, of two barrels, A B, situated one directly above the other, and connected together by tubes *a*, *b*, and *b'*, with flue-tubes arranged in each barrel in two sets, so as to leave a central space, *g*, and side spaces, *t t*, in each barrel, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

Witnesses: HUGH BURGESS.  
SAMUEL H. EGOLF,  
S. B. LATSHAW.