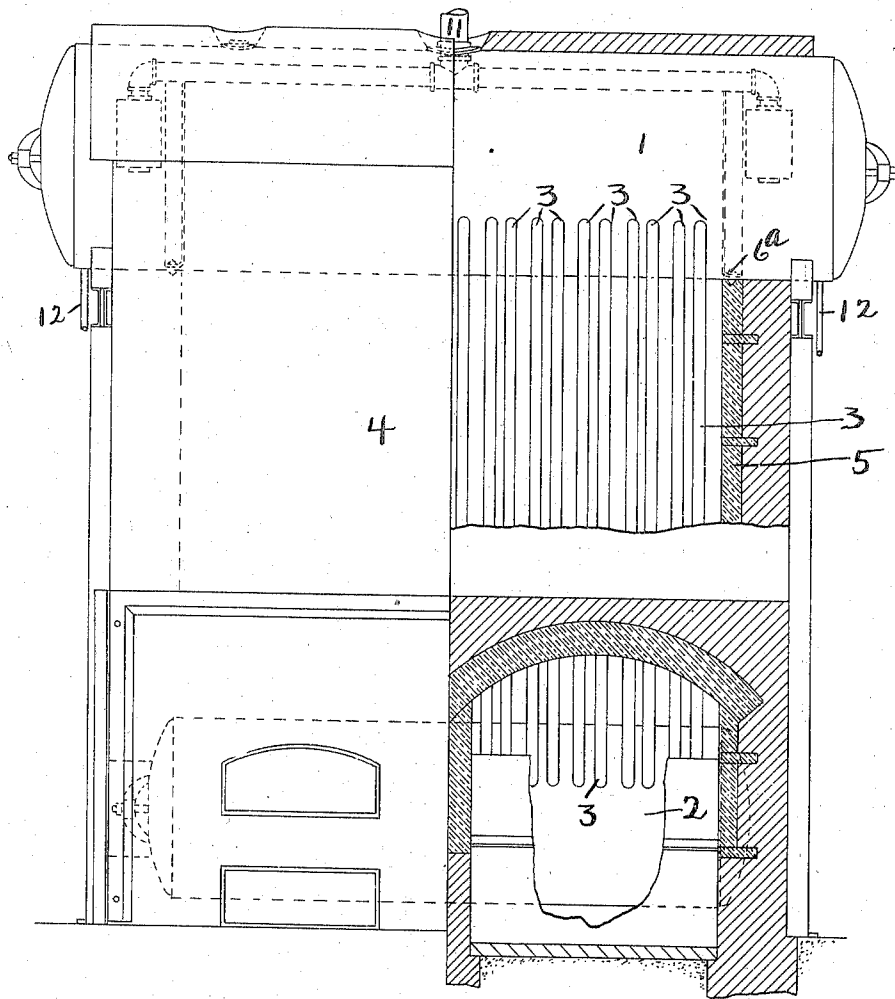


T. E. DURBAN.
STEAM BOILER.
APPLICATION FILED MAR. 18, 1909.

965,883.

Patented Aug. 2, 1910.
2 SHEETS—SHEET 1.

Fig. 1.



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Fig. 2.

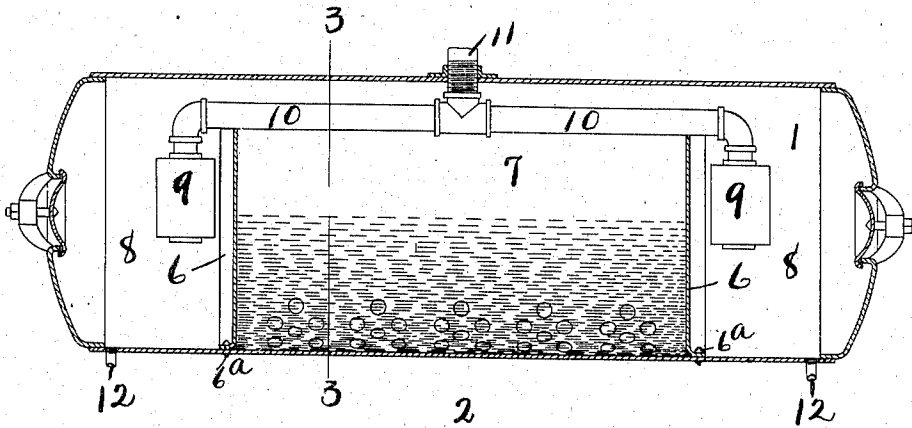
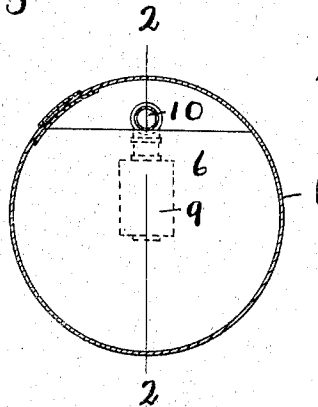


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS E. DURBAN, OF ERIE, PENNSYLVANIA.

STEAM-BOILER.

965,883.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed March 18, 1909. Serial No. 484,335.

To all whom it may concern:

Be it known that I, THOMAS E. DURBAN, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Steam-Boilers, of which the following is a specification.

This invention relates to steam boilers, and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

Common practice in boiler construction provides for the steam space above the water level, the steam space and water extending the entire length of the boiler. With this construction variations in the amount of water in the boiler are accompanied by comparatively small changes in the levels of the water. The most serious objection, however, is due to the fact that the steam is taken from the boiler at a point where it is more or less saturated with moisture. To obviate this I have divided the boiler by an upright partition into a water space and a steam space, thus making the steam outlet at a point more remote from the water level, and consequently at a point less liable to carry moisture from the boiler. This is particularly true in that type of boilers known as water tube boilers wherein a great amount of steam is evolved in a comparatively small space, so that the agitation of the water in the boiler is very great.

As illustrated, the invention is adapted for a water tube boiler having a lower drum and an upper drum with connecting water tubes. That part of the upper drum to and from which the connecting water tubes lead is preferably the central part of the drum, and is divided off by upright partitions, so that the steam spaces are provided at the ends of the drum. In this way that part of the drum, subjected to most intense heat, is protected by the water. Steam space is provided at a point remote from the agitated water, so that comparatively dry steam is obtained. These steam spaces also provide ample room for efficient steam separators.

Further details of the invention and its objects will appear from the following detail description and claims.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 is a front elevation of the boiler

and furnace, partly in section to better show the construction. Fig. 2 is a section on the line 2—2 in Fig. 3. Fig. 3 is a section on the line 3—3 in Fig. 2.

1 marks the upper drum; 2 the lower drum; 3 the connecting tubes; 4 the furnace walls and 5 the side walls. These are or may be of common construction. Upright partitions 6 are arranged in the upper drum, preferably at each side of that part of the drum to and from which the connecting tubes 3 lead. These partitions are preferably also at least as far out as the side walls 5, so that the rivets 6^a with which they are secured to the shell of the drum may be over the walls 5, and thus be protected from the direct action of the fire. These partitions form the water space 7 and the steam spaces 8 at each end of the drum. The separators 9 are arranged in the steam spaces 8, and the steam pipes 10 lead from these separators 9 to a common steam pipe 11. The violent agitation of the water in the water space it will be noted is so remote from the separators that there is little tendency to carry much moisture with the steam. The steam spaces are large enough to put in efficient separators, so that dry steam may be assured. That part of the drum which is subjected to the direct action of the fire is protected by the water. In ordinary practice it is believed that any moisture that may be deposited in the steam spaces 8 will evaporate, but if under any conditions this does not occur I prefer to provide means for drainage, as the drainage tubes 12, for this purpose. All that is necessary is, that the partitions 6 be supplied. By this I do not wish to be understood as limiting my invention to a partition which is perpendicular to the bottom of the drum. The upright partition divides the drum longitudinally or transversely into water and steam spaces.

What I claim as new is:

1. In a boiler, the combination of a drum; an upright partition dividing the drum into a water space and a steam space, in direct communication; tubes leading to the water space; and the steam outlet of the boiler with its opening arranged in said steam space above the bottom of said space.

2. In a boiler the combination of a drum; an upright partition dividing the boiler into a water space and a steam space, in direct communication; tubes leading to the water space; and the steam outlet for the boiler

positioned to form a dead end in the lower part of the steam space.

3. In a boiler, the combination of a drum having its axis approximately horizontal; an upright partition dividing the drum into a water space and a steam space, in direct communication; tubes leading to the water space; and the steam outlet of the boiler with its opening arranged in said steam space above the bottom of said space.
4. In a boiler, the combination of a drum having its axis approximately horizontal; an upright partition dividing the boiler into a water space and a steam space, in direct communication; tubes leading to the water space; and the steam outlet for the boiler positioned to form a dead end in the lower part of the steam space.
5. In a boiler, the combination of a drum; an upright partition dividing the drum into a water space and a steam space; a separator in the steam space; and a steam pipe leading from the separator.
6. In a boiler, the combination of a drum having its axis approximately horizontal; an upright partition dividing the drum into a water space and a steam space; a separator in the steam space; and a steam pipe leading from the separator.
7. In a boiler, the combination of a drum having its axis approximately horizontal; an upright partition dividing the drum into a water space and a steam space; and a furnace wall directly under the partition, said wall confining the action of the furnace gases to the water space.
8. In a boiler, the combination of a drum having its axis approximately horizontal; upright partitions dividing the drum into a central water space and end steam spaces; and a steam pipe leading from said steam spaces.
9. In a boiler, the combination of a drum having its axis approximately horizontal; upright partitions dividing the drum into a central water space and end steam spaces; separators in said steam spaces; and steam pipes leading from said separators.
10. In a boiler, the combination of a drum having its axis approximately horizontal; upright partitions dividing said drum into a central water space and end steam spaces; and furnace walls under said partitions confining the furnace gases to the water space.
11. In a boiler the combination of a lower drum and an upper drum; tubes connecting the upper and lower drums; said tubes leading to and from the central part of the up-

per drum; and partitions in the upper drum outside the tubes dividing the upper drum into a central water space and end steam spaces.

12. In a boiler, the combination of a lower drum and an upper drum; tubes connecting said drums; tubes leading at the central part of said drum; partitions outside of said tubes dividing the drum into a central water space and end steam spaces; separators in said steam spaces; and steam pipes leading from said separators.

13. In a boiler, the combination of a lower drum and an upper drum; tubes connecting said drums; tubes leading to the central part of said drum; partitions outside of said tubes dividing the drum into a central water space and end steam spaces; separators in said steam spaces; steam pipes leading from said separators; and furnace walls under said partitions confining the furnace gases to the water space.

14. In a boiler the combination of a horizontal steam and water drum; an upright partition dividing said drum into a water space and a steam space; a lower drum; tubes connecting the upper drum with the lower drum; a steam outlet for the boiler leading from the steam space and means for passing gases in a direction transverse to the axis of the steam and water drum.

15. In a boiler the combination of a horizontal steam and water drum; an upright partition dividing said drum into a water space and a steam space; a lower drum; tubes connecting the water space of the upper drum with the lower drum; a steam outlet for the boiler leading from the steam space and means for passing gases in a direction transverse to the axis of the steam and water drum, said steam space of the steam and water drum being outside of the first pass of the gases.

16. In a boiler the combination of a steam and water drum, having upright partitions dividing the said drum into end steam spaces and a central water space; a lower drum; tubes connecting said drums; and means for passing gases in a direction transverse to the steam and water drum past said tubes.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOMAS E. DURBAN.

Witnesses:

H. C. LORD,
J. R. CRAIG.