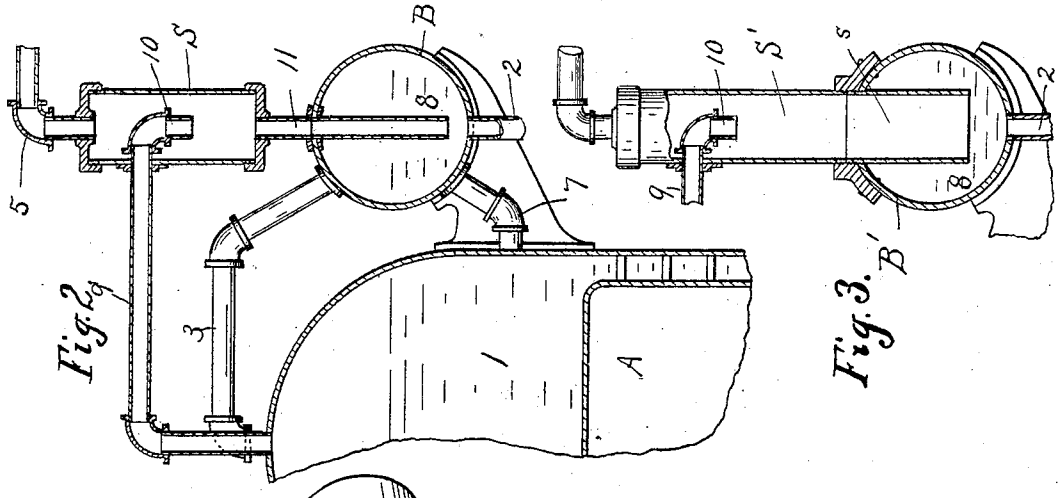
No. 644,862. Patented Mar. 6, 1900.

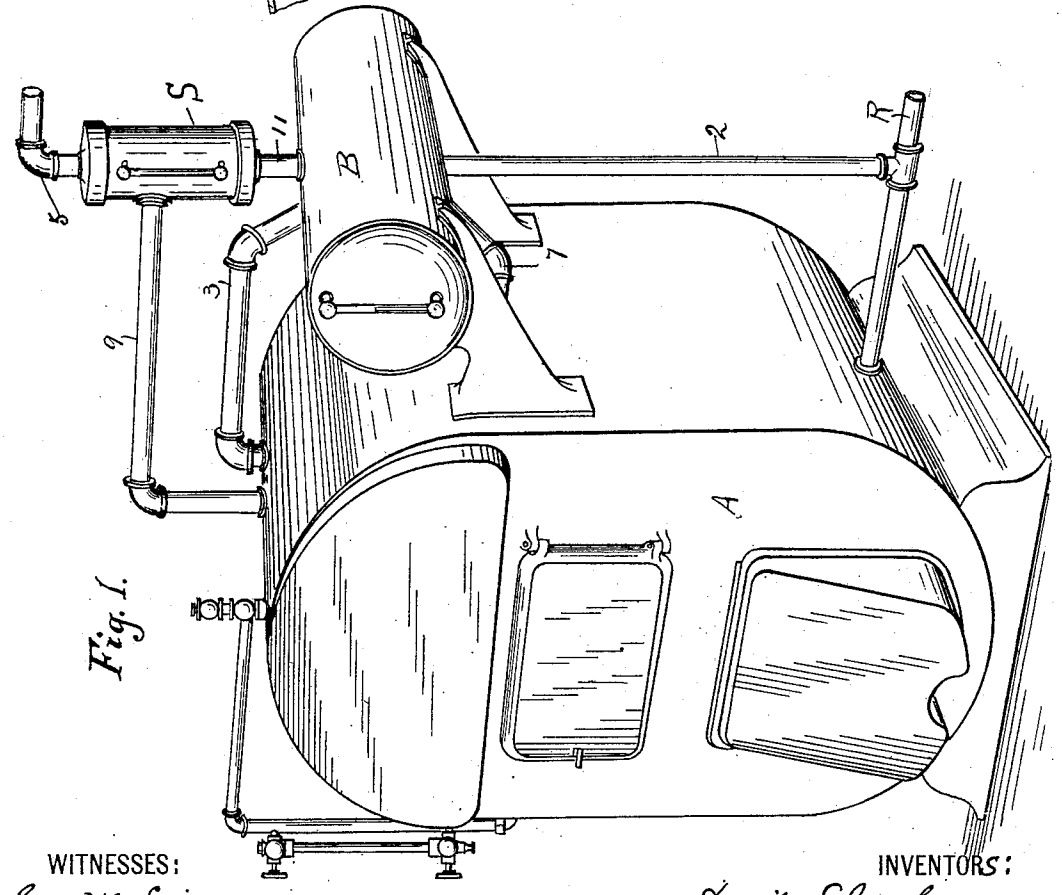
D. S. & M. R. JACOBUS.

BOILER.

(Application filed May 6, 1899.)

(No Model.)





WITNESSES:

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DAVID S. JACOBUS AND MARTIN R. JACOBUS, OF RIDGEFIELD, NEW JERSEY.

BOILER.

SPECIFICATION forming part of Letters Patent No. 644,862, dated March 6, 1900.

Application filed May 6, 1899. Serial No. 715,824. (No model.)

To all whom it may concern:

Be it known that we, DAVID S. JACOBUS and MARTIN R. JACOBUS, citizens of the United States, residing at Ridgefield, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Steam-Heating Boilers, of which the following is a specification.

Our invention has reference to improvements in steam-heating boilers of the types generally used for heating dwellings, apartments, &c., in which a comparatively small quantity of water is contained in the water-space.

This invention refers to improvements in the constructions described in our prior applications, Serial No. 702,631, filed January 19, 1899, and Serial No. 705,535, filed February 15, 1899, in which we combined with a steam-heating boiler or similar apparatus a water supply and receiving vessel connected below the water-level with the water-space of the boiler and above the water-level with the steam-space of the boiler for the purpose of establishing a substantially-permanent water-level.

In boilers of the type in which we desire to use our improvements considerable trouble is caused by the water being driven out of the boiler in starting up the fire and frequently during the regular operation of the heating apparatus, thus causing the boiler to be weakened by excessive heating or rendered useless by being burned out, or, if an ordinary automatic feeding device is used, the water which returns from the heating system will sometimes flood the boiler. In addition to these difficulties the water which is driven out of the boiler will sometimes cause trouble by producing a water-hammer and pounding in the steam-pipes.

It is the object of our present invention to overcome these objections by providing, in addition to a water supply and receiving vessel, a separator connected with said supply and receiving vessel below the water-level therein and also with the steam-space of the boiler. From this separator the main to the radiators, &c., is led.

The nature of our invention will best be understood when described in connection with the accompanying drawings, in which—

Figure 1 represents a perspective view of a steam-heating boiler provided with our improvements. Fig. 2 is a vertical section thereof, part being broken away. Fig. 3 is a vertical section, partly in elevation, illustrating a modified form for the separator.

Similar letters and numerals of reference designate corresponding parts throughout the several views of the drawings.

Referring to the drawings, the letter A designates a steam-heating boiler of any usual well-known construction, to which our improvement is applied. In connection with said boiler we make use of a water supply and receiving vessel B, which may be of any suitable form and is preferably placed at such a height as to be about one-half full at the ordinary level of the boiler A. The capacity of this vessel is such as to supply the proper amount of water in case of a sudden diminution, as in starting up the fire, or from other causes which would affect the water-level in the boiler. The vessel B is connected at or near its bottom or lower portion with the water-space 1 of the boiler, as by a suitable pipe 2, connecting with the return-pipe R from the radiators. Steam is conducted from the steam-space of the boiler by means of a suitable pipe connection 3 to the upper portion or what may be termed the "steam-space" of the vessel B. A suitable pipe connection 7 is made between the water-space 1 of the boiler A and the water-space 8 of the vessel B for establishing a water circulation between the water in the vessel B and the water in the boiler.

The construction so far described is substantially that shown and described in our prior application, Serial No. 705,535; but instead of drawing the steam from the steam-space in the water vessel as supplied by the pipe 3 we provide an external separator S, which is connected with the steam-space of the boiler by a pipe connection 9, having a downwardly-turned terminal 10 within said separator S. The steam so introduced into the separator passes out at the top of said separator through the steam-main 5, connected with said separator in a usual manner. The lower portion of said separator is connected with the water supply and receiving vessel by means of a vertical pipe 11,

which extends to near the bottom of said vessel, so as to be below the water-level within said vessel. In consequence of this construction any water which may be carried up from the boiler through the pipe connection 9 separates in the separator and passes into the supply and receiving vessel B, while substantially-dry steam passes upwardly through the separator and to the main 5, from whence it is distributed to the radiators. The separator S′ may be constructed in the form shown in Fig. 3, where it is extended directly into the supply and receiving vessel B′, instead of making use of the pipe 11. This may be done by either threading the separator and screwing it directly into the vessel or by making it in two parts and inserting the lower part *s* from the interior of the vessel in a well-known manner.

What we claim as new is—

1. The combination with a steam-heating boiler, of a water supply and receiving vessel located at a level with respect to the boiler to be only partially filled with water at all times and said vessel being connected below the water-level with the water-space of the boiler and above the water-level with the steam-space of the boiler, a separator having a connection with the water supply and receiving vessel below its water-level and a connection with the steam-space of the boiler, and a steam-main connected with said separator, substantially as described.

2. The combination with a steam-heating boiler, of a water supply and receiving vessel located at a level with respect to the boiler to be only partially filled with water at all times and said vessel being connected below the water-level with the water-space of the boiler and above the water-level with the steam-space of the boiler and also connected at another level with the water-space of the boiler so as to induce circulation of water, a separator having a connection with the water supply and receiving vessel below its water-level and a connection with the steam-space of the boiler, and a steam-main connected with said separator, substantially as described.

3. The combination with a steam-heating boiler, of a water supply and receiving vessel located at a level with respect to the boiler to be only partially filled with water at all times and said vessel being connected below the water-level with the water-space of the boiler and above the water-level with the steam-space of the boiler, a separator having a connection with the water supply and receiving vessel below its water-level, a steam-main connected with the top of said separator, and a connection with the steam-space of the boiler and said separator arranged intermediate of its connection with the steam-main and its connection with the water supply and receiving vessel, substantially as described.

4. The combination with a steam-heating boiler, of a water supply and receiving vessel located at a level with respect to the boiler to be only partially filled with water at all times and said vessel being connected below the water-level with the water-space of the boiler and above the water-level with the steam-space of the boiler, a separator having a connection with the water supply and receiving vessel below its water-level and a connection with the steam-space of the boiler having a downwardly-turned discharge end in said separator, and a steam-main connected with said separator, substantially as described.

5. The combination with a steam-heating boiler, of a water supply and receiving vessel located at a level with respect to the boiler to be only partially filled with water at all times and said vessel being connected below the water-level with the water-space of the boiler and above the water-level with the steam-space of the boiler, a separator having a connection with the water supply and receiving vessel below its water-level, a discharge-opening for steam at the top of said separator, and a connection with the steam-space of the boiler and said separator arranged intermediate of its connection with the steam-main and its connection with the water supply and receiving vessel, substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

DAVID S. JACOBUS.
MARTIN R. JACOBUS.

Witnesses:
EUGENIE P. HENDRICKSON,
G. W. EISENBAUM.