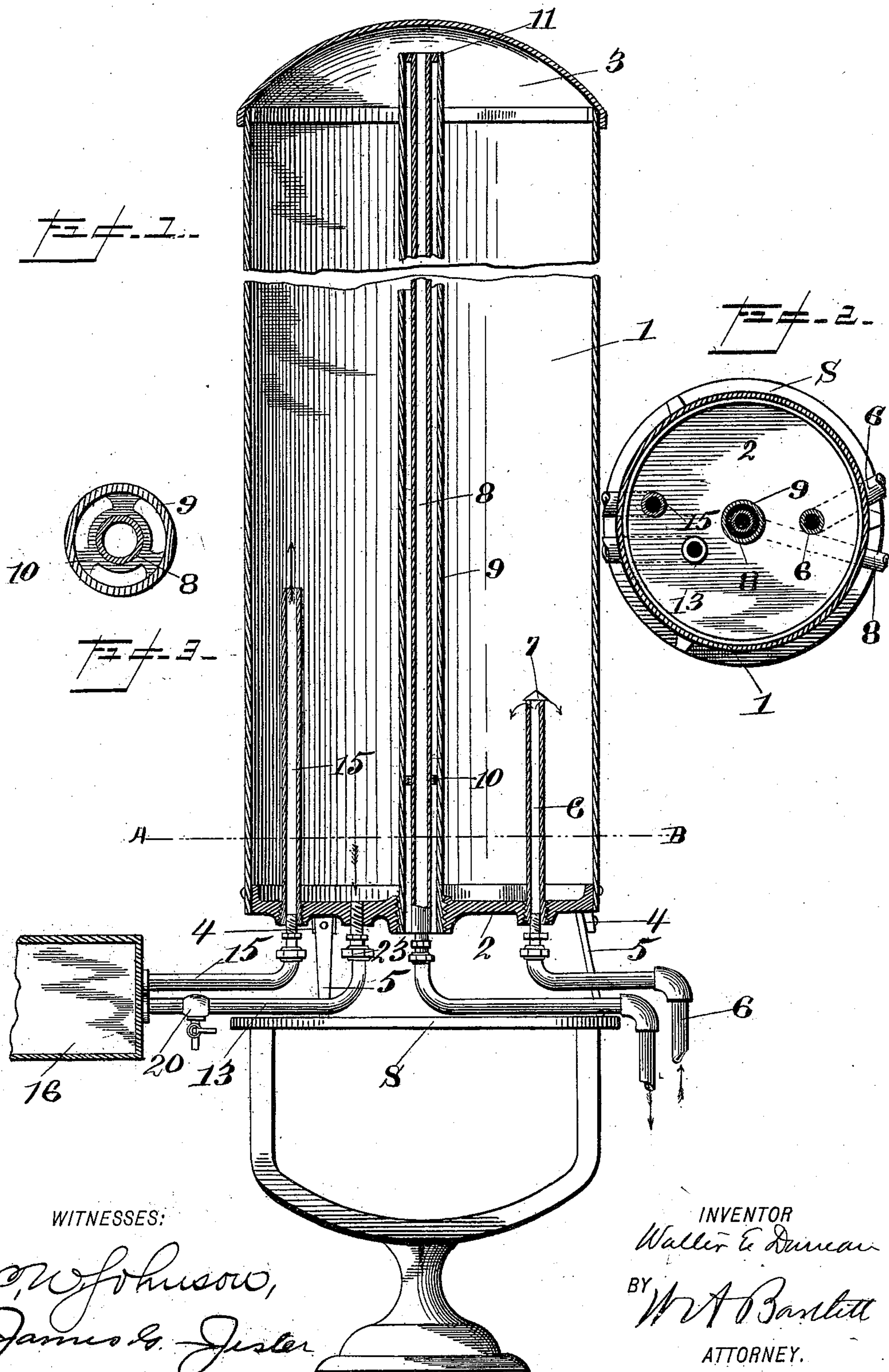


(No Model.)

W. E. DUNCAN.
STAND BOILER FOR HEATING WATER.

No. 523,738.

Patented July 31, 1894.



WITNESSES:

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WALTER E. DUNCAN, OF PHILADELPHIA, PENNSYLVANIA.

STAND-BOILER FOR HEATING WATER.

SPECIFICATION forming part of Letters Patent No. 523,738, dated July 31, 1894.

Application filed August 18, 1893. Serial No. 483,467. (No model.)

To all whom it may concern:

Be it known that I, WALTER E. DUNCAN, residing at Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Stand-Boilers for Heating Water, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to so called "stand" boilers and connections, or boilers for heating water for domestic purposes. It may also be used in connection with a radiator system.

The object of the invention is to produce a boiler of the character described, to which all the water connections can be easily and quickly made, at the end of the boiler or shell; also to produce a boiler in which the hot water escape pipe is shielded within the boiler from contact with the cold water. Also to improve boilers or water-heaters of the described character in various particulars.

Figure 1 is a vertical central section of the boiler shell and so much of the connections as is necessary to an understanding of my invention. The stand is shown in elevation. Fig. 2 is a cross section of same on line A—B. Fig. 3 is a cross section of the hot water pipe, jacket, and bushing.

The numeral 1 indicates the shell of the boiler, which is preferably of the usual cylindrical shape, and composed of sheet or plate metal. The lower head 2 is preferably of cast metal. The upper head 3 may be either cast or wrought, and is preferably dome shaped. The lower head or end piece 2, has lugs 4, 4, to which legs 5 may be attached, by rivets, screws, or in any other convenient manner, or the lugs may themselves serve as legs. The legs are of such length as to permit ready access to the bottom of the boiler to make connections above the top of the stand S. These connections are made by means of couplings.

The cold water supply pipe 6 enters the boiler through the bottom, and extends upward into the boiler some distance, say a foot or more. The top of this pipe 6 is covered by a deflector or shield 7, which guides the water downward as it enters the boiler. The pipe 6 enters the boiler so far that the water cannot be drawn out from the boiler through said supply pipe and back into the main, as

sometimes happens if the supply pipe terminates at the bottom of the boiler.

The hot water pipe 8, which conveys the water from the boiler to the bath room, radiator, or other place where hot water is used, is surrounded by a second pipe, 9, which serves as a shield therefor. Pipe 8 is separated from pipe 9 by opening bushings 10. The space between the top of pipe 9 and the pipe 8 is closed by an annular cap 11.

The pipe 9 has a screw threaded sleeve or bushing 12 near its lower end, which sleeve fits an opening in the head 2. When the pipes 8, 9, are in place in the boiler as shown, the pipe 8 extends nearly to the top of the boiler and into the dome, so that no considerable body of air can collect in the boiler above the top of pipe 8. The annular space between pipes 8 and 9 is an air chamber, open at the bottom. This air space will be filled with air heated by radiation from the hot water in the boiler. The air chamber will prevent radiation of any considerable amount of heat from the pipe 8 where it is in proximity to the colder water near the bottom of the boiler. Thus the water drawn from the boiler through pipe 8 will always come from the top, where the water is hottest, but will pass out through the bottom. The shell 1, having no pipe connections at the top, is free to expand and contract without loosening joints or connections, as has often occurred with some constructions.

The heating circulation is effected by means of pipes 13 and 15, connected to the water back or other heater 16. The pipe 13 enters a suitable hole in the bottom 2 of the boiler, and a convenient coupling 23 may be made close to the boiler shell. The pipe 13 thus takes its water from the very bottom of the boiler, where the water is naturally coolest, and conveys it to the water back 16. From the water back 16 the pipe 15 extends to a suitable coupling just below the boiler, and thence extends up into the boiler for some distance and above the level of the top of the cold water supply pipe. The hot water, entering the boiler by this tube, rises directly toward the top thereof, owing to the difference in specific gravity between the heated and the partly heated water.

A trap or cock 20 to permit the escape of sediment is preferably arranged at the lowest part of pipe 13. Care should be taken that pipe 15 has no downward bend after it leaves the water back, as such a bend makes a mud trap, which is a source of danger.

It will be seen that the cold water which enters the boiler is deflected toward the bottom, while the hot water may rise. Also that the hot water drawn from the boiler for use is taken from the top part thereof, and protected from radiation to the cooler water near the bottom within the boiler, and the shell is not connected to any of the pipes save at the bottom. Also that the supporting legs of the boiler permit ready access to the couplings, between the bottom of the boiler and the supporting stand.

What I claim is—

1. In a stand boiler of the character described, the vertical shell and top, the lower head provided with legs by which it is supported without assistance from the shell, the jacket secured to said head and extending upward into the shell, and closed at the top, and the hot water pipe extending through said head and jacket nearly to the top of the shell, all combined substantially as described.

2. In combination with the boiler shell, the lower head having an opening therein, the

jacket passing through said opening, and the hot water pipe extending through said jacket and out at the bottom of the boiler, the top of said jacket being closed and its bottom open, all substantially as described.

3. In a stand boiler of the character described, the vertical shell and cover, the lower head provided with legs by which it is supported independently of the shell, the closed jacket and its inclosed hot-water pipe passing through and supported by said lower head, and the inflow and circulation pipes connected to and supported by said head, all combined and relatively arranged substantially as described.

4. The boiler shell, the cast metal head therefor having lugs and openings for the pipes, the cold water supply pipe extending upward into the shell and having a deflector, the circulating pipes and heater, the return circulating pipe extending well up into the boiler, and the jacketed outflow pipe, all combined substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER E. DUNCAN.

Witnesses:

W. A. BARTLETT,
JAMES G. JESTER.