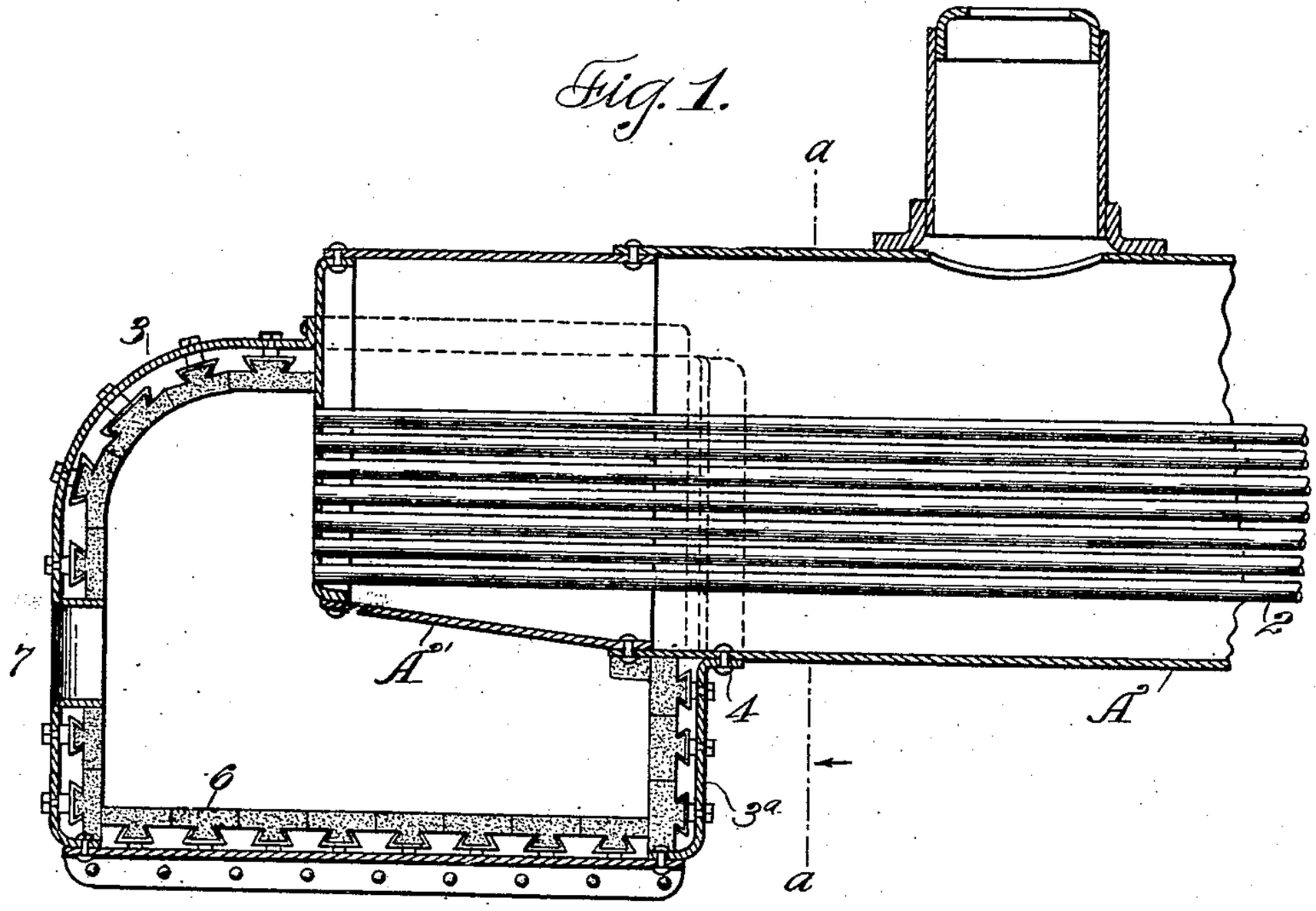
No. 875,349. PATENTED DEC. 31, 1907.

F. J. HICKEY.

STEAM BOILER.

APPLICATION FILED APR. 1, 1907.

Fig. 1.



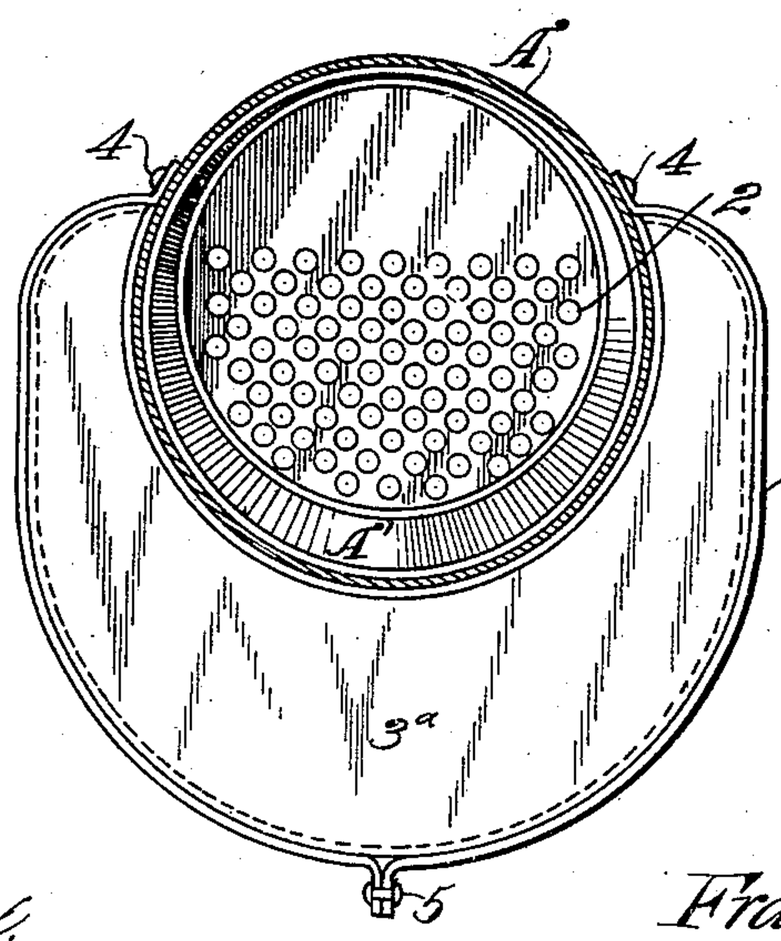


Fig. 2.

WITNESSES:

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FRANCIS J. HICKEY, OF SACRAMENTO, CALIFORNIA.

STEAM-BOILER.

No. 875,349. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed April 1, 1907. Serial No. 365,803.

To all whom it may concern:

Be it known that I, FRANCIS J. HICKEY, citizen of the United States, residing at Sacramento, in the county of Sacramento and State of California, have invented new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to improvements in steam boilers, and especially to that class known as the locomotive type of boilers.

It consists in the combination of parts, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section of the rear portion of the boiler. Fig. 2 is a transverse section through *a*—*a* Fig. 1.

For the purpose of improving boilers already built, I have shown a structure, providing for exterior and interior shells, forming a rearward connection of the original boiler, and a furnace employed in conjunction therewith, in which I dispense with the water-legs usual to such boilers and for which device a patent was issued to me the 19th day of June, 1906, No. 823,864.

My present invention is especially designed to provide for the construction of new boilers.

A is the boiler-shell which is made cylindrical in shape, extended to a considerable distance rearwardly of the ordinary boiler length, and having the lower part of the rear portion of the boiler-shell inclined upwardly as shown at A′, for the purpose of causing sediment and other foreign matter to be thrown toward that portion of the boiler, which is not directly exposed to the fire, and from which the sediment may be eventually discharged.

The boiler A has the usual tubular construction, as shown at 2, the tubes extending from the rear to the front head as shown.

3 is the furnace shell, made of any suitable shape, as square, elliptical, or other form, as the conditions warrant. This shell or casing is formed of plates riveted up and secured to the sides of the boiler-shell by studs, or tap bolts screwed into the boiler, or rivets if preferred as at 4. As shown in the end view, the sides of this casing extend outwardly from the point where they are secured to the shell, thence downwardly curving to their meeting edge, where they are riveted or are secured together, as shown at 5, and from the front of the lower or floor part of this casing, the upturned flanged portion 3ª is secured to the bottom of the boiler in front of the inclined floor A′ thereof. The interior of this shell or casing is provided with a lining 6, of fire-brick or other suitable refractory material, which is fitted and secured therein by any suitable or well known clamping means, so that the brick may be removed and replaced at will.

In the front of the furnace structure is a door opening at 7, and the usual mechanism for burning liquid or solid fuel, not here shown, may be connected with, or contained within the furnace.

By this construction I avoid the usual rectangular structure of this type of boilers, which forms a furnace, and the water-legs extending down upon either side thereof. Also dispensing with all stay bolts necessary in such water-legs, and in the crown sheet of the boiler which extends above the furnace; all of which construction weakens the boiler, and adds to its tendency to leak. My boiler-shell being cylindrical presents the strongest form and the greatest resistance to internal pressure, greatly simplifies the construction of the furnace, and by the use of a fire-resisting lining to the furnace there is no necessity for water-legs.

The portion of the boiler shown at A′, which is inclined or tapered, being subjected to the greatest heat, is more liable to need replacing in time, and for this reason the outer furnace shell or casing 3, is so made that it can be removed, leaving the boiler entirely free, so that any work may be done upon it without obstruction, and the new plates necessary can be readily replaced, after which the furnace may be again restored to its place.

By this construction the steam in the boiler is super-heated, and a more economical evaporation of water is effected, since a boiler of this kind in actual test, uses one-third less water than in other locomotives which are operated upon the same railroad system. It eliminates the flat surfaces which go to make up the water-legs of the ordinary type of fire-box boiler, does away with stay-bolts etc., and being of true cylindrical shape, presents the strongest and safest form of a boiler.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a locomotive type of boiler having internal fire-tubes, a furnace inclosing the

rear and lower part of the boiler, from which furnace the tubes extend, said furnace being made in detachable sections, and removably secured to the boiler about the water-line.

2. In a boiler of the character described, a substantially cylindrical shell, with longitudinal fire-tubes, said shell having the rear lower portion inclined upwardly toward its rear head, a sectional detachable furnace casing secured to the boiler and inclosing this portion of the boiler, a lining of refractory material, and means for removably securing the same within the furnace casing.

3. The combination with a cylindrical boiler shell having longitudinally disposed fire-tubes, of a furnace casing consisting of independent sections having their upper edges detachably secured to the opposite sides of the rear portion of the boiler shell, and their lower meeting edges united together, said casing extending forwardly and inclosing the bottom of the boiler shell, and a lining of refractory material with means for securing it within the furnace casing.

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

FRANCIS J. HICKEY.

Witnesses:
J. F. MISPLEY,
F. E. MICHEL.