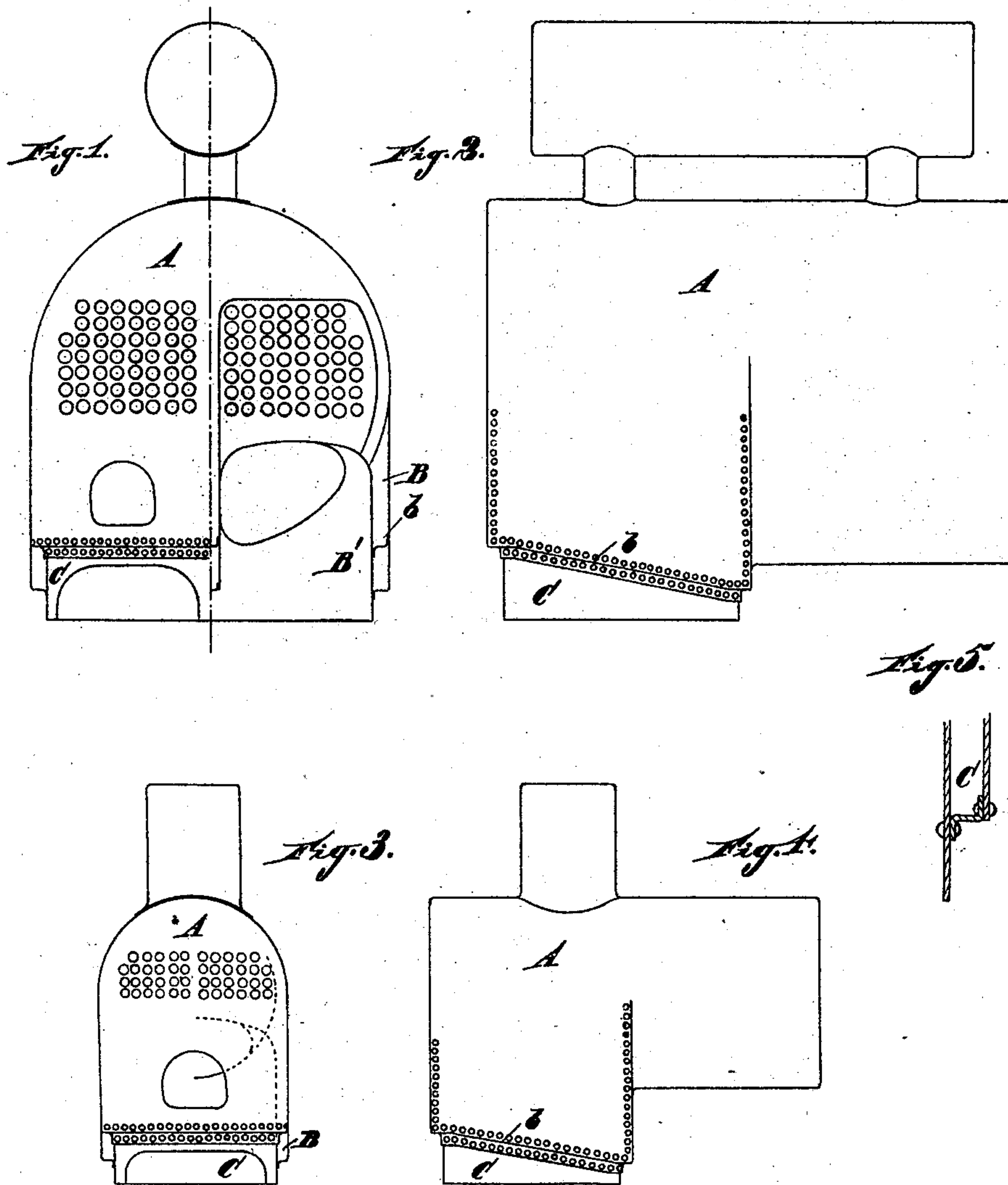


(No Model.)

F. E. KIRBY.  
MARINE BOILER.

No. 357,010.

Patented Feb. 1, 1887.



WITNESSES  
M. B. O'Gherty  
E. S. Fletcher.

Frank E. Kirby INVENTOR  
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# UNITED STATES PATENT OFFICE.

FRANK E. KIRBY, OF DETROIT, MICHIGAN.

## MARINE BOILER.

SPECIFICATION forming part of Letters Patent No. 357,010, dated February 1, 1887.

Application filed March 31, 1886. Serial No. 197,333. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK E. KIRBY, of Detroit, county of Wayne, State of Michigan, have invented a new and useful Improvement in Marine Boilers; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention consists of the combinations of devices and appliances hereinafter specified, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a view, partly in section and partly in elevation, of a marine boiler involving my invention, the left portion being in elevation and the right portion in section. Fig. 2 is a side elevation of the same. Fig. 3 is a front elevation, and Fig. 4 a side elevation of a different form of boiler. Fig. 5 is a separate view illustrating in enlarged form the angle-plate.

Heretofore it has been usual to construct boilers of this type with a water-bottom, or with water-legs extending down to the extreme bottom of the boiler, and at these lower points it has been customary to finish with a horizontal plate or plates riveted to the adjacent upright portions of the boiler, and so completing the water jacket or shell. It is usual to set steam-boilers of this type upon a bed of cement or putty, thus rendering these lower plates entirely inaccessible. Moreover, from their location they are almost invariably damp, and the materials adjacent to them induce and hasten oxidation and decay. It is, moreover, impossible to give to them the necessary and proper examination to discover such injury to the plate and so avert an accident or explosion. It is along these lower horizontal plates that boilers of this character are generally first to give way, and for the reason above explained. Should a leak be discovered or a plate found to be injured, it is in most cases necessary to raise the boiler high enough to enable a workman to get under it for the purpose of calking or otherwise repairing it. Boilers have also been made with the outer plates of the boiler-shell continued downward to the base-line, and then locating at a distance above the base-line, but inside of said outer plates, an angle-plate

to connect the shell with the furnace. This, however, located the said plate within the ash-pit of the furnace, where its rivets and seams were inaccessible, and where a slight leakage occurring was apt to become larger and dangerous before being discovered; and where such water legs or front have not extended down to the base-line they have sometimes been terminated by a plate, and the latter caused to rest on a cast-iron or outer saddle, rendering the parts equally inaccessible in case of injury.

It is the purpose of this invention to remedy the said evils in marine boilers or other boilers of that type which rest upon or are supported by the bottom plates of the water-legs—that is to say, in that class of boilers in which the boiler is supported from the floor and rests upon a bed of putty or other bed which obscures the joints and makes the discovery of a leak impossible and the remedy of a leaking joint impracticable without elevating or disturbing the location of the boiler. I accomplish this by terminating the water-body or the water-leg at a distance above the base upon the outside of the furnace, as illustrated in the drawings, and at this point finish the same by the employment of a flanged plate, which in fact constitutes the lower surface of the water body or leg, and the same is raised sufficiently high that it is kept dry at all times, not exposed to the direct heat of the furnace or ash-pit, nor to the action of those elements which rapidly corrode and cause the same to decay, and where the joints are always readily accessible.

In carrying out my invention, A represents any ordinary boiler, those shown in the drawings being marine boilers, although the invention is equally applicable to any type of boilers, which, like marine boilers, usually have water-legs or water-bodies extended down to the floor or foundation-line and here caused to rest upon a bed, thus supporting the boiler.

B represents its water-leg. This is not extended down in front and at the sides and rear as heretofore, so as to rest upon a foundation of putty or cement beneath, nor are the outer plates of the boiler-shell carried down alone to the base-line; but the furnace portion B' alone extends to the bottom, and the water-compartment is terminated outside the furnace at a distance above the bottom—as, for in-



stance, along the line *b*. The lower portion of the water leg or front is here terminated in any proper manner. That represented in the drawings is by a flanged plate, C. This plate, 5 of suitable size, has a flange turned down and riveted to the furnace, while its outer edge is turned upward into the form of a flange and riveted to the shell of the boiler, as clearly illustrated in Figs. 1 and 2.

10 I do not limit myself to any particular form of the plate C, for it is apparent that it may be constructed in a variety of ways. Thus, for instance, it might be in the form of an inverted-U plate or channel, in which case both ends 15 of all the rivets would be accessible.

It is thus seen that all the laps of the water-space are situated above and outside the base-line of the boiler, and, as before explained, this may be done by any peculiar form of flanged 20 plate C, or the lower edges of the outer plates may themselves be flanged and turned in against and riveted to the furnace; or it may be accomplished in any other convenient way.

My invention consists, essentially, in so making 25 ing a marine boiler or boiler of that type that its water-leg or water-body shall terminate above the foundation-line and the joint between the inner and outer shell at this point be made

wholly upon the exterior of the boiler, where it is visible and accessible for repairs. 30

What I claim is—

1. A boiler having a water-leg or water-body projecting down about its furnace and supported from beneath by extending its inner shell to a permanent floor or foundation, said 35 water-legs or water-body terminating upon the outside of the boiler by joining the inner and outer shell upon the exterior of the boiler and at a suitable distance above the foundation-bed, substantially as described. 40

2. A marine boiler of that type in which the inner shell projects down to and supports the boiler by resting upon the floor or foundation-bed, said boiler having its water-legs or water-body terminated at a point some distance above 45 said floor or foundation by uniting the inner and outer shell of the boiler by seams or joints located upon the exterior of the boiler, substantially as described.

In testimony whereof I sign this specification 50 in the presence of two witnesses.

FRANK E. KIRBY.

Witnesses:

N. S. WRIGHT,

M. B. O'DOHERTY.