(No Model.)

M. G. NIXON.

STEAM BOILER.

No. 462,325. Patented Nov. 3, 1891.

Fig. 1.

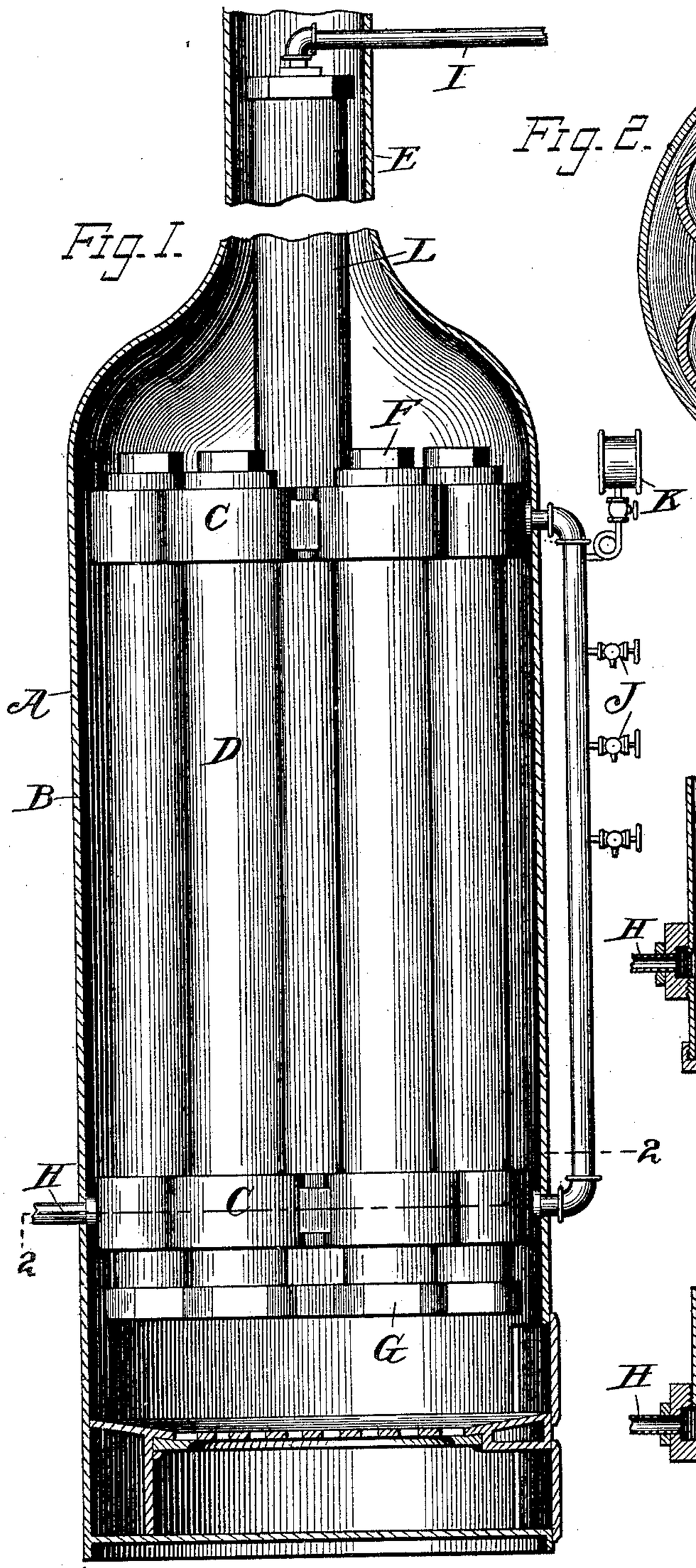

Fig. 2.

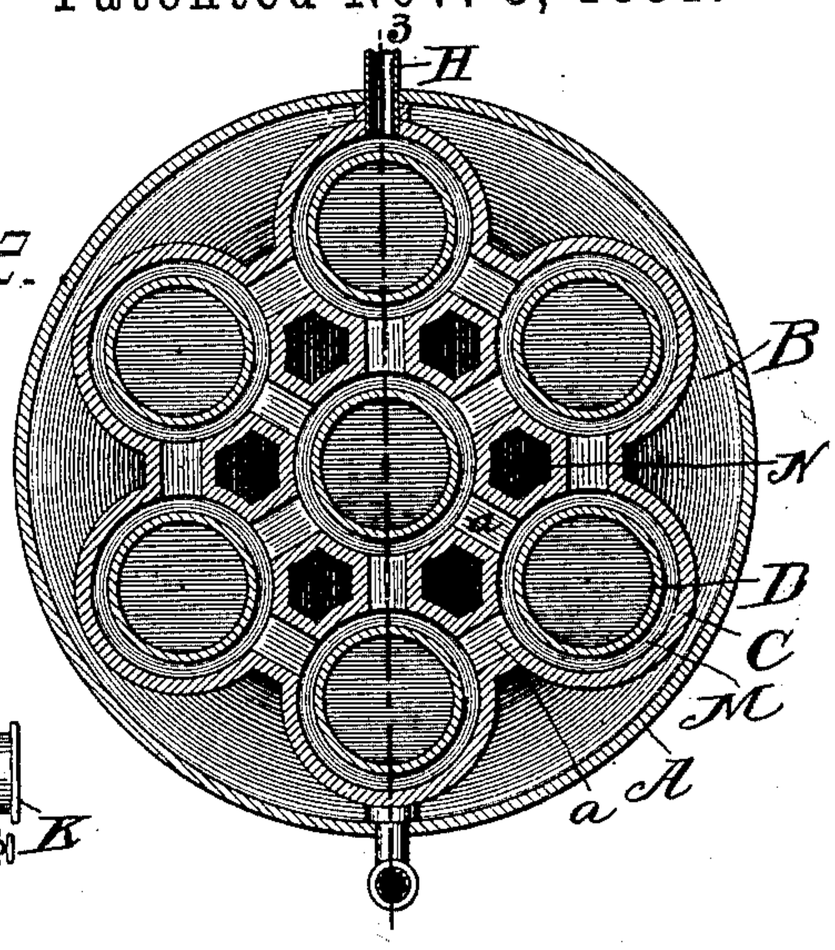

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Fig. 3.

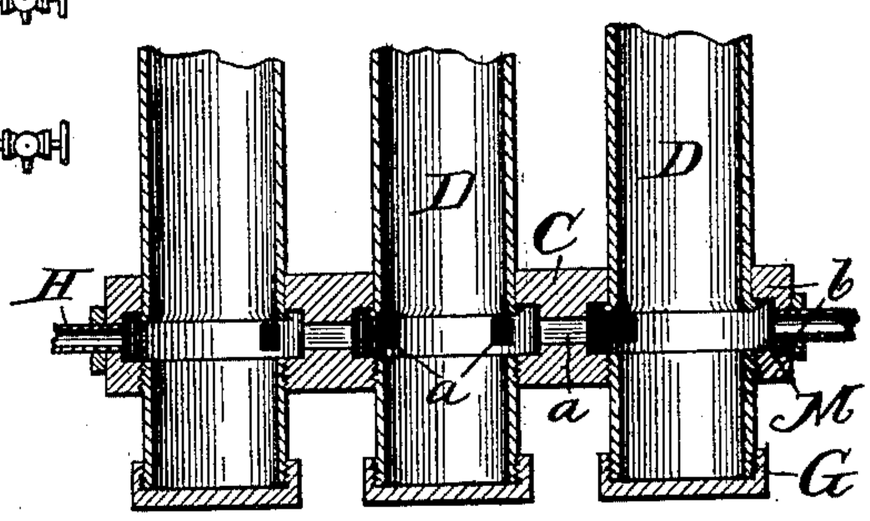
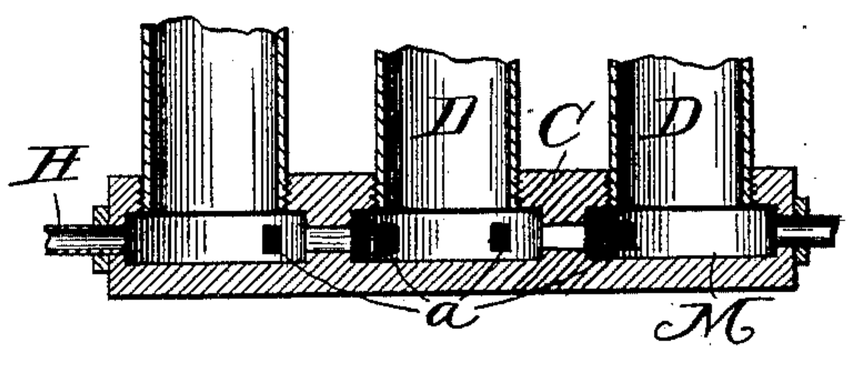


Fig. 4.



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UNITED STATES PATENT OFFICE.

MILES G. NIXON, OF WAUKEGAN, ILLINOIS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 462,325, dated November 3, 1891.

Application filed December 1, 1890. Serial No. 373,195. (No model.)

To all whom it may concern:

Be it known that I, MILES G. NIXON, a citizen of the United States, residing at Waukegan, county of Lake, State of Illinois, have invented a new and useful Improvement in Steam-Boilers, of which the following is a specification.

The object of my invention is to provide a light, compact, and quick-heating boiler of the upright class adapted particularly for marine engines on small launches.

It consists, broadly, of a boiler having two heads of peculiar form for top and bottom connected by vertical water-tubes.

It further consists of details of construction hereinafter more fully described, and particularly pointed out in the claims.

Figure 1 is a side elevation of a furnace provided with my boiler, the outer casing being shown in section. Fig. 2 is a cross-section on lines 2 2, Fig. 1. Fig. 3 is a sectional view on lines 3 3, Fig. 2. Fig. 4 is a sectional view of a modified form.

A represents the casing of the furnace; B, the boiler; C, the boiler-heads; D, the water-tubes; E, the smoke-stack; F, the plugs at the ends of the tubes; G, the drop-tubes extending down into the fire-box; H, the feed-water pipe; I, the steam-pipe; J, the try-cocks; K, the steam-gage, and M the chambers into which the tubes fit. The boiler-heads C, each made, preferably, of a single casting, are composed of a circular group of cylindrical chambers M, which form the sockets for the water-tubes D, which are expanded over the collars *b*. The outer end of the chamber is then closed by screwing a plug F into it at the upper head and by screwing a drop-tube G into the lower head. These drop-tubes may be of any desired length or the outer ones extended down sufficiently to surround the fire-box, thereby adding considerably to the heating-surface of the boiler; but, if preferred, plugs, such as used at the upper head, may be here used; or in place of having these heads cast with the chamber M open at both ends, as above described, they may be extended only part way through, one end being closed, as shown in the modification, Fig. 4. In the latter case it would be necessary to screw the tubes into the head, as the ends would not be accessible for expanding. Passages *a* connect these chambers M with one another in order to give a free circulation through the head. A central tube L is screwed into the upper head and extended up into the smoke-stack, utilizing the waste heat and forming a steam-dome, from which the steam-pipe I leads. The fire passes up freely about the tubes between them and the casing A, and also between them through the spaces N in the heads. This construction results in a rapid and uniform heating-boiler with a good circulation through its members. Its cheapness of construction is also an important feature, the heads being made, preferably, of cast iron or steel are comparatively inexpensive, and the tubes expanded or screwed into them, and the whole put together at slight cost. It is also light and compact and especially adapted for small steam-launches, for which it is particularly designed.

I do not wish to limit myself to the exact construction shown, as the same may be slightly varied without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. The herein-described steam-boiler, consisting of the combination of the two heads C, one at each end, and the water-tubes connecting them, said heads being composed of a group of cylindrical chambers M, open at each end, the inner ends of which form the sockets for the tubes, and the outer ends of which are closed by plugs F or similar device, circulating-passages *a*, connecting the adjoining chambers with one another, and open fire-space N, dividing said chambers from one another, all substantially as shown and described.

2. The herein-described upright steam-boiler, consisting of the combination of the two heads C and the vertical tubes D, connecting the same, said heads being composed of a group of cylindrical chambers M, forming sockets for said tubes, and circulating-passages *a*, connecting the adjoining chambers with one another, and the drop-tubes G, extending down into the fire-box, all substantially as shown and described.

3. The herein-described upright steam-boiler, consisting of the combination of the two water-heads C and the vertical tubes D, connecting the same, said water-heads being

composed of a group of cylindrical chambers M, forming the sockets for said tubes, and circulating-passages *a*, connecting the adjoining chambers with one another, the plugs F, stopping the upper ends of said tubes, and the drop-pipes G the lower ends of the same, all substantially as shown and described.

4. The herein-described steam-boiler head, consisting of the combination of the group of cylindrical chambers M, forming sockets for the tubes, said chambers having the collars *b* at the one end, about which the tubes are expanded, and a thread at the other, into which the plug F or similar device is screwed, and the circulating-passages *a*, connecting the adjoining chambers with one another, all substantially as shown and described.

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