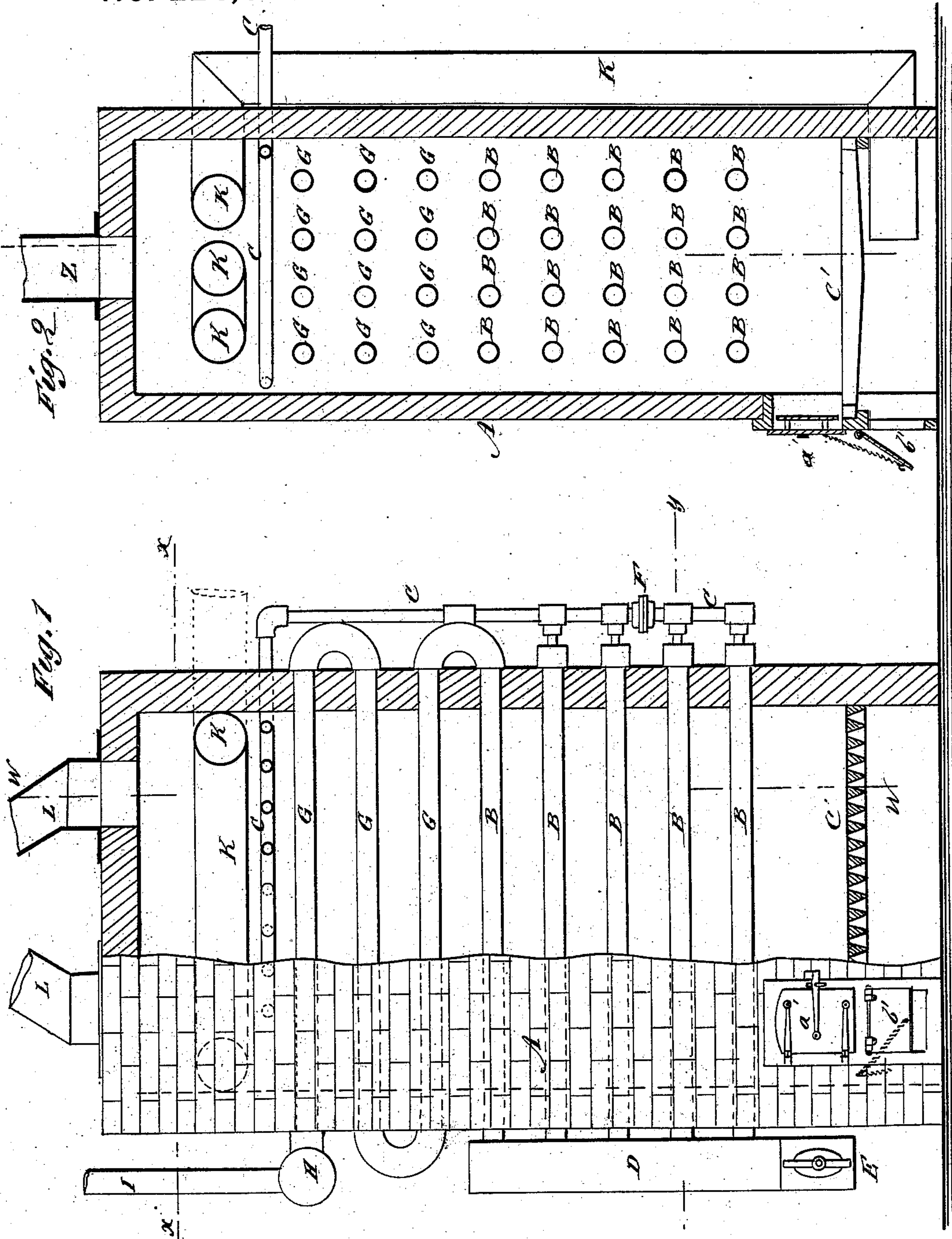


M. W. HAZELTON.
Sectional Boiler.

No. 224,685.

Patented Feb. 17, 1880.



WITNESSES:

C. Neveu
C. Sedgwick

INVENTOR:

M. W. Hazelton

BY

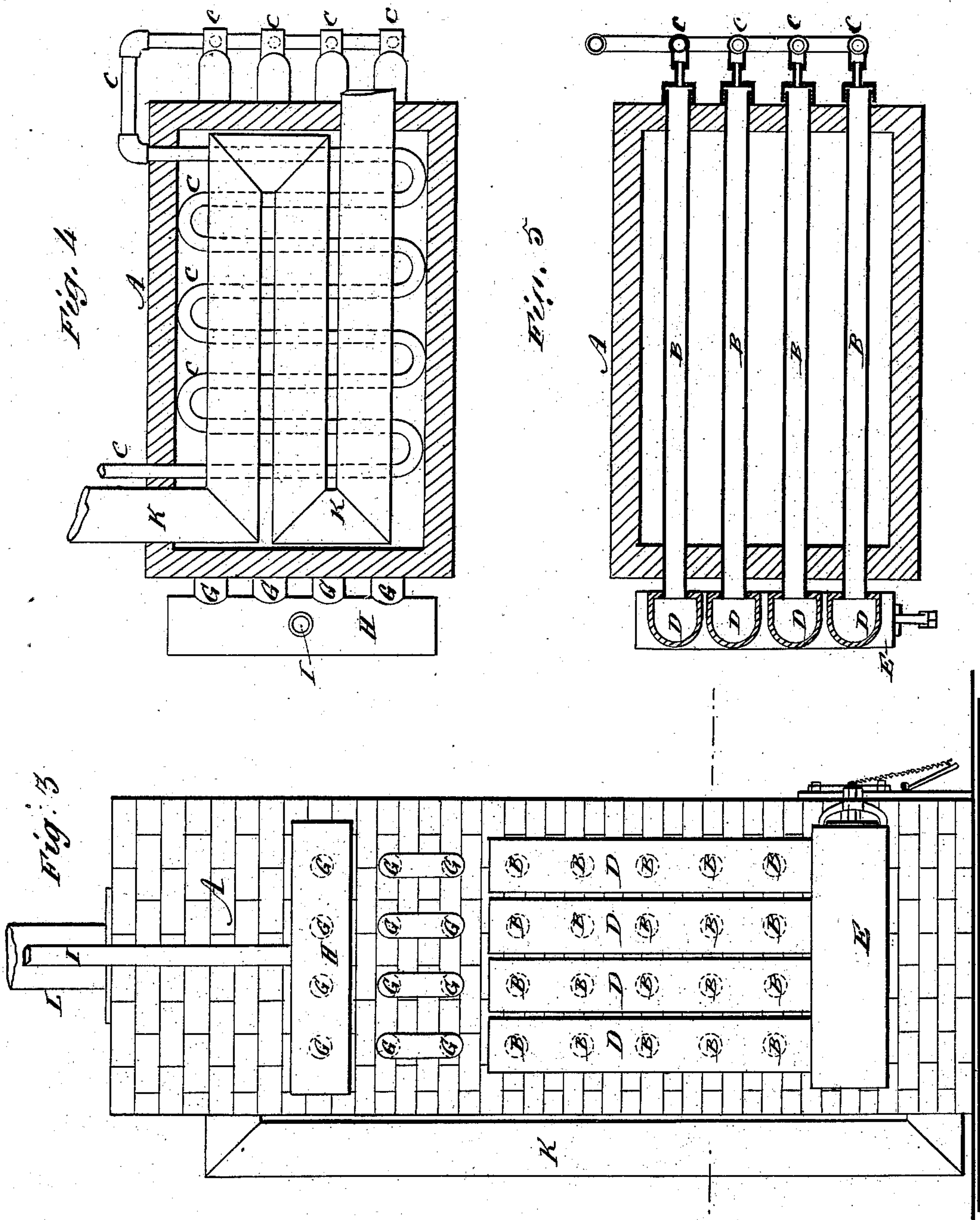
Mum & Co

ATTORNEYS.

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Alvin H. Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

MILTON W. HAZELTON, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF AND
EDWARD S. T. KENNEDY, OF NEW YORK, N. Y.

SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 224,685, dated February 17, 1880.

Application filed August 30, 1879.

To all whom it may concern:

Be it known that I, MILTON W. HAZELTON, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Sectional Boiler, of which the following is a specification.

Figure 1 is a front elevation of the boiler set in brick-work, partly in section. Fig. 2 is a sectional elevation of the same on line W W, Fig. 1. Fig. 3 is a side elevation. Fig. 4 is a horizontal section on line X X, Fig. 1. Fig. 5 is a horizontal section on line y y, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a stationary steam-boiler composed of hot-water, steam, feed-water, and air tubes laid horizontally, in coils or sections, one above another, in the order named, in a brick fire-chamber, and having all the tube couplings and connections outside of the brick-work, so that they may be readily got at for examination or repairs, and having also the steam and mud drums outside of the brick-work; and it further consists in constructing a grate-surface of the full horizontal sectional area of the fire-chamber.

The chief objects of this construction and arrangement are economy in construction, economy in fuel used in running the boiler, safety from explosion, and convenience in repairing.

In the drawings, A represents the rectangular brick fire-chamber, provided with the fire and ash-pit doors *a'* and *b'*, respectively, and with the grate *c'*.

B B are the hot-water tubes, set in the lower part of the fire-chamber A for the generation of steam, all connecting at one end with the feed-water pipes C C, and at the other with the vertical drums D D, which in turn connect with the mud-drum E.

The feed-water tubes C C are provided with check-valves F F, that, while they permit the downward flow of water into the tubes below them, present an efficient obstacle to the return of water or steam that way, and thus they en-

force a constant circulation of water through the lower tubes, and thereby add greatly to the safety and durability of the boiler.

G G are the steam-pipes, which are a continuation of the water-pipes, and are also coiled or laid horizontally, and with outside couplings or connections, and terminating in the steam-drum H, from which steam is taken by the pipe I.

K is the air-pipe, through which air may be forced by a fan or equivalent device into the ash-pit of the boiler. This pipe K occupies a portion of the space within the fire-chamber A above the feed-water pipe C, and the air forced through it absorbs much of the heat from the hot gases that would otherwise be lost in their passage up the smoke-stack L.

It will be seen that by this method of construction a separate heater for the feed-water is dispensed with, and the waste heat of the fire-chamber utilized for this purpose, and that the well-known advantages of applying a heated blast to a boiler-fire can be realized by making use of the otherwise wasted heat, thus, in fact, making one economy generate others.

A further obvious advantage possessed by this boiler over those commonly in use lies in the fact that the whole surface of the boiler, excepting the pipe couplings and connections, is a fire-surface, is exposed to the flames and hot gases, thereby assuring a maximum rate of heat-absorption by the contained water, and, further, that with so large a fire-surface steam can be generated as quickly with a slow and economical combustion of fuel as can be done in ordinary boilers by the most rapid and consequently wasteful rate of combustion.

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

1. The combination of feed-water pipes C C, hot-water pipes B B, vertical drums D D, mud-drum E, check-valves F F, steam-pipe G G, and steam-drum H, constructed and connected with each other substantially as herein shown and described.

2. The air-pipe K, set within a boiler fire-

chamber above the feed-water, steam, and hot-water pipes, for the purposes herein set forth, in combination with pipes B B, C C, and G G, drums D D and E H, and valves F F, substantially as herein shown and described.

5 3. The horizontal hot-water pipes B B and steam-pipes G G, set inside of a fire-chamber, in combination with the vertical drums

D D and mud-drum E, that are set outside of the fire-chamber, substantially as herein shown 10 and described.

MILTON W. HAZELTON.

Witnesses:

I. I. STORER,
C. SEDGWICK.