

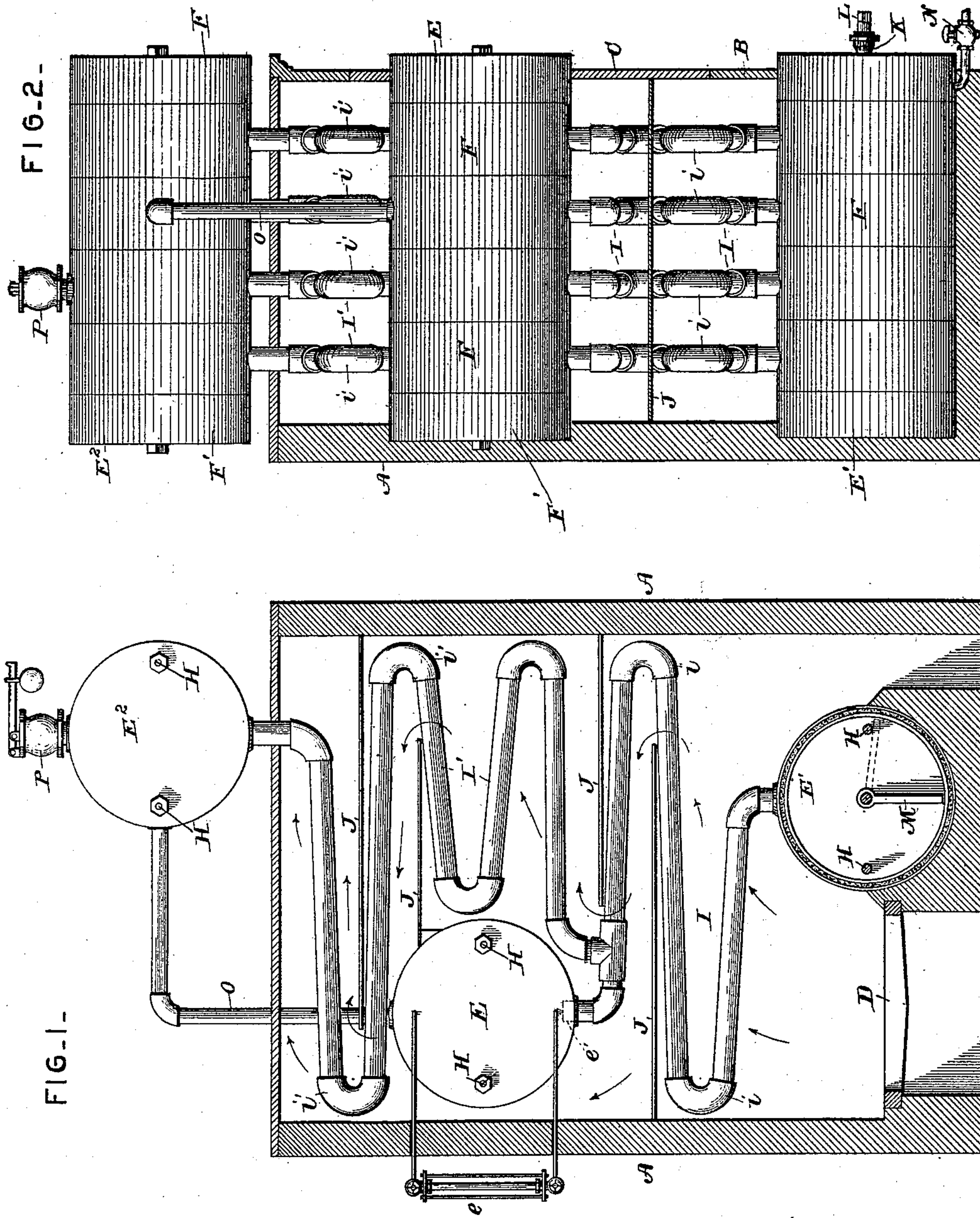
(No Model.)

2 Sheets—Sheet 1.

C. T. McLELLAN.
SECTIONAL STEAM BOILER.

No. 485,556.

Patented Nov. 1, 1892.



Witnesses

Inventor

Jas. H. McCallum
L. P. Wolhaupter

C. T. McEllan

By *his* Attorneys,

Chas. Snow & Co.

(No Model.)

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FIG. 3.

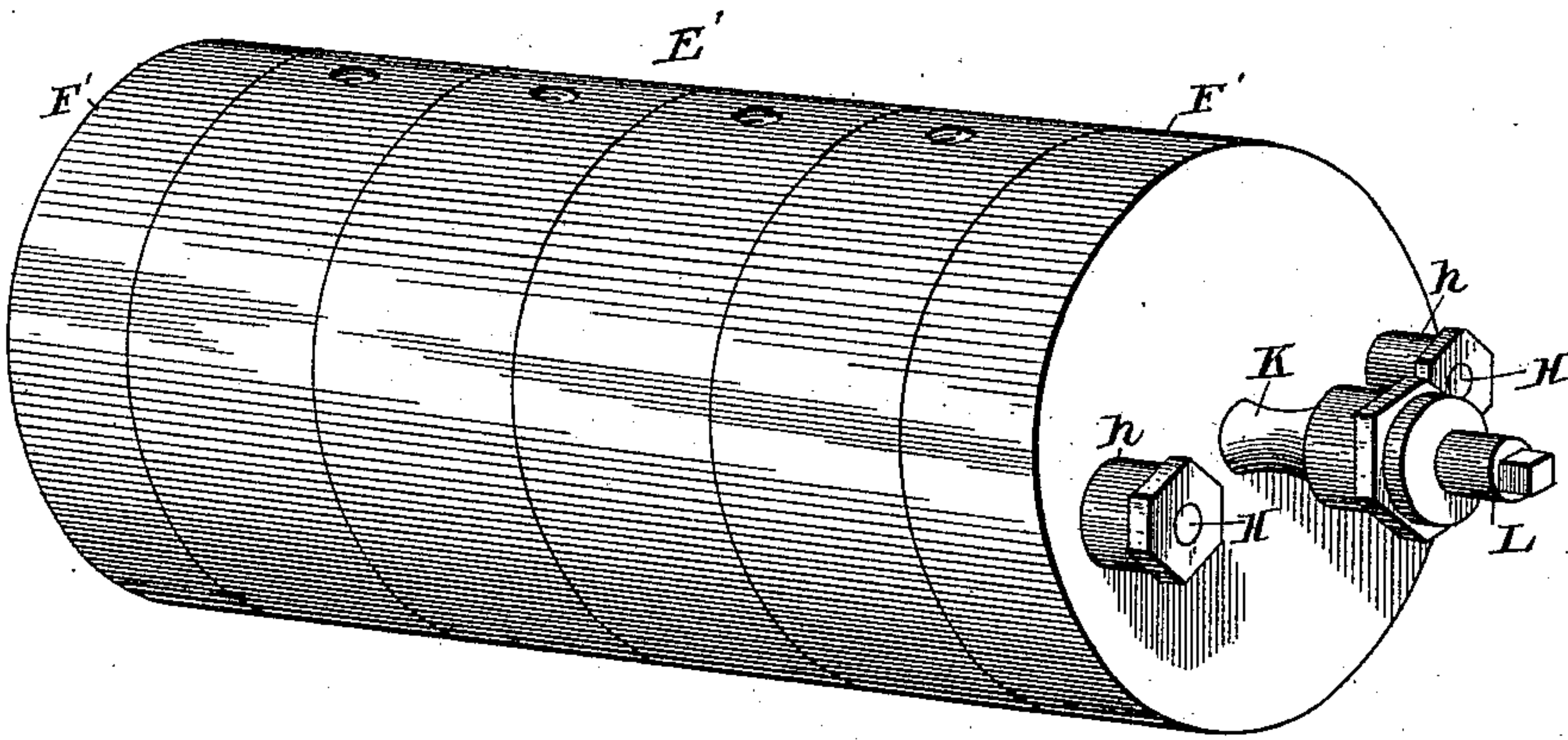


FIG. 4.

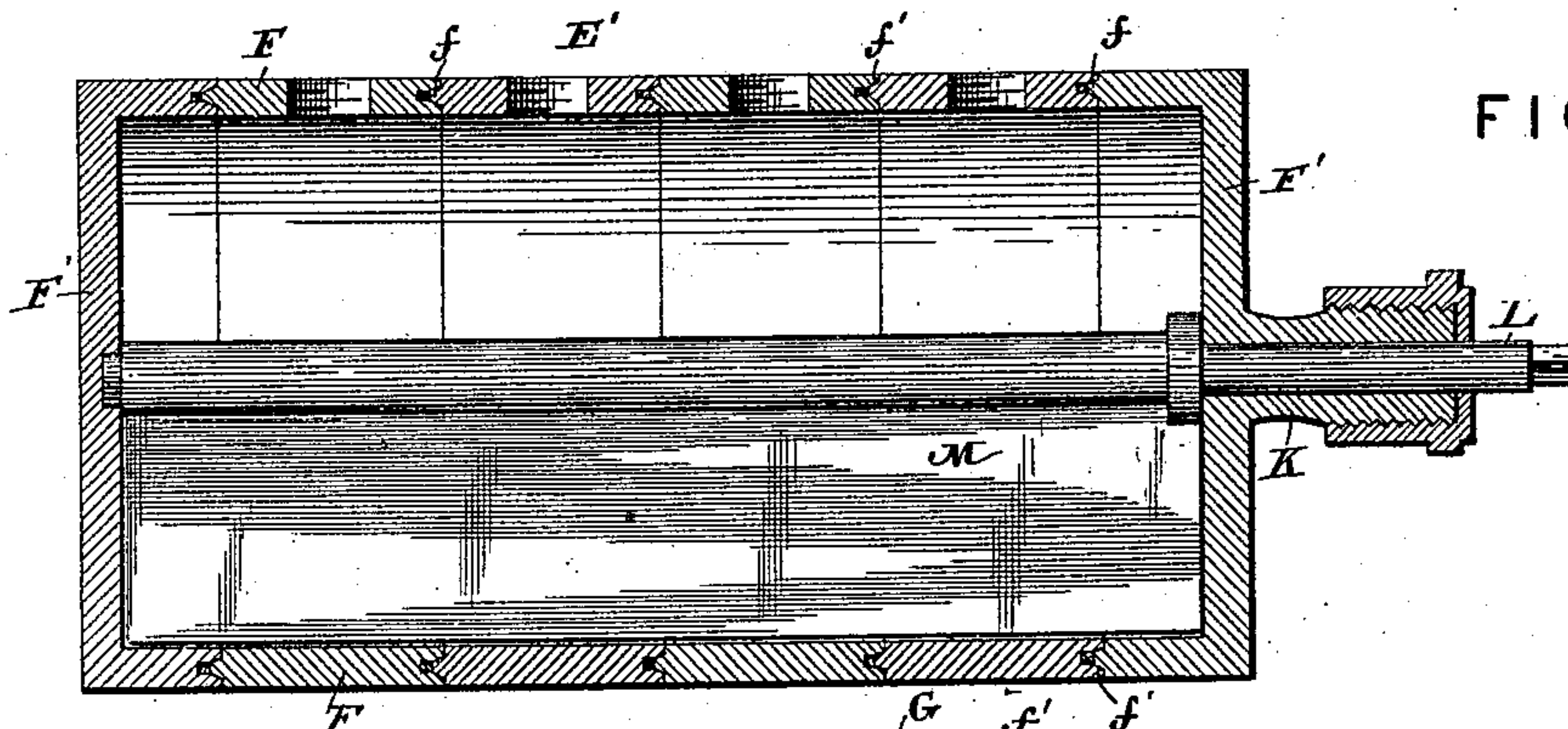
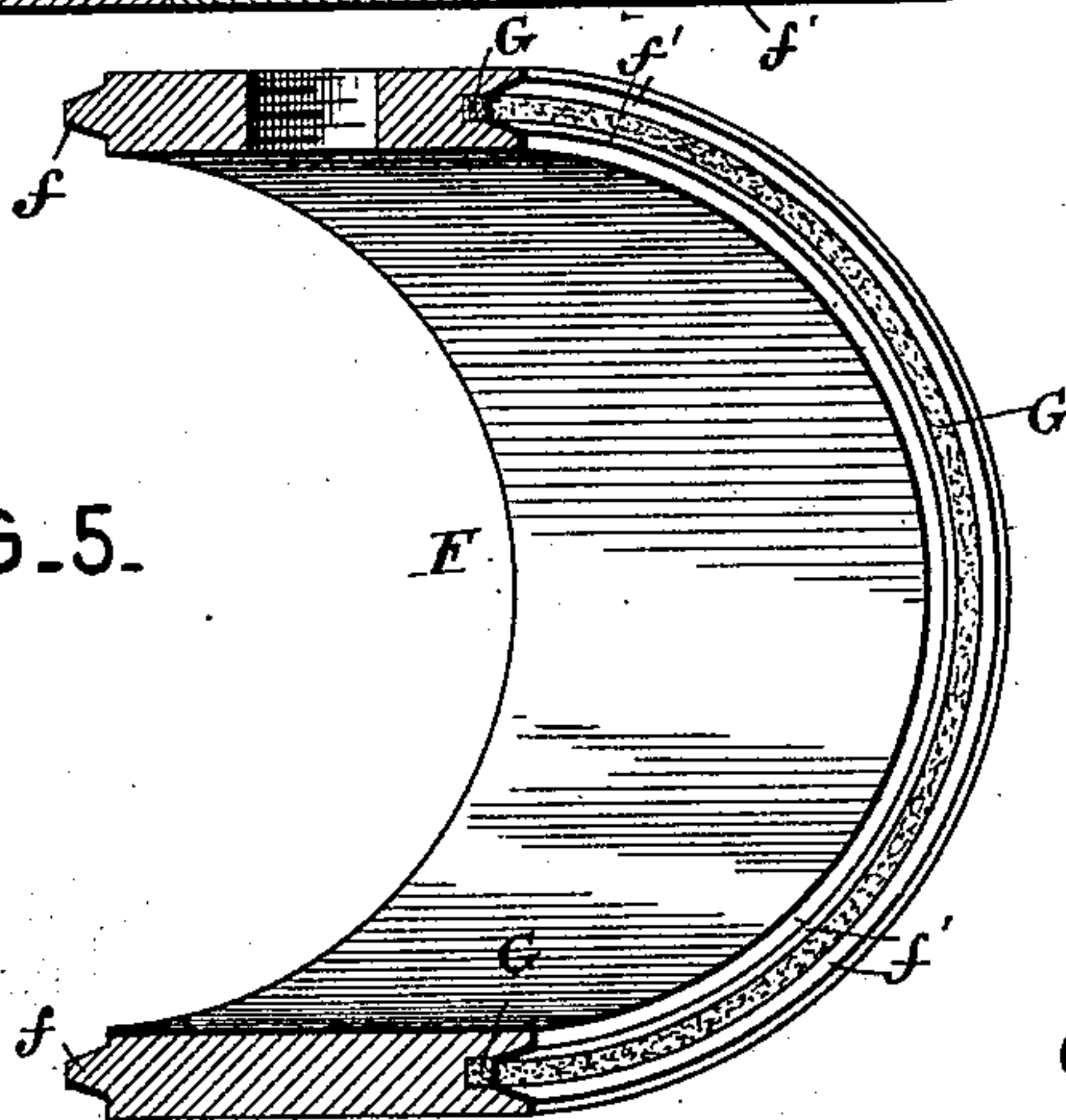


FIG. 5.



Witnesses

*Jas. H. McLathrum
 D. P. Holman*

Inventor

C. T. McLellan

By his Attorneys,

Chas. Snow & Co.

UNITED STATES PATENT OFFICE.

CHARLES T. McLELLAN, OF EASTON, PENNSYLVANIA.

SECTIONAL STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 485,556, dated November 1, 1892.

Application filed May 4, 1892. Serial No. 481,763. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. McLELLAN, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Sectional Steam-Boiler, of which the following is a specification.

This invention relates to steam-boilers; and it has for its object to provide an improved sectional boiler particularly adapted for the rapid generation of steam for heating or engine purposes, while at the same time providing a boiler all the parts of which can be readily taken apart for the purpose of repair or removal and easily set up.

To this end the main and primary object of this invention is to construct a sectional boiler of this type which is easily and cheaply built, while at the same time on account of the particular construction thereof can be arranged in much more compact form than most ordinary boilers to present a greater heating area than usual.

With these and many other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a front elevation of a steam-boiler constructed in accordance with this invention, the front of the casing and one section of the lower mud-drum being removed. Fig. 2 is a vertical sectional view through one side of the furnace, showing the boiler therein in side elevation. Fig. 3 is a detail in perspective of one of the boiler-drums. Fig. 4 is an enlarged vertical sectional view of the mud-drum. Fig. 5 is a detail in perspective, partly in section, of one of the drum-rings.

Referring to the accompanying drawings, A represents the furnace-casing, constructed of suitable material and having the usual cast-iron front B, provided with the usual fire and ash-pit doors, as well as the enlarged cleaning-door C, which provides means for gaining ready access within the furnace for the purpose of cleaning the various parts of the boiler. Within said furnace A and at one side of the same is located the fire-grate D, directly above which and near the top of the furnace

is located the horizontal sectional water-drum E of the boiler, which is designed to be fed with water in the usual manner and carry a sufficient quantity of the same, so as to provide a sufficient head of water in the circulating-pipes to be described, and the amount of water in said drum is indicated by means of an ordinary water-gage *e*, connected with one of the heads thereof. The said sectional water-drum E comprises a series of separate and independent drum-rings F, each of which is provided upon one edge with the projecting beveled tongues *f*, while the opposite edges of the same are indented with the annular grooves *f'*, which receive the tongue of the adjacent ring, between which and the bottom of the groove are interposed asbestos or other fireproof packing-rings G, which not only provide for a perfectly-tight connection between the rings, but also provide a water-tight joint, preventing and leakage from the drum, while at the same time completing a drum serving all the functions of a continuous drum. The end rings F' of the drum are of course headed and receive the opposite parallel clamping-bolts H, passing through the drum and clamping the several rings comprising the same tightly together, and are engaged at one end by the clamping-nuts *h*, which tightly hold the sections of the drum together. Each of the rings comprising the water-drum is provided with a bottom-threaded perforation *e'*, which receives the upper end of one of the lower circulating-coils I. The lower circulating-coils I, connected with each ring of the supported water-drum, are thus more compactly and closely arranged with respect to each other than could be possible where a solid drum was employed, which would necessitate the fittings of the coils to be sufficiently far apart so that the same could be secured in position. The lower coils I are arranged parallel to each other and have the sections comprising the same pass alternately from side to side of the furnace-casing and connected at such sides by the return-bends *i*, which bends are located directly opposite the outer edges of the horizontal draft-plates J. The said draft-plates J project alternately from opposite sides of the furnace-casing and provide a zigzag or sinuous course from the heat from the furnace-grate and around said

circulating-coils, which coils have the sections of piping comprising the same all downwardly inclined toward the lower mud-drum E', to which the same are connected.

5 The lower mud-drum E' is constructed similar in every respect to the water-drum E above and has the lower ends of the lower water-coils I connected with each ring thereof in a similar manner to the upper ends of the
10 coils connected with the water-drum. One of the heads of the mud-drum is additionally provided with the bearing or stuffing box K, which forms a bearing for one end of the scraper or agitator shaft L, mounted within
15 the mud-drum and projecting through said bearing-front K to the front of the furnace, so that the same can be readily controlled. The shaft L carries the scraper or agitator blade M, depending therefrom and extending
20 the full length of the mud-drum, so that as the shaft is oscillated from the front of the furnace the sediment accumulated in the bottom of the drum is stirred up by the agitator or scraper blade M, so that such sediment can
25 be readily blown out through the blow-off cock N, connected with one of the rings of the mud-drum, said scraper or agitator blade being limited to a movement through the lower half of the drum by the opposite clamping-bolts H, passing therethrough, and which
30 form stops for the blade at each opposite side of the drum, as clearly illustrated in dotted lines in the drawings.

Connected with each of the lower coils I, adjacent to their connections with the bottom of the water-drum, are the upper parallel water-coils I', constructed in a similar manner to the lower coils, passing from side to side of the casing, and connected at their
40 ends by the return-bends i', and also having the sections of piping comprising the same inclined downwardly toward the lower mud-drum, so that the rapid circulation, necessarily caused by the heat passing directly
45 through the circulating-pipes, will cause the sediment to rapidly run to the lower mud-drum, from which it may be blown off from time to time. The upper ends of the upper coils I' are connected to the bottom of the several rings comprising the upper steam-drum
50 E², similarly constructed in every respect to the water-drum E. Draft-plates J are arranged alternately from each side of the casing and the intermediate water-drum E, between the upper coils, to provide a continuous zigzag for the heat, so that the same is fully utilized before passing out through the chimney, and said plates can be removed, if
55 desired, through the front cleaning-door of the furnace for the purpose of cleaning the coils when desired. A steam-pipe O is connected to the top of the intermediate drum E and one side of the upper steam-drum to provide for the escape of the steam generated in
60 the water-drum to the upper steam-drum, from which the same may be led to the point of use, and the latter is provided with any ordi-

nary safety-valve P, which relieves the drum from undue pressure. Now it will be seen that owing to the sectional construction of
70 of the several drums comprising the boiler the circulating-coils of the boiler are carried by the corresponding rings of each drum and according to the width of said rings may be arranged as close together as may be de-
75 sired, owing to the fact that the fittings of each coil may be connected together and with the corresponding rings of each drum before the drums have been placed together, and thus provide for securing a more compact,
80 easily-handled, and constructed boiler than those ordinarily used.

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

85 1. In a steam-boiler, the furnace-casing, an intermediate sectional water-drum within said casing, an upper and lower sectional steam and mud drum above and below said water-drum, respectively, and out of line
90 therewith and each other, and continuous water-coils connecting said steam and mud drums at the upper and lower ends thereof and intermediately connected to the water-drum, substantially as set forth.

95 2. In a steam-boiler, an intermediate sectional water-drum, a sectional steam and a mud drum arranged above and below said intermediate water-drum, respectively, and parallel water-coils connected with each corresponding section of said drums, substantially as set forth.

100 3. In a steam-boiler, the furnace-casing having the fire-grate at one side, a sectional water-drum arranged above said grate within the casing, a lower sectional mud-drum arranged at one side of the fire-grate and out of line with the water-drum, lower parallel water-coils connected with each section of the water and mud drums, a sectional steam-drum
105 supported above the furnace and said water-drum and connected with the latter, and upper parallel water-coils connected with said lower water-coils and each section of the upper steam-drum, substantially as set forth.

110 4. In a steam-boiler, the furnace-casing, a sectional water-drum supported within said casing, the lower sectional mud-drum out of line with and below the water-drum, lower parallel water-coils connected with each section of the water and mud drums and inclining from side to side of the furnace-casing to the latter drum, a sectional steam-drum supported above the furnace-casing, a steam-pipe connected to said water-drum and said steam-drum, an upper parallel series of water-coils
115 similarly inclined and disposed as said lower water-coils and connected therewith and each section of the upper steam-drum, and draft-plates arranged horizontally within the furnace-casing and extending alternately from opposite sides thereof between the water-coils, substantially as set forth.

120 5. In a steam-boiler, an intermediate sec-

tional water-drum, a sectional steam and mud drum arranged above and below said intermediate water-drum, respectively, each sectional drum comprising a series of separate
5 and independent drum-rings having annular beveled tongues at one edge and opposite annular grooves in the other edge, which receive the tongue of the adjacent ring, asbestos or other fireproof packing placed in each groove,
10 opposite parallel clamping-bolts passing from the opposite heads of each drum through opposite sides of the same to clamp the several ring-sections together, parallel water-coils connecting the corresponding rings of each
15 drum, and an agitator-shaft mounted hori-

zontally within the lower mud-drum and having a swinging agitator-blade extending the entire length of the drum and adapted to be limited to a movement through the lower half of the drum by the opposite clamping-bolts 20 therein, with which said blade contacts at the limit of its movement in either direction, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 25 the presence of two witnesses.

CHARLES T. McLELLAN.

Witnesses:

HOWARD M. BELL,
WILLIAM FEASTER.