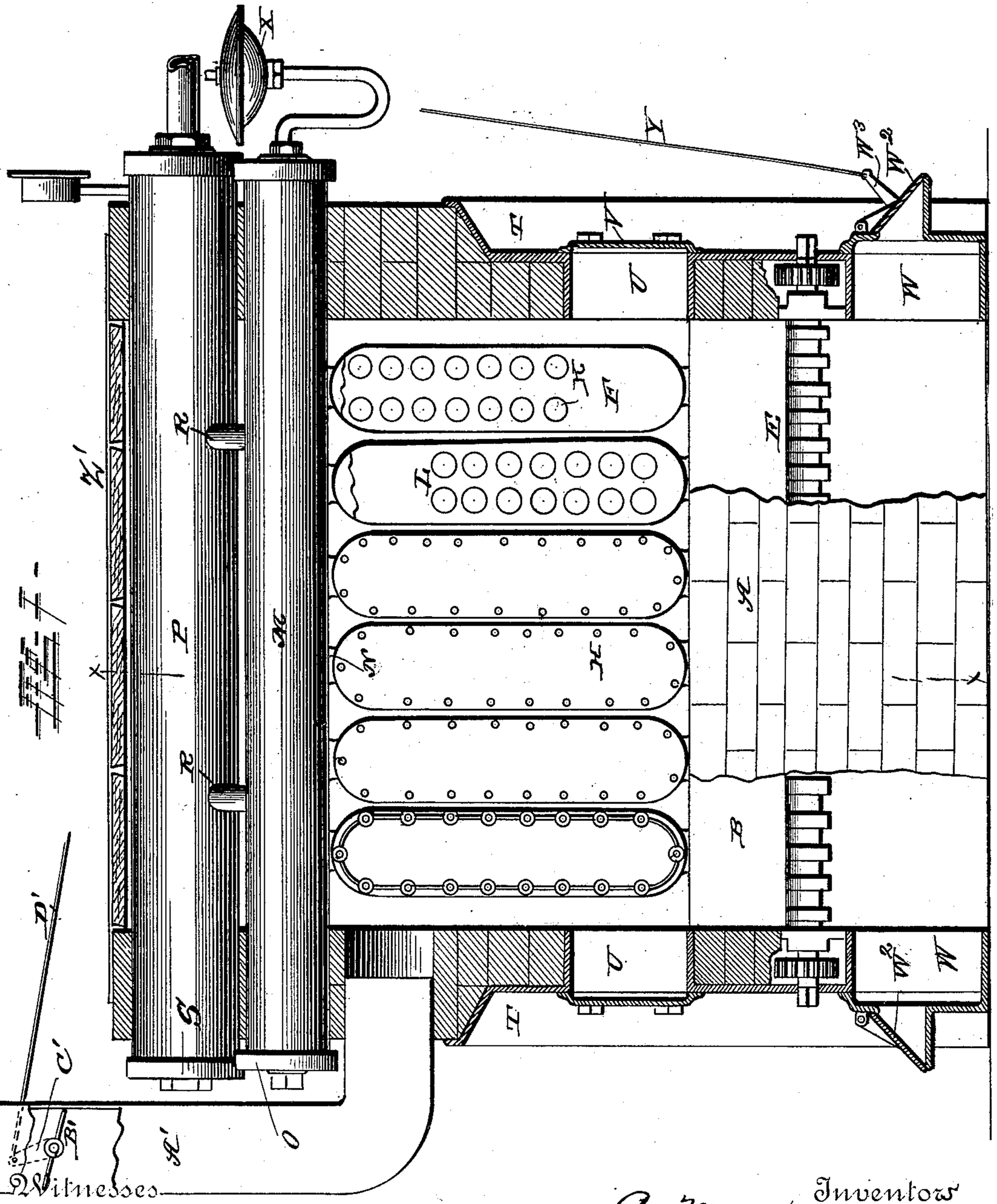
(No Model.) 2 Sheets—Sheet 1.

A. M. DIMMICK & E. Z. SMITH.

SECTIONAL STEAM BOILER.

No. 376,371. Patented Jan. 10, 1888.



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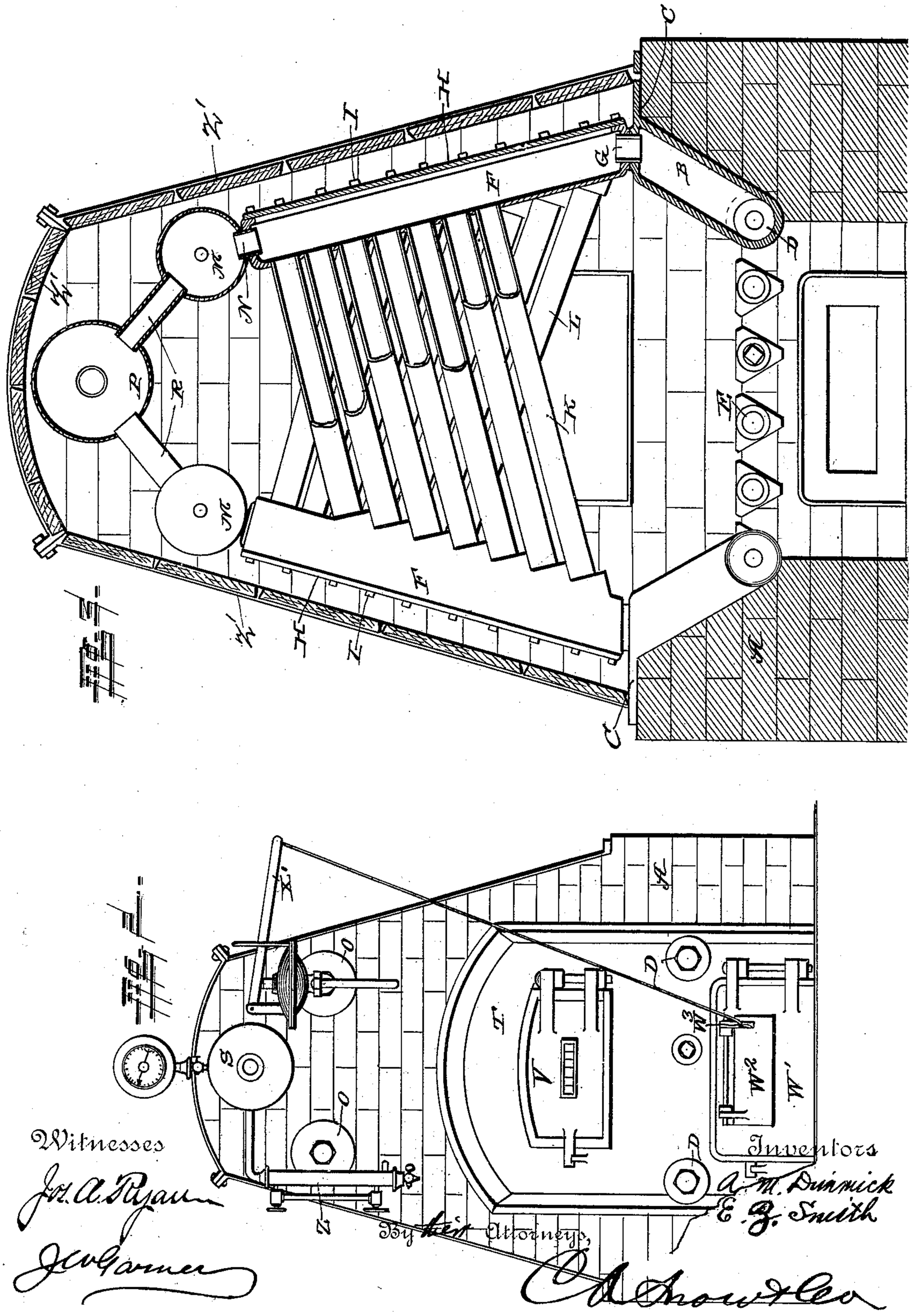

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UNITED STATES PATENT OFFICE.

ALBERT MELLVILLE DIMMICK AND ELMER Z. SMITH, OF WILKES-BARRÉ, PENNSYLVANIA.

SECTIONAL STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 376,371, dated January 10, 1888.

Application filed April 6, 1887. Serial No. 233,922. (No model.)

To all whom it may concern:

Be it known that we, ALBERT MELLVILLE DIMMICK and ELMER Z. SMITH, citizens of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented new and useful Improvements in Sectional Steam-Boilers, of which the following is a specification.

Our invention relates to an improvement in sectional steam-boilers; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularty pointed out in the claims.

In the drawings, Figure 1 is partly an elevetion and partly a vertical longitudinal sectional view of a sectional steam-boiler embodying our improvements. Fig. 2 is an end elevation of the same. Fig. 3 is a vertical transverse sectional view taken on the line *x x* of Fig. 1.

A represents the setting, which is made of brick-work and forms the support for the boiler and the sides of the combustion-chamber and ash-pit of the furnace. The side walls of the setting have their upper portions on their opposing inner sides flared or inclined outwardly, as shown in Fig. 3.

B represents a pair of mud-drums which extend the whole length of the boiler and bear against the inclined portions of the side walls of the setting. Each drum is provided at its upper side with an outwardly-extending lateral flange plate, C, which bears upon the upper side of the brick wall. It will be observed by referring to Fig. 3 that the mud-drums are supported in an inclined position, and that the said mud-drums form the sides for the combustion-chamber. The lower sides of the drums are semi-cylindrical in shape and are provided at their ends with openings having caps D. The said caps project beyond the ends of the boiler and are screwed to the ends of the mud-drums, and are thereby made detachable therefrom.

The grate of the combustion-chamber is composed of a series of parallel grate-bars, E. The furnace is provided with a combustion-chamber at each end, and each combustion-chamber has grate-bars E. By forming a combustion-chamber at each end of the furnace steam can be more readily kept up in the boiler by feeding the fires alternately with fresh coal, thus keeping one fire blazing while the other has fresh coal put upon it.

F represents the series of headers of the boiler, which are equal in length to the mud-drums and are secured upon the upper sides of the latter and communicate therewith through openings G. These headers are inclined toward each other, each being arranged at an angle opposite that in which its supporting mud-drum is secured. The outer sides of the headers are formed of plates H, which are detachable and are secured in position by means of bolts I. By removing the said bolts the plates H may be taken from the outer sides of the headers, and thereby access may be obtained to the interiors thereof.

K and L represent two series of tubes which connect the headers together, the said series of tubes being inclined in opposite directions.

M represents a pair of water-drums, one of which is secured on the upper side of each series of headers. These water-drums communicate with the upper ends of the headers through openings N, and the ends of the water-drums project beyond the front and rear walls of the setting and are provided with removable screw-caps O, which permit access to be obtained to the interiors of the water-drums.

P represents a steam-drum which is similar in construction to the water-drums, but is larger in diameter than they, and is arranged above the water-drums and in a vertical line midway between them. Short inclined pipes R connect the water-drums to the steam-drum, and the ends of the latter project through the front and rear walls of the setting and are provided with removable screw-caps S.

T represents a metallic plate which is secured to the front end of the frame. The said plate has an opening, U, through which fuel may be placed upon the fire, and a hinged door, V, for the said opening. In the lower side of the plate is an opening, W, which communicates with the ash-pit. This opening is covered by a hinged door, W′, which has a hinged draft-regulating door, W^2, that is provided with an outwardly-extending arm, W^3.

X represents a safety-valve which is attached to the front end of one of the water-drums. The lever X′ of the said safety-valve is connected to the arm W³ of the draft-regulator W² by means of a rod, Y.

Z represents a water-gage of usual construction, which is arranged on the front side of the boiler. The lower end of this water-gage communicates with one of the water-drums, and the upper end of the gage communicates with the steam-drum, as shown at Fig. 2.

A′ represents a smoke-pipe which communicates with the rear end of the furnace. In this smoke-pipe is pivoted a damper, B′, the shaft or axis of which, at one end, is provided with an arm, C′.

D′ represents a rod which is attached to the arm C′ and extends through and is connected with the lever-arm X′ of the safety-valve. By means of this construction the draft-regulator and the damper will be closed when the steam-pressure is so great as to raise the lever-arm X′ of the safety-valve, thus regulating the draft automatically.

Z′ represents a shell which forms the sides and top of the boiler-case and connects the end walls of the setting, and has its lower edges resting upon the lateral flange-plates C of the mud-drums.

From the foregoing description it will be readily understood that by inclining the headers toward each other and connecting them together by means of the series of tubes K and L, arranged in different inclinations, a constant circulation of water will be maintained throughout all parts of the boiler. Mud and sediment in the water enters the mud-drums and settles therein, and the latter may be cleared out from time to time, when necessary, by removing the caps D.

Particular stress is laid on the great freedom of circulation of water in our improved boiler. The entire boiler forms a heating-surface, owing to the reversed pitch of the water-tubes.

Having thus described our invention, we claim—

1. In a sectional steam-boiler, the combination of the mud-drums forming the sides of the combustion-chamber, the series of headers attached to the upper sides of the mud-drums and communicating therewith, the said headers being inclined toward each other, the oppositely-inclined series of tubes K and L, connecting the headers together, the water-drums arranged above the headers and communicating therewith, and the steam-drum connected to and communicating with the water-drums, substantially as described.

2. In a sectional steam-boiler, the combination of the mud-drums B, forming the sides of the combustion-chamber, the series of headers F, attached to the drums and communicating therewith, and the oppositely-inclined series of tubes K L, connecting the headers, said tubes being arranged at different heights, as set forth.

3. In a sectional steam-boiler, the combination of the side walls of the setting, the oppositely-inclined mud-drums B, forming the sides of the combustion-chamber and having the laterally-projecting plates C at their upper sides bearing on the side walls of the setting, and the case Z′, having its lower edges bearing on the plates C, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

ALBERT MELLVILLE DIMMICK.
ELMER Z SMITH.

Witnesses:
E. W. KEITHTURE,
W. S. PARSONS.