

(No Model.)

T. POORE.

FIRE BOX FOR BOILERS.

No. 335,715.

Patented Feb. 9, 1886.

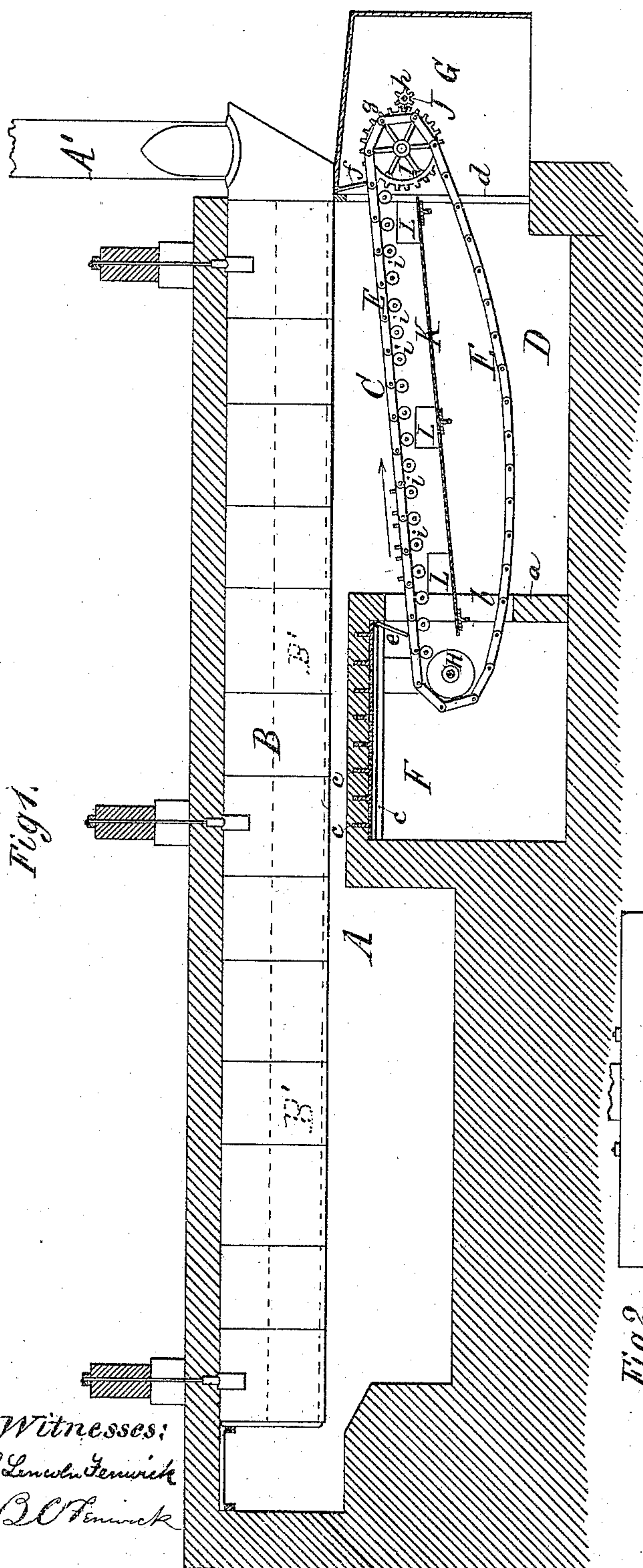


Fig 1.

Witnesses:
 R Lincoln Fenwick
 B O Fenwick

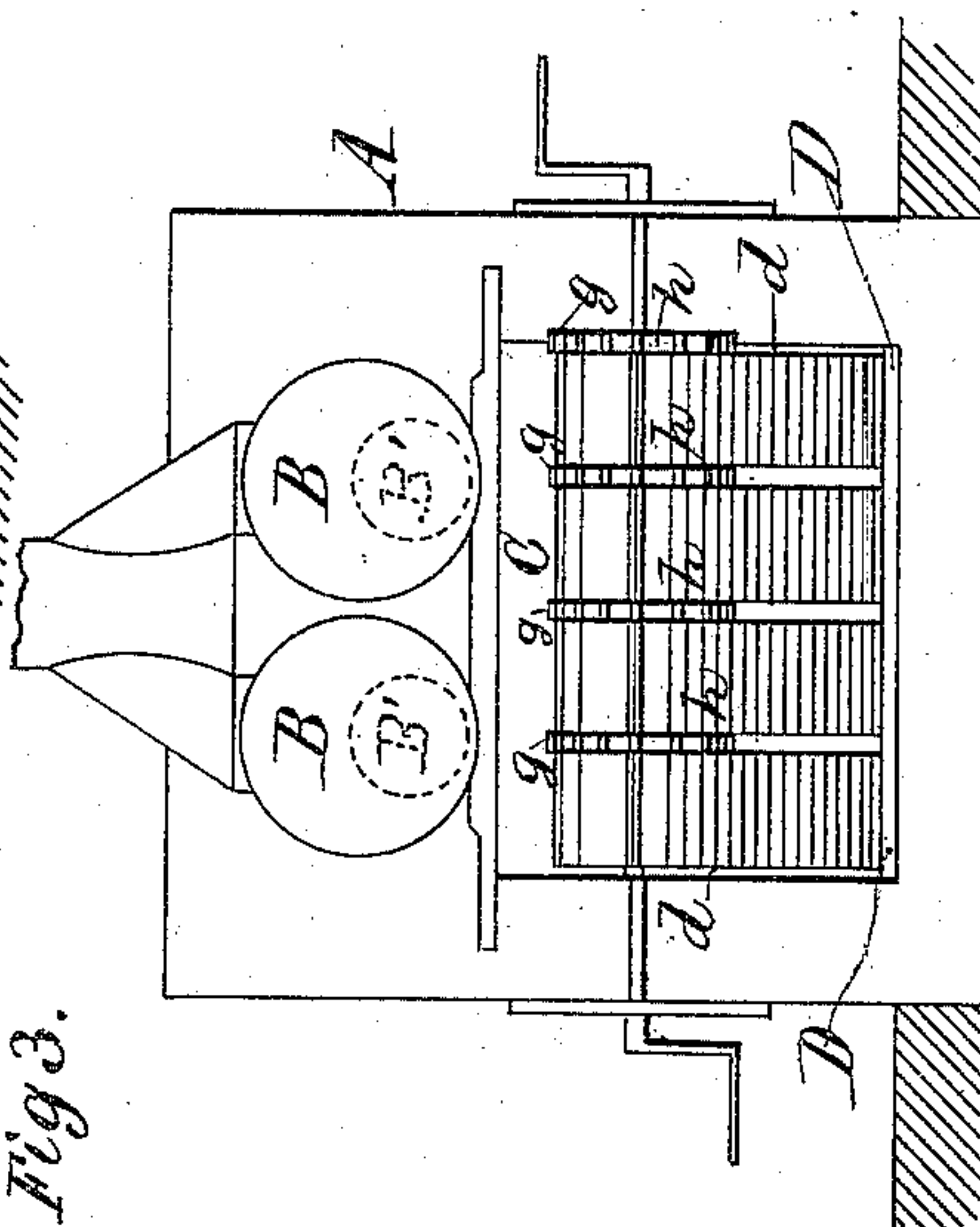


Fig. 3.

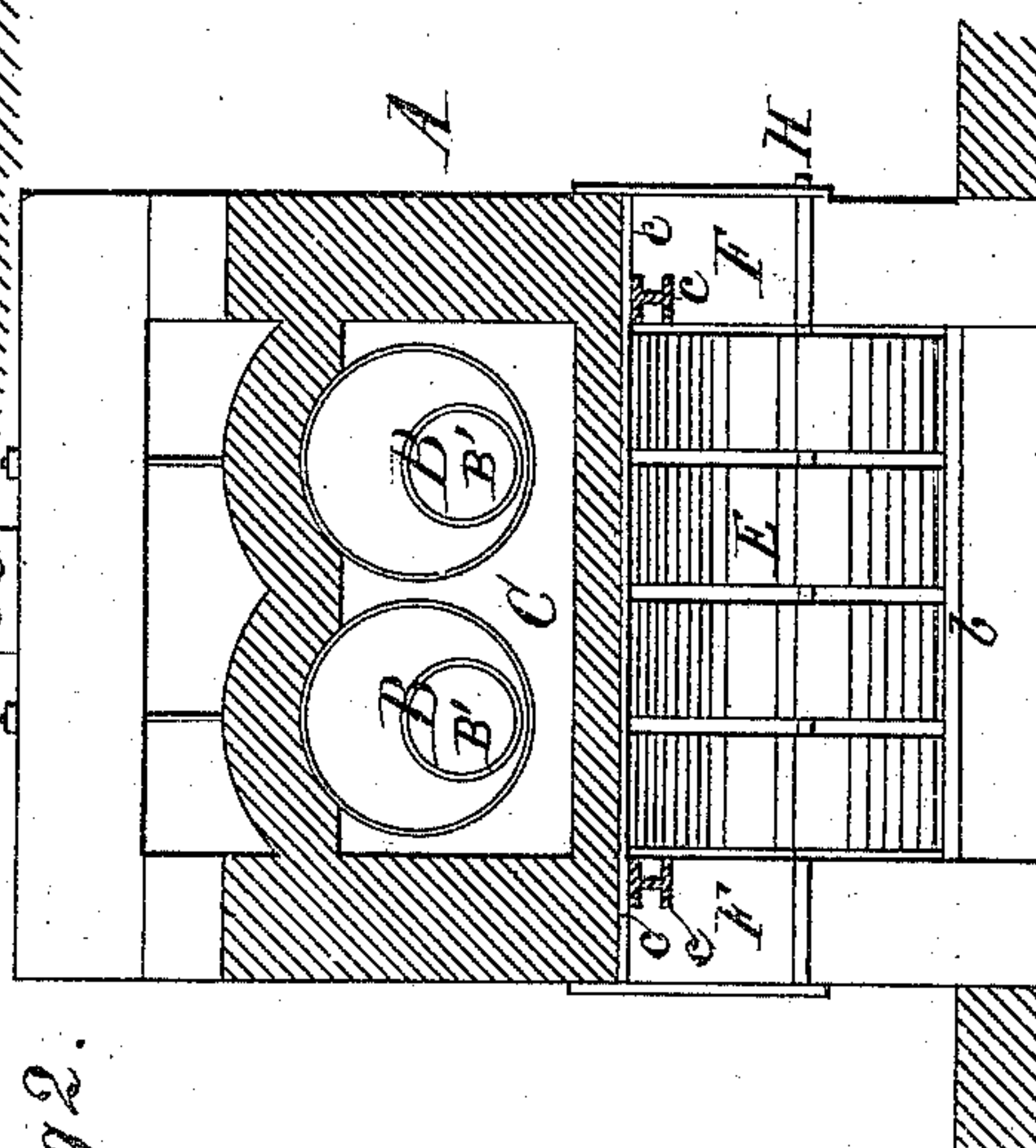


Fig 2.

Inventor:
Townsend Poore
by his Atty,
Fenwick and Lawrence.

UNITED STATES PATENT OFFICE.

TOWNSEND POORE, OF SCRANTON, PENNSYLVANIA.

FIRE-BOX FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 335,715, dated February 9, 1886.

Application filed April 15, 1885. Serial No. 162,320. (No model.)

To all whom it may concern:

Be it known that I, TOWNSEND POORE, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and useful Improvement in Combined Fire-Box and Endless-Chain Grate for Boiler and other Furnaces, of which the following is a specification.

My invention consists, first, in a fire-box having a feed archway or channel beneath the boilers extending from side to side of the furnace-wall in rear of the ash-pit chamber and in communication therewith; second, in an endless grate supported at its feed end in said archway or channel, passed through the ash-pit chamber, and suitably supported and driven at its discharging end near the front of the said chamber; third, in an endless-chain grate constructed and arranged to move in a direction toward the front of the fire-box; and, fourth, in the combination of the several parts, as will be hereinafter described and claimed.

My invention is designed especially for burning culm or anthracite dust, and it is found that this object can be more effectually accomplished by feeding the fuel upon the grate at the rear of the ash-pit chamber and moving it toward the front of the same in a direction the reverse of the draft of the furnace, and when the grate is thus arranged the archway affords great convenience for the dumping of the fuel in the proper position for handling when the fires require replenishment, while by having the ashes discharged at the front of the fire-box into a chute every facility for ready handling and removal by barrows or carts is secured.

In the drawings, Figure 1 is a longitudinal section of a boiler and furnace or fire-box with my invention; Fig. 2, a vertical cross-section of the same, and Fig. 3 a front view.

A is a boiler-furnace comprising a steam-boiler, B, a fire-chamber, C, and an ash-pit, D. The products of combustion under this construction will pass from the fire-chamber beneath the boiler to the rear of the boiler or boilers and be drawn through a return flue or flues, B', of the boiler or boilers to the front of the furnace by the draft of the stack or chimney A', which is at the front of the fur-

nace, and all communication with the stack or chimney cut off during the general operation of the furnace, except through the flue or flues of the boiler or boilers.

The fire-bridge wall *a* is formed with a passage, *b*, of a width and height suitable for the travel through it of an endless-chain grate, E, and in rear of this fire-bridge wall an archway or channel, F, is constructed extending from side to side of furnace-wall and affording entrance back of the bridge-wall *a* on either side of the furnace. The top or upper exposed portion of this archway is formed of fire-brick and united with the furnace-foundation and the fire-bridge wall in the manner shown, or in any other suitable manner, and is strengthened and sustained by iron girders *c*, or otherwise properly, as shown.

At the front of the ash-pit chamber a brick extension is made for supporting the shafts of the endless-chain grate, and for forming an ash-chute, G, and in the front wall of the ash-pit chamber an opening, *d*, of a width and height suitable for the travel of the endless-chain grate E is formed, as shown, and pendant from the wall of the archway and wall of the ash-chute are two pivoted self opening and closing doors or plates, *e f*, as shown. The grate E may be a single broad-surfaced endless chain, or it may be composed of a series of endless chains moving independently of one another and together, as may be found most desirable. This endless-chain grate, if a single chain, is supported at its feeding end by a plain drum, H, and at its discharging end by a driving-spider, I, and the shaft of this spider may be extended enough beyond the end of the spider and the outer side of the ash-chute to receive a crank-handle for revolving the spider, and thereby moving the endless chain in the direction of the arrow. The links of the chain may be provided with ribs on their upper surfaces, and also suitably notched or shaped on their under surfaces to insure the wings of the spider taking a firm hold upon them and causing the chain to move, as set forth in my application No. 162,319, filed April 15, 1885, now pending before the United States Patent Office. If the grate is formed of several endless chains, so as to move longitudinally independently of one another, and together, when desired, the spider and plain

drum will be made in sections and provided with toothed wheels *g*, and into the wheels *g* sliding shifting pinions *h* on a square or other suitable shaped shaft, *J*, provided with crank-
 5 handles, will gear, so as to move either all of the sections together, or any one or any number of them, as circumstances may require, in the same manner as set forth in my aforesaid pending application No. 162,319, filed April
 10 15, 1885. In either form of the endless grate that portion which supports the fuel will rest upon either rollers *i*, as shown, or upon longitudinal flat-surfaced bars, applied and sustained by cross-girders let into the furnace-
 15 walls, as set forth in my aforesaid pending application. Beneath the upper part of the endless chain a platform or screen, *K*, supported by cross-girders, is applied, so that ashes and live coals may be caught and prevented from falling upon workmen who may
 20 be in the ash-pit chamber repairing the under portion of the endless chain; and just above the platform *K*, in the side of the furnace, doors are provided for admission of
 25 air and also implements for cleaning ashes from the platform. The pivoted doors or plates *e f* serve for keeping closed the spaces provided above the grate as the grate with ignited fuel upon it travels in the direction of
 30 the arrow. The draft of the furnace is directly opposite to that indicated by the arrow, and hence the new or fresh fuel passing in the direction of the arrow is subjected to the flame drawn by the draft from a bed of red-hot fuel
 35 forward of the new or fresh fuel, and a very rapid ignition of the new fuel is insured, and this result is increased by setting the grate so that the fuel will be moved on an upward-incline plane, as shown. The fuel to be supplied
 40 to the furnace is dumped into the archway of the grate, and as the grate is slowly revolved by the spider and additional fuel fed upon it the fuel first fed upon the grate is carried along
 45 until it arrives at the front wall of the fire-chamber. When the grate is fully charged with fuel and the fire well going, the feed is stopped until the portion of the fire nearest the front and middle of the grate is reduced to
 50 ashes. Then the grate is moved so as to discharge the consumed products into the ash-

chute, and simultaneously therewith fuel is fed upon the grate as in the first instance until a proper quantity of the spent products is discharged and of new fuel is supplied. By this
 55 mode the fires are kept going without raking, an operation which tends to deaden and put out culm fires, and if necessary the side draft-doors are opened to any extent desired for the admission of air, and at periods these doors
 60 are opened and implements are inserted for the purpose of removing ashes and other matters from the platform or screen.

While I have set forth that I contemplate using a series of endless chains forming a grate
 65 and moving separately and together, I do not claim under this application such series of endless chains forming a grate and moved separately and together, as that is claimed under my pending application, No. 162,319, filed
 70 April 15, 1885; nor do I intend to claim under this application anything claimed in said application.

What I claim as my invention, and desire to secure by Letters Patent, is—
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1. A furnace provided with a feed archway or channel beneath the boilers from side to side of the furnace-wall, in rear of the ash-pit chamber and in communication with said
 80 chamber, substantially as described.

2. An endless-chain grate supported at its feed end in a feed archway or channel, passed through the ash-pit chamber, and supported and driven at its discharging end near the front
 85 of said chamber, substantially as described.

3. The combination, with a fire-box having a feed-archway in rear of its ash-pit chamber, of an endless-chain grate moving toward the front of the fire-box, an ash platform and screen,
 90 *K*, and side doors, *I I*, for admission of draft and cleaning implements, substantially as described.

4. The combination of the endless-chain grate moving against the draft of the fire-box, the fire-chamber provided with the pivoted
 95 doors or plates *e f*, and the feed archway or channel, substantially as described.

TOWNSEND POORE.

Witnesses:

JOHN F. SNYDER,
 HENRY JIFKINS.