

(No Model.)

T. POORE.

BOILER.

No. 336,431.

Patented Feb. 16, 1886.

Fig 1.

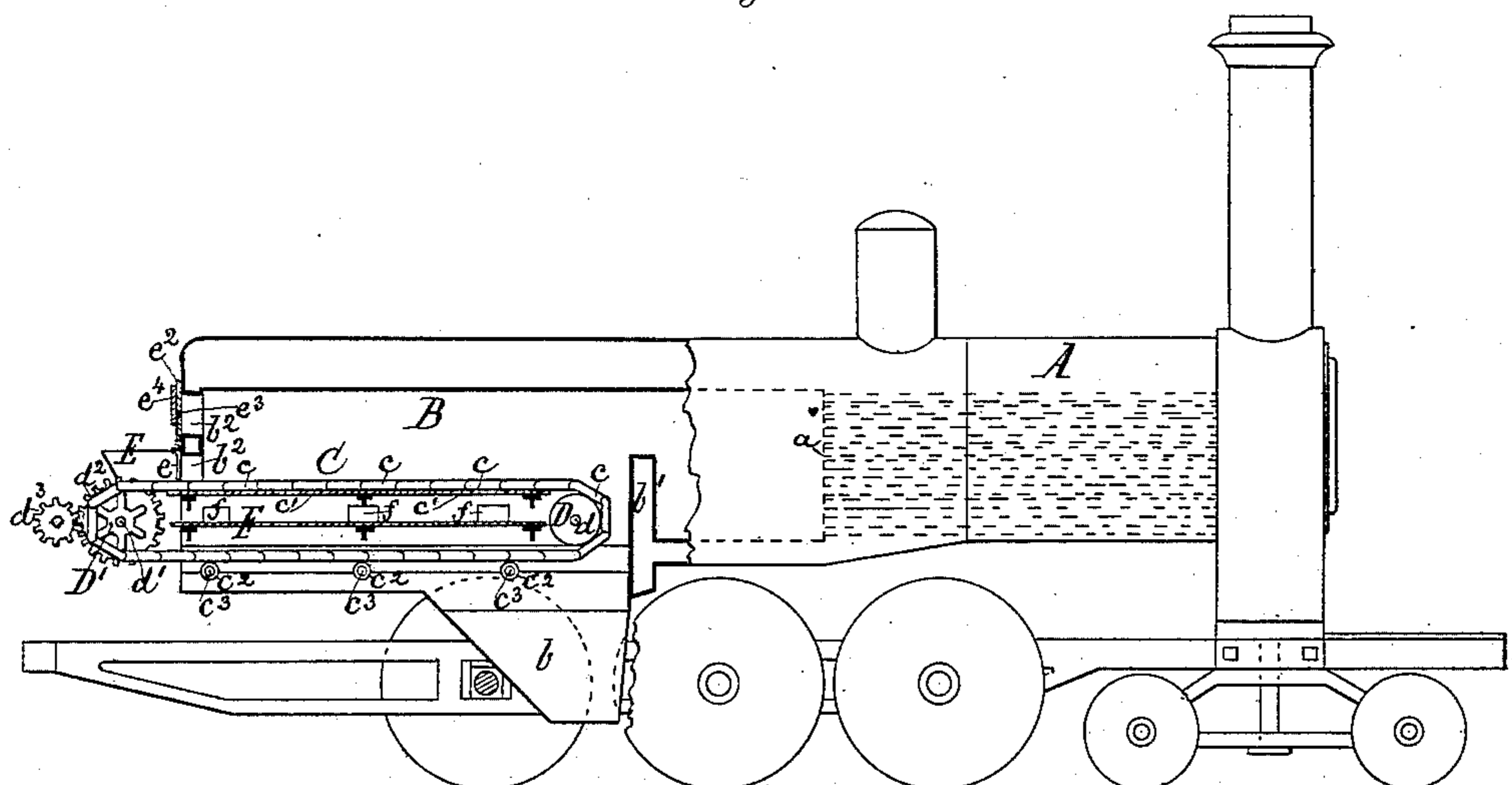
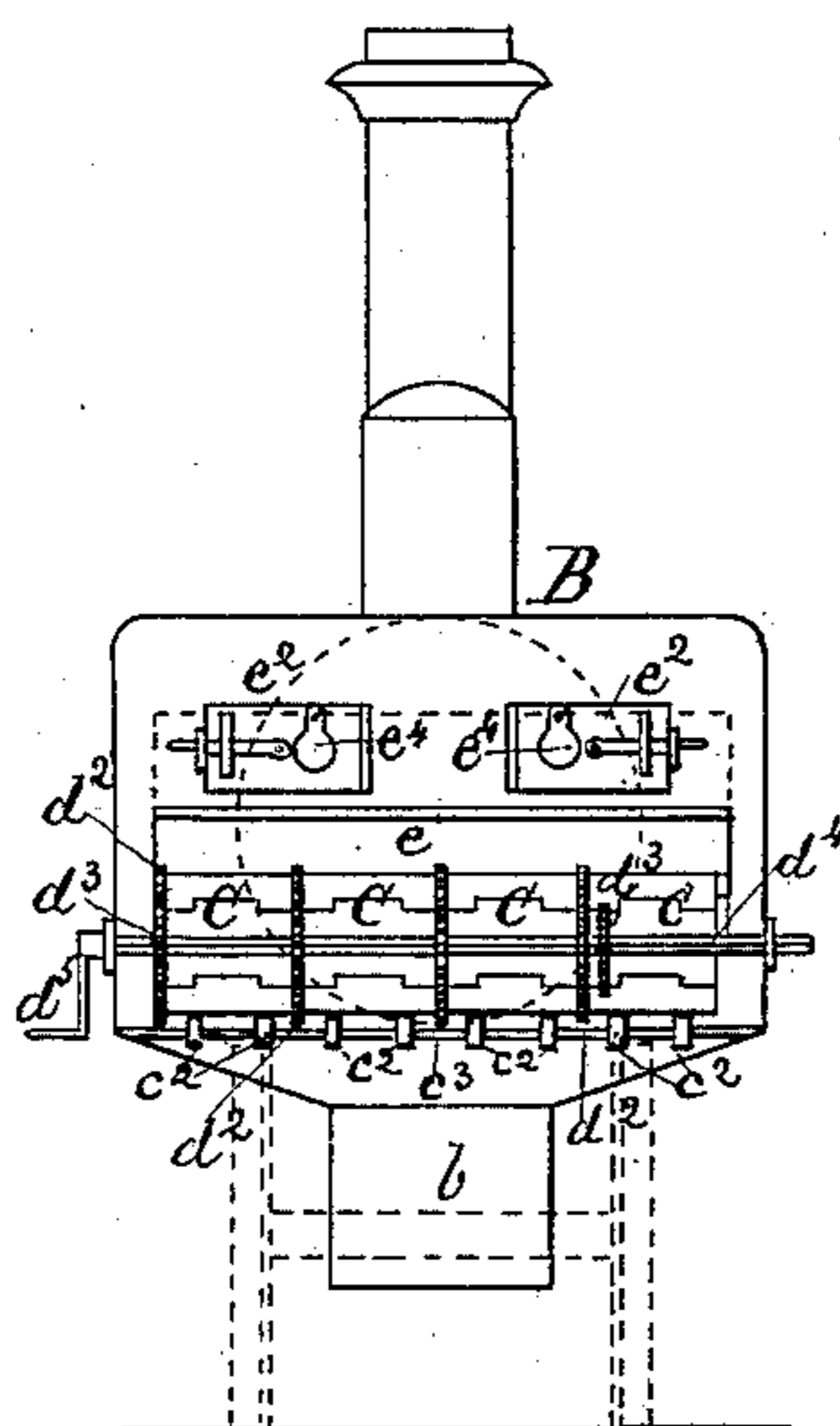


Fig 2.



Witnesses:

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BOILER.

SPECIFICATION forming part of Letters Patent No. 336,431, dated February 16, 1886.

Application filed May 25, 1885. Serial No. 166,660. (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 Improved Combined Boiler and Fire-Bed with Endless-Chain Traveling Grate, of which the following is a specification.

My invention consists in the combination of an endless-chain traveling grate moved by polygonal drums or spiders, or other equivalent means, with a combined boiler and fire-box of the character hereinafter described, whereby culm or other analogous fuel can be very successfully adopted for generating steam for practical purposes.

In the accompanying drawings, Figure 1 is an elevation of a locomotive-boiler, the furnace of which is partly in section in order to show the grates; and Fig. 2 is a back view of the same, showing grates and furnace-doors.

A in the drawings represents the cylindrical tubular portion of the boiler; B, a fire-box, which is of such width as to laterally overhang the driving-wheels to the full extent of the width of the cars used on railroads. To the bottom of the fire-box an ash-pan, *b*, is secured, which is so shaped as to avoid contact with the wheels. The fire-box is provided with a bridge-wall, *b'*, in front of which and at a suitable distance therefrom the rear flue-sheet, *a*, of the tubular portion A of the boiler is applied, as shown. The bridge-wall *b'* prevents the lighter particles of fuel upon the grate C from being drawn into the flues of the boiler—a thing which is liable when the tubular portion of the boiler is placed below the ordinary elevation or as low down with respect to the axles of the wheels as practicable. By this construction of the fire-box a very large area of steam-generating surface is obtained and the area of grate-surface is increased; but in order to practically and economically employ culm as a fuel, I have applied, instead of the ordinary stationary grate, which is not well adapted for such fuel, an endless-chain traveling grate, which is especially adapted for feeding and burning culm.

The endless-chain grate for culm feeding and burning may be in one continuous surface, formed of jointed links; but where the great

width of the same would cause it to be too unwieldy for being conveniently moved it will be preferable to adopt the sectional chain-grate described and claimed in my application No. 1 for a patent, heretofore filed. Said sectional grate comprises a number of endless chains, C, arranged parallel to each other, as shown in my present drawings, each chain being composed of a number of links in form of grate-plates *c*, suitably pivoted together and supported longitudinally upon T-shaped girders or guiding-bars *c'*, which are suitably attached to the fire-box, and supported by transverse girders of similar form let into the walls of the same. The lower portions of these grates are supported at suitable intervals by rollers *c''*, loosely fitted upon transverse shafts *c'''*, attached to the fire-box or ash-pan, and thus the sagging or swaying of the grates is prevented. Each chain-grate is stretched over a round drum, D, which is set a sufficient distance from the bridge-wall *b'* to form a dump-space, *w*, for ashes between the grate and the bridge-wall, loosely fitted upon a transverse shaft, *d*, suitably hung in bearings at the front end of the fire-box, and a spider, D', loosely fitted upon a transverse shaft, *d'*, suitably hung to the frame of the locomotive at a suitable distance away from the fire-box, as shown. By having the grates extend outside the fire-box a surface is secured upon which the fresh fuel can be placed, so as to be fed into the fire-box to the fire simultaneously with the discharge at the other end of the grate of ashes and other substances. Each spider D' is provided with a toothed wheel, *d''*, which gears into a pinion, *d'''*, loosely fitted upon a square shaft, *d''''*, which latter is turned by means of a crank, *d'''''*, or by other suitable means. By sliding the pinions *d'''* along the square shaft *d''''* in and out of gear with the wheels *d''*, one or more, or all, of the chain-grates may be operated when the crank *d'''''* is turned. Above the grates, outside of the fire-box, a suitable hopper, E, is provided, which may be fastened to the boiler or to the locomotive-frame in a suitable manner, its office being to serve as a chute and prevent the culm placed on the grates outside the fire-box from being shaken over the edge of the grate before it reaches the interior of the fire-box. A suitable door, *e*, is hinged to the fire-box

above the opening b^2 , over the grates, which is swung open when the fresh fuel upon the grates is moved into the fire-box, and which during the intervals between the necessary repetitions of this operation close up said opening b^2 . Above the opening b^2 draft-openings b^3 are provided in the fire-box, which are closed by means of ordinary doors, e^2 , whereby draft may be admitted to the fire-box in order to regulate the combustion of the fuel. These doors are provided with peep-holes e^3 , which are normally closed by swinging slides e^4 , and are opened by the engineer by pushing said slides aside for the purpose of observing the progress of combustion in the fire-box. Between the upper and lower portions of the grates a platform, F, is hung upon which the ashes are dropped from the upper grate portions, and from said platform they are removed by suitable implements introduced through doors f in the sides of the fire-box, which doors f may be used, if desired, as draft-doors.

I am aware of the Patent No. 192,725, and make no claim simply for a boiler such as is therein shown, the fire-box of said boiler having a stationary grate, whereas my improved boiler is adapted in form and construction for having combined with it an endless traveling chain grate, which makes the boiler more useful and economical in fuel, it being practicable with such grate to burn culm and other fine cheap fuel.

What I claim as my invention is—

1: In a locomotive-boiler, the endless chain traveling grate C, arranged over and above, applied upon a drum, D, and revolving spider D' , in combination with a fire-box, B, which extends laterally over the locomotive-wheels and forms a portion of the boiler A, and is provided with doors e e^2 , platform F, side openings, f , suitable supporting-girders and rollers for the grate and platform, and a bridge-wall, b' , between which and the rear end of the endless grate a space, w , for the dump or

discharge of ashes, is formed, substantially as described.

2. The grate formed of a series of endless traveling chains arranged over and above the locomotive-wheels, in combination with revolving drums D, spiders D' , fire-box B, which extends laterally over the locomotive-wheels and forms part of the boiler A, and has its bridge-wall b' some distance forward of the endless-chain grate, so that ashes may be dumped freely, substantially as described.

3. The combination of the endless-chain traveling grate C, arranged over and above the locomotive-wheels, with the fire-box B, which extends laterally over the locomotive-wheels and forms a part of the boiler A, and has an ash-discharging space, w , between its bridge-wall and the forward end of the traveling fire-bed, substantially as and for the purpose described.

4. The combination of the boiler A, fire-box B, having bridge b' and ash-pan b , endless traveling chain grate C, arranged over and above the locomotive-wheels partly outside the fire-box, and hopper E, substantially as and for the purpose described.

5. The combination of a sectional endless-chain grate C, arranged over and above the locomotive-wheels, with a fire-box which laterally extends beyond the wheels of a locomotive and has its bridge-wall set some distance forward of the front ends of the grate, so as to form a free dump-passage, w , for the ashes, substantially as described.

6. The combination, in a locomotive-boiler, of an endless traveling-chain grate arranged over and above the locomotive-wheels, and a fire-box, which extends laterally beyond the said wheels, substantially as and for the purpose described.

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Witnesses:

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