

No. 855,642.

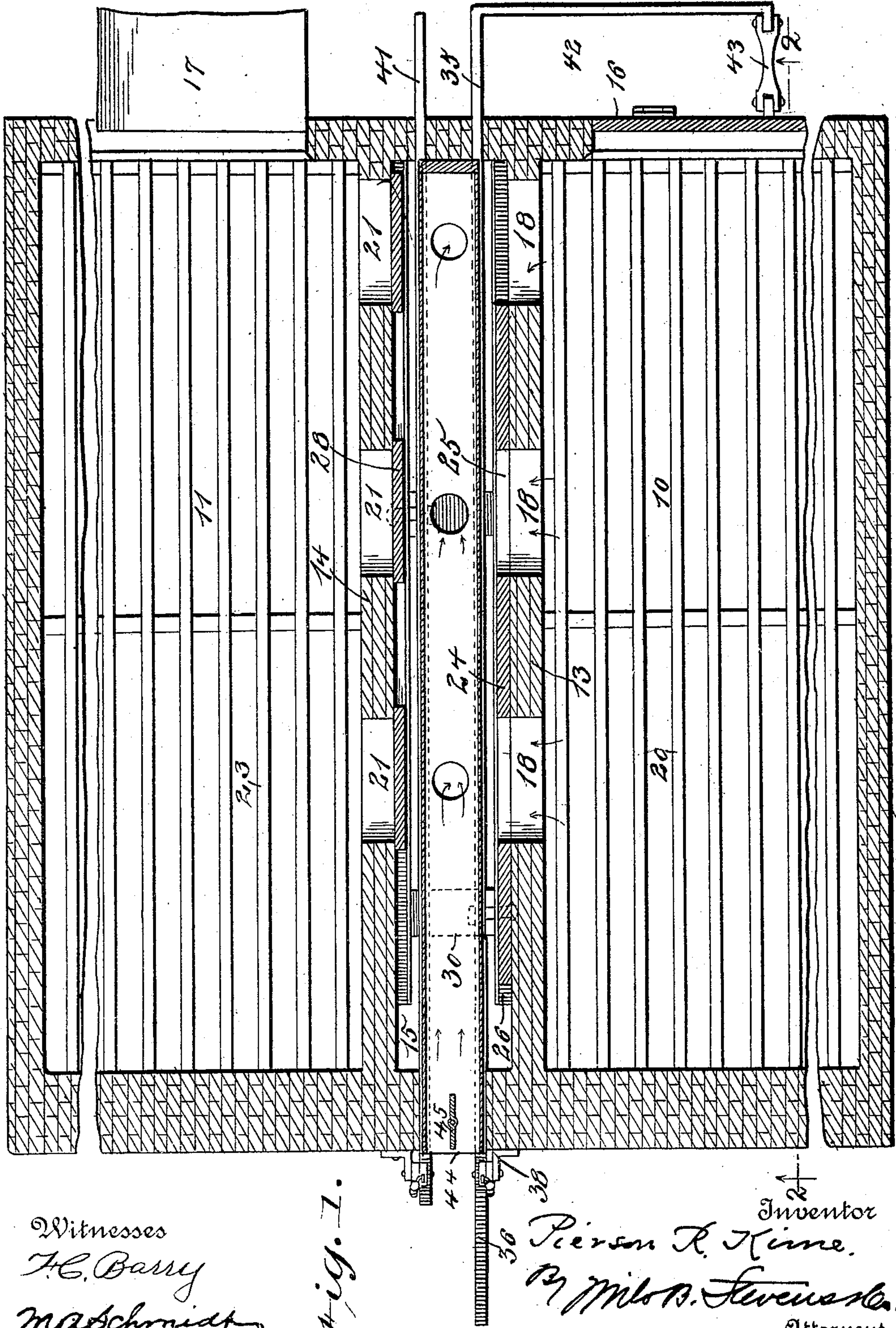
PATENTED JUNE 4, 1907.

P. R. KIME.

STEAM BOILER FURNACE.

APPLICATION FILED SEPT. 11, 1906.

3 SHEETS—SHEET 1.



Witnesses
H. C. Barry
Maschmiedt

Fig. 1.

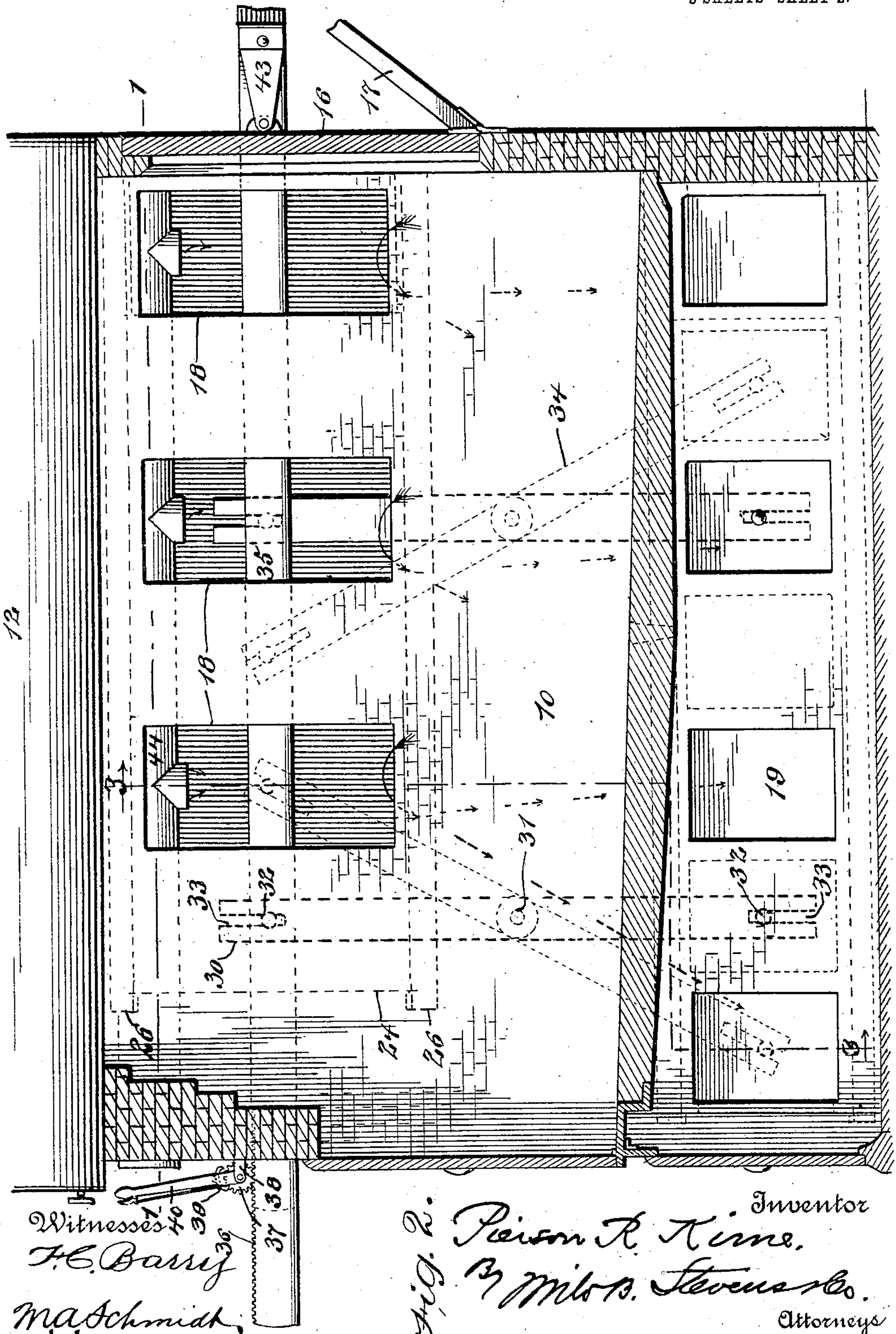
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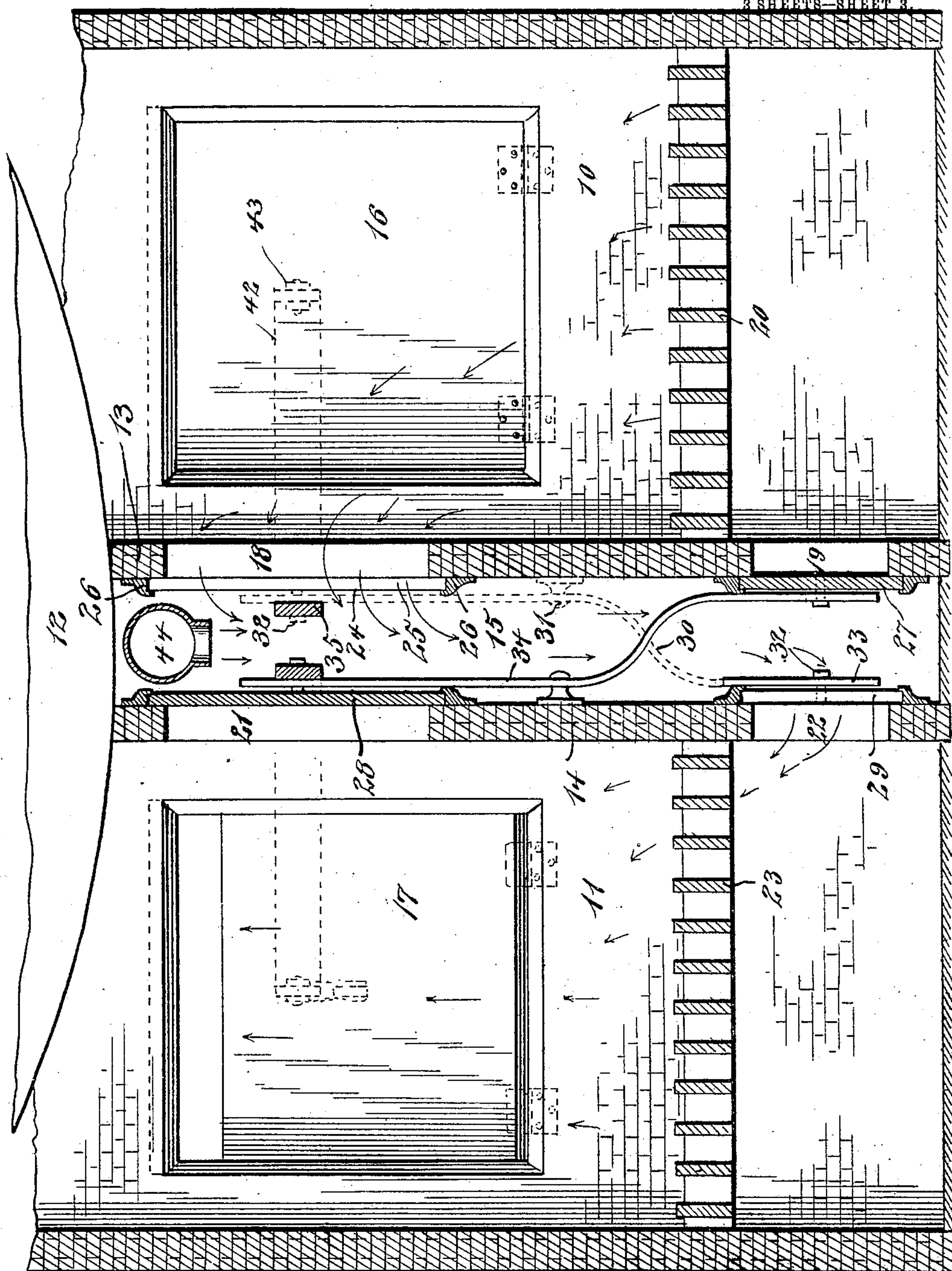


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3 SHEETS--SHEET 3



Witnesses
F. E. Barry
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Fig. 3.
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UNITED STATES PATENT OFFICE.

PIERSON R. KIME, OF GRAND RAPIDS, MICHIGAN.

STEAM-BOILER FURNACE.

No. 855,642.

Specification of Letters Patent.

Patented June 4, 1907.

Application filed September 11, 1906. Serial No. 334,096.

To all whom it may concern:

Be it known that I, PIERSON R. KIME, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Steam-Boiler Furnaces, of which the following is a specification.

This invention relates to steam boiler furnaces and has for its object an improved furnace in which all smoke and gases will be consumed or burned.

The invention comprises two independent furnaces divided by two walls which are spaced apart to form a flue. Above and below the grate, each furnace has openings which communicate with said flue. These openings are provided with dampers which can be operated so that the products of combustion will pass from one furnace through the fire of the other furnace and vice versa, thereby consuming all smoke and gases. Means are also provided for feeding air to the smoke and gases to increase combustion.

In the accompanying drawings, Figure 1 is a sectional plan view on the line 1—1 of Fig. 2. Fig. 2 is a longitudinal section on the line 2—2 of Fig. 1. Fig. 3 is a transverse section on the line 3—3 of Fig. 2.

Referring specifically to the drawings, 10 and 11, respectively, denote two independent furnaces extending under the boiler 12. The furnaces are divided by two walls 13 and 14, respectively, which are spaced from each other a suitable distance to form a flue 15.

At the rear end of the furnace 10 is an opening through which the products of combustion pass to the stack. This opening is provided with a damper 16. The rear end of the furnace 11 has a similar opening provided with a damper 17.

In the wall 13 are openings 18 and 19, respectively, the former of which communicate with the furnace 10 above its grate 20, and the latter openings communicate with said furnace below its grate. The wall 14 also has openings 21 and 22, respectively, which communicate, respectively, with the furnace 11 above and below its grate 23 in the same manner as the openings 18 and 19. The openings 18 are provided with a damper comprising a longitudinally slidable plate 24 having openings 25 adapted to register with said openings 18. The damper-plate is mounted on suitable brackets 26 extending from the

wall 13. Similar dampers 27, 28 and 29, respectively, are provided for the openings 19, 21 and 22.

The dampers 24 and 29 are connected in such a manner that they open and close simultaneously. This connection is made by a lever 30 which is pivoted at 31 to the wall 13. The damper-plate 24 is connected to the upper end of the lever, and the lower end of the lever is bent to extend over to the damper-plate 29 to which it is connected. The connection between the lever and the damper-plates is by pins 32 extending from the latter into slots 33 in the ends of the lever. The dampers 28 and 27 also work together, they being connected by a lever 34 in the same manner as the dampers 24 and 29.

The dampers 24 and 29 are operated by a bar 35 which is secured to the damper-plate 24. The front end of the bar extends outside the front wall of the furnace and is provided with a rack 36 which meshes with a pinion 37 mounted in a bracket 38. The pinion is operated by a dog 39 carried by a hand-lever 40. The dampers 28 and 27 are operated by a bar 41 which is secured to the damper-plate 28 and is operated in the same manner as the bar 35. The rear end of the bar 35 extends through the rear wall of the furnace and has a lateral bend 42 connected by a link 43, or in any other suitable manner to the damper 16. The bar 41 is connected in a like manner to the damper 17.

In the drawings I have shown the dampers set so that the products of combustion from the furnace 10 pass into the furnace 11. The dampers 24, 29 and 17 are open, and the dampers 16, 28 and 27 are closed. With the dampers in this position the smoke and gases from the furnace 10 pass through the openings 18 into the flue 15, and through the openings 22 into the furnace 11 below its grate 23, and are consumed by passing through the fire in said furnace. By reversing the dampers the smoke and gases from the furnace 11 can be passed through the furnace 10. After all the smoke and gases have been burned out, all the openings to the flue 15 can be closed and the dampers 16 and 17 both opened. When fresh fuel is needed one of the furnaces is first fired and the dampers set so that the smoke and gases pass into the other furnace. After all smoke and gases have been burned out, the second furnace is

fired and the dampers are set so that the smoke and gases therefrom pass through the first furnace.

To aid combustion of the smoke and gases they are mixed with air which is fed into the flue 15 through a pipe 44 provided with a damper 45 for controlling the amount of air.

The arrangement herein described is simple in operation and most effectual in consuming all smoke and gases, thereby keeping the boiler flues clean and increasing the heating capacity of the furnace, and at the same time saving fuel.

I claim:—

1. The combination with two independent furnaces, of a flue therebetween having openings into each of said furnaces above and below their grates, dampers for said openings, pins projecting from the dampers, and a lever having forked ends to straddle the pins of the upper and lower dampers, respectively, whereby said dampers are caused to move simultaneously in opposite directions.

2. The combination with two independent furnaces, of a flue therebetween having openings into each of said furnaces above and below their grates, dampers for said openings,

pins projecting from the dampers, a lever having forked ends to straddle the pins of the upper damper of one furnace and the lower damper of the opposite furnace, respectively, whereby said dampers are caused to move simultaneously in opposite directions, dampers for the outlet of each furnace, and a connection between the outlet and the upper dampers of each furnace.

3. The combination with independent furnaces each having a damper for its outlet, of a flue between the furnaces opening into each furnace above and below its grate, dampers for said openings arranged in sets, the upper dampers of each furnace being connected to the lower dampers of the opposite furnace, a rack-bar extending from each set of dampers and connected to one of the outlet dampers, a pinion meshing with the rack, and means for operating the pinion.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PIERSON R. KIME.

Witnesses:

PETER KLUNDER,
PETER H. LASS.