

No. 732,723.

PATENTED JULY 7, 1903.

E. F. EDGAR.
BOILER FURNACE.

APPLICATION FILED SEPT. 22, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

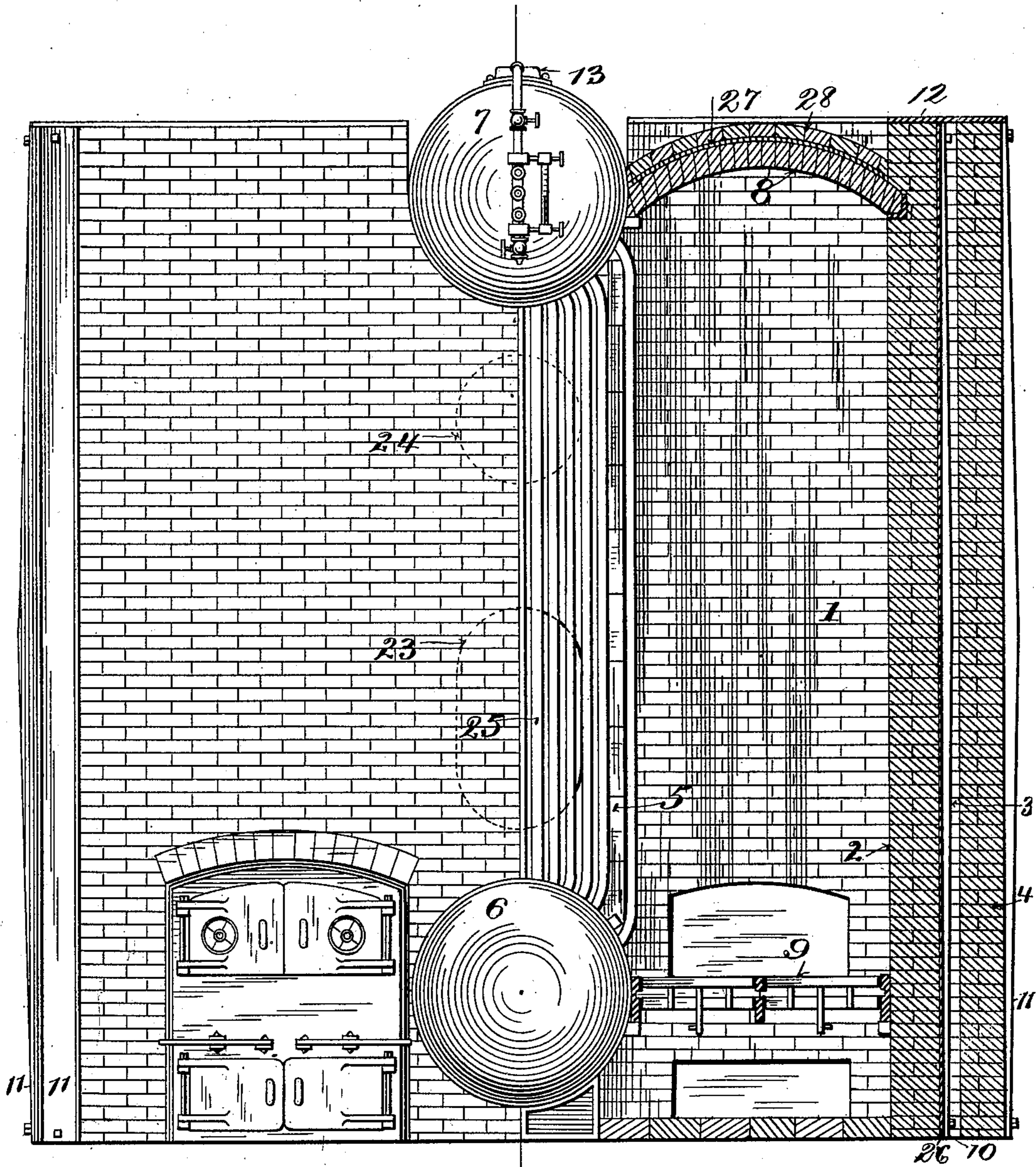


Fig. 1.

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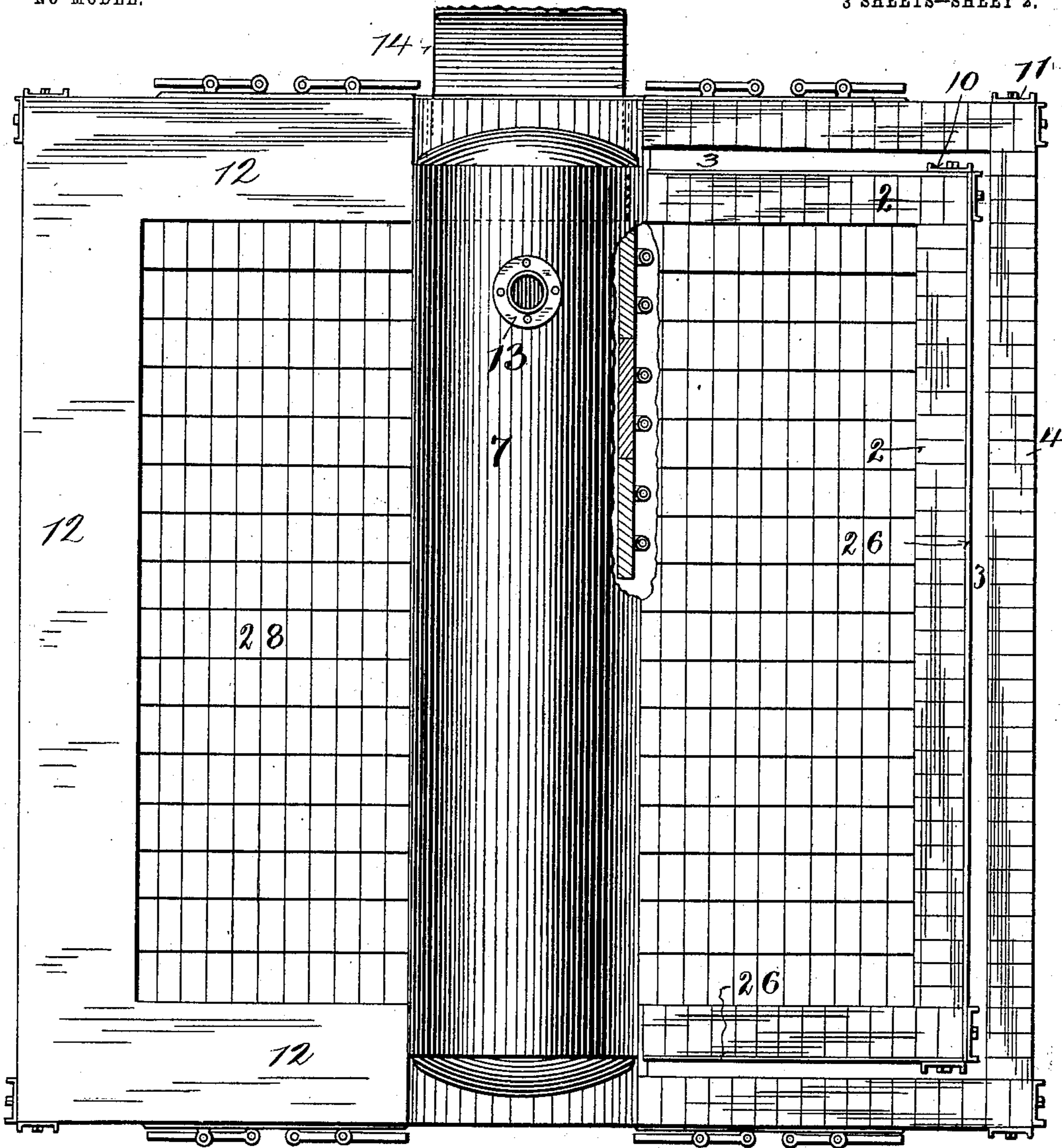


Fig. 2.

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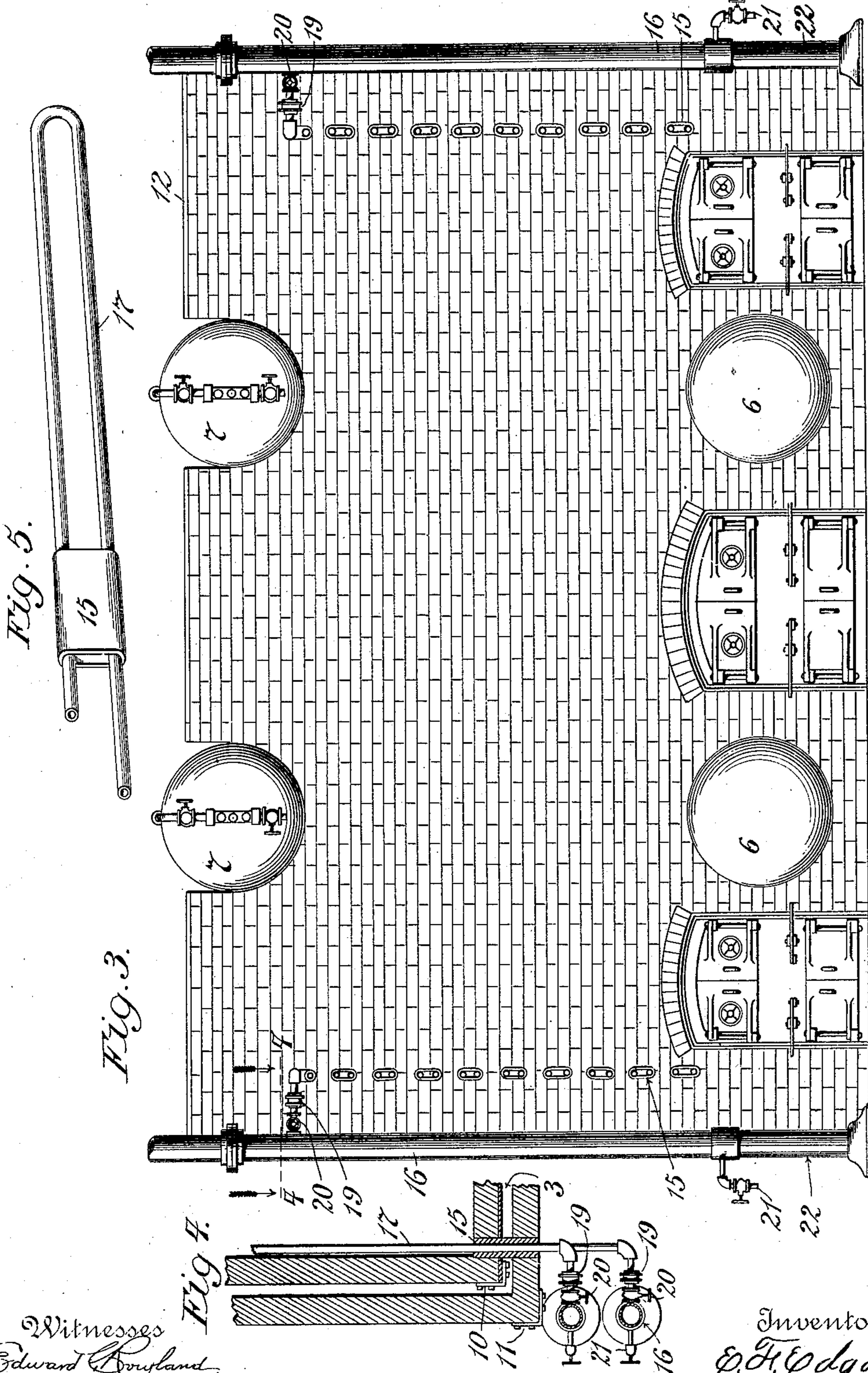
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3 SHEETS—SHEET 3.



Witnesses
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UNITED STATES PATENT OFFICE.

ELLIS F. EDGAR, OF WOODBRIDGE, NEW JERSEY.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 732,723, dated July 7, 1903.

Application filed September 22, 1902. Serial No. 124,424. (No model.)

To all whom it may concern:

Be it known that I, ELLIS F. EDGAR, a citizen of the United States, and a resident of Woodbridge, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Boiler-Furnaces, of which the following is a specification.

Figure 1 is a vertical front view, part in full and part in section, of furnace with one boiler-section. Fig. 2 is a plan view with plates 12 removed to show space 3 and broken away to show wall 5. Fig. 3 is a front elevation in full of furnace with two boiler-sections and superheater. Fig. 4 is a sectional plan view at lines 4-4 in Fig. 3. Fig. 5 is a perspective view of one superheating-loop 17 and thimble 15.

My invention relates to a boiler-furnace built in two separate walls with a space between, so that the expansion and contraction of the inner wall caused by the heat of the furnace will not affect the outer wall, which causes cracks and allows cold air to enter the furnace, thereby reducing the efficiency of the boiler, which has been a very detrimental feature in boiler-furnace constructions heretofore, and it is very important that the outer wall be kept air-tight, also the space between the said outer wall and the inner wall or furnace-lining, and as a further precaution I cover the outside of the inner wall in the space between the two walls with asbestos felt or fill the space with mineral wool or fine asbestos, thereby excluding all possibility of cold air entering the furnace, as the inner wall must necessarily be in danger of some slight cracks, but not as much so as in former constructions, where this inner wall was tied into the outer wall in construction, the two being tied together in that manner, the inside wall being of a very high temperature and the outside wall comparatively cool, when the inside wall, expanded from the heat, caused the outside wall to bulge out and crack, and owing to the rigidity of the two walls, being built into one, the inner wall would not come back in its former position when cool; but in this form here shown the inner wall will expand and contract with freedom. The corners of the inner wall are held in position by buckstays and rods separately from the outer walls, substantially as

shown, the center being allowed to spring out and in by the expansion and contraction.

I place in the furnaces one or more oblong boiler-sections consisting of one upper drum and one lower drum, connected by water-tubes, and a draft-exit at one end of said section may in some cases in a very large construction be constructed with draft-exits at both ends of said section. I usually fire these furnaces from both ends, making a double-end fire-box, which allows of more grate-surface and makes easier firing. There is always a brick arch running the entire length of the furnace, forming the top, one end resting on large square-headed rivets on the drum and the other end built in the side of the furnace-wall, substantially as shown. This brick arch, in conjunction with the brick walls on the sides and end of the furnace, causes a very high furnace temperature, which allows of perfect combustion and a very high boiler efficiency.

In Fig. 1 No. 1 is the furnace. No. 2 is the inside wall or lining of furnace; No. 3, space between inner wall or furnace lining and outer wall; 10, buckstays on corners of inner wall; 11, buckstays on corners of outer wall; 12, iron cap for covering space between walls 2 and 4; 26, asbestos on outside of inner wall; 8, brick arch over furnace; 27, asbestos felt over top of brick arch 8; 28, brick covering over top of asbestos felt 27. Grate 9, lower drum 6, upper drum 7, steam-exit 13, upper-draft exit 24, lower-draft exit 23, water-tubes connecting drums 25, wall 5, extending from lower drum to upper drum and from the draft-exit end of the section part way toward the opposite end of the section, usually from four to six feet, according to the economy and horse-power desired. This wall prevents the gases of the furnace from short-circuiting out of the draft-exits. This wall cuts off all communications of the heat from the furnace to the water-tubes, that lie next to the draft-exit and behind said wall, except at the end of said wall opposite from the draft-exit. There is another of these walls 5 also extending from the furnace-wall at the draft-exit end of section parallel to each other and of the same length, cutting the heat off from the same tubes, as there is a furnace on each side of these boiler-sections, or, in other

words, these boiler-sections divide up the furnace in smaller furnaces. There are usually half or more of the water-tubes of these sections exposed to the direct radiation of the furnace at the opposite end of the section from the draft-exit.

Fig. 2, with plate 12 removed on one side, shows space 3 between walls 2 and 4. This space runs entirely around the furnace between walls 2 and 4. Buckstays No. 10, staying corners of inner wall, are also shown here; buckstays 11, staying corners of outer wall; asbestos 26, covering outside of inner wall 2; bricks 28, top-covering over top of furnace, upper drum 7, steam-exit 13, smoke-flue 14, division-walls 5, extending from furnace-wall at draft-exit end of section, as hereinbefore described.

Fig. 3 shows the furnace divided in three furnaces by two oblong boiler-sections, as herein heretofore described, and superheater attachment consisting of a receiving-pipe and a discharge-pipe, one of each being located on each side of furnace, which are vertical; but owing to receiving-pipe 18 being behind discharge-pipe 16 it cannot be shown in Fig. 3, so I show a detail plan view of them in Fig. 4. 15 is thimble built in brick wall for receiving and holding superheating-loop 17, one end of which is connected to receiving-pipe 18 and one to discharge-pipe 16. They are connected by means of flange or union connections 19, and the flow of steam is controlled through the superheating-loop 17 by valves 20. In case one of these loops 17 should burn out or burst valves 20 could be closed, union or flange connections 19 disconnected, and superheating-loop 17 be withdrawn and a new one replaced without shutting down the boiler. 21 is a drip for drawing condensation from the vertical receiving and discharge pipes. 22 represents the pipe-

supports for the vertical receiving and discharge pipes.

Having described my invention, what I claim as new is—

1. A boiler-furnace having one or more oblong boiler-sections, comprising an upper drum and a lower drum connected by water-tubes, a draft-exit at one end of said section, and a wall on each side of said section, extending from the lower drum to the upper drum, and from the draft-exit end half the length or less of said section, the said oblong boiler section or sections extending the length of said furnace and dividing said furnace to provide a fire-box on each side of said oblong boiler section or sections, substantially as set forth.

2. A boiler-furnace having one or more oblong boiler-sections, comprising an upper drum and a lower drum connected by water-tubes, a draft-exit at one end of said section and a wall on each side of said section extending from the lower drum to the upper drum and from the draft-exit end half the length or less of said section, the said oblong boiler section or sections extending the length of said furnace and dividing said furnace to provide a fire-box on each side of said oblong boiler section or sections, said furnace having an inner wall or furnace-lining built and stayed independently, an outer wall built a short distance therefrom independently, the space between said walls being adapted to receive asbestos or other non-conductor of heat, substantially as described.

Signed at New York, in the county of New York and State of New York, this 19th day of September, A. D. 1902.

ELLIS F. EDGAR.

Witnesses:

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