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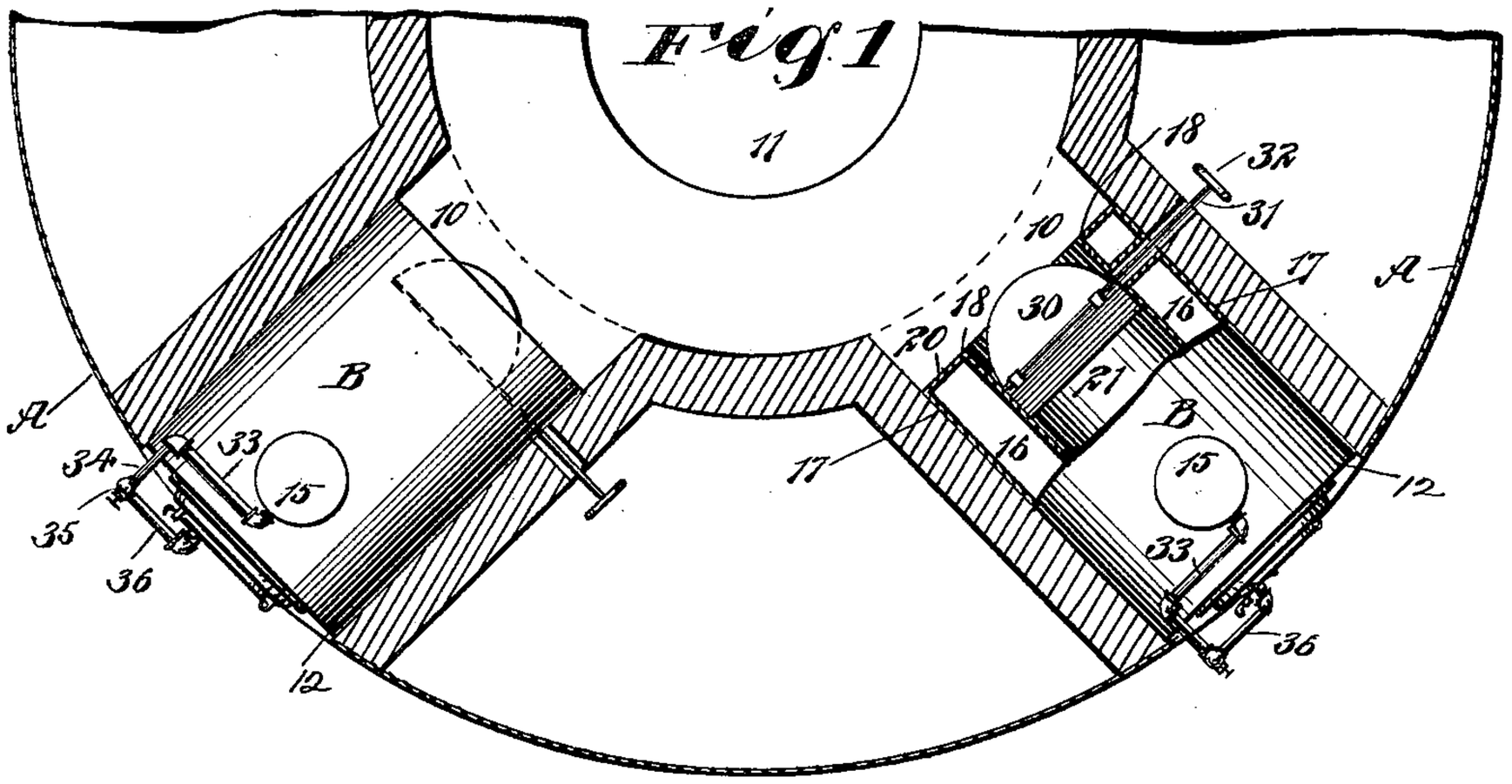
J. O'CONNELL & B. F. HILLERY.

KILN OR FURNACE.

(Application filed Dec. 7, 1898.)

(No Model.)

Fig. 1



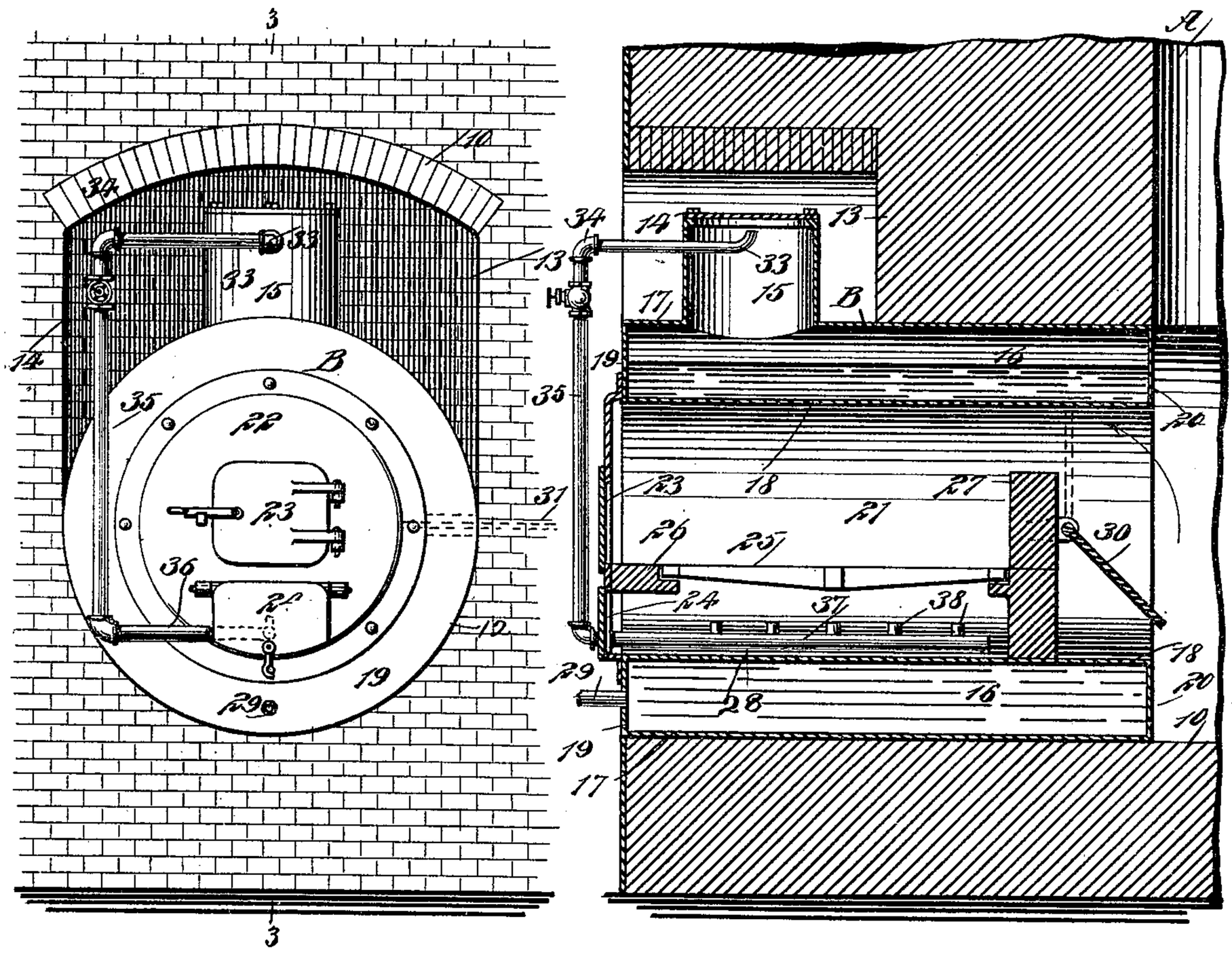


Fig. 2

Fig. 3

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KILN OR FURNACE.

SPECIFICATION forming part of Letters Patent No. 630,732, dated August 8, 1899.

Application filed December 7, 1898. Serial No. 698,580. (No model.)

To all whom it may concern:

Be it known that we, JAMES O'CONNELL and BENJAMIN FRANKLIN HILLERY, of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and useful Improvement in Kilns or Furnaces, of which the following is a full, clear, and exact description.

The object of the invention is to provide a boiler especially adapted to be set in the arches of kilns and furnaces, the fire-box of the furnace being opened into the body of the kiln, supplying the necessary heat thereto, and also to provide a means whereby steam generated in the boiler may be utilized for promoting combustion.

A further object of the invention is to provide a damper within the fire-box by means of which the intensity of the fire may be regulated, the damper being controlled from the exterior of the boiler.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a partial horizontal section through a kiln, illustrating the improved boilers applied thereto. Fig. 2 is a partial side elevation of the kiln, illustrating a boiler in position in one of the arches, and Fig. 3 is a vertical section taken practically on the line 3 3 of Fig. 2.

The kiln A (shown in the drawings) is of circular formation, being provided with a number of arches 10, which arches communicate with a central chamber 11, in which rock to be burned is located. In one or more of the arches 10 a boiler B is secured, the boiler being of peculiar construction.

The body 12 of the boiler is made to fit snugly into the lower portion of the arch, as shown in Fig. 2, and brickwork or masonry of any description (indicated at 13 in the drawings) is erected upon the upper rear portion of the boiler, extending to the upper portion of the arch; but the said upper masonry or brickwork 13 is so formed that a front chamber 14 is provided over the boiler, in which chamber the steam-dome 15 of the boiler is located.

The body of the boiler is provided with a continuous or circular water-chamber 16, that is in communication with the steam-dome 15. This water-chamber 16 is formed by constructing the body of the boiler with an outer shell 17 and an inner shell 18. The chamber between the two shells is closed at the front and at the rear of the said body by annular plates 19 and 20, as is best shown in Fig. 3. Under such a construction a fire-box 21 is formed at the longitudinal center of the boiler, extending from the front to the rear. The fire-box is open at the rear, so that the products of combustion may pass from the fire-box out into the central chamber 11 of the kiln; but the said fire-box is closed at the front by a head 22, provided with a fire-door 23 and an ash-pit door 24. A grate 25 is provided in the bottom portion of the fire-box, which grate rests upon suitable front supports 26 and upon a fire-wall 27, that extends from the bottom of the fire-box near its rear end, being fitted to the sides, the said wall terminating a predetermined distance from the top of the fire-box, as is shown also in Fig. 3.

The space 28 within the fire-box below the grate constitutes the ash-pit of the boiler. Water is supplied to the water-chamber 16 through the medium of a pipe 29, that enters the boiler preferably at the front. The fire is regulated to a greater or less extent through the medium of a damper 30, that is pivoted upon the rear face of the fire-wall 27, as shown in Figs. 1 and 3, the spindle 31 of the damper being carried out through and beyond the wall of the arch within which the boiler is placed, and the spindle 31 usually terminates in a hand-wheel 32, as is illustrated in Fig. 1. The damper 30 is of such construction that when it is closed, as shown in dotted lines in Fig. 3, the damper and fire-wall will effectually prevent any products of combustion entering the central or burning chamber of the kiln, thus enabling a person to readily work in the said chamber even when fire is in the boilers surrounding the chamber.

A pipe 33 is carried from the steam-dome

15 of the boiler and is connected with a second pipe 34, that is projected out to the front of the kiln, and the pipe 34 is connected with the upright pipe 35, that extends downward below the grate 25, being connected at its lower end with a lateral pipe 36, which lateral pipe is in its turn connected with a spray-pipe 37, the latter pipe extending longitudinally within the ash-pit, being provided with suitable supports. The spray-pipe 37 is provided with apertures in its upper surface and with a suitable number of nipples 38, as is particularly shown in Fig. 3. The fire-box of the boiler is particularly designed for the use of soft coal, and the steam delivered to the pipe 30 below the grate tends materially to increase combustion.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A boiler adapted for use in connection with kilns or furnaces, said boiler being provided with a central longitudinal fire-box, and a casing around the fire-box, forming a surrounding water-chamber, the rear of the fire-box being open, a fire-wall located near the rear of the fire-box, a damper likewise located near the rear of the fire-box, a spray-pipe located beneath the grate of the fire-box, and means, substantially as described, for connecting the said spray-pipe with the steam-dome of the boiler, as set forth.

2. The combination, with a kiln or furnace and its arches, of a boiler permanently located within the arch of the kiln, said boiler being provided with a central longitudinal fire-box and with a water-chamber surrounding the said fire-box, the rear of the fire-box being open, a fire-wall located near the rear of the fire-box, a damper carried by the fire-wall, a spray-pipe located beneath the grate of the fire-box, and means, substantially as described, for connecting the spray-pipe with the steam-dome of the boiler, as set forth.

3. The combination, with a kiln or furnace and its arches, of a boiler located in an arch, provided with an inner and an outer shell, the space within the outer shell forming a central longitudinal fire-box, and the space between the two shells a water-chamber surrounding the fire-box, said fire-box being open at its inner end and closed by a head at its outer end, the head being provided with doors, a fire-wall located within the fire-box near its inner end, a grate supported by the fire-wall and front head of the fire-box, a damper pivoted upon the fire-wall, the damper being capable of closing the space between the fire-wall and adjacent inner faces of the fire-box, a spray-pipe located beneath the grate, and supply-pipes connecting the spray-pipe with the steam-dome of the boiler, as described.

4. The combination, with a kiln or furnace and its arches, of a boiler permanently located within the arch of the kiln or furnace, the material of the arch being in close contact with the outer shell of the boiler except where the steam-dome of the boiler connects with the said outer shell, said boiler being provided with a longitudinal fire-box and a surrounding water-chamber, the fire-box being closed at its front and open at the rear, a fire-wall located within the fire-box near the rear, a damper capable of closing the space between the fire-wall and the contiguous surface of the fire-box, and means, substantially as described, for supplying steam from the dome to the ash-pit of the boiler, as described.

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