

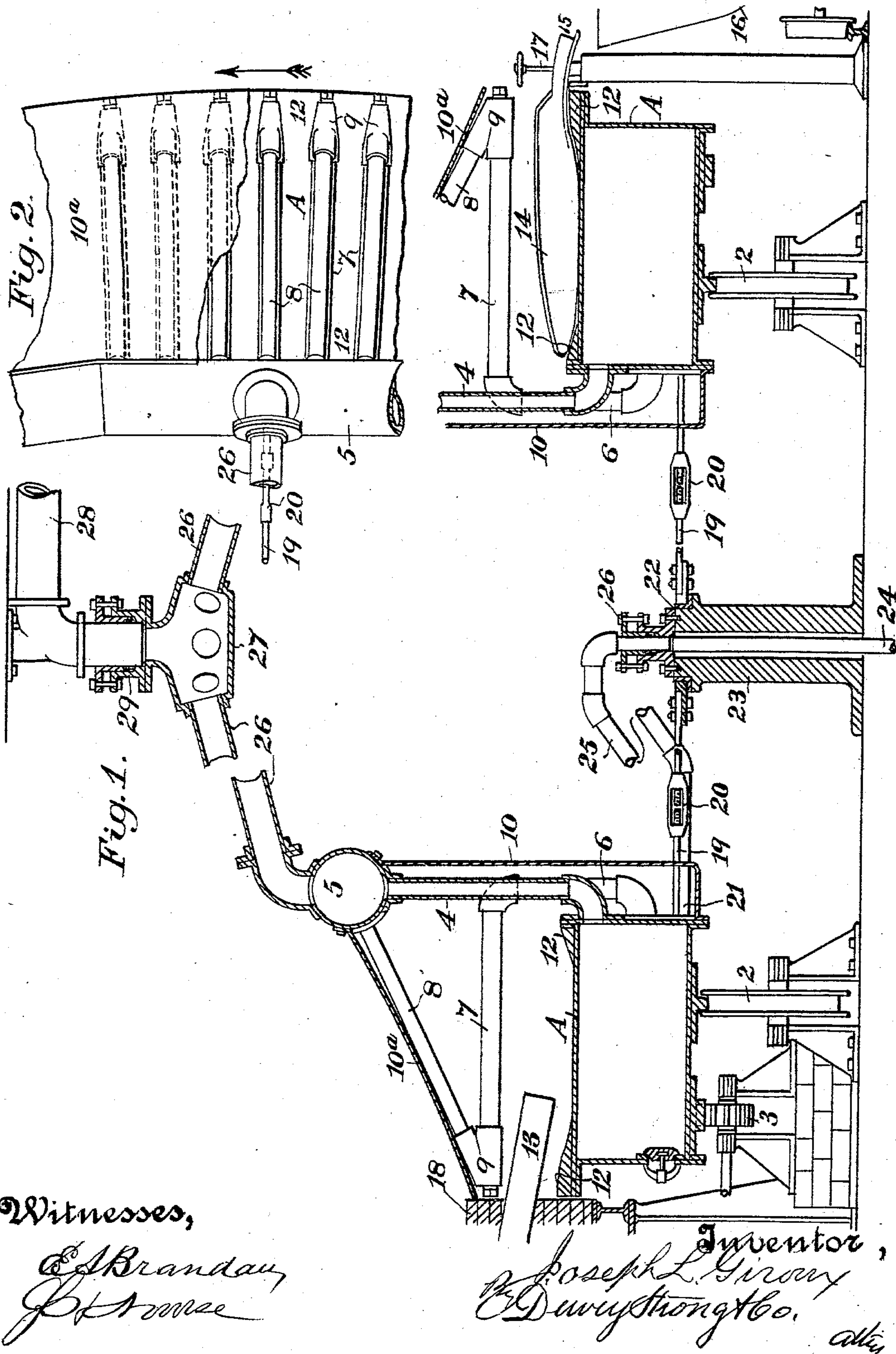
No. 704,743.

Patented July 15, 1902.

J. L. GIROUX.
STEAM GENERATOR.

(Application filed Apr. 9, 1902.)

(No Model.)



UNITED STATES PATENT OFFICE.

JOSEPH L. GIROUX, OF JEROME, ARIZONA TERRITORY.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 704,743, dated July 15, 1902.

Application filed April 9, 1902. Serial No. 101,979. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. GIROUX, residing at Jerome, county of Yavapai, Arizona Territory, have invented an Improvement in Steam-Generators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for generating steam, and it is especially designed for the employment of a fuel which can be continuously supplied and removed when exhausted.

My invention is especially designed for the utilization of the hot slag from smelting-furnaces and the like; but other forms of fuel may be employed in conjunction with a generator of this description.

It consists of an annular, tubular, and horizontally revoluble shell, a continuous fire-box or furnace in the form of an open channel from one side, and means for continuously supplying the fuel at one point, and means for removing it when the heat is exhausted.

My invention also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a part section and part elevation of a steam-generator embodying my invention. Fig. 2 is a portion of a plan of Fig. 1.

The object of my invention is to provide a steam-generator of large capacity, and I have in the present illustration shown it as especially fitted for the employment of a fuel consisting of the hot molten slag which is discharged from smelting-furnaces; and the invention therefore comprises means for continuously supplying the slag into the peculiarly-disposed furnace of the generator, of revolving the generator and its furnace about a vertical axis, of a means for removing the slag or other fuel when exhausted, means for forming a closure for the furnace during its revolution, and means for supplying water to the boiler and removing steam therefrom.

As shown in the present drawings, my generator is formed of short sections A, which may be made of any suitable or desired form in transverse section. In the present case I have shown these sections as rectangular, and

they are so formed and riveted together that when complete the generator is in the form of a large annular rim which is suitably supported upon a foundation with antifrictional bearings, as at 2, and a driving-rack engaged by gears, as at 3, or equivalent means whereby the tubular shell can be revolved around its center of rotation 23. From the inner periphery of this annular shell pipes 4 extend upwardly at short intervals, connecting with an annular steam-drum 5, located above the water-chamber A. Other pipes 6 connect with A and extend up between the pipes 4 to a plane sufficiently above the top of the part A, where by elbows they connect with horizontal pipes 7, extending above the part A and at such a distance as to form a furnace and fuel-space between said pipes and the top of A. Pipes 8 are connected with the outer ends of the pipes 7 by suitable angular couplings 9, so that the angular direction of the pipes 8 enables them to connect with the steam-drum 5. These connecting-pipes thus form a circulating system between the part A and the steam-drum. A shield or closure 10 extends from the inner periphery of the steam-drum to the inner and lower part of the chamber A, and a similar shield 10^a covers the inclined pipes 8, and the two shields thus form an inclosure for the pipes and in conjunction with the top of the part A thus form a furnace for the fuel. Elevated annular rims 12 extend around the outer and inner edges of the lower part of the furnace, and these rims serve to hold a liquid or semiliquid fuel. In the present case I have designed to employ the hot slag discharged from smelting-furnaces, and for this purpose I have shown an inlet pipe or passage, as 13, which may lead from the settling tank or attachment of the furnace in which the metal is separated from the slag. The slag is delivered through this passage into the generator-furnace previously described, and the generator is caused to revolve at a rate of speed depending upon its size and upon the length of time that the slag will retain its heat. The slag is removed by means of a plow 14, fixed so as to project into the pathway of the slag, which it thus scoops out and deposits in the discharge-chute 15 to

be delivered into cars 16 or in other desired manner. The plow may be adjusted by any suitable device, as the screw 17.

It will be understood that liquid hydrocarbon or other form of fuel could be used with good effect in a generator of this description, the operation being essentially the same as in the present illustration.

In order to retain the heat within the furnace, a wall is built, as shown at 18, surrounding the generator and close to its periphery. The periphery of this apparatus is made as nearly circular as possible and is designed to travel in close proximity with the wall 18, so that it does not allow any appreciable amount of heat to escape.

In order to strengthen and properly brace the generator, I have shown tension-rods 19 with turnbuckles 20 or other equivalent means for adjusting them. The outer ends of the rods are firmly secured to the inner periphery of the annular generator-shell, as shown at 21, and the inner ends are secured to a hub, as at 22, which is mounted and turnable upon a central pillar or standard 23.

In order to supply water to an apparatus of this description, I have shown the feed-water pipe 24 as extending up through the central pillar 23, having one or more branches, as 25, extending outwardly to the shell, connecting therewith at as many points as may be found desirable. A suitable packed joint, as at 26, allows the radial portion 25 of the pipe to revolve about the stationary vertical portion 24. By a similar arrangement steam is withdrawn from the steam-drum 5 by means of steam-delivery pipes 26, connecting with the upper part of the drum. These pipes 11 lead to a common center 27, with which they connect, and this receiver connects with a main steam-delivery pipe, as at 28, which leads the steam to any point where it is desirable to use it. A turnable packed joint, as 29, allows of the movement of the branch pipes 26 with relation to the stationary delivery-pipe 28 and maintains a tight joint during the operation.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

50 1. A steam-generator consisting of a revoluble water-chamber, a steam-drum located above said chamber, circulating-pipes con-

necting the two, means for supplying water to and conducting steam from the apparatus, and means for applying heat thereto. 55

2. A steam-generator consisting of an annular revoluble water-chamber, an annular steam-drum located above said chamber, circulating and conducting pipes connecting the two, and a screen or housing inclosing said pipes and forming a heating-space above the water-chamber. 60

3. A steam-generator consisting of an annular horizontally-revoluble water-chamber and means for applying a heating medium thereto, an annular steam-drum located above said chamber, vertical circulating-pipes connecting the chamber and drum, other horizontal and diagonal connecting-pipes extending above the water-chamber and forming an intermediate heating-space, and vertical and diagonal shields inclosing said connecting-pipes. 65

4. A steam-generator consisting of an annular revoluble water-chamber having elevated annular rims around the inner and outer periphery, means for supplying fuel to the channel thus formed, an annular steam-drum located above and interior to the inner line of the water-chamber, vertical circulating-pipes connecting the water-chamber and steam-drum, horizontal and diagonal pipes extending above the fuel-space and connecting the water-chamber and steam-drum, and shields inclosing said pipes and forming a furnace-chamber. 70 75 80 85

5. A steam-generator consisting of a revoluble circular water-chamber rectangular in cross-section and having a fuel-space formed on the top, a circular steam-drum located above said chamber, vertical circulating-pipes connecting the chamber and drum, horizontal and diagonal connecting-pipes extending above the water-chamber with an inclosing shield or housing, and a fixed surrounding wall within which the outer periphery of the water-chamber and the top shield turn in close proximity. 90 95

In witness whereof I have hereunto set my hand.

JOSEPH L. GIROUX.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.