No. 610,778. Patented Sept. 13, 1898.

R. L. WALKER.

FURNACE.

(Application filed Aug. 6, 1897.)

(No Model.)

Fig. 2.

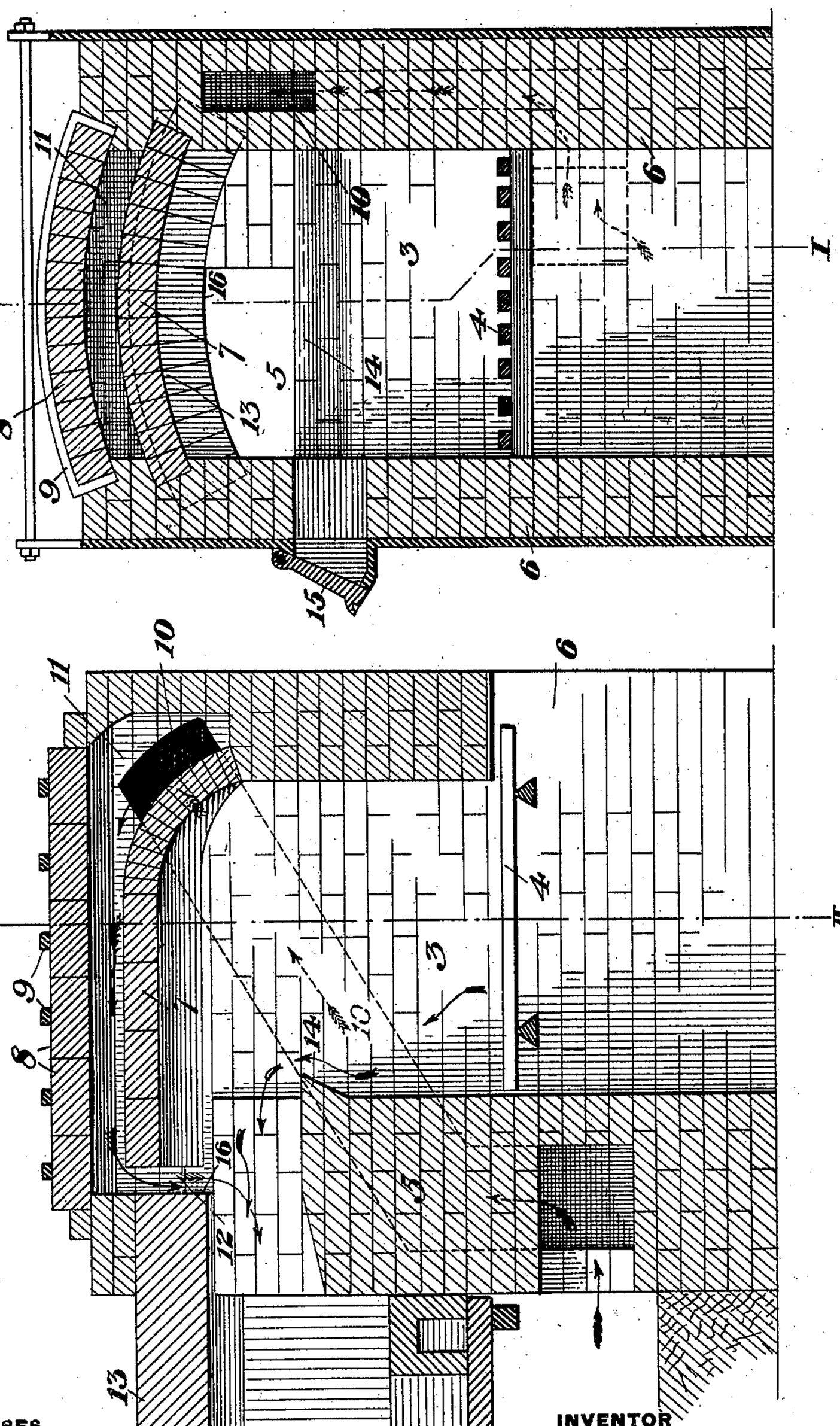

Fig. 1.

WITNESSES

INVENTOR

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by Baldwin & Baldwin

his attys.

UNITED STATES PATENT OFFICE.

ROBERT LOUDON WALKER, OF ALLEGHENY, PENNSYLVANIA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 610,778, dated September 13, 1898.

Application filed August 6, 1897. Serial No. 647,299. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LOUDON WALKER, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Smokeless Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a partial longitudinal section of a puddling-furnace constructed in accordance with my invention, and Fig. 2 is a cross-section on the line II II of Fig. 1.

My invention relates to furnaces such as are employed for heating, puddling iron, for steam-boiler, &c., and is designed to provide a furnace in which the amount of fuel consumed shall be greatly reduced and an intense even heat afforded.

In the drawings, 2 represents a puddling-chamber of a puddling-furnace, and 3 the fire-chamber or furnace proper, having grate-bars 4 for the reception of solid fuel.

5 is the bridge-wall, and 6 6 the side walls, of the furnace-chamber. 7 is the roof proper of this chamber, and above this roof is provided a second roof or cover 8, which is preferably removable and is formed of arch-shaped segments bound together by metal strips 9. The bridge-wall is made hollow, as shown, and connects by a flue 10, leading through one of the side walls, with the chamber or space in the double roof of the furnace-top. This chamber 11 above the roof proper forms a heating-chamber for the air which enters the hollow bridge-wall and passes thereinto, and this heated air is fed to the products of combustion by a port 12 at the front end of chamber 11. It will be noticed that the inner roof portion is at a higher level than the roof 13 of the puddling-chamber, so that a downwardly-extending offset or shoulder 16 is formed, against which the products of combustion will impinge on their way to the puddling or heating chamber, and meeting the heated air at this point will become thoroughly mixed therewith. In order to further insure this action and throw the products of combustion upwardly toward the upper portion of the throat above the bridge-wall, I preferably provide a lip 14, which projects from the upper end of the bridge-wall into the fire-chamber and causes the gases to pass upwardly through the upper part of the throat, where they will impinge upon the offset and become mixed with the heated air.

15 is the usual door for the charging of the furnace.

The advantages of my invention will be apparent to those skilled in the art, since in actual practice puddling and other furnaces provided with my invention have been found to greatly decrease the amount of fuel necessary, thus cheapening the product of the furnace.

Many changes in the form and arrangement of the flues and chambers may be provided without departing from my invention, since

What I claim is—

1. A heating-furnace having a fire-chamber provided with a closed top, grate-bars in the chamber, a suitable side opening for charging fuel upon the bars, an air-heating chamber covering the major portion of the roof of the fire-chamber, a port leading from the air-chamber into the throat of the furnace, and a depending offset extending in front of and to a point lower than the mouth of the port and arranged to deflect the flame and fuel-gases and commingle them with the heated air.

2. A heating-furnace having a fire-chamber provided with a closed top, and having grate-bars and a suitable opening for charging fuel upon the bars, an air-heating chamber covering a major portion of the roof of the fire-chamber, a hollow bridge-wall having an air-inlet, a flue in the side wall of the furnace connecting the hollow bridge-wall with the air-heating chamber, a port leading from the air-chamber into the throat of the furnace, and a depending offset extending in front of and to a point lower than the mouth of the port and arranged to deflect the flame and

gases and commingle them with the heated air.

3. A heating-furnace having an air-heating chamber in the roof of its fire-chamber, a port leading therefrom into the throat of the furnace, a depending offset extending in front of and to a point lower than the mouth of the port, and a bridge-wall having at its upper end a deflecting-lip which projects into the fire-chamber.

In testimony whereof I have hereunto set my hand.

ROBERT LOUDON WALKER.

Witnesses:

F. E. GAITHER,

H. M. CORWIN.