E. A. LESLIE AND H. M. BRIGHAM.

FURNACE FOR HEATING METALS.

APPLICATION FILED NOV. 18, 1918.

1,382,002. **Patented June 21, 1921.**

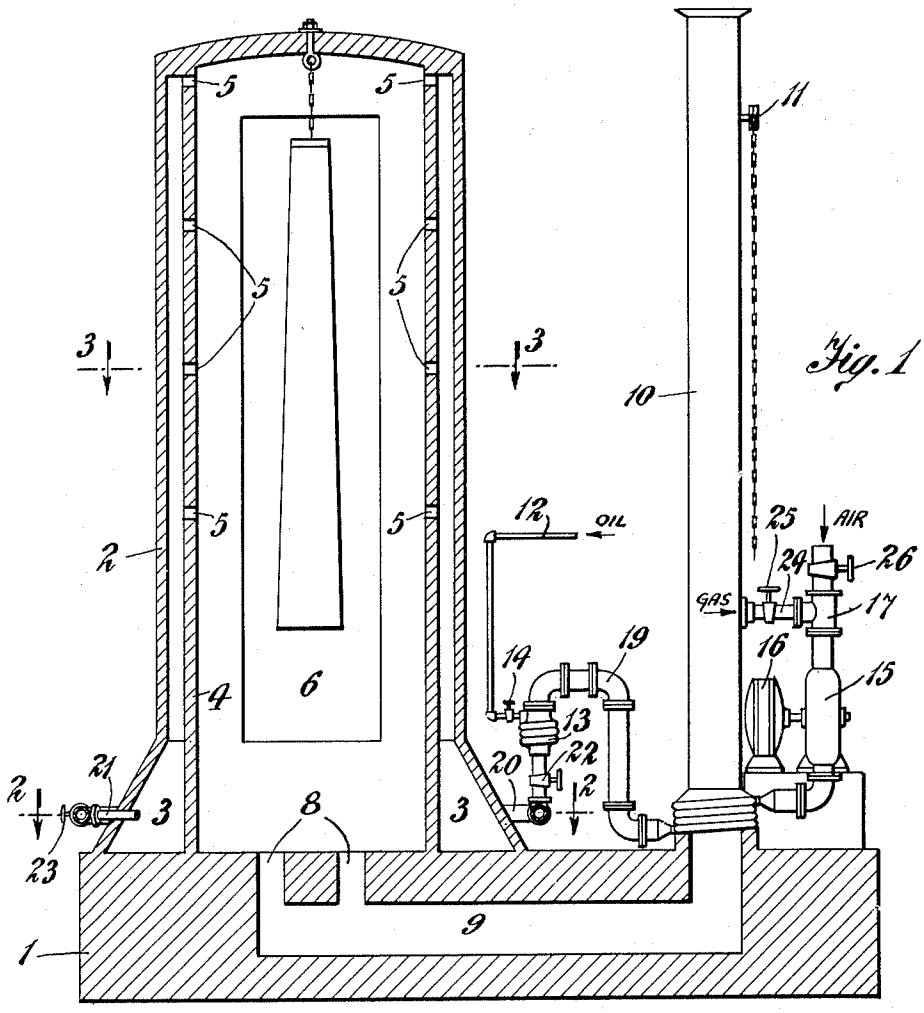


Fig. 1

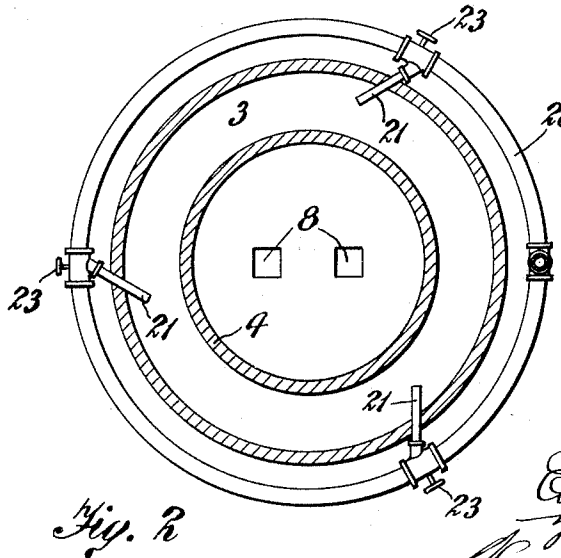


Fig. 2

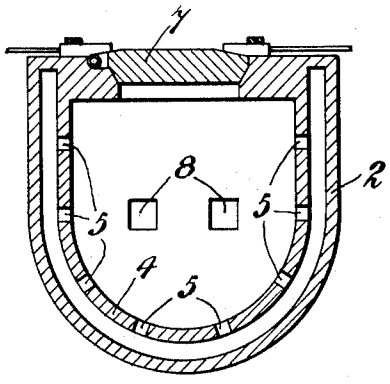


Fig. 3

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FURNACE FOR HEATING METALS.

1,382,002. Specification of Letters Patent. Patented June 21, 1921.

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To all whom it may concern:

Be it known that we EDWARD A. LESLIE and HENRY M. BRIGHAM, both citizens of the United States, and residents of the borough of Brooklyn, in the city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Furnaces for Heating Metals, of which the following is a specification.

The object of our invention is to provide a furnace for heating metals, by which the temperature, volume and duration of combustion is accurately controlled and the products of combustion shall contain a minimum of free oxygen. The other objects of our invention will be more fully set forth in the following specification.

Our furnace is adapted for heating metals, and particularly for heating steel which is to be tempered.

Similar numerals indicate similar parts in all the figures.

Of the accompanying drawings Figure 1 represents a vertical section of a furnace embodying our invention. Fig. 2 is a sectional view on the line 2—2 of Fig. 1. Fig. 3 is a sectional view on the line 3—3 of Fig. 1.

Upon the base or foundation 1 is erected an outer shell or wall 2 of fire brick or other suitable material, flared at the lower end to form a combustion chamber 3. Our furnace is also provided with an inner wall 4 also of fire brick or other suitable material, which with the wall 3 form an annular distributing chamber 4^a into which the products of combustion are discharged from the combustion chamber 3. As the products of combustion pass from the combustion chamber 3 into the distributing chamber 4^a, they are intimately intermingled and reduced to a substantially uniform temperature. The ports 5 through which the products of combustion are distributed to the heating chamber 6, are so arranged in the wall 4 that a substantially even temperature will be maintained throughout the chamber and the metal supported or otherwise maintained therein will be uniformly subjected to contact with products of combustion of substantially uniform temperature and gradually and uniformly raised to the desired temperature as the gases pass down through the chamber 6 and through the ports 8 in the base 9 into the stack 10 from which they are discharged into the atmosphere. A door 7 provides access to the chamber 6. The stack 10 is provided with a damper 11. As illustrated our furnace is adapted to burn liquid fuel, which is supplied by a pipe 12 to a mixing chamber 13, the flow of fuel being regulated by a cock 14. A fan 15, driven by a motor 16, draws air through the pipe 17 and forces it through the heater 18 where it is heated to the desired temperature by the waste products of combustion. Thence it passes on through a pipe 19 into the mixing chamber 13 in which the liquid fuel is vaporized and thoroughly mixed with air. The mixture then passes through the pipe 20 and is discharged into the combustion chamber 3 through the nozzles 21. The flow of mixture through the pipe 20 is regulated by the cock 22 and the flow through the respective nozzles 21 is regulated by cocks 23. A pipe 24 provided with a cock 25 communicates between the stack 10 and the pipe 17. The pipe 17 is also provided with a damper 26.

The temperature and duration of the combustion may be regulated by the cock 25 and the damper 26. The mingling of the waste products of combustion from which free oxygen has been practically eliminated, serves to dilute the air supplied and causes the combustible gases to hunt for the oxygen and thereby retards combustion and lowers the temperature of the products of combustion while at the same time increasing their volume. It is apparent that the temperature and rate of combustion may be readily and accurately varied by varying the proportion of waste products of combustion supplied through the manipulation of the cock 25 and the damper 26. The ports 5 are of such capacity and are so arranged as to maintain a substantially even temperature throughout the chamber 6. This construction renders it possible to quickly bring large or small objects which have been introduced into the heating chamber 6, to the desired temperature by subjecting them to contact with a large volume of the products of combustion of comparatively low temperature and this without danger of overheating or subjecting any portion of the object to be heated to an undue temperature.

Having described our invention we claim:

1. A furnace for heating metals comprising in combination a combustion chamber, a heating chamber, an annular distributing chamber surrounding the heating chamber into which the gaseous products of combus-

tion are discharged from the combustion chamber, ports in the inner wall of the distributing chamber through which the gaseous products of combustion are distributed into said heating chamber, means for supplying fluid fuel and air and a diluent gas to the combustion chamber, and means for varying the proportions of the air and diluent gas so supplied.

2. A furnace for heating metals comprising in combination a combustion chamber, a heating chamber, an annular distributing chamber surrounding the heating chamber into which the gaseous products of combustion are discharged from the combustion chamber, ports in the inner wall of the distributing chamber through which the gaseous products of combustion are distributed into said heating chamber, means for supplying fluid fuel and air and gaseous products of combustion to the combustion chamber and means for varying the proportions of the air and diluent gas so supplied.

Signed at New York city in the county of New York and State of New York, this 15th day of November, 1918.

EDWARD A. LESLIE.
HENRY M. BRIGHAM.

Witnesses:
MARGARET A. HECK,
PAUL R. JAMES.