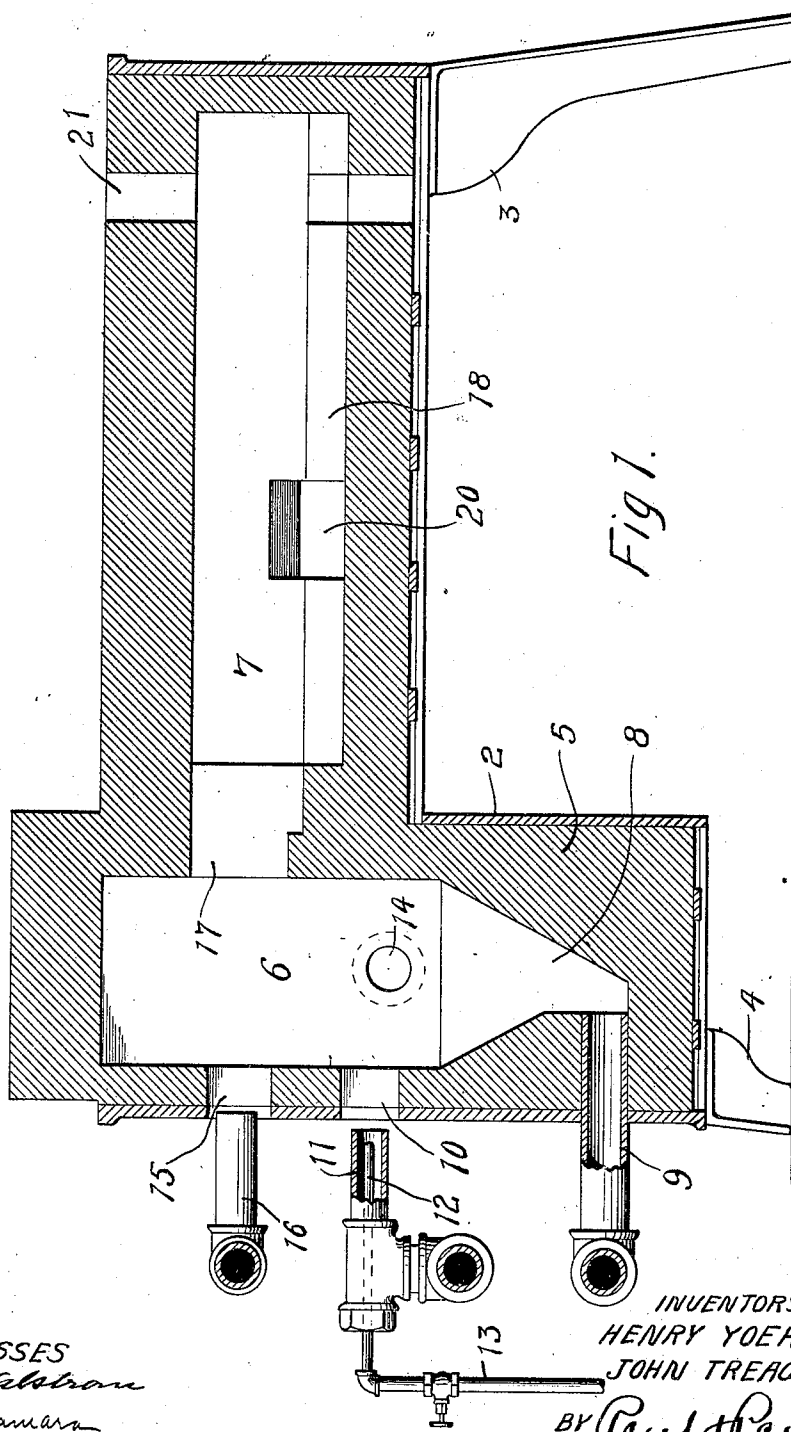


No. 828,081.

PATENTED AUG. 7, 1906.

H. YOERG & J. TREACY.  
OIL BURNING FURNACE.  
APPLICATION FILED JULY 31, 1905.

2 SHEETS—SHEET 1.



WITNESSES  
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*R. M. Mammara*

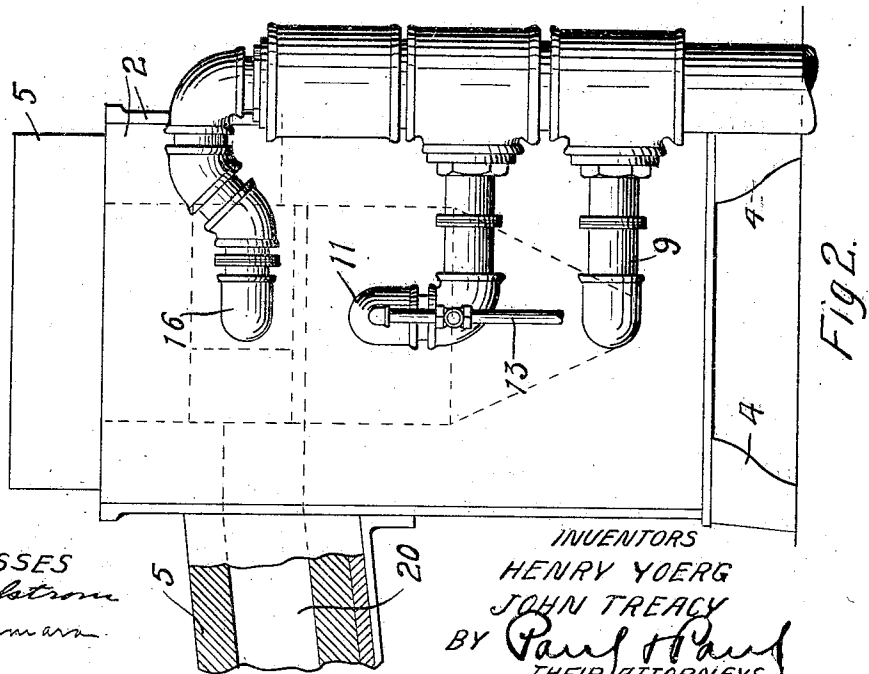
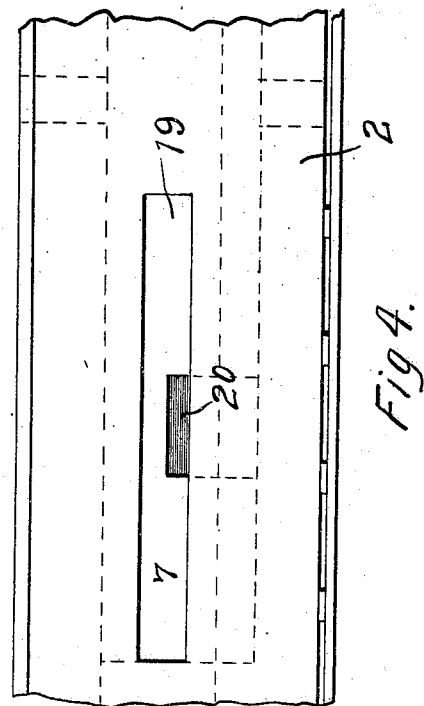
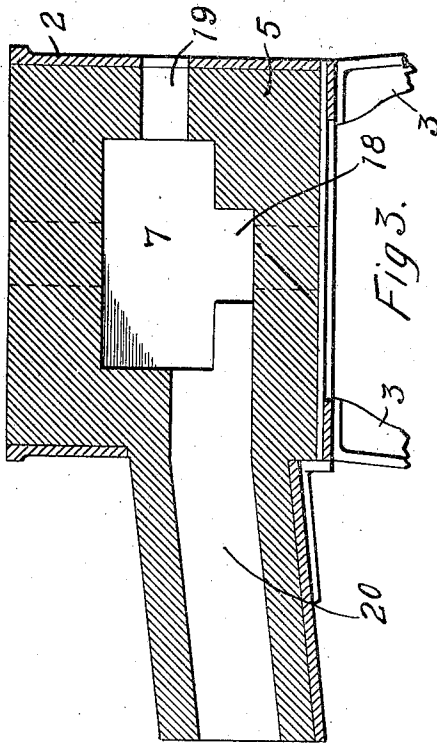
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

HENRY YOERG AND JOHN TREACY, OF ST. PAUL, MINNESOTA.

## OIL-BURNING FURNACE.

No. 828,081.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed July 31, 1905. Serial No. 271,948.

*To all whom it may concern:*

Be it known that we, HENRY YOERG and JOHN TREACY, of St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Oil-Burning Furnaces, of which the following is a specification.

The object of our invention is to provide for a more complete combustion of the oil than usually takes place in a furnace of this kind.

A further object is to provide means for utilizing all the heat and prevent it from escaping prematurely.

A further object is to effect a considerable saving in the consumption of oil and reducing the time usually required for heating the material in the furnace.

A further object is to provide a furnace which will be very efficient, using a minimum of oil to obtain a maximum of heat; and a still further object is to provide a furnace of simple and economical construction and one in which all parts of the furnace, and particularly the oil-burner, are exposed and easily accessible.

The invention consists generally in providing a furnace with a vertical combustion-chamber having a centrally-arranged oil-burner and a triple air-blast, one entering the lower part of the combustion-chamber below the burner and another being located above the burner opposite the passage to a horizontal heating-chamber, and the third inclosing the burner.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical longitudinal section of a furnace embodying our invention. Fig. 2 is an end elevation of the same. Fig. 3 is a transverse vertical section. Fig. 4 is a side elevation of the heating-chamber, showing the opening therein through which the articles to be heated are inserted into the chamber.

In the drawings, 2 represents a suitable casing having legs 3 and 4 and a lining 5 of fire-brick or other refractory material. In one end of the casing a vertical combustion-chamber 6 is formed, communicating near its upper end with a horizontal heating-chamber 7. The combustion-chamber has a tapered lower end 8 communicating with a

horizontal pipe 9, through which an air-blast is introduced into the chamber. Above the pipe 9 and near the middle of the combustion-chamber is an opening 10 in the wall of said chamber, and opposite said opening on the outside is a pipe 11, inclosing an oil-burner 12, connected by a pipe 13 with a supply of oil under compression. The oil is sprayed through this burner into the combustion-chamber and against the wall of said chamber opposite the opening 10 and is inclosed by the air-blast discharged from the pipe 11. An opening 14 is provided in the wall of the combustion-chamber on substantially the same level as the oil-burner to allow access to said chamber for the purpose of igniting the oil. An opening 15 is provided in the wall of the combustion-chamber above the opening 10, and a pipe 16 is arranged opposite said opening 15 and in line with the throat 17 of the heating-chamber 7. An air-blast is discharged through the pipe 16 into the combustion-chamber and directs the flame into the heating-chamber, supplying oxygen to complete combustion at that point and insuring the projection of the flame the entire length of the heating-chamber. A central longitudinal depression 18 is provided in the heating-chamber, and an opening 19 is formed in the wall of said chamber and the casing 2 on one side to allow the insertion of the material to be heated into the furnace, and opposite the opening 19 near the middle of the heating-chamber a draft-flue 20 is provided to draw the flames away from the side of the furnace on which the operator is standing. A flue 21 is also provided near the end of the horizontal heating-chamber.

In the operation of the furnace the oil is sprayed through the burner 12 into the combustion-chamber, and striking the opposite wall of the chamber will fly back in a fine spray, and being ignited will be directed by the blast from the bottom of the combustion-chamber to the upper part of said chamber, and being thoroughly mingled with the air-blast discharged from the pipe inclosing the burner and also from the pipe at the bottom of the combustion-chamber an almost complete combustion of the oil will take place. As the flames ascend to the upper part of the combustion-chamber they will meet the blast of air from the pipe 16 and be directed into the throat of the heating-chamber. The air-blast from the pipe 16 will mingle with the burning oil and insure the complete combustion.

tion of the same before entering the heating-chamber and produce a clear white flame of intense heat within the heating-chamber. The oil-burner and the air-blast pipes being  
 5 located outside the combustion-chamber are exposed and easily accessible for the purpose of cleaning or repairs. The burner inclosed by the blast-pipe 11 will act as an atomizer and deliver the oil to the combustion-cham-  
 10 ber in a vaporized form or as a very fine spray and insure the rapid mingling of the oil with the air and a practically complete combustion.

We claim as our invention—

15 1. A furnace having a vertical combustion-chamber and a horizontal heating-chamber communicating therewith, an air-blast communicating with the lower end of said combustion-chamber, an oil-burner connected  
 20 with a supply of oil under pressure and adapted to project it into said combustion-chamber above said air-blast, a second air-blast communicating with the upper part of said combustion-chamber above said oil-burner  
 25 and opposite the passage leading to said heating-chamber and adapted to project the flame horizontally through said heating-chamber, substantially as described.

30 2. A furnace having a vertical combustion-chamber and a horizontal heating-chamber communicating therewith, an air-blast pipe communicating with the lower end of said combustion-chamber, an oil-burner connect-  
 35 ed with a supply of oil under pressure and arranged to project the oil in a fine spray into and against the wall of said chamber above said blast-pipe, an air-blast pipe inclosing said burner and arranged to project a blast of  
 40 air into said chamber to mingle with the oil from said burner, and a third blast-pipe communicating with the upper part of said chamber and on substantially the same level as  
 45 said heating-chamber, substantially as described.

50 3. An oil-burning furnace comprising a vertical combustion-chamber having openings in its side walls one above another, one of said openings being near the middle of said combustion-chamber and the other near the top  
 55 of the same, a horizontal heating-chamber communicating with the upper part of said combustion-chamber opposite the upper opening therein, an air-blast pipe communi-  
 cating with the lower portion of said combustion-chamber, an oil-burner communicating

with a source of oil under pressure and arranged opposite the opening near the middle of said combustion-chamber to project and  
 60 spray the oil therethrough, and a blast-pipe arranged opposite the upper opening in said combustion-chamber and opposite the throat of said heating-chamber and adapted to pro-  
 65 ject a blast of air into said combustion-chamber to mingle with the burning oil and direct the flame into and through said heating-chamber.

4. An oil-burning furnace having a vertical combustion-chamber provided with openings  
 70 in its side walls one above another, an opening being near the middle of said combustion-chamber and the other near the top of the same, a horizontal heating-chamber commu-  
 75 nicating with the upper portion of said combustion-chamber, a blast-pipe leading into the lower part of said combustion-chamber, an oil-burner located outside of said combustion-chamber opposite the opening near the  
 80 middle thereof and communicating with a supply of oil under pressure, a blast-pipe inclosing said burner and also located outside of said chamber, and a third blast-pipe also  
 85 located outside of said chamber and arranged opposite the opening in the upper wall thereof and adapted to direct a blast of air into the  
 90 upper part of said chamber to mingle with the burning oil and complete combustion thereof and direct the flame into and through said heating-chamber.

5. An oil-burning furnace comprising a suitable casing and a lining of refractory material therefor, said casing having an upright combustion-chamber in one end thereof pro-  
 95 vided with a substantially conical lower end, a blast-pipe communicating with said conical end, an oil-burner communicating with a supply of oil under pressure and adapted to project the oil in a fine spray into said chamber, an air-blast pipe inclosing said burner, a  
 100 third air-blast pipe communicating with the upper part of said combustion-chamber, and a horizontal heating-chamber also communicating with the upper part of said combustion-chamber opposite said third air-blast  
 105 pipe, substantially as described.

In witness whereof we have hereunto set our hands this 26th day of July, 1905.

HENRY YOERG.  
 JOHN TREACY.

Witnesses:

RICHARD PAUL,  
 C. MACNAMARA.