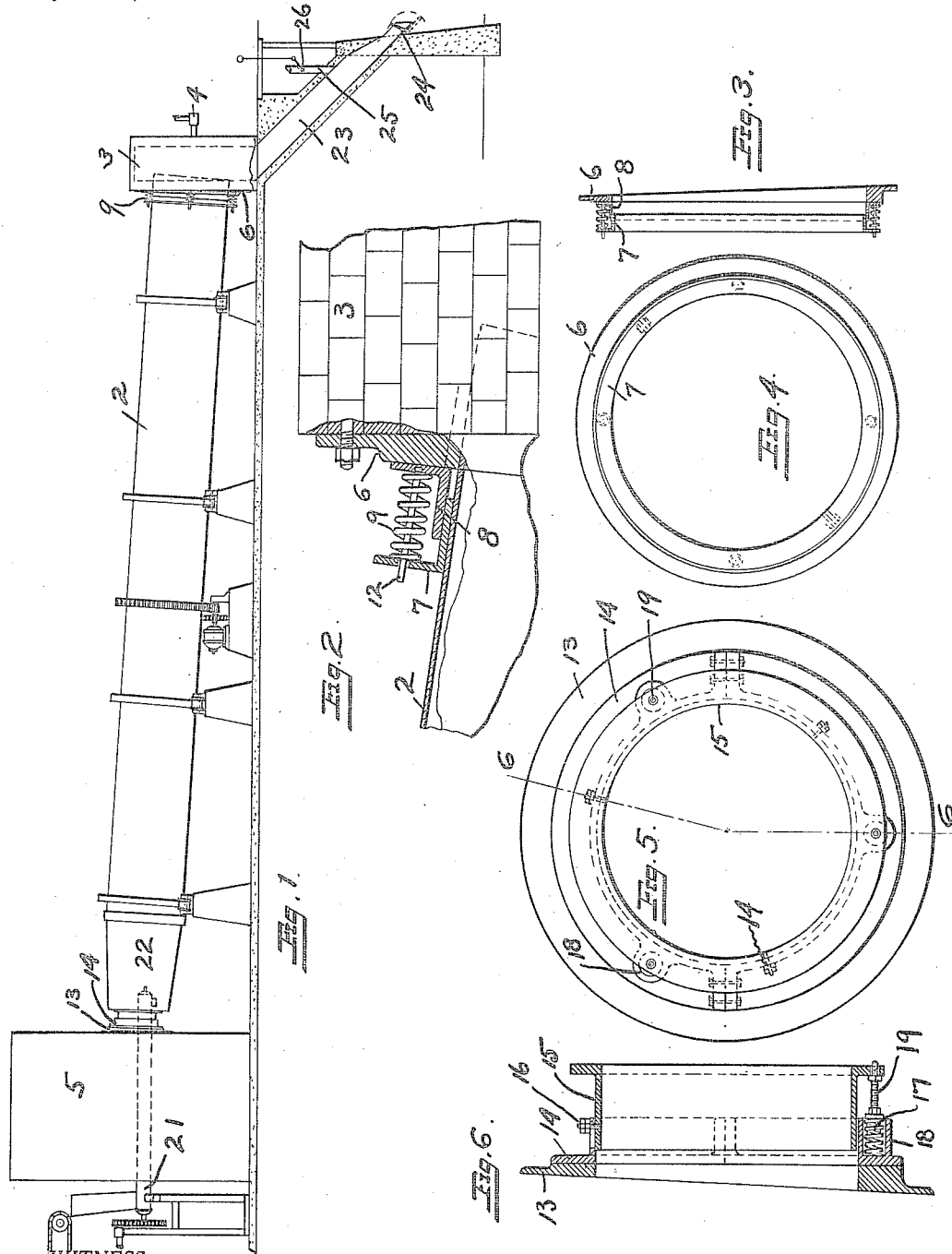


H. W. GOULD.
ROASTING FURNACE.
APPLICATION FILED MAY 29, 1918.

1,319,700.

Patented Oct. 28, 1919.



WITNESS
J. H. Morgan

INVENTOR.
HENRY W. GOULD.
BY *White & Post*
his ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY W. GOULD, OF SAN FRANCISCO, CALIFORNIA.

ROASTING-FURNACE.

1,319,700.

Specification of Letters Patent.

Patented Oct. 28, 1919.

Application filed May 29, 1918. Serial No. 237,310.

To all whom it may concern:

Be it known that I, HENRY W. GOULD, a citizen of the United States, and a resident of the city and county of San Francisco, State of California, have invented a certain new and useful Roasting-Furnace, of which the following is a specification.

The invention relates to roasting furnaces for ore or other minerals and particularly furnaces of the rotary type.

An object of the invention is to provide means for controlling the air entering the furnace.

Another object of the invention is to provide means for transferring heat from the material discharged from the furnace, to the air entering the furnace.

The invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description where I shall outline in full, that form of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. In said drawings I have shown one specific form of the furnace of my invention, but it is to be understood that I do not limit myself to such form, since the invention, as expressed in the claims, may be embodied in a plurality of forms.

Referring to said drawings:

Figure 1 is a side elevation of the furnace of my invention.

Fig. 2 is a detail, partly in section, showing the connection between the rotary kiln and the fire box.

Fig. 3 is a longitudinal section through the sealing rings at the lower end of the kiln.

Fig. 4 is an elevation of the rings shown in Fig. 3.

Fig. 5 is an elevation of the sealing rings at the upper end of the kiln.

Fig. 6 is a cross section taken on the line 6-6, Fig. 5.

The furnace of my invention comprises an inclined rotary kiln 2, suitably lined and suitably supported and provided with suitable means for rotating it. At its lower end the kiln extends into the fire box 3 which may be constructed for burning wood or coal, or which may be provided with an oil fuel burner 4 for directing a flame into the kiln. At its upper end the kiln is connected to dust chamber or collecting chamber 5,

into which the products of combustion and gases and vapors produced in the kiln pass. Means are provided for producing substantially air tight joints between the kiln and the fire box and chamber 5, so that the air which enters the kiln may be controlled. Secured to the face of the fire box and surrounding the kiln 2 is a face ring 6 having a face perpendicular to the axis of rotation of the kiln. Secured to the kiln is an angle ring 7 and engaging the angle ring is a second angle ring 8 contacting with the face ring 6. The ring 8 is held in tight contact with the face ring 6 by the springs 9, which also permit a lateral movement of the ring 8 with respect to the kiln. The two angle rings form a substantially tight sliding fit and the ring 8 forms a substantially tight running fit with the face ring, so that the joint between the kiln and the fire box is substantially air tight. Bolts 12 secured to the ring 8 and extending through apertures in ring 7 cause said rings to rotate together.

Secured to the face of the chamber 5 and surrounding the upper end of the kiln is a face ring 13 having its face perpendicular to the axis of rotation of the kiln. Rotatably engaging and forming a tight running fit with the face ring 13, is an angle ring 14 which is rotatable with and movable laterally with respect to the ring 15, secured to the upper end of the kiln. Bolts 16 engaging the ring 15 and extending through lateral apertures in the ring 14 produce rotation and permit lateral movement. Springs 17 arranged in seats 18 on the ring 14 and engaging adjustable abutments 19 on the ring 15, hold the ring 14 pressed tightly against the face ring 13, forming a substantially air tight joint between the kiln and the chamber 5.

The ore or material to be roasted is fed into the upper end of the kiln through the feed conduit 21 which extends through the chamber 5. At the upper end the kiln is provided with a conical section 22 which produces a steeper incline than the remaining portion of the kiln, so that the material fed is rapidly moved from the inlet end by the rotation of the kiln.

Arranged below and communicating with the fire box is a chute or chamber 23 into which the hot material from the kiln discharges, and the discharge of material from the chute is controlled by a gate 24. This chute is kept filled or partially filled with

the hot material and the air for completing combustion of the fuel enters the fire box through this chute, so that the air is heated to a very high degree before it enters the
5 fire box. In this manner substantially all of the heat in the discharged material is transferred to the air, thereby producing a large saving in heat. The air enters the chute through the conduit 25 which is provided with a valve 26, so that the amount
10 of air entering the chute may be controlled.

I claim:

1. A furnace comprising a rotatable kiln, a fire box arranged at one end of said kiln,
15 means for sealing the joint between the fire box and the rotatable kiln, a chamber connected to said fire box into which hot material from the kiln discharges and means for admitting air into the hot material in
20 said chamber.

2. A furnace comprising a rotatable kiln substantially sealed against the entrance of extraneous air and means for passing air in controllable quantity into said kiln
25 through a body of hot material discharged from said kiln.

3. A furnace comprising a rotatable inclined kiln, a fire box arranged at the lower

end of said kiln, means for sealing the joint between the fire box and the kiln, a chamber
30 arranged at the upper end of the kiln, means for sealing the joint between said chamber and kiln, a chamber arranged to receive hot material discharged from said kiln, and
35 means for passing air in controllable quantities through said hot material and into the fire box.

4. A furnace comprising an inclined rotary cylindrical kiln, the upper end of said kiln being conical, means for introducing material into said conical end and means
40 for introducing heat into the lower end of the kiln.

5. A furnace comprising a rotatable kiln, a fire box associated with the kiln and having an opening through which hot material from the kiln is discharged and means
45 for introducing air into the fire box through the discharge opening.

In testimony whereof, I have hereunto set
50 my hand at San Francisco, California, this 16th day of May, 1918.

HENRY W. GOULD.

In presence of—
H. G. Prostr.