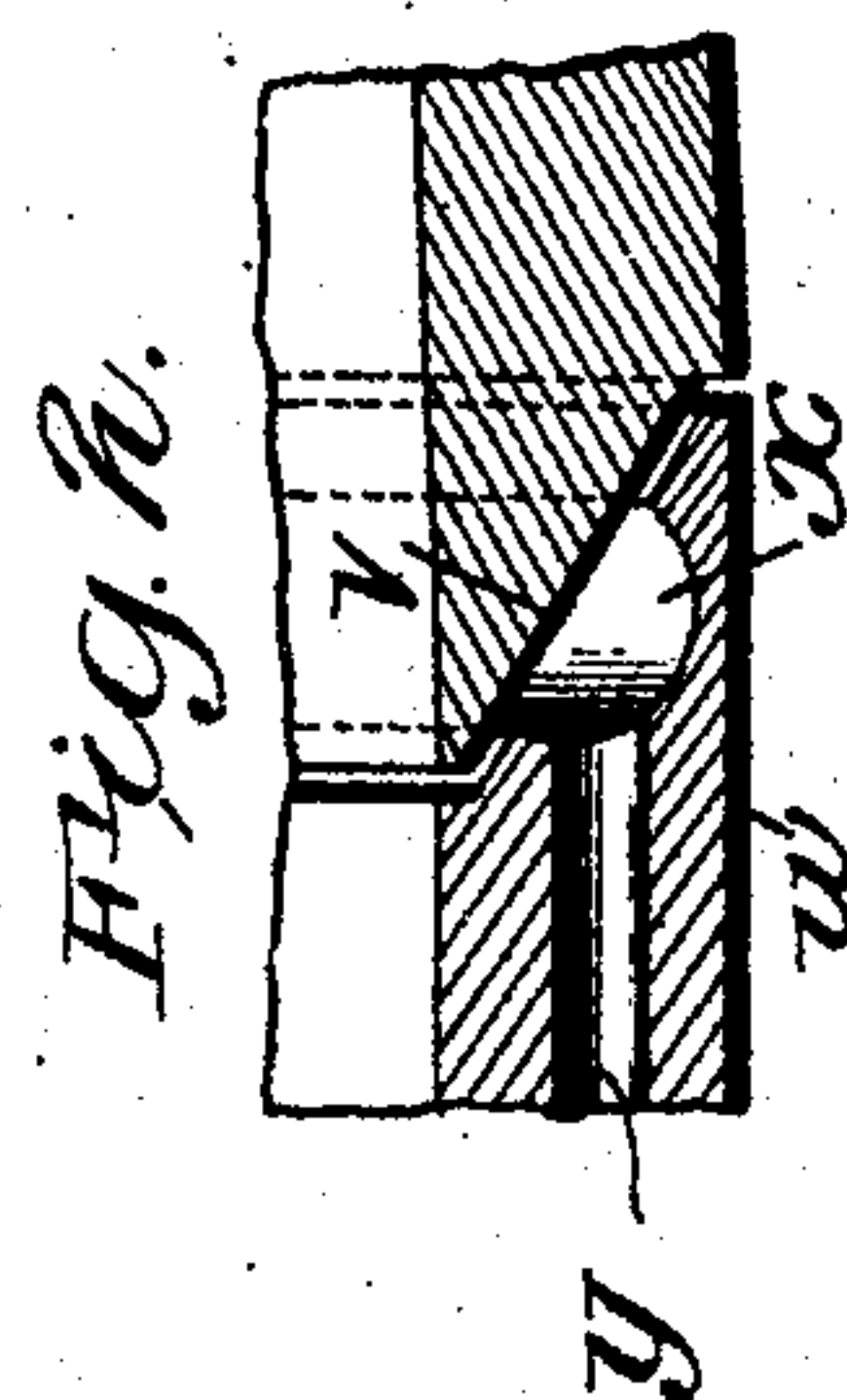
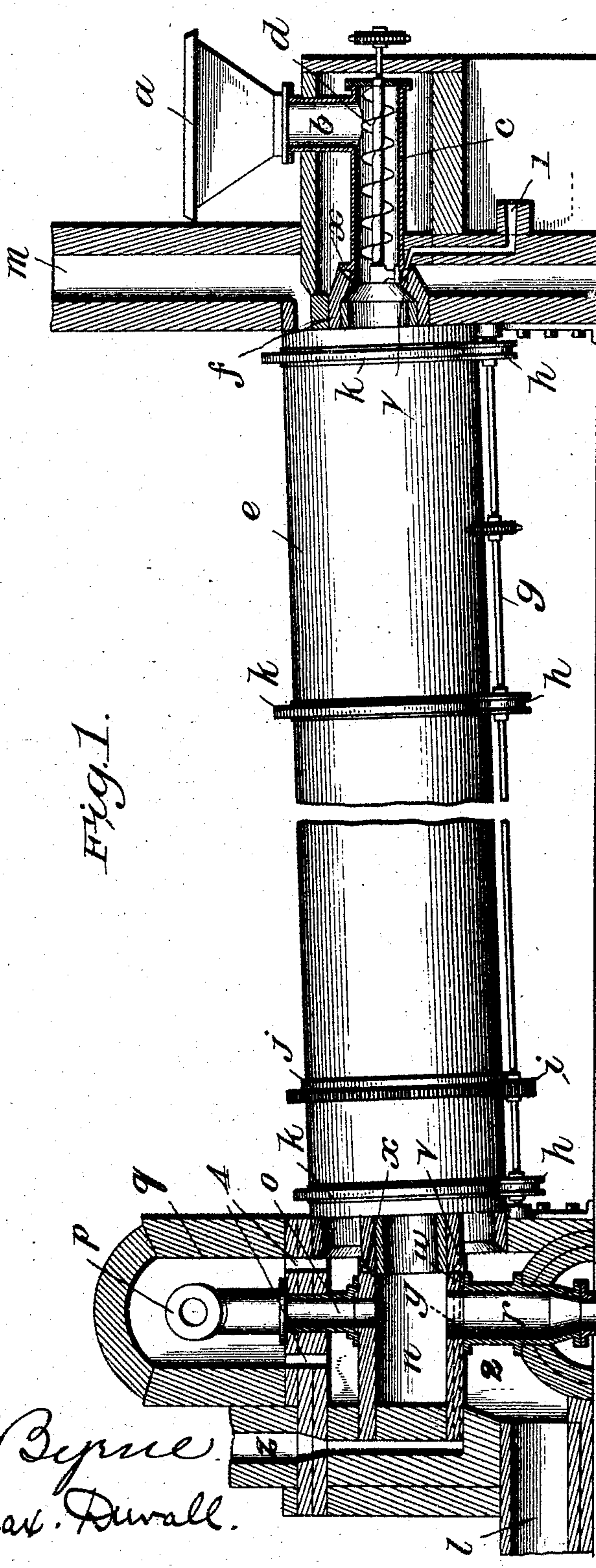


No. 781,546.

PATENTED JAN. 31, 1905.

S. PEACOCK.
GAS SEAL FURNACE.
APPLICATION FILED AUG. 8, 1904.



Witnesses

Witnesses
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UNITED STATES PATENT OFFICE.

SAMUEL PEACOCK, OF IOLA, KANSAS.

GAS-SEAL FURNACE.

SPECIFICATION forming part of Letters Patent No. 781,546, dated January 31, 1905.

Application filed August 8, 1904. Serial No. 219,979.

To all whom it may concern:

Be it known that I, SAMUEL PEACOCK, a citizen of the United States, residing at Iola, in the county of Allen and State of Kansas, have
 5 invented certain new and useful Improvements in Gas-Seal Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable
 10 others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in gas-sealed furnaces; and the object of my invention is to provide an efficient gas seal whereby air may be prevented from entering
 15 a furnace and injuriously affecting the material under treatment therein.

My invention may be applied to various forms of a furnace; but I have shown it in the drawings as a rotary roasting-furnace
 20 adapted especially for the treatment of zinc ores.

With the objects stated in view my invention consists in the construction and combinations of parts, as hereinafter described and
 25 claimed.

In the accompanying drawings, Figure 1 is a side view, partly in section, of a furnace, showing one embodiment of my invention; and Fig. 2 is a cross-section, on an enlarged
 30 scale, of the gas seal proper.

a represents a hopper in which the powdered ore, mixed, if desired, with any suitable reducing chemical agent, is fed. The ore falls through a pipe *b* into a nearly-horizon-
 35 tal pipe *c*, in which is a screw conveyer *d*, which is slowly revolved by a belt passing over the shaft thereof. My intention is that the ore itself shall be fed in such quantities as to practically keep the tube *b* full, thereby
 40 preventing the escape of gases therefrom.

e represents the inclined shell of a revolving rotary furnace, although, as said before, my invention can be applied to any form of furnace.

f represents the furnace itself, and it is separated from the shell by an annular passage, being supported in said shell by any suitable means, such as blocks of fire-brick or any suitable material.

50 Preferably the shell *e* and furnace *f* are

lined with fire-brick, and the furnace *f* may be provided with any desired stirring means, such as is afforded by having some of the fire-bricks which line the same project above the others, for example.

g represents a shaft provided with grooved rollers *h* and a driving-pinion *i*, which meshes with an annular gear-wheel *j* upon the furnace. In the grooved rollers *h* engage flanges
 60 *k* on the shell *e* in the usual manner. Preferably two sets of grooved rollers are used, one on each side of the shell *e* near the bottom.

l represents a flue leading from a furnace, from which the flame or hot products of
 65 combustion pass into the space 2 and thence inside the shell around the furnace and out through the flue *m* into the chimney.

n represents a stationary part of the end structure into which the roasted ore is delivered, whereupon it falls down through the pipe *r* and is delivered by the screw conveyer
 70 *s* into the inclined pipe *t*, and then a second screw conveyer *u* forces it up through another inclined pipe, this construction being
 75 used in order to form a tight seal to prevent air entering through the pipe *r*. In case zinc ore is treated it is the ashes and waste that pass out through the pipe *r*, the zinc being
 80 reduced in the furnace *f* and volatilized and passing up through the pipe *o* and along through the pipe *p*, which is incased in the structure *q* to prevent too rapid cooling. The
 85 volatilized zinc is led off and condensed in the usual way.

If desired, a gas seal similar to that hereinafter described may be applied to the discharge-pipe 3; but usually this will not be necessary.

Preferably each end of the furnace *f* is tapered, as shown at *v* in Fig. 2, and enters a tapered stationary portion *w*, which is provided with a pipe *y*, which pipe delivers into an annular enlargement *x*. A pipe *z* delivers neutral gases—such as nitrogen, carbonic-acid
 95 gas, or carbonic oxid—into the annular space *x* under pressure, and it escapes in both directions from said space, thereby effectually preventing any air from entering the furnace. The construction on the feed end of the fur- 100

nace is substantially the same as that on the delivery end. The gases which pass through the pipes z and 1 may be obtained in any suitable manner—as, for instance, they may be drawn off from the flue m or from around the pipe p in the casing q .

4 represents connections between the space 2 and the space around the pipe p , so that the pipe p may always be kept hot.

10 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of a rotary furnace and means for rotating the same, with a gas seal for each end of said furnace, consisting of a stationary part arranged in proximity to said furnace, and provided with a pipe and an annular channel located near the end of said furnace, whereby gas under pressure may be forced in both directions around the end of said furnace, substantially as described.

2. The combination of an inclined rotary furnace and means for rotating the same, said furnace being provided with tapered ends and a gas seal for each end of said furnace consisting of an inclined part arranged in proximity to said tapered ends, said inclined part being

provided with an annular recess and a pipe connecting therewith, whereby gas under pressure may be forced out through said annular recess in both directions around the end of said furnace, substantially as described. 30

3. The combination of an inclined rotary furnace and means for rotating the same, a hopper and associated means for delivering ore to said furnace, and means for delivering the ashes or roasted ore away from said furnace, both of said feed and delivery means being arranged to prevent the entrance of air, stationary structures at the end of said furnace, means for heating said furnace, and a gas seal for each end of said furnace arranged in proximity to the tapered end thereof, said gas seal consisting of a stationary structure provided with an inclined end, said inclined end being provided with an annular recess and a pipe leading to said recess, substantially as described. 40 45

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL PEACOCK.

Witnesses:

CHAS. H. GAYLORD,
W. C. HARRINGTON.