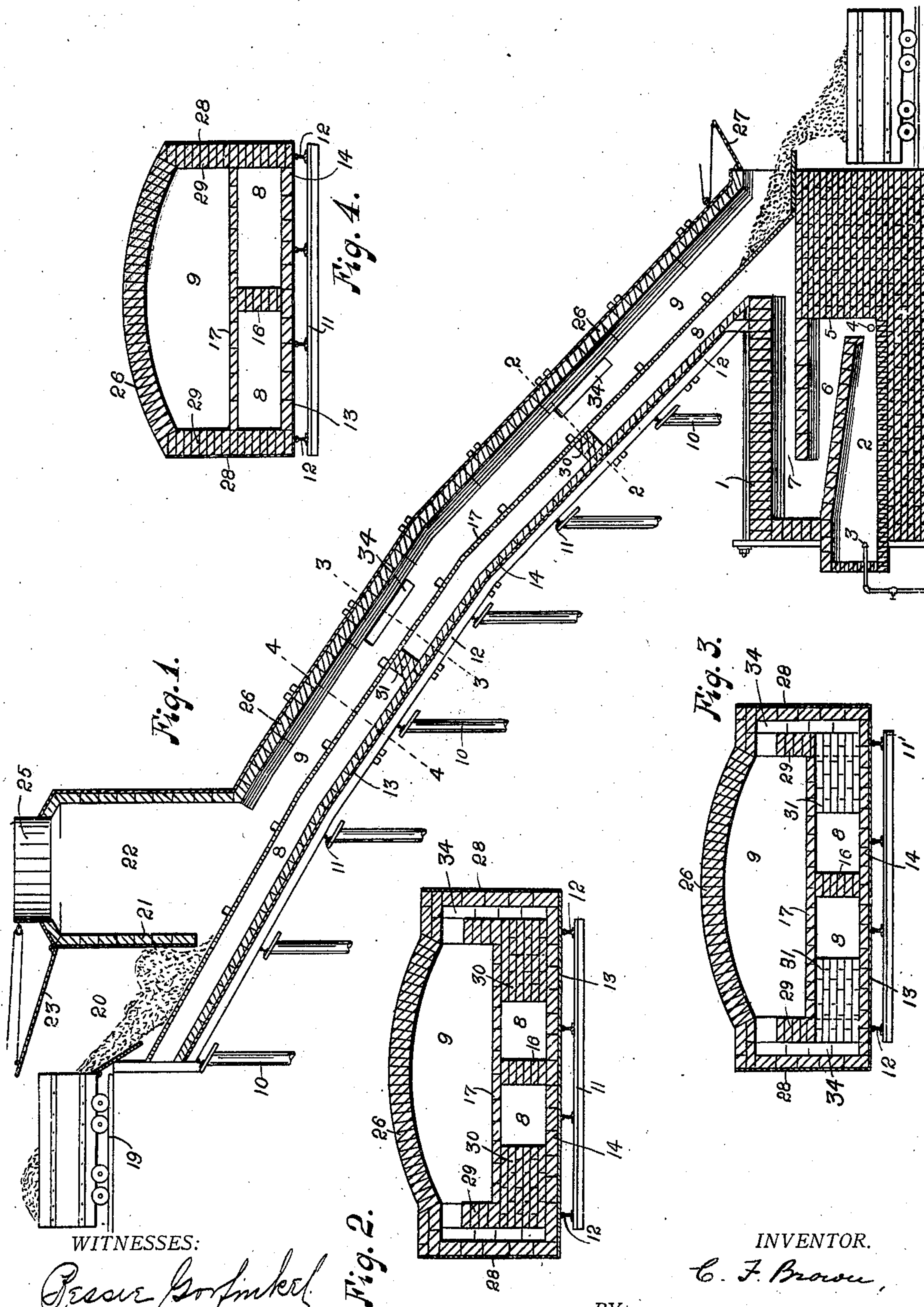


No. 847,399.

PATENTED MAR. 19, 1907.

C. F. BROWN.  
MERCURY RETORT AND FURNACE.

APPLICATION FILED APR. 10, 1906.



WITNESSES:

*Preser Gorfinkel*  
*James P. Coff*

Fig. 2.

BY

INVENTOR.

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# UNITED STATES PATENT OFFICE.

CONRAD F. BROWN, OF SAN JOSE, CALIFORNIA.

## MERCURY RETORT AND FURNACE.

No. 847,399.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed April 10, 1906. Serial No. 310,893.

*To all whom it may concern:*

Be it known that I, CONRAD F. BROWN, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Mercury Retorts and Furnaces, of which the following is a specification.

This invention relates to a mercury retort and furnace to be used with liquid or gaseous fuel, preferably the former, and which can be constructed at much less expense than those heretofore used.

In the accompanying drawing, Figure 1 is a longitudinal vertical section of the furnace, certain parts being shown in side elevation. Figs. 2, 3, and 4 are cross-sections of the lines 2 2, 3 3, 4 4 of Fig. 1.

Referring to the drawing, 1 represents the casing of the furnace proper, having an inwardly-tapering combustion-chamber 2. Into the outer end of said combustion-chamber is admitted the oil-burner 3. For use with said oil-burner there is provided a steam-pipe 4, which extends across the path of the flames from said burner, so that the steam therein is highly heated before passing to said burner. The products of combustion then impinge against a brick wall 5 and are reflected thereby into a passage 6 over the top of the combustion-chamber and thence by a passage 7 into the flue 8. This brick wall 5 prevents the passage of unconsumed carbon commingling with the mercury vapors.

Upon the furnace proper is the lower end of the ore-chute 9, the main part of which is supported by posts 10, erected at suitable intervals, of progressively-increasing heights and centrally supporting cross bars or rails 11. Upon said rails are laid longitudinal rails 12, and upon said longitudinal rails are laid sheets of metal 13. Upon these in turn is supported a layer of brickwork 14. This brickwork forms the lower surface of the flue 8 of the products of combustion, which itself forms the lower compartment of the chute. Dividing the flue into two side compartments is a central longitudinal wall 16, and upon said wall is supported a metal plate 17, which forms the top of the flue 8 and the bottom of the chute 9 for the ore. The ore is fed into this chute from a track 19 at the top, upon which ore-cars can travel to dump the ore into a hopper 20, formed by the top of the chute 9 and the front wall 21 of a vapor-cham-

ber 22, this hopper 20 being closed by a door 23 when the ore is not being fed. The ore fed into said hopper passes down to the chute underneath said front wall 21, the bottom of which is raised a sufficient distance from said chute to permit only a portion of the ore to pass at one time, so that the ore in descending cannot clog in the chute. The slope of the chute increases downward, the slope of the upper portion being about thirty degrees, the lower portion about forty-five degrees, and the intermediate portion about midway between these angles. The top of the chute is covered by brick arches 26, and at the bottom of the chute is a closed door 27, which can be opened from time to time to permit the waste ore to be removed. The top or covering of the chute is extended at the upper end to form with the wall 21 heretofore mentioned a vapor-chamber 22, from the top of which the vapor can pass out by an outlet 25 to any suitable condenser.

The sides of the flue and chute are formed of metallic plates 28, lined with a single layer of brick 29, and at suitable intervals along the flue there are arranged two pairs of abutments 30 31, of brick, extending into the path of the gases. At the sides of the flue in front of said abutments the bricks 29, which form the lining, are removed. The result is that the gases, striking the abutment, pass up from the flue by the opening 34 left by the removal of the bricks into the chute above, and thus mingle with the descending ore. At a suitable interval behind the first pair of abutments is the second pair 31.

The operation of the furnace is as follows: Ore being dumped upon the chute at the upper end gradually descends in the manner described. At the same time the products of combustion pass upward in the flue underneath. The hottest portion of the flue is the lowest, and in this part of the chute the mercury sulfids are completely roasted and the mercury vapor passes up the chute to the vapor-chamber. On arriving at the first pair of abutments 30 part of the gases pass into the intermediate portion of the chute and assist in carrying off the vapors, and after passing the second pair of abutments 31 another part of the products of combustion pass into the chute and further assist in carrying off the vapors. They also dry the ore to prepare it for the vaporization in the lowest portion of the chute.



By providing a succession of abutments 30  
31 and openings 34 at suitable intervals in  
the lengths of the flues and chutes the heat is  
transferred more effectively from the flue to  
5 the chute than when the gases pass into the  
chute directly from the fireplace.

I claim—

1. In a furnace of the character described,  
the combination of a combustion-chamber, a  
10 flue therefor, and a chute for the ore extend-  
ing over said flue, the top of the flue forming  
the bottom of the chute, the walls of the flue  
and chute being formed at suitable intervals  
in their length with passages to permit the  
15 gases to pass from the former to the latter,  
and means for feeding the ore at the top of  
the chute, substantially as described.

2. In a furnace of the character described,  
the combination of a combustion-chamber, a  
flue therefor, and a chute forming the bottom 20  
of the chute, the walls of the flue and chute  
being formed at suitable intervals in their  
length with passages to permit the gases to  
pass from the former to the latter, abutments  
in the flue deflecting the gases into said pas- 25  
sages, and means for feeding the ore at the  
top of the chute, substantially as described.

In witness whereof I have hereunto set my  
hand in the presence of two subscribing wit-  
nesses.

CONRAD F. BROWN.

Witnesses:

H. J. DOUGHERTY,

T. R. DOUGHERTY.