

No. 720,257.

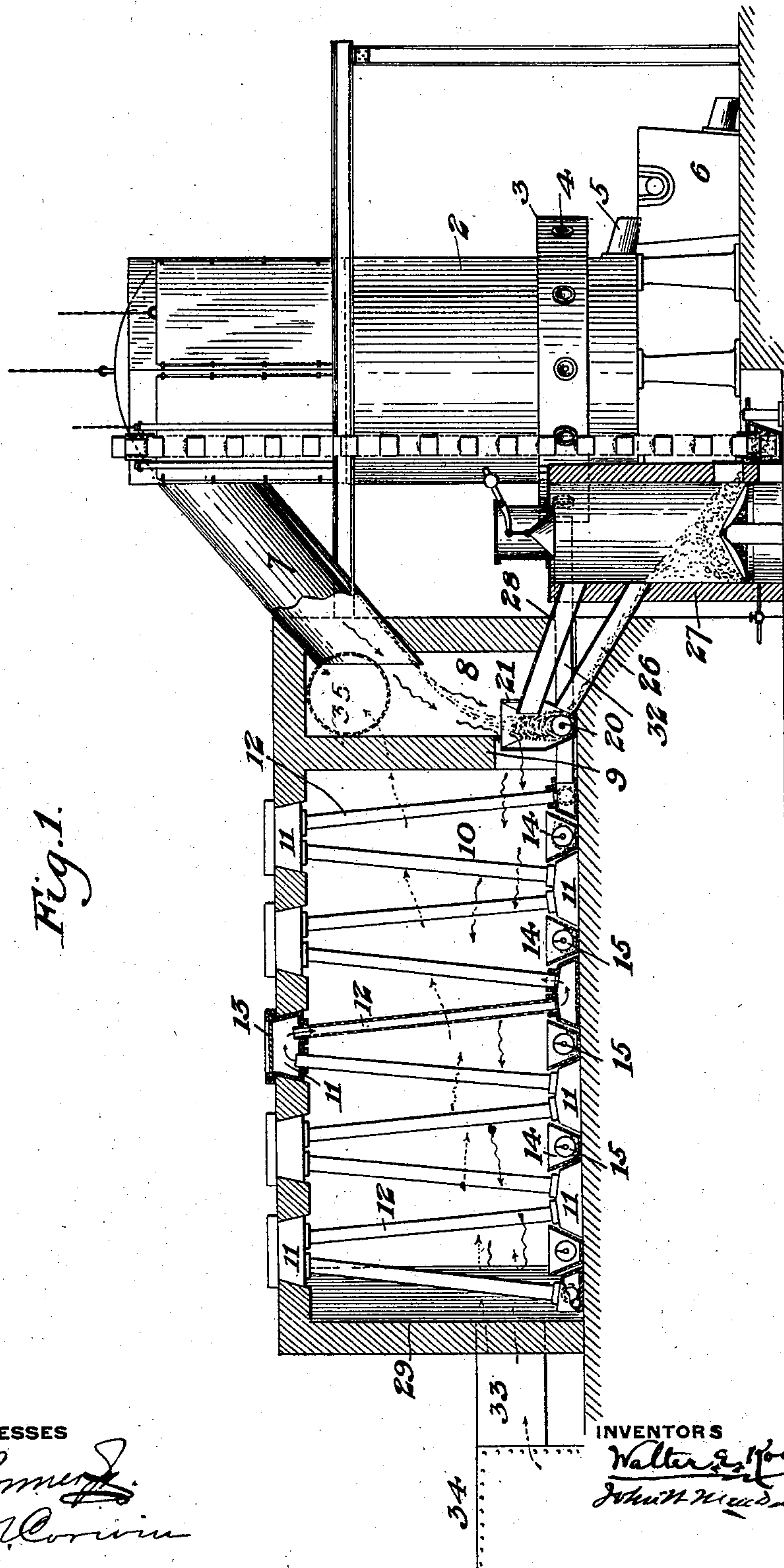
PATENTED FEB. 10, 1903.

W. E. KOCH & J. W. MACDONALD.
COMBINED DUST CATCHER AND BLAST HEATER.

APPLICATION FILED JAN. 30, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

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J. W. McCorvin

INVENTORS

Walter E. Koch
John W. MacDonald

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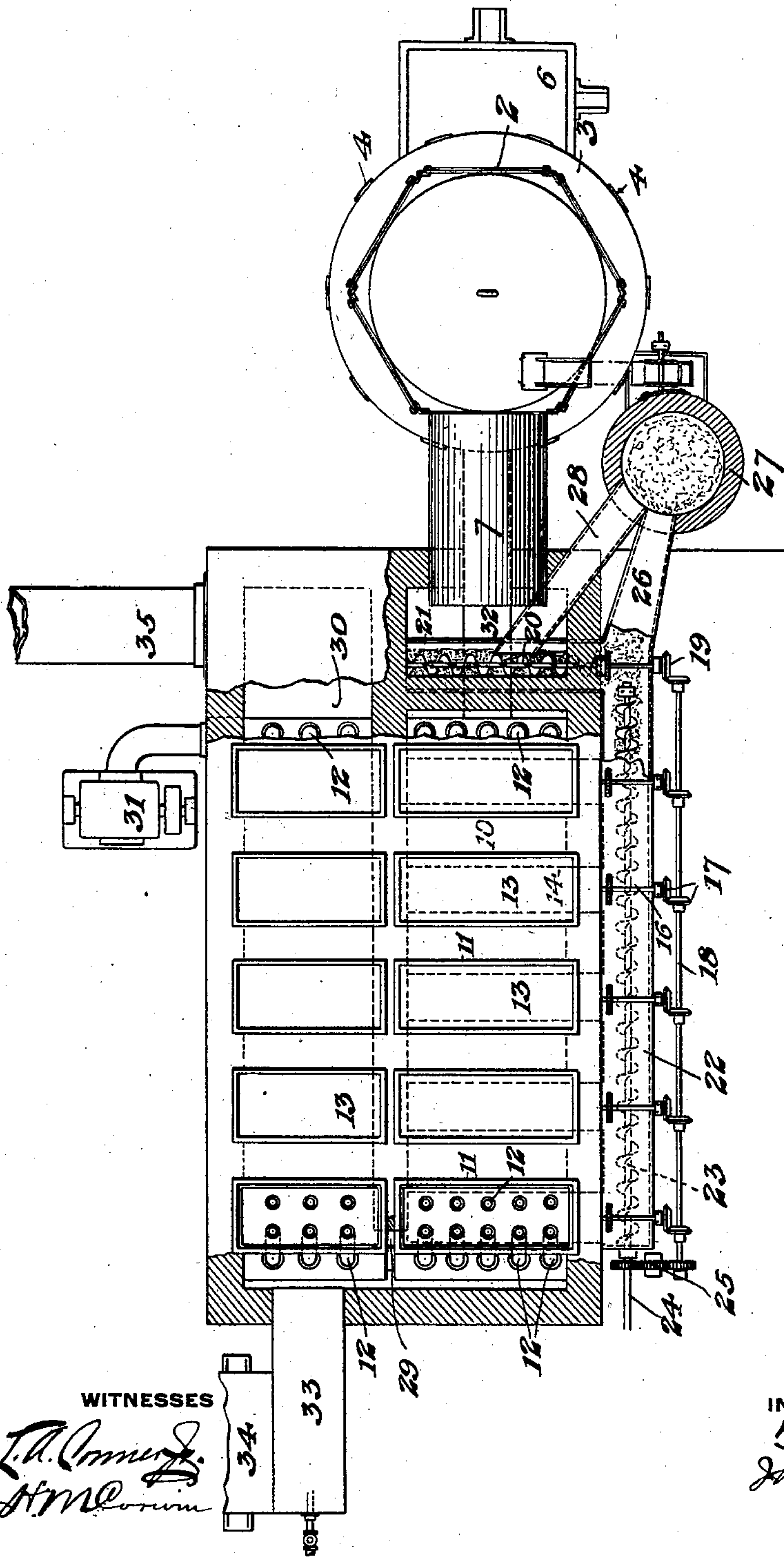
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L. A. Conner
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UNITED STATES PATENT OFFICE.

WALTER E. KOCH AND JOHN W. MACDONALD, OF PITTSBURG, PENNSYLVANIA; SAID KOCH ASSIGNOR TO SAID MACDONALD.

COMBINED DUST-CATCHER AND BLAST-HEATER.

SPECIFICATION forming part of Letters Patent No. 720,257, dated February 10, 1903.

Application filed January 30, 1902. Serial No. 91,842. (No model.)

To all whom it may concern:

Be it known that we, WALTER E. KOCH and JOHN W. MACDONALD, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Combined Dust-Catcher and Blast-Heater, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation of a smelting plant provided with our improved blast-heater and fume-arrester; and Fig. 2 is a top plan view of the same, partly broken away.

Our invention relates to the dust-catchers or fume-arresters from smelting-furnaces in which the air-blast for the smelting-furnace is heated; and its objects are to improve the construction of the dust-catcher and blast-heater, to reduce the friction of the blast in the blast-heating pipes, to utilize the waste products of the smelter and boiler efficiently, and to provide for continuous removal of the deposited materials from the dust-catcher.

In the drawings, 2 represents a smelting-furnace having the usual bustle-pipe 3, twyers 4, outlet 5, and forehearth 6.

7 is the downtake, which leads into chamber 8, having curtain-wall 9. This curtain-wall is in the form of an arch having a lower opening leading into a large chamber 10, having upper and lower transverse boxes 11, arranged alternately and connected by inclined pipes 12. The upper boxes are provided with removable covers 13, which are clamped in place, and the pipes 12 are slid down through the holes in the upper boxes, their lower ends resting in seats surrounding the holes in the lower boxes. After the pipes are inserted asbestos, sal-ammoniac, and metal filings are packed around both of their ends, and if a pipe becomes broken or injured it can easily be drawn up through the upper box, whose cover is removed, and another inserted and secured in the same manner. We have found that by using enlarged boxes at points where the air-currents are changed in direction the friction is greatly reduced and the blast may be forced into the smelter with much less pressure than is now used.

Between the lower boxes in the large cham-

ber 11 are troughs 14, containing feed-screws 15, having projecting shafts 16, provided with bevel-gear connections 17 with a common shaft 18. This shaft is also connected to bevel-gear 19 with a feed-screw 20 in a trough 21 in the smaller chamber. The material drawn out by these feed-screws enters a longitudinal trough 22, containing feed-screw 23, driven from shaft 24, having gearing connections 25 with the common shaft. The end of the trough 22 is connected by inclined channel 26 with a fritting-furnace 27, which has an outlet-flue 28, leading its gases into the first dust-catcher chamber. The large dust-catcher chamber containing the blast-heating boxes and pipes connects through an end opening 29 with a similar chamber 30, extending parallel and alongside it and containing similar boxes and pipes, the latter boxes, however, being smaller and with fewer connecting-pipes. The last upper box of the chamber 30 is connected with the top box of the next chamber, so that the air forced in by blower 31 passes through the pipes and boxes in the chamber 30, and thence as it expands under heat into the larger boxes and area of connecting-pipes in the parallel chamber, and thence through pipe 32, leading to the bustle-pipe of the smelter. The outlet-flue 33 for the boiler 34 of the plant discharges into the chamber 30, so that the waste gases from the boiler unite with those from the fritting-furnace and pass to the stack-flue 35.

The advantages of our invention result from the peculiar form and arrangement of the dust-catcher and blast-heater, the other parts of the apparatus forming no part of the present invention and being described and claimed in the copending application of Walter E. Koch, Serial No. 91,816, filed January 30, 1902. The large amount of friction created at the bend of blast-heaters heretofore used is reduced, with a corresponding reduction of power required for driving the blast through the heater. The parallel arrangement of the chambers is compact, all heated waste gases are utilized, and the deposited discharges of dust and ore are continuously withdrawn.

Many changes may be made in the form and arrangement of the parts without depart-

ing from our invention as defined in the claims.

We claim—

1. In smelting plants, a blast-heater having
5 oppositely-located boxes connected by pipes,
removable covers for the boxes opposite to
the ends of the pipes, a heating-chamber con-
taining the boxes and pipes, and means for
forcing a blast through said heating-channels;
10 substantially as described.

2. The combination with a smelting-fur-
nace, of a blast-heater connected thereto, said
heater having oppositely-located boxes con-
nected by pipes, a heating-chamber contain-
15 ing the boxes and pipes, and means for forc-
ing a blast through said heating-channels, the
area of the blast-channels being increased to-
ward the smelter end; substantially as de-
scribed.

20 3. A blast-heater comprising a chamber
connected with the downtake of a furnace,
upper and lower staggered boxes arranged al-
ternately in the heating-chamber, inclined
pipes connecting said boxes, and means for
25 forcing the blast through the boxes and pipes;
substantially as described.

4. A blast-heater, comprising a chamber
connected with the downtake of a furnace,
upper and lower boxes arranged alternately
30 in the heating-chamber, inclined pipes con-
necting said boxes, the upper staggered boxes
having top removable closures for openings
through which the pipes may be inserted or
removed, and means for forcing the blast
35 through the boxes and pipes; substantially as
described.

5. A blast-heater, a smelting-furnace hav-
ing a downtake connected to the heater, and
a boiler having its flue connected to the heater

arranged to pass the waste products therein- 40
to to join with those from the smelter down-
comer; substantially as described.

6. A blast-heater having upper and lower
boxes with connecting-pipes, collecting-
troughs between the lower boxes, feed-screws 45
in the troughs, and means for actuating said
feed-screws; substantially as described.

7. A blast-heater having two parallel cham-
bers arranged side by side and connected to-
gether at one end, upper and lower boxes in 50
said chambers connected by pipes, an air-
blast connection at one end of the series, an
outlet at the outer end leading to the furnace,
and a down-comer from the furnace arranged
to discharge gases into the blast-heating cham- 55
bers; substantially as described.

8. A dust-catcher and blast-heater having
means for heating the blast and provided with
transverse collecting-boxes, feed-screws in
said boxes, a common trough at the end of 60
the boxes, a feed-screw within said common
trough and connections for driving said feed-
screws; substantially as described.

9. A blast-heater and dust-catcher having
two chambers each containing blast-heating 65
apparatus, a furnace having a down-comer
discharging into one chamber, and a boiler
having its outlet-flue connected to the other
chamber to combine its gases with those of
the down-comer; substantially as described. 70

In testimony whereof we have hereunto set
our hands.

WALTER E. KOCH.
JOHN W. MACDONALD.

Witnesses:

L. A. CONNER, Jr.,
L. M. REDMAN.