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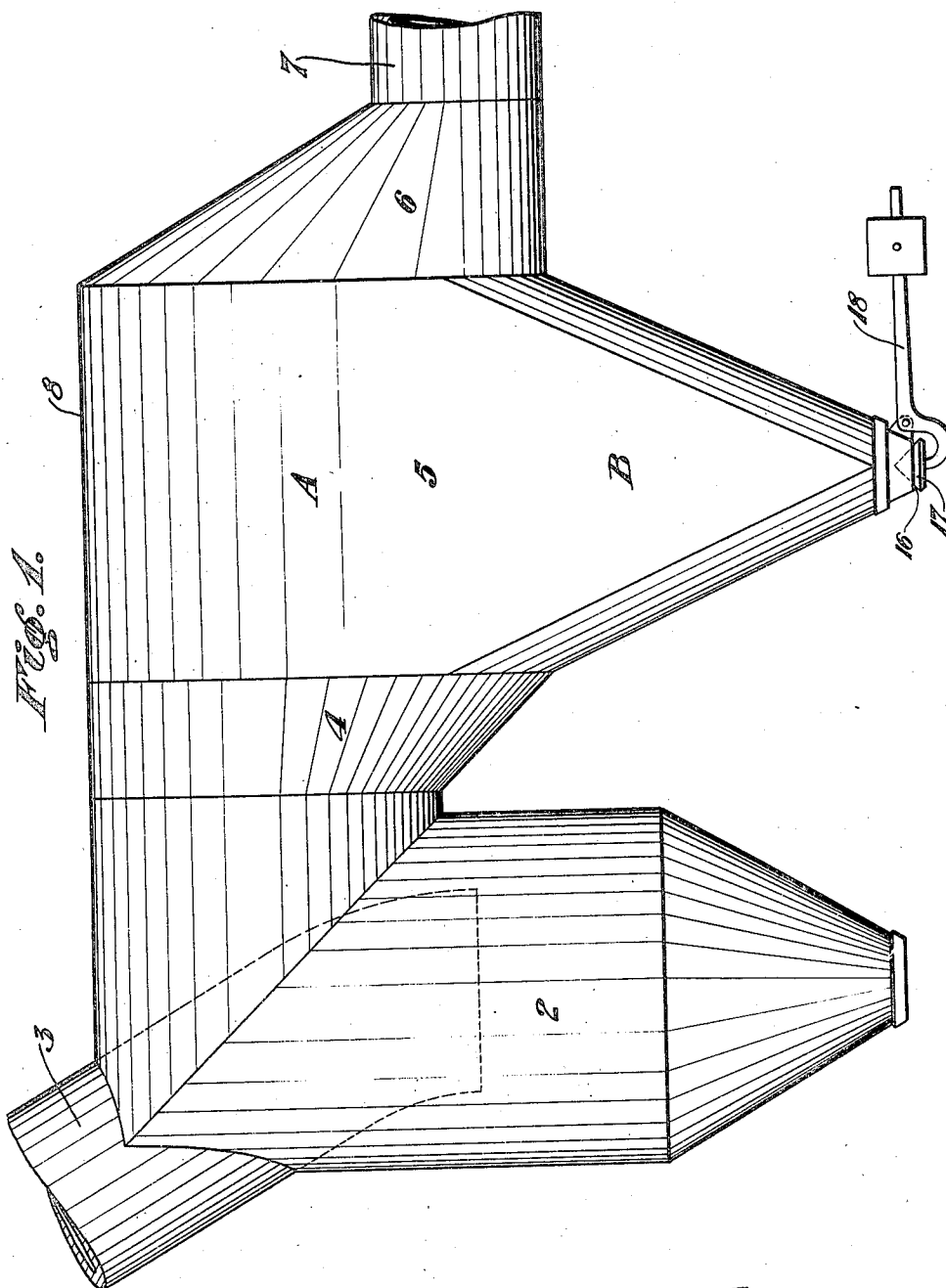
1,482,850

F. E. KLING

DUST CATCHER

Filed Aug. 4, 1922

4 Sheets-Sheet 1



Witnesses:

Edwin Trueb

Inventor:
FRED E. KLING,

by

Anthony Desina
his Attorney

Feb. 5, 1924.

1,482,850

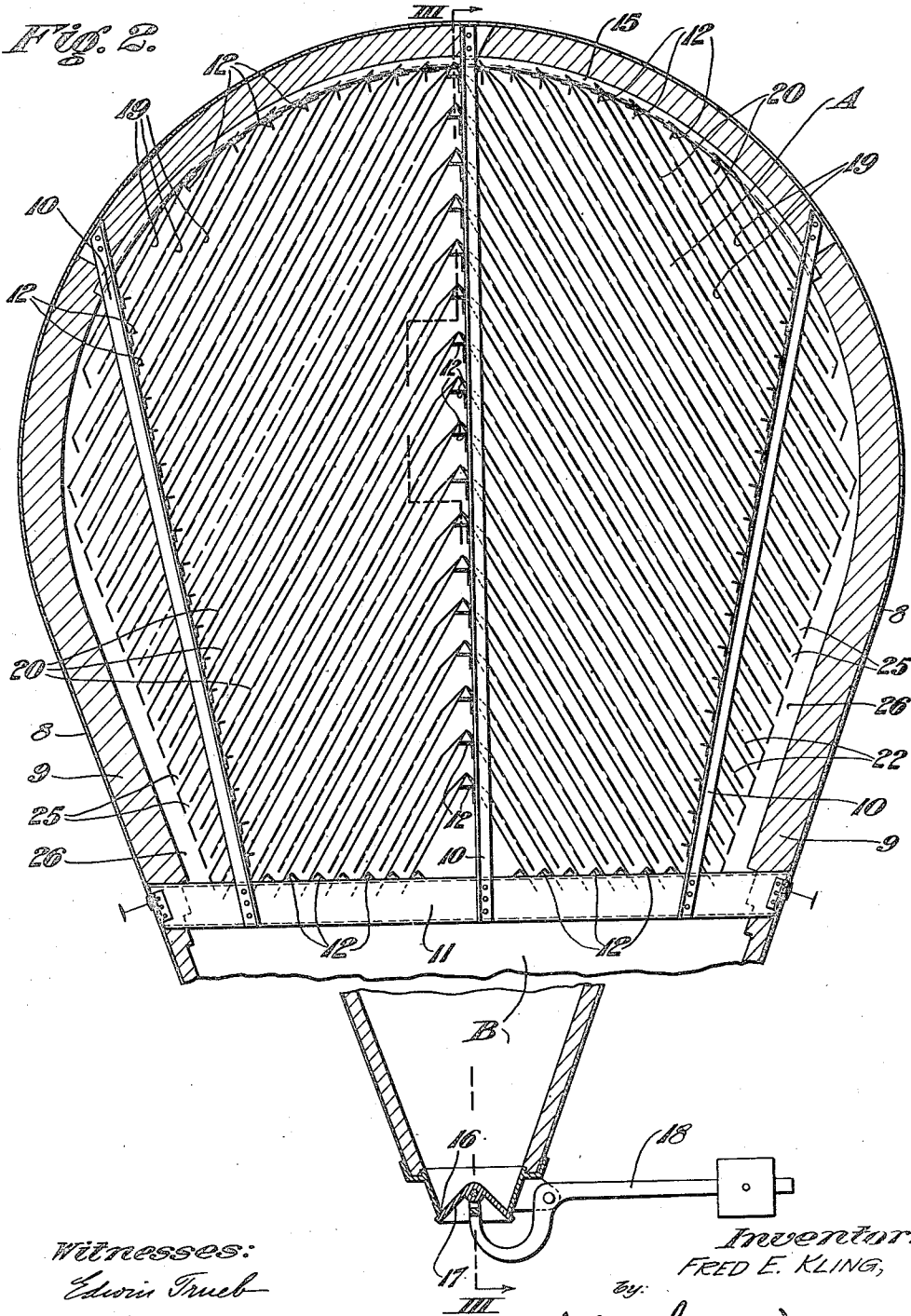
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Fig. 2.



Witnesses:
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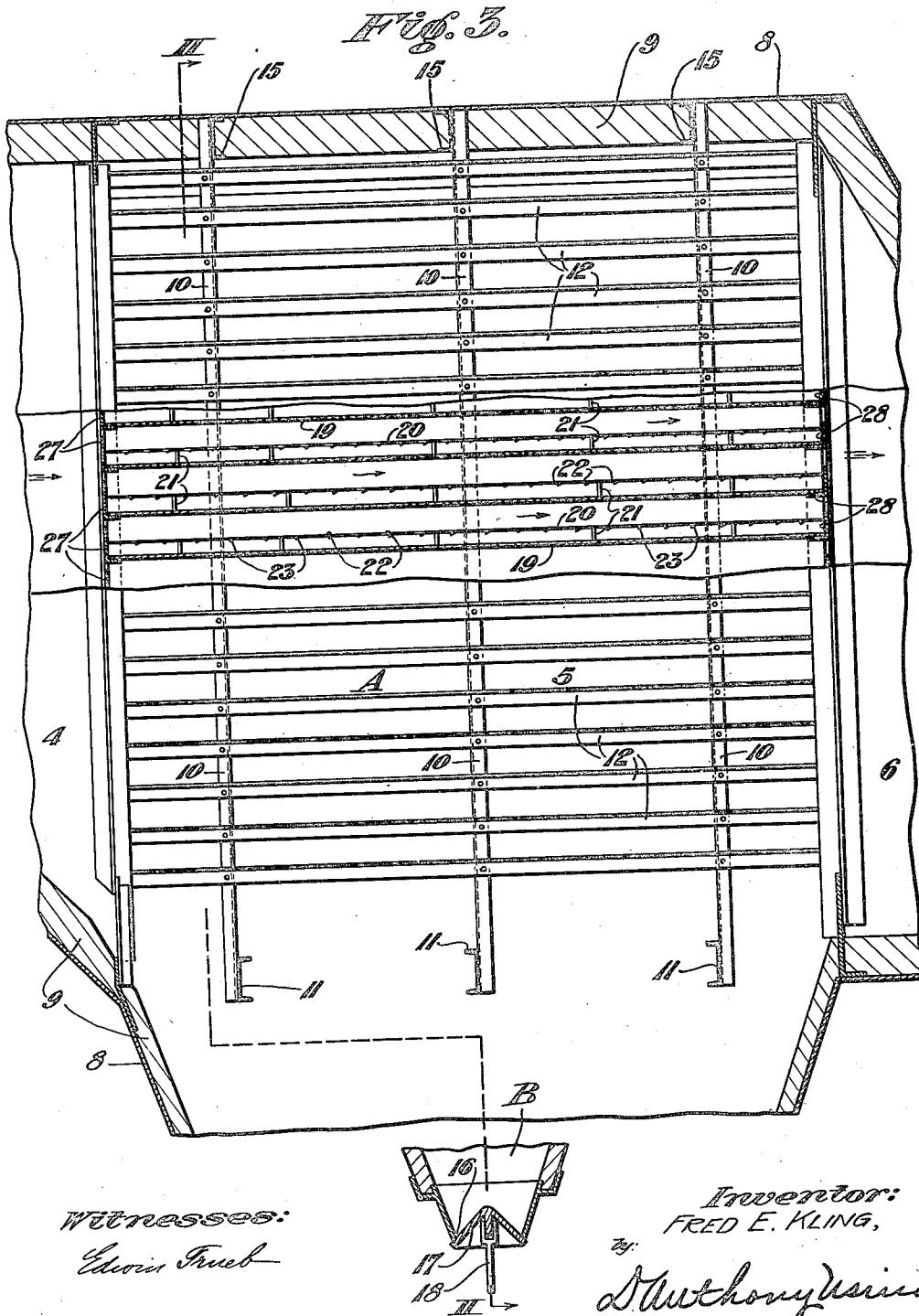
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Feb. 5, 1924.

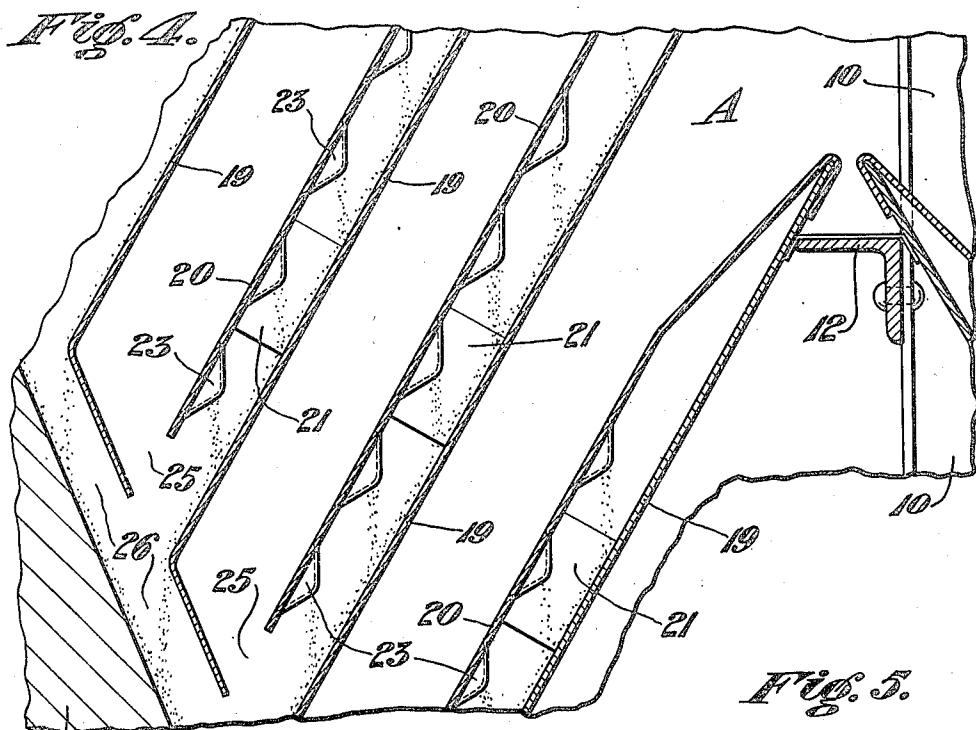
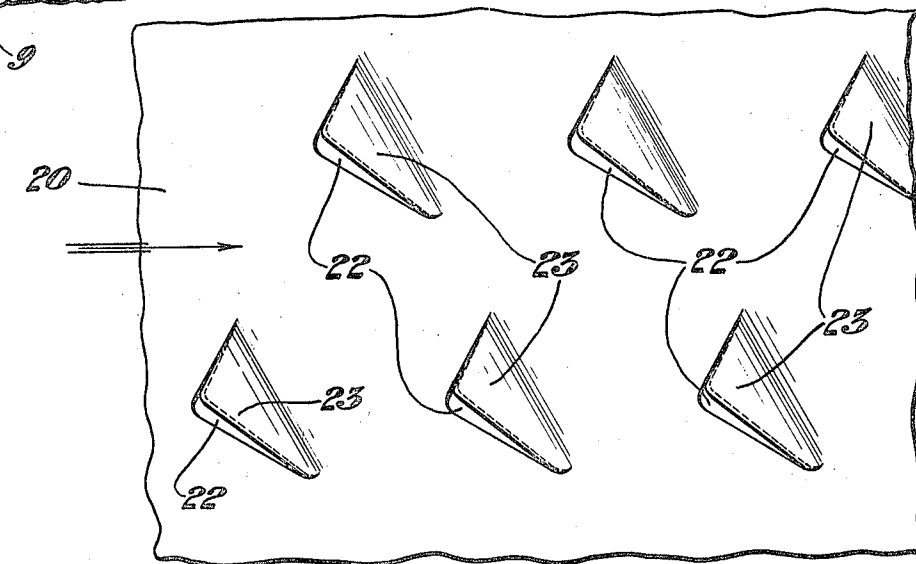
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Filed Aug. 4, 1922

4 Sheets-Sheet 4



Witnesses:

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by:

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UNITED STATES PATENT OFFICE.

FRED E. KLING, OF YOUNGSTOWN, OHIO.

DUST CATCHER.

Application filed August 4, 1922. Serial No. 579,682.

To all whom it may concern:

Be it known that I, FRED E. KLING, a citizen of the United States, and resident of Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Dust Catchers, of which the following is a specification.

This invention relates to dust catchers, and, while not limited thereto, relates particularly to secondary gas catchers used for removing the dust from hot blast furnace gas prior to its passage into the gas cleaners.

One object of the present invention is to divide the gas flow into a plurality of small flows during its passage through the catcher, so as to more thoroughly clean the gas.

Another object is to trap and separate the dust from the gas flow so as to prevent it being picked up by the oncoming gases and carried into the gas cleaners.

A further object is to provide a dust catcher having the novel arrangement, combination and construction of parts herein-after described and illustrated in the accompanying drawings.

In the drawings, Figure 1 is a side elevation of primary and secondary dust catchers and a gas cleaner as ordinarily combined, the secondary dust catcher being constructed in accordance with this invention.

Figure 2 is a cross sectional elevation through the secondary dust catcher on the line II—II of Figure 3.

Figure 3 is a sectional side elevation on the line III—III of Figure 2.

Figure 4 is an enlarged fragmentary detail showing the plate arrangement and construction.

Figure 5 is an enlarged plan of a portion of a dust trapping plate.

Referring more particularly to the drawings, the numeral 2 designates the primary dust catcher, which may be of any well known design. The primary dust catcher 2 is provided with an inlet conduit 3, through which the gases are received direct from the furnace, and an outlet conduit 4 leads from the opposite side of the primary dust catcher and is connected to the inlet port of the secondary dust catcher 5.

The primary dust catcher allows the gases to expand and, therefore, lessens their velocity, and as a result the heavier particles of

ore, coke, limestone, etc., are deposited within this catcher.

The secondary dust catcher 5 is provided with an outlet port at the opposite side from the inlet port and a conduit 6 extends from this port to the gas cleaner 7, which may be of any ordinary design. It will, of course, be understood that more than one gas cleaner may be used if desired.

The secondary cleaner 5 is constructed in accordance to this invention and comprises a casing composed of an outer metallic shell 8 and brick lining 9. A plurality of vertical supports 10 are mounted in the casing and have their upper ends secured to the casing and their lower ends secured to the transverse girders 11.

Longitudinal angle supports 12 are mounted within the casing, some being secured to the members 10 and others being secured to arched angle supports 15 along the dome or top of the casing, and to the transverse girders 11, respectively.

The vertical supports 10 are arranged in three series, one series being in the center of the catcher and the others being adjacent each side of the catcher.

The space within the casing above the girders 11 forms the cleaning or dust separating chamber A, and the space below the girders 11 forms a dust receiving chamber B. The lower end of the dust receiving chamber is provided with a discharge port 16, closed by a bell valve 17 having the usual operating lever 18.

A plurality of dust receiving and conveying plates 19 are secured to the angle supports 12 so as to be inclined transversely or downwardly and outwardly from the center of the catcher. The plates 19 are solid or unapertured and form supports for dust trapping plates 20, which have their upper ends secured to the plates 19 and are supported in spaced relation along their length by bars 21. The plates 20 are apertured as at 22 to form dust traps, which permit the dust to fall through onto the plates 19.

The plates 20 may be apertured in any desired manner, but preferably will be provided with substantially triangular apertures formed by cutting the metal along two sides of a triangle, and bending the resultant tongue 23 downwardly. The tongues, which are attached along the one edge of the opening form baffles to prevent the passage of

gas through the openings. It will be especially noted that in assembling the plates they are positioned so that the attached sides of the tongues are nearest the outlet port of the catcher, so that the flow of gas will be towards said tongues or baffles.

The outer longitudinal ends of the plates 19 are bent downwardly to a point approximately on a line with the next dust trapping plate 20, and the plates 20 are slightly shorter than the plates 19, thus a restricted outlet 25 is provided at the lower end of the plates for the discharge of any accumulated dust, although being of such size that it will prevent the flow of gas therethrough.

The plates 19 and 20 are arranged in pairs. That is, each plate 19 supports a plate 20 and the plates all terminate short of the side walls of the casing so as to provide a dust discharge passage 26.

The plates 19 are each provided with baffle angles 27 and 28 along their inlet and outlet ends, respectively. The baffle angles 27 are of greater height than the angle baffles 28 and extend upwardly to a point just below the next plate 19, thus forming a very restricted gas inlet passage between the plates. However, while the angle baffles 28 are not as high as the baffles 27 they extend above the plates 20 and form a restricted outlet for the gases passing from between the plates.

In operation, the gases enter the secondary dust catcher 5 from the primary dust catcher 2, in which the coarser foreign matter has been deposited. As the gases enter the secondary dust catcher 5 they are compelled to split up into numerous small streams and flow between the plates 19 and 20, and, due to the baffle angles 27, any coarse particles carried in the gases will be baffled out and compelled to pass into the dust receiving chamber B. As the gases pass between the plates 19 and 20, that is, over the plates 20, any dust carried thereby will settle onto the plates 20, and due to their inclined arrangement, will slide downwardly along the plate until it reaches one of the apertures 22, when it will be discharged onto the plate 19. The baffles or tongues 23 in the apertures will prevent the gas flowing through the apertures, and, therefore, dust deposited on the plates 19 will not be disturbed by the oncoming gases.

The dust deposited on the plates 19 will travel along the plate and be discharged into the space 26 and chamber B, from which it will be discharged at intervals.

The gases will pass from between the plates 19 and 20 by passing over the baffle angles, 28, from which point they will flow through the outlet conduit 6 to the gas cleaner 7.

The primary features of this invention lie

in breaking the gases up into numerous small or shallow streams, and trapping the dust independently from each of the streams, thus getting a thorough cleaning of the gases and preventing the separated dust from coming into contact with the oncoming gases.

While I have illustrated only one specific embodiment of my invention, it will be understood that various modifications may be made without departing from the scope of my invention as defined in the appended claims.

I claim:—

1. A dust catcher comprising a casing, a plurality of spaced plates extending from the center of said casing downwardly and outwardly toward the side walls thereof, means for supporting said plates, said plates being arranged in pairs and terminating short of the side walls of said casing so as to permit dust to travel downwardly along the side walls of the casing, the upper plate of each pair of plates being provided with perforations through which dust may fall and the lower plate being unapertured, and an inlet and outlet for the gases adapted to cause a flow of gas across said plates.

2. A dust catcher comprising a casing, a plurality of spaced plates extending from the center of said casing downwardly and outwardly toward the side walls thereof, means for supporting said plates, said plates being arranged in pairs and terminating short of the side walls of said casing so as to permit dust to travel downwardly along the side walls of the casing, the upper plate of each pair of plates being provided with perforations through which dust may fall and the lower plate being unapertured, an inlet and outlet for the gases adapted to cause a flow of gas across said plates, and a chamber below said plates adapted to receive the dust separated from the gas.

3. A dust catcher comprising a casing, a plurality of spaced plates extending from the center of said casing downwardly and outwardly toward the side walls thereof, means for supporting said plates, said plates being arranged in pairs and terminating short of the side walls of said casing so as to permit dust to travel downwardly along the side walls of the casing, the upper plate of each pair of plates being provided with perforations through which dust may fall, and the lower plate being unapertured, baffles in said apertures adapted to prevent the gas passing through said apertures, and an inlet and outlet for the gases adapted to cause a flow of gas across said plates, on a line at right angles to the vertical axis of said casing.

In testimony whereof, I have hereunto set my hand.

FRED E. KLING.