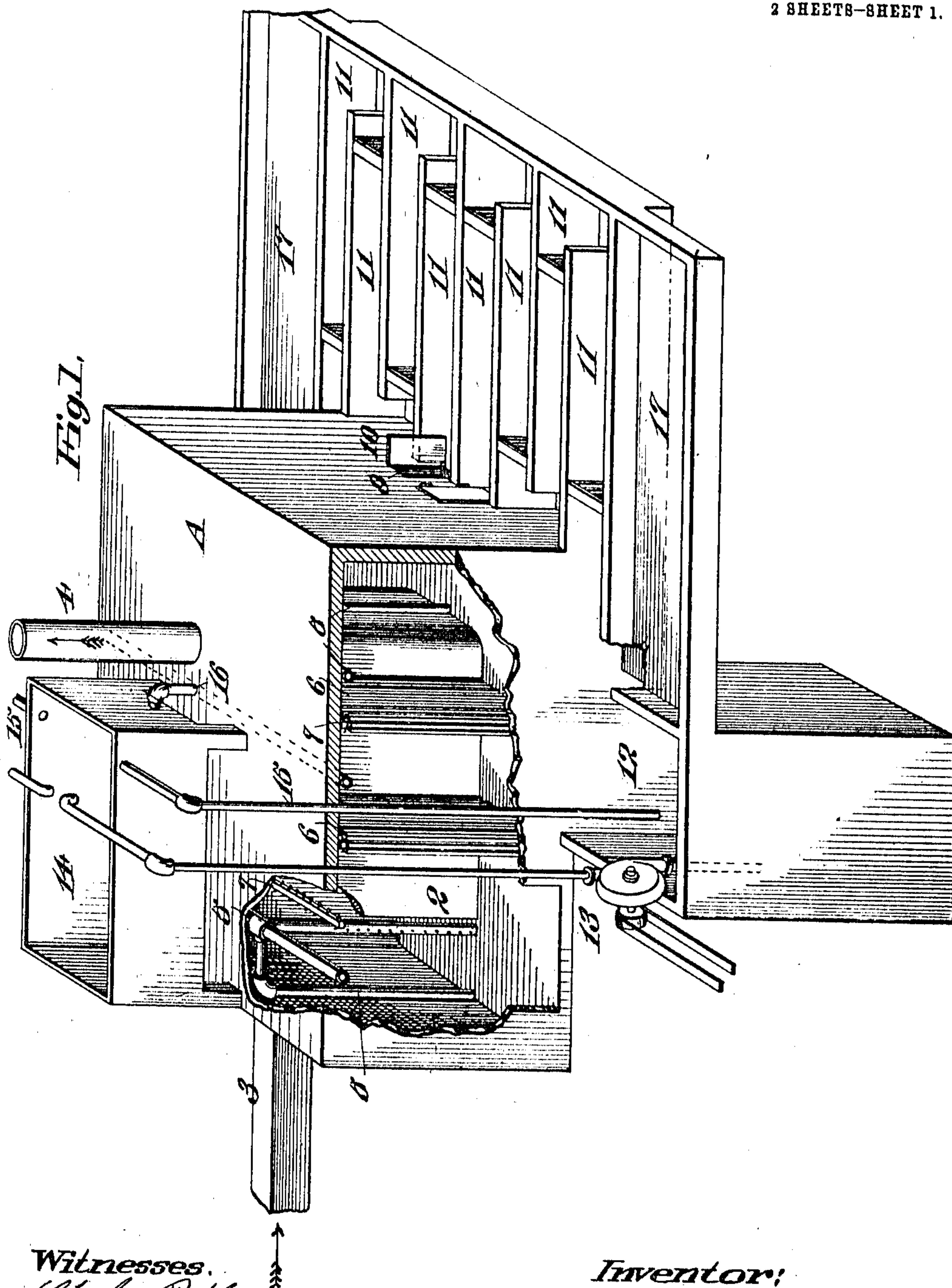


T. DE BENEDICTIS.  
FUME CONDENSER.  
APPLICATION FILED NOV. 3, 1910.

991,823.

Patented May 9, 1911.

2 SHEETS—SHEET 1.



Witnesses.  
Charles Pickles  
R. L. Brown

Inventor:  
Tommaso de Benedictis.

By Geo. H. Strong.  
att'y

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2 SHEETS-SHEET 2.

Fig. 2.

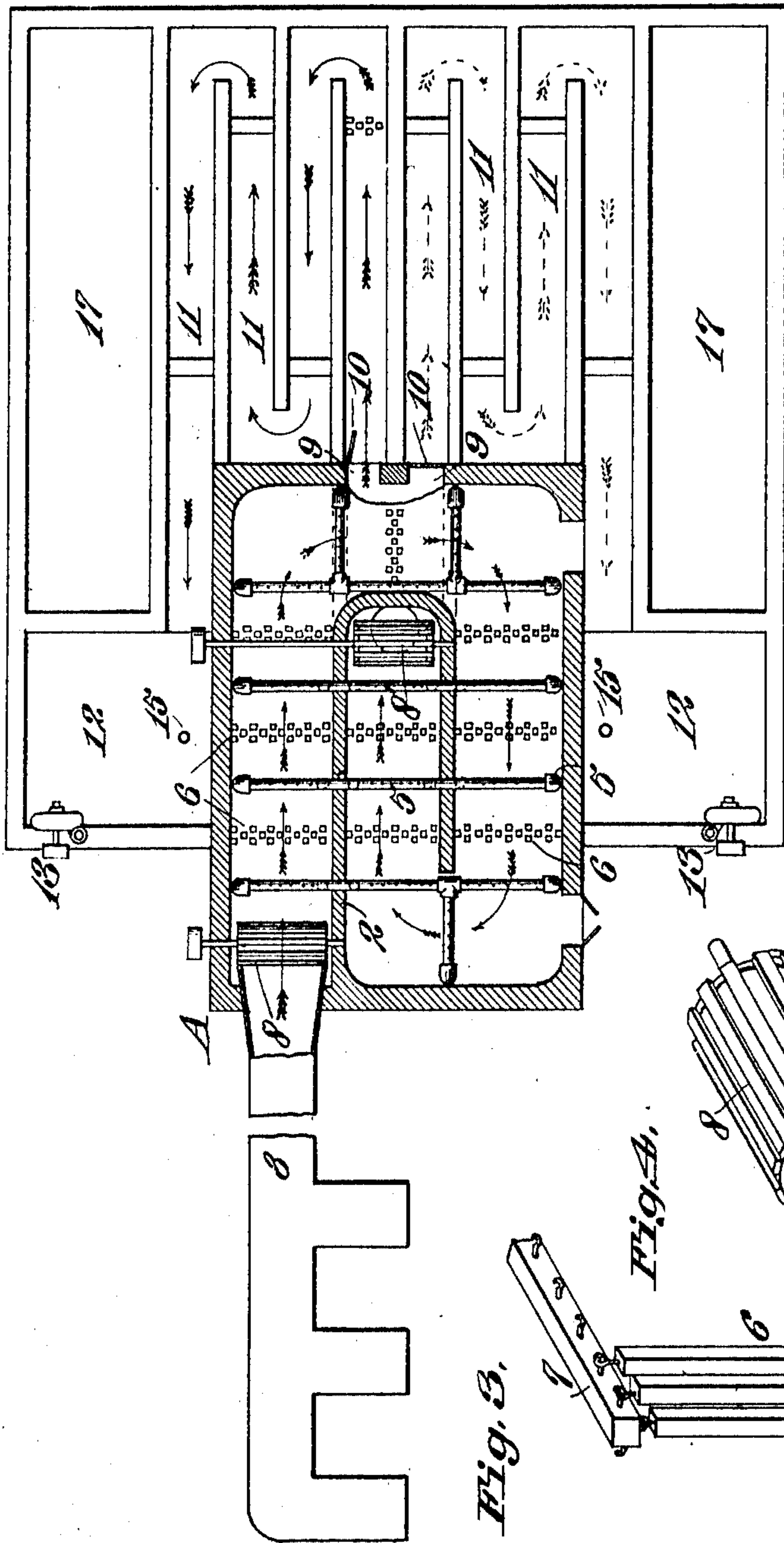


Fig. 3.

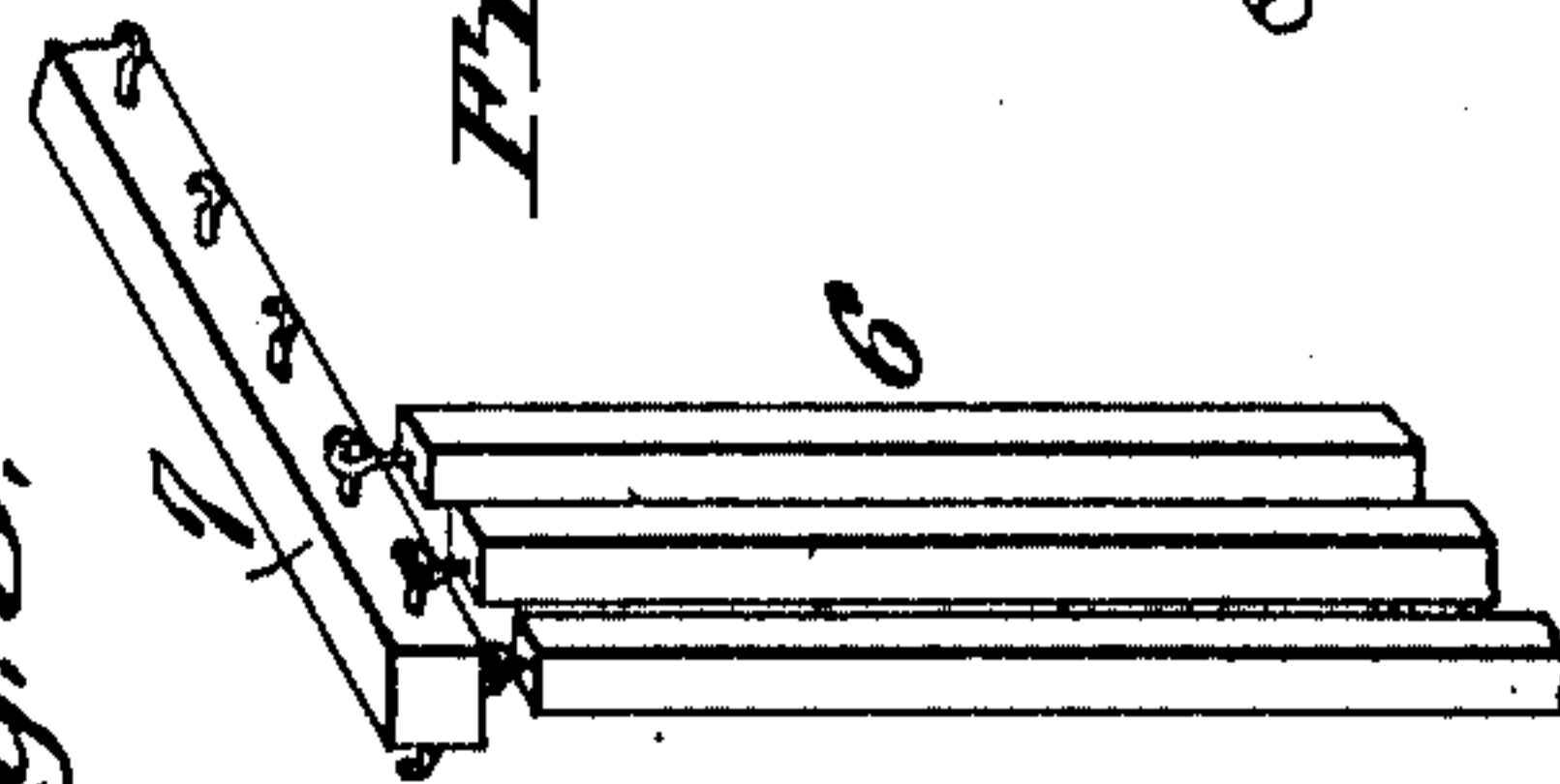
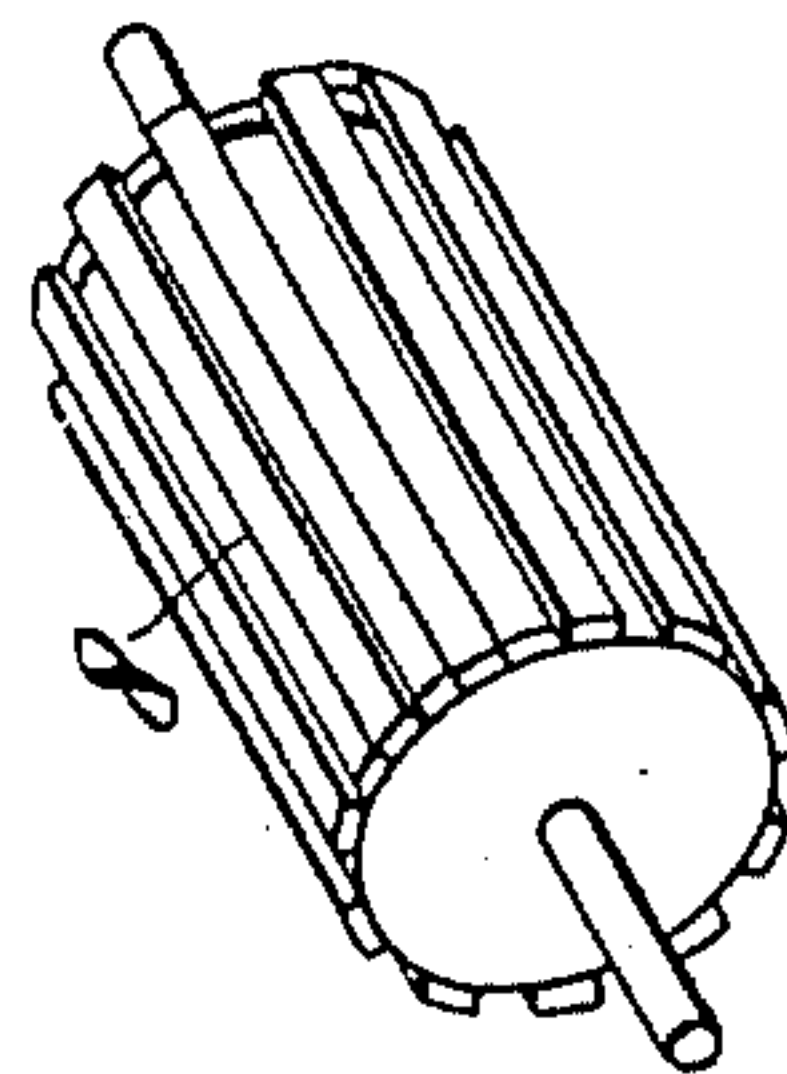


Fig. 4.



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# UNITED STATES PATENT OFFICE.

TOMMASO DE BENEDICTIS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF  
TO F. C. AMOROSO, OF SAN FRANCISCO, CALIFORNIA.

## FUME-CONDENSER.

991,823.

Specification of Letters Patent.

Patented May 9, 1911.

Application filed November 3, 1910. Serial No. 590,506.

*To all whom it may concern:*

Be it known that I, TOMMASO DE BENEDICTIS, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Fume-Condensers, of which the following is a specification.

This invention relates to smoke and fume condensers.

10 It is the object of this invention to provide a condenser for separating the volatile substances, dust particles and the like, from smoke and fumes, which is simple in construction and efficient in operation, and  
15 which is particularly adapted to handling smoke and fumes in a large volume, thus providing a condenser which is applicable for use in large smelting and manufacturing plants.

20 A further object is to provide a smoke and fume condenser which is so constructed as to be readily accessible for cleaning, repairing and for the removal of the materials collected and separated from the fumes.

25 The invention consists of the parts and combination and construction of parts hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

30 Figure 1 is a perspective view of the invention with parts broken away. Fig. 2 is a plan view partly in section. Fig. 3 is a detail of the suspended baffle bars. Fig. 4 is a detail of the beater drum.

35 In the drawings A represents a smoke room or chamber, preferably constructed of reinforced concrete or other masonry, and which is shown as cubical in form and enclosed on all sides. A partition is so disposed in the chamber A as to convert the  
40 interior of the latter into a continuous winding narrow compartment, one end of which is open to a flue 3, leading from a furnace or furnaces of any description, and the other  
45 terminating in a smoke stack or chimney 4 rising to any suitable height from the roof of the chamber A. A series of perforated pipes 5 are disposed at suitable intervals across the ceiling and down the side walls  
50 of the winding compartment or smoke chamber, and are preferably constructed of tile, glass or other vitreous material, not subject to the action of chemicals contained in the fumes or the water which they are  
55 designed to carry. These pipes 5 are so

perforated that they will discharge a series of fine jets of water throughout their length; the horizontal pipe extending across the ceiling of the smoke chamber discharging in a downward direction while the vertical  
60 pipes discharge in a horizontal direction parallel with the ceiling pipe connected therewith, so as to form virtually a fine net work or wall of rapidly moving water completely across the smoke passage in the  
65 chamber A, at suitable intervals.

Baffle bars 6, suspended in rows in staggered arrangement, are disposed across the smoke passage between the thin sheets or walls of water, as indicated in Fig. 2; these  
70 baffle bars being constructed of any suitable material and suspended from hooks on a glass rod 7 disposed near the ceiling of the smoke passage. These baffle bars are of such  
75 length as to extend from the ceiling to the floor of the smoke passage and are arranged in rows slightly separated from each other entirely across the passage.

Revoluble drums or cylinders, 8—8' formed of a series of horizontally disposed  
80 slats, are placed adjacent the intake and the discharge openings at each end of the smoke passage and are adapted to be rotated in any suitable manner, so as to create an artificial draft or suction in the smoke chamber; the  
85 slotted drum 8 at the intake breaking up or diffusing the smoke volume as it leaves the flue 3.

A pair of discharge openings 9 are located in one end of the chamber A at a point adjacent the floor thereof for the purpose of  
90 carrying away the water delivered by the spraying pipes 5; these openings 9 being provided with gates or doors 10 for closures, and are separated from each other so  
95 as to discharge at different points into separate ditches or troughs 11 which may be open to the atmosphere, the bottom or floors of which are approximately level and situated below the plane of the floor of the  
100 smoke chamber A. These troughs are preferably formed of masonry and terminate in wells or settling tanks 12 on each side of the smoke chamber A. The water flowing into the tanks 12 is removed by pumps 13 of any  
105 suitable description, which discharges the water into a reservoir 14 disposed above the smoke chamber A; an overflow pipe 15 leading from near the top of the reservoir 14 back to the tanks 12.



The spraying pipes 5 are connected to the reservoir 14 through a pipe 16 leading from the bottom of the latter, thus providing means by which the water may be used again as many times as desired.

In operation, the smoke or fumes to be treated are delivered to the smoke chamber A from the flue 3 whereupon they are driven forward by the slotted drum 8 through the thin sheets or walls of water formed by the pipes 5, and through the suspended baffle bars 6, the water acting to cool the fumes and precipitate certain particles therein, and the baffle bars 6, collecting on their surfaces such particles as are not removed by the water. The passage of the currents of fumes and gases passing between the baffle bars swing them on their pivotal mounting to cause them to strike one another and tremble, so as to continually loosen the particles collected thereon and causing them to fall into the water on the floor of the smoke chamber. The particles collected by the water are carried off through either of the discharge openings 9 into the troughs 11 and settling tanks 12; the heavier particles settling to the bottom thereof. A double arrangement of the troughs 11 and tanks 12 is provided so that while one is in use the other may be cleaned, thus permitting of a continuous operation. The water delivered to the tanks 12 is pumped to the reservoir 14 to be used again, as before described. The water after being used some time becomes acidified whereupon it is subjected to further treatment or is employed in any manner desired. When the water is drained from the troughs 11 and tanks 12, the sediment collected therein is removed to drying bins 17 disposed adjacent thereto.

By subjecting the fumes and gases to the treatment just described, they become thoroughly cleared of dust and poisonous particles, so that when discharged from the stack 4 they are entirely free from mineral substances.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A fume condensing apparatus consisting of a chamber adapted to receive the fumes, partitions forming vertical tortuous passages, perforated water spraying pipes located within the sides and top of the passages and adapted to discharge both transversely and downwardly through the passing fumes, and baffle bars suspended between

the spray pipes and arranged in the path of and crosswise of the sprays delivered by the side pipes.

2. A fume condensing apparatus comprising a chamber, means for transmitting fumes therethrough, partitions forming vertical tortuous passages, perforated water spraying pipes located within the sides and top of the passages and adapted to discharge cross-streams transversely and downwardly through the passing fumes, and baffle bars suspended between the spray pipes and arranged in the path and crosswise of the streams delivered by the side pipes, said bars being capable of an agitating movement.

3. The combination in a fume condensing apparatus, of a series of narrow tortuous passages, means for transmitting fumes therethrough, means for discharging cross-streams of fine sprays of water through the passing fumes, and suspended swinging baffle bars disposed within the chambers and between the spraying means and across the line of flow of the fumes.

4. The combination in a fume condensing apparatus, of narrow vertically disposed tortuous passages, means for transmitting fumes therethrough, means for discharging cross-streams of fine sprays of water transversely and downwardly within the passages, independently swinging baffle bars located between the spraying means and across the line of flow of the fumes, and revoluble slatted drums located within the chambers and adapted to create a draft and to break up the volume of fumes.

5. The combination in a fume condensing apparatus, of narrow vertically disposed tortuous passages, means for transmitting fumes therethrough, means for discharging cross-streams of fine sprays of water transversely and downwardly within the passages, independent swinging baffle bars located between the spraying means and across the line of flow of the fumes, revoluble slatted drums located within the chambers and adapted to create a draft and to break up the volume of fumes, and means for discharging the water and deposited residuum.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

TOMMASO DE BENEDICTIS.

Witnesses:

FRANK C. AMOROSO,  
GEO. F. CAVALLI.