

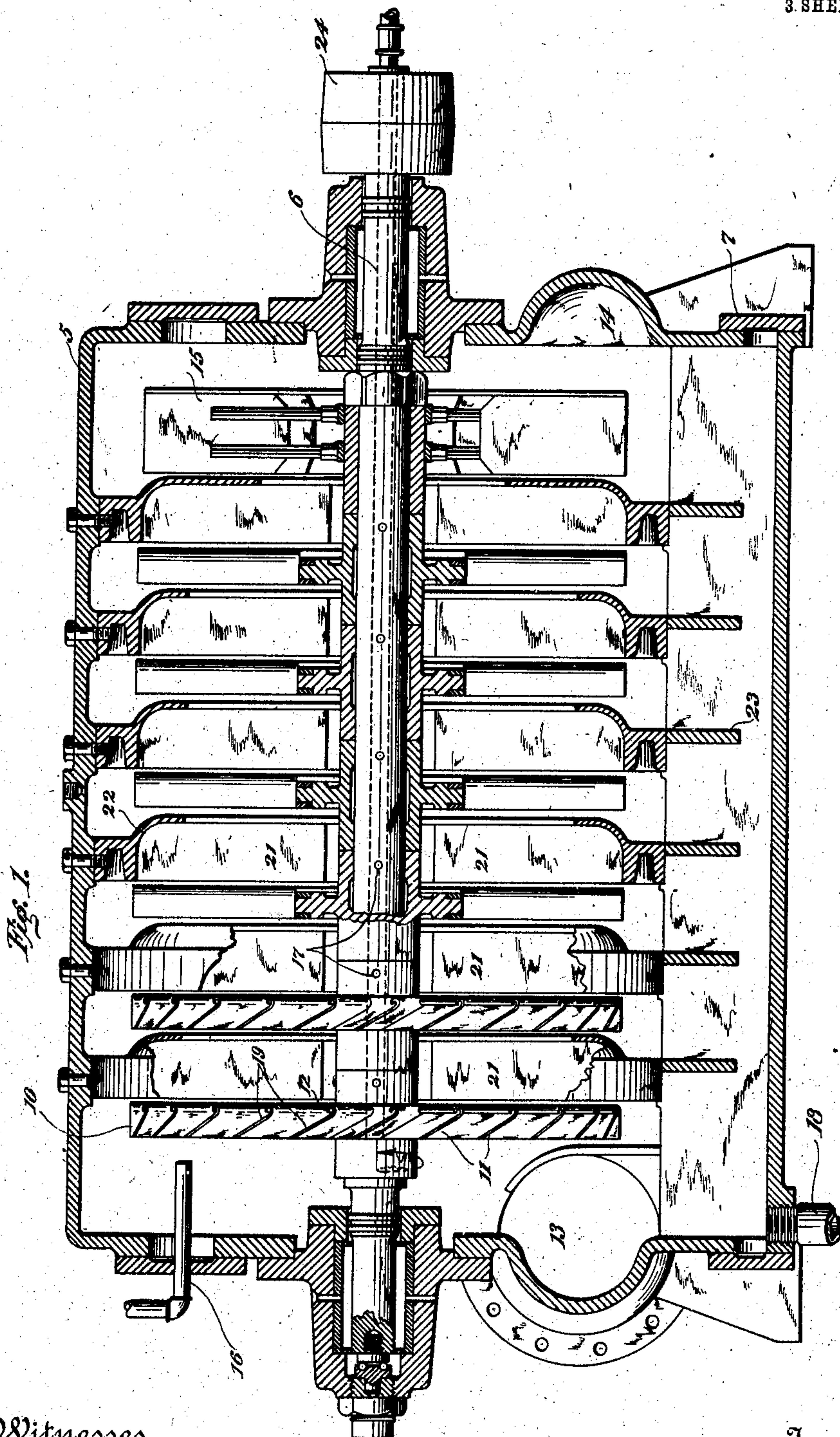
No. 815,812.

PATENTED MAR. 20, 1906.

A. M. GOW.
GAS PURIFYING APPARATUS.

APPLICATION FILED AUG. 1, 1904.

3 SHEETS—SHEET 1.



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No. 815,812.

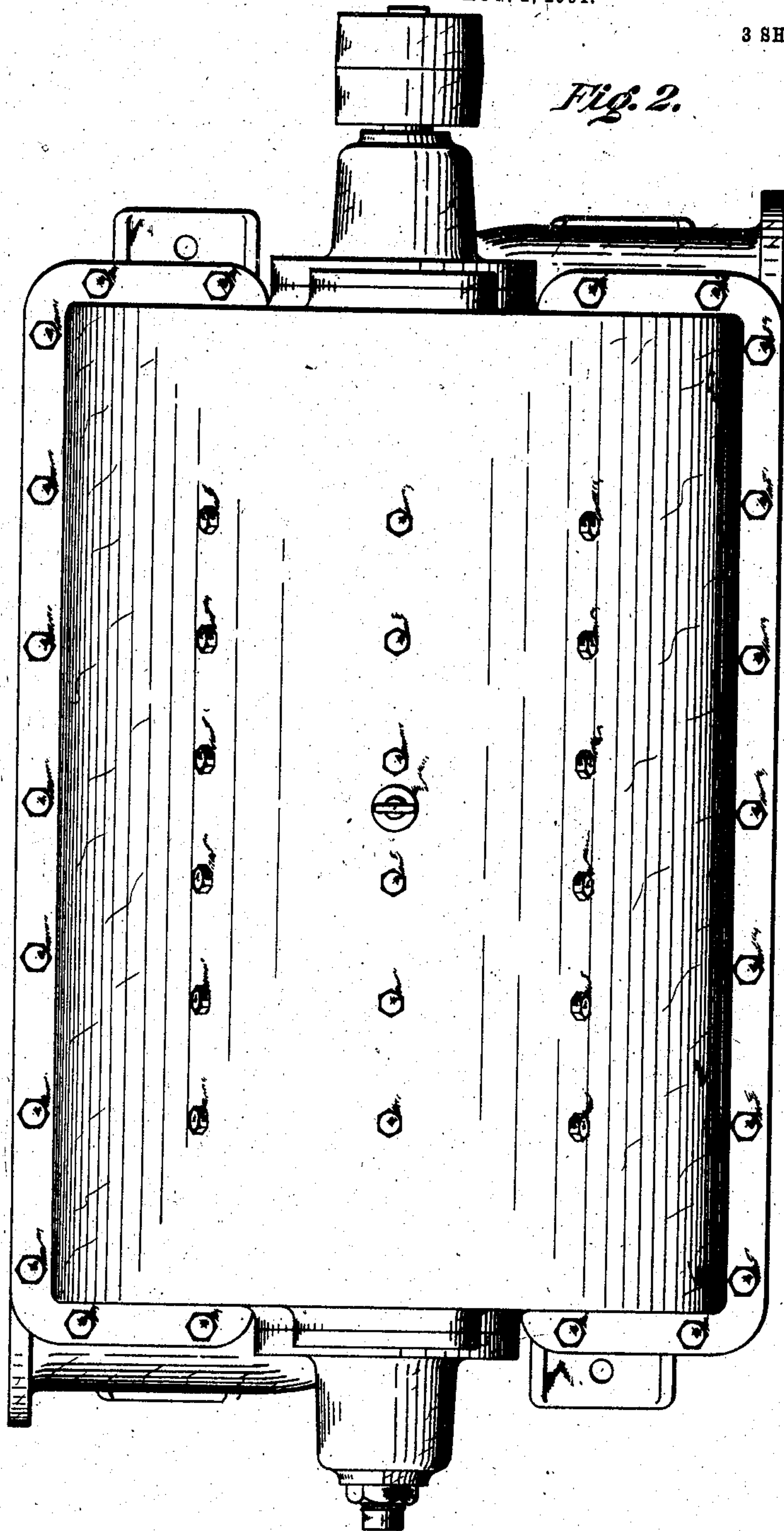
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

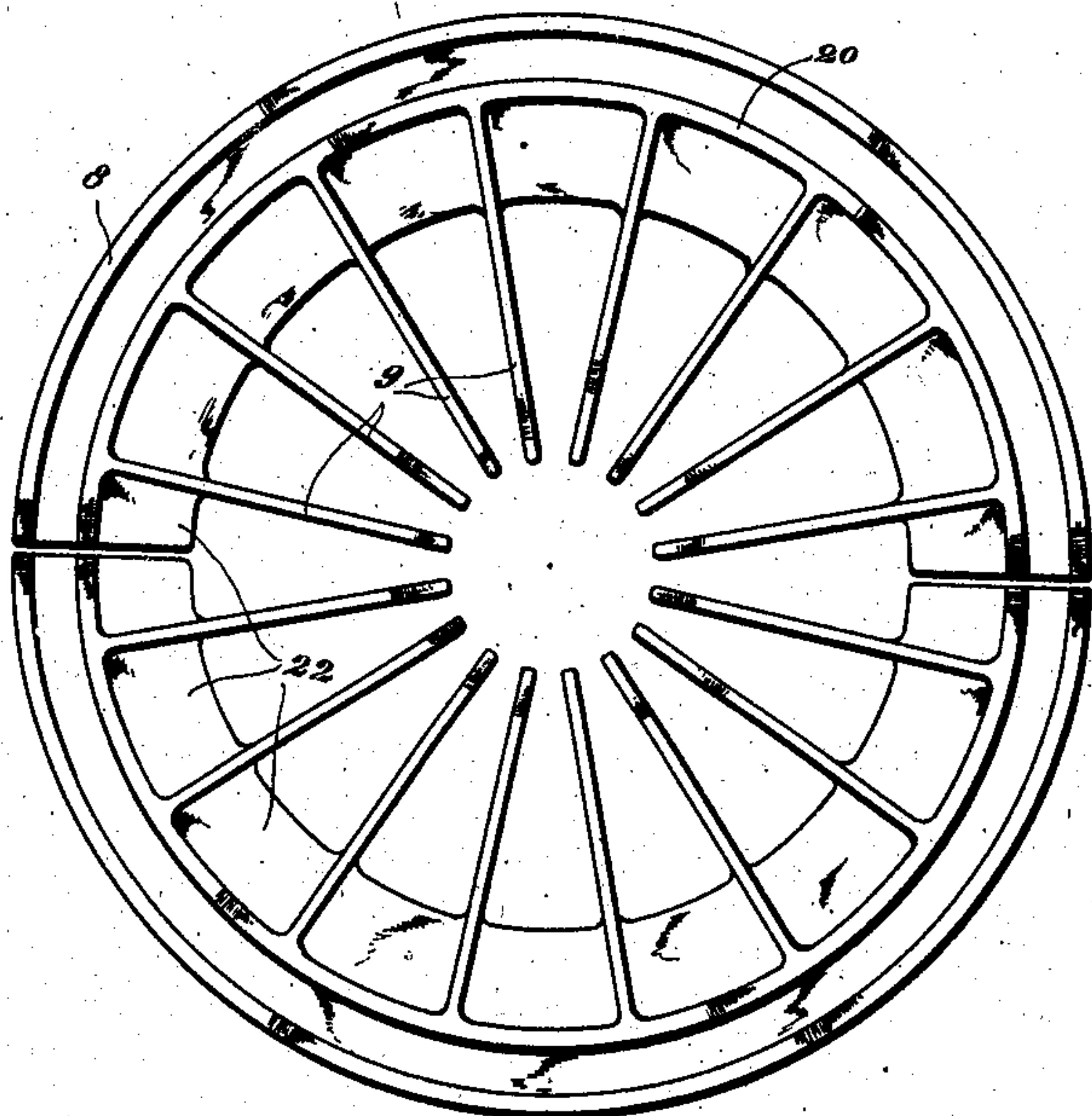
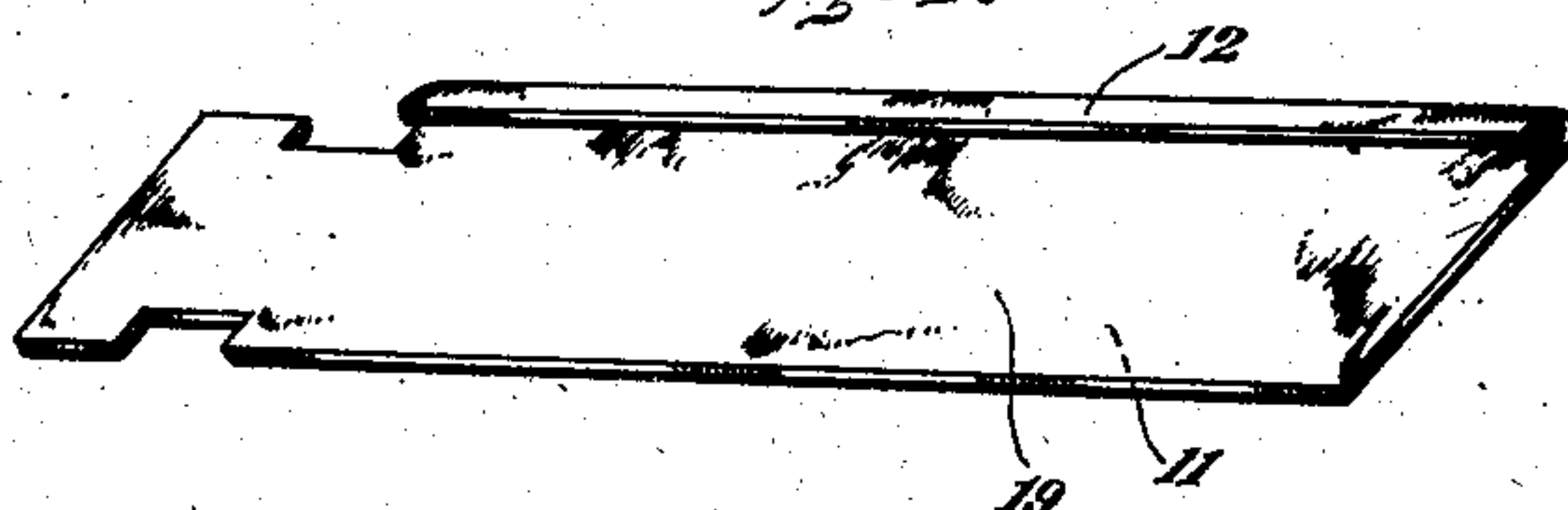


Fig. 4.



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UNITED STATES PATENT OFFICE.

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GAS-PURIFYING APPARATUS.

No. 815,812.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed August 1, 1904. Serial No. 218,975.

To all whom it may concern:

Be it known that I, ALEXANDER M. GOW, a citizen of the United States, and a resident of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Purifying Apparatus, of which the following is a specification.

This invention relates to gas-purifying apparatus, and has for an object the production of an apparatus which is efficient in the performance of its functions and economic as to operating cost.

In designing a commercially successful apparatus for the removal of the fine dust and free carbon from such gas as is devolved from blast-furnaces and the ordinary type of producers and for removing the heavy condensable hydrocarbon vapors many and serious obstacles have arisen, and those devices with which I am familiar which are fairly efficient are either extremely costly and complicated or bulky as compared to the possible capacities.

A further object of this invention has been to produce a relatively simple and inexpensive apparatus of the rotating type whereby said impurities, together with the attendant ammonia, may be removed at a minimum expenditure of power and labor.

A still further object has been to produce an apparatus as above outlined which may be utilized, if desired, to draw the gases away from the source of supply, and therefore serve the functions of both exhauster and scrubber.

In carrying out this invention a stream of gas is caused to flow through a suitable apparatus in which a plurality of series of movable collectors for the recement in the gas are located. These collectors are preferably in the form of blades or vanes, each carrying a chamber or receptacle at one side thereof adapted to collect the recement which contacts with its blade and to direct the same along a path at right angles to the axis of the gas stream and guide it to a portion of the apparatus removed from the path of said stream. As the specific gravities of the particles of dust and fine carbon are not sufficient to enable them to be thrown by centrifugal force successfully, the gas before it contacts with the recement-collectors is subjected to a spray of water, whereby the recement is

wetted and made "heavier," so to speak. In order to insure that all of the recement is removed, a plurality of sets or series of these rotating collectors are mounted on a common shaft, and between each set a series of stationary vanes are located, which serve to correct the angularity of the stream and also to act as washing-surfaces across which the gas in its travel is compelled to flow.

In practice the gas to be scrubbed may either be forced through the apparatus by means of any suitable gas-propeller located in the apparatus or may be drawn through by means of an exhauster.

The above and other objects I attain in a device embodying in its make up the elements constructed, combined, and located as will be more fully set forth in the specification, illustrated in the drawings, and pointed out in the appended claims.

The device illustrated represents a practical embodiment of this invention, and throughout the several views thereof similar elements are denoted by like characters.

Figure 1 is a partial longitudinal sectional view of the device, a portion of the same being shown broken away and a portion shown in side elevation. Fig. 2 is a plan view of the same. Fig. 3 is a view in end elevation of one of the washing members employed, and Fig. 4 is a view in perspective of one of the blades carrying its recement collector or chamber.

The device consists of a suitable housing or casing 5, within which a rotatable shaft 6 is suitably journaled, and the housing is preferably divided on the horizontal plane through its axis, so that the upper half may be readily lifted off. The housing has an open bottom and rests within a water-containing receptacle 7, which may fit the base of the housing, as illustrated in Fig. 1. Members 8, annular in form and provided with inwardly-projecting portions 9, are secured by any suitable means to the casing at intervals throughout the length of the same. These members 8 are each formed in two sections, as shown in Fig. 3, so that the upper section may be removed with the upper section of the casing. Rigidly secured to shaft 6 and positioned in front of each of said members 8 is a recement-collector 10, each of which comprises a plurality of blades 11, and each

blade is turned over, as shown at 12, to form a receptacle adapted to collect the recement which contacts with its blade. An inlet 13 admits the gas in front of the first recement-collector, and an outlet 14 for the gas is provided beyond the last recement-collector of the series. Between outlet 14 and the last member 8 toward the outlet an exhausting-fan 15 is carried by shaft 6. Water is admitted to the interior of the casing by means of a pipe 16, and in addition the shaft 6 is formed hollow and provided with outlets 17, situated in front of the recement-collectors, whereby, if desired, water may be admitted to the interior of the housing through this shaft. A discharge-pipe 18 is provided for the water-containing receptacle 7.

The gas entering inlet 13 comes in contact with the water-spray formed by delivering water from pipe 16 against the blades of the first recement-collector, and the recement in said gas is thereby thoroughly wetted. The particles of recement in the gas after being wetted, and thereby increased in weight, contact with the faces 19 of the blades, and as the shaft is rotated at a high speed the particles will move along the blade and collect in the receptacles formed by the bent-over portions 12, and these bent-over portions will guide and direct the particles so that they will be thrown by centrifugal force beyond the edge 20 of the members 8 and out of the path of the stream of gas flowing through the apparatus. The gas will leave the recement-collectors substantially normal to the blades and move across the washing-faces 21 of the members 8, which will be maintained in a wet condition by the water admitted. These radially-disposed portions of members 8, besides acting as washing-surfaces, serve to correct the angularity of the gas leaving the collector-blades and direct it in proper manner to the next succeeding series of collector-blades. The gas which is thrown off radially by centrifugal force from the collectors is directed back toward the center of the apparatus by means of curved surfaces 22 of members 8, which extend a short distance inwardly for that purpose. In order to preclude the possibility of any recement passing through the apparatus and in order to take care of the gas from blast-furnaces and to remove the heavy condensable vapors from gas generated in the ordinary type of producer, a plurality of series of these collectors and washers are employed, and in order to take away the work of building up pressure from the collectors, if the same is desired, the exhauster 15 is employed.

The member 8 adjacent to the exhauster has its curved portion 22 extended farther in toward the center of the device than the preceding members in order to direct the gas to the proper point of the exhauster.

The recement which is thrown out onto

the inner surface of the casing by the centrifugal action of the collectors will flow down the casing to the water contained in receptacle 7 and with said water will pass out of the apparatus. It will be seen that each of the members 8 is provided with a portion 23, extending downwardly below the surface of the water in receptacle 7, whereby the water in the receptacle acts as a seal for each of the portions of the apparatus partitioned off by the members 8.

It will be seen that with this apparatus in operation the ammonia contained in the gas from the fact that it is brought into intimate relation with the finely-divided water in the apparatus will be absorbed thereby and pass out with the water through the outlet to receptacle 7, and, if desired, this ammonia may be utilized as is now common.

It will be understood that the pitch of the collector-blades may be varied, and, if desired, the exhauster may be omitted and the blades utilized to build up the desired pressure, or the pitch may be so changed that the exhauster will do all of the work of propelling the gas through the apparatus.

A pulley 24 for driving the apparatus is illustrated; but it will be understood that the same may be driven from any suitable source of power and by any desired means.

It is obvious that many variations and changes in the details of construction would readily suggest themselves to persons skilled in the art and still fall within the spirit and scope of this invention. The invention therefore is not limited or restricted to the exact details of construction and arrangement shown; but,

Having now set forth the objects of the invention and a form of construction embodying the principle thereof and having described such construction, its functions, and mode of operation, what is claimed as new and useful, and sought to be secured by Letters Patent, is—

1. In an apparatus of the character described, means for causing a stream of fluid to flow through the apparatus, rotatable members whereby the fluid stream is cut transversely of its axis and the recement therein retarded in its travel, and recement channeled receptacles rotatable with said members for receiving recement retarded by said members and delivering it beyond the stream-path.

2. In an apparatus of the character described, means for causing a stream of fluid to flow through said apparatus, agents whereby said fluid is intimately mixed with a fluid of greater specific gravity, rotatable members whereby the fluid stream is cut transversely of its axis and the recement therein retarded in its travel, and recement channeled receptacles rotatable with said members for receiving recement retarded by said

members and delivering it beyond the stream-path.

3. In an apparatus of the character described, means for causing a stream of fluid
5 to flow through said apparatus, stationary washing-surfaces disposed in the stream-path, rotatable members whereby the fluid stream is cut transversely of its axis and the
recrement therein retarded in its travel and
10 recrement channeled receptacles rotatable with said members for receiving recrement retarded by said members and delivering it beyond the stream-path.

4. In an apparatus of the character described,
15 means for causing a stream of fluid to flow through said apparatus, recrement-ways located out of stream-path, agents for wetting the recrement contained in the fluid stream, rotatable members whereby the fluid
20 stream is cut transversely of its axis and the recrement therein retarded in its travel, and recrement channeled receptacles rotatable with said members for receiving recrement

retarded by said members and delivering it to said recrement-ways.

5. In an apparatus of the character described, means for causing a stream of gas to flow through the apparatus, and rotatable
recrement-receptacles for cutting the gas
stream transversely of its axis and centrifugally forcing the recrement collected, beyond
30 the gas stream.

6. In a recrement-separator, a plurality of compartments formed by annular, inwardly-projecting fluid-directors, a rotatable shaft
35 located centrally of said directors and carrying a fluid-propeller in each of said compartments, and recrement-receptacles carried by said propellers.

In testimony whereof I have hereunto subscribed my name this 25th day of July, 1904.

ALEXANDER M. GOW.

Witnesses:

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