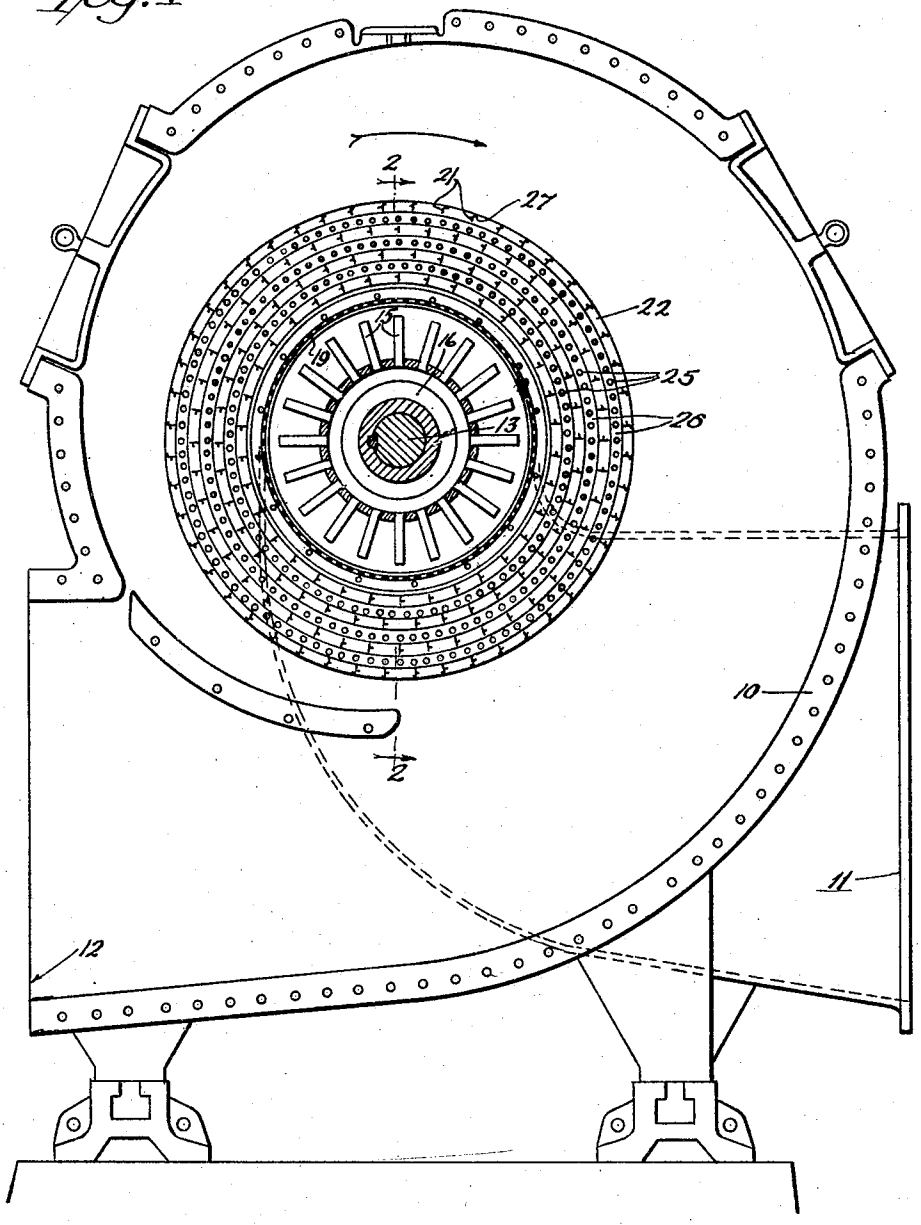
Sept. 22, 1931. A. J. BOYNTON 1,824,463

GAS CLEANING APPARATUS

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Fig. 1



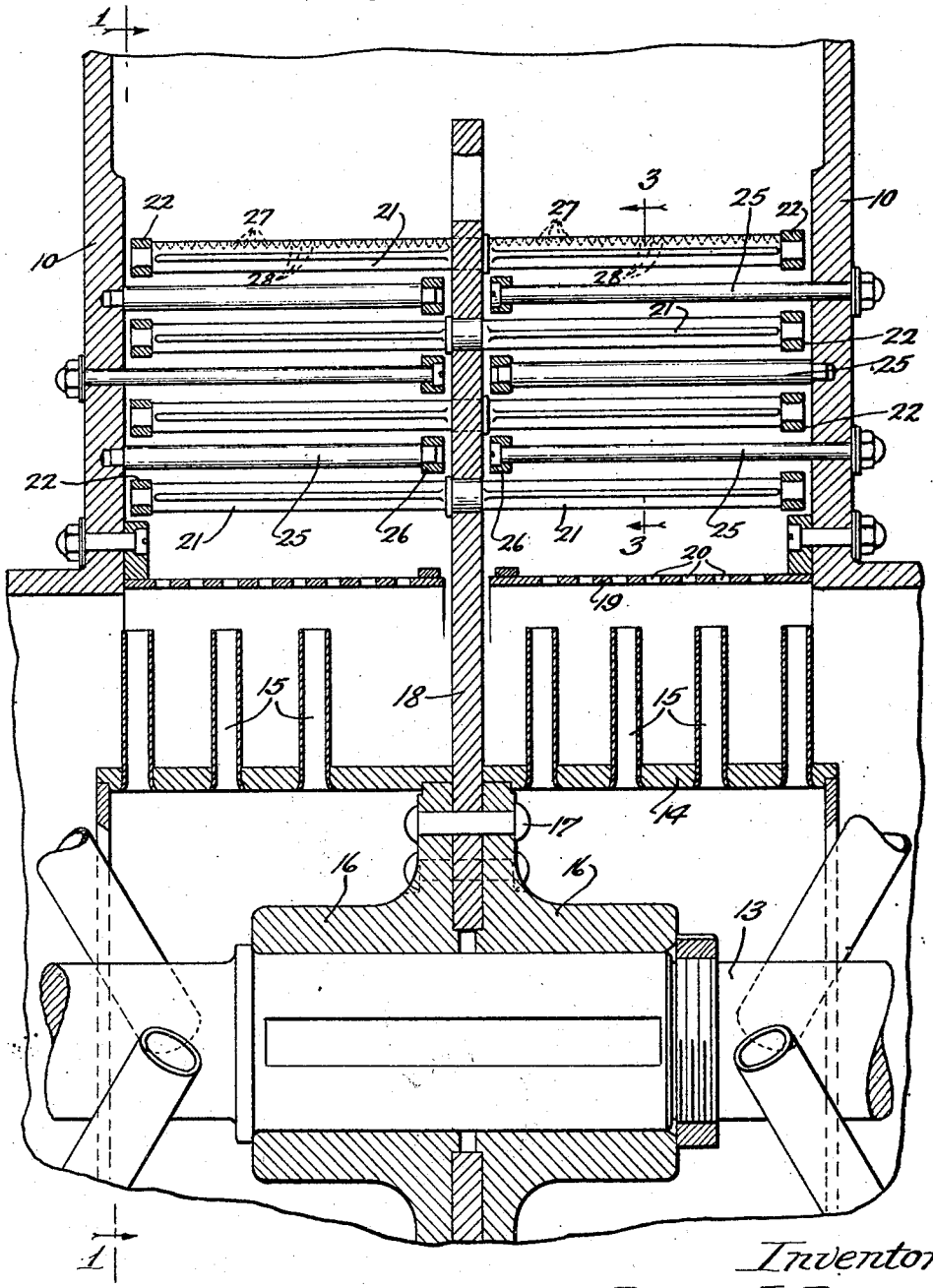
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GAS CLEANING APPARATUS

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Fig. 2



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GAS CLEANING APPARATUS

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Fig. 4

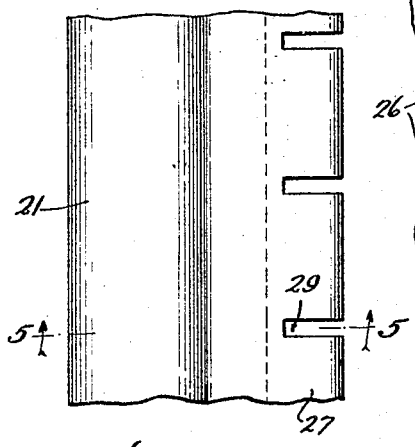


Fig. 3

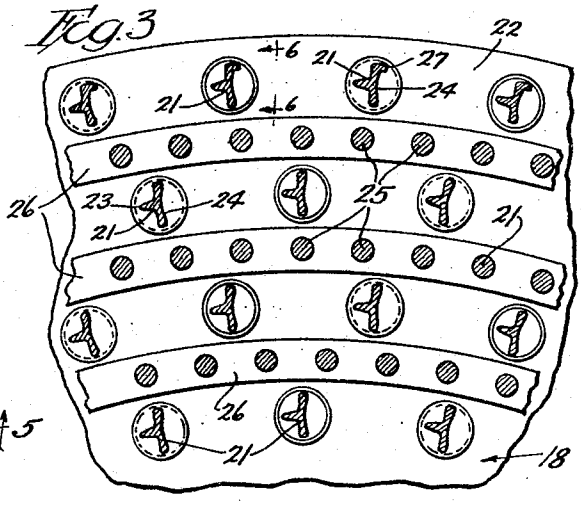


Fig. 5

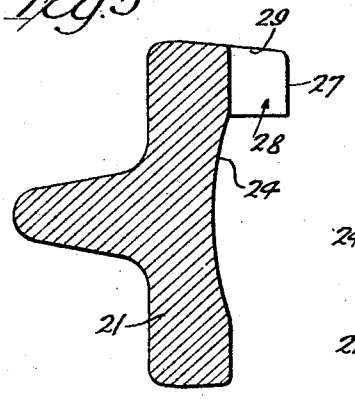


Fig. 6

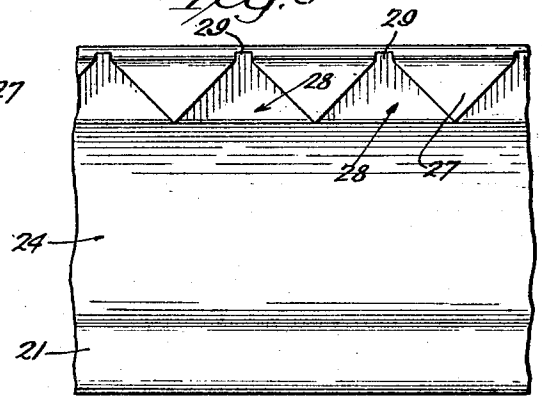


Fig. 7

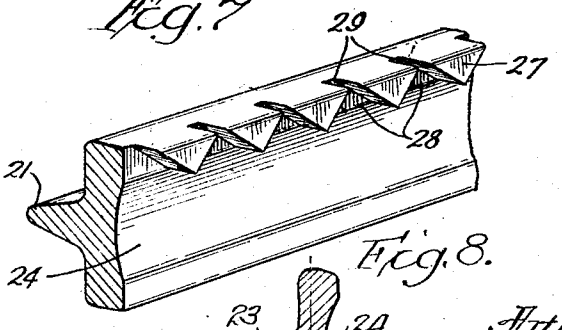
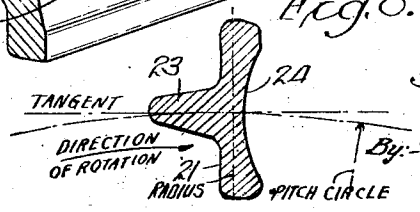


Fig. 8.



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Patented Sept. 22, 1931

1,824,463

UNITED STATES PATENT OFFICE

ARTHUR J. BOYNTON, OF WINNETKA, ILLINOIS, ASSIGNOR TO H. A. BRASSERT & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

GAS CLEANING APPARATUS

Application filed March 8, 1930. Serial No. 434,199.

This invention relates to improvements in gas cleaning apparatus of the type in which there is employed rotating elements operating to beat up the water contained in the gas into a finely divided mist and then cause the mist to cohere into drops sufficiently large to permit their removal from the gas stream.

This cohesion and removal is at present accomplished by means of a water eliminator through which the gas passes after leaving the disintegrator.

The disintegrator in connection with which this invention is particularly concerned embodies a plurality of rows of rotating disintegrating bars alternately arranged with stationary rows of bars.

It is one of the objects of the present invention to change the form and construction of the outer rows of rotating bars to cause a cohesion of the particles of mist as they leave them. In the rapid circular motion of this outer row of disintegrating bars, the mist strikes against the forward face of the bars and is projected outwardly, there being some tendency to enlargement of water globules by this action.

In order to increase the tendency to enlargement of globules, there is provided means projecting laterally from the face of the bars of the outer row along the outer edge thereof and in such projections there is formed a series of gradually reduced passageways opening through the peripheral edge of the projections, in such a way that the globules of water will be diverted from a straight path and merged together in the gradually narrowing spaces to pass therethrough and to be thrown outwardly at the outer edges of the bars. The result of such a construction is that there is a tendency to decrease the number and increase the size of drops of water passing off the edges of the bars.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a view taken on line 1—1, Figure 2, of an apparatus of this character constructed in accordance with the principles of this invention, showing some of the parts in section and some of the parts diagrammatically.

Figure 2 is a sectional view taken on line 2—2, Figure 1, on an enlarged scale, with parts omitted and with parts broken away.

Figure 3 is a detail sectional view taken on line 3—3, Figure 2.

Figure 4 is a top plan view of a portion of one of the outer bars of the disintegrator constructed in accordance with the principles of this invention.

Figure 5 is a detail sectional view taken on line 5—5, Figure 4.

Figure 6 is a view taken on line 6—6, Figure 3, with parts omitted.

Figure 7 is a detail perspective view taken from the outer face or side of one of the outermost bars. Figure 8 is an enlarged detail sectional view of one of the rotatable disintegrator bars.

Referring more particularly to the drawings the numeral 10 designates generally a casing in which the disintegrator is mounted, and the casing is provided with an inlet 11 through which the gas to be treated enters, and an outlet 12 for the dry gas.

Arranged within the casing 10 is a disintegrator which consists of a rotor embodying a shaft 13 suitably mounted, and encompassing the shaft is a housing 14 of a diameter considerably greater than the diameter of the shaft, and arranged in the wall of the housing 14 are tubular members 15 through which the gas which enters the housing is discharged.

Secured to the shaft 13 in any desired or suitable manner such as by means of hub members 16 and fastening devices 17, located within the housing 14, is a disc 18 which is of a diameter considerably greater than the external diameter of the housing 14 and passes through the housing wall, the housing 14, disc 18 and hub members 16 rotating with the shaft.

Supported in any desired or suitable man-

ner preferably by the wall of the casing 10 is a screen or reticulated member 19 which extends across and is spaced from the ends of the tubular members 15. This screen 19 may be formed of any suitable material having openings 20 therethrough to permit the gas which passes out of the tubular members 15 to pass therethrough.

Supported by the disc 18 and beyond the screen 19 are a plurality of bars 21 spaced from each other and arranged in series parallel with each other. The outer ends of these bars are supported in any suitable manner such as by means of rings 22 so that when the disc 18 is rotated the bars 21 will be also rotated. These bars 21, as shown more clearly in Figure 3, are of a substan ially T shape in cross section, the web 23 thereof being disposed in the rear of the bar while the face 24 is disposed at the front of the bar, with the result that during the operation of the device and when gas passes through the screen 19 into the path of movement of the bars or members 23, the outer face 24 of the bars will contact with the gas, with the result that moisture will be deposited upon the face of the bars, which moisture, when the bars are rotated, will be thrown outwardly and away from the bars.

The general construction of all of the rotatable bars 21 is the same and it will be noted that all of the corners of the bars are rounded so as to offer less resistance in its peripheral flight through the mist of water and gas. The tail or trailing portion 23 of the bar is short in comparison to the radial length of the bar and stiffens or reinforces the bar against the pressure of water and gas through which it forces its way. The radial length of the bar (that is radial with reference to the orbit of its path of movement) is necessary to withstand the stress of the centrifugal changes set up by the rapid rotation.

The advancing or striking surface of the bar is slightly dished or concaved, in order to reduce weight, and at the same time this surface prevents gas and water from glancing off the bar too rapidly, thereby increasing the impinging effect of the bar on the gas. The bar may be formed in any suitable manner as an integral structure by casting or molding, or by milling out of a solid bar, to a flat bar carrying a laterally projecting tail piece of substantially shorter length than the width of the bar.

Alternately arranged with the bars 21 are series of stationary bars 25, the latter being preferably supported by the wall of the casing 10, as shown in Figure 2, while the inner ends of these stationary bars 25 which are disposed on opposite sides of the disc 18 are connected together by means of rings 26.

It will therefore be manifest that when the gas is contacted with the bars 21 the larger particles or drops of water will adhere to the faces of the bars and will be thrown out or away from such faces during the rotation of the device. The contact of these bars will also cause particles of moisture in the mist to be formed into larger drops and in order to cause a greater coherence of these smaller drops, so as to effect a more perfect drying of the gas, the outer rows of bars 21 are provided with means on the forward face thereof so as to increase the tendency to the enlargement of the water globules.

A suitable and efficient means embodies the provision of a projection 27 extending laterally from the forward face 24 of the ribs and these projections are provided with gradually decreasing passages 28 terminating in slots 29 opening through the top of the projection, thereby forming a narrow outlet for the gas which enters the passages or recesses 28, with the result that when the outer bars 21 are rotated the globules of water in the gas will be diverted from a straight path and merged together in the gradually narrowing space terminating in the slot 29 through the top of the projection 27. The tendency of this operation being to decrease the number and increase the size of the drops of water passing off the outer edge of the bars.

It will therefore be seen that in the rapid circular motion of the outer row of bars 21 the mist will strike against the forward surface 24 of the bars and will tend to project or throw the same outwardly beyond the periphery, but in the course of such movement the gas comes into contact with the projection 27 and will enter the gradually reduced spaces 28 to pass through the slots 29 and thrown outwardly off of the edge of the bars, resulting in merging together of the drops of water in the mist, with the further result that the cohered drops will separate or fall out of the gas.

While the preferred forms of the invention have been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A gas cleaning apparatus embodying a rotary element, a series of spaced parallel bars mounted upon the rotor and extending in directions lengthwise of the axis of rotation of the rotary element, a series of stationary bars parallel with the rotating bars and alternately arranged with respect thereto, said bars operating to disintegrate the gas contacting therewith, and means carried by the forward surface of the outer row of rotating bars and operating to divert the globules of water in the gas from their path of flow and merge them together.

2. A gas cleaning apparatus embodying a rotatable disintegrator embodying a series

of bars having a surface movable transverse to the flow of gas to be contacted therewith and upon which surface moisture is formed into drops, to be eventually thrown outwardly from the bars, and means for causing the drops to merge into larger drops before being thrown off of said bars.

3. A gas cleaning apparatus embodying a rotatable disintegrator embodying a series of bars rotatable transverse to the flow of gas to be contacted therewith and upon the forward surface of which bars mist from the gas will be deposited, and means carried by the outer forward surface of the bars to cause a cohesion of the particles of mist as they leave said bars.

4. A gas cleaning apparatus embodying a rotatable disintegrator embodying a series of bars rotatable transverse to the flow of gas to be contacted therewith and upon the forward surface of which bars mist from the gas will be deposited, and means carried by the outer forward surface of the bars to cause a cohesion of the particles of mist as they leave said bars, the said means embodying passages gradually reducing in size and through which passages the globules of moisture pass.

5. A gas cleaning apparatus embodying a rotatable disintegrator embodying a series of bars rotatable transverse to the flow of gas to be contacted therewith and upon the forward surface of which bars mist from the gas will be deposited, and means carried by the outer forward surface of the bars to cause a cohesion of the particles of mist as they leave said bars, the said means embodying a lateral projection on said surface in the path of flow of the moisture globules, there being gradually reduced passages in the said projection and through which passages the moisture passes to be thrown off of the bars.

6. In a gas cleaning apparatus a disintegrator bar rapidly rotatable across the path of flow of the gas and against the forward surface of which the mist contacts to be projected outwardly thereby, and means for cohering the globules of moisture into larger globules as they leave the said surface, the said means embodying an obstruction to the flow of moisture along said surface and operating to divert the globules from their straight path of flow and merge them into larger drops.

7. In a gas cleaning apparatus a disintegrator bar rapidly rotatable across the path of flow of the gas and against the forward surface of which bar the mist contacts to be projected outwardly thereby, and a series of passages arranged to divert the globules of moisture as they move across said surface and merge them together into larger globules to be thrown off of said bar.

8. A gas cleaning apparatus embodying a disintegrator bar rapidly rotatable across the path of flow of the gas, a series of spaced V shaped projections arranged along the outer forward surface of the bar, said projections operating to divert the globules of moisture from a straight path of movement and merge them together in the gradually narrowing spaces between said projections, to be thrown out of the narrow portion of said spaces.

9. A disintegrator bar for gas cleaning apparatus embodying a mist striking surface, a portion of said surface being shaped to form gradually reduced moisture passages extending through the outer edge of said surface.

10. A disintegrator bar for gas cleaning apparatus embodying a mist striking surface, a portion of said surface having spaced co-operating V shaped portions projecting laterally therefrom to form gradually reduced moisture passages opening through the outer edge of said bar.

11. A disintegrator bar for gas cleaning apparatus embodying a mist striking surface, a portion of said surface having spaced co-operating V shaped portions projecting laterally therefrom to form gradually reduced moisture passages parallel with said surface and opening through the outer edge of said bar.

12. A disintegrator bar for gas cleaning apparatus embodying a mist striking surface, a portion of said surface along one edge only thereof having spaced co-operating V shaped portions projecting laterally therefrom to form gradually reduced moisture passages opening through the outer edge of said bar.

13. A disintegrator bar for gas cleaning apparatus embodying a surface against which the mist in the gas strikes, and means projecting from a portion only of said surface for diverting the globules of water from a straight path across said surface and to merge them together into larger drops.

In testimony whereof I have signed my name to this specification, on this 4th day of March, A. D. 1930.

ARTHUR J. BOYNTON.