H. E. THEISEN.

APPARATUS FOR WASHING, CLEANING, AND COOLING GASES.

APPLICATION FILED OCT. 20, 1913.

1,139,385.

Patented May 11, 1915.

2 SHEETS—SHEET 1.

Fig. 1

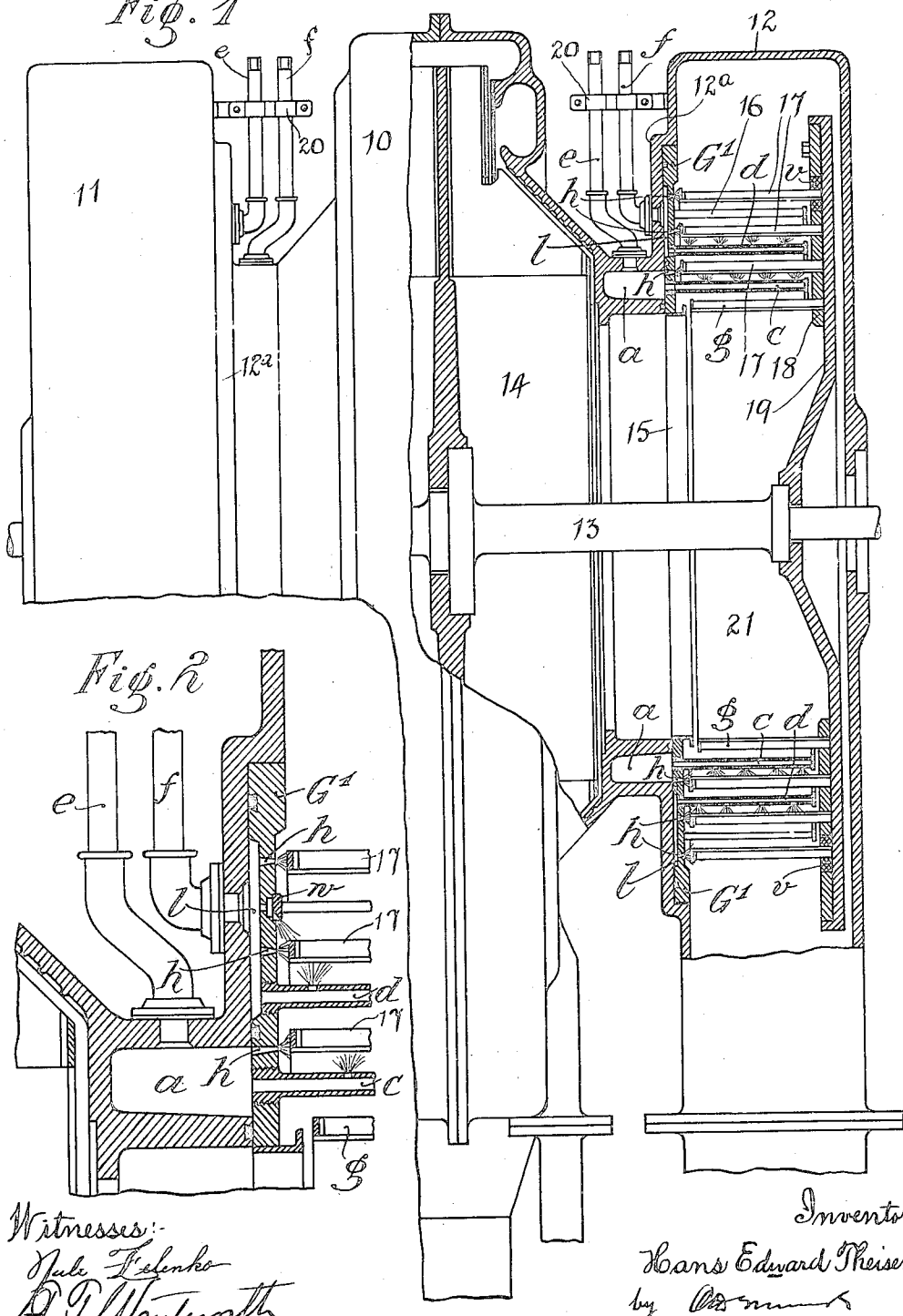


Fig. 2

Witnesses:-

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Fig. 3

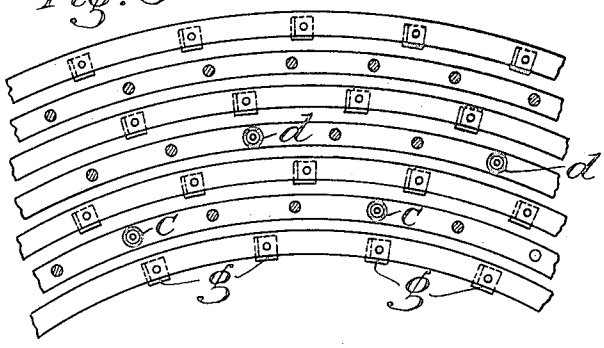


Fig. 4

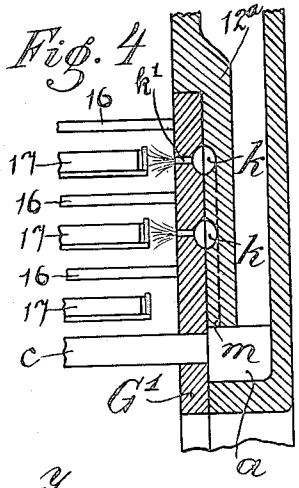


Fig. 5

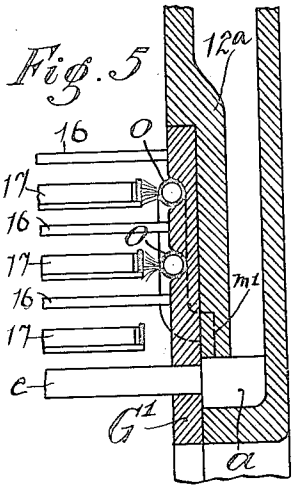


Fig. 6

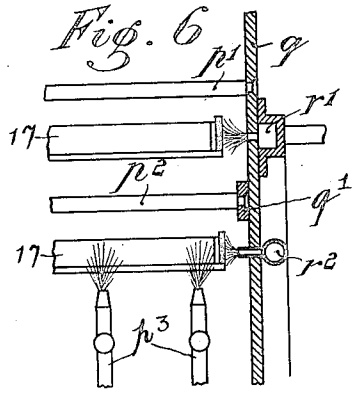
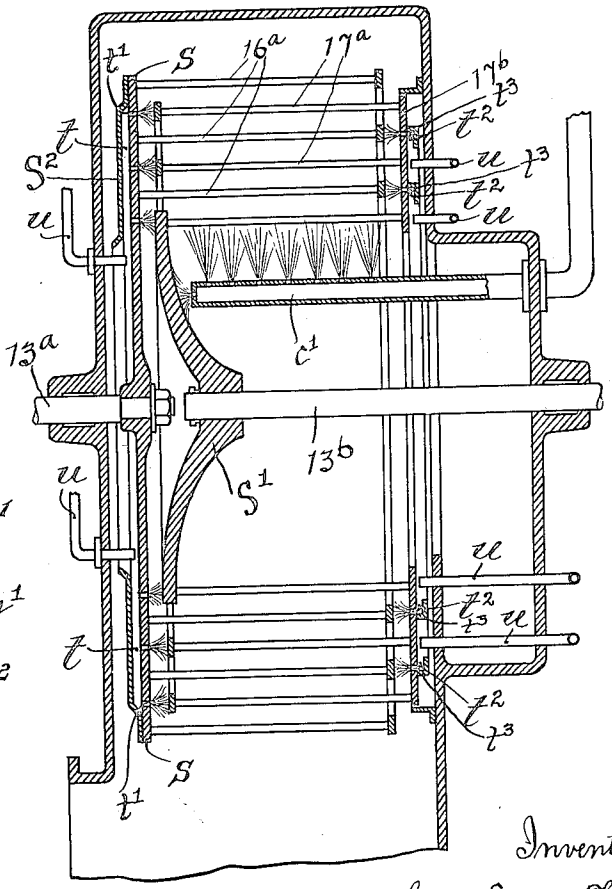


Fig. 7



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APPARATUS FOR WASHING, CLEANING, AND COOLING GASES.

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in the innermost ring 17 carried by the plate 18. The supply of water to the channel *a* is preferably controlled by the pipe *e* supported in a bracket 20 carried by the casing of one of the washing compartments. Water under pressure is supplied through pipe *e* (which may be suitably valved, the valve not being shown), entering the channel *a* and passing out, in spray form, through the small perforations in the nozzles *c*, thus mixing with and washing the gas being treated. To prevent the washing fluid from escaping into the fan compartment 10 from the washing compartments, I secure to each of the frames 19 an inner guard ring 21, preferably consisting of a series of bars or angle irons *g* suitably secured together at their ends, as shown in Fig. 3.

As above stated, it developed in practice that the body or strata of gas at some distance from the inner rings 17 was not adequately supplied with washing fluid owing to the fact that the inrushing gas carried with it the water issuing from the spray nozzles, and to remedy this defective condition I have, in the present invention, provided an additional series of concentric spray nozzles *d*, preferably carried by the disk G′, and closer to the outer peripheries of the compartments 11 and 12 than are the nozzles *c*. As clearly shown in Figs. 1 to 3, the nozzles *d* preferably alternate with the nozzles *c* and are arranged between certain of the disintegrator members, in a position to furnish an adequate supply of liquid to the outer body or strata of gas in the washing compartments.

The nozzles *d* may receive their supply of fluid from the channel *a*, but it is preferable to provide separate means for supplying the nozzles *d* with fluid, and to this end there is provided between the inner faces of the disk G′ and the seat 12^a therefor, a chamber *l* to which liquid is supplied through the pipe *f* from any suitable source. By providing the separate supply pipes *e* and *f* the flow of liquid to the nozzles *c* and *d* may be separately and independently controlled. The nozzles *c* and *d* are preferably removable from the disk G′ so as to be capable of being easily cleaned and replaced in operative position.

I have stated above, that in the operation of apparatus of the type herein referred to there was a tendency for unwashed gas to escape between the inner ends of the disintegrator members 17 and the disk G′, and in this connection it was also noted that the lateral walls of these disintegrator members were not sufficiently acted upon by the washing fluid. I have remedied both these defects in the present construction by providing a lateral water supply in the form of spray, which spray acts against the lateral walls of the disintegrators and also deflects any escaping gas back into the washing compartments.

The simplest form of lateral water supply is shown in Figs. 1 and 2, wherein the disk G′ is provided with a series of orifices *h*, certain of which communicate with the channel *a* and others of which communicate with the chamber *l*. Jets of liquid issue through these orifices, the liquid impinging against the lateral walls of the disintegrator members 17 and also acting against any gas which may flow toward them, deflecting such gas back into the washing compartments. In this way all escape of unwashed gas is prevented, and at the same time the deposit of tar and dust, *i. e.*, the formation of incrustation, is entirely avoided.

In the modified form of invention shown in Fig. 4, passages *k* are formed partly in the disk G′ and partly in the seat 12^a, and water supplied to these passages from the channel *a* through the radial duct *m*, issues against the lateral walls of the disintegrator members 17 through the outlet openings *k*′.

Fig. 5 is a form of invention wherein circular, perforated, pipes *o* are carried by the disk G′, these pipes being supplied with liquid from the channel *a* through the duct *m*′.

Fig. 6 shows a form in which outer disintegrator bars *p*′ are riveted or otherwise secured to a casing wall *q*, while the inner bars p^2 are secured to a ring *q*′ which may be removed, with the bars it supports, from the wall *q*. Water is supplied laterally to the device either through the conduits *r*′ or the jet tubes r^2, or through both. Jet tubes p^3 are provided to spray fluid against the body of the inner disintegrator.

In Fig. 7 I have shown a form of device wherein water is supplied laterally to the washing chamber in which two sets of disintegrators rotate in opposite directions. In this form of device wherein both sets of disintegrators rotate, water is admitted from both sides, while in the form where one set of disintegrators is stationary and the other rotates, water need enter at but one side of the apparatus.

S and S′ designate disks which are carried by the shafts 13^a, and 13^b, respectively, and rotate in opposite directions. To these disks are secured the disintegrator members 16^a and 17^a, within which is arranged the perforated pipe *c*′ for furnishing the main water supply to the gas.

Fixed to the disk S and spaced away therefrom is a plate S^2, between which and the disk S the chamber *t* is formed. Water is supplied to the chamber *t* through the pipes *u* and passes through the orifices *t*′ against the lateral walls of the disintegrator members 17^a.

In the lateral wall 17^b of the series of disintegrators 17^a a plurality of orifices t^2 is

formed, and adjacent each series of orifices is a ring t^3 of angle iron forming a channel for receiving the water which flows through the orifices t^2 against the end wall of the series of disintegrators 16^a. Water is supplied to the channels t^3 from a suitable source through the pipes u carried by the fixed casing of the device.

It will be understood that the principal body of water is supplied, usually, at the center of the device, flowing or spraying radially in a direction toward the outer periphery of the washing compartments, and that the lateral water supply is only auxiliary to the main supply and designed to augment the action of the latter; but it will be obvious that, if desired, the lateral water supply may be used as the principal supply and the other supply dispensed with.

While I have herein described and shown my invention in considerable detail, it will be understood that considerable modification may be made in the construction and arrangement of parts without departing from the spirit of the invention as defined by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:—

1. In an apparatus of the character specified, the combination of a plurality of annular disintegrator members, a perforated disk supporting certain of said members, and means whereby fluid is ejected through the perforations in said disk to act against the ends of said disintegrator members.

2. In an apparatus of the character specified, the combination of a casing divided into a central fan compartment and lateral washing compartments, a fluid channel between each washing compartment and the fan compartment, a disk in each washing compartment having openings therein communicating with said fluid channel, and disintegrator members in said washing compartments adapted to be acted on by the fluid issuing through the openings in said disk.

3. In an apparatus of the character specified, the combination of a casing divided into a central fan compartment and lateral washing compartments, a fluid channel between each washing compartment and the fan compartment, a disk in each washing compartment having openings therein communicating with said fluid channel, spray nozzles connected to said openings and traversing said washing compartments, and disintegrator members within said washing compartments and in line with the fluid issuing through said nozzles.

4. In an apparatus of the character specified, the combination of a casing divided into a central fan compartment and lateral washing compartments, the inner wall of each washing compartment being offset, a disk seated in said offset and spaced away from said wall to form a liquid chamber, there being perforations in said disk, a liquid channel adjacent said disk, spray nozzles carried by said disk and traversing said washing compartment, disintegrator members within said washing compartments, and means for supplying fluid to said liquid channel and to said liquid chamber whereby liquid issues through said nozzles and said perforations against said disintegrator members.

5. In an apparatus of the character specified, the combination of a casing having a fan compartment and an adjacent washing compartment in communication with each other, annular disintegrator members within said washing compartment, means for supplying washing fluid to said washing compartment, and means within the innermost disintegrator member for preventing the escape of fluid from the washing compartment into the fan compartment.

In testimony whereof I have affixed my signature in presence of two witnesses.

HANS ED. THEISEN.

Witnesses:

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