N. F. EGLER.

GAS CLEANING MECHANISM.

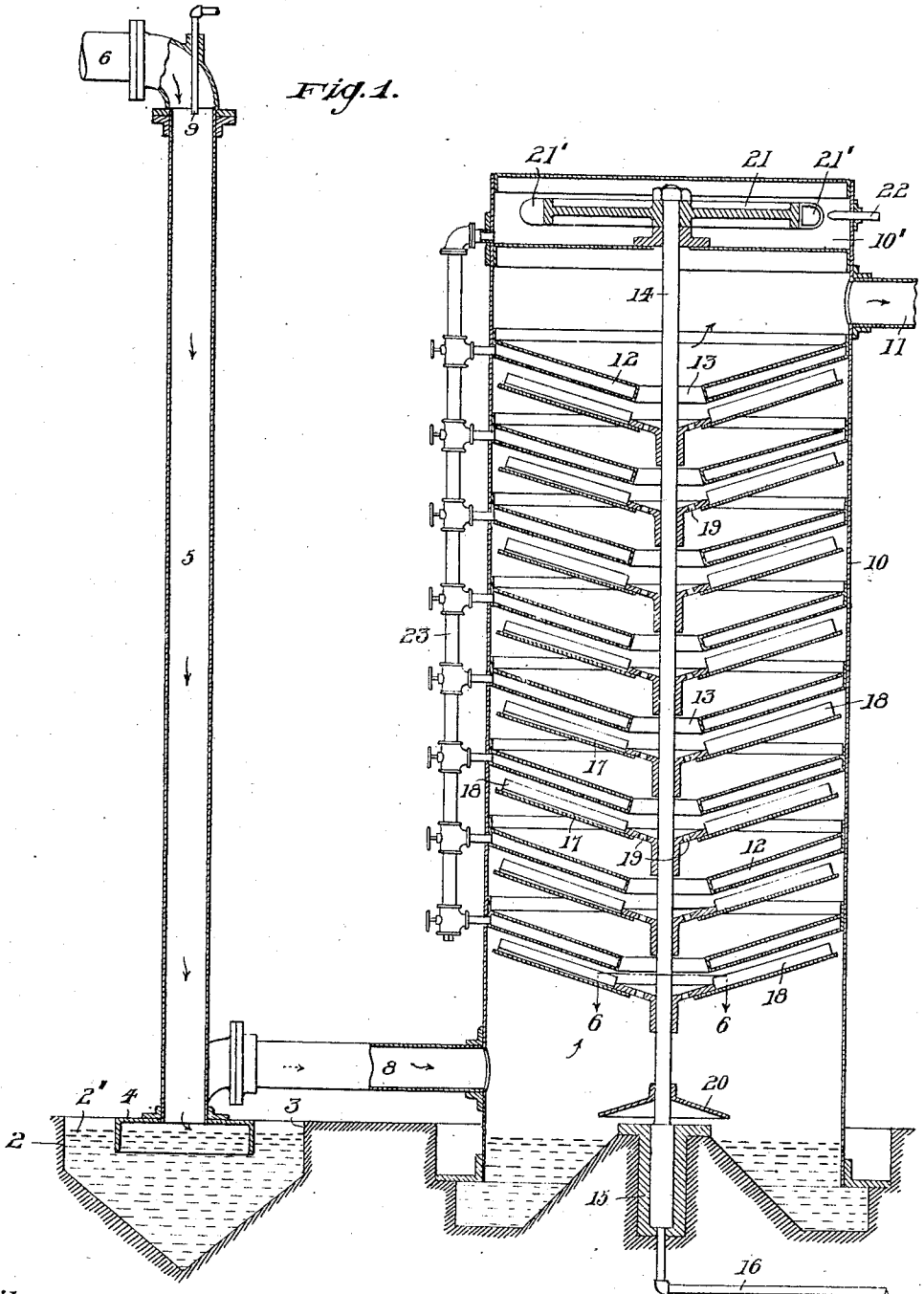
APPLICATION FILED AUG. 22, 1908. RENEWED APR. 29, 1910.

1,083,068.

Patented Dec. 30, 1913

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

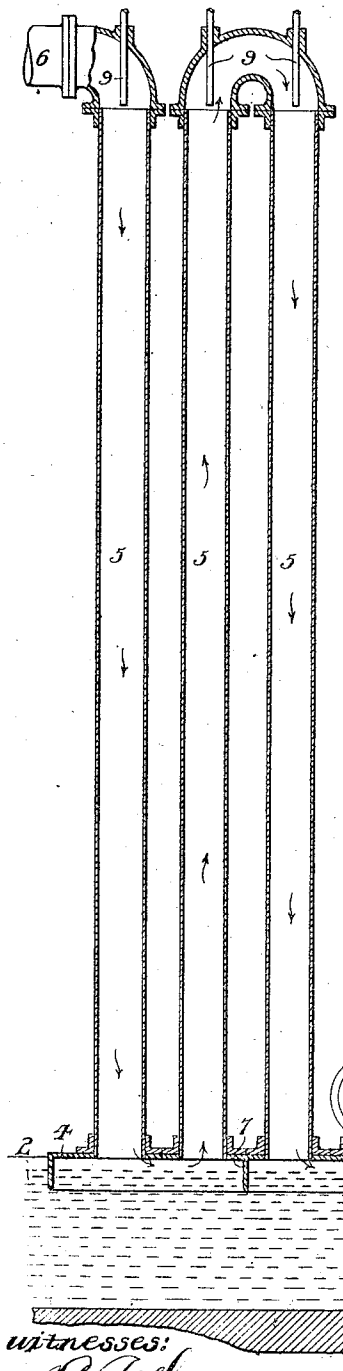


Fig. 3.

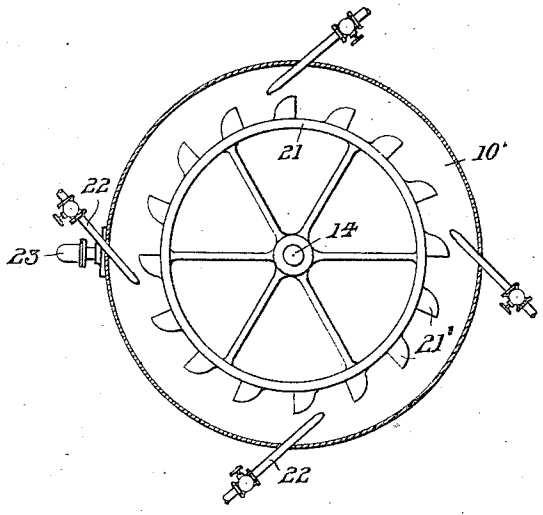


Fig. 4.

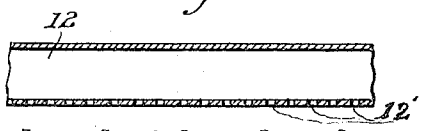


Fig. 5.

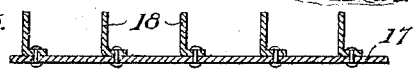
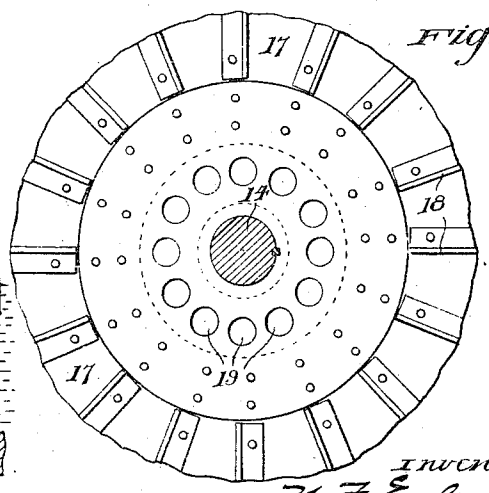


Fig. 6.



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UNITED STATES PATENT OFFICE.

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GAS-CLEANING MECHANISM.

1,083,068. Specification of Letters Patent. Patented Dec. 30, 1913.

Application filed August 22, 1908, Serial No. 449,833. Renewed April 29, 1910. Serial No. 558,335.

To all whom it may concern:

Be it known that I, NICHOLAS F. EGLER, a resident of South Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas-Cleaning Mechanism, of which the following is a specification.

The primary object of the invention is to provide a washer of improved construction wherein provision is had for subjecting the gas to a thorough cleansing operation, the same passing through the washer body in a circuitous course and so broken up as to thoroughly subject it to the cleansing water sprays so that it is discharged from the washer in a substantially pure state.

A feature of the invention is the rotation of the agitating means by a water motor, with provision for utilizing the spent water from the motor for washing the gas.

Still a further feature is the provision of means for relieving the agitator shaft of friction in its bottom bearing.

In the accompanying drawings, Figure 1 is a vertical sectional view of gas cleaning apparatus constructed in accordance with the invention. Fig. 2 is a view partly in section of the settling or preliminary cleaning chamber. Fig. 3 is a sectional plan of the water motor. Fig. 4 is a sectional detail of a portion of one of the water pockets, and Fig. 5 is a similar view of part of one of the agitators. Fig. 6 is a sectional view of a portion of one of the agitators taken on line 6—6 of Fig. 1.

Referring to the drawings, 2 designates a water chamber formed in base 3 of any suitable construction, and covering a portion of the chamber is the base member 4 of the settling chamber. In the present adaptation, the settling chamber consists of the series of vertical pipes 5 having their lower ends secured in openings in base 4. A gas inlet 6 communicates with the upper end of one of the pipes, and such of the pipes are connected at their upper ends by return bends as is necessary to form a continuous gas passage through the pipes, communication between the lower ends of the pipes being had above the surface of the water, as clearly shown in Fig. 2. The downward projection 7 on base 4 prevents the gas from moving over the surface of the water without passing upward and downward through the pipes, so that it can reach outlet 8 leading to the washer only after the settling chamber has been fully traversed. A water nozzle 9 is projected downwardly into the upper end of each of pipes 5 through which water is discharged downwardly through the downwardly flowing gas, the water discharging in chamber 2. By this means the temperature of the gas received at the inlet 6 from the gas producer is greatly reduced, and at the same time the impurities other than tar are precipitated into chamber 2. The latter is open at the top at 2′ so that the chamber and tubes 5 may be readily cleaned.

The washer proper consists of a shell-like cylindrical chamber 10, with the lower end of which pipe 8 communicates from the preliminary cleaning mechanism, and at the upper end is outlet 11 for the washed gas. Within chamber 10 is a vertical series of water pockets 12, the pockets spaced apart and each closing the chamber save for a central opening or passage 13. The pockets are dished downwardly or inclined from their outer edges to openings 13. The under side of each pocket is perforated at 12′ to spray the water into the space beneath, through which the gas circulates. Extending through openings 13 is vertical shaft 14, journaled at its lower end in thrust bearing 15, with a pipe 16 communicating with the bottom of the bearing through which water is admitted under such pressure as to relieve the friction of the shaft on its bearing and thereby cause the shaft to turn more easily.

Secured to the shaft between adjacent pockets are the disk-like agitators 17 which are dished complementary with the pockets and each of which has vertical flanges or ribs 18 on its upper face. The agitators extend outwardly nearly to the wall of chamber 10 so that the gas can escape upwardly through the chamber only by passing out around them and then inwardly and downwardly to openings 13. With the agitator disks rotating, the gas escaping through the circuitous passage is thoroughly broken up and at the same time subjected to the water jets discharging from the pockets, with the result that it is thoroughly cooled and the tar is effectively separated therefrom. The water and tar flow downwardly through openings 19 near the center of each deflector and into the water seal at the bottom of

chamber 10, from which they are discharged through a suitable drain or outlet, not shown. A shield 20 on shaft 14 protects bearing 15.

While shaft 14 may be rotated by various means, a feature of the invention is the rotation of this shaft by a water wheel 21 of ordinary construction secured to its upper end within the supplemental chamber 10′ at the top of chamber 10. Projecting through the wall of chamber 10′ are the several water admitting nozzles 22, the valves of which may be so adjusted as to rotate the wheel at any desired speed, the water being discharged against buckets 21′ with more or less force, as may be required. The spent water from chamber 10′ discharges into manifold 23 having valved connection with each of pockets 12, whereby the water used for propelling the washer is utilized for washing the gas, the same being supplied in greater or less quantity to the several pockets, as desired.

I claim:—

1. In gas cleaning apparatus, a chamber having a gas inlet and an outlet, a vertical succession of water pockets within the chamber and spaced apart, the pockets being arranged to permit water and gas to flow vertically through the chamber and also constructed to discharge water into the latter, means for supplying water to the pockets, and movable deflectors operative between the pockets.

2. In gas cleaning apparatus, a chamber having a gas inlet and an outlet, a vertical succession of water pockets within the chamber and a similar succession of deflectors within the chamber and alternating with the pockets, means for supplying water to the pockets with the latter constructed to discharge the same within the chamber, and deflector operating means.

3. In gas cleaning apparatus, a chamber having a gas inlet and an outlet, a vertical succession of downwardly dished water pockets secured within the chamber and open for water to discharge into the latter, the pockets formed with central passages, a shaft extending therethrough, downwardly dished deflectors secured to the shaft in the spaces between the pockets, and means for supplying water to the pockets.

4. In gas cleaning apparatus, a chamber having a gas inlet and an outlet, a vertical succession of perforated water pockets within the chamber and spaced apart and arranged to permit water and gas to flow from one space to the other between the pockets, deflectors within the chamber, a water motor space separate from the chamber, a valved connection between said space and each of the water pockets, and a motor in said space operatively connected to the deflectors.

5. In gas cleaning apparatus, a chamber having a gas inlet at its lower end and an outlet at its upper end, water pockets spaced apart within the chamber one above the other and perforated to discharge water therefrom, and deflecting devices operative in the spaces between adjacent pockets.

6. In gas cleaning apparatus, a chamber having a gas inlet at its lower end and a gas outlet at its upper end, a plurality of perforated water pockets secured within the chamber with a central passage extending through all pockets, a shaft rotatable in said passage, and deflectors on the shaft between the pockets.

7. In gas cleaning apparatus, a chamber having a gas inlet at its lower end and a gas outlet at its upper end, a plurality of perforated water pockets secured within the chamber one above the other and closing the latter excepting for a central passage through each pocket, a shaft rotatable in said passages, and disk-like deflectors secured to the shaft between the pockets.

8. In gas cleaning apparatus, a chamber having a gas inlet at its lower end and an outlet at its upper end, a series of water pockets perforated on their under faces and secured within the chamber one above the other and closing the chamber save for a central passage through each pocket, a shaft rotatable in said passages, the pockets being inclined downwardly from their outer edges toward said passages, and downwardly dished deflectors secured to the shaft between the pockets.

9. In gas cleaning apparatus, a chamber having a gas inlet and an outlet, a series of perforated water pockets secured within the chamber and spaced one above the other and closing the space between adjacent pockets save for a central passage through each pocket, a shaft rotatable in the central passage, deflectors secured to the shaft and operative between the pockets, a water motor for rotating the shaft, and means for conducting the spent water to the several pockets.

10. In gas cleaning apparatus, a chamber having a gas inlet and an outlet, a vertical shaft rotatable within the chamber, deflectors secured to the shaft, and means for exerting water pressure on the shaft for relieving the friction of the latter in its bearing.

11. In gas cleaning apparatus, a chamber having a gas inlet and an outlet, the chamber having a motor space at its upper end separated from the gas space, agitating means rotatable within the chamber, a water motor within said water space and connected to the agitating means, and means for conducting the spent water from the water chamber in the gas space.

12. In gas cleaning apparatus, a chamber

having a gas inlet and an outlet, a vertical series of perforated water pockets within the chamber and provided with openings forming a central passage, a shaft extending through the passage, and disk-like deflectors secured to the shaft and having openings therethrough for the purpose described.

13. In gas cleaning apparatus, a chamber having a gas inlet and an outlet, a succession of hollow open-bottom partitions in the chamber between the inlet and outlet with the partitions open for the passage of gas, a deflector adjacent each partition and in the path of the gas passing therethrough, means for moving the deflectors for agitating the gas, and means for supplying water to the hollow partitions which discharge the same on the deflectors.

14. In gas cleaning apparatus, an upright chamber having a gas inlet at its lower end and a gas outlet at its upper end, centrally open partitions spaced apart one above the other within the chamber, a vertical operating shaft extending through the partitions, downwardly dished deflectors secured to the shaft and rotatable beneath the partitions with the deflectors perforated adjacent the shaft for the purpose described, and means for discharging water onto the deflectors.

15. In gas cleaning apparatus, the combination of a chamber having a gas inlet at its lower end and a gas outlet at its upper end, downwardly dished centrally open partitions within the chamber and spaced apart one above the other, a downwardly dished rotatable deflector beneath each partition with the dished formation of the deflector embracing the dished formation of the partition, and water supplying means.

16. In gas cleaning apparatus, the combination of a chamber having a gas inlet at its lower end and a gas outlet at its upper end, rotatable downwardly dished deflectors spaced apart one above the other within the chamber, centrally open downwardly dished partitions within the chamber and spaced apart vertically with each partition located immediately above and depending into a dished deflector, and water supplying means.

17. In gas cleaning apparatus, the combination of a chamber having a gas inlet at its lower end and a gas outlet at its upper end, rotatable downwardly dished deflectors spaced apart one above the other within the chamber, centrally open downwardly dished partitions within the chamber and spaced apart vertically with each partition located immediately above and depending into a dished deflector, and means for directing a spray of water from the under surface of each partition onto the top surface of the deflector which rotates immediately therebeneath.

18. In gas cleaning apparatus, the combination of a chamber having a gas inlet at its lower end and a gas outlet at its upper end, downwardly dished centrally open partitions spaced apart vertically within the chamber, a shaft extending through the partition openings, shaft rotating means, downwardly dished deflectors secured to the shaft—one immediately beneath and embracing the dished portion of each partition, the lowermost portion of each deflector being open vertically to provide drainage, and water supplying means.

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

NICHOLAS F. EGLER.

Witnesses:
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J. M. NESBIT.