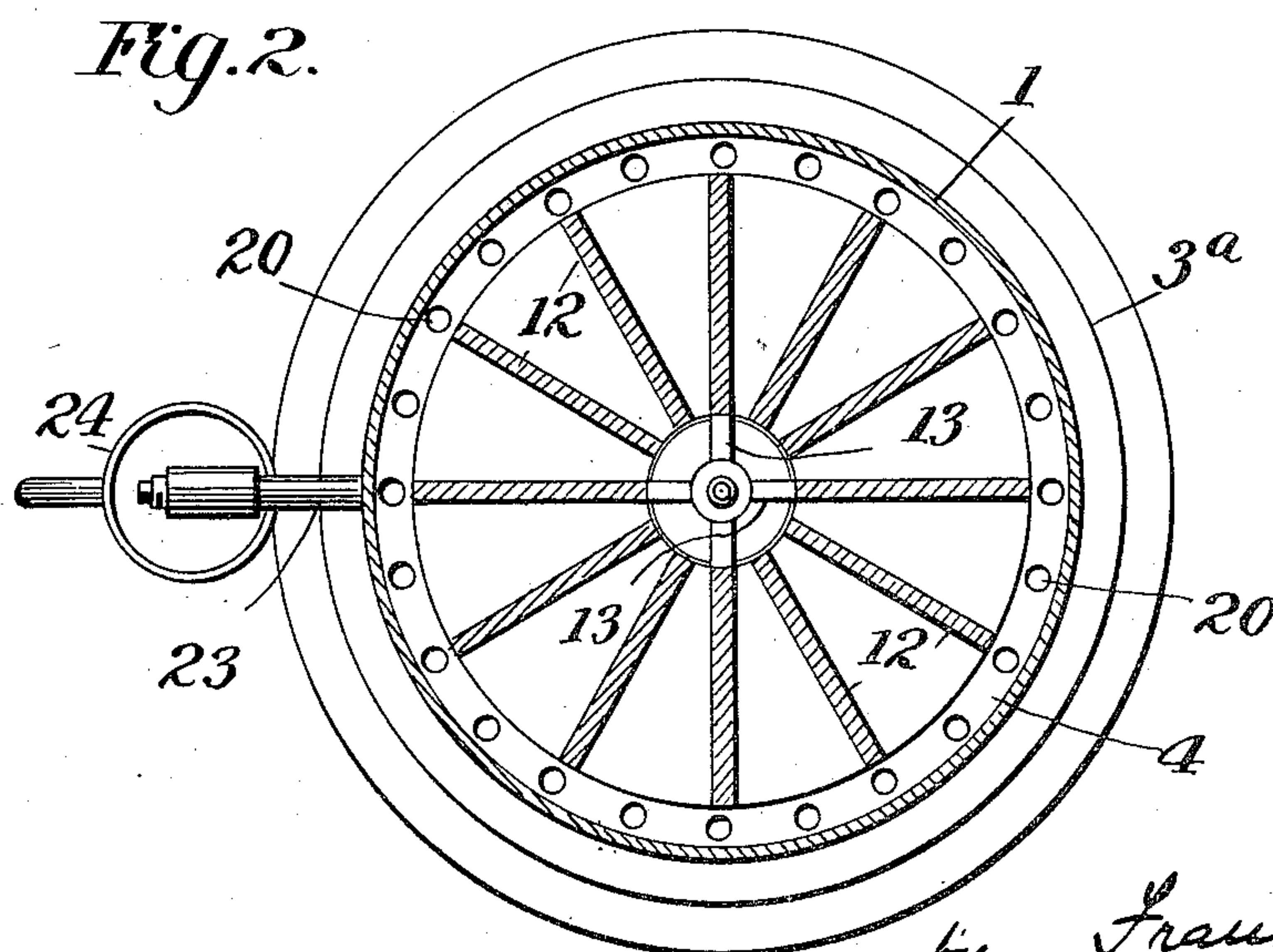
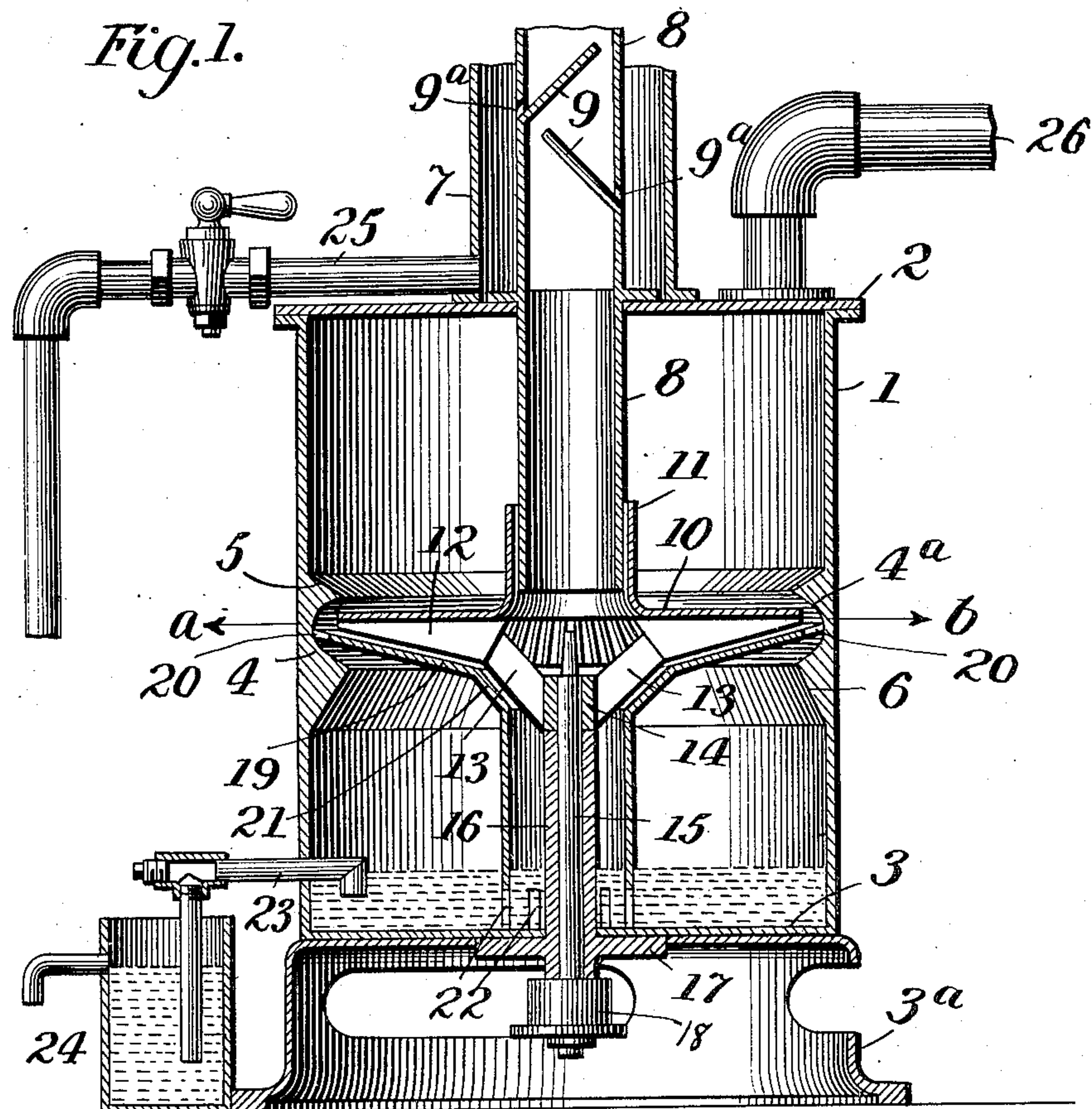


No. 861,634.

PATENTED JULY 30, 1907.

F. BURGER.
CENTRIFUGAL GAS SEPARATOR AND SCRUBBER.
APPLICATION FILED MAR. 25, 1905.



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UNITED STATES PATENT OFFICE.

FRANZ BURGER, OF FORT WAYNE, INDIANA, ASSIGNOR OF THREE-FOURTHS TO HENRY M. WILLIAMS, OF FORT WAYNE, INDIANA.

CENTRIFUGAL GAS SEPARATOR AND SCRUBBER.

No. 861,634.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed March 25, 1905. Serial No. 252,012.

To all whom it may concern:

Be it known that I, FRANZ BURGER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Centrifugal Gas Separators and Scrubbers, of which the following is a specification.

This invention has for its object to separate the impurities, such as tar, water, ashes or other materials, from gases generated by blast furnace processes or gas producer processes, so that the gas will be in proper condition to be used, as, for instance, in a gas engine, and to these ends the invention consists in the various features of construction and arrangement of parts co-operating together substantially in the manner set forth to produce the results stated.

Referring to the accompanying drawings, Figure 1 is a vertical section of an apparatus embodying my invention, and Fig. 2 is a transverse section on the line a—b, Fig. 1.

The apparatus comprises a cylindrical shell 1 of suitable material, preferably metal, having a cover or head 2 and a bottom 3, and this is supported on a suitable base 3^a. The shell 1 is provided in its interior, and preferably about its central portion, with an inward projection 4 which is provided on its upper and lower faces with tapering grooves 5 and 6, and between these faces is a curved or circular groove 4^a.

Projecting through the cover or head 2 is a pipe 8 and this extends into the shell to about a medium position. This pipe may be connected to any source of supply of the gas, and in the present instance it is shown extending above the head 2 and as being provided with inclined partitions 9 and with openings 9^a and surrounded by a cylinder 7, to which is connected a pipe 25, and this extension when thus constructed may act as a separator or scrubber for the gas in its passage therethrough, the impurities being collected by the inclined partitions and being deposited into the cylinder 7 and removed through the pipe 25. In this way much of the impurities may be separated and the complete and more perfect separation of the impurities is accomplished by the centrifugal separator.

Arranged to rotate in the casing and adjacent to the groove 4^a is a disk 10, and in the present instance this is provided with an upwardly-extending sleeve 11 surrounding the lower end of the pipe 8. The under surface of the disk 10 is provided with a series of radial paddles or extensions 12 which are preferably tapering as shown, and the disk and paddles are attached to spider arms 13 connected to the hub 14.

Some means for supporting and rotating the disk must be provided, and in the present instance I have shown a sleeve 16 which projects through the bottom

3 of the shell and is preferably provided with a flange 17 by means of which it is attached to the bottom 3, and through this sleeve extends a vertical shaft 15 to which the hub 14 is attached, said hub resting on the upper end of the sleeve. The shaft is rotated by any suitable means, it being shown as a pulley 18 on the lower end adapted to receive power from any desired source. It will thus be seen that the rotating disk, with its radial paddles supported and rotated by the shaft and upwardly-extending sleeve 11 surrounding the pipe 8, tends to assist in maintaining it in proper position.

Arranged beneath the disk and its paddles and preferably in close proximity thereto, as shown, is a dished plate 19, the outer circumference of which fits tightly in the circular groove 4^a, and it is provided near its circumference with a series of perforations 20. This dished plate has a large central opening and is connected to a flaring tube 21 surrounding the sleeve 16 and resting upon the bottom 3. This tube has perforations 22 near its lower end where it joins the bottom 3 of the vessel.

Some distance from the bottom and at the side of the vessel is located an overflow pipe 23 which is shown as delivering into a trap 24. Connected to the upper gas receiving chamber of the shell is a pipe 26 which may lead to the engine or other place of utilization of the gas.

Such being the general construction of the apparatus, its operation will be largely understood by those skilled in the art, and it will be seen that the gas enters the vessel 1 through the pipe 8, and when the extension shown in the drawing is used, it may enter through the pipe provided with scrubbers 9 and be partially purified therein. As the gas passes through the pipe 8 it flows under the rotating fan plate or disk 10 and passes between the radial paddles 12 to the circumference of the disk, into the circular groove 4^a and up to the gas receiving chamber, from which it is taken to the place where it is utilized through the outlet pipe 26. The heavier impurities separated from the gas will be thrown through centrifugal action against the surface of the groove 4^a and will run down on the inclined disk 19 or pass through the perforations 20 in the periphery into the lower settling chamber, or through the pipe 21 and perforations 22 into the settling chamber, and from this chamber the impurities may be removed through the pipe 23 to the trap 24 or otherwise. It will be seen that in this way the gas is agitated and passes by centrifugal action along the under side of the fan or disk 10, and after being purified it passes upwards into the receiving tank, while the heavier impurities are caught by the concentric groove and pass into the settling or receiving chamber

at the bottom of the tank. If the purified gas is used to run an engine the pulley 18 may be driven from such engine, or when the gas is otherwise used it may be driven by independent power. The improved cen-

5 trifugal separator or scrubber may be used alone for purifying the gas or in connection with other purifying or scrubbing devices, as indicated in the drawing.

What is claimed is:—

10 1. In an apparatus of the character described, the combination with a casing having an inward projection provided with a circular groove and having an inlet pipe, of a rotating disk having paddles on its under side arranged adjacent said groove, substantially as described.

15 2. In an apparatus of the character described, the combination with a casing having an inlet pipe, of a rotating disk having an upwardly-extending sleeve embracing the pipe and having paddles on its under side, substantially as described.

20 3. In an apparatus of the character described, the combination with a casing having an inlet pipe and an inward projection provided with a groove, of a rotating disk having a sleeve embracing the pipe and having paddles on its under side, substantially as described.

25 4. In an apparatus of the character described, the combination with a casing having an inlet pipe, of a rotating

disk having paddles on its under side, a shaft supporting the disk, and a dished plate arranged beneath the disk and paddles, substantially as described.

5. In an apparatus of the character described, the combination with a casing having an inlet pipe and an inward 30 projection having a groove, of a rotating disk having paddles on its under side, a shaft for rotating the disk, and a dished plate engaging the groove, having perforations at its edges and a central opening surrounding the shaft, substantially as described. 35

6. In an apparatus of the character described, the combination with a casing having an inlet pipe and an inward projection having a groove, of a rotating disk having a sleeve embracing the pipe, paddles on the under side of the disk; spider arms connected to the paddles, a hub support- 40 ing the spider arms, a sleeve connected to the bottom of the casing, a shaft within the sleeve supporting the hub, and a dished plate bearing in the groove and extending downward below the paddles and rotating disk, substantially as described. 45

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANZ BURGER.

Witnesses:

GEO. K. TORRENCE,
C. B. WATERS.