No. 832,372. PATENTED OCT. 2, 1906.

C. L. GERRARD.

MACHINE FOR REFINING FLOUR.

APPLICATION FILED OCT. 18, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

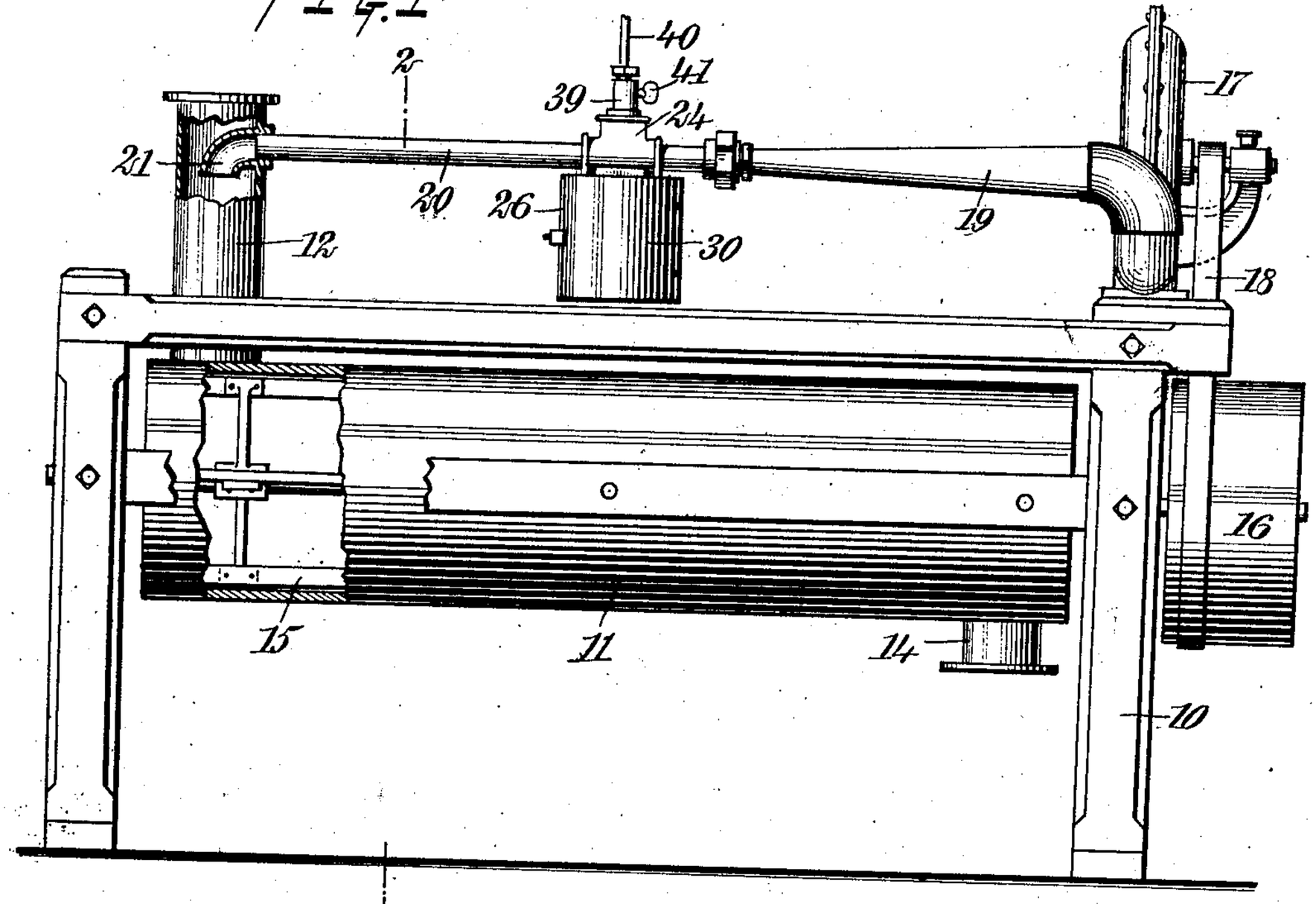


Fig. 5.

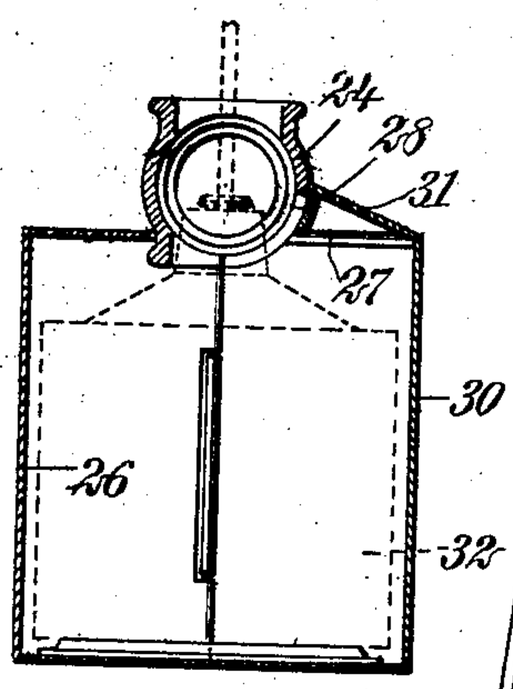
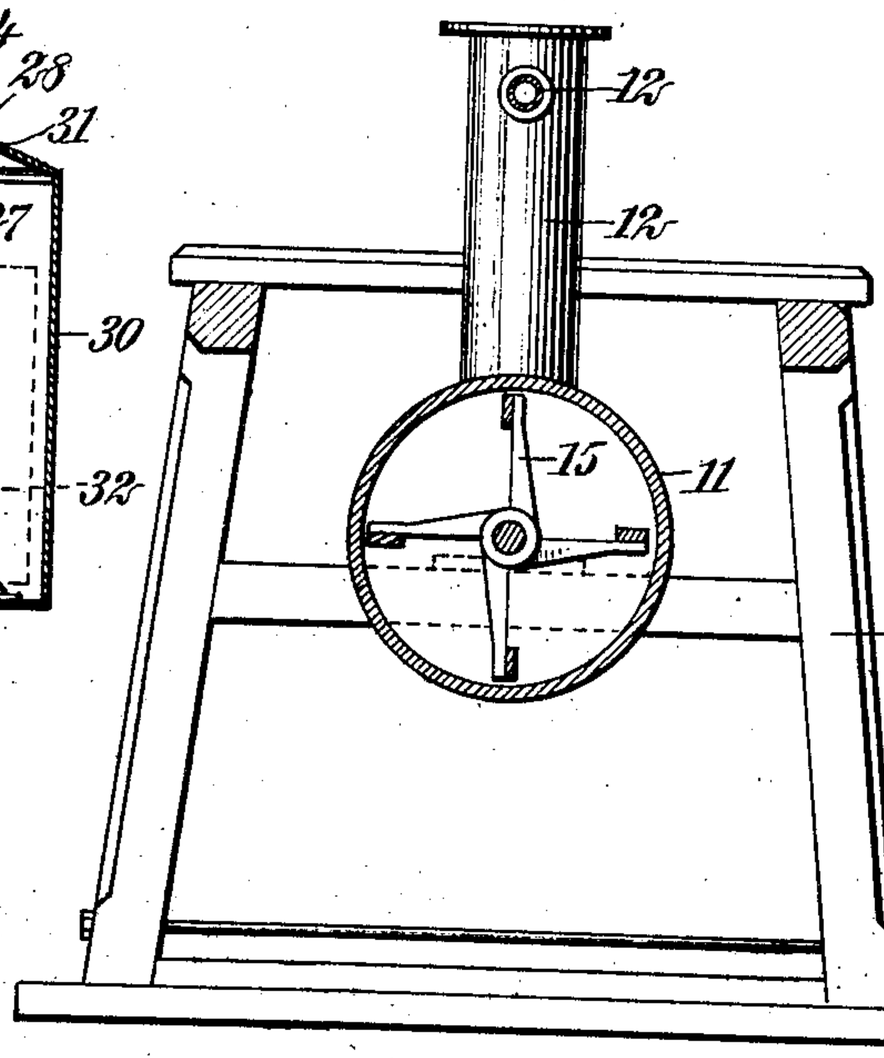


Fig. 2.



WITNESSES:

John J. Kettle

Isaac B. Owens.

INVENTOR

Clarence L. Gerrard

BY Munn & Co

ATTORNEYS

No. 832,372. PATENTED OCT. 2, 1906.

C. L. GERRARD.

MACHINE FOR REFINING FLOUR.

APPLICATION FILED OCT. 18, 1905.

2 SHEETS—SHEET 2.

Fig. 3

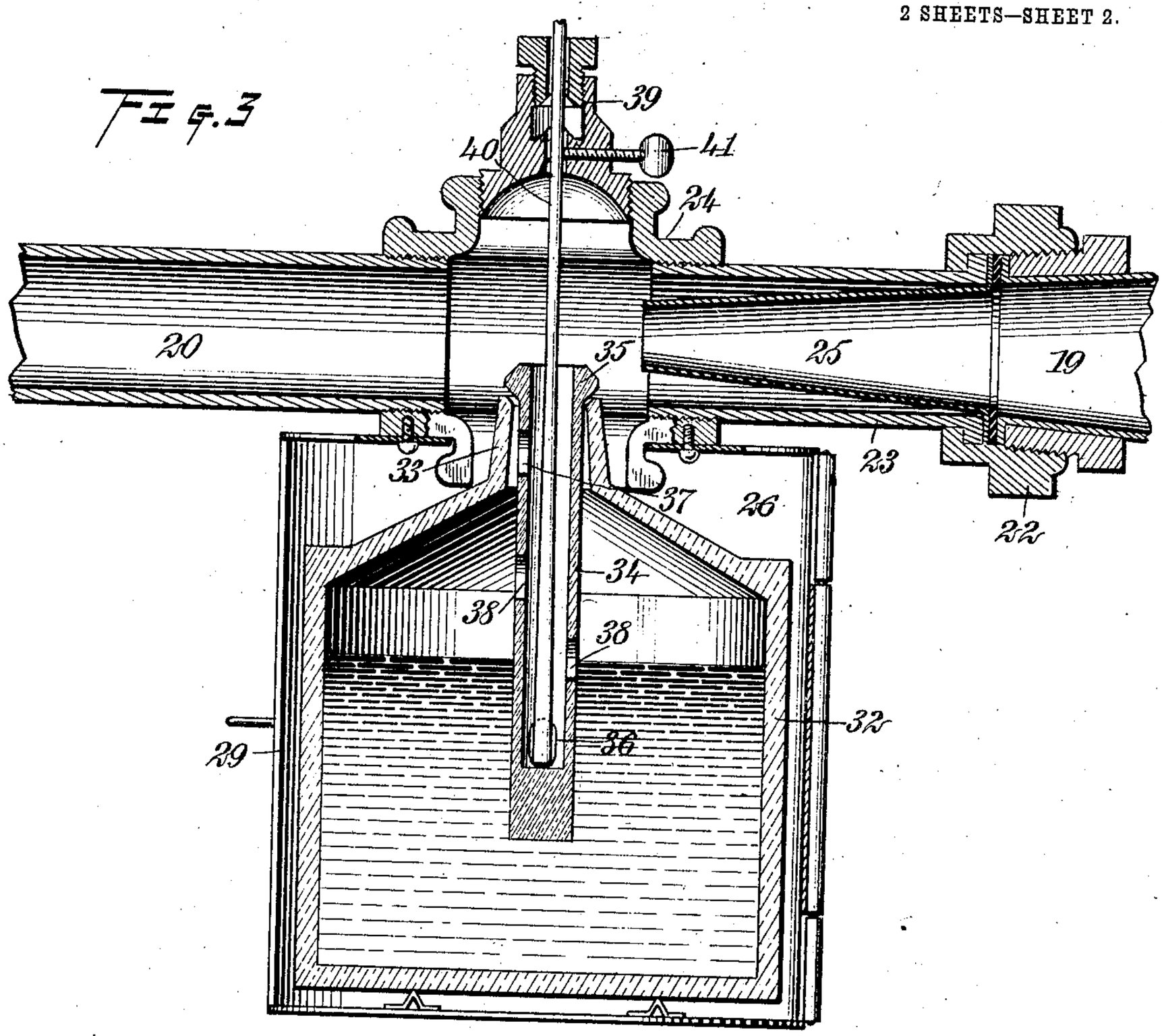
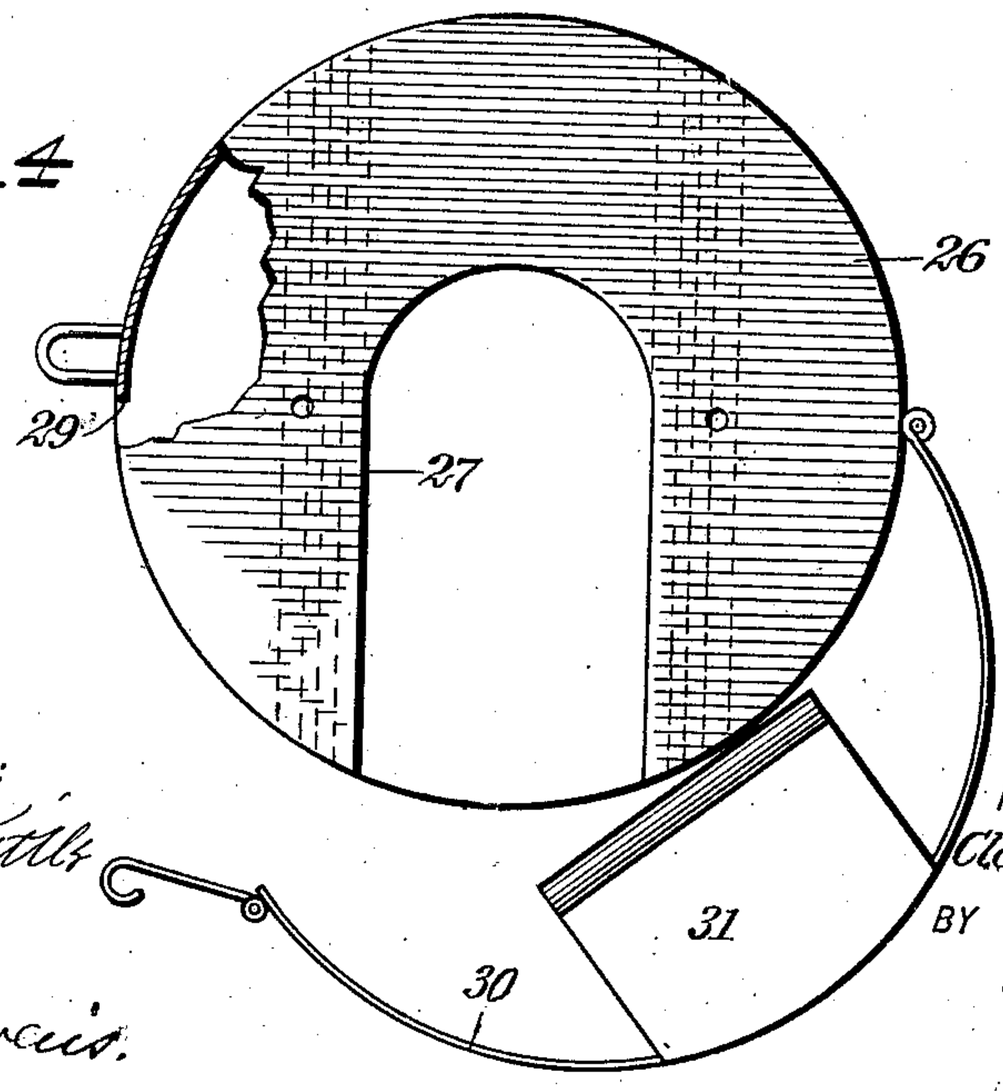


Fig. 4



WITNESSES:

John J. Kettle

Isaac B. Dennis.

INVENTOR

Clarence L. Gerrard

BY

Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

CLARENCE L. GERRARD, OF COLUMBUS, NEBRASKA, ASSIGNOR OF ONE-HALF TO FRED D. NAYLOR, OF COLUMBUS, NEBRASKA.

MACHINE FOR REFINING FLOUR.

No. 832,372. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed October 18, 1905. Serial No. 283,248.

To all whom it may concern:

Be it known that I, CLARENCE L. GERRARD, a citizen of the United States, and a resident of Columbus, in the county of Platte and State of Nebraska, have invented a new and Improved Machine for Refining Flour, of which the following is a full, clear, and exact description.

The invention relates to improvements in apparatus for forcing nitric oxid or other gas mixed with air through wheat-flour other like products to refine the same; and it consists in certain novel features of construction and combinations of parts, which will be fully set forth hereinafter, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, which illustrate as an example the preferred manner of carrying out my invention, in which drawings—

Figure 1 is a side elevation of the apparatus with parts broken away. Fig. 2 is a cross-section on the line 2 2 of Fig. 1. Fig. 3 is an enlarged sectional view of the generator preferably employed. Fig. 4 is a detail view showing the case in which the acid-receptacle is held, and Fig. 5 is a reduced vertical section through said case.

The apparatus is provided with a suitable frame 10, which supports the cylindric drum 11. The drum is provided at the upper side of one end with a flour-inlet spout 12 and at the under side of the opposite end with a flour-outlet spout 14. In the drum is located a rotary agitator 15, the shaft of which is in connection with a drive-pulley 16, located adjacent to the discharge end of the drum.

17 indicates a fan, which may be of any desired sort, but is preferably of the rotary type here illustrated, and this fan is connected by a belt 18 with the drive-pulley 16, so that the fan may be operated with the agitator. A discharge-pipe 19 from the fan leads to the generator, as will hereinafter fully appear, so that a mixture of air and nitric oxid is formed, and 20 indicates a pipe carrying this mixture to a nozzle 21 in the spout 12, so that the mixture of air and nitric oxid is entered into the spout and passed through the drum 11. The flour being agitated in the drum containing the mixture of air and oxid, as explained, absorbs said gases, and the refined flour is ejected from the spout 14, as best shown in Fig. 1. The pipe 19 has at its end a coupling 22, which is engaged with a pipe-section 23, secured in the generator-head 24. The pipe 20 passes from the head 24 opposite the pipe 23. Said union 22 also secures into position within the pipe-section 23 a tapering nozzle 25, which causes the air to be discharged into the head 24 at high velocity. Said head 24 supports a box or casing 26, which, as best shown in Fig. 3, has an opening 27 in its top, this opening passing from the top of the casing outward to the side edge thereof. Matching with the opening 27 is an opening 28 in the head 24. One side of the case or box 26 is open, as indicated at 29 in Figs. 3 and 4, and this opening is adapted to be closed by a semicircular door 30. (See Fig. 4.) The door 30 has a lip 31 at its upper edge adapted to close the opening 27, the lip being elevated so as also to close the opening 28 in the head 24. (See Fig. 5.)

32 indicates a jug or receptacle for holding the nitric-acid solution. This receptacle is formed, preferably, of porcelain or some other refractory material and has an open neck 33, which is adapted to fit in the opening 28 in the under side of the head 24. Said receptacle or jug 32 is placed in position in the case 26 by opening a door 30 and moving the receptacle 32 sidewise into the case, the neck 33 sliding through the openings 27 and 28 into the position shown in Figs. 3 and 5.

Fitted loosely in the neck 33 of the receptacle 32 is a porcelain or other refractory tube 34, which has an open upper end and a flange 35 surrounding it, which flange rests on the neck 33 of the jug. The lower end of the tube 34 is closed, and said tube is provided with a lower opening 36, an upper opening 37, and two intermediate openings 38. These openings communicate with the interior of the jug or receptacle 32. At its upper side the head 24 is provided with a stuffing-box and gland 39, through which the metallic rod 40 passes loosely, said rod projecting through the head downward into the tube 34 and resting on the closed lower end thereof, the arrangement being such that during the operation of the apparatus the rod 40 is free to move downward into the tube 34 by force of gravity as fast as the said rod is attacked and disintegrated by the action of the acid thereon. 41 indicates a

thumb-screw by means of which the rod 40 may be held against this movement when the device is not in operation.

Upon supplying the receptacle 32 with nitric-acid solution and introducing the rod 40 into the tube 34, as shown in Fig. 3, the solution will enter the tube 34 through the bottom opening 36, and in attacking the rod 40 nitric oxid will be generated, which will pass up through the tube into the head 24, mixing with the air, as explained. The rod 40 may be constructed of various metals. The reactions in the lower part of the tube 34 develop heat, which causes the solution to circulate through the opening 36 and up out of the openings 38. The upper opening 37 allows for overflow, should the solution rise excessively in the tube, and prevents the solution from entering the head 24 of the apparatus. The air-blast passing from the fan 17 and sweeping through the head 24 will gather the gas or oxid generated in the tube 34 and the mixture will pass through the pipe 20 and spout 12 into the drum 11, as before explained. In connection with the manner of feeding the rod 40 it will be seen that said rod rests by force of gravity on the closed lower end of the tube 34, and as fast as the rod is disintegrated it will fall into the tube. In this manner the rod is kept submerged at a uniform depth and a uniform generation of gas results. The gas-generator above described forms the subject-matter of my divisional application, Serial No. 302,414, filed February 23, 1906.

Having thus described the preferred form of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for treating flour, comprising a frame, a drum sustained thereby and having an inlet and outlet, an agitator in the drum, a fan mounted on the frame, means connecting the agitator and fan to drive one from the other, a discharge-pipe passing from the fan, a gas-generator, a generator-head connected thereto to which head the discharge-pipe leads, and a pipe passing from the generator-head to the inlet of the drum, for the purpose specified.

2. An apparatus for treating flour, comprising a frame, a drum sustained thereby and having an inlet and outlet, an agitator in the drum, a fan mounted on the frame, means connecting the agitator and fan to drive one from the other, a discharge-pipe passing from the fan, a gas-generator, a generator-head connected thereto to which head the discharge-pipe leads, a casing inclosing the gas-generator and attached to the generator-head, and a pipe passing from the generator-head to the inlet of the drum, for the purpose specified.

3. An apparatus for treating flour comprising a frame, a drum mounted thereon and having an inlet and outlet, a fan, a discharge-pipe passing therefrom, a generator-head, a gas-generator with which the head communicates, a contracting-nozzle discharging from the said pipe into the head, and a pipe leading from the head to the drum-inlet.

4. An apparatus for treating flour comprising a frame, a drum mounted thereon and having an inlet and outlet, a fan, a discharge-pipe passing therefrom, a generator-head, a gas-generator with which the head communicates, a casing inclosing the gas-generator and attached to the generator-head, a contracting-nozzle discharging from the said pipe into the head, and a pipe leading from the head to the drum-outlet.

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

CLARENCE L. GERRARD.

Witnesses:

LEANDER GERRARD,

M. BRUGGER.