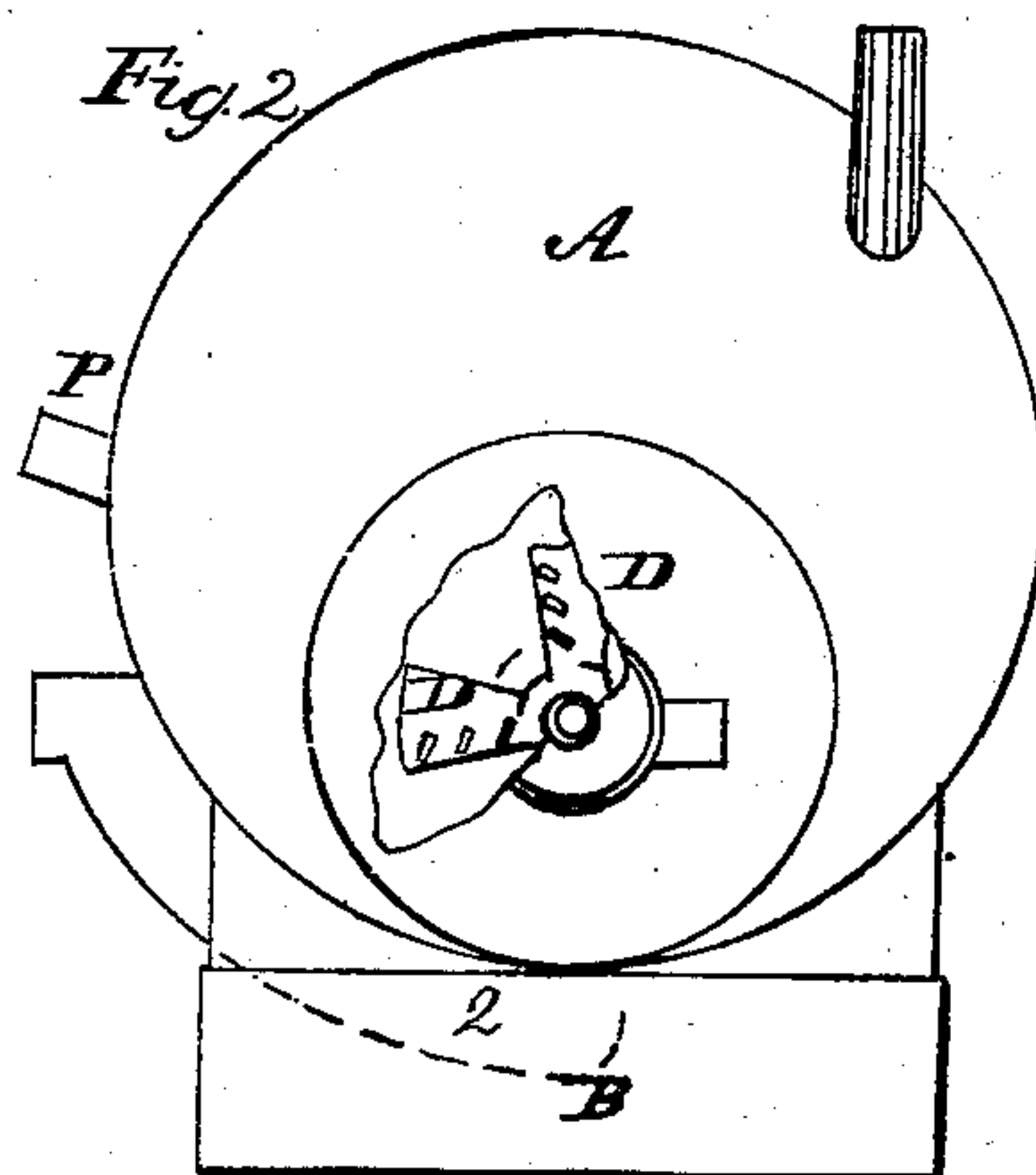
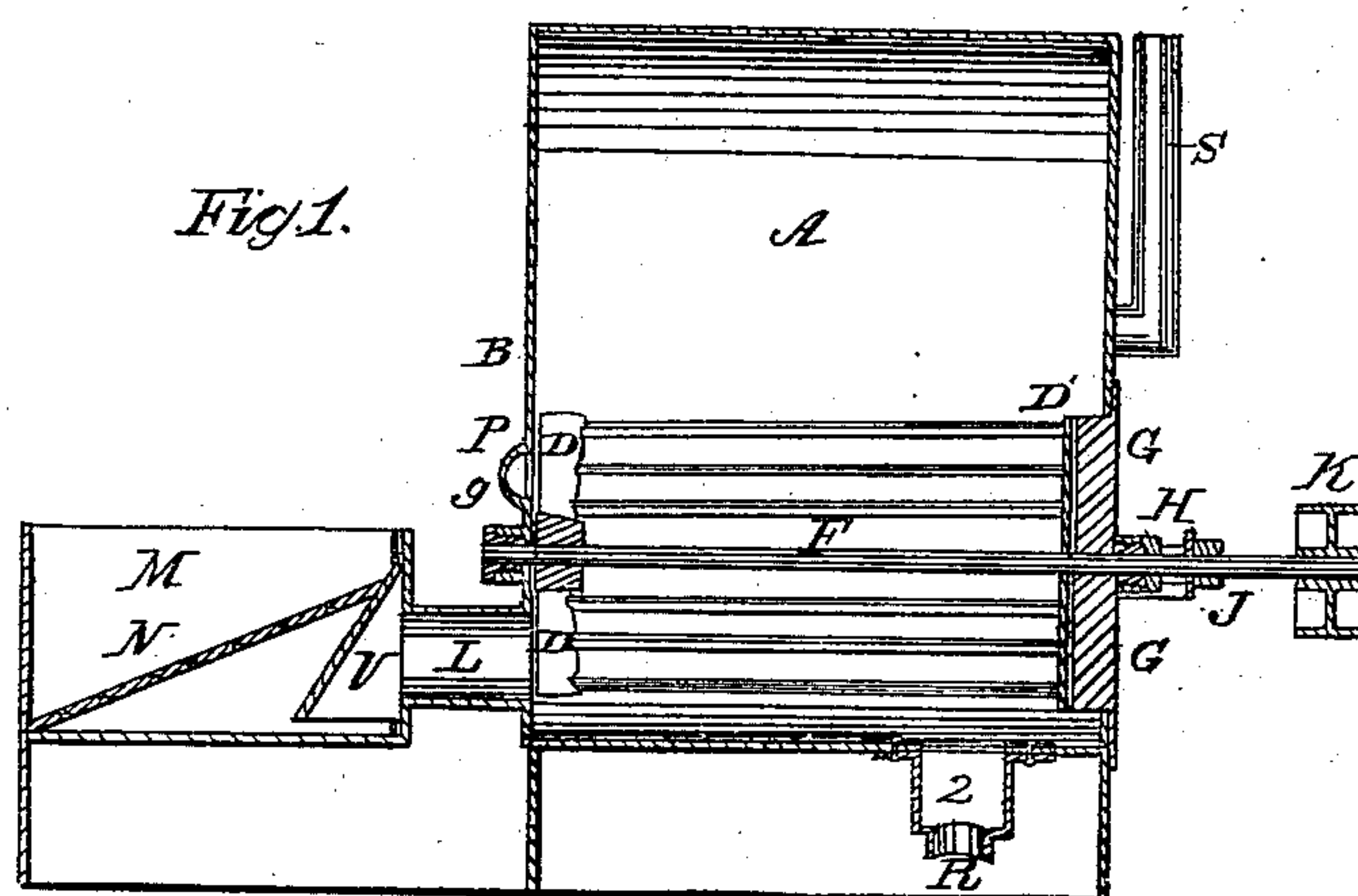


H. B. BOND.
Defecating Cane Juice.

No. 82,682.

Patented Oct. 6, 1868.



Witnesses.
Rufus R. Rhodes
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HOWARD B. BOND, OF HOUMA, LOUISIANA.

Letters Patent No. 82,682, dated October 6, 1868.

IMPROVED APPARATUS FOR DEFECATING CANE-JUICE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, HOWARD B. BOND, of Houma, parish of Terre Bonne, and State of Louisiana, have invented a certain new, useful, and improved Apparatus for Defecating Cane-Juice, Molasses, Sirups, Sugar in solution, or any other saccharine liquid, as well as liquid or semi-liquid substances in which no saccharine matter is contained, with the fumes of sulphur or other defecating-gas or gases; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, in which—

Figure 1 is a sectional view, the line of bisection being longitudinal, and

Figure 2 an end view of my apparatus.

Before proceeding to describe my invention, it is proper to premise that in the defecation of saccharine liquids, with a view to the improvement of the sugars manufactured therefrom, sulphurous-acid gas, generated by the burning of sulphur, has been found the most economic and potent agent. But the theory has been, that whatever the mechanical organism employed, it was necessary to use water in connection therewith, to free the said gas from sulphurous acid and sublimed sulphur, in order to produce a perfect result. I have found, on the contrary, that the use of water is entirely unnecessary, and that a more perfect and satisfactory defecation can be accomplished without the use of water. My invention therefore dispenses altogether with the cumbrous and costly appliances for washing the sulphurous-acid gas with water. Again, an evil incident to all the apparatus now in use is, that they are so contrived as to allow of the escape of the fumes, in the process of defecation, from the apparatus, to the great inconvenience of every operative whose presence is required in the sugar-house. Sometimes, indeed, these persons are permanently injured by inhaling the fumes, and hence it becomes a matter of great importance so to contrive an apparatus as that this evil may be abated.

My invention does not permit the escape of a particle of the gas, excepting through the chimney. But my invention will be more clearly and quickly understood by reference to the drawings.

A is a tight cistern, of circular or other suitable form. It may be constructed of any proper material. At one end of this cistern is an opening or man-hole, sufficiently large to allow of the introduction and withdrawal of a revolving agitator or dash-wheel, which is closed by a suitable cover or man-head, G, of the same material as the cistern, and secured to its place by any suitable or usual means. Connected to this man-head is a stuffing-box, H, to prevent any gas from escaping through the opening through which the shaft of the agitator passes, and at the other end of the cistern another stuffing-box G' is fixed, for the other end of the shaft, for the same purpose. This latter stuffing-box also serves the purpose of a journal for that end of the shaft. The packing in the stuffing-box at one end of the shaft is tightened by means of a right-handed screw upon the follower, and that at the other end of said shaft is tightened by a left-handed screw, and the two are so arranged that the rotation of the shaft, through friction, will tend directly to screw up the followers, and tighten the packing, thereby preventing any leakage of gas or wrong adjustment of the bearings.

Affixed upon the outside of the man-head G, is a bent bar or hanger, J, in which a journal is placed for the end of the shaft that passes through said head, which, extending for a little distance beyond said journal, has on it a band-pulley, K, through which motion is imparted to the shaft, which is marked O upon the drawing. The agitator upon shaft O, and which is of course placed within the cylinder, consists of a system of radiating vanes, D, and arms D', at its two longitudinal extremities, to and between which, horizontal paddles are attached. The vanes D are placed at an angle of about forty degrees, and next the end, B, of the cistern at which the sulphurous-acid gas enters, so that in the revolution of the dashers they exert a powerful indraught upon the gas as it enters through the pipe P that leads from the furnace; the pipe S, through which the gas escapes from the cistern into the chimney, and thus out of the sugar-house, being of the same size as pipe P, through which the gas enters the cistern. The effect of the indraught that is produced by the revolution of the vanes D is to concentrate, or, so to speak, pack the gas within said cylinder, and hence to effect a more perfect defecation of the juice or other substance operated upon, than would otherwise occur. The horizontal paddles or

strips between D and arms D' are so placed that their inner edges point above or below the shaft O, so that in their revolution they will emerge from the juice at a slight angle to its upper surface. The object of this arrangement is to lessen the noise and shock incident to their striking upon the sirup or juice, and to cause the paddles to throw up the liquid to a greater height than would be done by paddles, the edges of which, on the inner side, pointed to the shaft O.

From the cistern A, the defecated juice or material, whatever it may be, passes out through pipe *q*, which is connected to the cistern, at the bottom thereof, and curves up, as clearly seen at fig. 2, until it attains a height coincident or nearly coincident with the height of the axis of the agitator. This pipe is provided with an opening, R, at its lowest point, which is just underneath the opening into the cylinder, through which any excess of juice, which does not pass off through the pipe, may be drawn out at pleasure. The pipe *q* is removable, and consequently, by being taken off, may be adjusted so as to discharge the liquid upon either side of the cistern A, as convenience may dictate.

M is a rectangular juice-box or receiver, into which the juice is precipitated, from the rolling-mill, upon a perforated diaphragm, N, which is placed at an angle, as shown at fig. 1. The perforations or holes through this diaphragm expand in the direction of the lower surface thereof, and thus they allow the juice or other material to flow freely through them, without danger of clogging or choking—an evil to which the strainers, as heretofore made, are peculiarly subject. L is a tube or conduit-pipe, for conveying the liquid from the receiver M into the cistern A. Within the receiver M, a sliding gate or fender, V, is so placed as to cover the opening L, and which being fitted in such manner as to be air-tight, and to dip into the material for some space below its upper surface, serves to cut off or prevent any escape of the sulphurous-acid gas into the receiver, and from thence into the sugar-house.

The effect of this arrangement is to avoid altogether the very great annoyance, resulting from the presence of gas in the sugar-house, to which I adverted in the preamble to this specification.

The pipe P is so ordered that it may be removable and adjustable, so that it may be put on either side of the cistern A, and in such position as that the gas may be readily drawn through it by the action of the vanes D. The pipe L, at some point between the furnace and the cistern, should run in a downward direction, in order that no liquid from the cistern shall make its way through the same, and put out the fire in the furnace.

The operation of my apparatus is very simple. The cane-juice, sugars in solution, oils, or other material to be defecated, are conducted into the receiver M, where it falls upon and is strained by the perforated diaphragm N, and thence passes through conduit L into the cistern, or, as we might call it, the gasometer A, where it is broken up by the rapid revolution of the agitator, its vanes, arms, and paddles, and all its parts brought into contact with the sulphurous-acid gas, and is thus defecated. The vanes D not only act upon the gas to draw it rapidly from the furnace, but they also exercise the same effect upon the juice, and give to it a rapidity of flow it would not otherwise have. As soon as the material rises in the pipe *q* to its upper end, it flows out into proper receptacles, whilst all the gas escapes through pipe S, as we have seen, into the chimney, and thence into the open air.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The closed cistern A, provided with the removable man-head and the stuffing-boxes, constructed and operating substantially as and for the purpose set forth.
2. The combination, with the cistern A, of the agitator herein described, when the latter is constructed substantially as set forth, and is provided with vanes, or the equivalent thereof, arranged in such manner as to produce a pressure or packing of the gas inside the cistern, substantially as described.
3. The pipe G, made removable and adjustable, as described, in such manner that it can be used for discharging the juice on either side of the cistern A, as set forth.
4. Perforating the strainer or diaphragm N with holes, that expand as they pass to the under surface of the same, for the purpose set forth.
5. The sliding gate or fender V, when constructed and operating as described, and for the purpose set forth.
6. The combination of the juice-receiver M, when provided with the perforated strainer N and sliding gate or fender V with the cistern A and its component parts, substantially in the manner and for the purpose set forth.

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Witnesses:

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