(No Model.)

2 Sheets—Sheet 1.

J. A. LOMBAS.

MACHINE FOR MANUFACTURING AND BLEACHING SUGAR.

No. 365,616. Patented June 28, 1887.

Fig. 1.

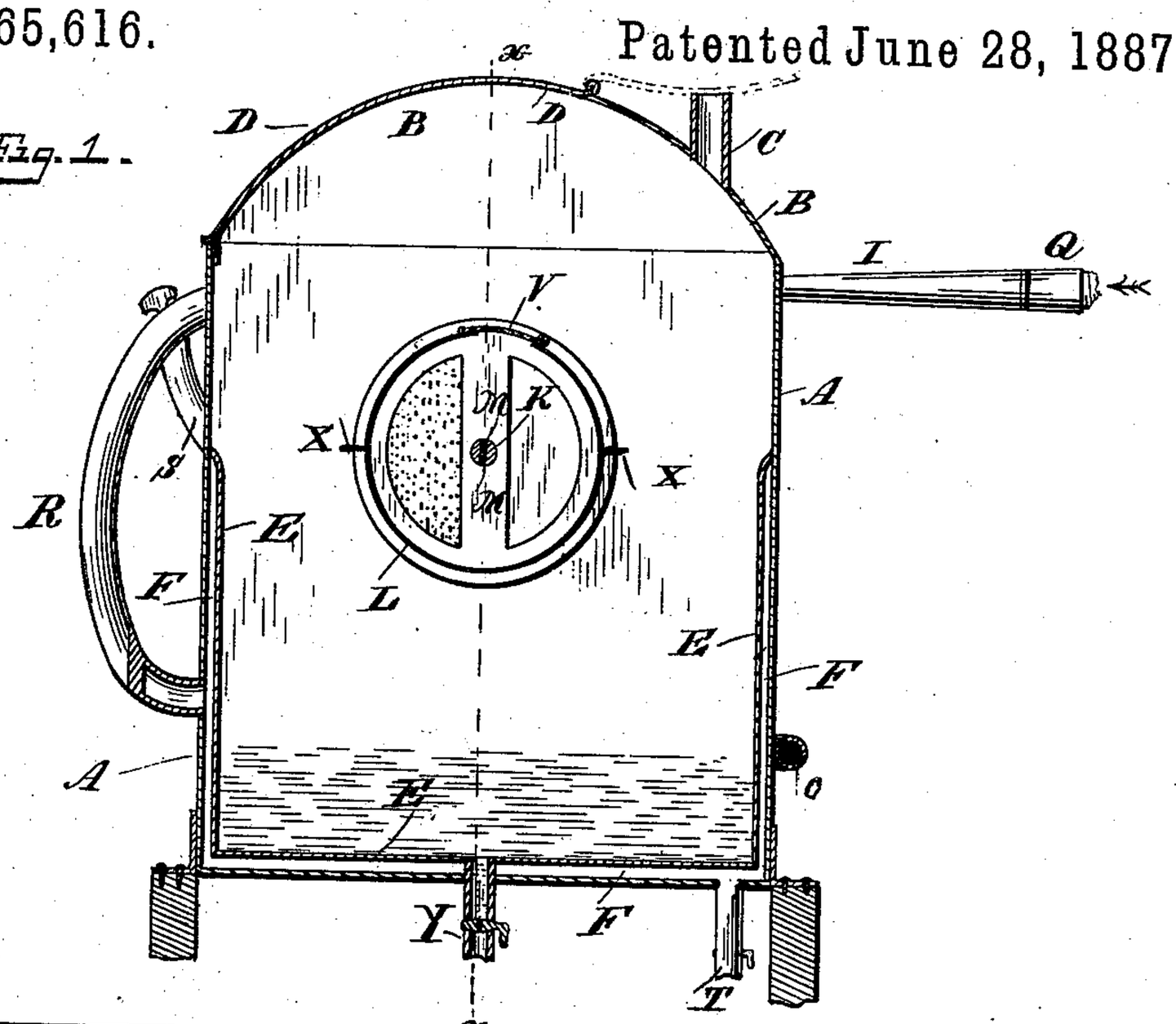


Fig. 2.

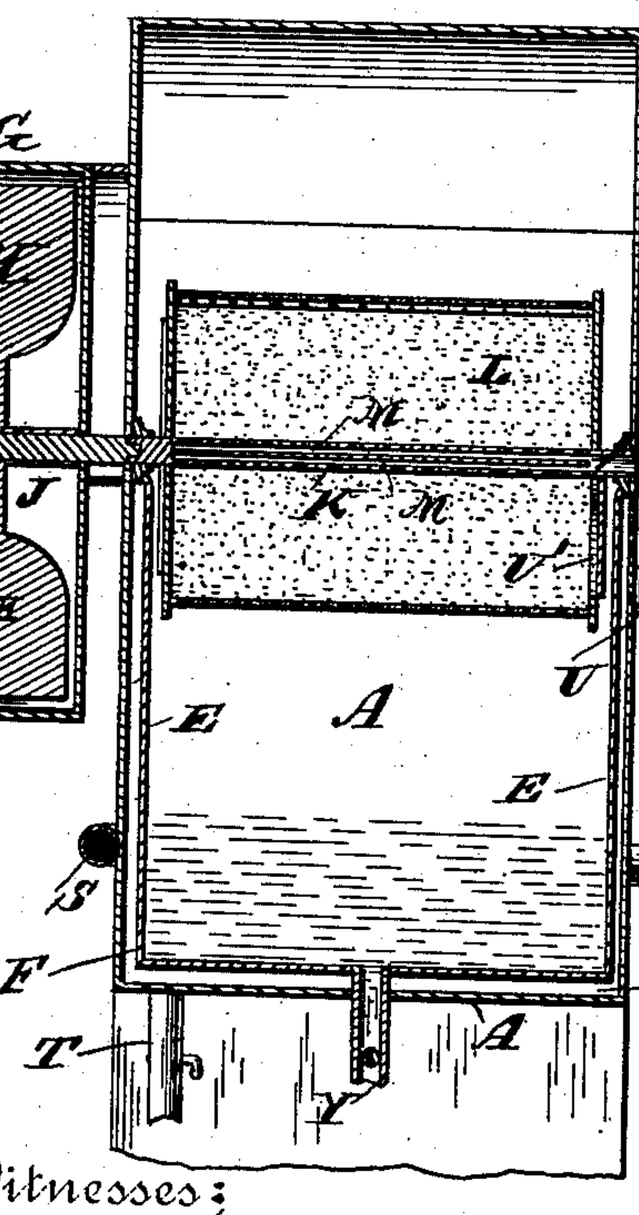
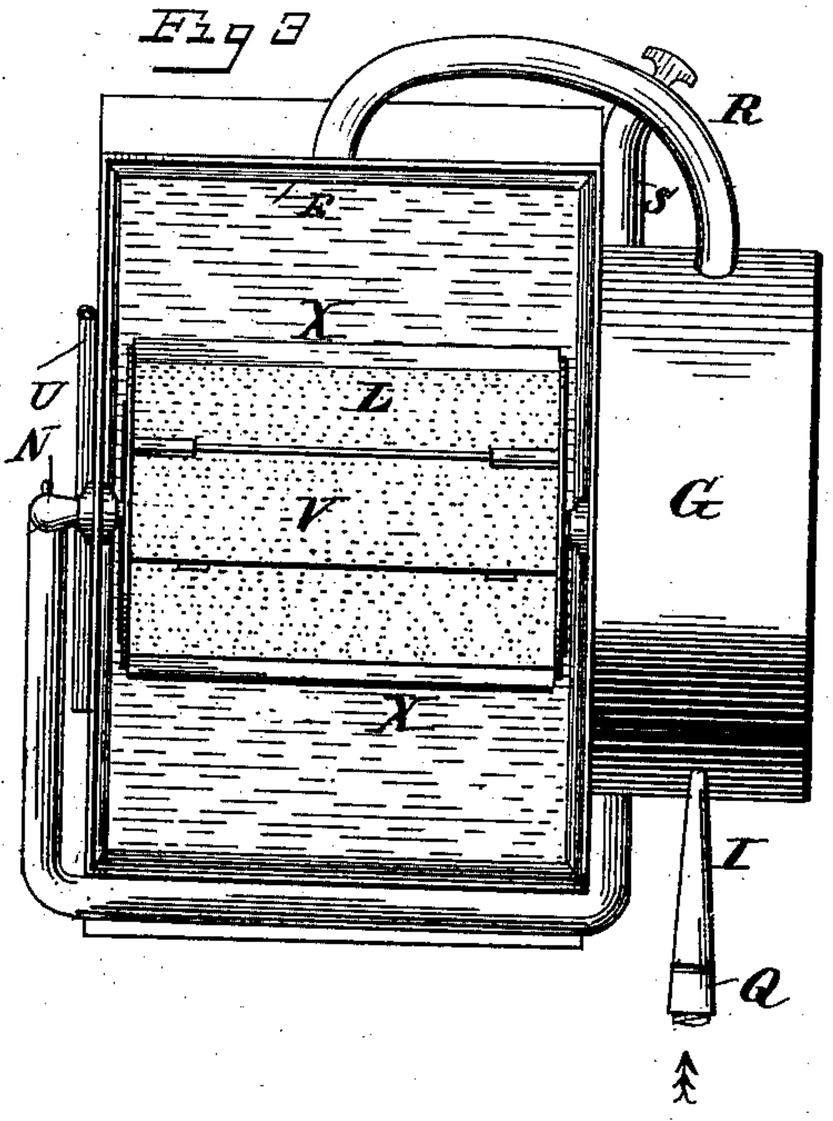


Fig 3



Witnesses:
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(No Model.) 2 Sheets—Sheet 2.

J. A. LOMBAS.

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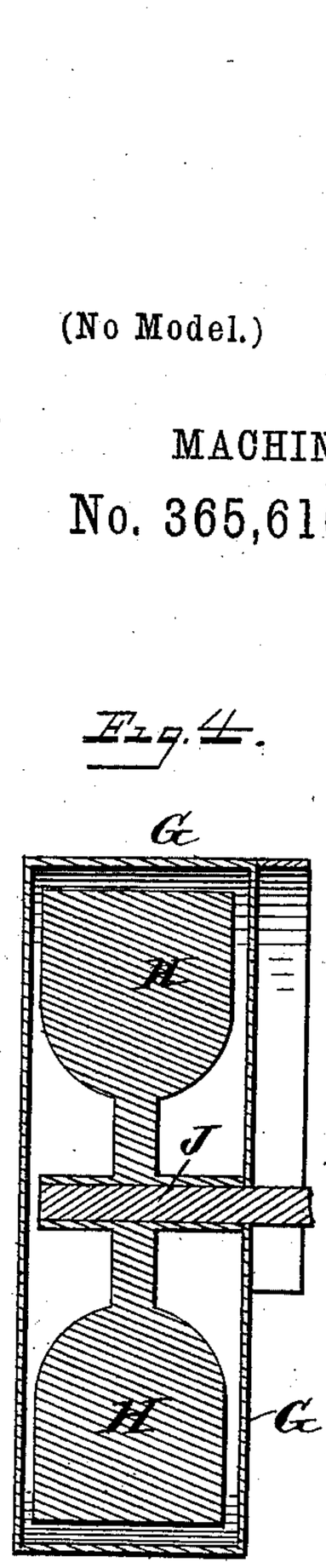
Fig. 4.



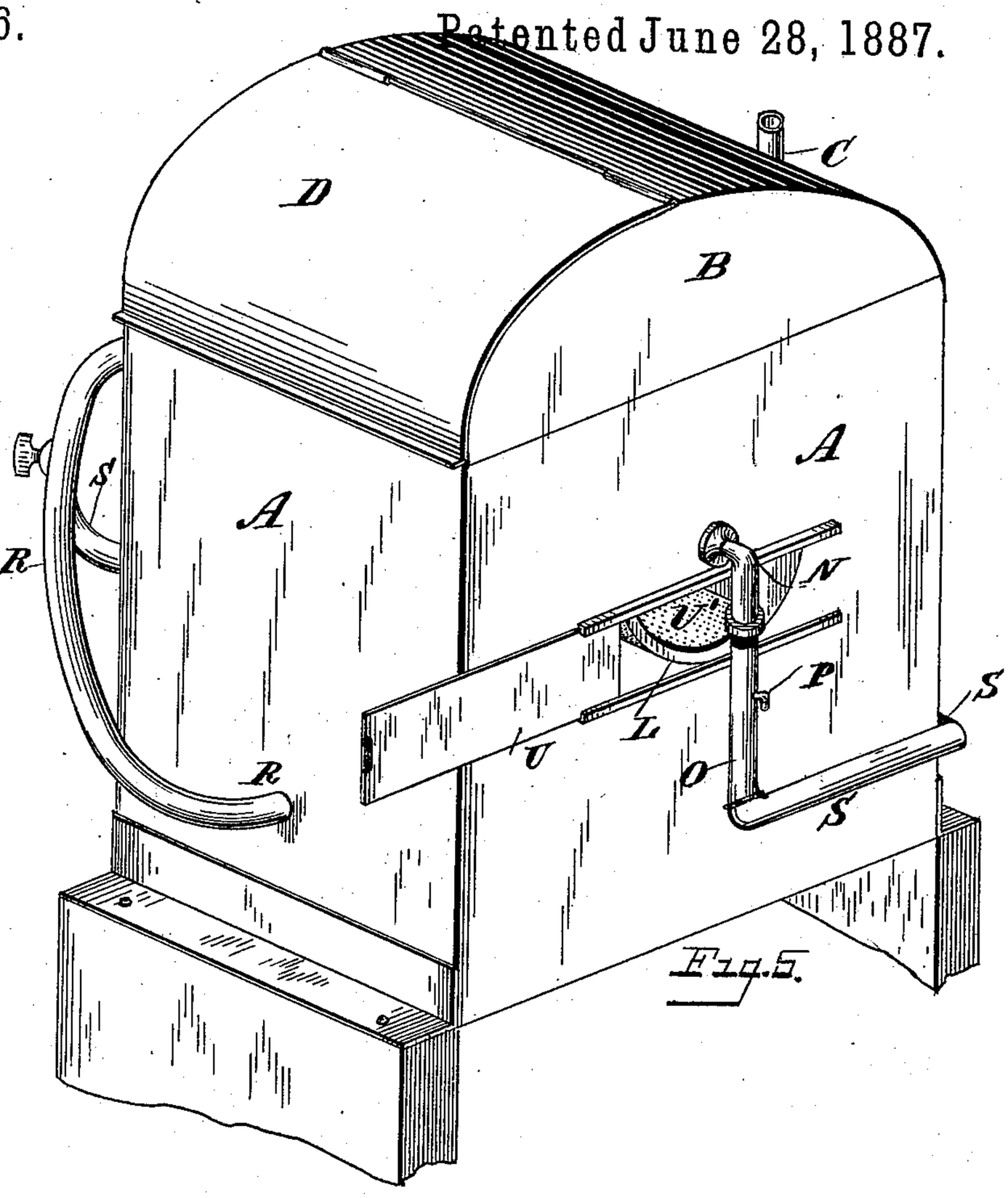
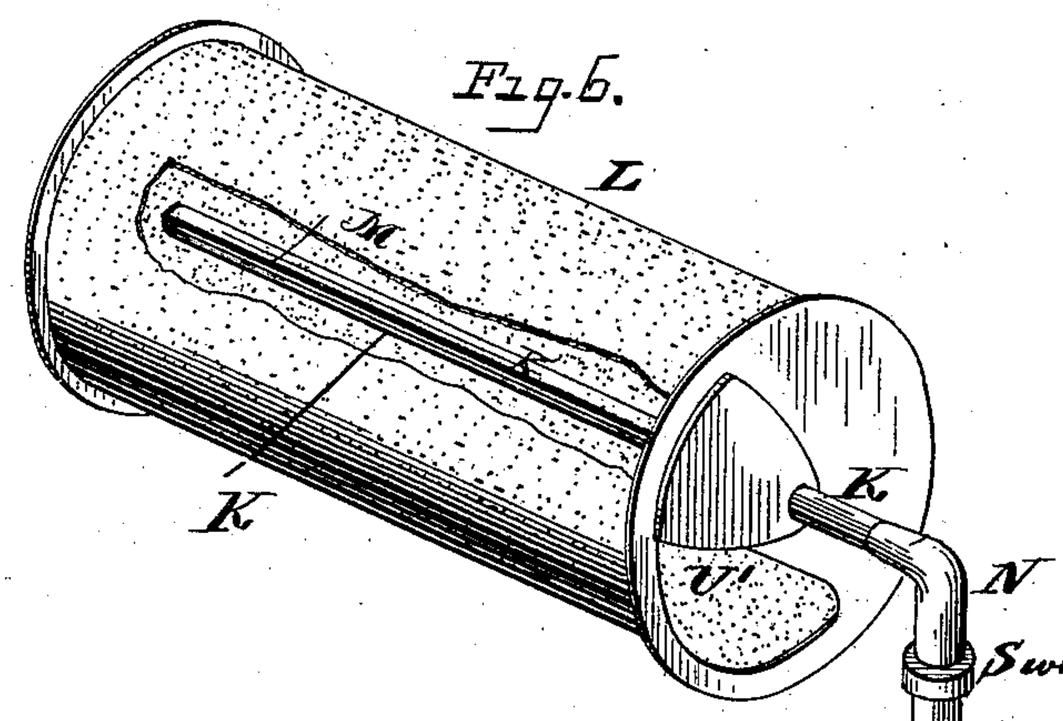


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH A. LOMBAS, OF LOCKPORT, LOUISIANA, ASSIGNOR OF ONE-HALF TO PHLEGIE R. MELANÇON, OF SAME PLACE.

MACHINE FOR MANUFACTURING AND BLEACHING SUGAR.

SPECIFICATION forming part of Letters Patent No. 365,616, dated June 28, 1887.

Application filed March 10, 1887. Serial No. 230,378. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. LOMBAS, a citizen of the United States, and a resident of Lockport, in the parish of La Fourche and State of Louisiana, have invented certain new and useful Improvements in Machines for Manufacturing and Bleaching Sugar; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a longitudinal vertical section of my improved machine for manufacturing and bleaching sugar. Fig. 2 is a transverse sectional view of the same through the plane indicated by the broken line *x x* in Fig. 1. Fig. 3 is a plan or top view of the machine with the arched top part or cover removed. Fig. 4 is a section through the casing which incloses the fan-wheel or bucket-wheel. Fig. 5 is a perspective view of the outside of the machine; and Fig. 6 is a detail view of the tubular slotted shaft upon which the revolving drum or cylinder is mounted, showing also the swiveled steam-pipe for connecting said tubular shaft with the steam-supply when desired.

Like letters of reference denote corresponding parts in all the figures.

My invention has relation to that class of machines which are used for bleaching the sugar as it comes from the "coolers;" and it consists in the construction and combination of parts of the improved machine, which will be hereinafter more fully described and claimed.

In the accompanying two sheets of drawings, the letter A designates the outside casing of the machine, which has an arched top, B, provided with an air-outlet, C, and a hinged cover, D, adapted to be swung back, so as to rest against the air-pipe or any other suitable support, as indicated in dotted lines. The lower part of the box or casing A is provided with a jacket, E, forming a chamber, F, surrounding the casing on all sides and extending under its bottom part, as clearly shown in the sectional views.

Upon one side of the casing A is another box or casing, G, which forms a steam-tight box for the fan-wheel or bucket-wheel H, the fans or buckets of which are so disposed that they will receive and be acted upon by a jet of steam entering the casing through the steam-nozzle I. The central shaft, J, of the fan-wheel coincides with the tubular central shaft, K, of a revolving drum or cylinder, L, made of finely-perforated sheet metal, fine wire-gauze, or any other suitable material. The tubular shaft K of this drum is provided with two longitudinal slits or narrow slots, M M, extending from end to end within the cylinder, and the other end of central shaft, K, is boxed in bearings in that side of the casing A in such a manner that the swiveled head N of the steam-pipe O may be connected to the tubular shaft at will. Said steam-pipe O is provided below its swiveled head with a stop-cock or faucet, P, so that the steam may be shut off during the operation of connecting or disconnecting the swiveled head N with the tubular shaft K.

The steam by which my machine is operated is fed to it through the main steam-pipe Q, one end of which is connected with a boiler, the exhaust from a steam-engine, or any other source of a steam-supply, while its other end terminates, as we have seen, in the steam-nozzle I, which enters the fan-box G, and revolves the fan-wheel within the same. Another steam-pipe, R, forms an outlet or exhaust from the fan-box, conducting the steam into the steam-chamber F, so as to thoroughly heat the contents of the box by steam. This last-named steam-pipe R has a branch pipe, S, which communicates with pipe O, the several pipes being provided at suitable points with proper stop-cocks, valves, or faucets for regulating or shutting off the supply of steam. The bottom of the steam-chamber F is provided with a pipe, T, for carrying off the water of condensation and excess of steam.

The revolving drum or cylinder L is provided with a door, V, through which it is filled with sugar in the form or at the stage in which this comes from the so-called "coolers," and in one of the heads of the cylinder is another door, U′, which registers with a door or slide, U, in the casing A, and through these two

doors U′ and U the sugar, after undergoing the bleaching process in the cylinder, may be withdrawn by the use of scrapers and other suitable implements. The cylinder L is further provided with two or more wings or flanges, X, extending from end to end, and the use of which will be hereinafter set forth.

The entire machine is mounted at a proper height upon suitable supports, so as to admit of the insertion of molasses-pans underneath it, adapted to receive the fluid molasses through the outlet Y in the bottom of the casing A.

Having thus fully described the construction of my machine in its various parts, I shall now describe the operation of the same, which is as follows: As has been already stated, the sugar, after it is taken from the coolers, is placed within the drum or cylinder L until the same is full, when the door V is closed. The steam is then turned on, which causes the fan-wheel to revolve rapidly, so as to rotate the drum or cylinder with a speed of about one thousand revolutions per minute, more or less. At the same time, or at the beginning of the bleaching process, the swiveled head N of the steam-pipe O S is connected with the tubular slitted shaft K, and the stop-cock P is opened, so that steam will enter the tubular shaft and escape in opposite directions through the slits M M in the same. After the contents of the cylinder have become sufficiently moistened and heated by this steam-jet to cause the crystals of sugar to adhere together steam is again shut off by closing the stop-cock P, and by the rapid revolutions of the foraminated drum or cylinder L the molasses and other coloring-matter contained in the sugar is expelled through the fine apertures in the cylinder. This process of expelling the molasses from the grains of sugar is further facilitated by the wings or flanges X upon the outside of the cylinder, which, by the rapid revolutions of the latter, expel the air from the interior of the casing A, so as to form a partial vacuum within the same, the expelled air escaping through the outlet C in the arched cover. The steam being fed continuously through the pipe R to the steam-jacket E F causes the sides and bottom of the casing A to be thoroughly heated, so as to cook and thicken the molasses as it escapes from the revolving cylinder and is collected in the bottom of the casing A. By making the cover of this casing A arched, as shown, the molasses, which is thrown upon this cover by the rapid revolutions of the cylinder, will flow or drip from this cover down into the casing, and be collected at the bottom of the same, where it is subjected to the cooking process. The degree of heat in the bottom of the casing may readily be regulated by means of a suitably-constructed faucet or valve on pipe R.

By this machine and process the sugar within the drum is bleached very rapidly, and as the cylinder is rotated, preferably by means of steam, which, if desired, may be the waste steam or exhaust-steam from an engine running the cane-mill, or any other machinery, it will be seen that the whole process of bleaching by my machine may be reduced to a minimum of cost. The same steam which operates the fan-wheel by which the cylinder is revolved serves to cook the molasses which escapes from the cylinder and collects in the bottom of the casing within which the cylinder is mounted and revolves, and by properly grading the heat of the molasses-receptacle in the lower part of the casing the molasses may be brought to the proper consistency for granulating into sugar in the coolers without any intermediate step or process, after which it is ready for feeding into the cylinder again to be bleached and form merchantable bleached sugar. Thus it will be seen that I not only bleach the sugar rapidly and thoroughly, but that I have, by the use of my improved machine, hereinbefore described, reduced the cost of manufacturing and bleaching sugar to a minimum.

Whenever it is desired to clean out the cylinder and the other parts of the machine after the sugar and molasses have been removed from the same, this may readily be done by turning on the steam, so that steam will pervade the interior of the cylinder, as well as all parts of the exterior box. By then opening the faucet or pipe Y the water of condensation containing the dissolved sugar and impurities may be drawn off, leaving the machine perfectly clean. When it is desired to dry the machine after such cleaning, the steam may be turned off again by turning the swivel-head N away from its connection with the tubular shaft, when by the revolutions of the cylinder, owing to its fans or wings X, the cold air which is sucked through the tubular shaft into the machine will be thoroughly agitated within the casing A, and then expelled through the air-outlet C.

It is obvious that the revolving cylinder may be revolved by means of a pulley and belting, gear-wheels, friction-wheels, or any other of the well-known mechanical appliances for producing a rotary motion, without departing from that part of my invention; but on the score of economy, as well as for the other reasons stated in my specification, I prefer to rotate the cylinder by means of a fan-wheel rotated by a jet of steam, as hereinbefore described.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of the casing containing the revolving cylinder, the steam-jacket enveloping the lower part of said casing, the foraminated cylinder revolving within the casing and provided with two or more longitudinal exterior flanges, the box containing the fan-wheel and provided with an inlet and outlet for steam, the fan-wheel or bucket-wheel inside of said box, and the central shaft of the

cylinder connected to the shaft of the fan-wheel so as to revolve with the same, substantially as set forth.

2. The combination of the cylindrical drum or cylinder, the tubular shaft slitted longitudinally on opposite sides within the same, the fan-wheel or bucket-wheel whereby said cylinder is revolved, and a steam-pipe adapted to be connected or disconnected at will with the tubular cylinder-shaft, substantially as set forth.

3. The combination of the casing containing the revolving cylinder, the steam-tight fan-box, the steam-inlet to said box, the steam outlet or pipe leading from said box to the steam-jacket, the steam-jacket enveloping the lower part of the casing within which the cylinder revolves, and the branch pipe leading from the last-named steam-pipe to a swiveled head, adapted to connect the steam supply with the central tubular shaft of the revolving cylinder, substantially as set forth.

4. The combination of the casing containing the revolving cylinder, the steam-jacket enveloping the lower part of the same, which forms a molasses-receptacle, the molasses-outlet in the bottom of said casing, the revolving cylinder arranged within the casing and provided with longitudinal exterior wings or flanges, the arched top or cover provided with a hinged part or section, and the air-outlet in the arched cover, through which the air inside of the casing may be expelled by the rapid revolution of the flanged cylinder, substantially as set forth.

5. In combination with the casing A, provided with a steam-heated molasses-receptacle in its bottom part, the revolving cylinder provided with a central tubular shaft slitted longitudinally from end to end within the cylinder between the heads of the same, and provided with exterior longitudinal wings or flanges, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

JOSEPH A. LOMBAS.

Witnesses:

LOUIS BAGGER,

AUGUST PETERSON.