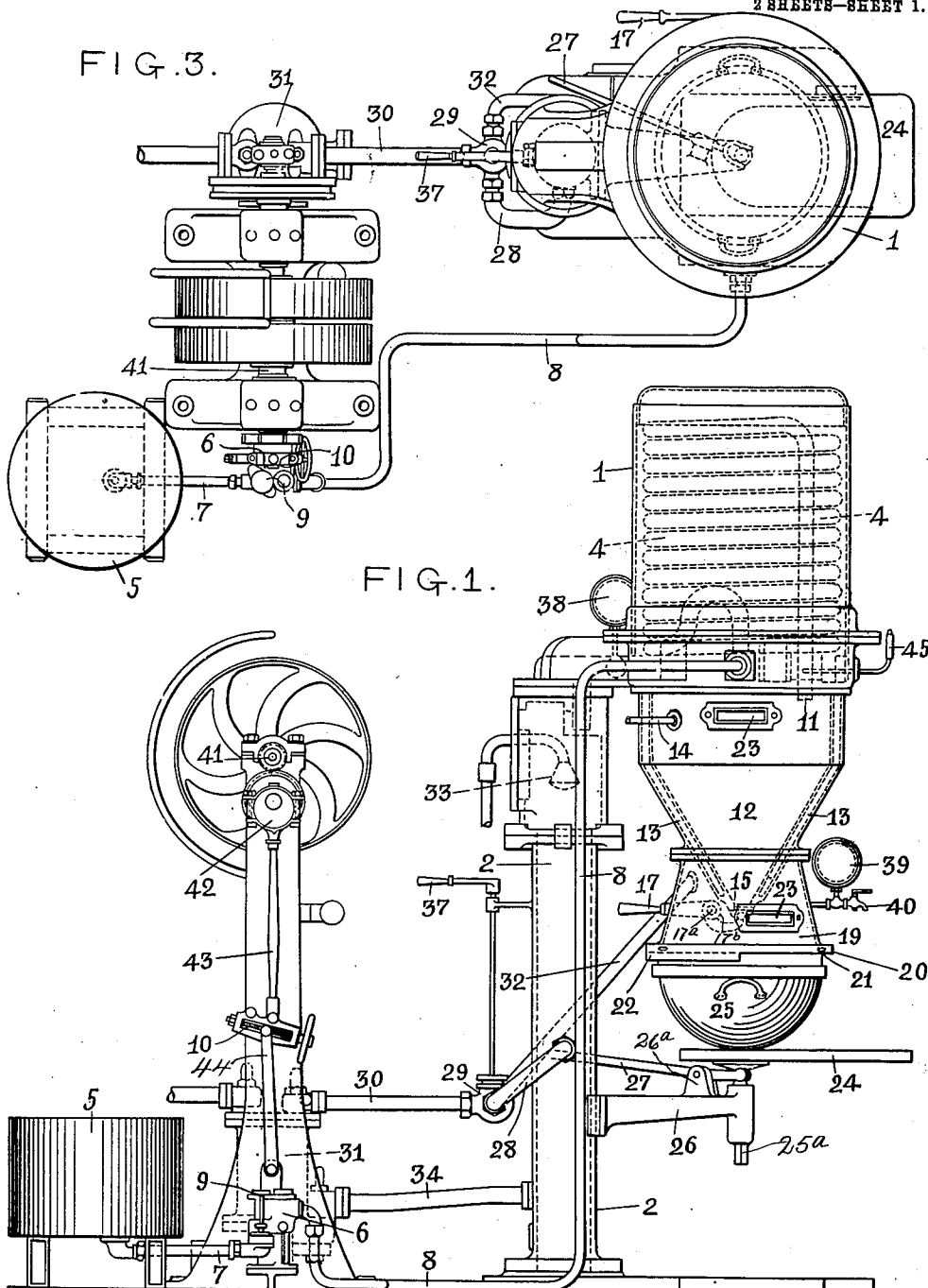


G. S. BAKER.
VACUUM PAN.
APPLICATION FILED JAN. 30, 1909.

956,508.

Patented May 3, 1910.

2 SHEETS—SHEET 1.



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FIG. 4.

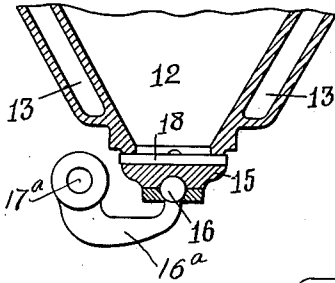


FIG. 2.

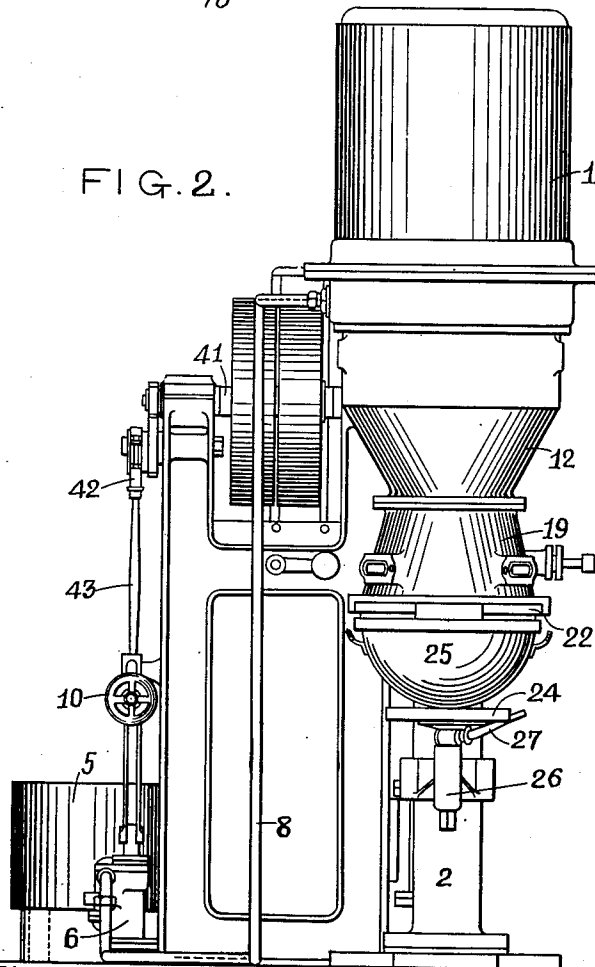
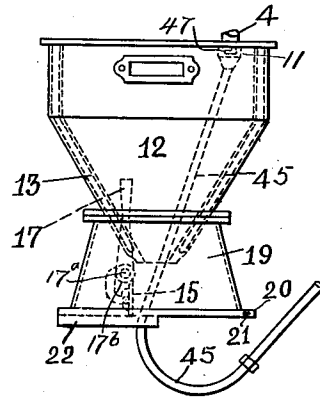


FIG. 5.



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UNITED STATES PATENT OFFICE.

GEORGE SAMUEL BAKER, OF LONDON, ENGLAND.

VACUUM-PAN.

956,508.

Specification of Letters Patent.

Patented May 3, 1910.

Application filed January 30, 1909. Serial No. 475,234.

To all whom it may concern:

Be it known that I, GEORGE SAMUEL BAKER, a subject of the King of England, residing at London, N. W., in England, have invented certain new and useful Improvements in Vacuum-Pans, of which the following is a specification.

This invention relates to improvements in machines for boiling sugar and the like chiefly of that class in which the sugar is pumped into and boiled *in vacuo* in a coil contained within a steam heated dome or chamber carried by a column or standard and having below same a container into which the coil discharges.

The primary object of the present invention is to so construct the machine that the operation thereof may be rendered continuous instead of intermittent as hitherto, the vacuum not being destroyed in the entire apparatus at any time, and a further object is also to adapt such a machine for use when boiling under pressure, that is to say, without a vacuum.

A preferred construction and a modification of the improved machine are represented in the annexed drawings, Figure 1 being a side elevation thereof. Fig. 2 an end elevation from the right of Fig. 1. Fig. 3 a plan view, Fig. 4 a sectional detail view showing part of the container and discharge valve, and Fig. 5 a detail view showing the modification referred to.

Referring to Figs. 1 to 4, 1 designates the dome or boiling chamber carried by the column 2 and heated by steam from a convenient source (not shown). Within said dome 1 is the coil 4 into which is pumped the sugar or syrup from the vessel 5 by means of the pump 6 and pipe system 7, 8. The supply of syrup is controlled by the valve 9 and also by varying the stroke of the pump by means of the screw and link adjustment gear 10 or in any other convenient manner. The coil 4 discharges at the point 11 into the receiver 12 located below the dome 1 and jacketed as at 13, a suitable steam inlet as 14 to said jacket being provided. At the base of the receiver is the discharge valve 15 (see more particularly Fig. 4) mounted upon a ball joint 16 carried by a pivoted arm 16^a and operatable by lever 17 which is mounted on a shaft 17^a extending through suitable stuffing boxes in the walls of casting 19,

whereby the vacuum may be preserved. The valve 15 may have a rubber seat 18 for insuring tight closure. Securely attached to the lower portion of the receiver 12 is the casting 19 forming an auxiliary chamber, the lower edge of which is provided with a flange 20 supporting an annular strip of rubber or other like packing 21, and also with a positioning flange 22. Both the receiver 12 and the casting 19 are provided with a suitable number of glazed inspection apertures 23. Below the casting is mounted the table or bracket 24 for supporting the pan or receiver 25, said table having a stem 25^a capable of sliding in an arm 26 attached to the column 2 and carrying bearings 26^a for a lever 27 by which the table and pan can be raised or lowered. The aforesaid column 2 is hollow for its entire height and at its upper end communicates with the top of the receiver 12 and at a point lower down with a pipe 28 communicating with a three-way or other suitable cock 29 in a pipe 30 leading to a double acting vacuum pump 31. The interior of the casting 19 is also adapted to be placed in communication with the pump through said three-way cock by means of the pipe 32. A jet condenser 33 is arranged within the hollow column and supplied with liquid from any suitable source (not shown) and a pipe 34 communicates with said column and with the pump cylinder on the opposite side of the piston thereof to the pipe 30, through which pipe 34 condensing water and products of condensation from the receiver 12 and coil 4 which collect in the column 2 may be pumped. The three-way cock 29 may be operated by lever 37 or in any other convenient manner. Gages 38 and 39 are provided to show the degree of vacuum in the receiver 12 and casting 19 respectively and the latter is provided with a relief cock 40. A thermometer 45 is inserted near the discharge end of the coil for indicating the temperature of the syrup. The pumps 31 and 6 may be operated in any convenient manner from the pulley shaft 41 the said pump 6 being shown as driven by eccentric 42 and rods 43, 44 containing the link gear 10 previously referred to.

The operation of the apparatus thus far described is as follows. Steam is admitted to the dome 1 and syrup pumped into the coil 4 through the pipes 7, 8 by the pump 6,

the discharge valve 15 being closed and the three-way cock 29 manipulated to open communication through the pipes 30 and 28 and hollow column 2 between the pump and receiver 12 to produce a vacuum in the latter and consequently in the coil. The cooking or boiling operation proceeds long enough to boil a charge which is collected in the receiver 12 and when completed the table 24 is raised to bring the upper edge of the pan 25 in close contact with the packing 21 in the edge of the casting 19 whereupon the cock 29 is operated to shut off the receiver from the top end of the pump 31 and open it to the casting 19 through pipe 32 to create a vacuum within same, the pan 25 being by this means strongly sucked against the packed lower edge 21 of said casting to produce a hermetic closure. The lower portion of the pump 31 is in constant communication with the receiver 12 through column 2 and pipe 34 and maintains the vacuum therein while the cock 29 is open to casting 19. When the gages 38 and 39 show that an equal degree of vacuum exists within the receiver 12 and casting 19 the discharge valve 15 is opened and the contents of the receiver discharged into the pan. The valve 15 is then again closed, the cock 29 reversed to shut off the casting 19 from the pump and again place the receiver 12 in communication with the upper end of said pump, whereupon the pan 25 is released by opening the relief cock 40 and the apparatus is ready to treat another charge of syrup pumped into the coil 4.

It will be obvious that at no time during the boiling and discharging operation until its removal from the machine is the syrup exposed to the atmosphere, either the coil and receiver or the casting being always under a vacuum.

Fig. 5 shows a modification for use when boiling the syrup at high temperature and not under vacuum, the boiled syrup being discharged from the coil 4 by pressure produced therein by the syrup pump 6. In this case after opening the discharge valve 15, a pipe 46 having a bayonet joint 47 or other easily attachable union is passed up through the casting 19 and receiver 12 and connected to the coil 4 at the point 11, the other end of said pipe 46 leading to a cooler or other desired receptacle.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. In a machine for the purpose described the combination of a steam heated chamber, a boiling coil therein adapted to receive the material to be heated, a valved discharge receiver in communication with said coil, means for producing a vacuum in said receiver, an auxiliary chamber adapted to be placed in communication with said receiver

by means of its valve, a permanent communication between the receiver and the vacuum producing means, a valved communication between said means and the auxiliary discharge chamber and a separable discharge pan adapted to be hermetically connected to the auxiliary discharge chamber when the latter is in communication with the vacuum producing means.

2. In a machine for the purpose described the combination of a steam heated dome, a boiling coil therein, means for supplying said coil with the substance to be treated, a valved discharge receiver in communication with the coil, means for producing a vacuum in said receiver, an auxiliary chamber open below inclosing the valved portion of said receiver, packing inserted in the edge of said auxiliary chamber, a permanent communication between the receiver and the vacuum producing means, a valved communication between said means and the auxiliary chamber, and a separable pan adapted to close the open end of said auxiliary chamber and to hermetically contact with said packing when the chamber is in communication with the vacuum producing means.

3. In a machine for the purpose described the combination of a steam heated dome, a column supporting same, a boiling coil within said dome, means for supplying said coil with syrup, a receiver in communication with said coil, a discharge valve at the lower end of said receiver, an auxiliary chamber normally open at its lower end inclosing said discharge valve, packing material inserted in the lower edge of said auxiliary chamber, a double acting vacuum pump cylinder, a permanent communication through the column between one end of the pump cylinder and the receiver, communications between the other end of said cylinder and the auxiliary chamber respectively, a cock for closing one of said latter communications and simultaneously opening the other and a separable pan adapted to close the open end of said auxiliary chamber and to hermetically contact with the packing thereof when said chamber is in communication with the vacuum pump.

4. In a machine for the purpose described the combination of a steam heated dome, a column supporting same, a boiling coil within said dome, means for supplying said coil with syrup, a receiver in communication with said coil, a discharge valve at the lower end of said receiver, an auxiliary chamber normally open at one end inclosing said discharge valve, packing material inserted in the lower edge of said auxiliary chamber, a pan adapted to close the open end of said chamber and to contact with said packing, a vacuum pump cylinder, a permanent communication through the column between one end of the pump cylinder

and the receiver, communications between
the other end of said cylinder and the aux-
iliary chamber respectively, a cock for clos-
ing one of said latter communications and
5 simultaneously opening the other, and a jet
condenser in the column aforesaid substan-
tially as described.

In witness whereof I have signed this
specification in the presence of two wit-
nesses.

GEORGE SAMUEL BAKER.

Witnesses:

F. L. RAND,

H. D. JAMESON.