

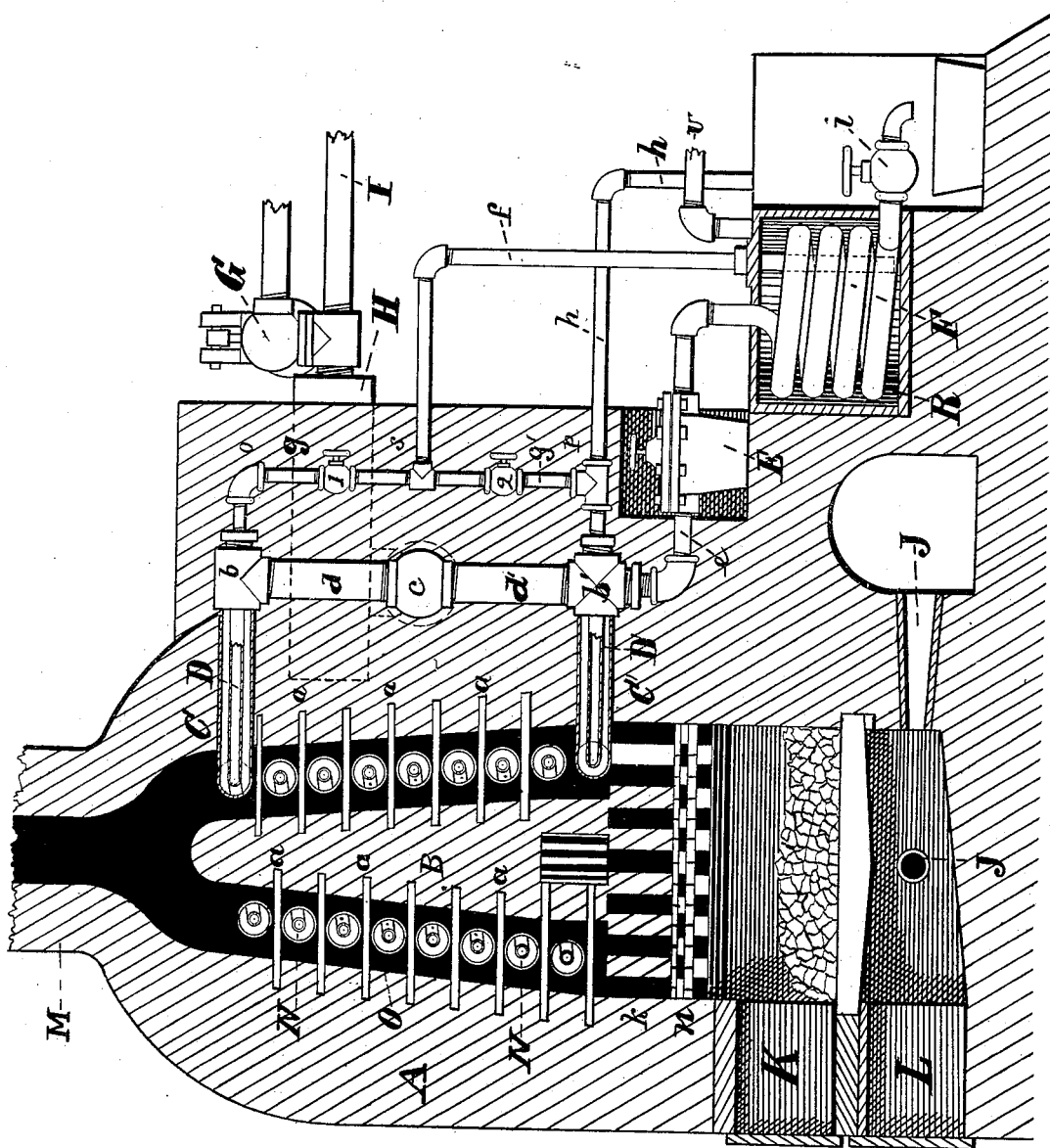
(No Model.)

W. F. BROWNE.

EVAPORATING SACCHARINE JUICES, &c.

No. 263,312.

Patented Aug. 29, 1882.



Witnesses.
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EVAPORATING SACCHARINE JUICES, &c.

SPECIFICATION forming part of Letters Patent No. 263,312, dated August 29, 1882.

Application filed August 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FRANK BROWNE, of the city, county, and State of New York, have invented certain new and useful
5 Improvements in the Mode and Process of and Means for Evaporating Saccharine Juices and other Liquid Substances; and I do hereby declare the following description to be a clear and full description thereof, reference being
10 had to the accompanying drawing, which forms a part of this specification.

This invention relates to the mode and process of and means for evaporating saccharine juices or any liquids which may contain solid
15 substances or any substance which may possess a specific gravity greater than the liquid with which it may be combined.

The invention consists in the arrangement of the means or devices for and the process
20 of forcing saccharine juices, and other liquids therein, through said means or device, whereby the said saccharine juices or other liquids containing soluble matter is heated while under pressure to a degree of heat above
25 the degree required to evolve steam from the aqueous element contained therein, and thence discharging said heated product into a suitable receiver, where the aqueous element will be evolved to steam and pass out through
30 suitable safety devices, while the saccharine products or the unvolatilized products from other liquids are trapped off through a suitable trapping device into a cooler, and thence
35 to a receiver, or directly to some suitable receivers.

A in the drawing represents masonry or a structure of brick-work, in which a furnace and ash-pit are located, K and L being doors thereto.

40 *n* is an arch provided with flues *h*. On top of this arch a core, B, is built, thus forming an annular flue-space, O, in which a coil of pipe, N, is located, the two ends of which project at C C' and unite with two fittings, *b b'*,
45 which are connected by the vertical stand-pipe *d d'* and valve *e*.

50 *a* are supports introduced between the coils of pipe, with their ends projecting into the wall A and core B, the object of which is to support the coil and keep it from sagging when great heat is applied.

D D' are the ends of an internal perforated pipe, which is coiled within the large pipe or coil N. These ends project through the fittings
55 *b b'* and form nipples, to which the fittings are attached. To these fittings the vertical feed-pipe *g g'* and valves 1 and 2 are secured. At or near the center of this pipe a connection is formed with the induction-pipe *f* and T-fitting S, and the pipe *f* connects with a pump. 60

h h is a pipe for blowing off the inner pipe, D D'.

H is a steam-dome, to which the safety-valve G is secured.

I is a pipe leading from the safety-valve con- 65 nection to a motor or other place of use.

e is a connecting-pipe, leading from the vertical run of the cross-fitting *b'* and to a trap, E. To the outlet of this trap the coil F is connected. This coil can be used for a cooler, the
70 water for cooling the same being introduced through pipe *v* into tank R.

i is a valve to control the flow from the coil F.

J represent pipes through which air is blown into the furnace. 75

The operation of the above-described apparatus is as follows: Saccharine juices or other liquids are forced through pipe *f* into pipes *g g'*, thence through the pipes D D' into the perforated coil, where it is sprayed out into the 80 outer coil, N, and therein heated, after which the steam evolved therein will escape through the upper coils into pipe C, and down through pipe *d*, thence through connection *e*, by a pipe, (shown in dotted line) to the dome H, while the
85 saccharine matter and other products will flow down through pipe C' and the connection *b'*, thence through pipe *e* into the trap E, whence it is discharged into the cooling-coil F. By closing either valve 1 or 2 the liquid will be
90 forced into but one end of the coil, while the steam and other products will escape, as above described. One, two, or more of these coils C C' can be employed, and also the internal coils, D D', can be dispensed with, and the liquid
95 containing solid matter to be separated can be forced into the upper end and taken out at the lower end thereof, which can be connected to a suitable expansion-chamber, where aqueous matter is expanded to steam, while the
100 residual matter is discharged into suitable evaporating or drying pans.

When an evaporator of this class is to be employed to evaporate water from salt or from other water containing mineral properties the ends of the coil C' can project into an open receiver or chamber or into a vacuum-chamber, where the steam will be caused to separate rapidly, thus leaving but little moisture to be subsequently evaporated from the recovered salts.

10 I herein disclaim all subject-matter embraced in claims which appear in my subsequent application, filed December 19, 1881, serial number 48,267, as follows: These claims embrace the subject-matter consisting of a device for heating liquids or for generating steam. This device consists of a conduit or conduits provided with an internal perforated conduit extending entirely through the external conduit, and into which liquids are forced and sprayed out into

20 the external conduit, where the liquids are rapidly heated or evolved to steam. The two ends of the external conduit are connected with a separator, into which the heated liquid or steam is discharged. The internal conduit is connected with a device for forcing liquid therein, and the separator is connected with a trap for conducting the concentrated liquids away, as described.

What I claim, and desire to secure by Letters Patent, is—

1. The process of concentrating liquids containing solid matter in solution, which consists in forcing and spraying them under pressure into and through a heated coil, and finally separating the steam from the concentrated liquid or solid portion (outside the furnace) and collecting the former in a dome and the latter in a suitable receptacle.

2. The heating-coil and its feed-pipe, in combination with the furnace, the trap E, and the cooler F, for the purpose specified.

3. The outer heating-coil, the connecting stand-pipe *d d'*, the dome H, the trap E, and cooling-coil F, in combination with the inner perforated spray-pipe, the feed-pipes *g g' f*, cooling-tank R, and feed-pipe *v*, for the purpose specified.

4. In the furnace, the arch *n*, having flues *k*, in combination with the core B, mounted thereon, and the stack A, forming the flue-space O, for the purpose specified.

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Witnesses:

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