

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN DIFFUSION APPARATUS.

Specification forming part of Letters Patent No. **210,158**, dated November 19, 1878; application filed
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To all whom it may concern:

Be it known that I, RUDOLF SIEG, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Diffusion Apparatus, of which the following is a specification:

Figure 1 is a plan view of my improved diffusion apparatus. Fig. 2 is a side elevation, partly in section.

Similar letters of reference indicate corresponding parts.

My invention relates to apparatus for extracting saccharine matter from sugar-cane and other sugar-producing substances.

Referring to the drawing, A A, &c., are receptacles for the finely-cut sugar-cane. These receptacles are slightly tapered, being smallest at the bottom, and they are each provided with a man-hole, B, at the top, for receiving the finely-cut sugar-cane, and have discharge-openings C, which are provided with close-fitting covers. The receptacles A are arranged in two rows of four each. A car, D, running on rails *a* above the tops of the receptacles, receives the finely-cut sugar-cane from a conveyer, E, and is provided with spouts *h*, for discharging the cane into the top of the receptacle A through the man-hole B.

A pipe, E', connects the upper portion of each receptacle with a valve, *c*, at the top of the conducting and heating pipe F, and a water-supply pipe, G, is connected, by means of an angle-valve, H, with the upper end of each heater and conductor F.

The top of each receptacle A is connected with a heater and conductor, F, and the lower end of the heater and conductor is connected by a pipe, I, with the bottom of the adjacent receptacle, thus forming a connection between the receptacles.

The heater and conductor F consists of a central tube, *d*, which is surrounded by a steam-jacket, *e*, which is provided with a steam-supply pipe, *f*, and a pipe, *g*, for the discharge of the water of condensation. In the tube *d* there is an internal tube, *h*, which is connected with the steam-space around the tube *d* by short pipes *i* at its upper and lower end.

The heater and conductor may consist of a

tube having an internal steam-pipe, *j*, which is provided with a long strainer-nozzle, *k*, and with a ball-valve placed in the strainer-nozzle, and capable of closing the upper end of the steam-pipe. The steam-pipe in this case is supplied through the pipe *l*.

An air-valve, J, is connected with each of the connecting-pipes E, for admitting air when the receptacles are discharged, and upon each side of the receptacles there are rails *m*, upon which there are cars for receiving the bagasse as it is discharged from the receptacles.

The operation of my improved apparatus is as follows: The cane is cut by suitable machinery into small pieces, and delivered to the car D by the conveyer E. The car is of sufficient length to admit of discharging the finely-cut sugar-cane into either of the receptacles A, while some portion of it is always under the upper ends of the conveyer E.

Water is admitted through the pipe G and valve H to the heater and conductor F, in passing through which the water becomes heated. As the water enters the bottom of the adjacent receptacle, the sliced cane is dropped from the car D into the said receptacle, and, meeting the upward current of water, it settles slowly, and at the same time parts with its saccharine matter. When the receptacle is filled the upper man-hole is closed, and the next receptacle in order is filled with sugar-cane, and the water and juice from the receptacle first filled enters the bottom of the second receptacle, being heated in its passage through the heater and conductor F. The third, fourth, fifth, and sixth receptacles are filled in a similar manner. After six receptacles are filled in this manner, the valve J of the last working vessel is opened. The now finished juice is drawn off into a receiving-tank standing a little lower than the supply-tank above from which the battery is fed with water. When the contents of one vessel have been drawn off, the valve H of the first vessel is closed, and the valve *c* belonging to the vessel just discharged is opened, thereby emptying the juice-pipe entirely. The latter is then also closed, and the water-valve H of the second vessel is opened, while the valve *c* leading to the heater and conductor is shut.

The exhausted cane-slices are now discharged, through the discharge-opening C, into one of the cars *n*, running upon the rails *m* outside of the sugar-house.

The process just described is carried on continuously.

The advantages claimed for my improvement are, that the juice may be kept at a uniform heat in passing from one receptacle to another, thereby facilitating the process of extraction and economizing room, as smaller and fewer vessels may be employed.

Another advantage secured by the process is, that the small pieces of cane are prevented from settling heavily together, and the saccharine matter is, in consequence, more completely extracted.

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

1. The valved heater F, connected with the receptacles A by the pipes E' I, substantially as and for the purpose specified.

2. The conductor and heater consisting of the tube *d*, having the internal heating-tube *h*, and the steam-jacket *e*, substantially as herein described.

RUDOLF SIEG.

Witnesses:

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