

UNITED STATES PATENT OFFICE.

JAMES A. MORRELL, OF NEW YORK, N. Y.

IMPROVEMENT IN THE MANUFACTURE OF SUGAR.

Specification forming part of Letters Patent No. **141,067**, dated July 22, 1873; application filed June 4, 1873.

To all whom it may concern:

Be it known that I, JAMES A. MORRELL, of the city, county, and State of New York, have invented a new and useful Improvement in the Art of Manufacturing Sugar; and I do hereby declare that the following is full, clear, and exact description of the same.

In Letters Patent issued to me by the United States on the 12th of September, A. D. 1871, No. 118,875, I described a process for manufacturing sugar by the use of rarefied air impregnated or surcharged with electricity passed through the saccharine solution while undergoing evaporation. In a subsequent application for Letters Patent, passed for issue, but not yet issued, I describe another process applied to the sugar while in process of granulation, consisting in the application to the granulating mass of induced currents of electricity not applied with currents of air. I have since discovered that by introducing electrical currents, either independently or in conjunction with currents of air, into the cane-juice, sugar-liquor, sirup, or other saccharine solution from which it is intended, by subsequent evaporation, to manufacture sugar, such a change is effected in the glucose or grape-sugar held in solution with the cane or crystallizable sugar that, on subsequent evaporation of the mass, a much larger crystallization of the latter can be effected than when the evaporation occurs in the mode in common use in sugar manufactories and refineries; the effect being to "cut" the glucose, so that after evaporation of the water it will not hold the crystallizable sugar, but permit the granulation of all the merchantable sugar.

In working my improved process I introduce into the mass of the saccharine solution to be evaporated in the vacuum-pans or other vessels in common use for the purpose, before the work of evaporation commences, and, if more convenient, while the solution remains in the vats or the vessels where it is held for use, currents of electricity, generated either by passing atmospheric air in currents through insulated

pipes containing diverse metals capable of exciting voltaic action, leading into the said solution, or by means of frictional machines generating currents to be carried by insulated wires into such mass, or by galvanic batteries or other known means of generating electrical currents which can be conveyed into such solution. This process of electrization should be continued, in liquors of a gravity of, say, 27° Baumé, for about two hours; if the solution is thicker, the process should be continued longer in proportion to the density of the mass. I, however, do not wish to limit my claim to the degree of use, as experiment will very readily determine what is the most effective mode of treating any particular solution.

After this operation has been concluded the solution is to be drawn off into the vacuum-pans or other means used for evaporating, crystallizing, and finishing the sugar, which part of the process is conducted in the usual methods.

I do not, in this patent, wish to be understood as seeking to cover the use of electrical currents in or during the processes of evaporation or granulation, such having been included in the before-recited cases.

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

The mode of inducing a separation of the glucose or grape-sugar and crystallizable sugar contained in saccharine solutions preparatory to the evaporation and granulation of the same by passing through such solutions induced currents of electricity, whether accompanied by atmospheric currents or not, such solutions being afterward evaporated and granulated according to any known process.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAS. A. MORRELL.

Witnesses:

R. MASON,
D. P. HOLLOWAY.