UNITED STATES PATENT OFFICE.

THOMAS MOORE, OF BLOOMINGTON, ILLINOIS.

IMPROVED PROCESS OF MAKING SUGAR.

Specification forming part of Letters Patent No. **48,580**, dated July 4, 1865.

To all whom it may concern:

Be it known that I, THOMAS MOORE, of Bloomington, in the county of McLean and State of Illinois, have discovered a new and improved process for making crystallized sugar from all the African and Chinese varieties of the *Holcus sacchara*, often called "imphee," "sorghum saccharatum," "sorghum sucre," &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to fully understand and make use of the same.

The object of this invention is to remove from the juice of said canes all the acidulous, gelatinous, and albuminous particles which may be mixed with it before and during the process of boiling, and also to facilitate the crystallization of the sugar after the juice has been boiled down to the requisite consistency. To effect this purpose I pass the juice, after it has been expressed from the canes by the usual method, into a heater of any suitable construction and material, and while cold mix with it a liquor made of white-oak bark, (by steeping the same in boiling water,) in the general proportions of one pint to every eight gallons of the juice, (more or less may be required, according to the different qualities of the juice, as can be ascertained by well-known methods,) after which the whole mass is gradually heated to 200° Fahrenheit, or nearly the boiling temperature, or till large bubbles will begin to arise on the surface of the thick scum which will be formed. When either point is reached the heat must be shut off and the whole allowed to stand for five or ten minutes, as the case may be, after which the scum or network of coagulated impurities must be removed. After the scum is removed the juice is treated with a weak lye of wood-ashes, the object of which is threefold, to wit: first, to counteract the excess of tannate of oak-bark should such event happen; second, to neutralize acidulous properties of the juice; third, to further aid as a defecating agent, in this latter respect its work being most powerful. This lye is to be sufficiently weak that its color will not be darker than ordinary dark brandy or ale color, and used in the general proportions of six quarts to every hundred gallons of juice. After the introduction of this last-named defecating agent the whole mixture should be well stirred and then allowed to stand for fifteen minutes to settle, after which the liquor must be passed through a thick flannel strainer into the boiler or evaporator, (of any suitable construction,) and there brought to boiling actively. The first scum which arises must be carefully removed. The boiling must not cease, however, till large bubbles arise and slowly explode with a sputtering noise, emitting little globules of steam. Then, as a test of finishing, take a drop of the sirup between the thumb and finger, and if it will "rope out" to the full span, the point of granulation, or "strike-point," is reached and the fire must be quickly shut off. Then flow off the sirup through a long pipe (which acts as a cooler) into vats or casks prepared for crystallizing.

If the process of granulation is desired to go on quickly, the vats or casks must be kept at a temperature which may range from 70° to 90° Fahrenheit, when granulation will frequently take place in forty-eight hours. In ordinary temperature the process is as certain, but slower.

The "throwing-in" process, as it is termed, of one or two pounds of dry sugar to each cask or vat, as a nucleus for crystallization, may be of use if granulation does not take place readily, though this latter is not indispensable in this process; neither is it claimed.

When the separation of the sugar from the sirup has taken place, as can be easily ascertained by examination, the sugar will be deposited at the bottom of the vat or cask in a solid mass, and the sirup can be poured off. The "mush sugar" can then be drained by placing in conical pots or any other approved method, and when thoroughly dripped may be placed on a table to dry and then barreled. This process will make a good raw brown sugar. If a lighter or finer article of sugar is desired, the usual claying or washing process may be used to advantage.

By this process, when carefully executed, sugar can be produced in every case from sorgo and imphee canes not spoiled by hybridism, and is both novel, economical, and useful, inasmuch as the combination of the tannate of oak-bark and lye is a perfect and cheap defecating agent, easily obtained by the farmer or

manufacturer, easy of application, and enables him to produce sugar without the costly appliances and tedious process of bone-charcoal filtering, which has proved the great incumbrance to the successful prosecution of this enterprise.

It must be clearly understood that although the liquor of oak-bark is a tannate principally, the use of tannin or tannic acid in sugar-making is not new, as its use has been recommended in 1847 by W. J. Evans, M. D., of London, and included in Galloway's English patent of 1853, and possibly other patents; but it will be observed that my manner of using, its purpose, and its combination are entirely different, as Galloway uses tannin to precipitate the acetates of lead, &c., used as defecating agents, while I use the tannate to render insoluble the gelatinous and starchy particles of sorgo and imphee juices, so they can be removed. Further, it must be clearly understood that the use of lye as a neutralizer of acids is an old principle, and my use of it in this process is only partly for that purpose, but much more for its defecating powers, and my application of it, in combination with the tannate, as set forth in my description, is novel and for a new and useful purpose.

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

1. The within-described process of treating saccharine juices and sirups of the sorgo and imphee canes by first treating the juice with a tannate made of white-oak bark or other equivalent while cold, and raising it to a certain point by a gradual heat, for the purpose of rendering insoluble in order to remove certain gelatinous and starchy matters contained therein, then mixing with it a weak lye for further defecation, then boiling to the point of crystallization, substantially in the manner set forth.

2. Distinctly, the use of a liquor made of oak-bark or other equivalent material, in connection with lye of wood-ashes or other equivalent, as an effectual agent for the defecation of sorgo and imphee juices and sirups, substantially as and for the purposes specified.

THOMAS MOORE.

Witnesses:

DAVID BRIER,

JESSE BIRCH.