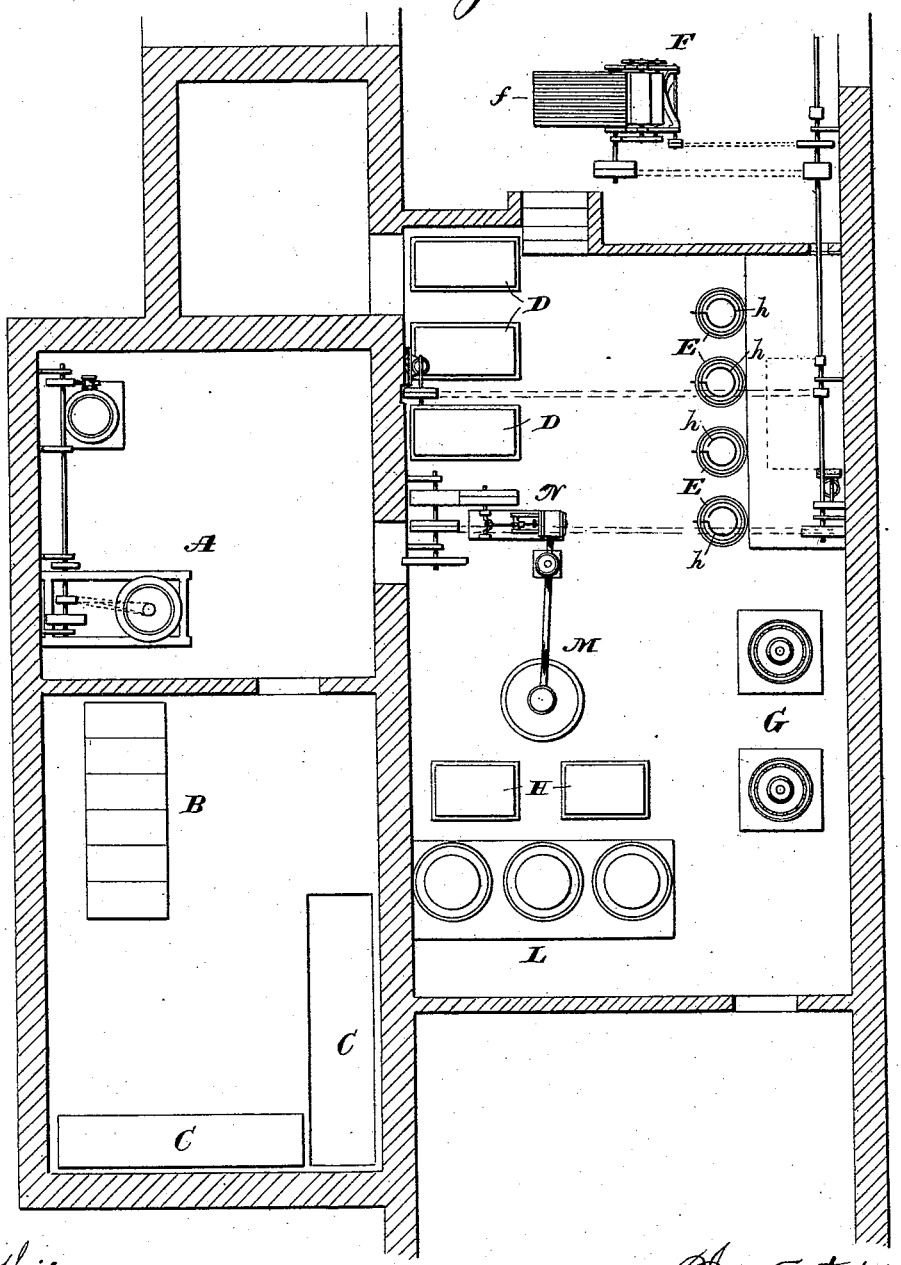
(No Model.) 3 Sheets—Sheet 1.

G. MONSELISE.

PROCESS OF EXTRACTING SUGAR FROM SORGHUM.

No. 522,478. Patented July 3, 1894.

Fig. 1.



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No. 522,478. Patented July 3, 1894.

Fig. 2.

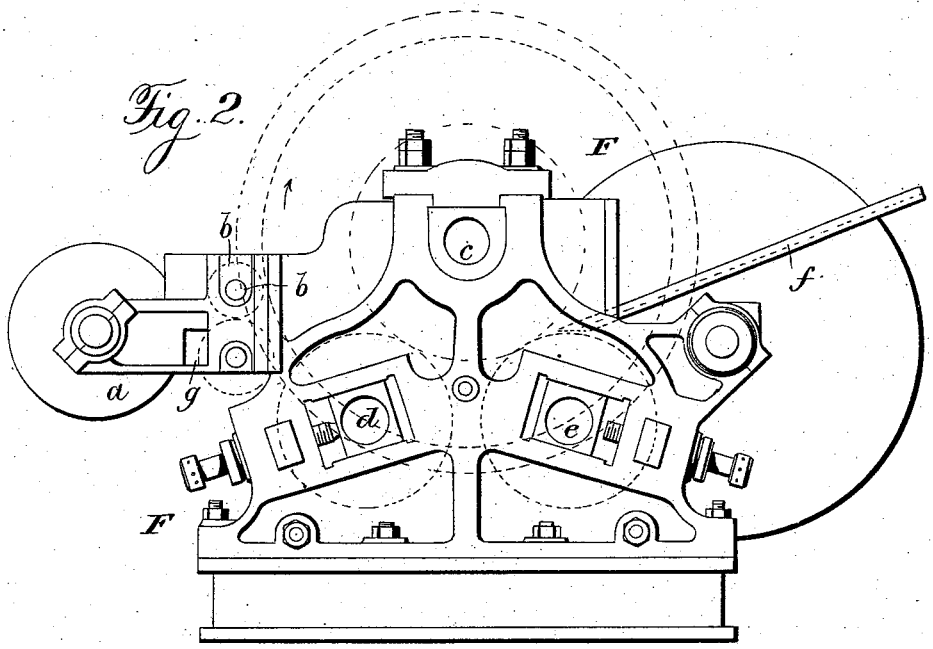
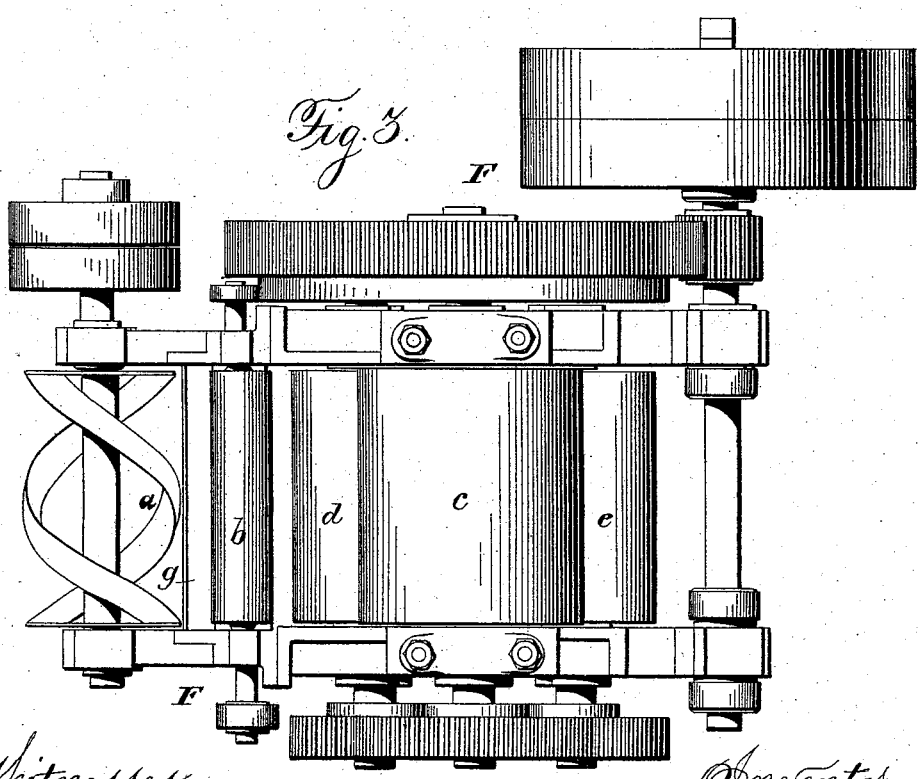


Fig. 3.



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PROCESS OF EXTRACTING SUGAR FROM SORGHUM.

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Fig. 4

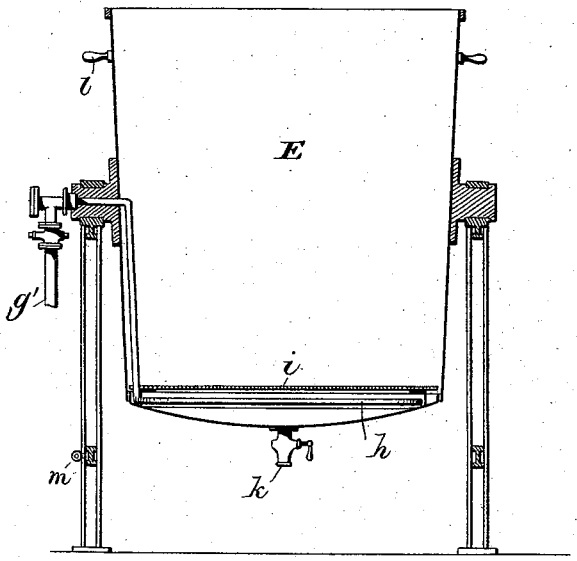
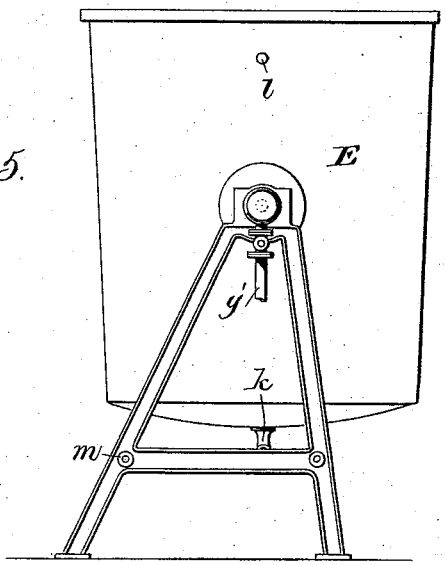


Fig. 5.



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UNITED STATES PATENT OFFICE.

GIULIO MONSELISE, OF MILAN, ITALY.

PROCESS OF EXTRACTING SUGAR FROM SORGHUM.

SPECIFICATION forming part of Letters Patent No. 522,478, dated July 3, 1894.

Application filed July 24, 1889. Serial No. 318,567. (No model.) Patented in Italy August 8, 1885, No. 18,653, and October 31, 1886, No. 20.522, and in France June 25, 1889, No. 199,158.

To all whom it may concern:

Be it known that I, GIULIO MONSELISE, a subject of the King of Italy, residing at Milan, Italy, have invented a new Process for the Extraction of Sugar from Sorghum, (for which I have obtained Letters Patent in Italy, No. 18,653, dated August 8, 1885, and No. 20,522, dated October 31, 1886, and in France, No. 199,158, dated June 25, 1889,) of which the following is a specification.

The object of my invention is to provide an improved process for the manufacture of sugar from sorghum, which I accomplish in the manner and by the means hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1, is a general plan of a complete apparatus adapted for use in carrying my invention into effect. Fig. 2, is a side elevation of the roller press forming part of the apparatus. Fig. 3, is a plan view of the same. Figs. 4 and 5, are detail views illustrating a vertical section and a side elevation respectively of the macerating vats.

The cane to be treated is deprived of its stems and is then subjected to the action of a roller press F, where it is fed down the table *f* and between the cast iron crushing rolls *c*, *d*, *e*. These rolls are adjustable with respect to one another as shown in Fig. 2. The cane after passing between the rolls *c*, *d*, *e*, is carried between the rollers *b*, *b*, one of which is preferably made of wood and the other of cast iron and grooved. It then passes to the bar *g*, having a cutting edge on its front upper portion. In front of the bar *g* and almost in contact with it, a heavy helicoidal knife *a* is caused to rotate so that by the action of the said knife *a* in conjunction with the cutting edge of the bar *g* the crushed canes are reduced to minute pieces. The fragments of cane are next digested with water in the macerating vats E, Figs. 1, 4 and 5, that are arranged to be heated by means of steam. These vats E are made of wrought iron and turn upon pivots as shown in Figs. 4 and 5, to facilitate the discharge of the substances contained in them after the digestion or maceration has been effected. In each vat E one of the rotating pivots is tubular and receives through a stuffing box a copper tube *g'*, which enters the vat and terminates in a coil *h*. Near the bottom of each vat is a false bottom *i* that is perforated, to allow the saccharine liquid to pass through, and below this is a discharging cock *k*. When a vat is to be emptied, its longitudinal axis is kept in a horizontal position by a cord or other flexible tie connecting the handle *l* with the ring *m*. The crushed and comminuted cane fragments discharged from the vats are then squeezed in the presses G to still further extract the moisture. The juices thus obtained, when cooled, are defecated by means of a small proportion of tannin mixed with sufficient lime to render the juices slightly alkaline. This operation is accomplished in defecators D of any suitable construction. I find that a proportion of from .008 to .012 of tannin produces good results, and with the addition of a small quantity of lime completes the defecation. The defecated juices are transferred to heating tanks L where the temperature of the juice is raised to about 95° centigrade or about 203° Fahrenheit. The coagulable material is thus separated from the liquid, which is allowed to rest for about ten minutes and is then poured into other tanks H from which it is drawn into a vacuum pan M by means of a pump N. While the liquid is in the tanks H a small proportion of salicylic acid (about .005 to .008) is added thereto for the purpose of decolorizing the liquid. The proportion of salicylic acid employed should not be sufficient to saturate the lime, and after its addition the juice should still show an alkaline reaction. The salicylic acid is transformed into salicylate of lime, and hence no free salicylic acid is present in the saccharine liquid, and no antisceptic action is exerted by it, its only function being that of a decolorizing agent. By this method of defecating the juice, by means of tannin and lime, and decolorizing by means of salicylic acid, the usual necessity of precipitating the excess of lime with carbonic acid, and decolorizing with bone-black, is avoided. The small excess of lime present in the liquid combines with the salicylic acid as salicylate of lime; or the excess of lime may be eliminated by the use of carbonic acid or in any other well known manner. By this process, also, transparent

liquids can be obtained directly without resorting to the employment of filter presses, as usually required.

In the vacuum pan M boiling is carried to the point of incipient granulation. The boiling mass is then conducted into steam heated sheet iron receptacles B where crystallization is effected after which, by means of hydro-extractors A, a solid and granular sugar is obtained.

In the apparatus illustrated tanks C are provided for collecting the molasses.

Having thus described my invention, what I claim is—

The herein described process of extracting sugar from sorghum, which consists in reducing the cane to small pieces, subjecting the fragments to maceration under the action of steam, pressing the fragments to extract the saccharine juices, defecating the juices by means of tannin and lime in small proportions to render the juices slightly alkaline, then heating the defecated juice to about 203° Fahrenheit, then decolorizing the liquid by the addition of a small proportion of salicylic acid, and subsequently evaporating the liquid to the point of crystallization, substantially as described.

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

GIULIO MONSELISE.

Witnesses:

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GIOVANNI BATTISTA FALIVA.