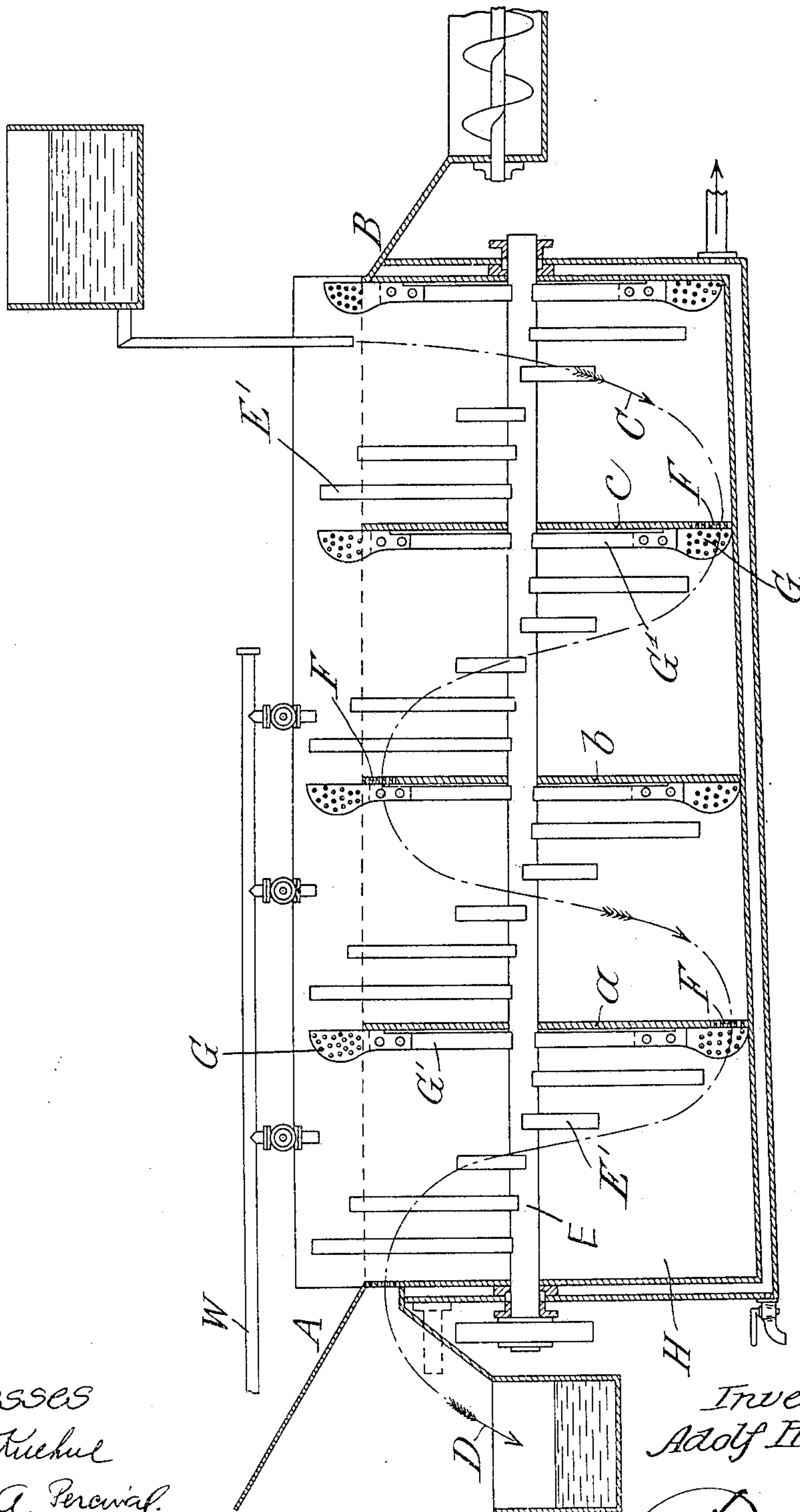


No. 793,133.

PATENTED JUNE 27, 1905.

A. HINZE.
LIXIVIATING APPARATUS.
APPLICATION FILED MAR. 17, 1905.



Witnesses
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UNITED STATES PATENT OFFICE.

ADOLF HINZE, OF ROSITZ, GERMANY.

LIXIVIATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 793,133, dated June 27, 1905.

Application filed March 17, 1905. Serial No. 250,664.

To all whom it may concern:

Be it known that I, ADOLF HINZE, a subject of the King of Prussia, German Emperor, and a resident of Rositz, Saxe-Altenburg, Germany, have invented new and useful Improvements in Lixiviating and Washing Apparatus, of which the following is a specification.

My invention relates to a continuous-action counter-current washing and lixiviating apparatus for sugar and other substances.

In order to produce commercial white sugar or to refine raw sugar to a high degree, the usual practice is to separate the syrup, as far as possible, from the raw green sugar or the washed raw sugar in a centrifugal machine and then to wash again with steam or water or with a purer or wholly pure liquor of sugar. In washing with steam or water part of the sugar is again dissolved, whereby the quantity of pure sugar obtained from the green sugar is reduced. If, on the other hand, a pure sugar liquor or solution is used, a considerable quantity of sugar must be dissolved to produce it, and this is rendered of but small value owing to its absorbing or taking up the non-sugary matters. To overcome this drawback as far as possible, a preliminary washing has been introduced—that is to say, for the purification a more or less impure solution or liquor of sugar is taken and subsequently a thoroughly pure one. For the preliminary treatment the run-off syrup obtained in cleansing with pure, “clear,” or fine liquor is employed. On this method there are three runnings, which renders the procedure troublesome and uncertain. The most advantageous plan is obviously to employ a single running of little relative value. With this object in view various processes have of late been introduced. In such processes several vessels are combined to form a battery. They can be so arranged that the syrup of the preceding stage always passes to the sugar mass of the next. Since the water-syrup penetrates the mass very slowly, it is sucked through by vacuum. Certain other apparatus for washing and

lixiviating have also been designed, by means of which it is proposed to effect purification on the counter-current principle in a single apparatus. In such apparatus the material is run in at one end and by means of a suitable conveying device (usually of the spiral or screw type) is caused to travel through the apparatus while the washing liquor flows in a contrary direction. One of such apparatus consists of a pipe containing a screw conveyer, the spirals of which are made of fine sieves. The sugar mass to be purified is to be caused to flow through the washing liquor in counter direction. This, however, would appear to be impossible, since the washing liquor (concentrated sugar liquor) after passing through a sieve can, by reason of its viscosity, at most mix with the mass and thereupon be carried back by the latter. If, however, in such apparatus the sugar were washed with water, (which as specifically light liquid would seem to be the only one which can come into serious consideration,) so much sugar would be dissolved that the process would not be practically applicable for purifying sugar. In another prior apparatus, which consists of a single compartment, the sugar, in order that it may be mixed, is conveyed from one end to the other by means of spirally-disposed agitators. The purpose of this apparatus is to effect uniform mixing, whereby, however, purification is rendered impossible.

The subject of my invention is a washing apparatus which is free from the defects above described and which effects purification of the sugar in the simplest manner possible.

The invention is illustrated in the drawing, in which the figure is a vertical section of the apparatus.

The apparatus consists of a tank H, having a double wall to admit of steam-heating and divided into compartments by partitions *a b c*. The number of such partitions depends upon the special conditions of each particular case.

In the tank is mounted an agitating or stirring device consisting of a horizontal

shaft E, with radial arms E' disposed in spiral manner. The purpose of this device is to cause intimate mingling of the mass entering at A with the wash liquor and to convey it from A to B. The mass is raised above the partitions *a b c* by scoops G, removably secured to arms G', projecting from the shaft E. These scoops G are perforated, so that the washing liquor may be left behind. This liquor must be a more or less concentrated sugar solution of a high degree of purity and must flow in the direction of the arrows C D counter to the mass. In order that this flow may not take place merely at the surface, the wash liquor with the aid of a suitable fall should pass through perforations or sieves F, located alternately at the top and bottom of the partitions *a b c*.

Should the wash liquor, owing to its taking up the non-sugary matters, become specifically too heavy and too viscous, it can be diluted or thinned, for which purpose a pipe W is provided.

It is obvious that this washing apparatus can likewise be employed for purifying and lixiviating any other substances the conditions of which are similar to those of sugar.

Having thus described my invention, I claim as new—

1. A counter-current washing and lixiviating apparatus, comprising a tank, partitions dividing the same into compartments, said partitions being perforated alternately the one above, the succeeding one below, a spiral conveyer mounted in the tank, and perforated scoops mounted radially on the conveyer, substantially as described.

2. A counter-current washing and lixiviating apparatus, comprising a steam-jacketed tank, partitions dividing the same into compartments, said partitions being perforated alternately the one above, the succeeding one below, a horizontal shaft mounted in the tank and having spirally-disposed radial arms, and perforated scoops mounted radially on the said shaft, substantially as described.

In witness whereof I have hereunto signed my name, this 3d day of March, 1905, in the presence of two subscribing witnesses.

ADOLF HINZE.

Witnesses:

HENRY HASFER,
WOLDEMAR HAUPT.