C. D. VAN RAALTEN.

PRESS IN PARTICULAR FOR SUGAR CANE OR THE LIKE.

APPLICATION FILED DEC. 28, 1918.

1,326,231. Patented Dec. 30, 1919.

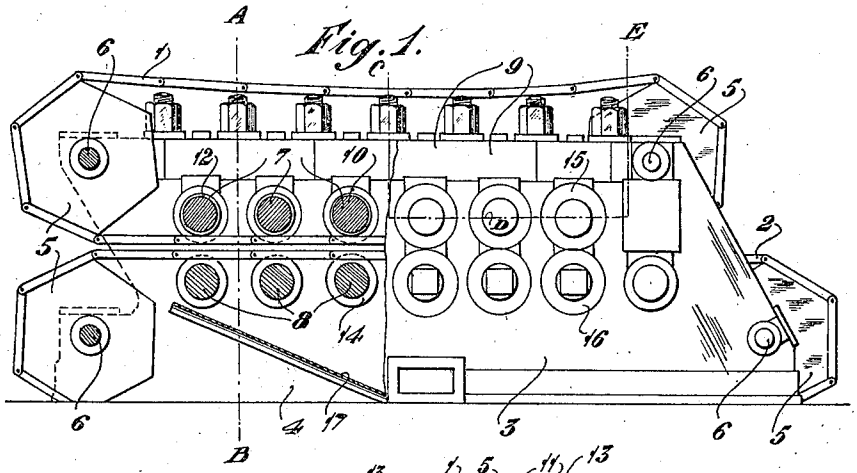


Fig. 1.

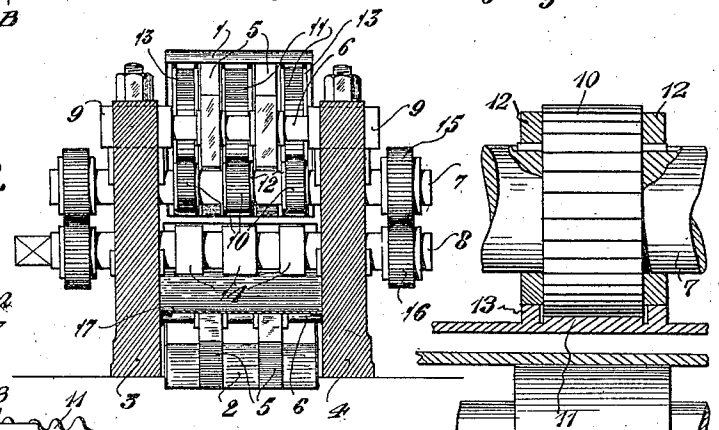


Fig. 2.

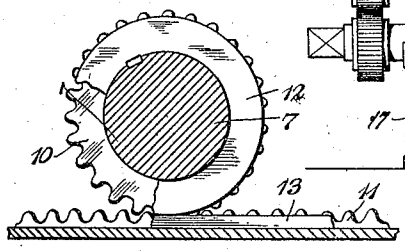


Fig. 4.

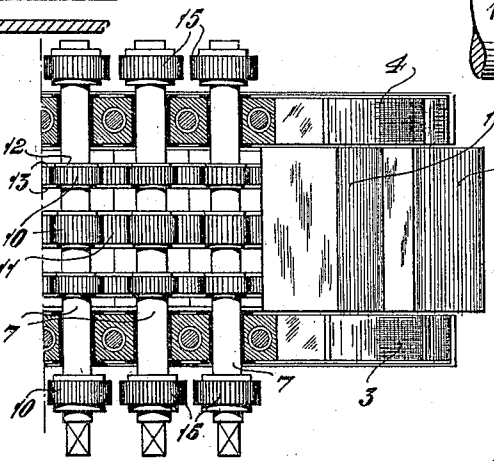


Fig. 3.

Fig. 5.

Inventor.
C. D. van Raalten.
By H. R. Kerslake
Atty.

UNITED STATES PATENT OFFICE.

CORNELIS DAVID VAN RAALTEN, OF GEMPOLKREP, MODJOKERTO, JAVA.

PRESS IN PARTICULAR FOR SUGAR-CANE OR THE LIKE.

1,326,231. Specification of Letters Patent. Patented Dec. 30, 1919.

Application filed December 28, 1918. Serial No. 268,730.

To all whom it may concern:

Be it known that I, CORNELIS DAVID VAN RAALTEN, head engineer, subject of the Queen of The Netherlands, residing at Gempolkrep, Modjokerto, Java, Dutch East Indies, have invented certain new and useful Improvements in Presses in Particular for Sugar-Cane or the like, of which the following is a specification.

This invention relates to improvements in presses especially though not necessarily designed for pressing sugar cane or the like and is of the type comprising a pair of endless chains composed of plates, said chains passing between rollers.

Primarily the invention has for its object to increase the extraction of the juice from the sugar cane or generally of the liquid from liquid containing materials.

Efforts have been made to get rid of the system of roller mills by using presses of the type referred to above. The known presses of this kind however do not allow of the appliance of the exceedingly high pressure which is necessary for the extraction of the juice from sugar cane or the like. Although such a high pressure surely can be attained in the usual roller mills, the latter have the inconvenience of exerting the high pressure only for very short periods of time, varying with periods of less pressure, during which the extracted juice is again partially absorbed. This drawback is being avoided in the presses in which endless chains composed of plates are being used. The points however which according to the invention are regarded as very important and which were neglected in the known presses of this kind are primarily the manner in which the endless chains are driven and secondly the way in which the pressure is applied to the chains. It goes without saying that the usual manner of driving the plates by means of a hexagon, octagon, dodecagon, over which the chain is being passed does not allow of exerting the high pressure required for completely squeezing out the juice from the sugar cane or the like.

According to the invention the pressure can be increased to its maximum without disturbing the continuous working of the press by providing the upper series of plates with toothed racks coöperating with toothed wheels mounted on the shaft of the pressure rollers and having pitch-circles, the diameter of which is equal or almost equal to same of the pressure rollers.

This construction guarantees a perfect transmission of power and enables to work with any available pressure on the material to be treated between the plates.

This and other features of the invention will be more fully described hereinafter with reference to the accompanying drawings, in which—

Figure 1 is partially an elevation, partially a longitudinal section of the press,

Fig. 2 is a cross-section on the line A—B in Fig. 1 and

Fig. 3 is partially a plan view, partially a horizontal section on the line C—D—E of the press as shown in Fig. 1.

Fig. 4 is an enlarged fragmentary longitudinal sectional detail of the roller and rim arrangement for coacting with the gears and rack and,

Fig. 5 is an end elevational detail thereof partly in transverse section.

The pair of endless chains 1 and 2 composed of plates are arranged between a series of standards 3 and 4 and are passed over hexagons 5, arranged in pairs, one above the other, at both ends of the press and mounted on shafts 6, which are suitably supported.

The chains 1 and 2 pass between a plurality of upper and lower shafts 7 and 8, which are supported in bearings formed in the standards 3 and 4. The upper shafts as well as the lower shafts are rotatably mounted.

The upper shafts are also capable of vertical adjustment; the top metals of these shafts are inclosed by steel caps 9 provided with hydraulic pressure means such as for instance hydraulic rams.

The upper shafts are provided with three toothed portions or wheels 10 meshing with toothed racks 11, attached to the plates of the upper chain 1. Pressure rollers 12 at both sides of the toothed portions 10 cooperate with running surfaces or projecting rims 13 at both sides of the toothed racks. The diameter of the pressure rollers is equal or almost equal to the diameter of the pitch circles of the portions and those of the racks

are not exposed to the hydraulic pressure on the upper shafts. The pressure rollers 12 may be shrunk on the shaft.

The lower shafts are provided with enlarged portions 14 forming rollers, which support the plates of the lower endless chain 2.

Independently of the pressure applied to the upper shafts the upper endless chain is driven by means of the upper shafts, which to this end are provided with gear wheels 15 meshing with gear wheels 16 on the lower shafts 8. The latter may be driven in any appropriate manner by a common motor in one or more sets according to the material to be treated.

The plates of the lower endless chain 2 are perforated so that the juice squeezed out from the cane can pass through the perforations into a juice-pan 17, from which it may be drained in any suitable manner.

A most striking advantage of the press according to the invention is the fact that motion is imparted to the endless chains by means of coöperating teeth in such a manner that considerable strains in the plate composed chains are avoided.

This construction furthermore has the advantage of allowing of the application of hydraulic pressure in presses in which endless plate composed chains are employed.

Hitherto this has been impossible owing to the fact that the propulsion of the chains by means of hexagons, octagons or the like is too imperfect and defective for the application of high hydraulic pressure.

In accordance with the art of the material to be treated the number of shafts and rollers and the length of the chains may be varied, so that the time during which the mass is being exposed to a high pressure is shortened or increased.

Having fully described my invention, what I claim and desire to secure by Letters Patent is:

1. In a press having coacting chains and relatively adjustable shafts and provided with coacting racks and toothed wheels respectively mounted on the chains and on the adjustable shafts, the combination therewith, of bearing surfaces arranged on the inner surface of the chain in proximity to the adjustable shafts and positioned on opposite sides of the racks and pressure rollers mounted on the adjustable shafts and positioned on opposite sides of the toothed wheels for engagement with the bearing surface and being of a diameter approximately equal to the pitch diameter of the toothed wheels whereby to prevent grinding action between the wheels and racks when subjected to pressure.

2. In a press of the character described, in combination, supporting standards, upper and lower plate composed chains operating longitudinally between the standards, rotatable transverse shafts arranged above and below the adjacent lower lay of the upper chain and the upper lay of the lower chain, vertical slidable bearings on the standards for receiving the upper shafts, longitudinally extending racks carried by the inner surfaces of the plates of the upper chain, toothed wheels carried by the upper shafts and meshing with the racks, rims arranged on opposite sides of the racks and parallel therewith, pressure rollers carried by the upper shafts on opposite sides of the toothed wheels and bearing on the rims to prevent grinding action between the wheels and racks when subjected to pressure, and rollers carried by the lower shafts.

In testimony whereof I affix my signature.

CORNELIS DAVID VAN RAALTEN.