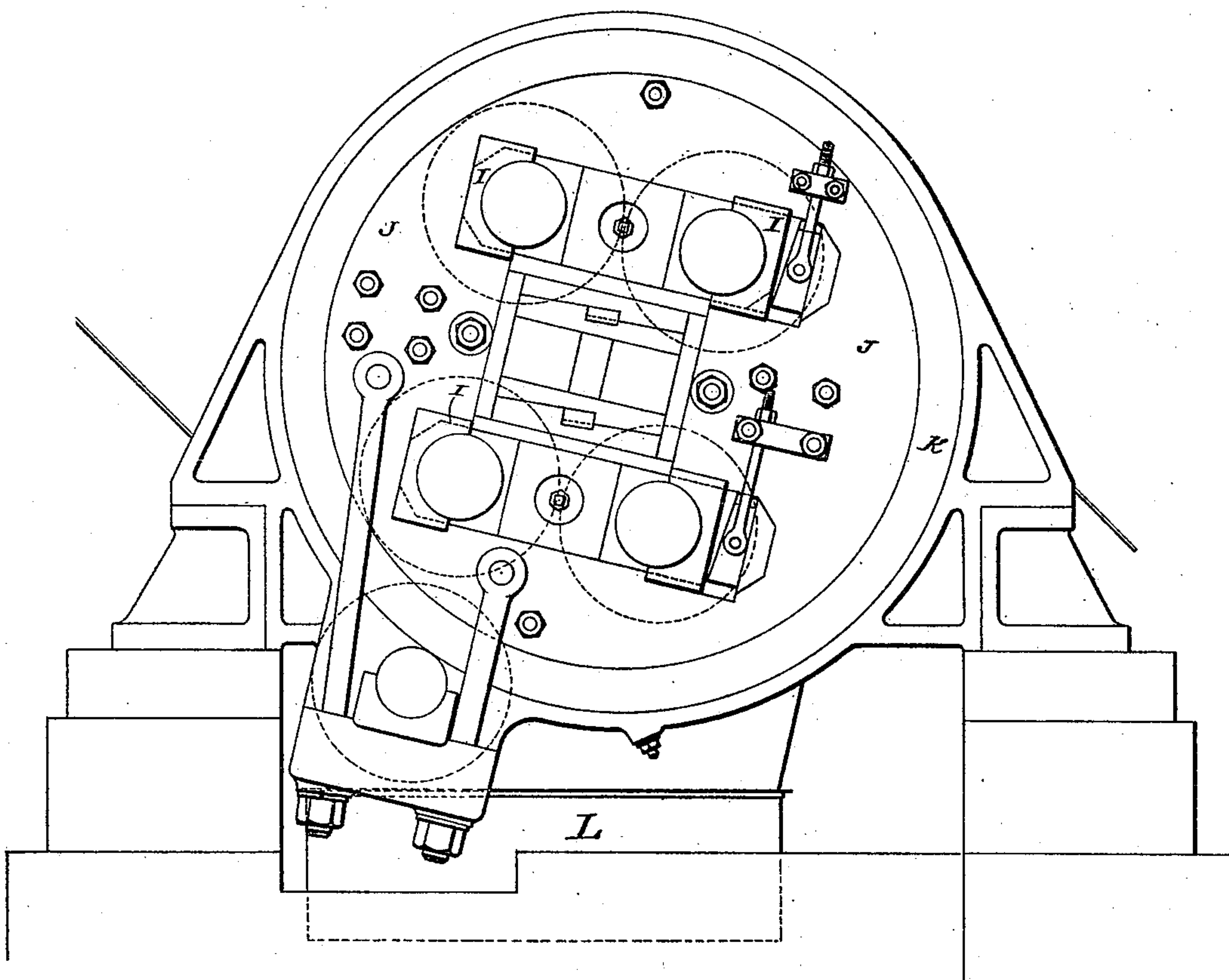


(No Model.)

2 Sheets—Sheet 1.

A. LEBLANC.
METHOD OF EXTRACTING CANE JUICE AND APPARATUS THEREFOR.
No. 459,496. Patented Sept. 15, 1891.

Fig. 1



Witnesses:
R. F. Gaylord
E. Hopkinson

Inventor
Alfred Leblanc
By
Duncan Curtis & Page
Attorneys.

(No Model.)

2 Sheets—Sheet 2.

A. LEBLANC.
METHOD OF EXTRACTING CANE JUICE AND APPARATUS THEREFOR.
No. 459,496. Patented Sept. 15, 1891.

Fig. 2

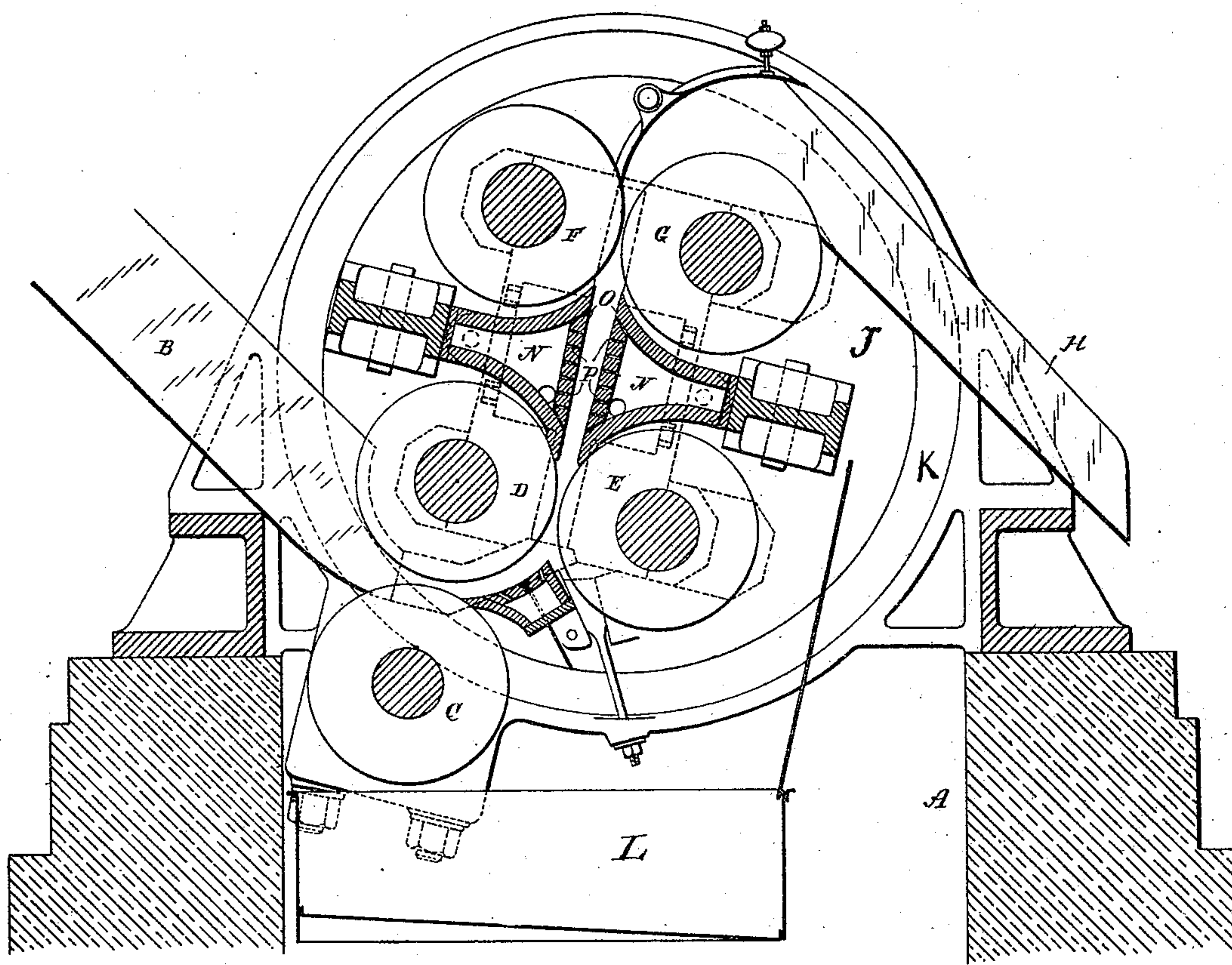
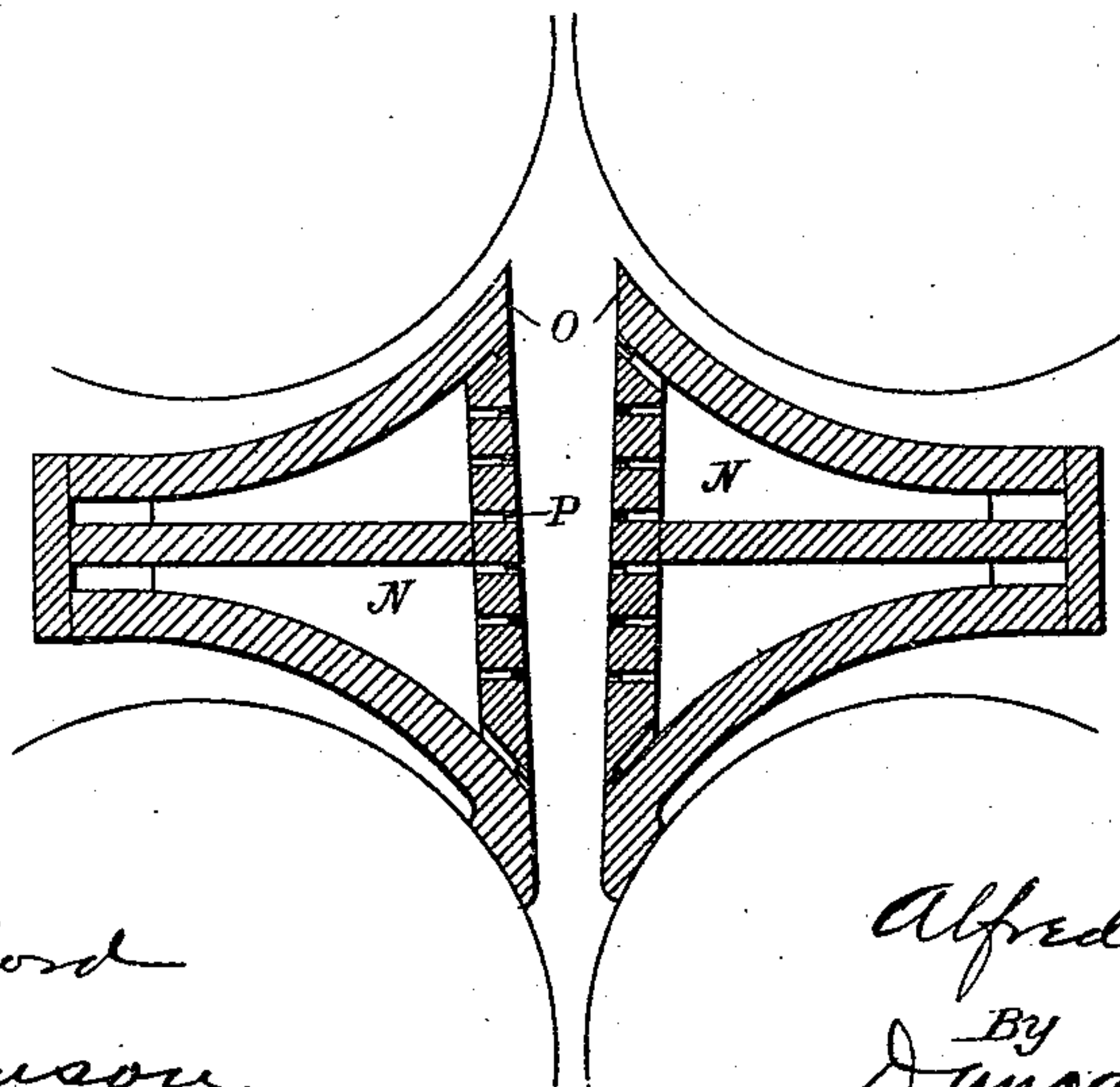


Fig. 3



Witnesses:

R. F. Gaylord
C. Hopkinson

Inventor

Alfred Leblanc

By Duncan Curtis & Page

Attorneys.

UNITED STATES PATENT OFFICE.

ALFREDO LEBLANC, OF HAVANA, CUBA.

METHOD OF EXTRACTING CANE-JUICE AND APPARATUS THEREFOR.

SPECIFICATION forming part of Letters Patent No. 459,496, dated September 15, 1891.

Application filed December 21, 1889. Serial No. 334,510. (No model.)

To all whom it may concern:

Be it known that I, ALFREDO LEBLANC, a citizen of Spain, residing at Havana, Province of Havana, Island of Cuba, have invented a certain new and useful Method of Extracting Sugar-Cane Juice and Apparatus Therefor, of which the following is a description, reference being had to the accompanying drawings.

As is well understood by those skilled in the art of extracting sugar-cane juice, the common methods of crushing and squeezing the cane are all ineffective to make the extraction complete—that is, there is a material quantity of juice left in the bagasse after it has passed through the mill that it would be desirable to secure if economically practical. The difficulties attendant upon complete extraction by the common methods are such, however, that the resultant saving in juice by extending such processes does not economically compare with the cost of securing such gain. For example, the more the bagasse is rolled or compressed and the drier it becomes the greater is the tendency to absorption of the juices by the crushed bagasse, and a point is reached in the ordinary process of expressing when it is no longer economical to expend the power and time requisite to secure the remaining small quantity of juice.

The object of my invention is to submit the cane to a process of treatment by which its juices will be quickly and wholly extracted, or as nearly so as may be desirable, and with an economical expenditure of power and time.

The invention consists, first, in suitably crushing the cane and immediately conducting it to and through a fluid jet or current, which jet is forced into and through the body of bagasse as it leaves the crushing devices, and thereby drives out the cane-juices, and, secondly, it consists of an expressing-mill having feeding-rolls which may also be crushing-rolls, a passage or conduit leading from said feeding-rolls formed by or connected with devices for forcing a current or jet of air, steam, water, or other fluid through the crushed cane or bagasse as it passes along such passage.

Referring to the drawings, Figure 1 repre-

sents the end elevation of a mill adapted to carry out my invention. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a modified detail view of the parts composing what I term the “aspirators”—that is, the parts forming the conduit leading from the feeding or crushing rolls, and which constitute the means for extracting the juices of the cane by fluid-pressure.

The letter A indicates the groundwork of the machine, which may be of masonry or other suitable material.

B is the feeding-chute by which the cane is delivered to the first pair of rolls C D, D E being the second pair of crushing-rolls, F G the third or final pair, and H the discharge-chute. These rolls are adjustably journaled in blocks I, which blocks are supported in proper positions by the cheeks or housings J. The mill-cheeks J are surrounded and held together by the ring or hoop K. This ring or hoop has any suitable means of attachment or connections with the groundwork whereby the mill as a whole is supported. By the use of such a strap or ring the rolls are held firmly together and without depending upon the main supports of the machine, as is usual. The strains set up are equalized and confined to the housings by the rings K. Furthermore, this construction facilitates the erection of the machine, as the rolls may be introduced through the housings and sidewise to the longitudinal center of the machine. I have shown this ring or hoop as circular in outline; but manifestly it may be of other shapes, so long as it is a continuous frame and confines the strains exerted by the rolls.

L is a pan for collecting the juice as it drips from the rolls.

M represents a steam box or injector which is arranged between the rolls C and E, so that a conduit or passage-way is formed for conducting the crushed cane from the first pair of rolls to the second pair. The face of this box over which the bagasse passes is perforated, and the box is connected with a source of steam or some liquid. By these means the bagasse is injected with steam or any liquid and so moistened between the first two pressures, a step that assists in the extraction of the juices, and which is fully explained in

United States Letters Patent No. 304,012, issued to me August 26, 1884.

The method of extracting the cane-juice thus far described and as practiced in the present machine produces the maximum amount of product, or that may be readily obtained by the preliminary pressures; but so far as concerns the preliminary crushing of the cane and the first steps of extracting the juices most readily expressed in their relation to the process of the present invention (which I shall next describe) any method may be employed, though I prefer that here given. It is desirable only to have the cane crushed and the greater amount of the juices removed before the application of the present process, which is for the purpose of removing the final products that by ordinary methods are difficult to obtain.

N represents what I term "aspirators." They are box-like structures properly supported between the second and third pairs of rolls, so as to form a conduit or passage for the bagasse from one pair to the other. The faces O of the boxes are directly opposite each other. The boxes are attached to any proper source of air, steam, or other fluid under pressure or exhaust. Usually steam or air will be used, and a pressure of the fluid will be maintained in one box, while an exhaust or partial vacuum will be maintained in the other box.

In operating these devices a fluid under high pressure is forced through the bagasse, and thereby mechanically drives or carries off the juices. If water or steam be used, the moistening of the bagasse is an advantage, as the moisture absorbed by the bagasse prepares it for a final pressure, if it be preferred to so proceed, as illustrated in the drawings.

In lieu of using fluid-pressure on one side and an exhaust on the other, both aspirators may be caused to exhaust or draw into them the air, and of course with the air the juices of the cane. So, too, the aspirators may be constructed with two chambers in each, as seen in Fig. 3, and one chamber may operate in conjunction or each in conjunction with the chambers of a similarly-constructed oppositely-arranged aspirator, or any two chambers of oppositely-arranged aspirators may be worked alternately with pressure and exhaust. Furthermore, a single aspirator may be alone employed, when obviously it would be worked to draw in air, or on the exhaust

principle; but if it have two chambers they may supplement each other by a direct or alternating action. However the aspirators be operated, it is to be noted that the cane-juice is extracted by causing a fluid jet or current under pressure to pass into and out from the bagasse and while the bagasse is being conducted past the jet after being crushed.

The aspirators may be variously modified in construction and arrangement relatively to the crushing-rolls, and accordingly I do not limit myself to any particular form; but it is essential that the aspirators be located close to the crushing-rolls in order that the bagasse as it issues from the rolls be immediately conducted between the aspirators and through the fluid jet or jets, so that it will be acted upon by the jet before the juices expressed by the rolls can be absorbed by the spongy mass of bagasse fiber.

I am aware that it is not new to use perforated plates or like devices in the bagasse-passages of a cane-mill for the purpose of allowing the juices of the cane to escape or for the purpose of injecting, moistening, or washing the bagasse between pressures or previous to a pressure; also, that it is not new to dissolve the juices of crushed cane by steam under pressure in a closed vessel and preliminarily to the removal of the juices of the crushed cane, and I do not claim any such process or the appliances for practicing the same.

What is claimed as new is—

1. The herein-described process of extracting sugar-cane juices, consisting in crushing the cane and as the crushed cane leaves the crushing devices conducting it to and through a fluid jet or current which is forced into and through the passing body of bagasse to carry off the juices, substantially as and for the purpose set forth.

2. The herein-described mechanism for extracting cane-juice, the same consisting of crushing-rolls and a conduit or passage leading from said rolls formed in part or whole by aspirating devices, whereby a fluid may be forced through the crushed cane to carry off the juices thereof, substantially as herein described.

ALFREDO LEBLANC.

Witnesses:

TORÉ ROBLEDA,
GABRIEL PICHARDO.