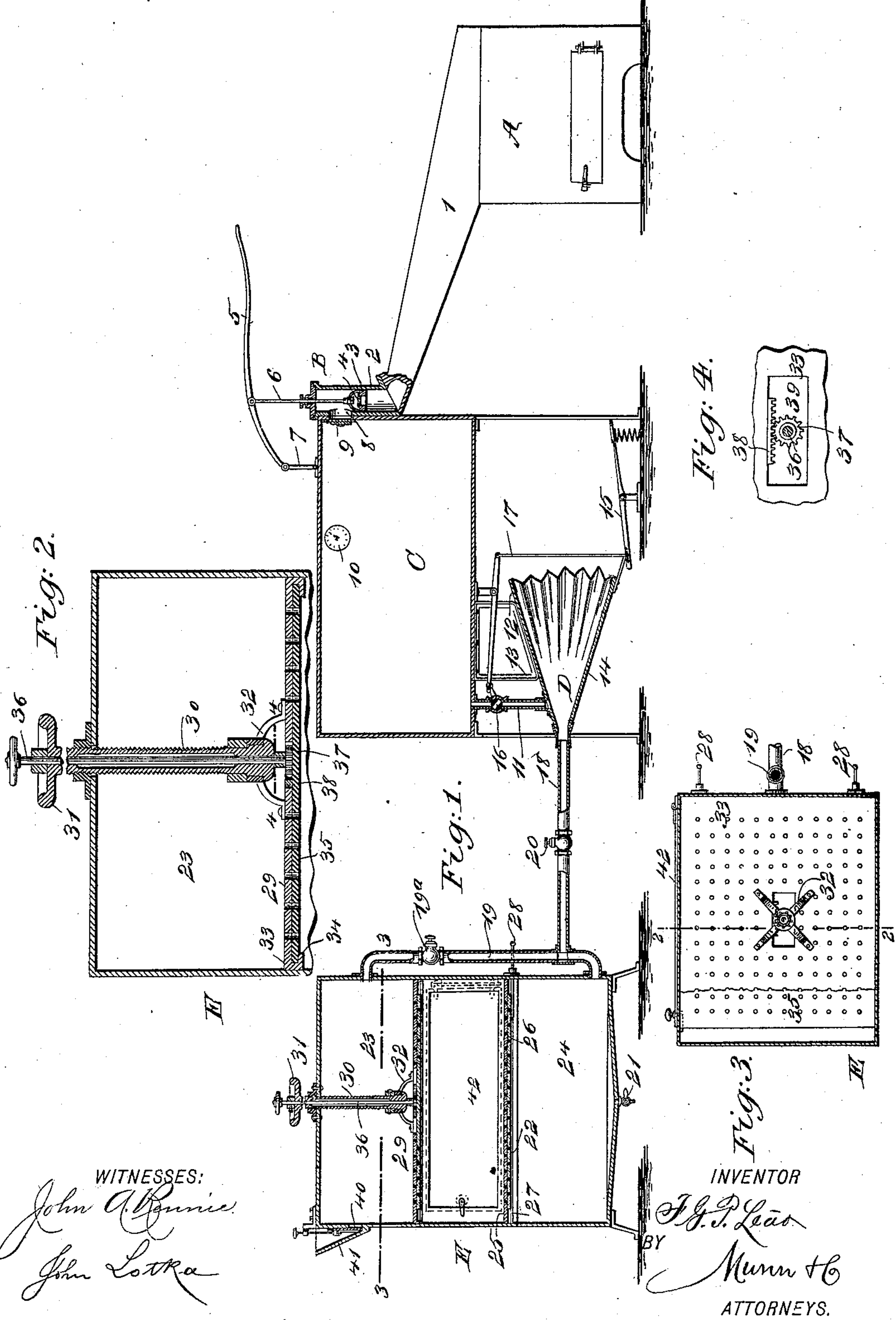


(No Model.)

F. G. P. LEÃO.
APPARATUS FOR TREATING RUBBER.

No. 532,975.

Patented Jan. 22, 1895.



WITNESSES:

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APPARATUS FOR TREATING RUBBER.

SPECIFICATION forming part of Letters Patent No. 532,975, dated January 22, 1895.

Application filed May 11, 1894. Serial No. 510,880. (No model.)

To all whom it may concern:

Be it known that I, FRANCISCO GARCIA PEREIRA LEÃO, a citizen of the Republic of Brazil, at present residing in New York, in the county and State of New York, have invented a new and useful Apparatus for Treating Rubber, of which the following is a full, clear, and exact description.

My invention relates to an apparatus for treating rubber and similar vegetable juices which possess the property of coagulating when acted upon by certain gases, such as carbonic acid gas.

The object of my invention is to provide a simple apparatus that will permit of forcing the gas through the material to be treated, so as to obtain a homogeneous coagulated mass, and to so construct the apparatus as to avoid the loss of gas at the time the material to be treated is introduced into or removed from the apparatus.

Another object of my invention is to prevent the material from being contaminated by foreign matter, as it often is when treated according to the primitive processes which are now employed for coagulating rubber.

To these ends my invention consists of certain features of construction and combinations of parts, that will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, which illustrate an apparatus embodying my improvements, and in which—

Figure 1 is a longitudinal section, and partly a side elevation of the entire apparatus. Fig. 2 is a broken transverse sectional elevation of the upper part of the coagulating chamber, taken on the line 2—2 of Fig. 3, and drawn upon an enlarged scale. Fig. 3 is a horizontal section of the said chamber on line 3—3 of Fig. 1; and Fig. 4 is a broken sectional plan view of a detail on line 4—4 of Fig. 2.

Like letters and numerals refer to like parts throughout the several views.

The apparatus shown in the drawings consists of the following principal parts: a gas producer A; a pump B, connected thereto; a gas holder C communicating with the pump; a bellows D or equivalent device, and a coagulating chamber E adapted to contain the liquid to be treated.

The gas producer A may be of any suitable construction, according to the gas it is intended to employ. As illustrated the gas producer consists of a furnace or retort provided with a stack or cap 1 the upper end of which is connected to the lower end of the pump barrel 2. In the furnace or retort is produced the gas or smoke with which the rubber is to be treated.

The pump B is employed to draw the gas or smoke produced in the furnace into the gas holder C and compress the said gas or smoke.

Various constructions of pumps may be adopted. I have shown a pump provided with an apertured piston 3 having an upwardly opening valve 4 and adapted to be operated by the means of a hand lever 5 connected to the piston rod 6 and also to a support 7 having a pivotal connection with the top of the gas holder C. The pump barrel 2 and the gas holder communicate through the medium of an aperture 8, adapted to be closed by a valve 9 opening into the gas holder. During the up-stroke of the piston 3, the piston valve 4 remains closed and the smoke or gas contained in the barrel 2 is forced through the opening 8 into the gas holder C. When the piston begins to move downward, the pressure within the gas holder closes the valve 9, and the valve 4 opens to admit gas or smoke from the gas producer A into the pump barrel 2. In this manner the gas is compressed at each up-stroke of the pump piston.

The gas holder C may be of any approved construction, and is preferably provided with a pressure gage 10. A pipe 11 leads from the bottom of the gas holder to the bellows D. The latter has a stationary top 12 secured to the gas holder by means of a frame 13, and a movable bottom 14 which is adapted to be operated through the medium of a treadle 15. In order to prevent the gas from passing into the bellows when the pump is worked to compress the gas in the gas holder, I provide a valve or cock 16 in the pipe 11, said valve preferably having an operative connection with the treadle 14 by means of levers 17 or equivalent parts. This connection is so made that during the upward movement of the bottom 14 the valve 16 will be closed, and during the downward movement of the bellows bot-

tom the valve will be open. A pipe 18 is connected to the outlet of the bellows and communicates with another pipe 19 connecting the upper and the lower parts of the coagulating chamber E. The pipe 18 usually is provided with a cock 20, and it will be understood that cocks may be added in the various pipes of the apparatus wherever it may be deemed desirable. I prefer to place a cock 19^a near the upper end of the pipe 19.

The coagulating chamber E is a closed box preferably having an inclined bottom and a discharge cock 21 at the lowest point of the bottom. An essentially horizontal partition 22 divides the coagulating chamber into an upper compartment 23 and a lower compartment 24. The partition 22 consists of an upper stationary perforated plate 25 and a lower perforated plate 26 having sliding movement in guideways 27 and adapted to be shifted through the medium of handles 28 to bring the perforations of the plates 25 and 26 into registry, or out of alignment.

In the upper compartment 23 is adapted to move vertically a piston or plunger 29 tightly engaging the walls of the coagulating chamber. Into the top of the coagulating chamber screws a hollow rod or sleeve 30, provided with a hand wheel 31 or equivalent means whereby it may be turned. The lower end of the screw rod has a loose connection with a spider 32, secured to the plunger, the connection being such that the rod can turn relatively to the spider, but will carry it up or down according to the direction in which the screw rod is rotated. The plunger 29 consists of an upper perforated plate 33 provided with guideways 34 and a lower perforated plate 35 having sliding movement in the said guideways. In order to shift the lower plate so as to cause the perforations thereof to register or to come out of alignment with those of the upper plate, I turn a rod 36 that extends within the sleeve or screw rod 30 and is provided at its lower end with a pinion 37 engaging a rack 38 secured to the lower plate 35 and projecting into an aperture 39 of the upper plate 33. In the upper compartment 23 is arranged an inlet opening adapted to be opened or closed by means of a valve 40, the valve being located at the bottom of a charging funnel 41 secured to the outside of the coagulating chamber. At a slight distance above the partition 22, I provide a door 42 through which the material may be removed.

The operation of the gas producer A, the pump B, the gas holder C, and the bellows D will be obvious without further explanation.

The coagulating chamber E is employed in the following manner: The plunger 29 being in its upper position, above the valve 40 and the upper orifice of the pipe 19, the rubber or other resinous juice is poured into the funnel 41 and allowed to spread on the partition 22, the perforations of the upper plate 25 being closed by bringing the lower plate 26 into the appropriate position. The valve 40 is then

closed, the bellows operated to force gas or smoke into the coagulating chamber, and the lower plate 26 of the partition 22 slid to bring its perforations into registry with those of the upper plate 25. Thus the gas or smoke has access both to the upper and to the lower surface of the rubber or other material. In order to bring the gas or smoke in contact with the inner particles of the material, and thus obtain a homogeneously coagulated mass, the screw rod 30 is turned to lower the plunger 29, the perforations of the plunger plates 33 and 35 being previously brought out of alignment by turning the rod 36. The gas or smoke confined between the plunger and the partition 22 will then be forced through the material. At the same time, the compressed gas will drive the moisture out of the material, the water collecting in the lower compartment 24, whence it may be discharged when desired by means of the cock 21. When the plunger has been brought down almost in contact with the material, the plate 26 is shifted to close the perforations of the upper plate 25, and the material may then be removed through the door 42.

When the pipe 19 is provided with the cock 19^a, this cock is closed before the plunger is lowered, and the valve 40 opened while the plunger travels downward so as to admit air into the upper compartment 23 above the plunger. When the plunger is at the end of its downward stroke, the perforations of the plate 25 of the partition 22 are closed as above described. The door 42 may then be opened without any loss of gas or smoke, and if desired the plunger may be raised, after opening the door, to the position shown in Fig. 1, so as to permit the coagulated material to be more readily removed.

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

1. An apparatus for the purpose described, comprising a gas holder and means for forcing gas into it, a bellows adjacent to the holder, a pipe connecting the bellows with the holder, a valve in the said pipe, means for simultaneously operating the bellows and the valve, and a coagulating chamber connected to the bellows, substantially as described.

2. In an apparatus for the purpose described, a coagulating chamber, adapted for connection with a suitable gas supply, and provided with a perforated plate for supporting the material to be treated, a plunger located in the coagulating chamber and adapted to move toward and from the said supporting plate, the plunger comprising two contiguous perforated plates, one of which is movable in relation to the other, means for moving the plunger relatively to the supporting plate, and means for moving one of the plunger plates to bring its perforations into registry or out of alignment with the perforations of the other plunger plate, substantially as described.

3. In an apparatus for the purpose described, a coagulating chamber provided with a hollow rod screwing into the top of the chamber, a perforated plunger plate secured to the lower end of the said rod, another perforated plunger plate arranged contiguous to the first named plate, and capable of moving relatively thereto to bring the perforations of the said plates into alignment or out of reg-

istry, a rack secured to the said movable plate, a rod extending longitudinally through the hollow screw rod, and a pinion secured to the said rod and engaging the said rack, substantially as described.

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Witnesses:

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