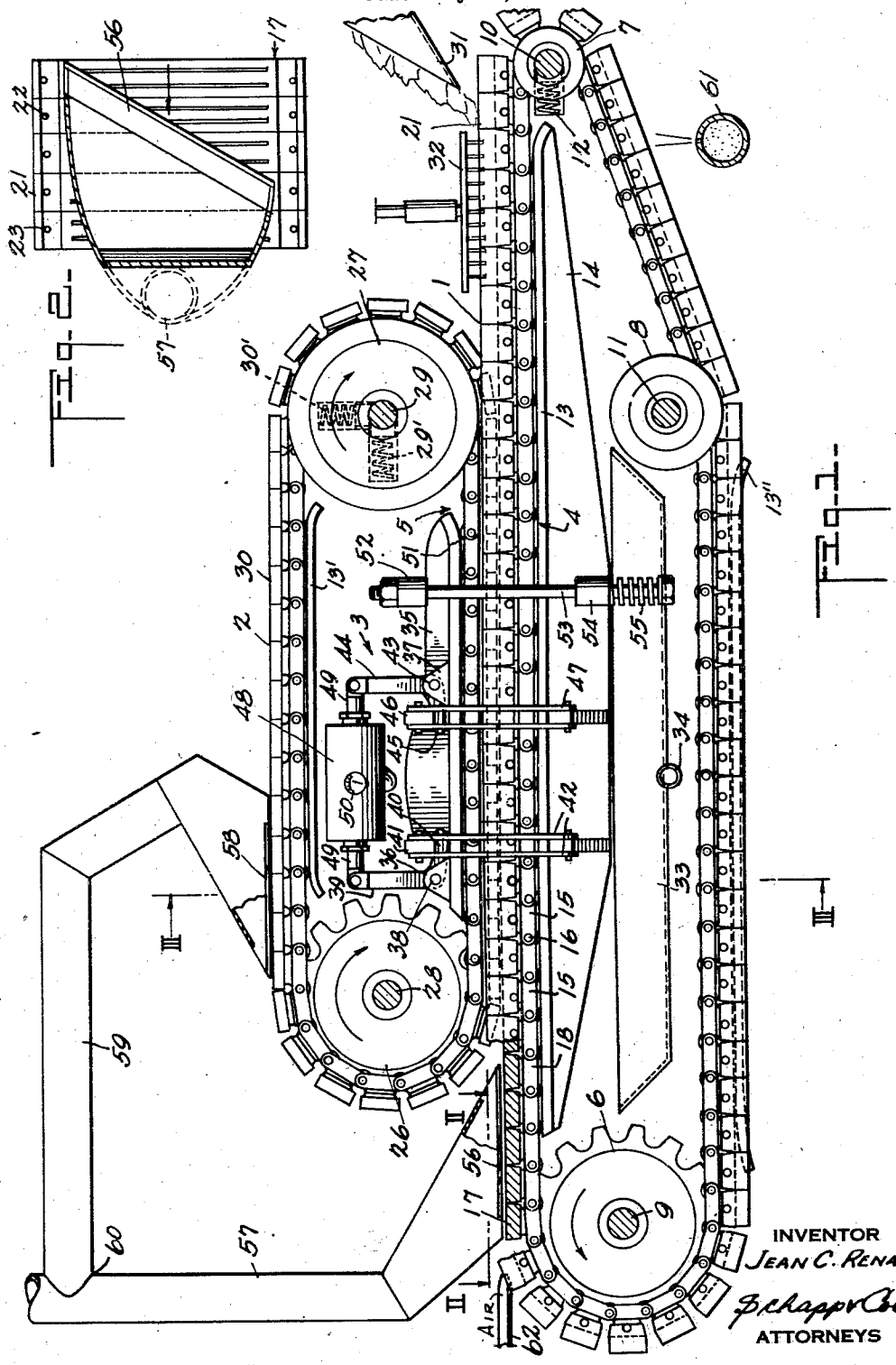
May 5, 1942. J. C. RENAULT 2,281,860

CONTINUOUS FEED AND PRESSURE PRESS

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CONTINUOUS FEED AND PRESSURE PRESS

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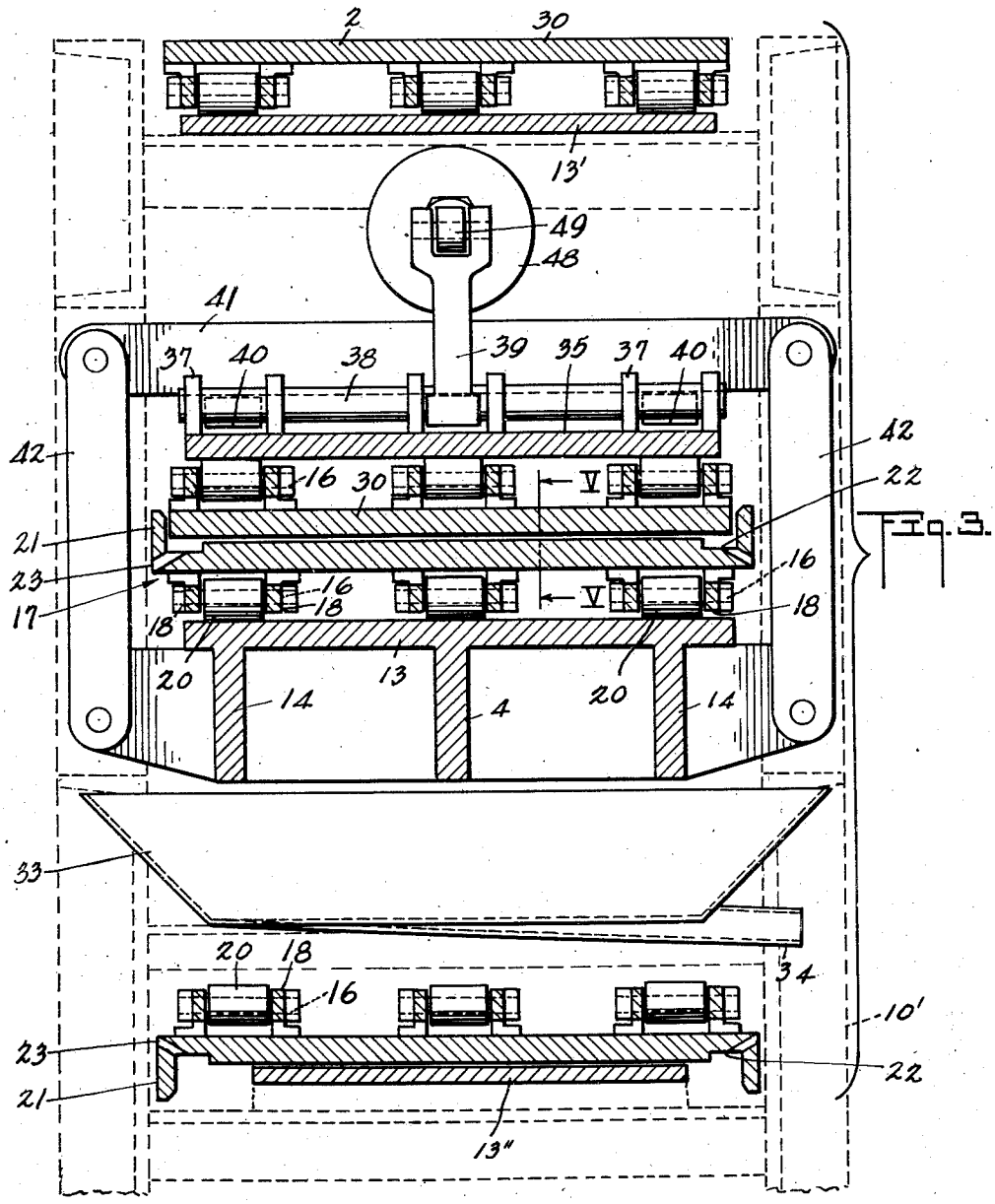


Fig. 3.

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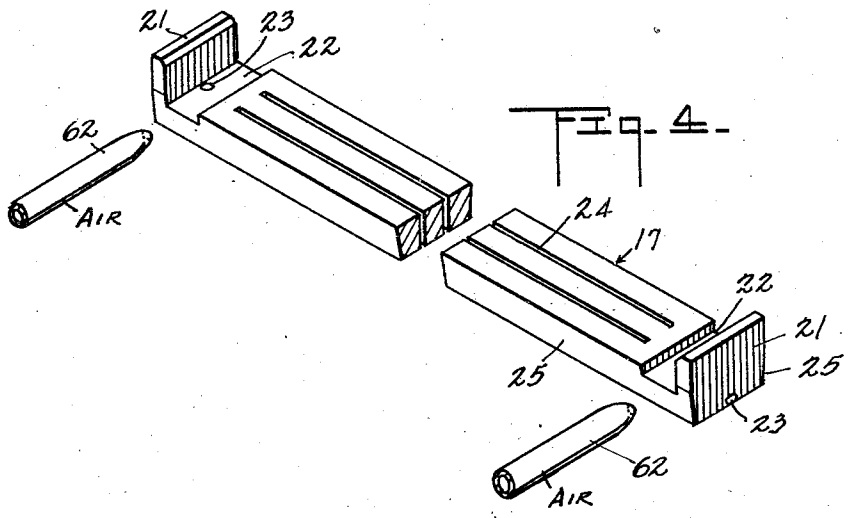


Fig. 4.

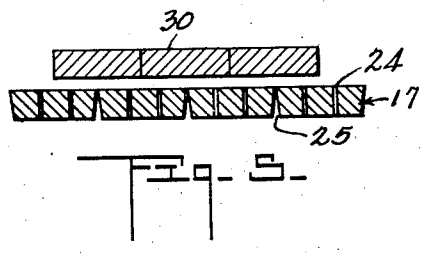


Fig. 5.

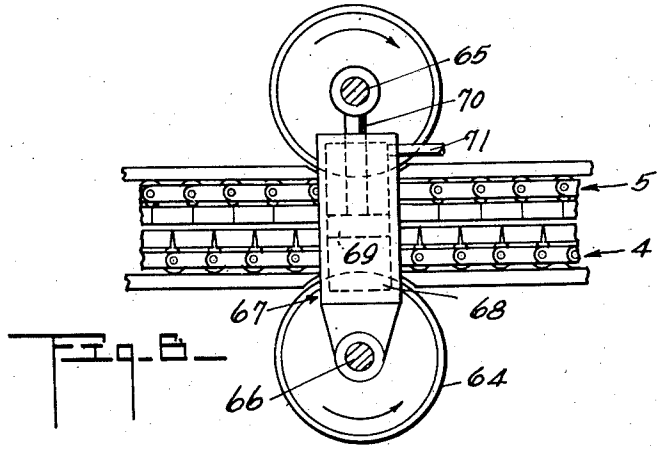


Fig. 6.

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Patented May 5, 1942 2,281,860

UNITED STATES PATENT OFFICE

2,281,860

CONTINUOUS FEED AND PRESSURE PRESS

Jean C. Renault, Salinas, Calif.

Application May 27, 1939, Serial No. 276,205

8 Claims. (Cl. 100—35)

The present invention relates to improvements in a continuous feed and pressure press adapted to compress material for various purposes.

My invention has been particularly developed for the purpose of squeezing natural juices from different kinds of vegetable materials to prepare the solids for drying and further disposal. It has special reference to the treatment of off-fall leaves of lettuce in large growing and packing establishments, where the disposal of the said off-fall has become a serious problem.

My invention is designed to allow these leaves and vegetable matter to be quickly divested of their liquid contents in a continuous process so as to leave a relatively dry pulp, which may be used for feed or burned or otherwise disposed of.

While my invention has been designed for the operation described, it should be understood that its principles may be employed for many other purposes, wherever it may be desired to compress, comminute or crush material, whether vegetable or mineral, in a continuous process and in a most effective manner.

In carrying out my invention it is particularly proposed to utilize a pair of endless conveyors arranged to present reaches running in confronting relation so that the material may be fed between and advanced by the said reaches, while special means are provided for exerting pressure on the reaches for compressing the material passing therebetween.

In this connection it is proposed to provide a compressing means by means of which a great amount of force may be applied, while at the same time, it has sufficient flexibility to allow the pressure medium to adjust itself, to a certain degree at least, to variations in resistance and volume offered by the advancing material.

It is further proposed to provide suitable means for collecting the juices or liquids squeezed from the material.

Further objects and advantages of my invention will appear as the specification proceeds and the novel features thereof will be set forth in the claims hereto attached.

The preferred forms of my invention are illustrated in the accompanying drawings, forming part of this application, in which:

Figure 1 shows a side elevation of the operative parts of my invention, the frame structure being omitted to simplify the disclosure;

Figure 2, a detail section of a pulp remover, taken along line II—II of Figure 1;

Figure 3, a transverse section taken along line III—III of Figure 2;

Figure 4, a perspective view of a conveyor slat used in my invention;

Figure 5, a schematic detail view showing the relative arrangement of the two conveyor reaches as seen from line V—V of Figure 3; and

Figure 6 a detail view, in side elevation, of a fragmentary portion of a modified form of compression means.

While I have shown only the preferred forms of my invention, I wish to have it understood that various changes or modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

Referring to the drawings in detail, my invention comprises in its principal features, two endless chain conveyors 1 and 2 and means indicated at 3 for forcing registering reaches 4 and 5 of the conveyors upon one another for compressing the material interposed therebetween.

The conveyor 1 is preferably mounted in a vertical plane on a set of drive sprockets 6 and two sets of idler sprockets 7 and 8, in such a manner as to present its long upper reach 4 in a horizontal plane.

The shafts 9, 10 and 11 of the sprockets are suitably supported in frame structure parts of which are shown at 10' in Figure 3. The idler shaft 10 is preferably mounted with freedom of adjustability and under spring tension as indicated at 12.

A suitable table 13 with reinforcing ribs 14 supports the upper reach of the conveyor.

The conveyor 1 is made up of a plurality of links 15 hinged together as at 16. Each link comprises a transverse slat 17 having a plurality of sets of brackets 18 projecting inwardly therefrom, the brackets of adjacent links being interconnected by the hinge pins 16 which carry rollers 20 adapted for engagement by the sprockets 9, 10 and 11. These rollers also ride on the table 13 and serve as anti-friction supports for the upper reach of the conveyor.

A detail perspective view of one of the slats (with brackets and rollers omitted) is shown in Figure 4. It comprises an elongated plate extending transversely across the conveyor and may be perfectly flat in its outer face. In its preferred form, however, it is formed with lateral flanges 21 projecting outwardly, grooves 22 adjacent the flanges, ports 23 leading from the grooves underneath the flanges to the outer edges of the slats and slits 24 in the body portion of the slats.

The front and rear edges of the slats are pref-

erably tapered or bevelled as at 25 (see particularly Figure 5), and the width of each slat is such, as compared with the supporting brackets, that throughout the upper reach of the conveyor the slats form a continuous surface, as diagrammatically illustrated in Figure 5, the front and rear edges of adjacent slats being in contact while the bevelled edges form V-shaped, self-cleaning openings preventing the accumulation of matter between the slats.

The flanges 21 and the grooves 22 of the different slats are alined so that in the upper reach there is a continuous flange with a continuous groove forming a discharge gutter.

The conveyor 2 is similarly constructed. It is in the form of an endless conveyor riding over the sprockets 26 and 27, suitably supported on shafts 28 and 29 and this conveyor is mounted over the first conveyor so that its lower reach runs parallel to the upper reach of the first conveyor and in slightly spaced relation thereto.

The upper conveyor is shorter than the lower one and the latter projects at both ends to allow of feeding of the material thereon and removal of the treated material therefrom. The two conveyors are operated so that the two coacting reaches run in the same direction.

The shaft 29 has a spring 29' urging the shaft rearward and a spring 30' allowing the shaft to rise under the influence of material entering between the conveyors.

The links of the upper conveyor are arranged similarly to those of the lower conveyor except that the slats 30 may be plain (the flanges, grooves, slits and bevelled edges of the lower conveyor slats being omitted) and are slightly shorter than the slats of the lower conveyor so that the upper slats fit between the flanges of the lower slats (see Figure 3).

The two conveyors are preferably arranged in such a manner that the slats stagger as shown in Figure 5, a joint of one conveyor being opposite the center of the slat in the other conveyor.

Suitable supporting plates 13' and 13'' may also be arranged for the upper reach of the upper conveyor and the lower reach of the lower conveyor.

In operation the material, such as waste lettuce leaves, is fed on the rear end of the lower conveyor, from a chute 31, is spread over the conveyor by means of a suitable rotary brush 32 and thereupon advances into the space between the coacting reaches of the conveyor chains where the juice is squeezed out of the material and allowed to run off, through the slits 24, the grooves 22, ports 23 and possibly through slight cracks between the slats, into a drip pan 33 having a suitable outlet 34.

To allow of perfect control of the pressure brought to bear on the material passing between the two reaches, I provide the special compression means 3. This means comprises a pressure shoe or plate 35 overlying the lower reach of the upper conveyor and suitable means for urging this pressure shoe toward the table 13 supporting the upper reach of the lower conveyor.

This pressure shoe has an alined series of brackets 36 rising from its heel end and a similar series of brackets 37 rising from an intermediate section thereof. The brackets 36 support a transverse shaft 38 having an arm 39 extending in substantially upward direction and two arms 40 extending rearwardly and underneath a cross-member 41.

The cross-member 41 is supported transversely over the shoe by means of links 42 rising from the table 13 on opposite sides of the conveyors. The bottom portion of the table 13, the cross-members 41 and the links 42 thus form two girdles encircling the table and the shoe, which latter two may be defined as a pair of pressure members. The arms 39 and 40 and the shaft 38 form a bell crank lever engaging under the cross-member 41.

The brackets 37 rising from an intermediate portion of the shoe support a similar bell crank lever including a shaft 43, an upward arm 44 and a forwardly extending arm 45 engaging under a second cross-member 46 supported over the shoe in links 47 rising from the table 13.

The upper ends of the two arms 39 and 44 are interconnected by a suitable, controllable expansion means, here shown as a hydraulic press 48 having two plungers 49 operating the arms and a suitable pressure indicator as shown at 50.

When the pressure in the hydraulic press is increased, the upper ends of the arms 39 and 44 are forced apart, with the result that the shafts 38 and 43 are forced downward, increasing the pressure of the shoe upon the lower reach of the upper conveyor.

It will be noted that this application of pressure is flexible in the sense that the shoe is allowed a certain amount of oscillating movement in response to variations in resistance offered by the passing material. It is also allowed to adjust itself to a slight angularity so as to have a wedge action causing the material to thin out as it advances between the conveyor reaches so that the squeezing action may continue throughout the length of the shoe.

The pressure means thus far described bears down on the heel of the shoe and a central portion of the same, thus allowing the toe portion, which has a slight upward bend as at 51, to rise and to ride more easily over new material coming in. Yielding resistance is offered to such rising movement by a cross-bar 52, opposite ends of which are engaged by bolts 53 straddling the conveyor reaches and passing through lugs 54 projecting from the table 13, springs 55 exerting downward pressure on the bolts.

After the material passes the upper conveyor it is removed from the bottom conveyor by means of a blade 56 (Figure 2) which extends across the conveyor at an angle so that it simultaneously engages a number of slats and is then sucked into a pipe 57 by means of a cyclone collector.

Material adhering to the upper conveyor may be similarly removed by means of a blade 58 for discharge through pipe 59, which joins the former pipe at 60. The final product may be suitably disposed of, as by burning, in which case the heat created may be used for heating the pipes 57 and 59 to further dry the material before burning.

Heat may also be applied to the lower conveyor, as at 61, and streams of air may be directed through the grooves 22 of the slats on the lower conveyor by means of nozzles 62.

The operation of my machine will be readily understood from the foregoing description. The material is fed on the projecting rear end of the lower conveyor from the chute 31, is distributed by means of the brush 32 and then enters between the two coacting reaches of the conveyors. It is then squeezed and pressed while it advances, the squeezing and pressing gradually increasing until finally a very large percentage of the juices

is removed and the material emerges in the form of a thin sheet of pulp. The liquid finds its way to the trough **33**, while the solids are picked up by the blades **56** and **58** for discharge into the cyclone collector.

A modified form of my invention is disclosed and illustrated in Figure 6 in which the pressure is exerted by two coacting drums **63** and **64** mounted above and below the coacting reaches **4** and **5** of the conveyors. The shafts **65** and **66** may be drawn toward one another for increasing the pressure by any suitable means, such as the hydraulic press **67** shown in dotted lines, comprising a cylinder **68** attached to the lower shaft, a piston **69** slidable therein and having a piston rod **70** attached to the other shaft and means **71** for admitting a pressure medium between the piston and the closed end of the cylinder.

I claim:

1. In a continuous feed and pressure press, a pair of endless conveyors arranged to have confronting reaches adapted to advance material therebetween, a pair of plates bearing on opposite sides of said confronting reaches, links projecting from one of the plates, a pair of cross-members supported in the links in spaced relation to the other plate, bell crank levers pivoted on the latter plate, one arm of each of said levers being positioned to bear underneath one of the cross-members, and pressure means disposed between the other arms of said levers and being operative thereon for urging the plates toward one another to compress material between said confronting reaches.

2. In a press, a pair of pressure members adapted to bear on material interposed therebetween for compressing the same, a pair of girdles encircling the pressure members at spaced points, a pair of levers fulcrumed on one of said members and arranged to pry underneath said girdles, and expansion means operative on said levers for forcing the pressure members toward one another.

3. In a press, a pair of pressure members adapted to bear on material interposed therebetween for compressing the same, a pair of girdles encircling the pressure members at spaced points, a pair of levers fulcrumed on one of said members and arranged to pry underneath said girdles, and expansion means carried by said levers and operative thereon for forcing the pressure members toward one another.

4. In a press, a pair of pressure members adapted to bear on material interposed therebetween for compressing the same, a pair of girdles encircling the pressure members at spaced points, a pair of levers fulcrumed on one of said members and arranged to pry underneath said girdles, and an hydraulic motor movably carried by the levers and operative thereon for forcing the pressure members toward one another.

5. In a continuous feed and pressure press, a pair of endless conveyors arranged to have confronting flexible reaches adapted to advance material therebetween, a pair of plates bearing on opposite sides of said confronting reaches, separate means disposed at spaced points for urging the plates toward one another, and common operating means for the latter means operable to permit of rocking movement of one of the plates with respect to the other and about an object passing between the reaches.

6. In a continuous feed and pressure press, a pair of endless conveyors arranged to have confronting flexible reaches adapted to advance material therebetween, a pair of plates bearing on opposite sides of said confronting reaches, separate means disposed at spaced points for urging the plates toward one another, and common operating means for the latter means operable to permit of rocking movement of the plates with respect to one another and about an object passing between the reaches.

7. In a continuous feed and pressure press, a pair of endless conveyors arranged to have confronting flexible reaches adapted to advance material therebetween, a pair of plates bearing on opposite sides of said confronting reaches, separate means disposed at spaced points for urging the plates toward one another, and a movably mounted hydraulic motor operative on both of said means for actuating the same with freedom of rocking motion of one of said plates with respect to the other and about an object passing between the reaches.

8. In a continuous feed and pressure press, a pair of endless conveyors arranged to have confronting flexible reaches adapted to advance material therebetween, a pair of plates bearing on opposite sides of said confronting reaches, separate means disposed at spaced points for urging the plates toward one another, and a movably mounted hydraulic motor operative on both of said means for actuating the same with freedom of rocking motion of both of said plates with respect to one another and about an object passing between the reaches.

JEAN C. RENAULT.