

(No Model.)

V. D. ANDERSON.  
PRESS.

4 Sheets—Sheet 1.

No. 464,600.

Patented Dec. 8, 1891.

Fig. 1.

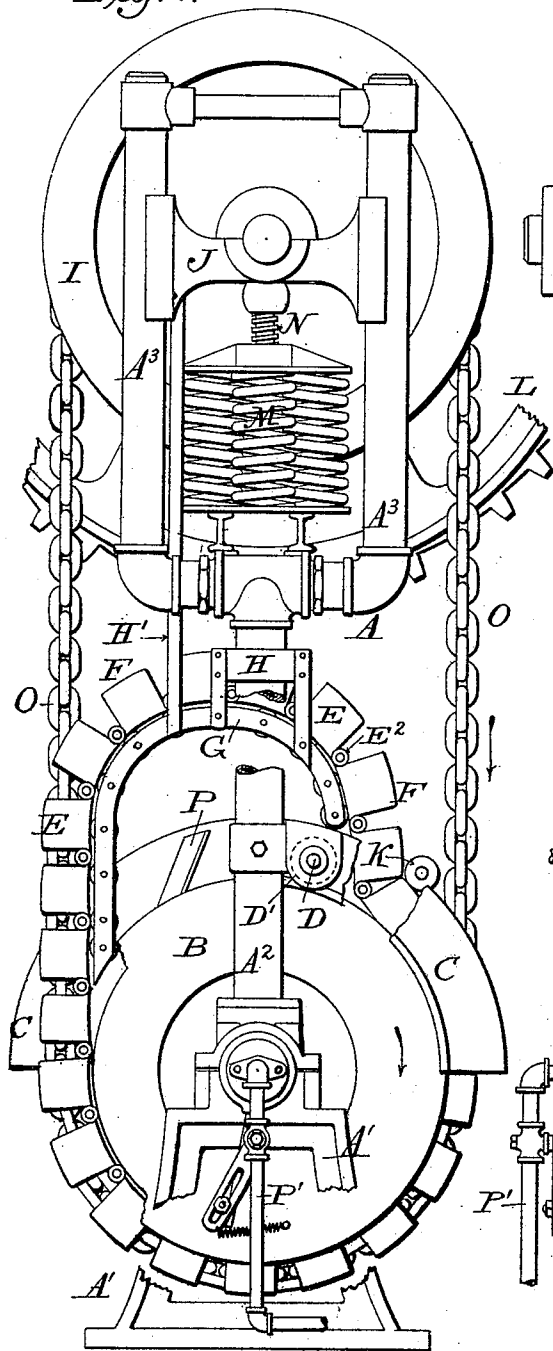
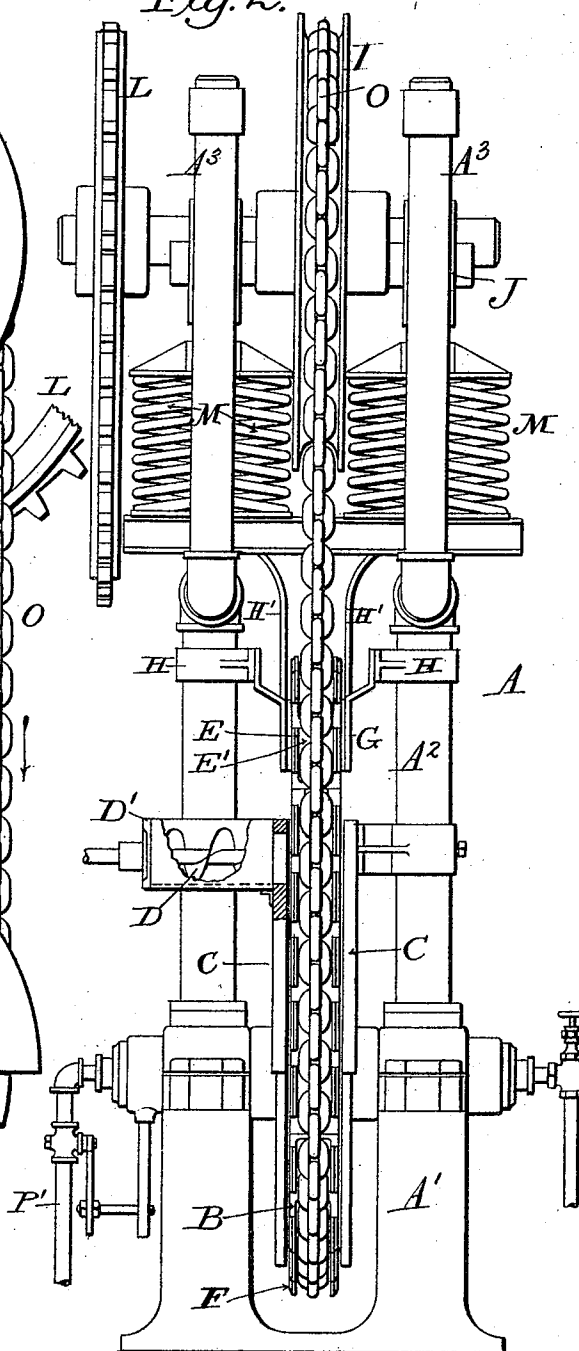


Fig. 2.



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C. B. Pull.

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Att'y.

(No Model.)

4 Sheets—Sheet 2.

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PRESS.

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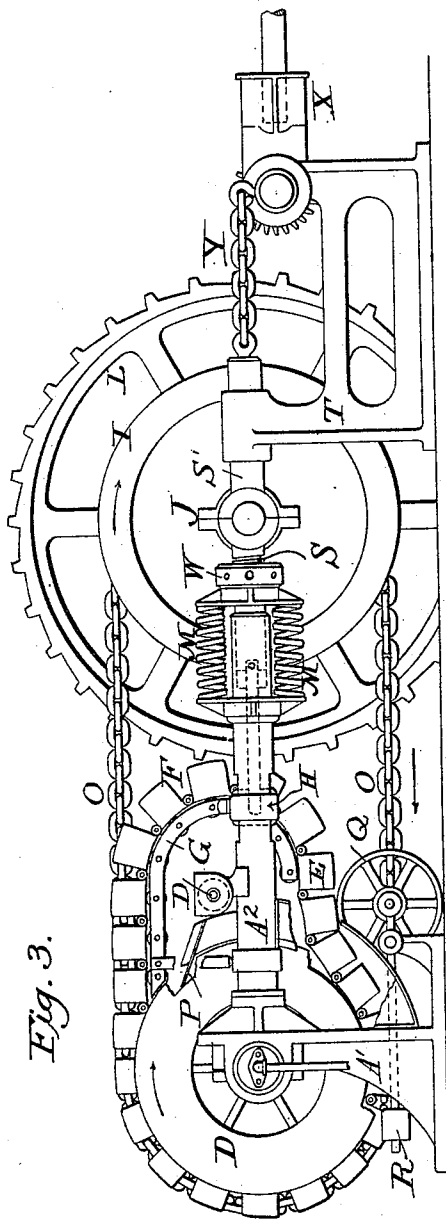


Fig. 3.

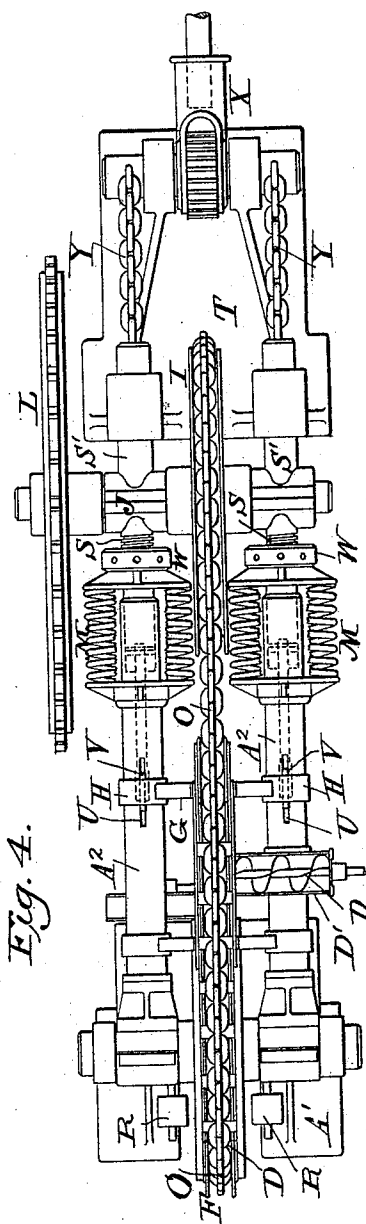


Fig. 4.

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by *Dodger Sons,*  
Attys.



(No Model.)

4 Sheets—Sheet 4.

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Patented Dec. 8, 1891.

Fig. 7.

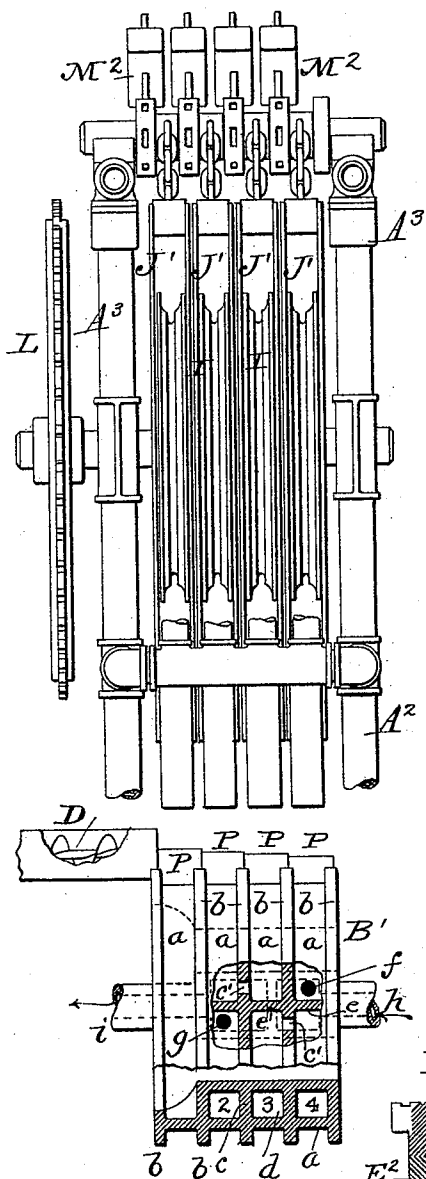


Fig. 8.

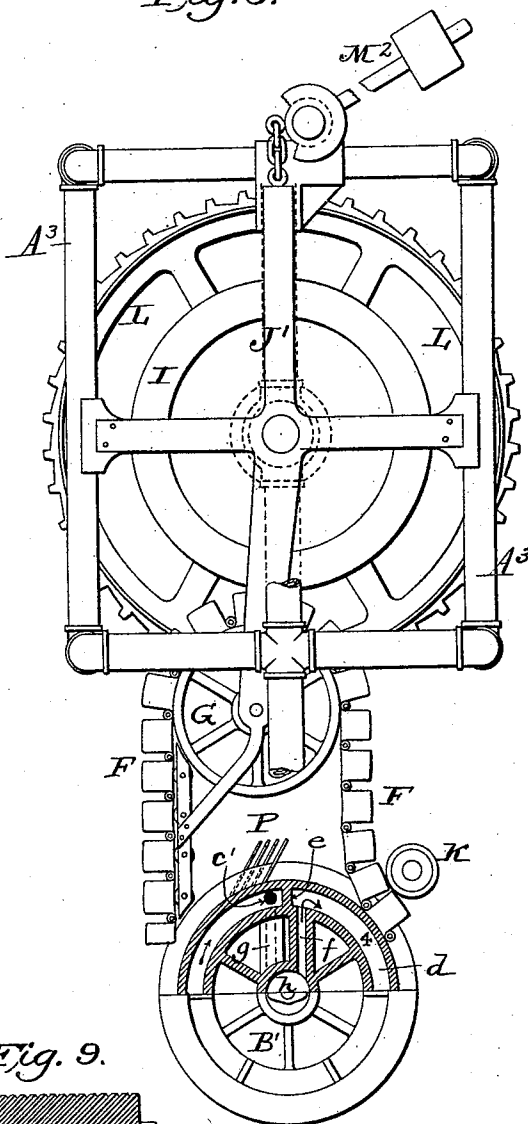


Fig. 9.

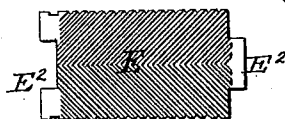
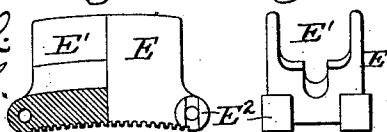


Fig. 10.

Fig. 11.



Witness:

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C. W. Bull.

V. D. ANDERSON,  
Inventor,

by Dodge Lons,  
Att'y.

# UNITED STATES PATENT OFFICE.

VALERIUS D. ANDERSON, OF CLEVELAND, OHIO.

## PRESS.

SPECIFICATION forming part of Letters Patent No. 464,600, dated December 8, 1891.

Application filed July 7, 1891. Serial No. 398,674. (No model.)

*To all whom it may concern:*

Be it known that I, VALERIUS D. ANDERSON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Combined Press and Drier, of which the following is a specification.

My invention relates to machines for either pressing or drying or both pressing and drying substances; and it consists in various features, details, and combinations herein-after fully set forth and claimed.

In the drawings, Figure 1 is a side view of my improved machine with parts broken away; Fig. 2, a front face view of the same; Figs. 3 and 4, respectively side and top plan views of a machine constructed in accordance with my invention and designed to be set horizontally instead of vertically; Figs. 5, 6, 7, and 8, views illustrating various modifications; and Figs. 9, 10, and 11, views illustrating certain details.

A indicates the frame-work of my improved machine, comprising a bed or base A', the columns A<sup>2</sup>, and the yokes A<sup>3</sup>, the columns and yokes being advisably made of tubing, which combines the properties of strength and lightness. Mounted in suitable boxes or bearings on the base is a drum or cylinder B, which is advisably flanged circumferentially, as shown in Figs. 1 and 2, and secured to the frame-work on opposite sides of the drum are guards or guard-plates C, which fit against and (advisably) rest upon the edges of the flanges of the cylinder or drum, the said guards extending about half-way around the drum, as also shown in Figs. 1 and 2.

D indicates a worm or feeding screw or conveyor mounted in a trough or spout D', which latter projects horizontally from the side of one of the guards C at a point almost above the center of the drum and above the drum-flanges, the said guard C being provided with a hole or opening to permit the passage there-through of the material to be dried or pressed. Rotary motion may be imparted to the conveyor D in any suitable manner, or, if desired, the conveyor may be omitted altogether or replaced by any suitable feeding devices.

E E indicate what I term "lags," and which will advisably be connected one with another to form an endless chain F. These lags, which

are shown in detail in Figs. 9, 10, and 11, are curved on their inner faces on the arc of a circle concentric with the periphery of the drum, and are provided on their outer faces with seats or recesses E' for a purpose presently explained. The lags will also under this arrangement be provided with perforated lugs E<sup>2</sup> at their ends to receive connecting-pins. Upon reference to Figs. 9 and 10 it will be noticed that the lags are shown as provided with corrugated, ribbed, or roughened inner faces; but this is not essential.

The endless chain F fits between the flanges of the drum or cylinder, around the lower side of which it passes, as shown in Figs. 1 and 2, the upper portion of the chain passing over a curved support or supporting-frame G, adjustably connected to the columns by collars H. Upon reference to Fig. 1 it will be noted that the descending side of the chain is so arranged as to be what may be termed "slack," and rests upon the periphery of the drum with a force or pressure due only to the weight of its lags. This is secured by placing the center of the frame or support G back of the center of the drum or by arranging a guiding roller or wheel K to bear against the descending side of the chain of lags, in order to cause the lags to touch the cylinder on its top instead of on the descending side. In Fig. 1 I have shown both plans—an arrangement which may advantageously be employed.

The idea of having the lags first touch the drum or cylinder on its top instead of on its side and to bear upon the cylinder or drum only with such force as is due to their own weight comprises one of the most important features of the present invention.

In my experience I have found that if it is attempted to feed the material in between the lags and the cylinder at approximately the point at which pressure is applied the material will back out and cannot be fed properly, and it is for this reason and to overcome this practical difficulty that I make the chain of lags slack on the descending side. Now when material is fed onto the upper face of the drum or cylinder, the slack lags resting upon the material with only their own weight do not act to prevent the material from being fed properly, but, on the other hand, bear only with sufficient force to press

the material against the drum and cause it to move with them and the drum, it not being attempted at this stage to perform any part of the pressing action proper. After the material has thus been properly started on its way between the chain of lags and the periphery of the drum it is subjected to pressure by means now to be described.

I indicates a grooved wheel located directly above the drum or cylinder and carried in boxes or bearings J, adjustable vertically upon and with reference to the yokes of the frame-work. Upon the shaft of this wheel I is secured a large sprocket-wheel L, to which motion may be imparted by a link-belt. If desired, the sprocket-wheel may be omitted and motion imparted to the wheel I in any other suitable manner or to the drum. The boxes or bearings are supported by coiled springs M, mounted in the yokes, the tension of said springs being regulated by the screws N, as shown in Fig. 1.

O indicates a chain, which passes over the wheel I and thence downward around the chain of lags, passing about the under side of the drum. The springs, acting to move the wheel I upward, of course draw the chain O firmly against the outer face of the lags, and thereby subject the material between the cylinder and lags to the required pressure. The pressure given by the chain O is sufficient to cause the cylinder to turn or rotate.

The material which is pressed by the means and in the manner just described is carried around to the upgoing side of the cylinder, and as the two chains leave the cylinder it (the material) is carried forward toward the upper side or top of the drum, where it is intercepted by a plow or scraper P, which extends downward between the flanges of the drum, as shown in Fig. 1. This scraper inclines forwardly at its upper edge, and will also be advisably inclined at an angle to the axis of the drum, so that when the material rides up the face of the scraper it will be thrown laterally over the top of the guard C. This plow or scraper will be supported by the guards or guard-plates C, which latter, by the way, serve to prevent anything from working its way down into the space between the lags and the top of the flanges of the drum.

Should any foreign substances find their way with the material into the space between the lags and drum, no harm will come to the machine, as the springs will yield and slacken the chain O. The chance for such an obstruction injuring the machine is further lessened by reason of the flexibility of the two chains F and O, which will yield at whatever point the obstruction may be encountered.

It will be noticed, upon reference to Fig. 1, that the support or supporting-frame G for the lag-chain F is suspended from the boxes J of wheel I, so that when the said wheel rises and falls the support G will also rise and fall, thereby assuring a like adjustment and regulation of the chains O and F.

When it is desired to dry the material, the drum or cylinder will be adapted to receive steam, hot water, hot oil, or other suitable heating agent, and for this purpose the gudgeons or journals will be made hollow and connected with suitable pipes P', through which in this instance the steam is supplied. If it be desired to have the drying action alone, the springs will be so adjusted as to cause the chains to give only sufficient pressure to cause proper feeding of the material; but, on the other hand, if it is desired to simultaneously dry and press the material the springs will be so adjusted as to cause the chain O to press the material between the lags and cylinder.

The machine described is designed to stand upright, but where from want of room it cannot be so set it may be arranged horizontally, as shown in Figs. 3 and 4. Upon reference to these figures it will be noticed that the machine in its main features resembles that shown in Figs. 1 and 2; but the change in position necessitates certain minor changes in the construction, which will now be pointed out. The worm or feed-conveyer D is arranged so as to deliver the material onto the chain of lags instead of onto the drum, and the chain must in such an arrangement be supported near its point of contact with the drum by a wheel Q, which is advisably mounted in the end of a counter-balanced lever or levers R, as otherwise the chain would fall away from the drum and would not cause the proper feed. The main frame of the machine also differs somewhat, for instead of using two yokes, as previously described, the boxes or bearings J are provided with extensions S S', which fit, respectively, into the columns A<sup>2</sup> and a base-frame T and form a sliding connection therewith. Upon reference to Fig. 4 it will be seen that the columns are slotted, as at U, to receive the upturned end of rods V, attached at one end to the brackets or collars H, and at the other ends to the extensions S or the bearings. Any variation in the position of the shaft of wheel I will be accompanied by a like variation of the rods V, (and the guide G, carried by the brackets H), as the said rods are secured to the extensions S of the shaft-bearings. These extensions S are threaded externally to receive nuts W, by adjusting which the force of the springs may be varied. In lieu of or in addition to these adjusting devices I have shown and may use a windlass X, connected by chains Y with the extensions S' of the bearings. The chain-and-windlass connection serves to move the wheel I away from the drum or cylinder, and consequently draws the chain O tightly and with almost any desired amount of force against that portion of the lag-chain resting upon the drum.

In Fig. 6 I have shown as a substitute for the supporting-frame G a supporting-wheel Z, which may advantageously be employed in certain arrangements, the wheel in such case being so arranged relatively to the drum or

cylinder as to produce the slack in the lag-chain.

Fig. 5 shows also that in lieu of the chain O a belt or rope O' may be employed to press the lag-chain against the drum, the necessary tightening of the chain being effected through or by means a belt-tightener M'.

Instead of employing a traveling chain or band O or O', a fixed pressure device may be used, as illustrated in Fig. 6, comprising a slightly flexible rod, bar, or band O<sup>2</sup>, curved to conform to the drum and supported at its ends by springs or weights, or both. The lags of the lag-chain F would under such an arrangement be provided with wheels or guiding-rollers E<sup>3</sup> to bear upon the flexible or yielding device O<sup>2</sup>.

Where it is desired to increase the working capacity of the machine for drying or pressing or both drying and pressing, it is only necessary to elongate the drum; but, inasmuch as it would be impracticable to have lags extending the full length of the drum, the latter will be made up of a series of sections, each similar to the drum shown in Figs. 1 to 6. In other words, the drum B' (shown partly in section in Figs. 7 and 8) will be provided with a series of peripheral grooves or channels *a*, separated by flanges *b*, a series of the plows or scrapers P being arranged to deliver the material from the first groove into the second, from the second to the third, and so on throughout the length of the drum. This arrangement calls for separate lag-chains F, separate wheels I, and separate chains O, each one of the wheels being mounted in a vertically-moving frame J'. Weights M<sup>2</sup>, connected with these frames J', maintain the requisite tension on the chains O, (which latter, however, are omitted from Figs. 7 and 8.) The drum or cylinder may be made hollow from end to end to allow the heating agent to pass directly through, or it may be made with annular diaphragms or partitions *c*, which form annular chambers *d*, corresponding to the grooves or channels *a* of the drum, as shown in Figs. 7 and 8. These annular chambers *d* are each provided with a transverse wall or partition *e*, and with an inlet on one side of said wall and an outlet on the other side. The inlet *f* of the end chamber (numbered 4) communicates with the supply-pipe *h*, and the outlet *g* of the last chamber at the opposite end (numbered 2) communicates with the discharge-pipe *i*, which is a continuation of the pipe *h*. A diaphragm or partition in the pipe *h i* prevents the heating agent from passing directly through and causes it to pass first into the inlet of chamber 4. After passing around through this annular chamber the heat passes through the lateral opening *c'* into the next chamber 3, and after circulating in this chamber passes through another lateral opening *c'* into the chamber 2, from which it finally passes down the outlet *g* into the pipe *i*. It will be ob-

served that that portion of the cylinder which last receives the material is heated to a higher temperature than is the receiving end of the drum or cylinder. Indeed it will be found advisable to exclude the heat during the first pressing effect, and I therefore do not connect the chamber 1 with the heat-supply. There are two reasons for this. If the receiving end of the cylinder were hot, the gluten in the material would cause it to adhere to the cylinder; but if part of the water is taken out by pressure and the material is then subjected to the action of the warmer sections of the drum this difficulty is avoided. Furthermore, when the material to be heated contains a large percentage of moisture, it becomes merely a waste of heat to attempt to secure any efficient drying action on the receiving end of the cylinder, owing to the loss by condensation.

The repeated pressing of the material and subjecting it to the gradually-increasing heat results in the production of a material perfectly dry and ready for use.

Instead of forming the flanges on the drum or cylinder the latter may be grooved to receive separating-bars, which will act as flanges and be cut away to permit the material to pass from one channel to another, the said bars being affixed rigidly in position.

Having thus described my invention, what I claim is—

1. In a press, the combination, with a drum or cylinder, of a chain of lags passing there-around and adapted to hold the material to be acted upon against the face of the drum, and a pressure device, substantially such as shown and described, for causing the lag-chain to press the underlying material against the drum.

2. The combination, with a drum or cylinder and means for supplying heat thereto, of a chain of lags applied to the cylinder and a device, substantially such as shown and described, serving to press the lags against the cylinder.

3. In a press, the combination, with a drum, of a chain of lags passing about the same and a flexible or yielding device, substantially such as shown and described, serving to press the lags against the drum.

4. In a press, the combination, with a drum, of a chain of lags passing about the same, a pressure-chain, and a wheel for the latter.

5. In a press, the combination, with a drum, of a lag-chain passing about the same, a support therefor, a pressure-chain, and a wheel for the latter.

6. In combination with a drum, a lag-chain passing about the same, a pressure-chain, a wheel therefor mounted in a movable frame, and a support for the lag-chain connected with the movable frame.

7. In a press, the combination, with a drum, of a lag-chain passing about the same, and a pressure device bearing upon the lag-chain

at a point removed from the point of initial contact of the lag-chain and the drum, substantially as and for the purpose set forth.

8. In combination with a drum, a lag-chain passing about the same, a pressure device, and a support G for the lag-chain, having its forward face in rear of the forward face of the drum.

9. In combination with a drum having peripheral flanges, the lag-chain, and pressure device, and the guards C applied to the flanges.

10. In combination with a drum, the lag-chain, and pressure device, and the inclined scraper P, applied to the drum.

11. In combination with a drum, lag-chain, and pressure device, the guard C, trough D', and worm D.

12. In combination with a drum, a lag-chain, and a pressure device passing about the drum, and a wheel adapted to bear against the outer face of the lag-chain, substantially as shown, to hold the same against the drum.

13. In combination with a drum, a chain F, composed of a series of lags E, having recesses E' in their outer faces, and a flexible pressure device.

14. In combination with the main frame, the drum, the lag-chain, the pressure device or chain, a wheel for the latter adapted to rise and fall, and springs sustaining the wheel.

15. In combination with the chains O and F, the drum provided with a series of annular heating-chambers.

16. The drum provided with circumferential grooves and with corresponding heating-chambers, in combination with the chains O and F.

17. In combination with a cylinder having the grooves or channels, scrapers adapted to convey the material from one channel to the next, a series of heating-chambers formed within the drum, a heat-supply entering the discharge end of the drum, the lag-chains, and the pressure-chains.

In witness whereof I hereunto set my hand in the presence of two witnesses.

VALERIUS D. ANDERSON.

Witnesses:

WALTER A. BIDDLE,  
L. T. FISH.