

No. 678,082.

Patented July 9, 1901.

G. S. WITHAM.
PULP STRAINER.

(Application filed Apr. 24, 1901.)

(No Model.)

2 Sheets—Sheet I.

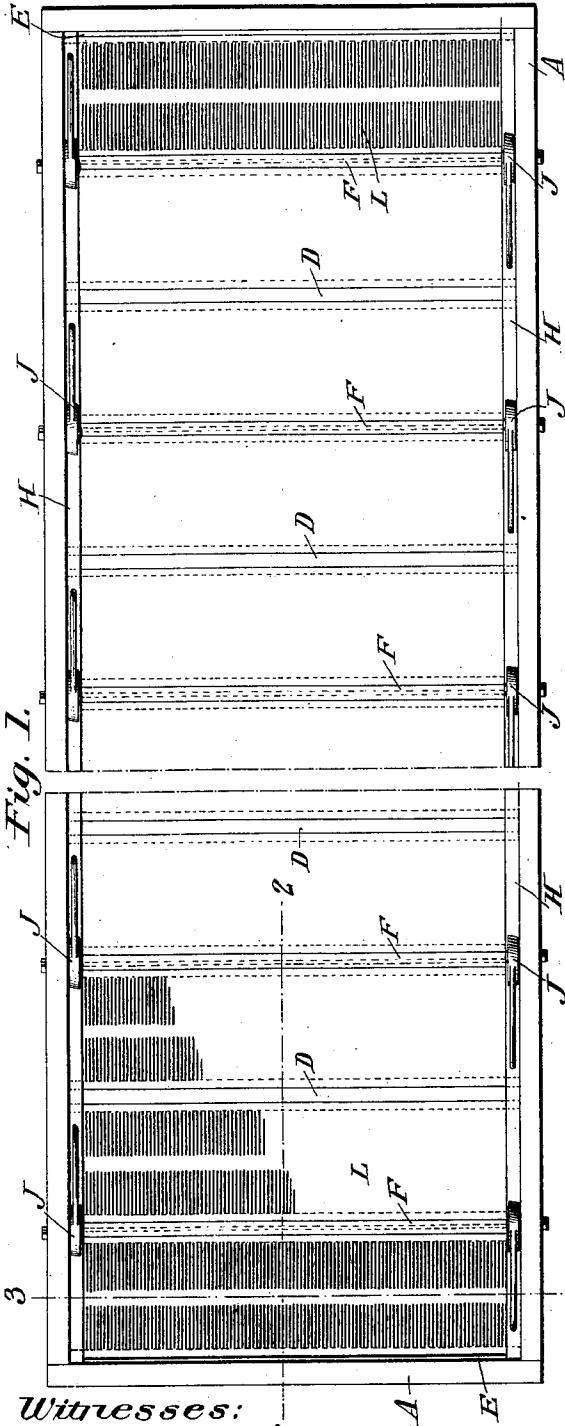
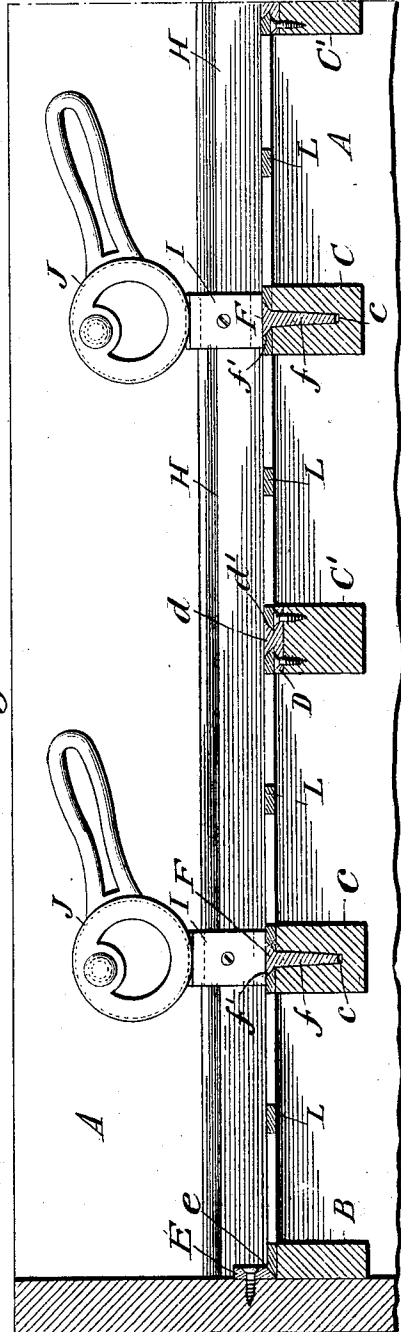


Fig. 1.

Witnesses:
E. A. Buoch
A. M. Parkins

Fig. 2.



Inventor:
 George S. Witham,
 By his Attorneys.

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2 Sheets—Sheet 2.

Fig. 3.

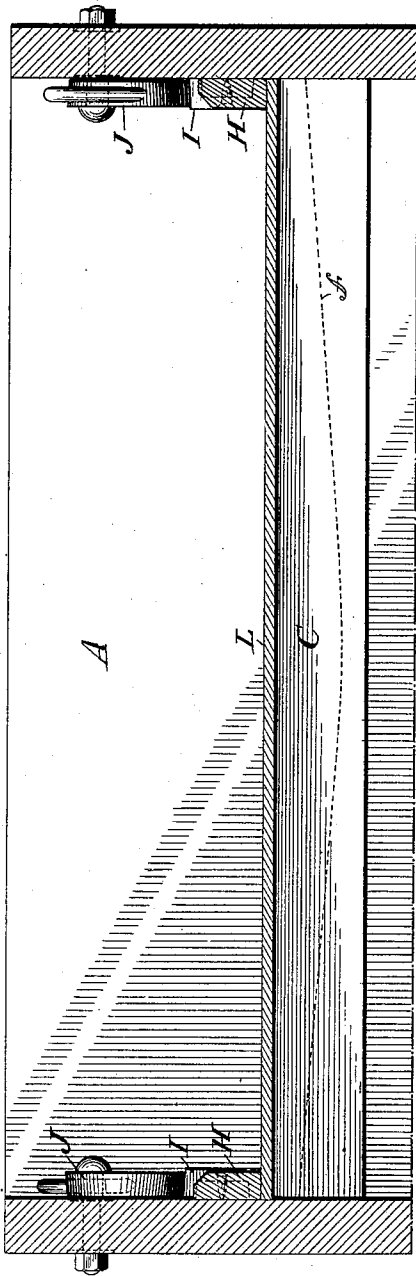


Fig. 4.

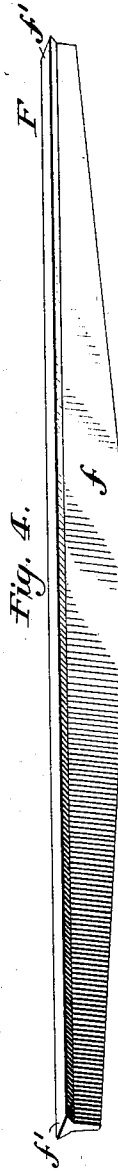


Fig. 5.



Fig. 6.



Fig. 7.



Witnesses:
E. A. Balloch
A. M. Parkins.

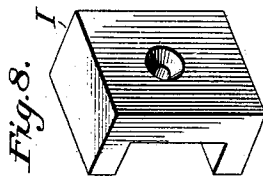


Fig. 8.

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UNITED STATES PATENT OFFICE.

GEORGE S. WITHAM, OF MADISON, MAINE.

PULP-STRAINER.

SPECIFICATION forming part of Letters Patent No. 678,082, dated July 9, 1901.

Application filed April 24, 1901. Serial No. 57,248. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. WITHAM, a citizen of the United States, residing at Madison, in the county of Somerset and State of Maine, have invented certain new and useful Improvements in Pulp-Strainers, of which the following is a specification.

My invention relates to apparatus for straining paper-pulp of the class in which stationary screen-plates are arranged horizontally in a vat. Usually the vats employed in this class of apparatus are of large dimensions, and a number of screen-plates are arranged side by side in the vat and supported on a frame placed horizontally between the top and bottom of the vat to provide a sufficient space above the screen to receive the unstrained pulp and sufficient space below it to receive the liquid and other matter which passes through the screen. It is customary to secure the screen-plates to their supporting-frame by means of screws; but other devices have been suggested to take the place of screws, whereby the plates may be more conveniently secured and removed.

The object of my invention is to provide improved means for securing screen-plates to their supporting-frame, which, while being simple in construction, may be easily operated and will firmly hold the plates in place when in use, but permit of ready removal when desired.

In carrying out my invention I provide screen-plates constructed in the usual way, except that they have no screw-holes, and their opposite edges are beveled or otherwise formed in such manner as to engage clamping and locking devices which are carried by the screen-supporting frame. Above the screen and on opposite sides of the vat I arrange pressure-bars, which are constructed and arranged to bear forcibly upon the clamping devices, so as to cause them to firmly engage the plates and hold them securely. These pressure-bars also preferably bear upon the opposite ends of the plates themselves, and they are operated by cam-levers attached to the sides of the vat.

Further details of the invention are hereinafter more fully described, and the subject-matter deemed novel is set forth in the claims.

In the accompanying drawings, Figure 1 is a top plan view of a pulp-screening apparatus with my improvements applied, the middle portion of the apparatus being removed. Fig. 2 is a view, on an enlarged scale and in local section, on the line 2 2 of Fig. 1. Fig. 3 is a view, on an enlarged scale and in transverse section, on the line 3 3 of Fig. 1. Fig. 4 is a perspective view of one of the clamping-bars. Fig. 5 is a perspective view of a portion of one of the pressure-bars with one of the wearing-blocks mounted on it. Fig. 6 is a perspective view of a portion of one of the locking-bars. Fig. 7 is a view of a portion of one of the locking-bars used at the opposite ends of the series of plates. Fig. 8 is a perspective view of one of the wearing-blocks carried by the pressure-bars.

The vat A may be of any suitable construction. My invention does not involve any material modification of the vat, nor does it relate to any novel means for keeping the plates clear or for promoting the straining of the pulp. Hence I have not shown in the drawings any means for this purpose.

The screen-supporting frame is shown as consisting of end cross-beams B and intermediate cross-beams C C'. Only one of the beams B is shown in the drawings; but it will be understood that both beams may be constructed and arranged in the same way. On each alternate cross-beam C' is secured a locking-bar D, which is formed on its upper side with a locking-rib *d*, having undercut grooves *d'*, that extend from end to end of the bar transversely across the vat. At each end of the vat over each end cross-beam B is secured a locking-bar E, having a beveled lower edge forming a groove *e*, extending transversely across the vat to receive the edge of the adjacent screen-plate.

Each alternate cross-beam C is formed with a recess or groove *c*, extending from end to end of the beam and opening from the top downward, preferably tapering or decreasing in width downwardly. Each of these grooves is adapted to receive a clamping-bar F, the form of which is most clearly shown in Fig. 4. This bar has a body portion *f*, adapted to enter the groove *c*, and a head *f'*, having its opposite sides beveled or undercut, adapting it to engage the beveled plates L. The plates

L, it will be observed, extend transversely across the vat, their opposite beveled edges being transverse to the vat. The perforations or slots in the plates may be formed in any suitable way. It will be noticed that there is a stationary locking-bar D between each two plates in the middle portion of the vat and a movable clamping-bar F between each two plates, the arrangement being such throughout the vat that one edge of each plate may engage a stationary locking-bar, while the other edge engages a movable clamping-bar.

In assembling the plates they are first made to engage the locking-bars and to rest upon the tops of the cross-beams, thus assuming a horizontal position, as shown in Fig. 2. The clamping-bars F are then inserted in the grooves or recesses *c* in the cross-beams C, the beveled edges *f'* of the head of the clamping-bars registering with the beveled edges of the plates. When the parts are thus engaged, longitudinal or lateral movement of the plates is prevented and the plates cannot rise without lifting the clamping-bars F.

It should be stated that the plates L are of approximately the same width as the vat. When the parts are thus arranged, a plane flat smooth upper surface is presented, over which scrapers or other such devices may be conveniently operated. It is necessary for most efficient working to prevent the clamping-bars F from rising, and for this purpose I preferably employ the mechanism shown in the drawings and now to be described.

On opposite sides of the vat I employ a pressure-bar H of the form indicated in Fig. 5. Each of these bars extends from end to end of the vat above the screen-plates, and they are loosely arranged when not held by the locking-levers hereinafter described. The pressure-bars may thus be readily removed or replaced when desired and when the locking-levers are thrown out of operation.

The bars H are preferably cut away at *h* to avoid the opposite ends of the locking-bars E, these bars extending completely across the vat, as indicated in Fig. 1. The bars H are recessed at *h'* to receive wearing-blocks I of the form shown particularly in Figs. 5 and 8. The wearing-blocks are attached to the pressure-bars by screws or other suitable devices, and they preferably extend a short distance above the top of the pressure-bars. Each bar is shown as having wearing-blocks arranged over the several clamping-bars F, and the lower ends or surfaces of the wearing-blocks are preferably arranged in line with the lower surfaces of the bars, so that the bars will bear upon the opposite ends of the screen-plates while the wearing-blocks bear upon the opposite ends of the clamping-bars. However, it may be stated that this precise arrangement is not essential so long as the construction is such as to hold the clamping-bars firmly in position. Above the pressure-bars, and pref-

erably above each wearing-block, is arranged a cam-lever J, pivotally connected with the vat and adapted to bear upon the upper surface of the blocks. The peripheries of the cams are preferably inclined or beveled, as shown particularly in Fig. 3, and the upper surfaces of the blocks are correspondingly inclined, the arrangement being such that when the cams engage the blocks they will tend to force the blocks and the bars on which they are mounted against the sides of the vat, while at the same time forcing them downwardly. This arrangement prevents the bars from springing inwardly out of engagement with the cams.

As before stated, the screen-plates are made to engage the locking-bars and clamping-bars in the manner before described. When this is done, the pressure-bars are placed in position in the vat over the screen-plates, and then the levers J are operated to engage the wearing-blocks and force them and the pressure-bars on which they are mounted downwardly, so as to hold the clamping-bars securely in position. By this means the screen-plates are securely held in position, and when it is desired to remove them they may be quickly withdrawn by simply turning the cam-levers, removing the pressure-bars, and lifting the plates out of engagement with the clamping-bars and the locking-bars. When lifting the screen-plates, the clamping-bars F will rise part way with the plates, but will soon be disengaged therefrom and fall back into position, or the clamping-bars may be removed, if desired, when removing the screen-plates.

I have described the best way now known to me of carrying out my invention; but I wish it understood that I do not limit myself to the precise construction of the several parts shown, as variations can be made in the details of construction of many of the parts without departing from my invention. It is not essential that the screen-plates and the locking-bars and clamping-bars should be beveled precisely in the manner shown so long as they are so formed as to interlock or engage each other to accomplish the same purpose. The means used for pressing down upon the clamping-bars may be varied. So far as the broad features of my invention are concerned, it is only essential that the screen-plates should be provided with means for engaging their opposite edges to hold them in place and that means should be provided for holding the clamping devices firmly in place. It may be stated, however, that the means for engaging the screen-plates and for clamping them onto the supporting-frame should not project above the surface of the screen or into the vat in such manner as to obstruct the operation of scrapers or other devices used in the vat.

I claim as my invention—

1. The combination of a vat provided with a screen-supporting frame, screen-plates ar-

5 ranged on the frame, the locking-bars mounted on the screen-supporting frame, the movable clamping-bars interposed between the locking-bars, arranged transversely across the vat and engaging the edges of the screen-plates, and means for holding the clamping-bars in position.

10 2. The combination of a vat provided with a screen-supporting frame, screen-plates arranged thereon, locking-bars extending transversely across the vat with which the edges of the screen-plates engage, vertically-movable clamping-bars arranged transversely across the vat, and engaging the edges of the screen-plates, pressure-bars operating on the clamping-bars, and means for operating the pressure-bars.

15 3. The combination of a vat provided with a screen-supporting frame, a series of screen-plates supported thereon, a series of locking-bars with which the edges of the plates engage, and a series of clamping-bars arranged alternately with the stationary locking-bars and movable in a direction at right angles to the plane of the plates.

20 4. The combination of a vat, a screen-supporting frame therein, a series of screen-plates mounted thereon, a series of beveled locking-bars engaging the edges of the screen-plates, a series of vertically-movable beveled clamping-bars engaging the screen-plates, and means for holding the clamping-bars in position.

25 5. The combination of a vat, a screen-sup-

porting frame therein, a series of screen-plates 35 mounted thereon, the locking-bars engaging the screen-plates, the vertically-movable clamping-bars also engaging the screen-plates, the pressure-bars and cam-levers operating upon the pressure-bars. 40

6. The combination of a vat, a screen-supporting frame therein, a series of transversely-arranged screen-plates mounted on the frame, the locking-bars engaging the screen-plates, the movable clamping-bars also engaging the screen-plates, and extending transversely across the vat, the pressure-bars engaging the opposite ends of the locking-bars, and the clamping-levers operating upon the pressure-bars. 45 50

7. The combination of a vat, a screen-supporting frame therein, a series of screen-plates mounted on the frame, locking-bars engaging the screen-plates, clamping-bars engaging the screen-plates and extending transversely across the vat, the pressure-bars, the wearing-blocks thereon engaging the opposite ends of the clamping-bars, and having inclined upper surfaces, and clamping-levers having beveled or inclined surfaces engaging the upper surfaces of the wearing-blocks. 55 60

In testimony whereof I have hereunto subscribed my name.

GEORGE S. WITHAM.

Witnesses:

R. G. HENDERSON,
E. R. WALKER.