No. 694,900. Patented Mar. 4, 1902.

S. H. TIBBETTS.

SCREEN FOR PAPER PULP.

(Application filed July 1, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

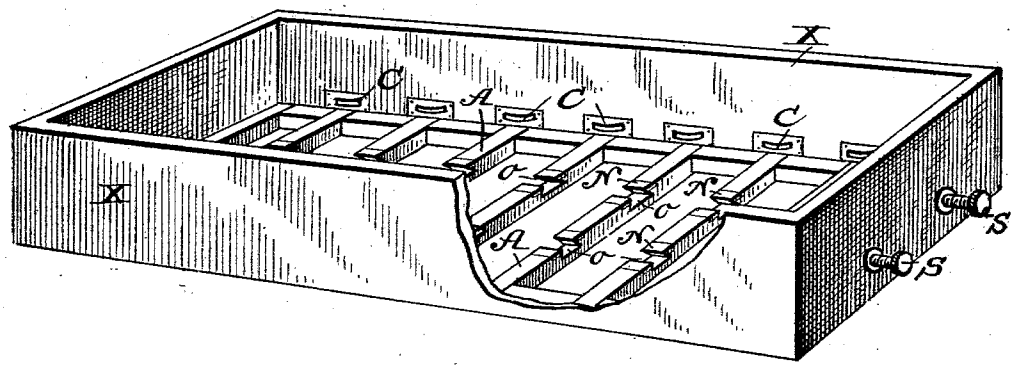


Fig. 2.

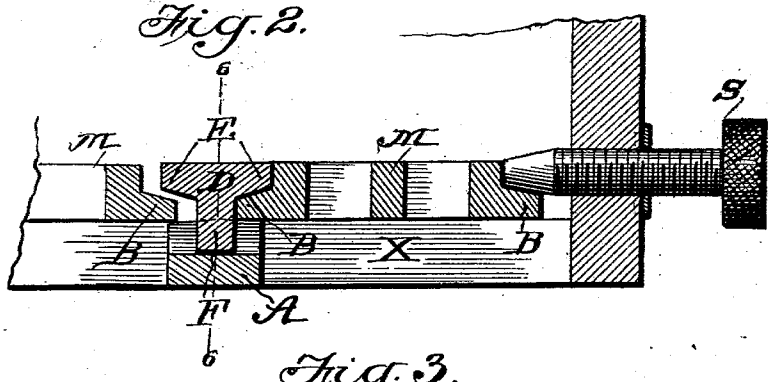


Fig. 3.

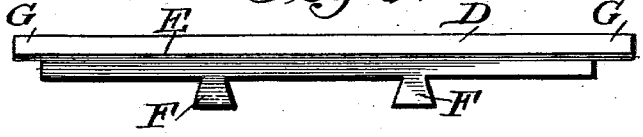
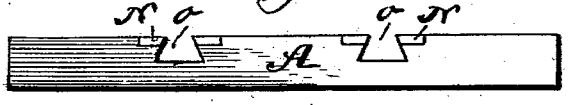


Fig. 4.



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SCREEN FOR PAPER PULP.

(Application filed July 1, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

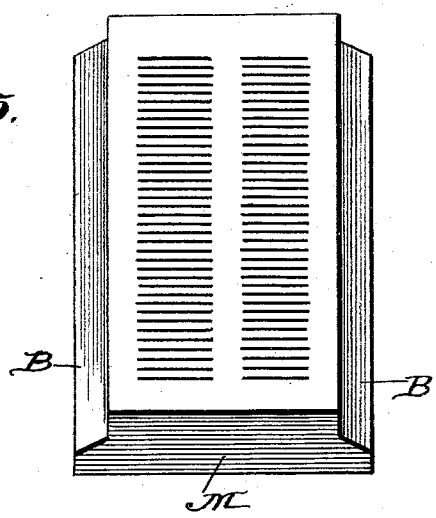


Fig. 6.

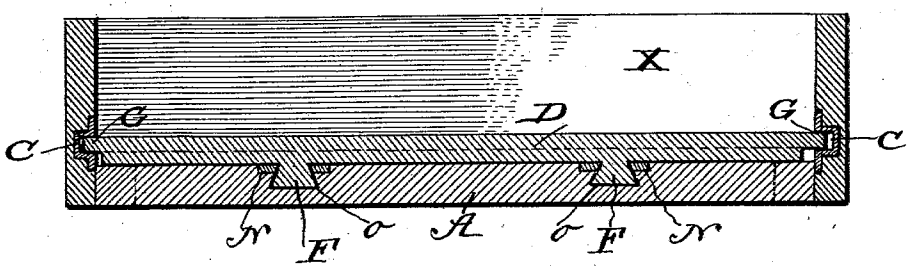
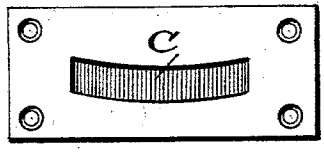


Fig. 7.



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UNITED STATES PATENT OFFICE.

SETH HUTCHINS TIBBETTS, OF GROVETON, NEW HAMPSHIRE, ASSIGNOR OF ONE-HALF TO EDWARD E. TIBBETTS, OF GROVETON, NEW HAMPSHIRE.

SCREEN FOR PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 694,900, dated March 4, 1902.

Application filed July 1, 1901. Serial No. 66,736. (No model.)

To all whom it may concern:

Be it known that I, SETH HUTCHINS TIBBETTS, of Groveton, in the county of Coos and State of New Hampshire, have invented a new and useful Improvement in Screens for Paper-Pulp, of which the following is a specification.

My invention comprises a new means for fastening screen-plates in the cradle of a paper-pulp screen without the aid of screws. In practice there are usually from two to three of these screens to each paper-machine for screening the stock that the paper is made from, and in pulp-mills a great many of these screens are used in cleaning the stock and fitting it for the paper-mill. In each one of these screens there are usually ten plates. The most common size of these plates is twelve by forty inches and about one-half inch thick, made of bronze metal. To fasten one of these plates properly requires thirty one-and-one-half-inch screws, so that a screen with ten plates requires three hundred screws to fasten the plates in the cradle. In practice it is called a day's work for a man to take out the old plates and insert new ones in two of these screens. There is also another difficulty that is caused by using screws and that is that the cross-pieces that the plates are fastened to soon wear out by turning in and out these screws and have to be renewed quite often. These plates have to be changed every two or three weeks, and this causes much trouble, owing to the time it takes to change them, the embarrassment that the screws give in breaking off, and looseness from the wearing of the holes, so that the screws do not hold. My invention is designed to obviate the difficulty referred to, since it will not take one-tenth of the time to change the plates as it will by the old way and the cross-pieces will not have to be renewed, as no wear comes on them, as in the old way.

Figure 1 is a perspective view, partly broken away, of the cradle in which the screen-plates are contained. Fig. 2 is a partial longitudinal section through the screen. Fig. 3 is a detached side view of one of the retaining-bars for the screen-plate. Fig. 4 is a similar view of one of the cross-bars of the cradle above and to which the retaining-bar is secured. Fig. 5 is a perspective view of one of the screen-plates. Fig. 6 is a cross-section on line 6 6 of Fig. 2. Fig. 7 is a detail of the mortise-plate.

In the drawings, X represents the cradle, in whose bottom are arranged cross-pieces A each formed on its upper surfaces with two dovetail notches *o*.

D represents the retaining-bars, one of which is located immediately above and parallel to each cross-piece A, and M represents the screen-plates, which are arranged transversely to the cradle and are held in by the retaining-bars D. The only difference between the new plate and the old is that on the new one there is a lip on each lower side of the plate. (Shown by the letter B, Figs. 2 and 5.) This lip, as shown, is made tapering or wedge shape. The retaining-bar has formed along its upper edges overhanging lips E at an inverse angle to those on the plates. On the bottom of this bar are two dovetail tenons F, which fit in the dovetail notches *o*, Fig. 4, of the cross-pieces A. The retaining-bar is made a little longer than the plates which it fastens, and its ends G fit in the mortise C, Fig. 1, in the sides of the cradle. The mortises are in the nature of metal pockets, Fig. 7, made with their chambers in the form of an arc and so placed that the convex part comes over the center of each cross-piece A, Fig. 1, and have a cam-like action in securing and tightening the ends of said bars. These mortises are made convex and so placed that the lowest part is just the right height to press the ends of the retaining-rods firmly down on the cross-pieces A, and in removing the retaining-bar when the bar is moved sidewise the mortise loosens up its cam-like grip and makes it easier to remove the said bar. The mortises are made deeper horizontally than the end pieces G are long, so when the retaining-bar is moved sidewise enough, so that the tenons F F clear the notches *o o*, then by pushing the retaining-bar endwise a little one end will go in deeper into one mortise and clear the other, so it can be taken out. The function of this simple

arrangement will be understood by referring to Fig. 2.

The letters M M show the cross-section of the plates, and D the retaining-bar. To assemble these plates in the cradle, one of the plates M is placed in one end of the cradle and then one of the retaining-bars D. I put one end of the latter in a mortise C and push it far enough, so that the near end will pass down in the cradle, and then pull the bar, so that the near end will pass into the mortise on the near side; then adjust the bar endwise, so that the tenons F F will be opposite the notches *o o;* then push it sidewise, so that the lip E will pass over the lip B. This, owing to the ends of the retaining-bar being in the mortises and the dovetails tenons F F in the notches *o o*, will hold that side of the plate firmly down. Then take another plate M and push the lip B under the lip E of the retaining-bar, then another bar, then a plate, and so on until all of them are in. In each end of the cradle are set-screws S, arranged in the plane of the plates. After the plates and retaining-bars are all in the tightening up of these set-screws will press the plates and bars into a smooth and solid bottom, and the more pressure on the set-screws the tighter they will hug to the pieces A. On each side of a notch *o* there is a piece of metal N, fastened on the wood, so that they can be adjusted to take up any wear that might take place.

Underneath the cradle is arranged machinery for producing a downward suction, (not shown,) which pulls the pulp down through the narrow slits in the screen-plates, and also gives an upward pressure, which forces away any dirt that covers the slits in the plates, working something like a vacuum-pump. If the screen-plates are not firmly held down and tight, dirt would work through, and dirty paper would be the result. As the pulp-stock goes in the cradle over the top and passes the whole length of the screen, it is important that the plates and fastenings should be so constructed that they give a practically smooth bottom; otherwise as the stock passes from one end to the other it would bank up and soon stop up all the slits in the plates. My invention fully provides for these conditions.

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

1. A screen comprising a main frame or cradle having in its bottom cross-bars with undercut notches, retaining-bars having on their lower sides tenons corresponding to said notches and having overhanging upper edges, and screen-plates having lips along their lower edges adapted to be caught and held by the retaining-bars substantially as described.

2. A screen comprising a main frame or cradle having in its bottom cross-bars with undercut notches, retaining-bars having on their lower sides tenons corresponding to said notches and having overhanging upper edges, tightening devices for the ends of the retaining-bars, and screen-plates having lips along their lower edges adapted to be caught and held by the retaining-bars substantially as described.

3. A screen comprising a main frame or cradle having in its bottom cross-bars with undercut notches and mortises in the sides of the cradle immediately above each cross-bar, retaining-bars having on their lower sides tenons corresponding to said notches and overhanging upper edges, the ends of said retaining-bars being seated in said mortises, and screen-plates having lips along their lower edges adapted to be caught and held by the retaining-bars substantially as described.

4. A screen comprising a main frame or cradle having in its bottom cross-bars with undercut notches and mortises in the sides of the cradle immediately above each end of the cross-bar, retaining-bars having on their lower sides tenons corresponding to said notches and overhanging upper edges, the ends of said retaining-bars being seated in said mortises and the mortises being made of a greater horizontal depth than that occupied by the fixed position of the retaining-bars, so as to permit the retaining-bars to be entered by an endwise movement, then drawn back, and moved laterally to seat the tenons in the notches, and screen-plates having lips along their lower edges adapted to be caught and held by the retaining-bars, substantially as and for the purpose described.

5. A screen comprising a main frame or cradle, having in its bottom cross-bars with undercut notches, retaining-bars having on their lower sides tenons corresponding to said notches and overhanging upper edges, cam-like tightening-seats for the ends of the retaining-bars arranged to force the ends of the said bars down when the bar is moved laterally to a position above the cross-bars, and screen-plates having lips along their lower edges adapted to be caught and held by the retaining-bars substantially as described.

6. A screen comprising a main frame or cradle having in its bottom cross-bars with detachable retaining-bars above them, said retaining-bars having overhanging edges, detachable screen-plates having lips along their lower edges adapted to be caught and held by the retaining-bars, and set-screws at the ends of the cradle arranged in the plane of the screen-plates and adapted to bear against and tighten the same substantially as described.

7. A screen comprising a main frame or cradle having in its bottom cross-bars with detachable retaining-bars above them, said retaining-bars having overhanging edges, screen-plates having lips along their lower

edges adapted to be caught and held by the retaining-bars, said lips of the plates and overhanging edges of the retaining-bars being made with inclined adjacent edges to form a wedging action when brought together, and tightening devices at the ends of the series of plates to bring the screen-plates and retaining-bars together with a tightening action substantially as described.

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Witnesses:
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