J. OLSEN.

PULP SCREEN PLATE FASTENER.

APPLICATION FILED APR. 10, 1911.

1,013,890.

Patented Jan. 9, 1912.

2 SHEETS—SHEET 1.

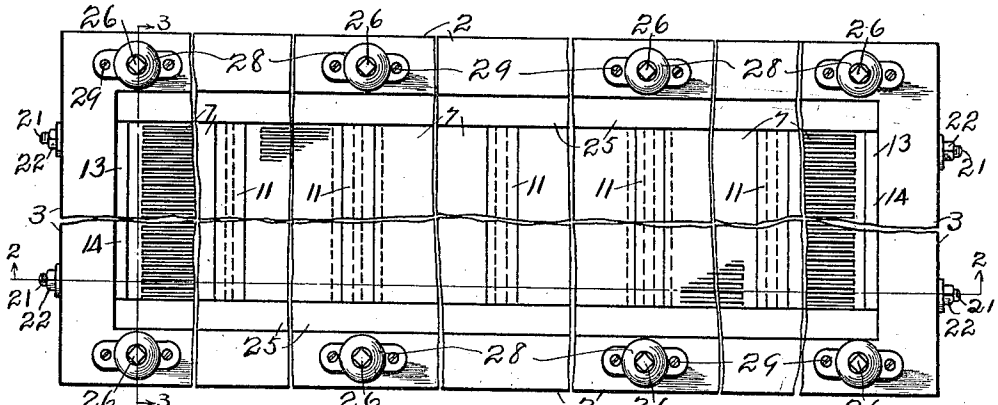

Fig. 1.

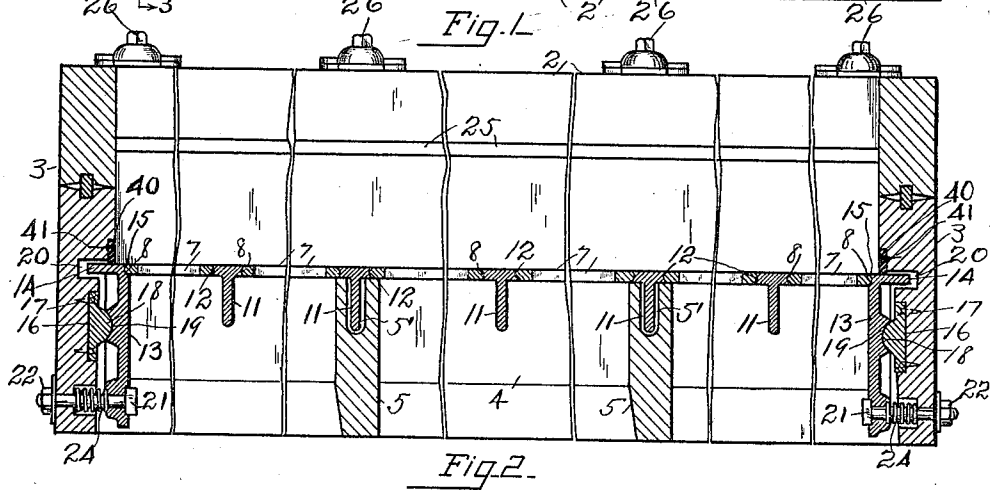

Fig. 2.

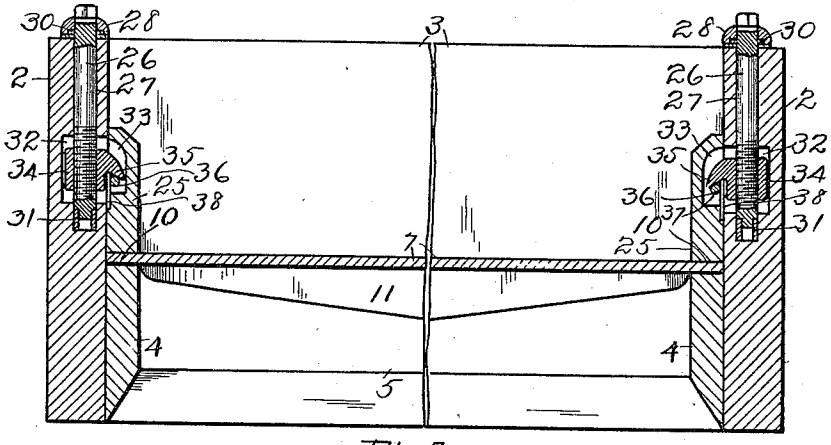

Fig. 3.

WITNESSES:

Chas. H. Hughes

J. S. O'Connor

INVENTOR.

JOHN OLSEN

BY Harry D. Wallace

ATTORNEY.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

J. OLSEN.

PULP SCREEN PLATE FASTENER.

APPLICATION FILED APR. 10, 1911.

1,013,890.

Patented Jan. 9, 1912.

2 SHEETS—SHEET 2.

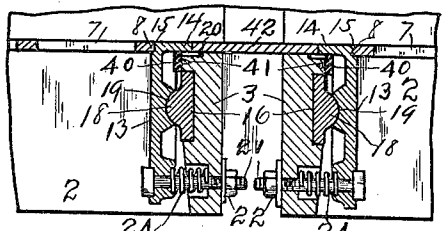

Fig. 4.

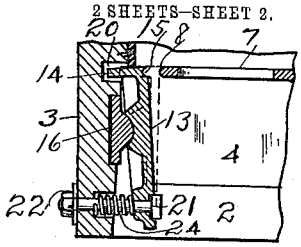

Fig. 5.

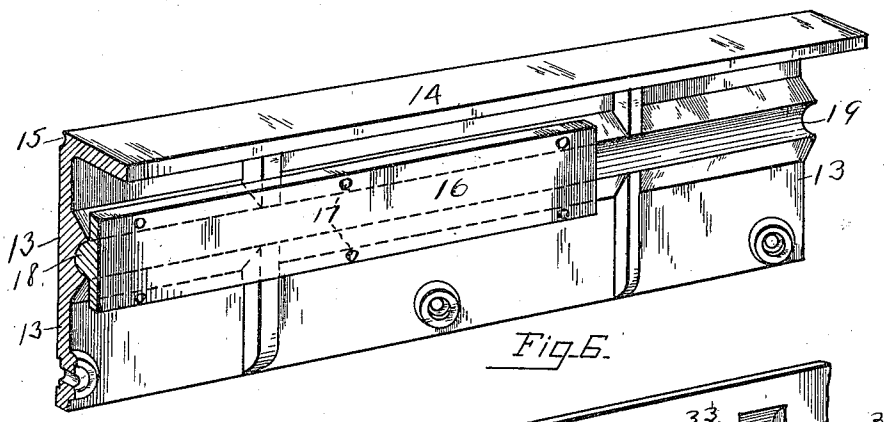

Fig. 6.

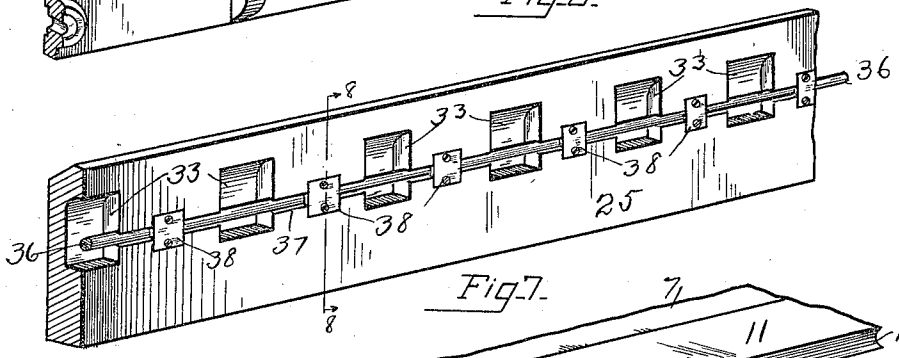

Fig. 7.

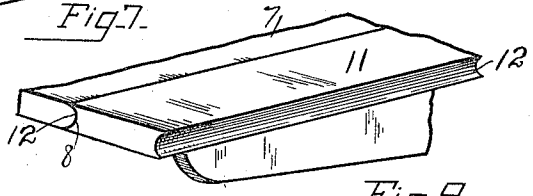

Fig. 9.

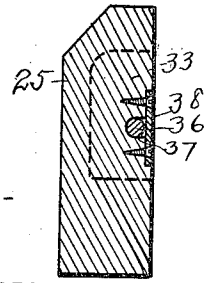

Fig. 8.

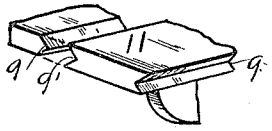

Fig. 10.

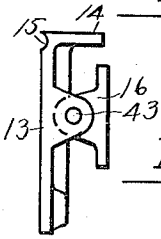

Fig. 11.

WITNESSES:
Chas. H. Hughes.
J. T. O'Connell

INVENTOR.
JOHN OLSEN
BY Harry D. Wallace
ATTORNEY.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN OLSEN, OF WATERTOWN, NEW YORK.

PULP-SCREEN-PLATE FASTENER.

1,013,890. Specification of Letters Patent. Patented Jan. 9, 1912.

Application filed April 10, 1911. Serial No. 619,951.

To all whom it may concern:

Be it known that I, JOHN OLSEN, a citizen of the United States, residing at Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Pulp-Screen-Plate Fasteners, of which the following is a specification.

My invention relates to machines for straining pulp used for making paper, in which, as a rule, a number of stationary screen-plates are disposed horizontally in the vat, the plates being supported on a frame and forming the bottom of the vat.

Heretofore, it has been customary to secure the screen-plates to their frame by means of screws which pierce the plates. Under the old method of fastening the screen-plates, to remove or replace the plates, is a long and tedious operation, and often results in breaking the screws and in injuring the plates, besides consuming considerable time in effecting the changes.

The object of my invention is to provide novel, simple and effective means for securing the screen-plates in the vat, without the use of any screws, the construction and arrangement of the fastening parts being such that the screen-plates may be readily and quickly applied or removed, for the purpose of cleaning, repairing, or renewing the screening parts.

The features and parts of the invention will be understood from the detailed description which follows, and by reference to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a top plan view of a pulp screen, having my improvement applied. Fig. 2 is a vertical longitudinal section, substantially on line 2—2 of Fig. 1; showing the construction and arrangement of one series of the fastening parts. Fig. 3 is a vertical transverse section, substantially on line 3—3 of Fig. 1; showing the fastening parts employed for clamping or compressing the screen-plates upon the frame. Fig. 4 is a sectional view; showing the method of joining two screens together to operate as one; also showing the relation of certain of the plate fastening parts to the combined structures. Fig. 5 is a sectional view; showing the rocking clamping member in released position. Fig. 6 is an enlarged perspective view of the rocking clamping member and its pivotal support. Fig. 7 is an enlarged perspective view of one of the side-clamps. Fig. 8 is a cross-section on line 8—8 of Fig. 7. Fig. 9 is a perspective view of portions of a screen-plate and a floating bar. Fig. 10 is a perspective view; showing a modification of the tongues and grooves of the plate and floating bar. Fig. 11 is a modified view of the rocking clamping member.

In the drawings, 2 represents the side walls, and 3 the end walls of a pulp screen vat. 4 represents the sills or frame timbers which support the screen-plates, and 5 represents the intermediate cross-timbers or pieces of the vat frame, all of which may be framed and assembled in the usual manner.

7 represents the slotted metallic plates through which the pulp is strained for use as paper stock. These plates may be made of any suitable material and in any suitable manner, except that the lateral edges of the plates are preferably formed convex, as indicated at 8, for forming oppositely-facing parallel nosings for joining and interlocking with certain of the fastening parts. The lateral edges of the screen-plates may be made V-shaped, as indicated at 9 in Fig. 10, for interfitting the corresponding grooves 9′ formed in the fastening parts. In practice, several of the plates 7 are disposed horizontally in, and form the bottom or floor of the vat, and they are usually disposed so that their ends 10 rest upon the side-sills or supports 4 of the vat. The plates 7 are usually of a length about equal to the inside width of the vat, so that the plates may be applied and removed without requiring the dismantling of the vat. The plates 7 are placed side-by-side in the vat, and in order to effectually interlock and hold them in place, a series of metallic bars, as 11, are arranged transversely in the vat, the ends of said bars resting upon the sills 4, and one of such bars is disposed between each adjacent pair of the plates, in regular order throughout the length of the vat. The bars 11 of the present device are preferably T-shaped in cross-section, the depending portions being trussed to give them greater strength, and the top portions of the bars have their opposite edges formed into concave grooves or gutters 12, which extend the full length of the bars, and receive the convex nosings 8 of the plates, for interlocking the said parts

and producing a continuous substantially level floor. Neither the plates 7 nor the bars 11 are anchored or secured in any manner to the sills 4, but all of these parts may be moved freely, either singly or together, in the direction of the length of the vat, for adjusting, interlocking, or removing the said parts.

After the plates 7 and the floating bars 11 have been placed in position upon the sills 4, it is necessary to employ some means for compressing or forcing the plates and bars together, as well as, for holding the said parts rigidly joined and stationary during the screening of the pulp. To do this, I provide novel clamping members, each of which consists of a metallic part 13, which is disposed at the end of the vat and extends transversely therein. The top of each member 13 is formed into a horizontal outwardly-facing flange 14, and the upper corner of the member is provided with a concave groove 15, for receiving the convex edge of the initial or final plate 7; the top surface of the flange 14 being substantially level with the top of the screen-plates, and forming the extreme end portion of the floor of the vat. The members 13 are pivoted to the end timbers 3 of the vat, by means of supporting-plates 16, which are secured to the walls 3 by screws or nails 17, the pivot or knuckle connection between the parts 13 and 16 comprising a tongue 18 formed on the exposed face of the plate 16, and a central longitudinal groove 19, which is formed in the rear or outer side of the member 13. When these parts are placed in working position, the members 13 may be rocked toward or away from the plates 7 a sufficient distance to permit the insertion or removal of the plates and bars 11. The end timbers 3 are recessed at 20 to afford space for the movement of flanges 14 during the adjustment of the parts. Each rocking member 13 is also supported in part by a series of bolts 21, which pierce the end walls 3 of the vat, and also the lower portions of the members. The bolts 21 are preferably inserted first through the rocking parts 13, and then through the end timbers 3, and their outer ends are threaded for receiving nuts 22, by means of which the members may be rocked on their pivots 18—19. The tightening up of the nuts 22 draws the lower edges of the rocking members or clamps 13 toward the end walls 3, and at the same time swings or moves the upper edges having the grooves 15 toward the screen-plates. Under this arrangement, the plates 7 and the bars 11 may all be forced tightly against each other and securely interlocked by means of the tongues 8 and the grooves 12 and 15. The convex edges of the plates and the concave grooves of the bars 11 and members 13, insure close and water-tight joints between all of said parts when they are compressed and held together by the tightening up of the nuts 22, whether the whole series of plates and bars are exactly level or not. To loosen the plates 7 and the bars 11, for the purpose of removing one or more of said parts, the attendant should unscrew the nuts 22, which will relieve the tension upon the members 13. Soon as the nuts are unscrewed, the said members will be tilted or rocked away from the plates, for breaking the joints between the rocking members and the plates, by means of coil-springs 24, which are interposed between the end walls 3 and the members 13, as shown in Fig. 5. One of the rocking members 13 is sufficient to hold a number of the screen-plates and floating bars in operative position, providing the furthermost plate in the series is given suitable seating or anchorage to prevent it from yielding when the tension is applied to the clamping member. But I prefer to employ two of the clamping members 13 to each screen, and dispose one at each end of the vat, as illustrated in the drawings. Under the latter arrangement, a slight loosening up of the nuts 22, at the opposite ends of the vat, will permit the ready and quick removal of any or all of the plates and floating bars. In case the floating bars 11 come opposite the cross-timbers 5, the latter may be recessed or cut-away, as at 5′, to receive the depending parts of the bars, as shown in Fig. 2.

The clamping and fastening parts thus far described, only have for their object the compression, interlocking and holding of the screen-plates and floating bars in a continuous manner, and for preventing the said parts from separating or moving in the direction of the length of the vat. Owing to the great strain upon the screen-plates and related parts during the screening operations, it is necessary to provide powerful means for clamping and holding the plates and bars level, and tightly and firmly upon the sills or frame parts 4 of the vat. To accomplish this in a novel and simple manner, I provide like side clamping pieces 25, preferably made of wood, and having a length equal to the inside length of the vat, and their lower edges rest upon the upper faces of the screen-plates 7 and the floating bars 11, as shown in Figs. 1, 2 and 3. To hold the clamps 25 in place, and also to cause them to exert a strong downward bearing or pressure upon the plates and bars, I provide a series of simple fastening and tension devices, which will now be described.

26, 26 represent a series of screws, which are disposed at regular spaced intervals, in vertical holes or openings 27 formed in the side walls 2, 2 of the vat. The screws 26 are held in place by a series of perforated caps or escutcheons 28, which are secured to the

top edges of the vat by screws or nails 29. The undersides of the caps 28 are recessed to receive flanges 30 carried by the screws 26. The bottoms of the flanges 30 rest upon the vat sections 2, 2, and the screws are thus held from vertical movement, while allowed to freely rotate. The lower ends of the screws 26 are preferably inserted in thimbles or bushings 31 which prevent the screws from moving laterally. The inner faces of the side walls 2 of the vat, and the abutting faces of the side-clamps 25, are provided with a number of coinciding recesses or pockets 32 and 33 respectively, which are arranged directly opposite the screws 26, the recesses 32 extending across the openings 27. In the recesses 32 are placed clamping-nuts 34, each of which is pierced by one of the screws 26, and may be raised or lowered by the rotation of the screws. Each of the nuts 34 is provided with a downwardly-facing integral hook 35, which projects into the corresponding recess 33 of the side-clamps 25. The side-clamps 25 are each fitted with a catch-rod 36, which lies in a longitudinal groove 37, and is held in place by a series of plates 38, which may be secured by any suitable means. The rods 36 preferably extend the full length of the clamps 25, and thus afford a strong catch for the hooks 35 of nuts 34. To apply the side-clamps 25, the nuts 34 are first raised by rotating the screws 26 sufficiently to allow the rods 36 to pass under the points of the hooks 35. Soon as the clamps 25 are set in position (see Fig. 3) the screws 26 may be rotated in the opposite direction for lowering the nuts 34, and the further turning of the screws forces the clamps 25 tightly against the upper faces of the plates 7 and bars 11, and at the same time the hooks serve to draw the clamps 25 tightly against the walls 2—2 of the vat. This completes the operation of applying and fastening the screen-plates.

To remove the screen-plates, for the purpose of cleaning or repairing the machine, the attendants should first unscrew the bolts 26, for breaking the engagement between the nuts 34 and the rods 36, so as to permit the removal of the side-clamps 25. The next step is to unscrew the nuts 22 for allowing the rocking clamping members 13 to be tilted or rocked by the springs 24, away from the plates (see Fig. 5). The plates 7 and also the bars 11 may then be removed or readjusted as desired.

When the rocking members 13 are installed in the machine, these parts being adjustable, require some freedom of movement, and for that reason the flanges 14 of said members do not contact with the end timbers 3 of the vat. To close the slight crevice or opening between said parts at each end of the vat, for rendering the same water-tight, I provide flexible packing strips preferably rubber, as at 40, and secure said strips to the walls 3 by screws or nails 41. In case a screen is operated alone, these packing strips are usually disposed so that their lower edges bear against the upper faces of the flanges 14. When, however, two or more screens are joined together, as illustrated in Fig. 4, the packings 40 are preferably placed beneath the flanges 14 (see Fig. 4).

It is obvious that two or three pulp screening machines may be joined together for operation as one screen, without requiring any extra fastening parts, and without requiring any changes or rearrangements of the parts herein shown and described, except the shifting of the packing strips 40, as explained, and that my improvement is equally applicable to inclined, as well as flat or horizontal pulp screens.

I reserve the right to make changes or modifications of the parts of the device, within the scope defined by the appended claims, without departing from the spirit of my invention.

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

1. A screen-plate fastener, comprising a pair of side-clamps disposed longitudinally in a screen vat, each of said clamps having a catch-rod embedded in one side, and having a plurality of recesses for affording access to said catch-rods, a series of screen-plates disposed in the vat beneath said side-clamps, a series of screws pivoted in the side walls of the vat opposite the recesses in said side-clamps, and a nut carried by each screw adapted to engage the said catch-rods, for compressing said side-clamps tightly upon the screen-plates and also against the side walls of the vat.

2. In a screen-plate fastener, the combination with a series of screen-plates and a screen vat, of a pair of rocking clamping members pivotally disposed in the vat below the level of the tops of the screen-plates, grooves formed in said clamping members for interlocking with the screen-plates, and a series of bolts piercing the clamping members and also the end walls of the vat, for rocking said clamping members in the direction for compressing the screen-plates tightly together laterally.

3. The combination with a screen vat and a series of screen-plates disposed horizontally in the vat, of a screen-plate fastener, comprising a pair of side-clamps disposed longitudinally in the vat, adapted to press and hold the plates tightly upon the side parts of the vat, a series of screws carried by the side walls of the vat, rods carried by the side-clamps and a series of nuts carried by said screws, adapted to engage said rods for locking and holding the side-clamps in place.

4. The combination with a screen vat and a series of screen-plates, of a pair of rocking clamping members pivotally disposed below the level of the screen-plates, grooves formed in said clamping members for interlocking with the screen-plates at each end of the vat, and a series of bolts carried by said clamping members adapted for rocking said clamping members toward the screen-plates for compressing and holding said plates in a continuous level position, and for rendering the joints between said plates and said clamping members water-tight.

5. The combination with a screen vat and a series of screen-plates adjustably arranged within the vat, of a pair of rocking clamping members pivoted in said vat below the level of the screen-plates, grooves formed in said clamping members for interlocking with the screen-plates at the ends of the vat, a series of bolts carried by said clamping members adapted for rocking said clamping members toward the screen-plates for compressing and holding said plates in a continuous level position, and for rendering the joints between the plates and said clamping members water-tight, and a series of springs for rocking said clamping members away from said plates for permitting the removal of the plates.

6. The combination with a screen vat and a series of screen-plates disposed horizontally and slidably upon the sills of the vat, of a rocking clamping member pivotally mounted in each end of the vat, the said clamping members adapted to engage and interlock with the outer edges of the opposite end plates, a series of bolts and nuts adapted for rocking said clamping members in the direction for engaging and compressing the screen-plates together, and a series of springs adapted for rocking said clamping members in the opposite direction for disconnecting and removing the screen-plates.

7. A screen-plate fastener, comprising a pair of rocking clamping members disposed transversely in a screen vat, means for pivotally connecting said clamping members to the end walls of the vat, a series of screen-plates arranged horizontally in the vat, means for interlocking the said clamping members with the opposite end plates of said series, bolts for rocking said clamping members toward each other for clamping the screen-plates together as one part, and a series of springs adapted for rocking said clamping members away from each other for permitting the removal and the replacing of the screen-plates.

8. The combination with a vat and a plurality of screen-plates arranged horizontally in the vat, of a screen-plate fastener, comprising a pair of side-clamps adapted to rest upon the upper faces of the screen-plates, each of said clamps having a catch-rod disposed along one side facing the adjacent wall of the vat, and having a plurality of recesses for affording access to said catch-rods, a series of screws pivotally disposed in vertical openings in the side walls of the vat, the said screws being spaced to correspond to said recesses, and a nut carried by each of said screws adapted to engage the said catch-rods for compressing said side-clamps tightly against the screen-plates and also against the side-walls of the vat.

9. In a pulp screen, the combination with a vat and a series of slotted screen-plates disposed in the vat, each of said plates having its lateral edges formed convex for providing nosings extending the full length of the plates, of a series of T-shaped sliding bars disposed between the adjacent screen-plates in alternate order, the horizontal portion of each bar having its opposite lateral edges formed into concave grooves adapted for receiving the nosings of the screen-plates for forming close water-tight joints, and a rocking clamping member disposed across each end of the vat for compressing and holding the screen-plates and floating bars stationary, each of said clamping members having a concave groove to receive the free edge of the plate at the end of the vat, and means for rocking said clamping members into and out of engagement with said end plates.

10. The combination with a screen vat and a series of screen-plates adjustably disposed in the vat, of a series of floating bars disposed between each contiguous pair of plates, the said bars having oppositely facing concave grooves for receiving lateral convex edges of the plates for interlocking said parts together, a screen-plate fastener, comprising a pair of rocking clamping members disposed transversely in the opposite ends of the vat, the said clamping members having concave grooves for receiving the lateral edges of the end plates, means for rocking said clamping members in the direction for compressing the screen-plates and floating bars for forming a continuous water-tight and level floor in the vat, a pair of side-clamps disposed lengthwise in the vat and resting upon the top surface of the screen-plates and floating bars, a series of screws and a series of nuts carried by the side walls of the vat adapted for compressing and holding said side-clamps tightly against the screen-plates and floating bars.

11. The combination with a screen vat and a plurality of screen plates forming the bottom of the vat, of a series of floating bars disposed between the screen plates in alternate order, means comprising concave grooves formed in said bars and convex edges formed on the screen plates for effecting water-tight interlocking joints between

the said parts, sills for supporting the screen plates and floating bars, upon which the said parts are adapted to slide in the direction of the length of the vat, screen plate fastening means, comprising a pair of rocking members disposed in the opposite ends of the vat below the top level of the screen plates and bars, adapted for compressing said plates and bars and for holding said parts from movement in the direction of the length of the vat, means for manually rocking said members for compressing and holding said plates and bars in a continuous part, and means for automatically rocking said members in the opposite direction for permitting the separation and removal of said plates and bars.

12. The combination with a screen vat and a series of screen plates forming the bottom of the vat, of a series of floating bars disposed between the screen plates, means comprising concave grooves formed in the said bars and convex edges formed on said screen plates, for effecting water-tight interlocking joints between said parts, sills for supporting said screen plates and floating bars, upon which said parts may slide in the direction of the length of the vat, a fastening device for clamping and holding the said plates and bars tightly upon the said sills, independent clamping fasteners, comprising a pair of rocking members disposed in the opposite ends of the vat, adapted for compressing said plates and bars and for holding said parts from movement in the direction of the length of the vat, bolts and nuts for manually rocking said members for compressing and holding said plates and bars in one continuous part, and means for automatically rocking said members in the opposite direction for permitting the separation and removal of said plates and bars.

13. The combination with a screen vat and a series of screen plates forming the bottom of the vat, of a series of bars disposed between the screen plates, means comprising concave grooves formed in said bars and convex edges formed on said plates for effecting water-tight joints between and for interlocking said parts, and means comprising rocking end members for compressing and holding said plates and said bars in one continuous substantially level part.

14. The combination with a screen vat and a series of screen plates disposed horizontally and slidably in the vat, of a rocking clamping member mounted in one end of the vat, said clamping member adapted to engage and interlock with the adjacent end plate, means for manually rocking said clamping member in the direction for compressing the screen plates together laterally, and means for automatically rocking said clamping member away from said plate for permitting the removal of said plates.

15. The combination with a screen vat and a series of screen plates arranged horizontally in the vat, of a rocking clamping member disposed in one end of the vat, said clamping member capable of engaging and interlocking with the adjacent end plate, a series of floating bars interposed between the adjacent screen plates, said bars arranged to interlock with the lateral edges of the screen plates, means for rocking said clamping member for compressing the screen plates and bars together laterally, and means for swinging said clamping member in the opposite direction for permitting the removal or adjustment of the screen plates and bars.

16. The combination with a screen vat and a number of screen plates forming the bottom of the vat, of a rocking clamping member pivotally disposed in the vat, convex nosings formed on the opposite lateral edges of each of said plates, a concave groove formed in said clamping member adapted to receive the nosing of the adjacent plate for interlocking and forming a water-tight joint between said parts, and means for moving the grooved portion of said clamping member toward or away from the plates for fastening or releasing the said plates.

17. The combination with a screen vat and a series of screen plates disposed in the vat, of a pair of clamps disposed in the vat adapted for preventing the vertical movement of the plates, a series of adjustable fasteners carried by the vat adapted for forcing said clamps downwardly and also laterally for holding the plates and for making water-tight joints between the clamps and the walls of the vat, and a pair of rocking members disposed in the vat capable of being interlocked with the opposite-end plates and adapted for compressing and holding all of said plates from movement longitudinally in the vat.

18. In combination, a vat, a series of slotted screen-plates disposed horizontally in the vat, a screen-plate fastener comprising a pair of side-clamps disposed longitudinally at the opposite sides within the vat, the lower edges of said clamps resting upon the ends of the plates, screws carried by the side walls of the vat, and a series of nuts carried by said screws, each of said nuts having a hook for engaging parts carried by said clamps, adapted for forcing said clamps downwardly and laterally, for locking the clamps and also the plates in place.

19. In combination, a vat, a series of screen-plates forming the bottom of the vat, a rocking clamping member disposed at each end of the vat, means for interlocking

the rocking members with the adjacent screen-plates, and means for tilting the rocking members into and out of engagement with the screen-plates.

20. In combination, a screen vat, a number of screen-plates forming the bottom of the vat, side-clamps in the vat resting upon the opposite ends of said plates, each of said clamps having a catch-rod, screws disposed in the side walls of the vat, and nuts carried by said screws adapted to engage said catch-rods for drawing and holding said clamps tightly against said plates.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN OLSEN.

Witnesses:
GEORGE W. TRIPP,
ERNEST G. MEASTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."