

No. 660,764.

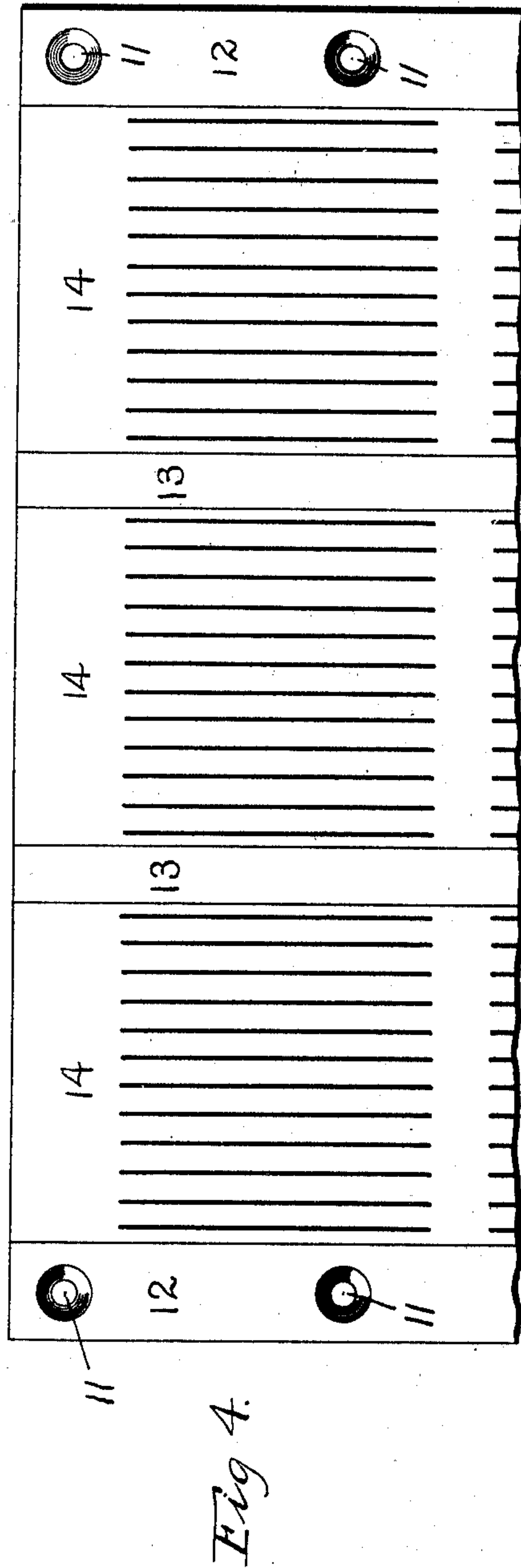
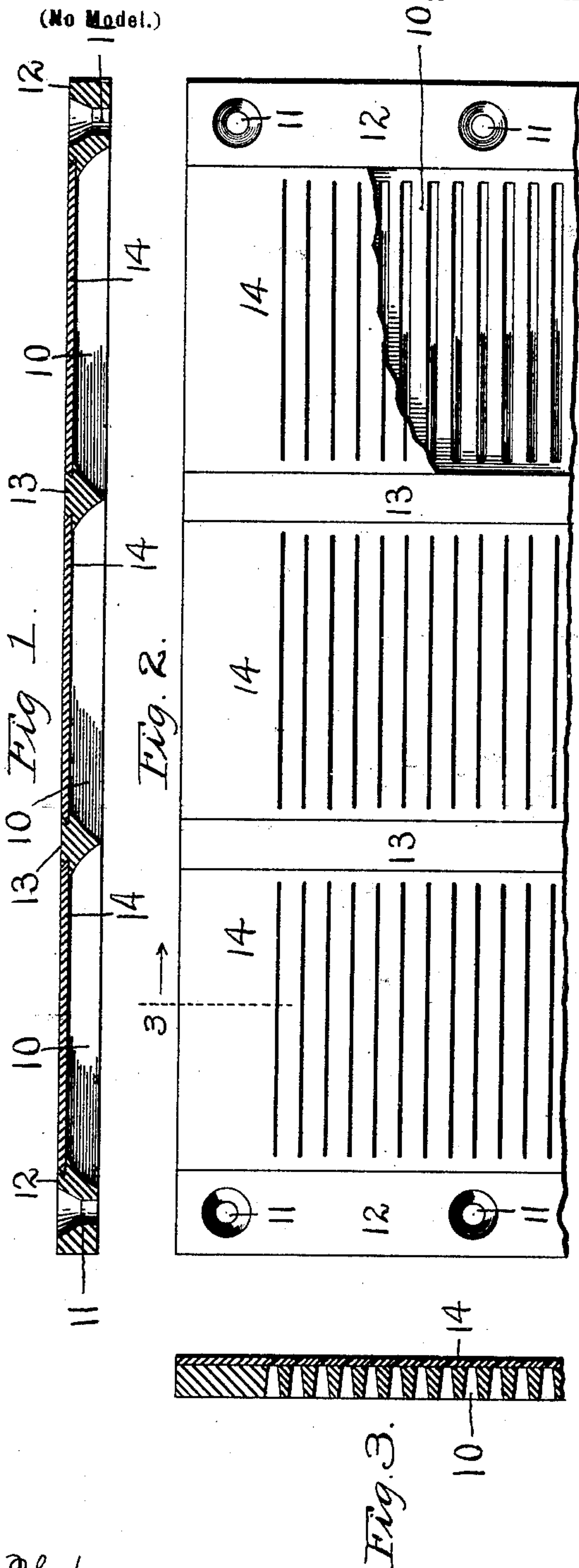
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E. J. WELCH.

SCREEN PLATE FOR STRAINING PAPER PULP.

(Application filed Mar. 20, 1900.)

(No Model.)



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SCREEN-PLATE FOR STRAINING PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 660,764, dated October 30, 1900.

Application filed March 20, 1900. Serial No. 9,383. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. WELCH, a citizen of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and useful Screen-Plate for Straining Paper-Pulp, of which the following is a specification.

This invention relates to a screen for straining the stock employed in paper-manufacturing; and the object of this invention is to provide a strong, simple, and efficient form of screen-plate which may be made to wear longer and which may be more readily repaired than the screen-plates which have heretofore been employed for straining paper-stock.

To this end this invention consists of the screen-plate and of the combination of parts therein, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying drawings, Figure 1 is a transverse sectional view of a screen-plate constructed according to this invention. Fig. 2 is a plan view of the same, partially broken away. Fig. 3 is a sectional view taken on the line 3 3 of Fig. 2; and Fig. 4 is a view similar to Fig. 2, illustrating a slightly-modified form of construction.

In the manufacture of paper, and especially in the manufacture of paper from wood-pulp, it is necessary that the stock should be refined by being drawn or forced through comparatively fine screens. To produce the finer grades of papers, the orifices or slots of the screen-plates are extremely narrow, often being less than one-hundredth of an inch in width. Screen-plates which have heretofore been used for straining paper-stock have ordinarily been formed from solid brass plates. These brass plates first have comparatively wide or coarse grooves or cuts milled out of their rear faces. These coarse cuts extend through the plate nearly, but not quite, to the top face thereof, the remaining metal of the plate being sawed through or slotted with an extremely-fine cutter which will make slots of the narrow width required. An ordinary screen-plate as thus constructed can be used for straining paper-stocks for only a compara-

tively short time on account of the enlargement of its fine slots due to the wear or abrasion of the paper-stock as it is drawn through the screen, and especially on account of the presence of sulfurous and other acids in the stock. On this account the screen-plates employed for straining paper-stock frequently require to be replaced or repaired.

To repair an ordinary screen-plate of the construction before described, it has heretofore been proposed to roll down or compress the surface of the worn-out plate, so as to tend to close the worn or enlarged slots in the face thereof and to recut the screen-plate after the same has thus been rolled down. By this method of rolling down and then recutting the worn-out screen-plates the same screen-plates may be used for two or three successive times; but when the screen-plates have been recut a number of times the entire surface of the plate between the coarse cuts and its upper face becomes worn out, rendering the plate entirely useless.

The especial object of my present invention is to provide a screen-plate which may be made to wear longer than the screen-plates of the construction above described and which may be readily and efficiently repaired as frequently as may become necessary.

To this end a screen-plate constructed according to my present invention comprises a main plate having a plurality of gridironed or coarsely-slotted sections therein. The upper surface of the main plate over the gridironed sections is recessed, leaving side ribs at the edge of the plate and one or more intermediate ribs between the gridironed sections of the plate. Secured in the recesses of the main plate, and preferably having dovetailed edges engaging said recesses, are top plates, which are preferably sweated or soldered in position, so that their surfaces are flush with the tops of the side and intermediate ribs of the main plate. As shown in the accompanying drawings, the main plate herein illustrated is provided with a plurality of gridironed or coarsely-slotted sections 10. In the present instance I have illustrated a plate having three gridironed sections, although in practice I have employed screen-

plates having two such sections. Along two of its sides the main screen-plate is provided with screw-holes 11 for securing the screen-plate to a ledge or rabbet inside of the ordinary screen-box. The upper surface of the main plate is recessed over each of its coarsely-grooved or gridironed sections 10, leaving edge ribs 12 at the sides of the plate and intermediate ribs 13 between the sections 10.

Fitting into the recesses in the surface of the main plate, and preferably having dovetailed edges, are the top plates 14, which are first secured in place by being sweated or soldered in position and then are grooved or slotted with a fine saw or cutter. The slots in the top plates of the screen preferably extend transversely in said top plates 14, as shown in Fig. 2, although in some instances the slots or grooves may extend longitudinally with respect to the top plates 14, as shown in Fig. 4. In both constructions the surfaces of the top plates 14 are preferably flush with the side ribs 12 and intermediate ribs 13 of the main plate.

If desired, the top plates 14 of a screen-plate constructed according to my invention may be made of harder metal than the body portion of the screen-plate, and on this account I have provided a construction which is more durable than the ordinary form of screen-plate formed by cutting out or grooving a solid plate of brass.

In addition to this a screen-plate constructed according to my invention may be much more readily repaired than screen-plates which have heretofore been used.

When it is desired to repair a screen-plate of my invention, it is first taken out of the screening-box or position where the same is used and is heated sufficiently to allow the top plates to be loosened and taken out. The top plates which are removed are replaced by new top plates, which are first soldered or sweated in position and are then cut or slotted, and inasmuch as the position of the screw-holes 11 remains unchanged a screen-plate constructed according to my invention may be accurately and quickly replaced in the position from which the same was taken.

In addition to this the screen-plates may be repaired as frequently as may become necessary, a single main plate being capable of wearing out a considerable number of replaceable top plates.

In actual use screen-plates constructed according to my invention have the advantage of presenting a greater area of screening-surface than in the ordinary forms of plates heretofore employed. This is due to the fact that the cutter which is used for milling out the gridironed sections of the main plate will extend through the plate far enough so that the arcs formed at the sides of the rear ribs 12 and intermediate ribs 13 will be comparatively short and more nearly upright than in the ordinary

form of plate, and on this account the thickness of metal will be uniform for the total length of the fine slots through the plate 14, and inasmuch as the under sides of the removable plates 14 may be ground or smoothly finished before these plates are secured in place the fine slots through the plate 14 will have uniform lower edges, which is not the case with an ordinary screen-plate on account of the chatter-marks or unevennesses formed in milling out the bottom of the coarser slots.

A further advantage in the use of screen-plates constructed according to my invention arises from the fact that the top plates when soldered or sweated into place in their sockets are held with perfect rigidity, so that the main plate and top plates form practically one integral structure in which the parts are not liable to spring or warp apart when the plate is bent or deflected under the screening pressure.

I am aware that it is not new to provide a screen-plate with a finely-slotted top plate which is held in place on a main or supporting plate by screws. The actual use of such plates is objectionable, however, for the reason that the plates are liable to warp or spring apart when subjected to screening pressure, so as to leave a crack or space between said plates, and my invention is to be distinguished from the composite plates of this character not only for the reason that each of my plates forms practically one rigid integral structure, but also by reason of the fact that the top plates of my device may be removed and replaced without covering up or altering the location of the screw-holes which receive the screws for holding the screen-plates in place in a screening-box, which fact permits the screen-plates to be replaced with absolute accuracy after they have been repaired or renewed.

I am aware that changes may be made in the details of construction and in the relative proportions of screen-plates constructed according to my invention, and I do not wish, therefore, to be limited to the form herein shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. As an article of manufacture, a screen-plate for straining paper-stock comprising a main plate having a gridironed section, and having a recess in its upper surface over said gridironed section, arranged to leave raised side ribs at the edges of the plate, and a top plate fitting into said recess and soldered or sweated in place so that its surface will be flush with the top of the side ribs, substantially as described.

2. As an article of manufacture, a screen-plate for straining paper-stock, comprising a main plate 10 having coarsely-grooved gridironed sections, and having recesses above said gridironed sections, arranged to leave

raised side ribs 12 at the edges of the plate,
and raised intermediate ribs 13, the side ribs
12 being provided with perforations or screw-
holes, and a top plate fitting into each recess
5 in the main plate, and soldered or sweated in
place so that its surface is flush with the top
of the ribs, substantially as described.

In testimony whereof I have hereunto set
my hand in the presence of two subscribing
witnesses.

EDWARD J. WELCH.

Witnesses:

PHILIP W. SOUTHGATE,
LOUIS W. SOUTHGATE.