(No Model.)

C. PINDER & W. A. HARDY.

Screen Plate for Paper Machines.

No. 239,837. **Patented April 5, 1881.**

Fig: 1.

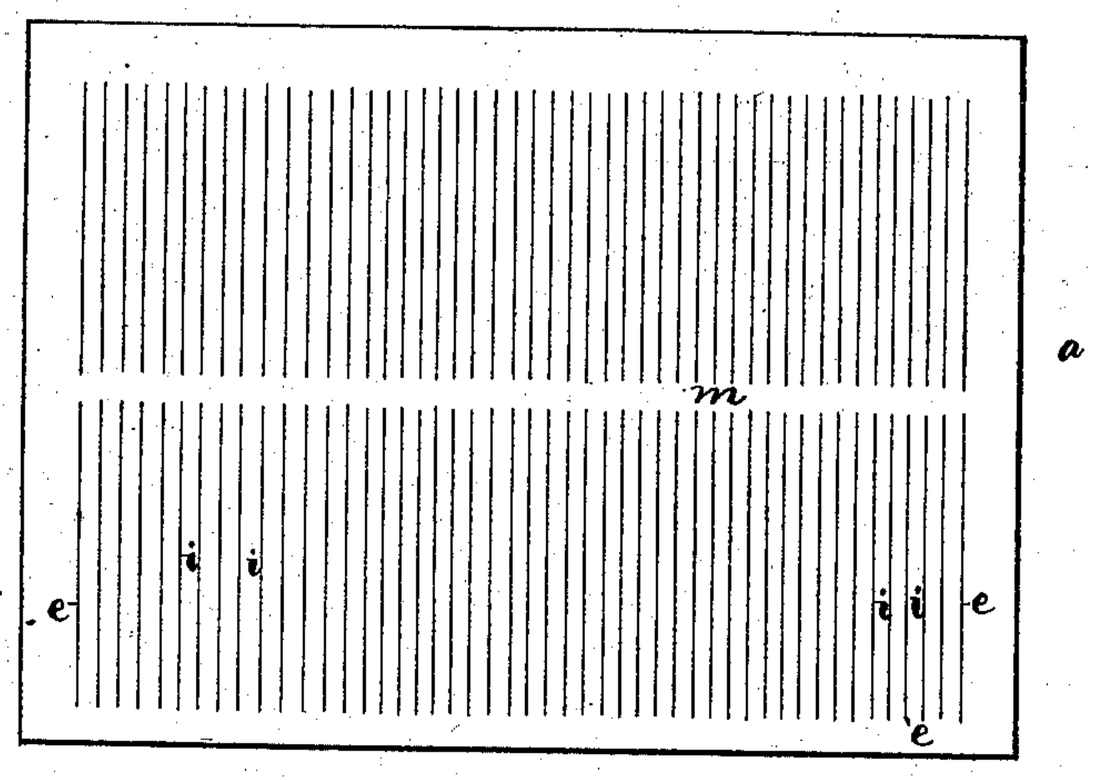


Fig: 2.

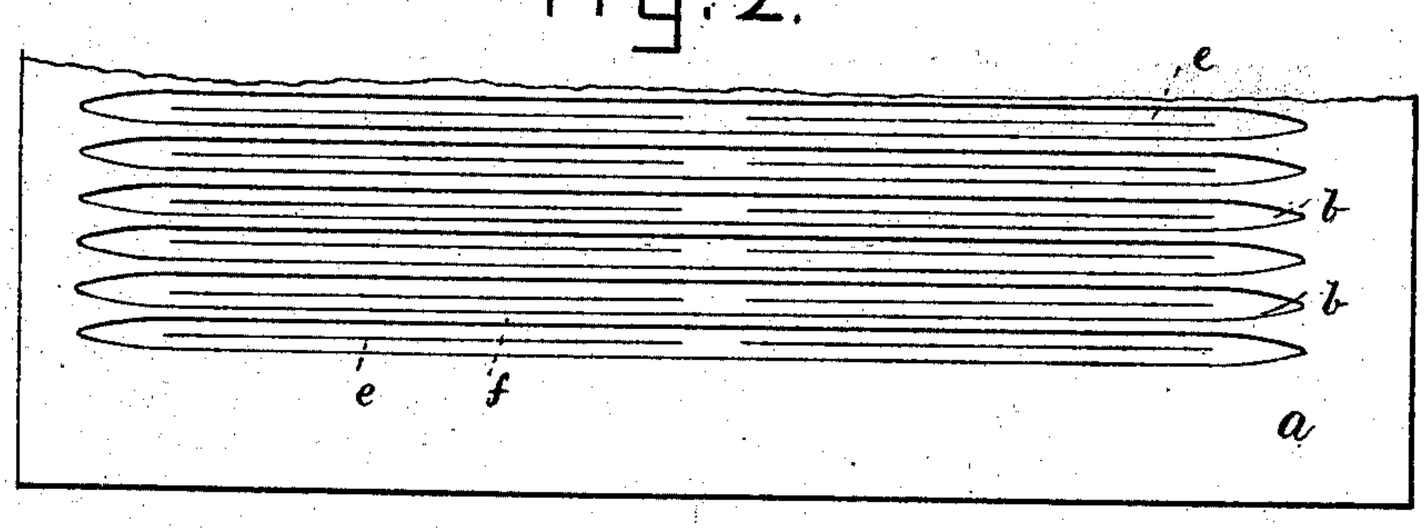


Fig: 3.

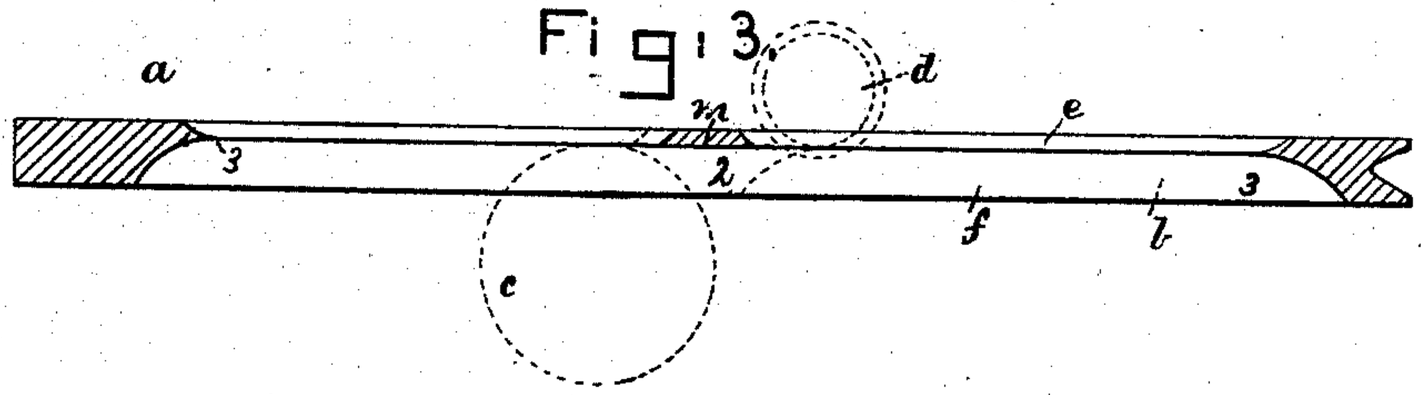
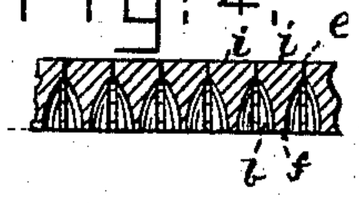


Fig: 4.



WITNESSES—

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UNITED STATES PATENT OFFICE.

CHARLES PINDER AND WILLIAM A. HARDY, OF FITCHBURG, MASS.

SCREEN-PLATE FOR PAPER-MACHINES.

SPECIFICATION forming part of Letters Patent No. 239,837, dated April 5, 1881.

Application filed March 7, 1881. (No model.)

To all whom it may concern:

Be it known that we, CHARLES PINDER and WILLIAM A. HARDY, of Fitchburg, county of Worcester, and State of Massachusetts, have invented an Improvement in Screen-Plates for Paper-Making Machines, of which the following description, in connection with the accompanying drawings, is a specification.

Our invention relates to screen-plates for paper-making mechanism, and has for its object to increase the screenage-surface of the plate, and at the same time cheapen its construction.

Screen-plates as commonly constructed are made of rolled brass about three-eighths of an inch thick, this thickness being required to give requisite strength. The said plates are milled out at their under surface, the milling-tool forming a series of channels extending nearly through the plate to its upper surface, which is then sawed through into the said channels, thus forming a series of slits, through which the pulp passes. It is requisite that these slits shall remain of the same width, in order to effectively screen the pulp, and the ridges of metal between the milled channels are left to form a sufficient support for the plate and pulp thereon, as described in a former patent granted to us, No. 234,719, dated November 23, 1880, to which reference may be had. It has been found in practice that these slits and milled channels, when cut in a single homogeneous plate in the usual manner, cannot be made more than three or four inches long without so weakening the portions of the plate between the said channels as to render them liable to be sprung out of place under the action of the superincumbent pulp. These channels have consequently been made of the above-mentioned length, and several series of them placed end to end in the same plate.

Owing to the nature of the milling-tool employed, the upper surfaces of the channels are curved from the under side of the plate toward the upper side, so that the said channels, near the upper surface of the plate, where sawed through to make the screening-slits, are much shorter than at the under side, and a considerable screenage-space is lost between each series of channels and slits.

We have discovered in our experiments in the construction of screen-plates that when the channels and slits are made longer than above described the portions of the plate between them become laterally displaced, making some of the slits wider than they should be, and wholly closing up others, but that there is no appreciable yielding in a downward direction under the weight of the superincumbent pulp.

Our invention, in accordance with this discovery, consists in making the milled channels several times longer than heretofore practiced, extending them entirely across the plate, if need be, and dividing the sawed slits longitudinally into a series of short slits (about the usual length) separated by a narrow portion of unslitted metal, which serves to bind the strips of metal between the slits and channels together, and prevent lateral displacement thereof. This small portion of metal between the bottom of the channel and upper surface of the plate performs the function of the portion formerly left between the adjacent series of channels, which extended from the under to the upper surface of the plate, and by the present plan the unslitted portion between the different series of slits is much shorter than formerly, and the screenage area consequently increased.

Figure 1 is a plan view of a screen-plate constructed in accordance with our invention; Fig. 2, an under-side view of a portion thereof on a larger scale; Fig. 3, a longitudinal section of Fig. 2, on a plane passing through the slits, the dotted lines indicating the form of cutting-tools and a plate as commonly constructed; and Fig. 4 is a transverse section thereof.

The plate *a* may be of any desired dimensions and material, it being shown as a section of a plate to be mounted in a holding-frame, as described in a former patent to us, No. 226,545, dated April 13, 1880.

The plate *a* is provided with a series of channels, *b*, formed by a suitable milling-tool, *c*, (see dotted lines, Fig. 3,) in its under portion, and extending nearly through to its upper surface, as shown. The upper portion of the plate is then cut through by a saw, *d*, (see dotted lines, Fig. 3,) forming a series of fine

slits, *e*, extending through from the upper surface of the plate into the channels *b*, formed by milling-tools. The ribs *f*, of the material of the plate that are left between the said channels *b*, serve as a support for the portions *i* of the upper part of the plate between the slits *e* in Fig. 1 and the pulp sustained thereon. It has been found in practice that when these channels *b* and slits *a* (one to each of the said channels *b*) are made above a certain length—say three or four inches—the portions *f i* of the plate between the said channels and slits are not sufficiently rigid, and become bent out of shape as the plate is used. The plates have consequently been milled and sawed, as shown in dotted lines, Fig. 3, making several series of the said channels, placed end to end, and leaving the metal at 2 untouched.

In a sectional plate of a size shown in the drawings there would have to be two such series of channels, in order to afford the requisite rigidity, and when the plate is not made in sections there would be several such series in its whole surface.

In our invention the channels *b* are made to extend from one to the other side of the plate; but the slits *e*, instead of extending the entire length of the channels, as before, only extend for a length about the same as that of the channels as formerly constructed, a portion of uncut metal, *m*, being left between the different slits *e*, that correspond to each one of the channels *b*. By this method of construction the ribs *f* between the channels are found to be sufficiently strong to properly support the overlying strip *i* of the upper portion of the plate and the pulp thereon, while the uncut portions *m* of the upper part of the plate prevent the lateral yielding or displacement of the strips *f i*, which would take place if the slits *e* extended the entire length of the channels *b* when extended entirely across the plate, as described, and the said strips *f i* were rigidly held only at the end of the said channels.

As the effective length of a slit, *e*, for screenage is only the distance between the points 3 when the saw-cut intersects the channel made by the milling-tool, it will be seen, referring to Fig. 3, that the said length is considerably increased by the removal of the metal at 2, which, by the former methods, was deemed necessary to perfectly sustain the strips *i*.

In large plates it may not always be desirable to extend the channels wholly across the plate; but two or three or any desired number of series may be employed without departing from our invention, the said channels being longer than usual, and each connected with two or more slits separated by a portion of unsawed metal.

We claim—

1. As an improved article of manufacture, a screen-plate provided with a series of channels, *b*, extending wholly across and into the said plate, from its under to its upper surface, and with two or more sawed slits extending from the upper surface of the plate through into each of the said channels, a portion of metal being left unsawed between the different slits in connection with one and the same channel, substantially as and for the purpose set forth.

2. In a screen-plate, the channels *b*, extending in from one surface thereof, and two or more sawed slits, *e*, extended through from the other surface of the plate into each of the said channels *b*, combined with the unsawed portions *m* of the said plate between each pair of slits and the corresponding channel, whereby the strips of metal left between the adjacent parallel channels and slits are prevented from yielding laterally to open some of the said slits and close others, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES PINDER.
WM. A. HARDY.

Witnesses:
E. B. ROCKWOOD,
JOS. P. LIVERMORE.