# M. MATHEWS.

## Machine for Watermarking Paper.

No. 166,122. Patented July 27, 1875.

Fig 1.

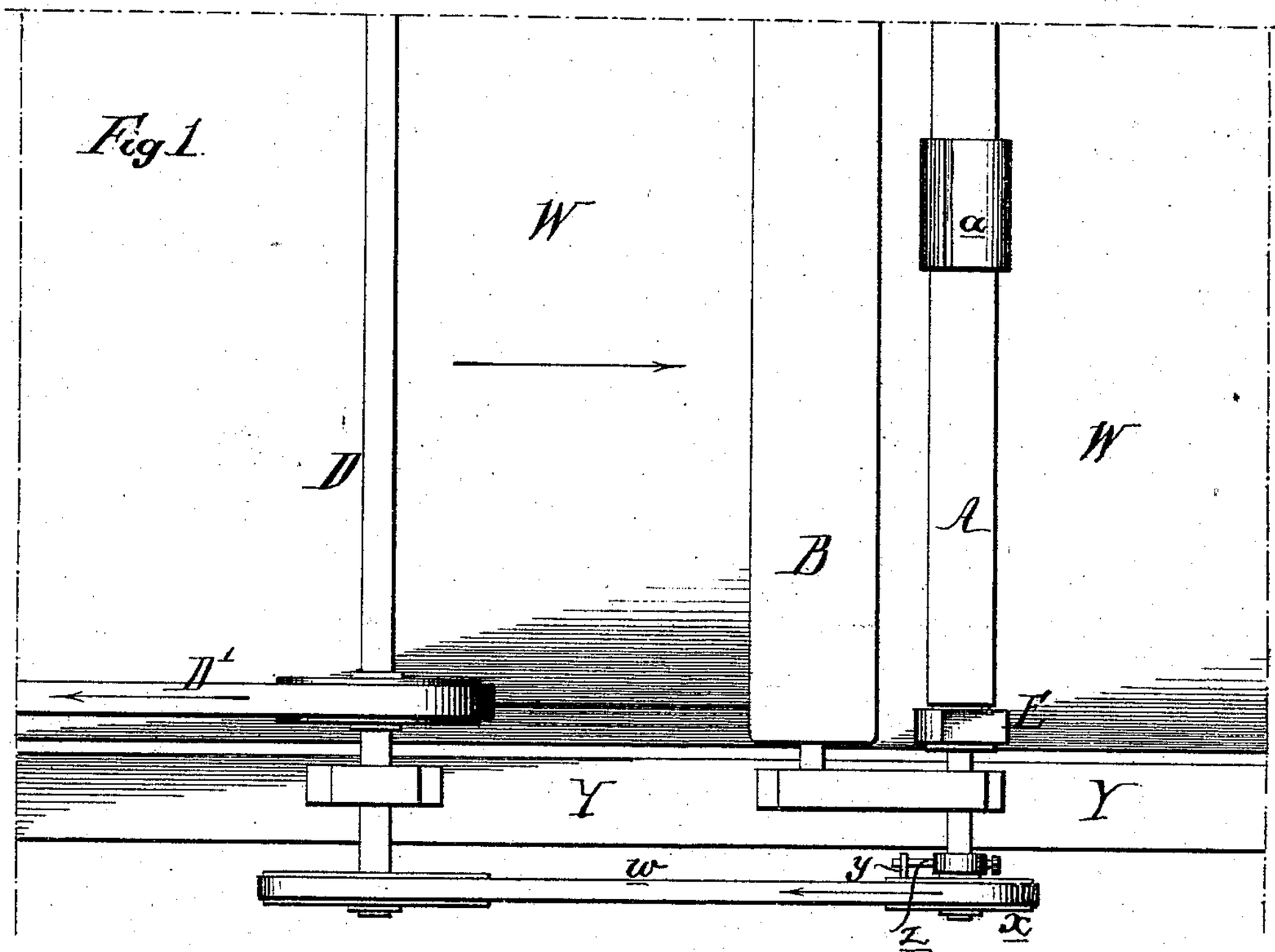



Fig 2.

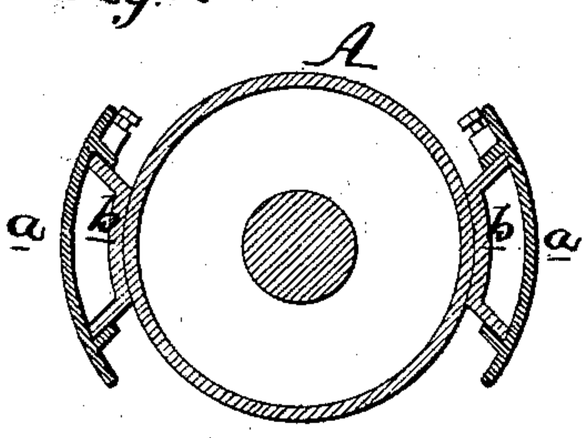



Fig 3.

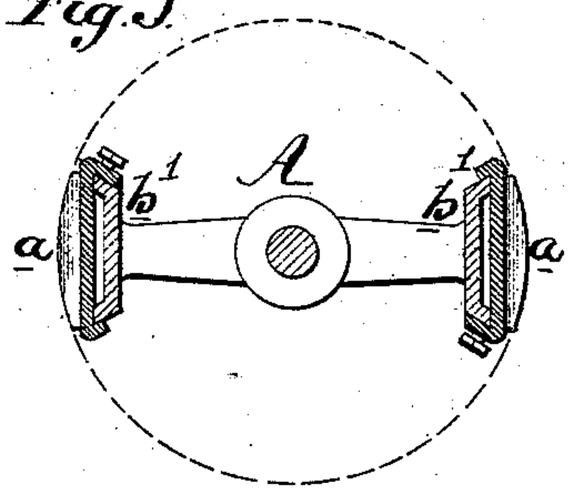
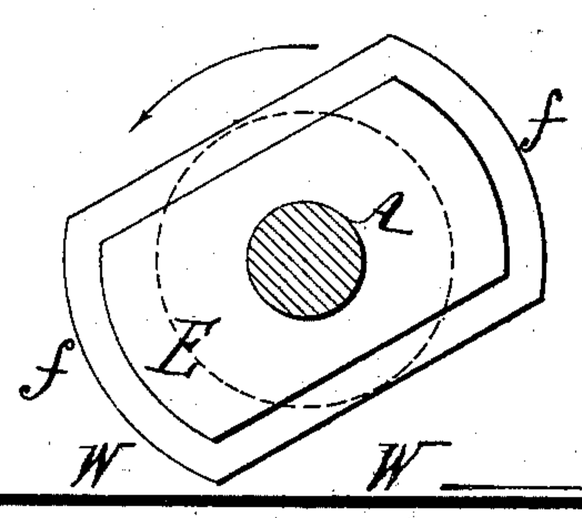



Fig 4




Witnesses,
Harry Smith
Hubert Howson

Mathew Mathews,
by his Attorneys
Howson and Howson

# UNITED STATES PATENT OFFICE.

MATHEW MATHEWS, OF SAGGART, IRELAND.

## IMPROVEMENT IN MACHINES FOR WATER-MARKING PAPER.

Specification forming part of Letters Patent No. **166,122**, dated July 27, 1875; application filed February 21, 1874.

*To all whom it may concern:*

Be it known that I, MATHEW MATHEWS, of Saggart, county of Dublin, Ireland, have invented certain Improvements in Apparatus for Water-Marking Paper, of which the following is a specification:

The object of my invention is to so construct the water-marking appliances of paper-making machines as to insure the rotation of the marking-roll at the same surface speed as the wire-cloth while the water-mark is being imparted to the paper. This object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a plan view of part of a paper-making machine with my improvements attached. Figs. 2 and 3 are enlarged sectional views, showing modes of attaching the design-plate to the skeleton-roll; and Fig. 4, an enlarged view of part of my invention.

The usual method of making the water-marking device is to form it of wire and sew it on the dandy-roller; but this necessitates a separate roller for each design, and it will be evident that in large manufactories the cost and bulkiness of the many rolls required is a serious objection.

On this account I prefer to employ, in conjunction with a plain dandy-roll, B, a skeleton-roll, A, to which marking-plates are attached, as shown in Figs. 2 and 3. These rolls turn in suitable bearings in the frame Y of the machine, and the roll A I prefer to operate from the deckle-shaft D, through the medium of a belt, *w*, passing over a loose pulley, *x*, on the end of the said roll A. A pin, *y*, on the pulley *x* bears against a stud, *z*, keyed on the end of the skeleton-roll, which is thus rotated during the operation of the machine. The plates *a* bearing the water-marking design are made in the arc of a circle of the proper diameter, and attached to the flanges *b* of the skeleton-roll A, so as to be readily detachable therefrom, as shown in Fig. 2. In the modification, Fig. 3, the plates are made straight and attached to flanges on the arms *b* of the roll, the surface of the design or lettering being rounded off to the proper curve. A rubber-covered segment, E, the diameter of the rounded portions *f*, of which is the same as the marking-plates on the roll, is placed on each end of the said roll over the edge of the wire-cloth, for a purpose described hereafter.

As the paper-pulp is carried on the wire-cloth in the direction of the arrow, Fig. 1, after leaving the deckle-straps D′ it passes beneath the plain dandy-roll B, where some of its moisture is pressed out, after which it is water-marked by the plate *a* on the skeleton-roll, and thence it passes to the couching-rolls. The diameter of the loose pulley *x* is made proportionate to the size of the proposed sheet of paper, so that the water-marker may be brought round at the proper moment through the medium of the pin *y* and stud *z*. In case the pulley *x* should not operate the roll A at the same speed as the surface speed of the wire-cloth, I arrange the rounded portion *f* of the segment E on a line with the marking-plate *a*, so that from the moment the said portion *f* comes in contact with the wire-cloth W, Fig. 4, the roll must move at the same surface speed as the said wire-cloth. When the said rounded portion of the segment passes out of contact with the wire-cloth, the roll A ceases to move until the loose pulley *x* brings the pin *y* again in contact with the pin *z*. Thus the marking-plate *a* is caused to rotate at the same surface speed as the wire-cloth during the formation of the water-mark, while, at the same time, the marking-plate is brought round at the proper moment to correspond with the size of the sheet to be made.

I claim as my invention—

The segments E on the skeleton-roll, and having rounded portions *f* on line with the marking-plates *a*, in combination with the wire-cloth W, whereby the said plates *a* are caused to move at exactly the same surface speed as the said wire-cloth during the formation of the water-mark.

MATHEW MATHEWS.

In presence of—
THOMAS MURPHY,
J. NODHEN.