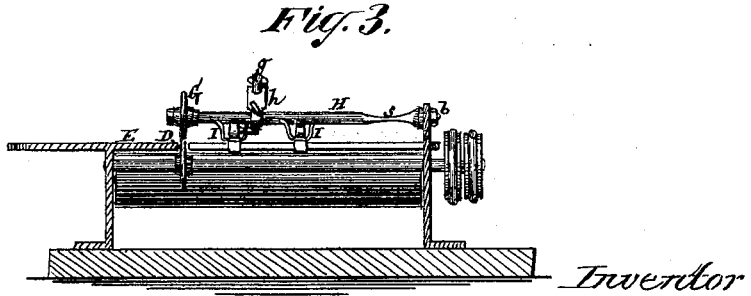
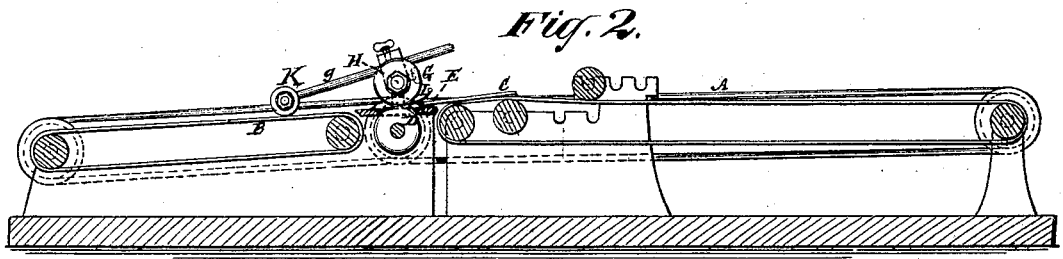
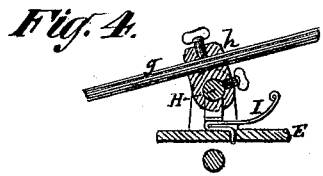
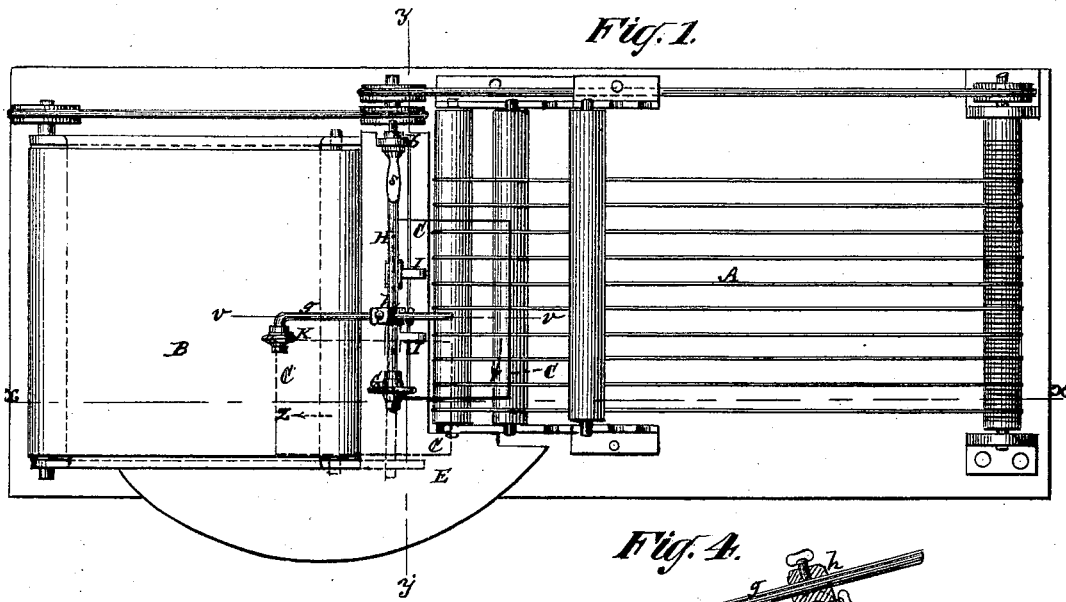


J. McADAMS.  
Paper-Ruling Machines.

No. 200,553.

Patented Feb. 19, 1878.



*Witnesses*  
John Becker  
J. H. Haines

*Inventor*  
John Mc Adams  
by his Attorneys  
Brown & Allen

# UNITED STATES PATENT OFFICE.

JOHN McADAMS, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN PAPER-RULING MACHINES.

Specification forming part of Letters Patent No. **200,553**, dated February 19, 1878; application filed August 20, 1877.

*To all whom it may concern:*

Be it known that I, JOHN McADAMS, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements on Means for Turning Paper in Ruling-Machines, of which the following is a description, reference being had to the accompanying drawing, forming part of this specification.

This invention relates to means for shifting or turning paper in ruling-machines to effect a cross-ruling of the paper as the latter passes through the ruling-machine; and the invention consists in certain novel combinations of devices, whereby the paper, after it has been ruled by one set of pens with parallel lines running in one direction, is passed by a conveyer to the turning devices, which operate to give to the paper upon the surface on which it rests a quarter-turn, so that said paper, on having its feed continued in the same direction as before, may be ruled by a second set of pens in rear of the former pens, with lines crossing at right angles to the lines with which it was previously ruled.

Figure 1 represents a plan of the paper conveying and turning devices of a ruling-machine having my invention applied. Fig. 2 is a longitudinal vertical section of the same on the line *x*, and Fig. 3 a transverse section thereof on the line *y y*. Fig. 4 is a detail section on the line *v v*.

A represents the primary endless-string conveyer or carrying device, the upper surface of which moves as indicated by the arrow *z*, and which serves to convey the paper, after it has been ruled in one direction by one set of pens, to the turning devices, which give the paper a quarter-turn between said carrying device A and an endless apron, B, which moves in the same direction as the conveyer A, and delivers the paper to a string or other carrying device that takes it to the next set of pens, which rule the paper in a direction transverse to the former ruling. In this way or by these means the motion of the paper is not changed for ruling it with lines at right angles to each other, and the two sets of pens for ruling at right angles may be arranged one in front of the other; but the paper itself is simply or bodily turned between ruling it in one direction and ruling it at right angles thereto.

The means for thus turning the paper C between the carrying device A and the endless apron B are substantially as follows: D is an under-driven roller or wheel, arranged to revolve, as regards the upper portion of its periphery, in the same direction as the feed by the string conveyer A, at one side and in rear of which latter it is situated, and caused to slightly project through a table-surface, E, between the string conveyer A and apron B. Above this wheel D is a loose upper roller or wheel, G, between which and the under wheel or roller D the paper C is introduced by the conveyer A, in order that said paper may be turned, through the hold upon its one side by the wheels D and G, from the position shown for it by full lines in Fig. 1 to that shown for it by dotted lines in the same figure, said wheels D and G operating in connection with suitable retarding or checking devices, as hereinafter described.

The loose wheel G is fitted to turn upon an elastic shaft, H, arranged over the shaft which carries the driven lower wheel D, and rigidly secured at its end *b*, which is farthest from the wheel G. This elastic construction of the shaft H provides for a yielding and self-adjusting gripe or hold of the wheels D and G on the paper.

As these wheels D and G receive from the string conveyer A the forward edge of the paper C at its one side in between them, said paper is restrained from getting out of line, and from being projected through said wheels before being turned, by its front edge coming into contact with or entering beneath one or more retarders or checking devices, I, on the inner side of the wheel G at a greater or less distance from the latter. Said retarders are constructed with a bent or curved arm, which overlaps the front edge of the sheet as it is entered beneath them, and are furthermore constructed to clip or receive within their upper ends or portions the elastic shaft H, which thus gives to them an easy or yielding action.

By the rotation of the lower wheel D and elastic gripe of the upper wheel G on the forward edge of the sheet at its one side, subject to the arresting action of the retarders or checking devices I, the sheet or paper is bodily turned by the wheels D and G for one-quarter

of a turn, or thereabout, on or over the table-surface E, conveyer A, and apron B, onto which latter it is fed by the wheels D G. Such turning action on the paper by the wheels D G carries the forward edge of the sheet from under the retarders I as said wheels commence to turn the sheet, and after the sheet has been turned and fed by the wheels D G onto the apron B the impetus given to it in turning is or may be arrested by a roller or other stop, K, to keep the inner edge of the sheet in line with the feed of the paper by said apron. This stop K is carried by an arm, *g*, adjustable through a socket, *h*, which, in its turn, is adjustable along, and capable of being secured by set-screw on, the elastic shaft H, that not only serves to bear the wheel G on the paper between said wheel and the wheel D, but also has a torsional elasticity by constructing it with a flattened portion, *s*, whereby the stop K is kept down on the apron B.

By employing a close apron, B, instead of a string conveyer to catch and convey the sheet after it has been turned, the edges of the paper or sheet are prevented from catching while being turned, and a bearing-surface is provided for the stop-roller K.

I claim—

1. The combination, with the endless conveyers A and B, of the laterally and intermediately disposed wheels or rollers D G, and

one or more paper retarding or checking devices arranged to one side of said wheels or rollers, and constructed to stop or hold the sheet at its forward edge while being turned by the wheels or rollers D G, substantially as specified.

2. The elastic shaft H and its loose wheel or roller G, in combination with the wheel or roller D, having a positive motion, the conveyer A, near one side and in rear of which said wheels or rollers are arranged, and one or more paper retarding or checking devices, I, arranged to one side of the wheels or rollers D G, and constructed to stop or hold the sheet at its forward edge while being turned by said wheels or rollers, essentially as and for the purpose herein set forth.

3. The combination, with the elastic shaft H and the wheels or rollers D and G, of one or more paper retarding or checking devices, I, arranged to one side of said wheels or rollers, and constructed to stop or hold the sheet at its forward edge while being turned, substantially as specified.

4. The stop K, in combination with the wheels or rollers D G, essentially as described.

JOHN McADAMS.

Witnesses:

HENRY T. BROWN,  
FRED. HAYNES.