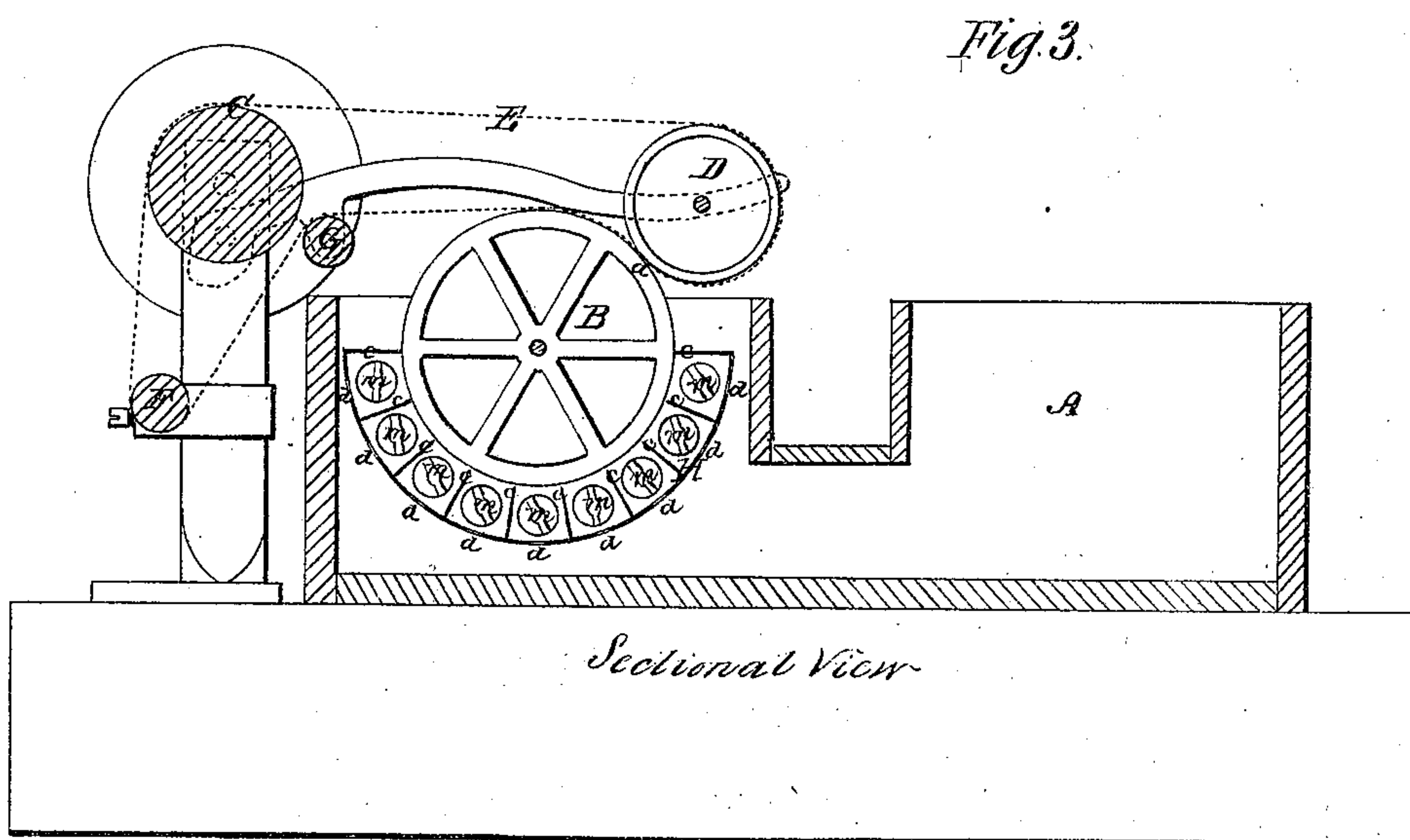
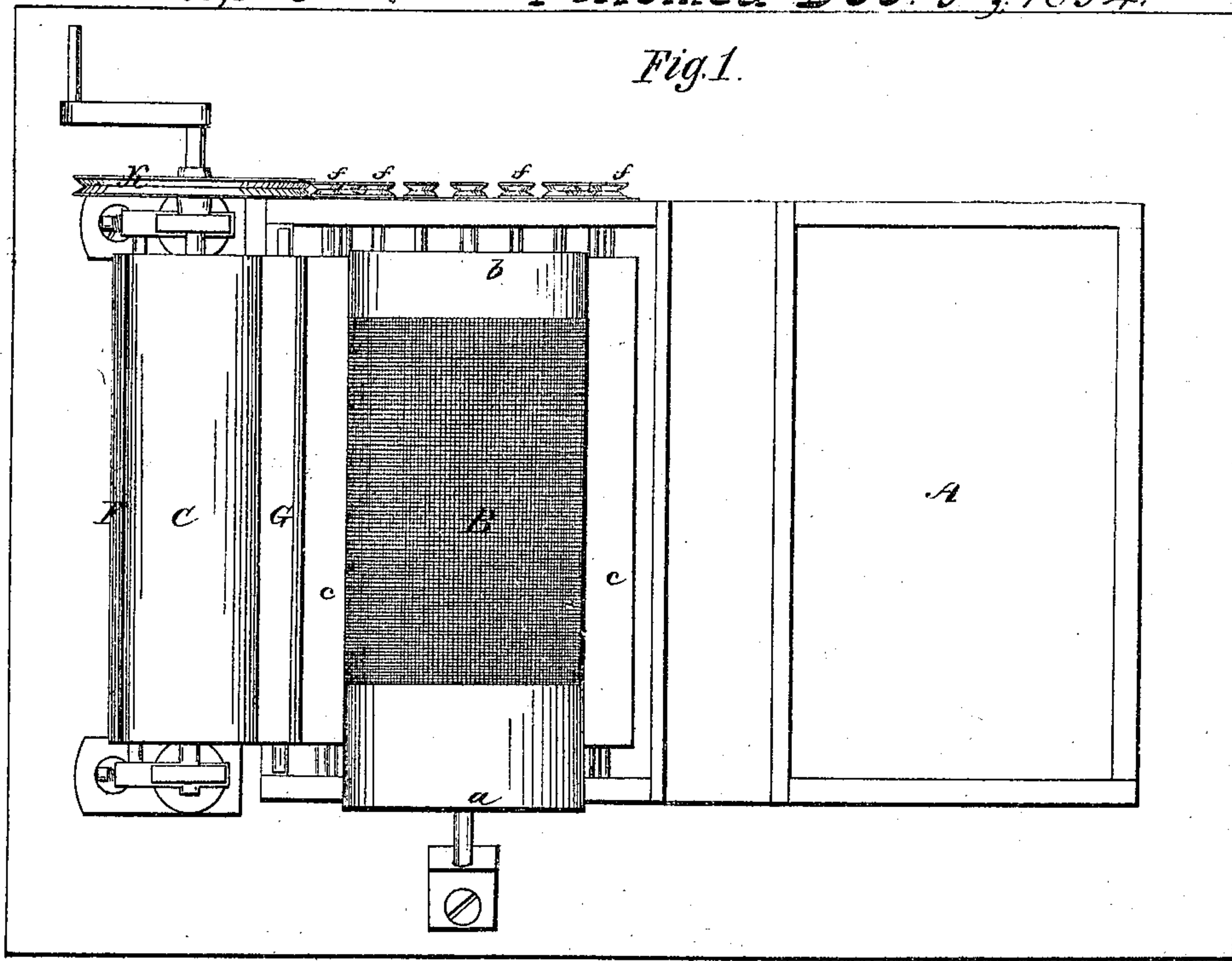


O. Marland. Sheet 1. 2 Sheets.  
 Paper Mach.

N<sup>o</sup> 12,028. Patented Dec. 5, 1854.

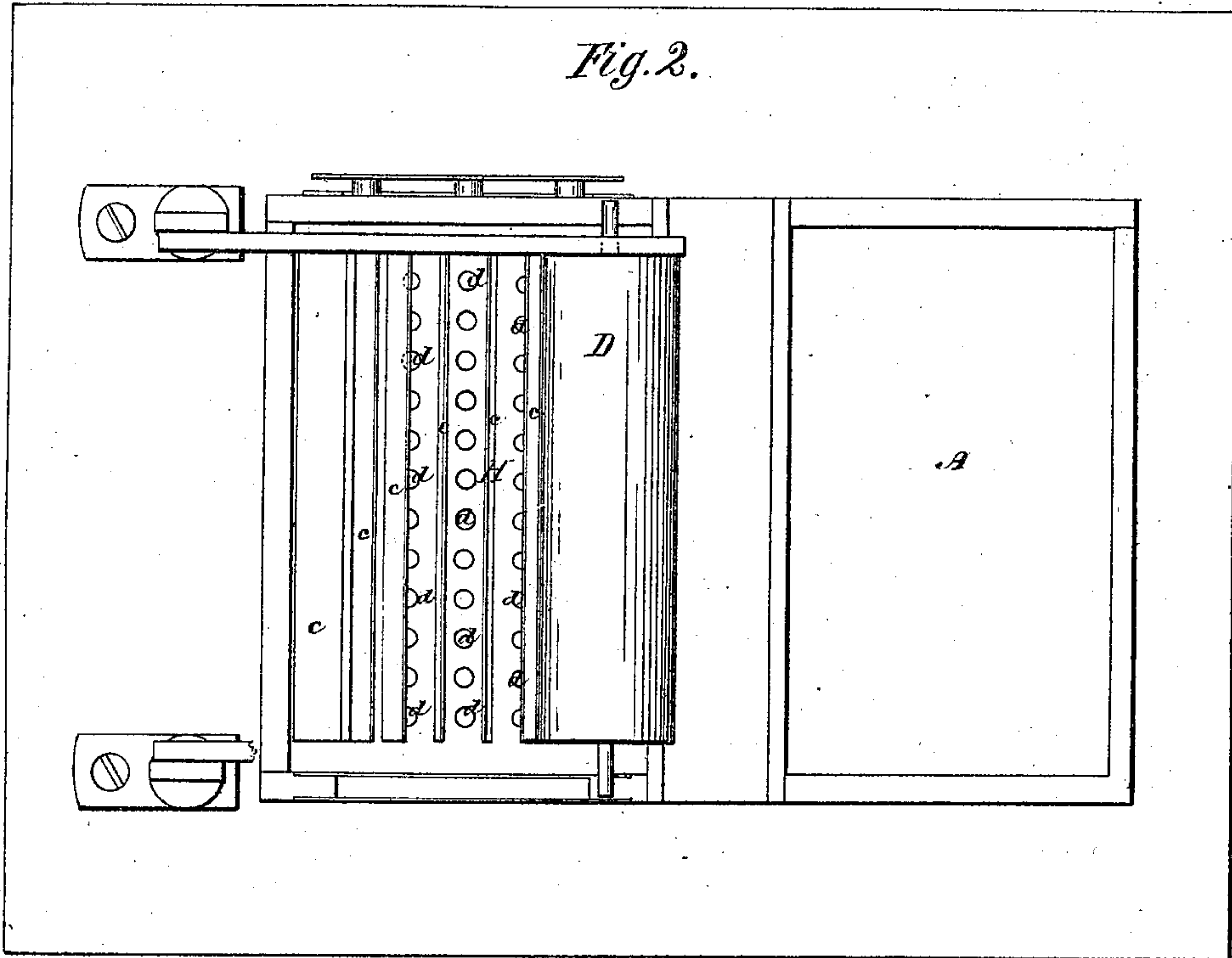


*O. Marland. Sheet 2 of 2 Sheets*  
*Paper Mach.*

*N<sup>o</sup> 12,028.*

*Patented Dec. 5, 1854.*

*Fig. 2.*



*Fig. 4.*





# UNITED STATES PATENT OFFICE.

OBADIAH MARLAND, OF BOSTON, MASSACHUSETTS.

## PAPER-MAKING MACHINE.

Specification of Letters Patent No. 12,028, dated December 5, 1854.

*To all whom it may concern:*

Be it known that I, OBADIAH MARLAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and  
5 useful Improvement in Cylinder-Paper Machines, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

10 Figure 1 is a plan of a Cylinder Machine with my improvement attached, the felt cloth and couch roll being removed to show the parts beneath. Fig. 2 a plan with certain other parts removed, Fig. 3 a longitudinal  
15 section through the machine, and Fig. 4 a view of one of the spiral conveyers detached.

My invention has for its object the remedying of the well known defects of cylinder  
20 made paper, by interlacing and interweaving the fibers of the pulp as they are laid upon the surface of the cylinder mold. This I accomplish by producing currents and counter currents within the vat by means  
25 of spiral revolving conveyers, in a manner which will now be described.

A is the vat; B, the cylinder mold, which is constructed and operated as in ordinary cylinder paper machines.

30 D is the couch roll; E, the felt cloth which passes over the roll C, beneath the felt stretcher F, and over the carrier roll G. The paper leaves the cylinder at the point *a*.

H is a metallic shell which surrounds the  
35 cylinder mold within the vat; this shell is divided into a number of compartments by the longitudinal partitions *c*. These compartments are open at each end and also communicate with the vat through numerous  
40 holes *d*, made through the exterior of the shell; in each of the compartments of the shell H is a spiral conveyer *m*, seen detached in Fig. 4, these conveyers are revolved alternately in one direction and the other for the  
45 purpose of producing currents and counter currents of the pulp along the surface of the cylinder; the shafts of these conveyers pass through stuffing boxes in the sides of

the vat and carry at their extremities, the pulleys *f* around which passes a cord from  
50 the driving pulley K, the cord passing above one pulley, and beneath the next through the series, by which means the conveyers are rotated alternately in opposite directions as  
55 already explained.

It is well known that the fibers of the pulp in an ordinary cylinder paper machine, or a great majority of them, are laid longitudinally and parallel to each other by the  
60 uniform and uninterrupted motion of the cylinder in one direction. This disposition of the fibers causes the paper, though strong in one direction, to be quite weak longitudinally. It is evident however that where the  
65 above described method is employed the fibers first laid upon the cylinder will be inclined in one direction by the first revolving conveyer; this layer is immediately  
70 succeeded by another, the fibers of which form a certain angle with the first, this angle being dependent upon the relative velocities of the surface of the revolving cylinder mold, and of the current produced in the  
75 pulp by the revolving conveyers. These layers are again covered by others, the fibers of each layer crossing those of the layer beneath it. An exceedingly firm texture is  
80 thus produced, and I am enabled to secure all the advantages attendant upon the use of both cylinder and Fourdrinier machines, without their disadvantages.

Claim—

What I claim as my invention and desire to secure by Letters Patent is—

Producing, within the vat of a cylinder  
85 paper making machine, currents and counter currents of the pulp, parallel or nearly so to the axis of the cylinder, by the use of spiral conveyers operating within the partition  
90 shell H or by means of their mechanical equivalents as described.

OBADIAH MARLAND.

Witnesses:

SAM. COOPER,  
JOHN S. CLOW.