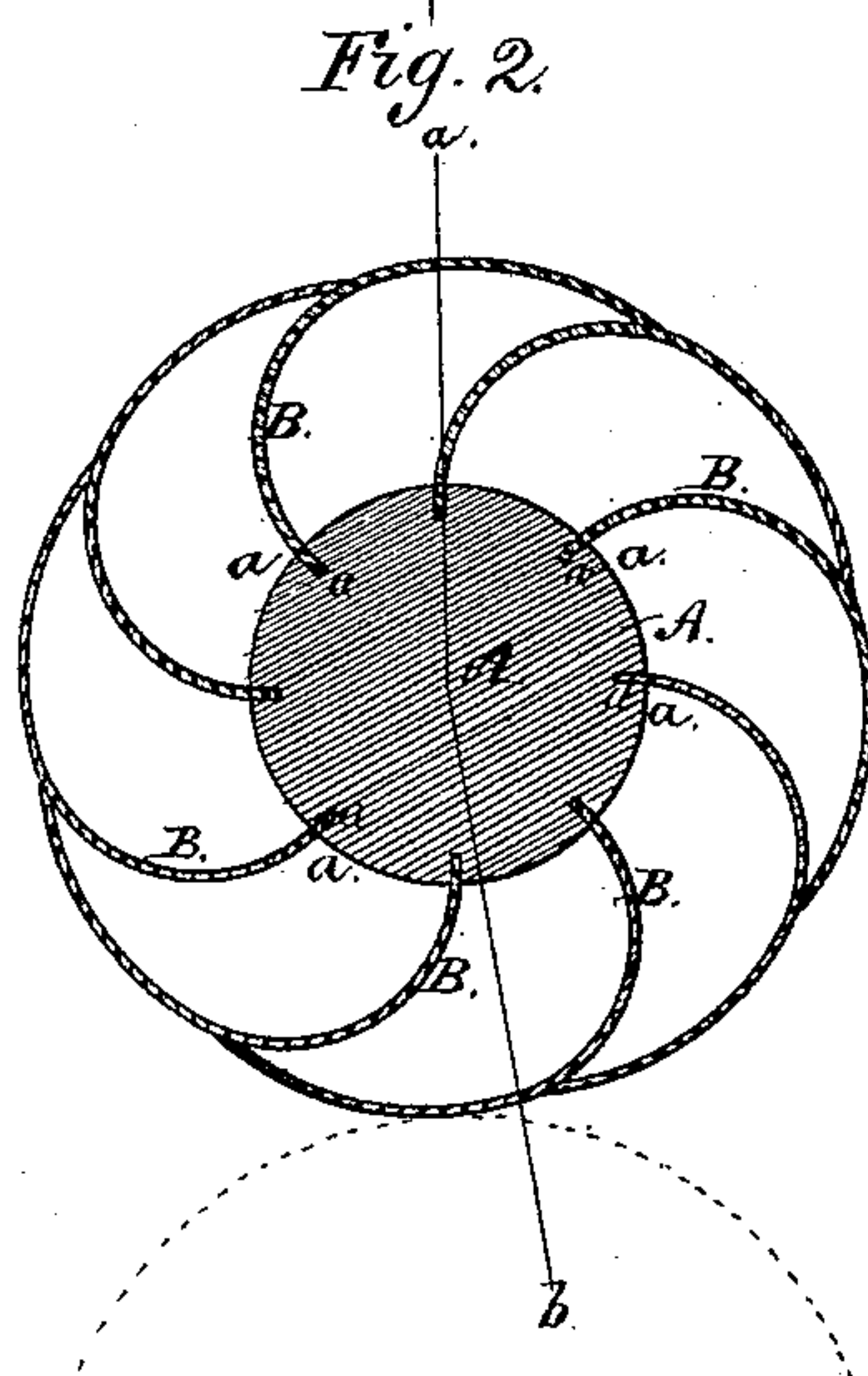
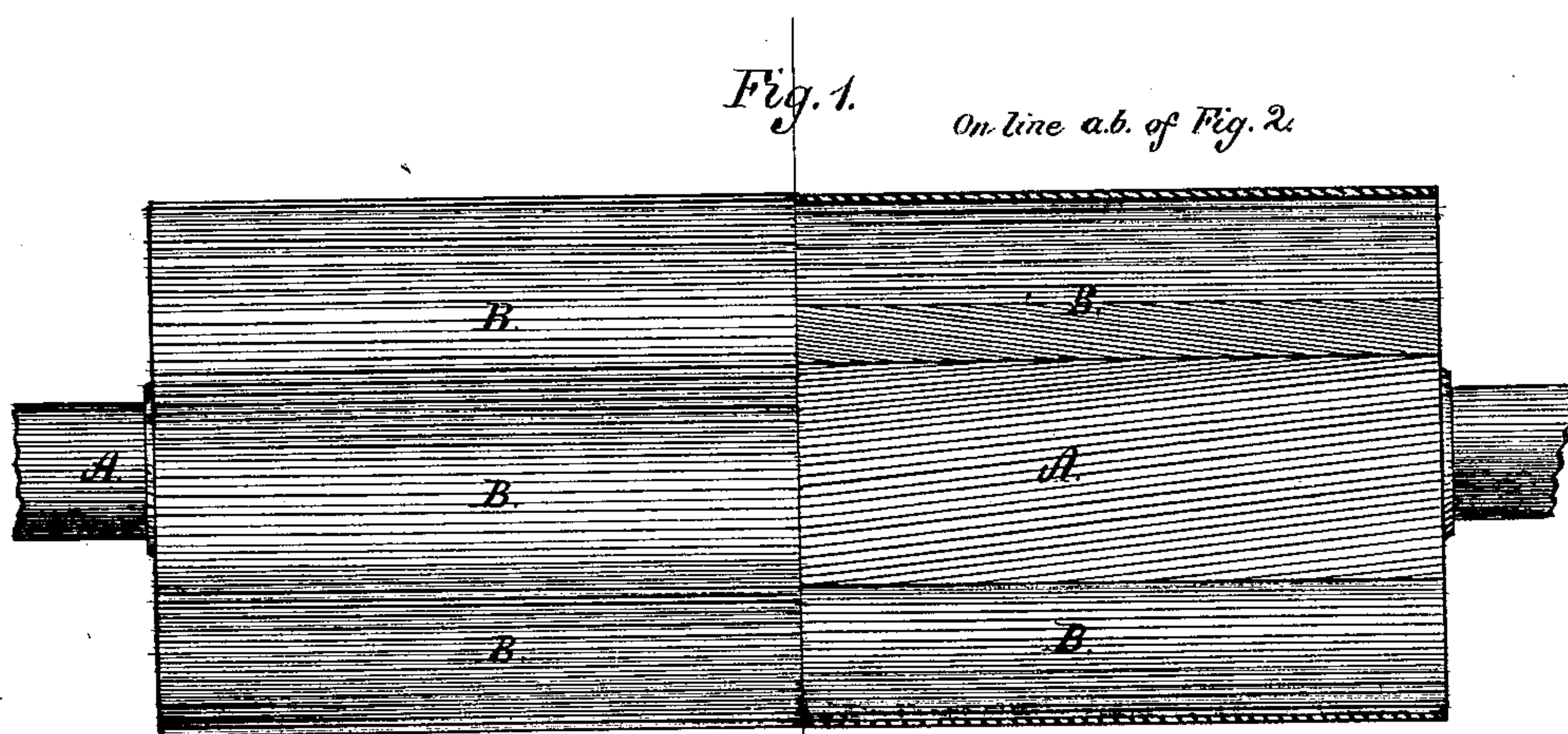


P. COBURN.  
MACHINERY FOR CALENDERING AND POLISHING PAPER.  
No. 103,569. Patented May 31, 1870.



*Witnesses,*  
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# United States Patent Office.

PHINEHAS COBURN, OF EAST WALPOLE, MASSACHUSETTS.

Letters Patent No. 103,569, dated May 31, 1870.

## IMPROVEMENT IN MACHINERY FOR CALENDERING AND POLISHING PAPER.

The Schedule referred to in these Letters Patent and making part of the same.

To all to whom these presents shall come:

Be it known that I, PHINEHAS COBURN, of East Walpole, in the county of Norfolk and Commonwealth of Massachusetts, have made an invention of a novel and useful Improvement in Paper-Machinery; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawing making part of this specification, and in which—

Figure 1 is a front elevation, part section, and

Figure 2, a transverse section of a "calender-roll," so-called, embodying my improvement.

This improvement relates to that portion of paper-making machinery which polishes or glazes the surface of the paper, as well as condenses its bulk.

Heretofore this result has been effected by passing the paper, either in a continuous strip, as manufactured upon the machine, or in sheets, between revolving cylinders under pressure, the surface of these cylinders being in some instances composed of cast-iron, and in others of paper coiled edgewise about a shaft or body, these latter being very costly.

The periphery of these rolls or "calenders," as they are technically termed, soon becomes indented and scored or abraded to such an extent as to injure or disfigure the surface of the paper, and requires to be often removed, placed in a lathe, and turned off to a smooth surface.

The object of my present improvement, as herein embodied, is to produce a "calender" or polishing-roll which, while imparting a brilliant polish and hard surface to the paper, shall possess the qualities of comparative cheapness and durability and requiring little, if any care.

This invention consists in the employment of a series of long, thin steel plates of equal size, fixed at one edge, and at regular intervals, to the periphery of a metallic shaft, parallel throughout to the axis of the latter, and departing therefrom at a curved tangent, the width of these plates, and the nature of the curve described by each, being such that they intersect each other, and constitute in aggregate a continuous elastic or yielding surface or polishing circumference.

The accompanying drawing represents, at A, a straight cylindrical metallic shaft.

Within the periphery of this shaft, from end to end thereof, or substantially so, and extending entirely about the same, I cut a series of saw-kerfs or channels *a a*, &c., such channels being disposed at equal distances asunder, and in parallelism with each other, and in alignment with the axis of the shaft.

B B, &c., denote a series of long, thin, rectangular steel plates of like size and form, and of equal number with the channels *a a*, &c., one edge of such plates extending into one of the said channels *a a*, until each is supplied, the plates being secured therein by mechanical means, if considered necessary or judicious.

As before premised, the plates or wings B B, &c., depart or emanate from the shaft A at such a curved tangent thereto as to intersect and overlap one another at a very acute angle, by this means producing a practically continuous surface or circumference, which possesses inherent elastic properties, owing to the sliding of the free end of one plate upon the curved body of its neighbor, when subjected to torsive or radial strain.

In use the above-described roll revolves in contact with or in the neighborhood of a stationary bed or another roll, whether of like character or of a solid and inelastic nature, the paper to be polished or glazed being passed between the two.

Should hard foreign substances find access between the two rolls, as now often occurs, to great damage of the "calender" roll, the elastic or yielding nature of my roll allows them to pass through without injury to the latter, thus securing one very important advantage over others in use.

A second advantage of my roll, as herein described, will be found in the fact that its circumferential steel plates may be hardened, thus not only producing a more effective polishing-surface to act upon the paper, but rendering the plate very durable.

Third, in addition to the advantageous surface acquired by the hardening of the plates B B, the peculiar drawing motion exerted by them upon the paper has the effect of imparting, with comparatively little pressure, a very brilliant and hard polish to the surface of the latter.

Having thus described the nature, uses, and advantages of my invention, and the manner in which the same is to be practically carried out,

I claim as my invention, and desire to secure by Letters Patent of the United States, the following, to wit:

### Claims.

1. A metallic "calender" roll, for polishing or glazing paper, the periphery of which is elastic or yielding, for purposes herein stated.
2. A "calender" roll, for polishing or glazing paper, composed of an axial shaft or body and series of curved tangential plates or wings, emanating therefrom in such manner as to overlap each other, and produce a practically continuous surface, whereby I produce results herein set forth.
3. A "calender" or polishing roll for paper machinery, composed of a central shaft or body and a series of hardened steel wings or tangential plates, substantially as and for the purpose herein shown and described.

PHINEHAS COBURN.

Witnesses:

H. E. COBURN,  
G. N. COBURN.