2 Sheets—Sheet 1.

F. W. BIRD.

PAPER CALENDERING-MACHINE.

No. 187,586. Patented Feb. 20, 1877.

Fig. 1.

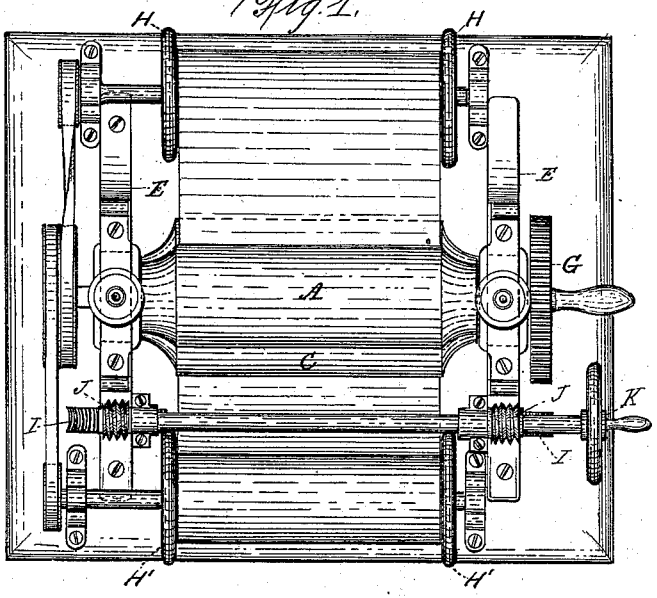
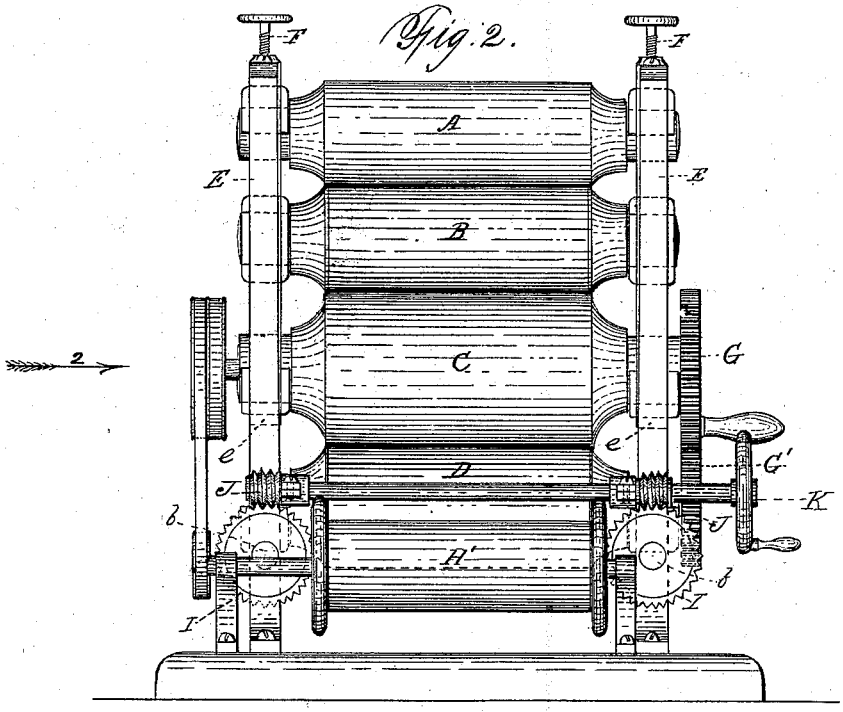


Fig. 2.



WITNESSES;

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2 Sheets—Sheet 2.

F. W. BIRD.

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Fig. 3.

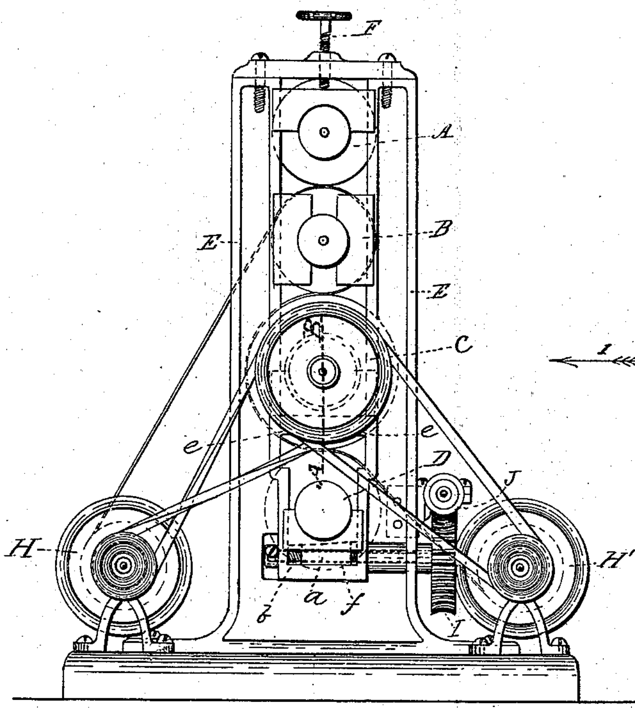
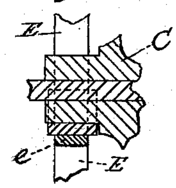


Fig. 4.



WITNESSES;

G. F. Place,
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INVENTOR;

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UNITED STATES PATENT OFFICE.

FRANCIS W. BIRD, OF EAST WALPOLE, MASSACHUSETTS.

IMPROVEMENT IN PAPER-CALENDERING MACHINES.

Specification forming part of Letters Patent No. **187,586**, dated February 20, 1877; application filed September 22, 1876.

To all whom it may concern:

Be it known that I, FRANCIS W. BIRD, of East Walpole, county of Norfolk, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Paper-Calendering Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and the letters of reference marked thereon, forming a part of this specification, and in which—

Figure 1 represents a top or plan view of my improved paper-calendering machine. Fig. 2 represents a side view of the machine, looking in direction of arrow 1, Fig. 3. Fig. 3 represents an end view, looking in direction of arrow 2, Fig. 2; and Fig. 4 represents a section, on line A B, Fig. 3, of one end of a portion of the machine, as will be hereafter explained.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe my invention more in detail.

In the drawings I have represented a stack of four calender-rolls, A, B, C, and D, supported in suitable stands E E. The rolls A, B, and D are of chilled iron, or can be made of any other metal which may be preferred for any special use. Roll C is of paper, or of any other desirable material, and is supported by bearings *e e* at each end, attached to the stands E E, as shown in section in Fig. 4 of the drawings, and the pressure upon this, in connection with the two upper rolls, is produced by screws F F, or by levers, or in any other desirable manner. The bottom roll, D, is the friction-roll; and, being connected with roll C by gears G G′, is run faster than roll C, and thus produces the desired polish by friction. The bearings of the friction-roll D rest upon wedge-shaped blocks *a a*, one at each end. These blocks rest upon stands E at *f*, and are operated by screws *b*, which pass through them, and slide them backward and forward, so as to produce the amount of pressure and friction desired; or the same result may be produced by means of levers, or in any other suitable way. H and H′ are paper-reels.

The paper to be calendered is run from reel H between rolls A and B; thence between rolls B and C, thence between roll C and friction-roll D, and wound up on paper-reel H. Or, this stack of calender-rolls may be attached to the paper-machine, and the polishing process be accomplished without first being reeled.

The spindles *b b* are provided with worm-gears I I, which can be operated, by means of worm-gears J J upon shaft K, when friction-roll D is to be adjusted up or down, to increase or decrease the friction.

Having described my improvement in paper-calendering machines, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

The combination, with a stack of paper-calendering rolls, two or more high, of the friction and polishing roll D, arranged upon separate and independent bearings from the other rolls, and beneath them, and driven at a different speed from the other rolls, and also having combined therewith mechanism, substantially as described, for adjusting roll D at the will of the operator, while the machine is in operation, as and for the purposes set forth.

FRANCIS W. BIRD.

Witnesses:

G. H. PLACE,

GARRET SCHENCK.