

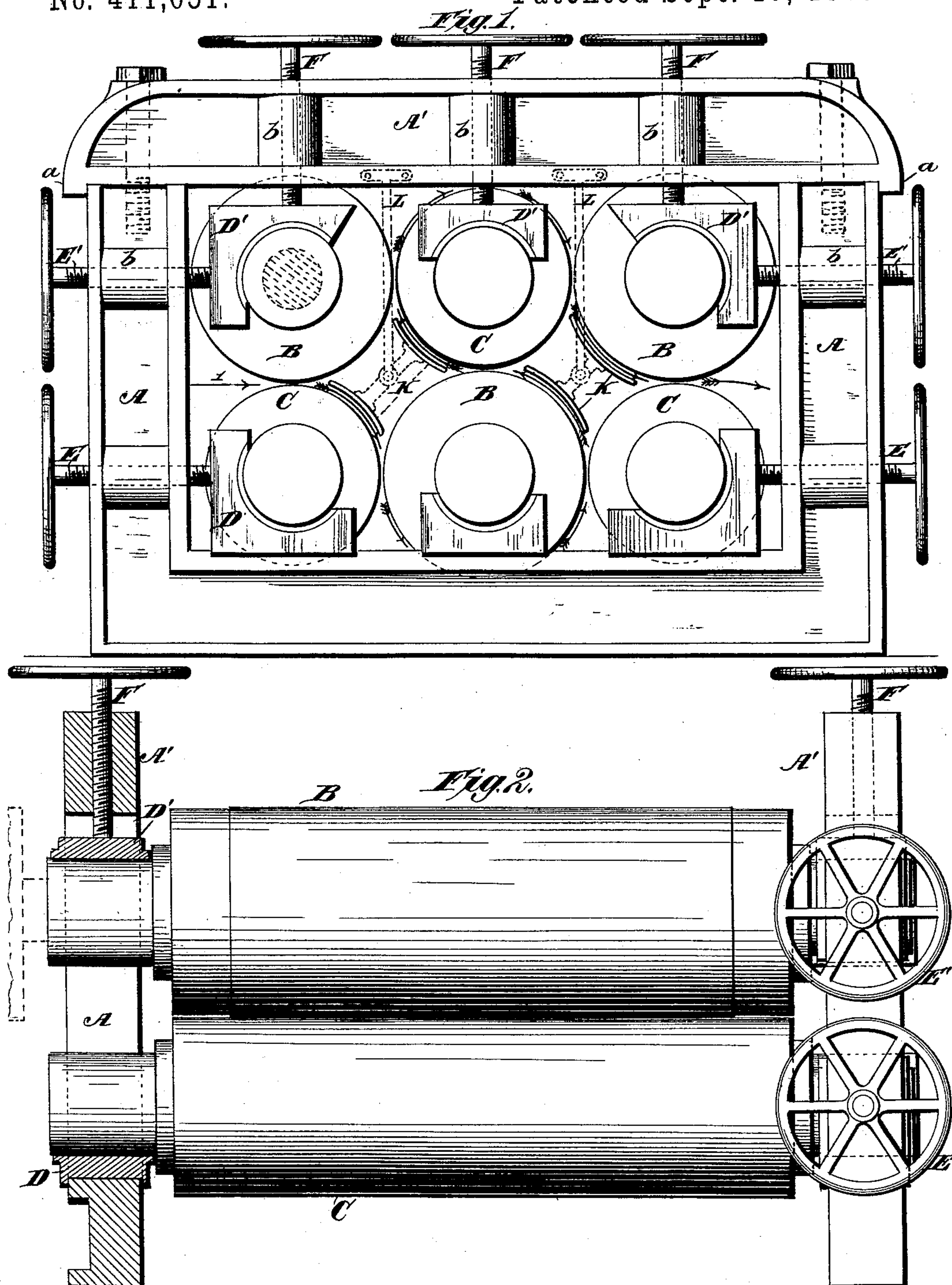
(No Model.)

2 Sheets—Sheet 1.

J. McLAUGHLIN.
PAPER CALENDERING MACHINE.

No. 411,051.

Patented Sept. 17, 1889.



Witnesses,
Phil G. Matt.
Edgar Henderson.

Inventor,
John McLaughlin,
By
Edgar Henderson *Att'y.*

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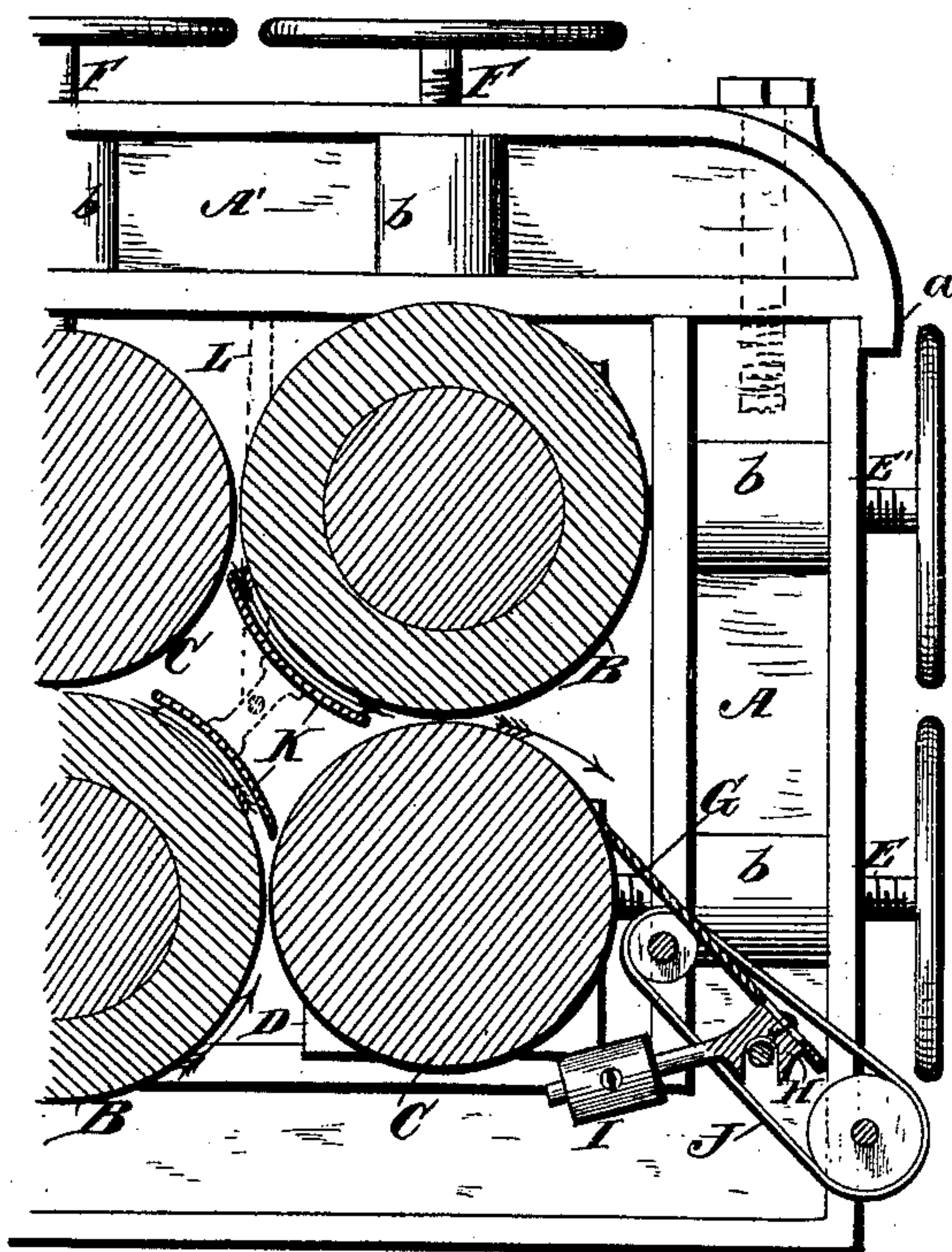
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Fig. 3.



Witnesses.
Robert Emmett,
Edgar Henderson.

Inventor:
John M. Laughlin,
By
Edgar Henderson,
Atty.

UNITED STATES PATENT OFFICE.

JOHN McLAUGHLIN, OF LEE, MASSACHUSETTS.

PAPER-CALENDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 411,051, dated September 17, 1889.

Application filed July 13, 1888. Serial No. 279,874. (No model.)

To all whom it may concern:

Be it known that I, JOHN McLAUGHLIN, a citizen of the United States, residing at Lee, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Paper-Calendering Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to paper-making machines, more particularly to calendering-machines, and has for its object to so construct the machine and combine its rolls that the paper can pass between them in such a manner as to receive at least four "nips" in its travel between them. Under my arrangement of the rolls and manner of passing the paper between them, if six rolls be employed there will be seven nips on the paper; if eight rolls be employed, ten nips, and so on as the number of rolls employed may be greater.

Heretofore the rolls have generally been arranged one above the other in an upright frame, so that if there were employed five rolls there would be only four nips on the paper, or, in other words, there would always be one nip less than the number of rolls employed, whereas under my arrangement there will not be fewer nips than the number of rolls employed, and when more than a certain number of rolls are used there will be more nips than rollers—for instance, with six rolls there will be seven nips. The advantage and importance of my arrangement of rolls, permitting the particular manner indicated of passing the paper between them, will thus be apparent to and appreciated by those skilled in the art.

The invention will now be described in detail, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a side elevation of a frame, termed "horizontal frame" to distinguish it from a vertical frame, in which rolls as here-

tofore arranged have been supported. Fig. 2 is a front elevation of the same with a portion of the frame in section. Fig. 3 is a cross-section through the same.

In the drawings, the letter A designates a frame of any suitable form or shape in cross-section, and preferably so constructed that its top A' may be removable, the same resting upon the upright portions of the frame and formed with flanges *a*, fitting down around the upright portions, so as to prevent the top from slipping or moving laterally. In this frame are journaled four or more rolls B and C, six being illustrated in the drawings. These rolls are shown as arranged in sets of two, so as to bring one roll of each set above the other and each set forward or in advance of the other. The lower rolls fit in sectional or segmental journal-boxes D, which are capable of sliding on the lower part of the frame, and are adjustable toward each other to regulate the pressure on the paper by means of set-screws or hand-bolts E, passed through the upright portions of the frame and made to bear against said boxes, as shown. The upper rolls are shown as resting upon the lower ones, and their journals fit in sectional or segmental boxes D'. These rolls are adjusted horizontally by the set-screws or hand-bolts E', which pass through the upright portions of the frame and bear against the boxes, and the downward pressure of these rolls on the lower rolls is regulated by the set-screws or hand-bolts F, passed through the top of the machine and made to bear against the top of the boxes. The portions of the frame through which the set-screws or bolts pass are preferably made heavier than the other portions, as shown at *b*, for the purposes of increased strength, while the other portions, for lightness and economy of metal, may be channeled or otherwise lightened, as illustrated.

The paper to be calendered will be introduced between the rolls B and C at the point indicated by the arrow 1, and after passing between them will pass down between the rolls C and B in the lower part of the frame, thence under roll B and up between it and the next lower roll C, thence over the lower roll B and backward between it and the upper roll C, thence upward and between said

roll C and the front roll B, thence rearward over the upper roll C and downward between it and the last upper roll B, and thence rearward between said roll and the last lower roll C, as indicated by the several arrows.

It will thus be seen that the paper is passed between two sets of rolls in a direction or course that causes it to pass between four rolls of the two sets at four different points, thus imparting as many nips to the paper. This manner of passing the paper between the rolls obtains the maximum number of nips or points of contact or compression between the four rolls, and to that extent lessens the time and labor to properly calender the paper. It will also be observed that the same statement is true and equally applicable to whichever two sets of the series of rolls it may have reference—that is to say, the intermediate set of rolls may be used in connection with the first set of rolls or with the second set of rolls to make the two sets composed of four rolls, and whichever is used the four points of contact will be obtained, although the paper may pursue a somewhat different line of travel. The same is true no matter how many rolls more than four are used, and so it will be understood that I am not limited in the number of rolls or sets of rolls employed. For the same reason it will be seen that my invention includes, broadly, such an arrangement of rolls as will give four points of contact or four nips between four rolls; but I very much prefer the horizontal arrangement, as illustrated, because the rolls are brought under better control of the attendant and are easier to manipulate.

The last roll of the series will have applied to it the stripping-fingers G, extending from the blocks H, to which are connected the adjustable weights I, and tapes J may be employed for carrying the paper from the rolls to a receptacle below provided for it. The fingers and tapes will operate as described in my patent, No. 242,550, dated June 7, 1881, and need not, therefore, be more particularly described.

Doctors K may be arranged at suitable points, as illustrated in Figs. 1 and 3, so as to direct the paper to its place between the rolls, as shown. These doctors will consist of sheets or plates of metal—say steel—extending the width of the rolls, and may be suitably pivoted by pins or rods L to the sides of the machine.

The rolls may be operated in any well-known way in which calendering-rolls are now commonly operated—for instance, by power applied from any suitable source to one of the rolls through a pulley. (Shown by dotted lines in Fig. 2 of the drawings.)

I do not claim herein what I regard as my method of passing the paper between the rolls, so as to obtain the maximum number of nips out of the rolls, as the same forms the subject-matter of a separate application filed by me July 13, 1888, Serial No. 279,873.

Having described my invention and set forth its merits, what I claim is—

1. In a paper-calendering machine, the combination of a series of calender-rolls arranged in sets, with each four rolls of the series in proximity and opposite to one another, substantially as described, to form double rows with four points of contact between each four rolls of the series, substantially as and for the purposes described.

2. In a calendering-machine, the combination of a series of calender-rolls arranged in horizontal sets, with two rolls in each set and one roll of each set over its mate, the rolls of the sets being contiguous to each other and to the rolls of the next set, to form four points of contact between each four rolls of the series, substantially as and for the purposes described.

3. In a calendering-machine, the combination of a series of calender-rolls arranged in horizontal sets and movable toward each other, movable journal-boxes for the journals of the rolls, and set-screws for adjusting said boxes and rolls horizontally, whereby the pressure between the rolls can be regulated, substantially as and for the purposes described.

4. In a calendering-machine, the combination of a series of calender-rolls arranged in horizontal sets, movable journal-boxes for the journals of the rolls, and set-screws bearing vertically and horizontally against said boxes for adjusting the boxes both horizontally and vertically to regulate the pressure between the rolls, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN McLAUGHLIN.

Witnesses:

JAMES McLAUGHLIN,
EDWARD L. CHILDS.