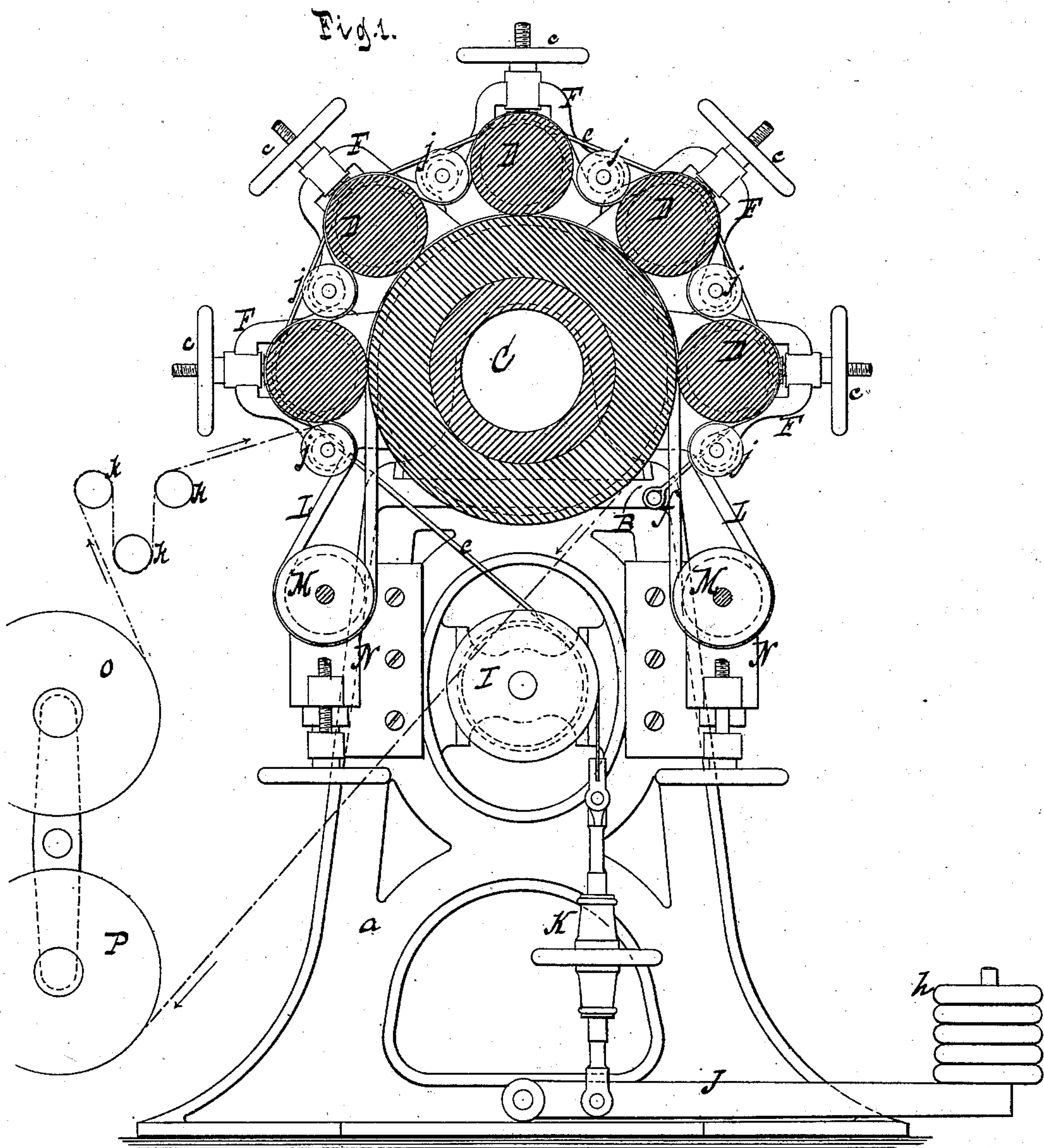


H. SCHLATTER & H. C. GROS.
Machine for Calendering Paper and other Materials.

No. 222,081.

Patented Nov. 25, 1879.



Witnesses.

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 William Miller

Inventors
Heinrich Schlatter.
Hermann Charles Gros.

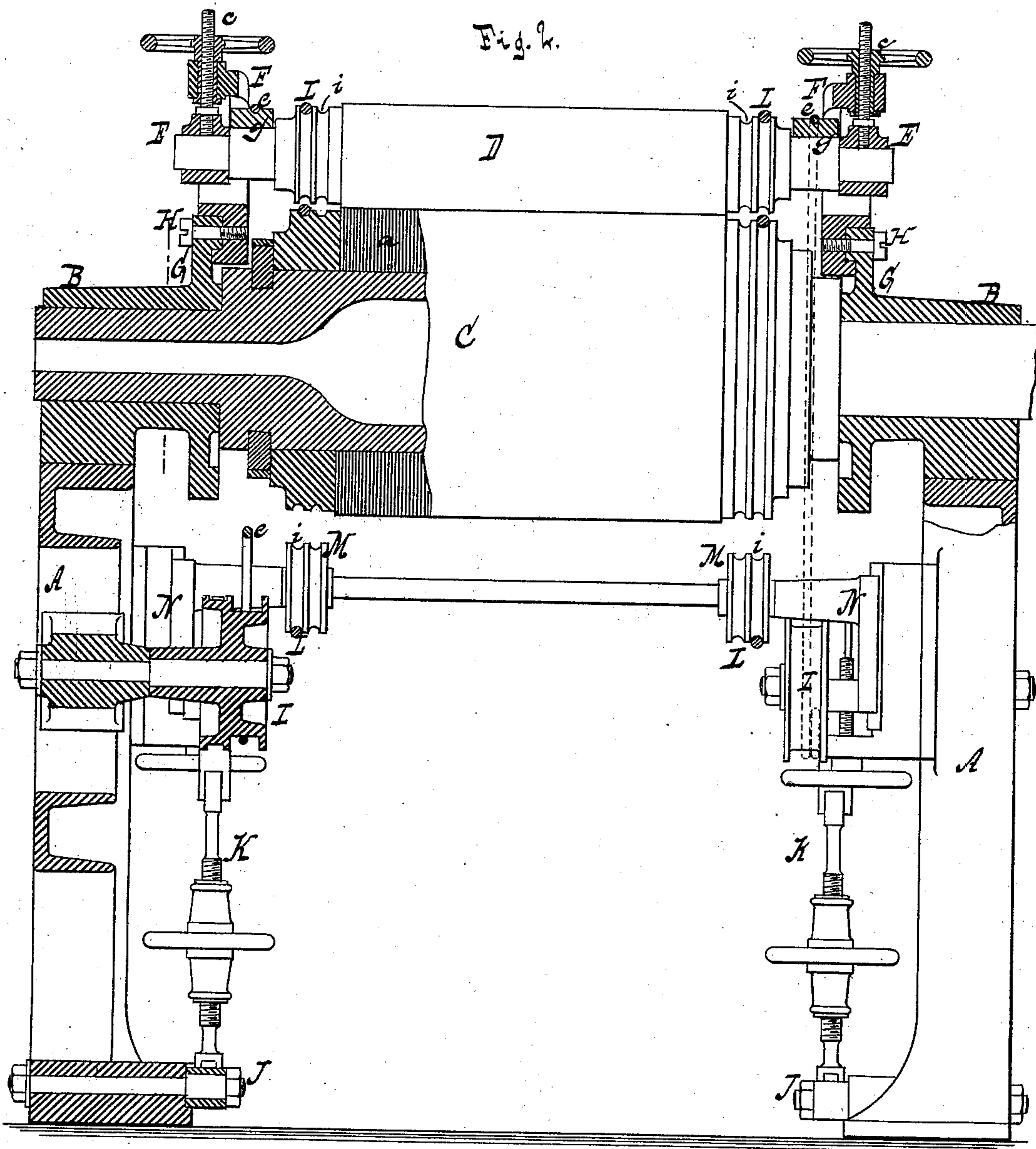
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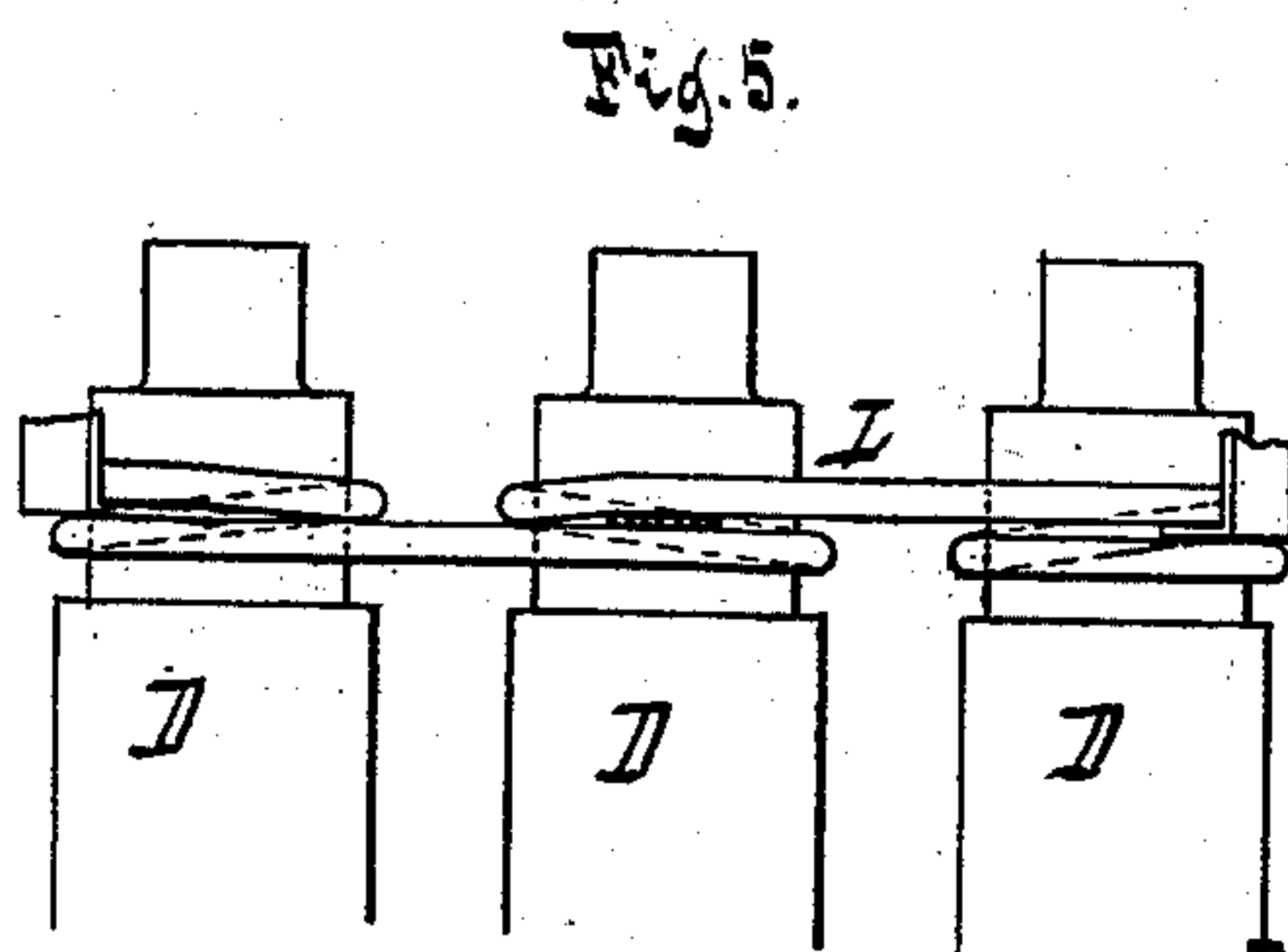
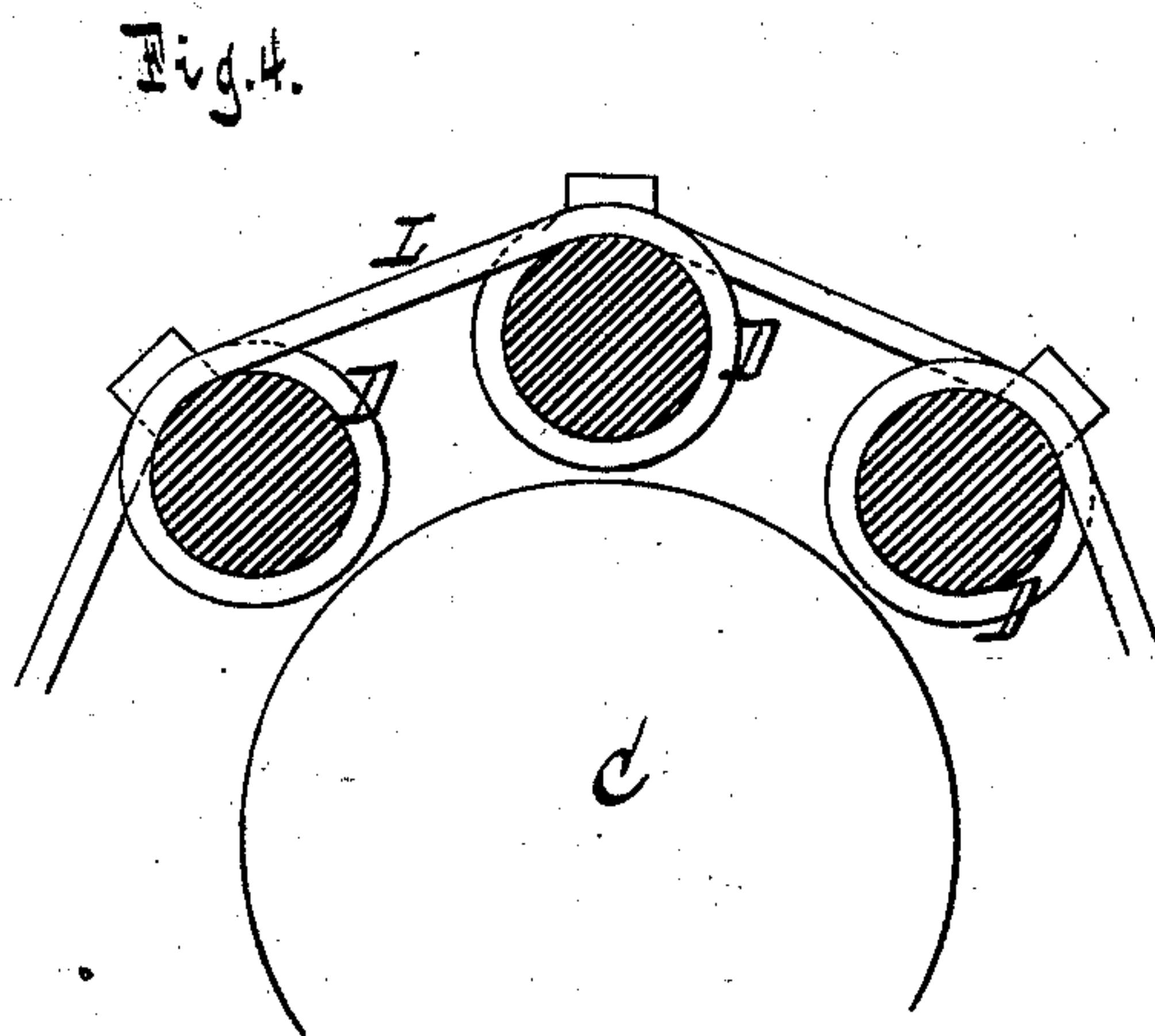
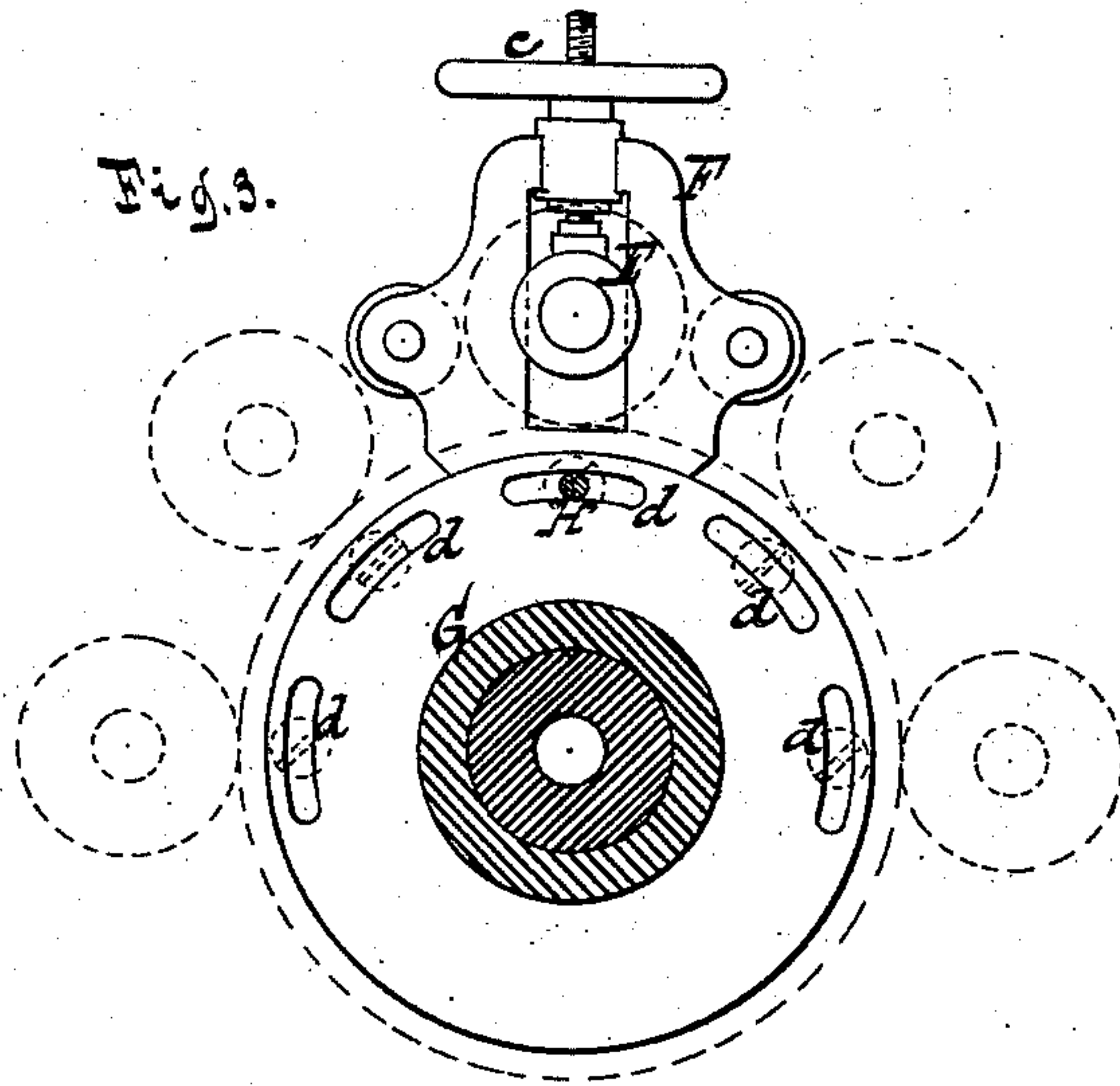
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UNITED STATES PATENT OFFICE.

HEINRICH SCHLATTER AND HERMANN C. GROS, OF REUTLINGEN,
WÜRTEMBERG, GERMANY.

IMPROVEMENT IN MACHINES FOR CALENDERING PAPER AND OTHER MATERIALS.

Specification forming part of Letters Patent No. **222,081**, dated November 25, 1879; application filed May 14, 1879.

To all whom it may concern:

Be it known that we, HEINRICH SCHLATTER and HERMANN C. GROS, both of Reutlingen, in the Kingdom of Würtemberg, in the Empire of Germany, have invented a new and useful Improvement in Machines for Calendering Paper and other Materials, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical cross-section of a machine embodying our invention. Fig. 2 is a front view thereof, partly in section. Fig. 3 is a side view of a portion of the machine-frame. Figs. 4 and 5 show a modification in the arrangement of the belt.

Similar letters indicate corresponding parts.

Our invention relates to machines for calendering paper or other materials, and will first be described with reference to the drawings, and then pointed out in the claims.

The letter A designates two standards, composing the machine-frame, upon which are secured boxes B, for supporting the journals of a roller, C. The function of this roller C is to support the paper or other material to be calendered, and the same is usually made hollow so that it may be heated, while to the surface thereof is applied a layer of paper or other soft material. With this roller C are combined a series of rollers, D, which are arranged on the circumference thereof, so as to bear on its surface, the same having a proportionately less diameter than the central roller. These circumferential rollers D have a hard surface, and perform the calendering operation; but, if desired, a layer of paper or other soft material may be applied thereto instead of the central roller, in which case the latter constitutes the calendering device.

The journals of the circumferential rollers D rest in boxes E, which are adjustable radially to the axis of the central roller, C, so that the circumferential rollers can be set toward and from the central roller at will. To render the journal-boxes E thus adjustable, we fit the same in slotted brackets F, whose slots extend radially to the axis of the sup-

porting-roller C, and connect the same to set-screws *e*, passing through the ends of the brackets. Said journal-boxes E are also adjustable in a plane concentric to the axis of the central roller, C, so that the circumferential rollers are adapted to be set in proper relation to the central roller—that is to say, so that their axes are parallel to the axis of the latter. This concentric adjustment of the boxes E is effected as follows: The brackets F at the respective ends of the circumferential rollers D are fastened to a flanged hub, G, formed on each of the journal-boxes B of the central roller by means of set-screws H, and at the points where these screws pass through said hub we provide the latter with a slot or slots, *d*, concentric to the axis of the supporting-roller, (see Fig. 3,) so that the brackets, and with them the boxes, are capable of being moved and adjusted in the desired direction.

A second advantage gained by this arrangement is that the number of the circumferential rollers D may be increased or diminished.

With the circumferential rollers D are combined tension bands or ropes *e*, (steel bands being usually employed,) for the purpose of holding the same forcibly in contact with the central roller, C. Two of these bands *e* are used, one at each end of the circumferential rollers, and they are brought into play when it is desired to have the circumferential rollers press upon the paper only in contradistinction to their having a rubbing action thereon. These bands *e* are fastened to the machine-frame at one end, as at *f*, Fig. 1, thence pass over each of the circumferential rollers D at or near their opposite ends, and are connected to drums or windlasses I mounted in the lower part of the machine-frame, so that by winding the bands on these drums a greater or less pressure can be brought to bear on the circumferential rollers.

One advantage peculiar to the bands *e* is that inasmuch as they act upon all circumferential rollers simultaneously the latter are caused to exert a uniform pressure.

At the points where the bands *e* pass over the circumferential rollers *D* the latter are each provided with a grooved segment, *g*. In some cases a spiral spring is arranged at a suitable point in each of the bands *e* to render the same elastic.

For the purpose of setting the drums *I* we make use of levers *J*, carrying balance-weights *h*, these levers being connected to the drums by means of adjustable bands *K*; but if desired a crank or cranks may be used for this purpose, and in that case a suitable detent is combined with each of the drums. It may be remarked that the bands *e* can be connected directly to the balance-levers *J*.

To permit the action of the bands *e* on the circumferential rollers *D*, the set-screws *c*, for adjusting the journal-boxes *E* of these rollers, are constructed to allow the boxes a small amount of play in the slotted brackets *F*—that is to say, the screws are respectively formed of a threaded stem and a thumb-nut, which latter embraces such stem, and has two heads so arranged that, while the nut is adapted to move the stem, it is capable of a slight longitudinal motion, as shown in Fig. 2.

The circumferential rollers *D* are severally geared with the central roller, *C*, by means of cords or belts *L*, which pass over the central roller, around guide-pulleys *M*, and over each of the circumferential rollers, as clearly shown in Fig. 1, the rollers being provided with grooves *i* to receive the cords or belts. By this arrangement a revolving motion imparted to the central roller, *C*, is transmitted to each of the circumferential rollers *D* by means of the cords or belts.

In this example two grooves, *i*, are formed at each end of the circumferential rollers *D*, as well as the central roller, *C*, so that four of the cords or belts *L* may be used, two at each end of the rollers. The relative proportion of those portions of the circumferential rollers *D*, covered by the cords or pulleys *L* to that part of the central roller, *C*, surrounded thereby, is such that the superficial speed imparted to the circumferential rollers is greater than that of the central roller, the result of which is that the circumferential rollers have a frictional or rubbing action.

The guide-pulleys *K* are mounted in adjustable bearings *N*, so that by their means the ropes or belts *L* can be tightened, and between each of the circumferential rollers *D* is arranged a small roller, *j*, to increase the surface-contact of the cords or belts with the circumferential rollers. This last-named object can also be accomplished by winding the cords or belts *L* around the circumferential rollers *D*, as shown in Figs. 4 and 5.

The course of the paper or other material to be calendered is indicated in Fig. 1, the same being conducted from a roll, *O*, over smoothing-rollers *K*, and thence around the central roller, *C*, to a roll, *P*, on which it is wound as it emerges from the machine, and if the material is to be calendered on both sides it is re-

versed and passed through the machine a second time.

If it is desired to calender the paper or other material by compression, either the set-screws *c* or the tension-bands *e* are adjusted to press the circumferential rollers *D* upon the central roller, *C*. In this position the circumferential rollers *D* are revolved by contact with the central roller, *C*, and the material passing between them is subjected to the pressing action of the circumferential rollers.

If it is desired to calender the material by friction the circumferential rollers *D* are set so that they just touch the central roller, *C*, but without pressing thereon, and the ropes or belts *L* are applied to the rollers, so that the material passing between them receives the rubbing action before referred to.

If desired the parts of our machine may be duplicated, so that the paper or other material may be calendered on both sides in one operation, and in that case the cord or belt running over one of the central rollers is arranged to drive the circumferential rollers of the other central roller.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a calendering-machine, the combination of a central roller, a series of circumferential rollers, and mechanism for adjusting the circumferential rollers radially to the axis of the central roller, for producing a calendering action either by pressure or by friction, or by both combined, substantially as shown and described.

2. The combination, with the central roller, *C*, and circumferential rollers *D*, of mechanism for adjusting the circumferential rollers concentric to the axis of the central roller, substantially as and for the purpose described.

3. The combination, with the central roller, *C*, and circumferential rollers *D*, of a tension band or rope, which is fast at one end and extends over the circumferential rollers to a drum or windlass, or other tension device, for producing the desired pressure between the circumferential rollers and central roller, substantially as hereinbefore set forth.

4. The combination, with the central roller, *C*, and circumferential rollers *D*, of a driving rope or belt extending round each of said rollers, whereby motion is imparted to the circumferential rollers from the central roller, substantially as shown and described.

5. The combination of two or more central rollers and a series of circumferential rollers adapted to be set radially toward and from the central roller, substantially as described.

In testimony that we claim the foregoing we have hereunto set our hands and seals this 14th day of January, 1879.

HEINRICH SCHLATTER. [L. S.]
HERMANN CHARLES GROS. [L. S.]

Witnesses:

ALBERT SCHEIZER,
FRIEDRICH SCHWEIZER.