

No. 639,974.

Patented Dec. 26, 1899.

H. M. HARLEY & E. U. GIBBS.

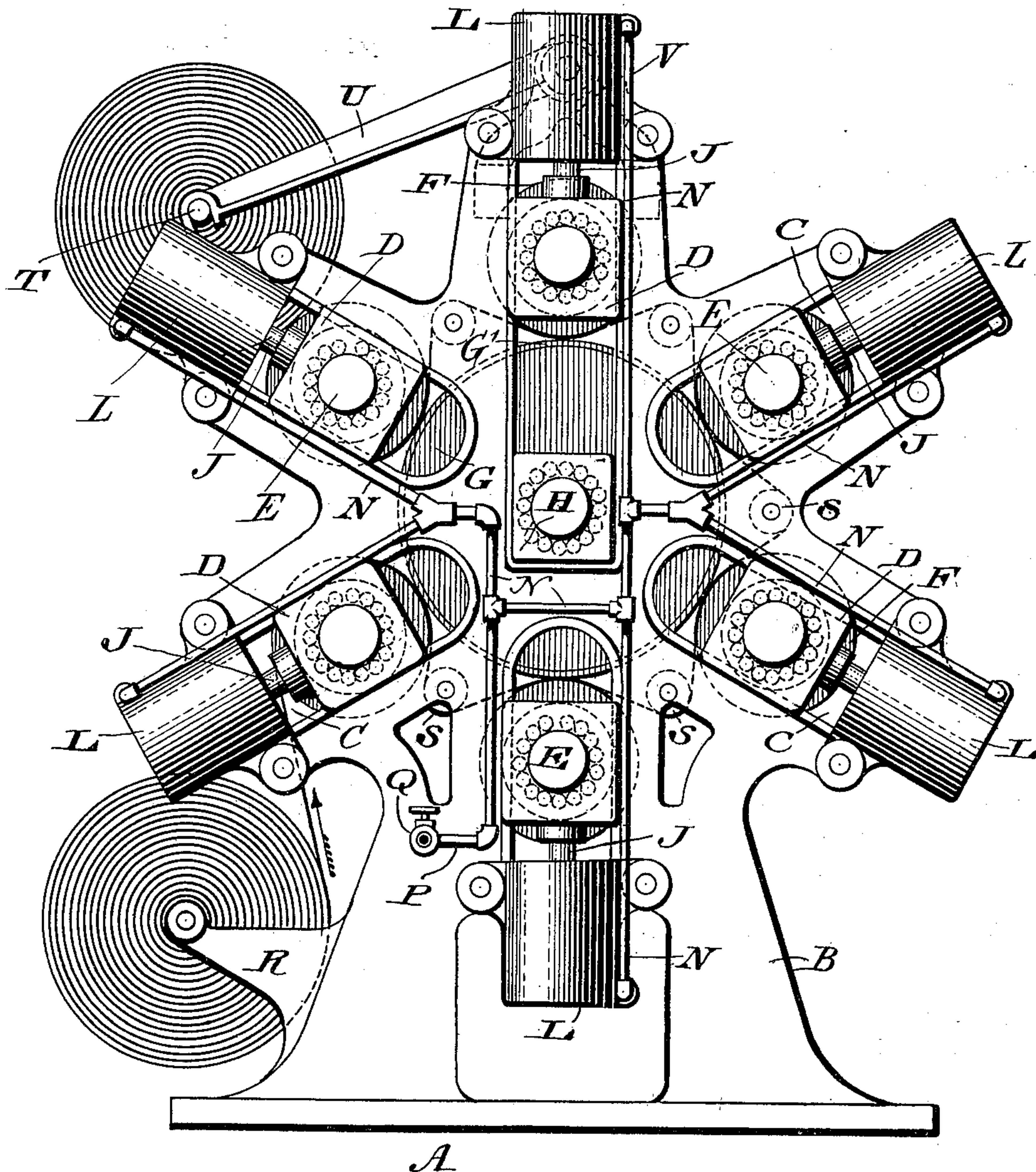
CALENDERING MACHINE.

(Application filed June 4, 1898.)

(No Model.)

4 Sheets—Sheet 1.

Fig: 1.



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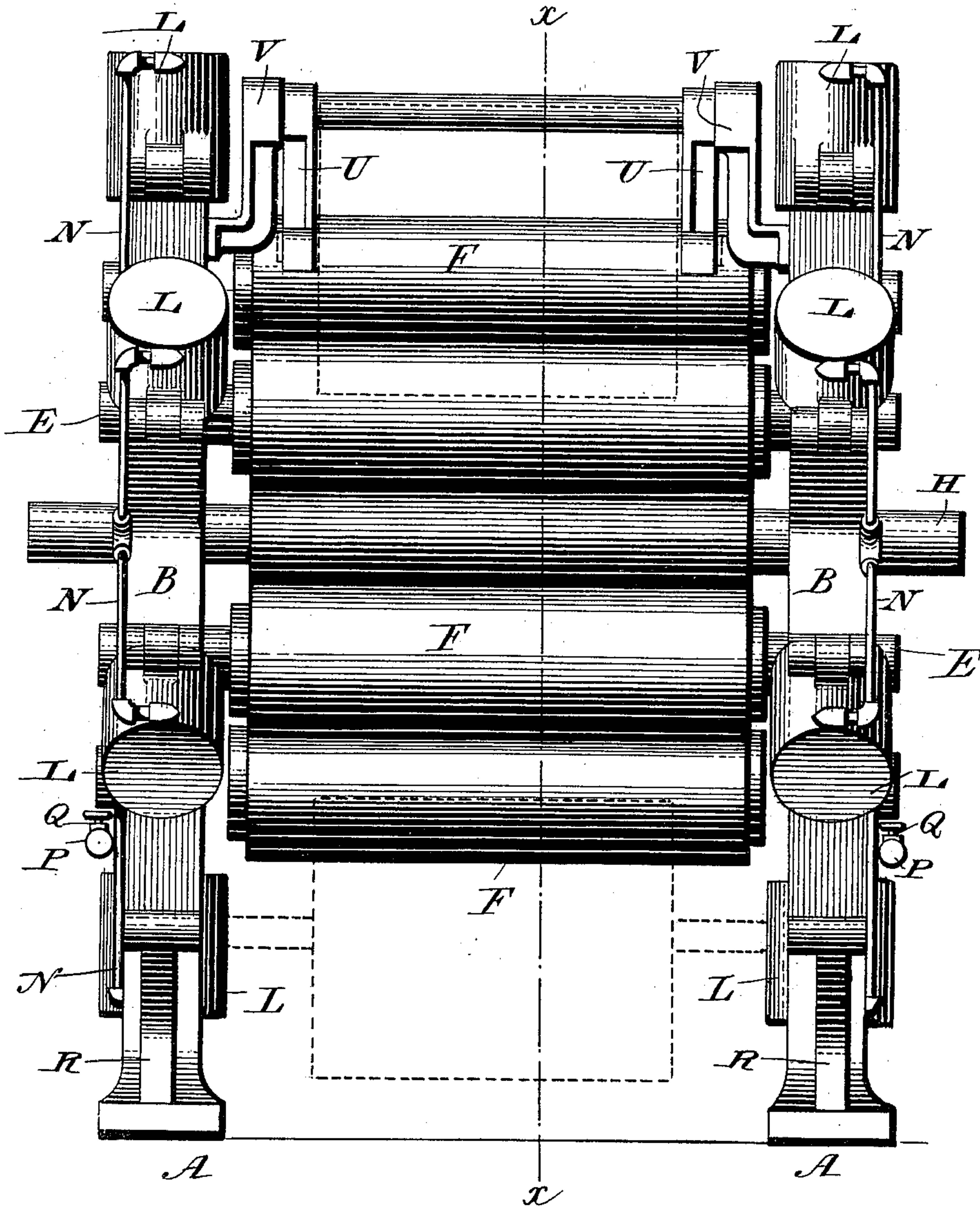
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Fig: 2.



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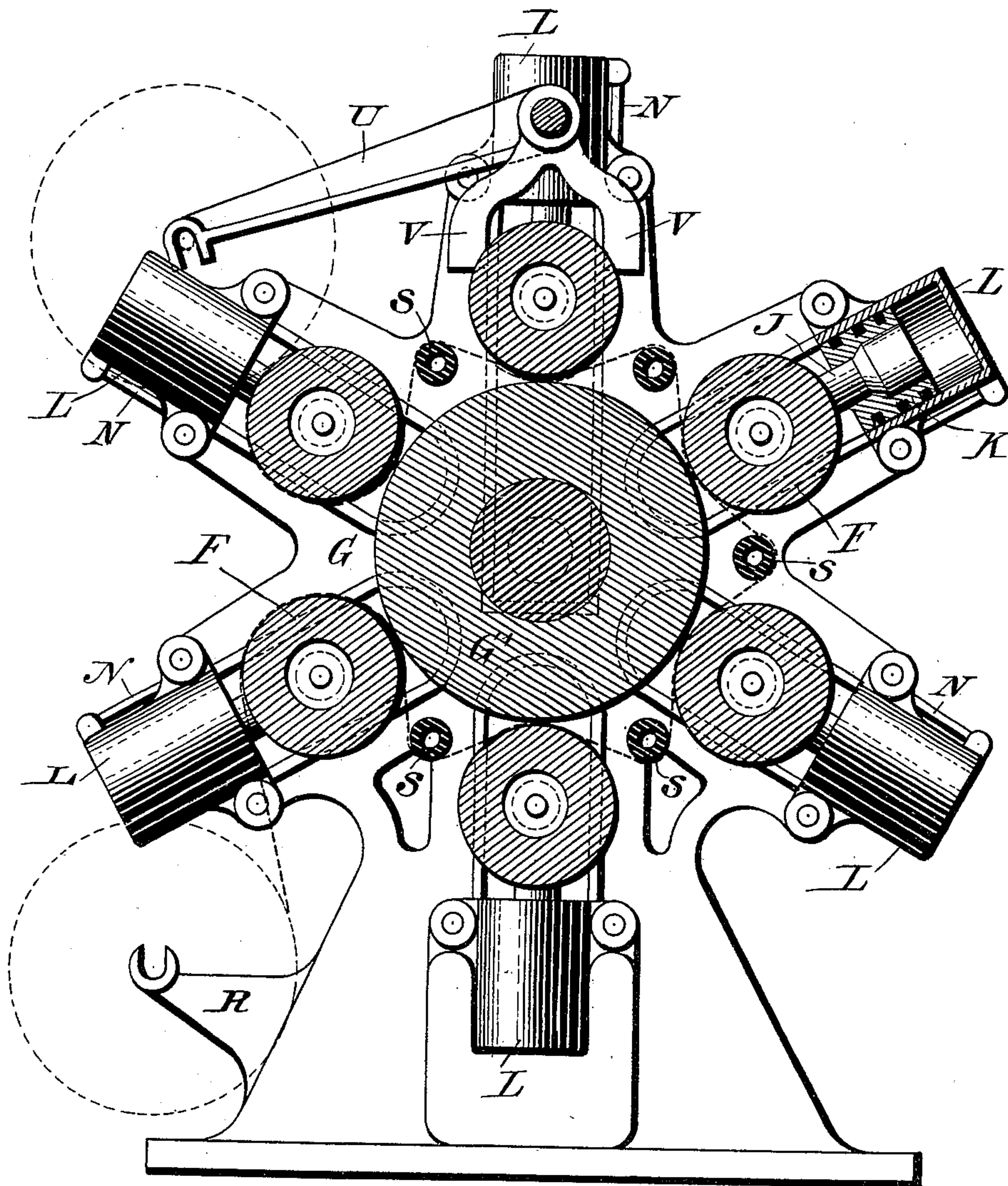
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4 Sheets—Sheet 3.

Fig. 3.



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Fig: 4.

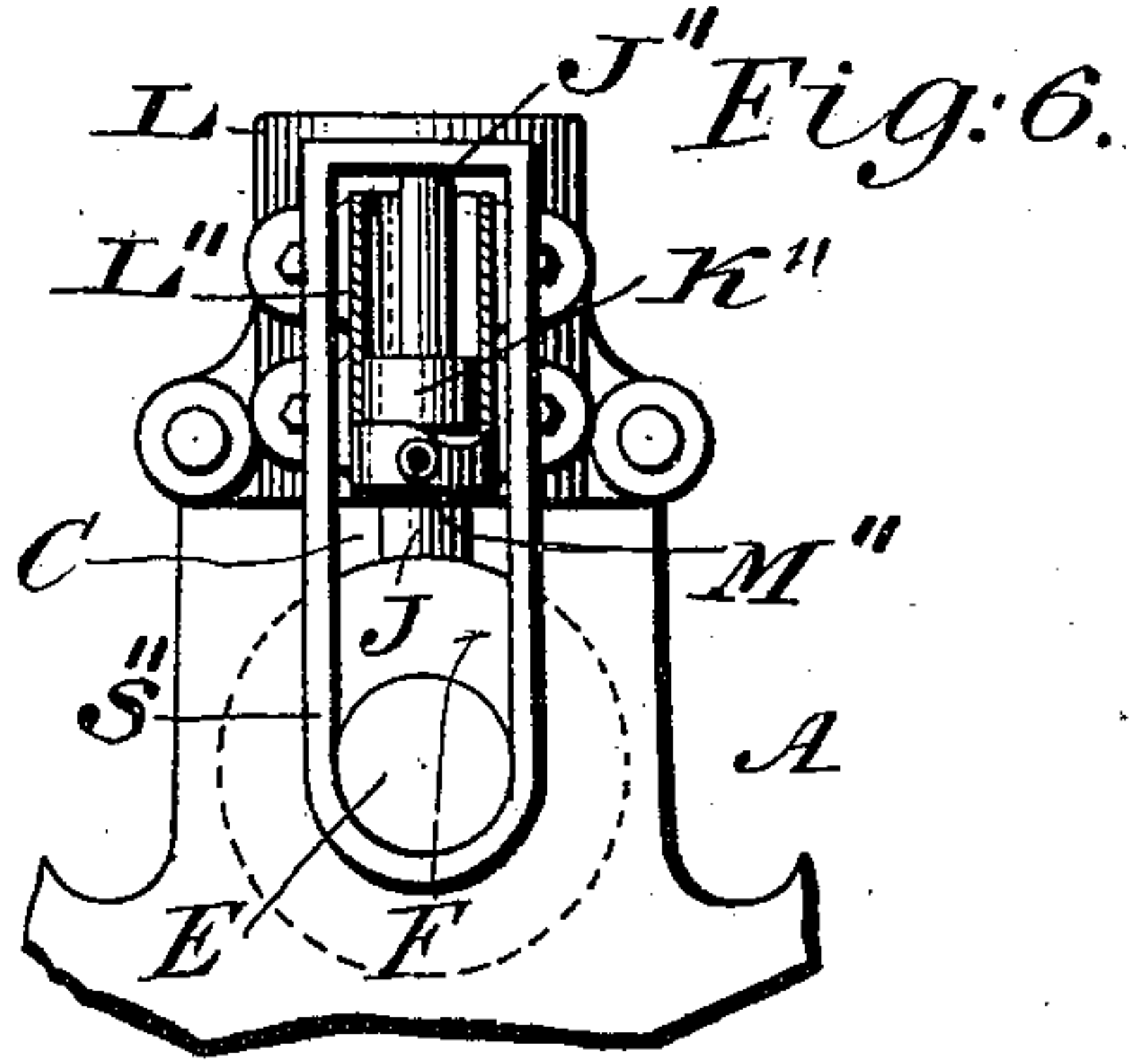
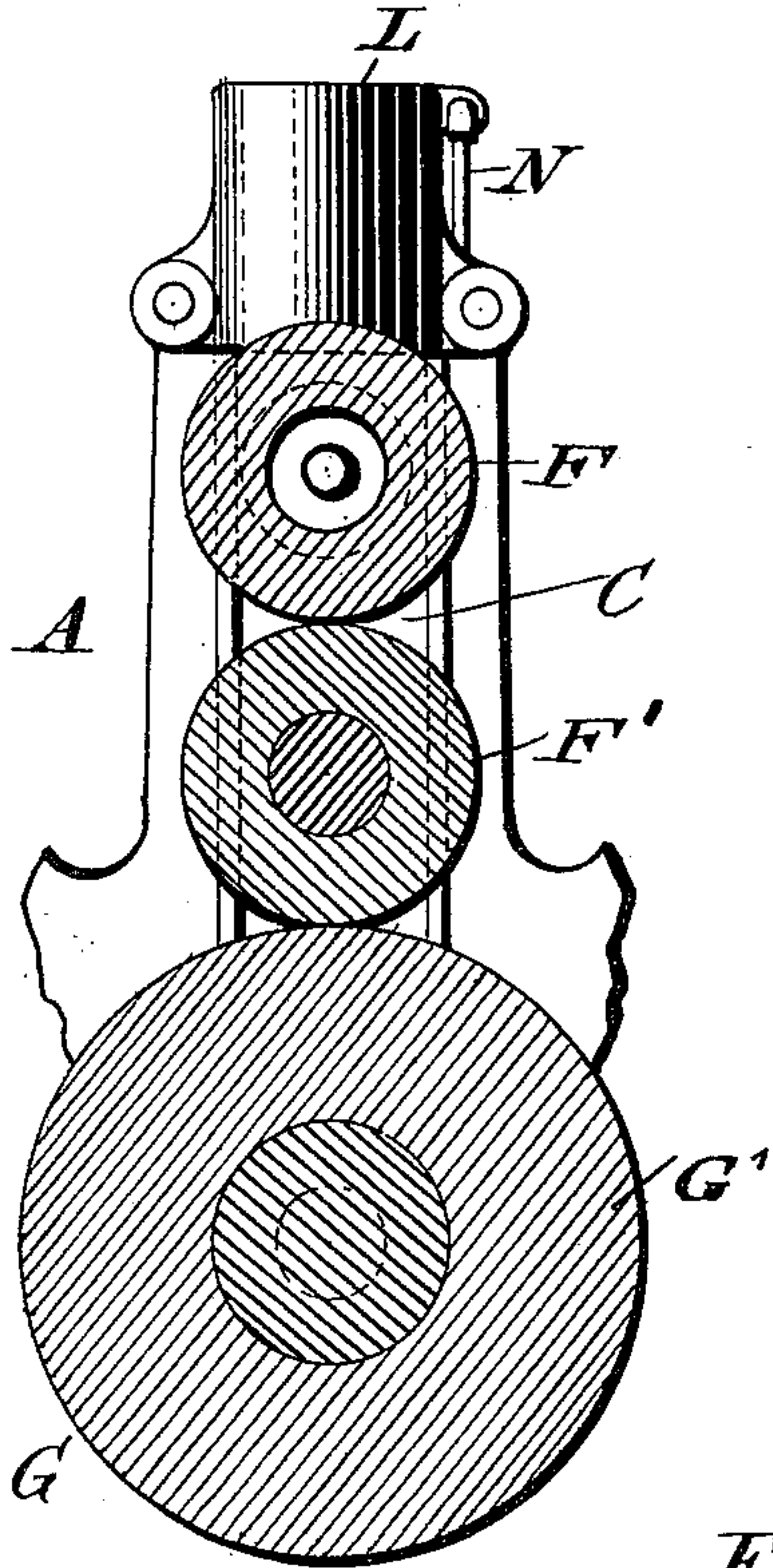


Fig: 7.

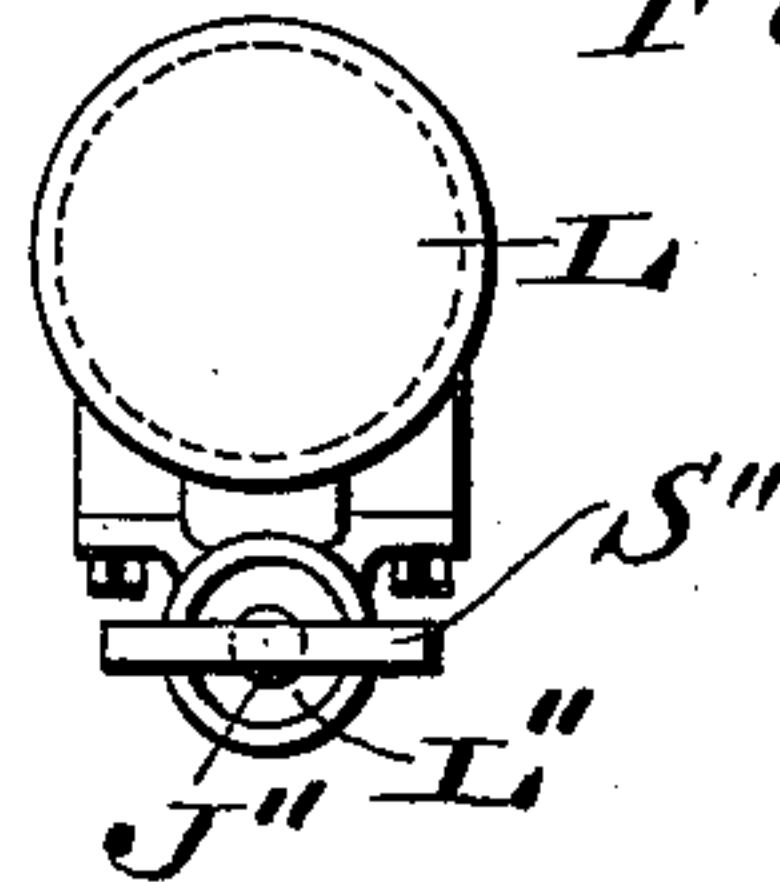
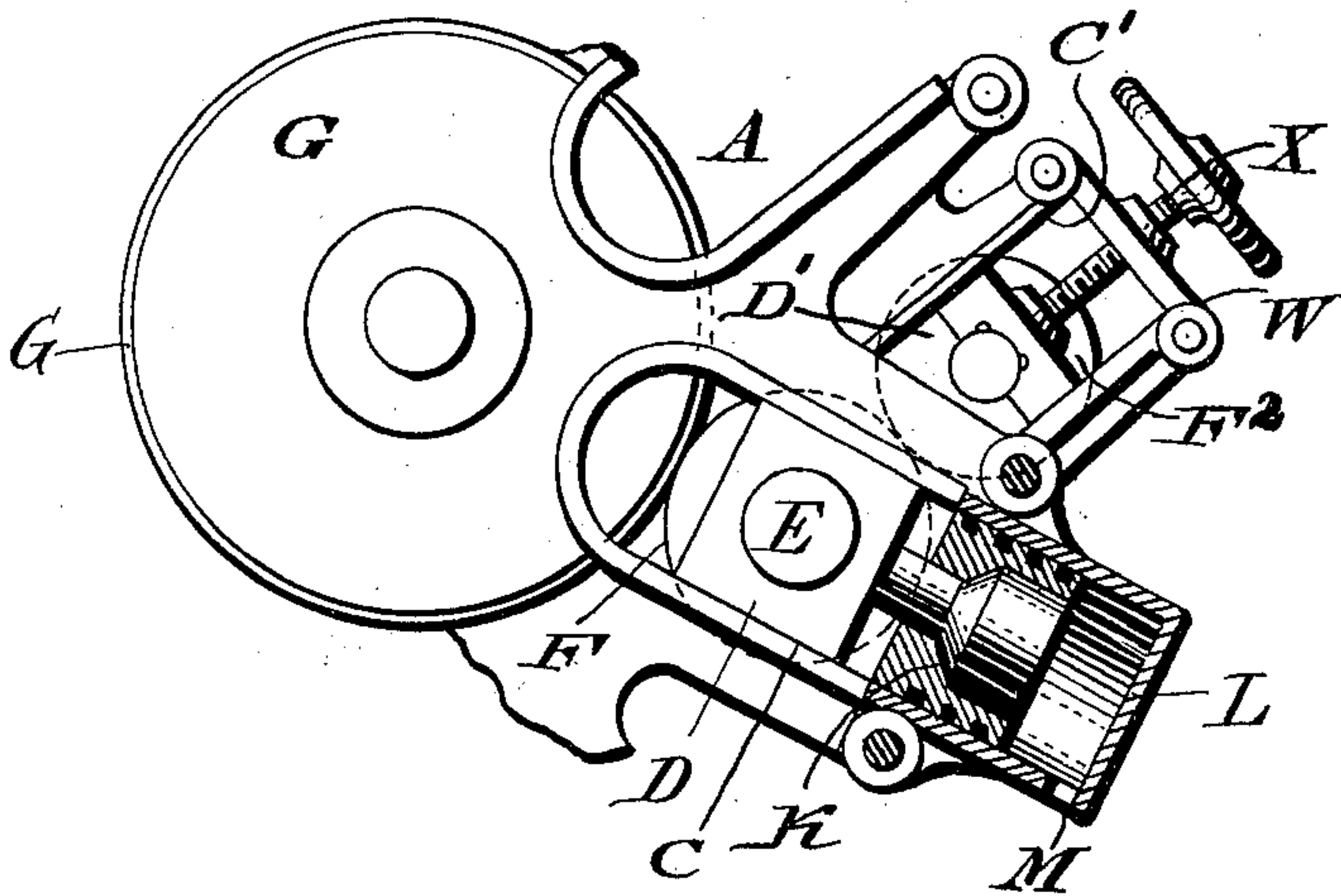


Fig: 5.



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UNITED STATES PATENT OFFICE.

HENRY M. HARLEY AND EUGENE U. GIBBS, OF GLOUCESTER CITY, NEW JERSEY, ASSIGNORS OF ONE-THIRD TO GEORGE A. HEYL, OF PHILADELPHIA, PENNSYLVANIA.

CALENDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 639,974, dated December 26, 1899.

Application filed June 4, 1898. Serial No. 682,543. (No model.)

To all whom it may concern:

Be it known that we, HENRY M. HARLEY and EUGENE U. GIBBS, citizens of the United States, residing at Gloucester City, in the county of Camden, State of New Jersey, have invented a new and useful Improvement in Calendering-Machines, which improvement is fully set forth in the following specification and accompanying drawings.

Our invention has reference to an improved construction of calendering-machine wherein the material to be calendered is fed between presser devices arranged adjacent to and adapted to coact with a main drum or cylinder, the object being to produce in a simple and inexpensive manner a machine of this character which will not only effectively insure the thorough and even calendering of the material fed thereto, but one in which the mechanism thereof will readily and quickly yield to compensate for any unevenness in the material destined for treatment or for any unevenness in the periphery of the drum or cylinder or of the presser devices, thus successfully eliminating all liability of mutilating the material.

It comprises a suitable framework having mounted therein a main drum or cylinder, presser devices arranged adjacent thereto and at intervals around the periphery thereof, and means for automatically moving said presser devices into operative position with relation to said drum or cylinder and for regulating the pressure thereon, as well as withdrawing the said presser devices when necessary or desired.

It further consists of novel details of construction, all as will be hereinafter fully described, and pointed out in the claims.

Figure 1 represents a side elevation of a calendering-machine embodying our invention. Fig. 2 represents a front elevation thereof. Fig. 3 represents a vertical section of the same, taken on line $x x$, Fig. 2. Fig. 4 represents a detail view showing the main drum or cylinder, the presser device, and one form of auxiliary presser device to be referred to. Fig. 5 represents a similar view showing another form of auxiliary presser device. Figs. 6 and 7 represent detail views of

a modified form of our invention, certain of the parts being shown in section.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates a suitable framework composed of two oppositely-disposed uprights or frames B, which may, if desired, be mounted upon any convenient base, (not shown,) said uprights being provided with a plurality of guideways C, arranged in the present instance radially and adapted to receive therein journal-boxes D, which latter carry shafts E, whereon are mounted presser-rollers F. These rollers are located at convenient distances apart and are adapted when the machine is in operation to impinge the periphery of a main drum or cylinder G, carried in journal-boxes H, which for convenience are preferably arranged to slide freely in the same guideways in which the journal-boxes D of one of the presser-rollers F are carried, said drum or cylinder G being preferably provided with a soft or resilient covering G', which may or may not be used, according to requirements.

Each of the journal-boxes referred to is provided with suitable antifriction-bearings, as shown in dotted lines in Fig. 1, and in addition thereto said boxes are each provided with a rod J, the outer free end of which supports a plunger or piston K, adapted to work in a cylinder L, secured to the outer extremity of each of the guideways C.

The cylinders L are preferably, but not necessarily, open at one end, and the plungers therein are properly and suitably packed, so that the inward movement of the presser-rollers F against the periphery of the main drum or cylinder G may be positively insured, said movement being caused by the admission into the cylinders behind the plungers of a suitable fluid, as steam, compressed air, or other desired agencies, which enter said cylinders through ports M and pipes N, which latter lead into each of the cylinders, said pipes branching from a main supply-pipe P, the latter having a controlling-valve Q thereon to govern the pressure admitted to the cylinders L.

R designates brackets or arms which pro-

ject from the uprights B—in the present instance to the left thereof—and are designed to carry the roll of material destined for treatment, the same being guided over and between the first one of the presser-rollers F and the drum or cylinder G, then under an idler-roller S, thence between the next succeeding presser-roller F and the drum G, then under another idler-roller S, and continuing in this manner until the material has been passed under the last succeeding presser-roller F at the upper left-hand corner of the machine, from whence it is rolled upon a reel T, which latter is carried in the free ends of arms U, pivotally secured to brackets V, projecting from the uprights B.

By the above construction and arrangement of parts the material to be treated is presented to the main drum or cylinder G at intervals around the periphery thereof, and the presser-rollers F by reason of the cushion in the cylinders J, formed by the steam or other fluid at the rear ends of the plungers, and the pliant or resilient nature of the drum or cylinder G will readily yield to any unevenness in the material or to any obstacle of a foreign nature which might be accidentally carried in by the working parts, it being also noted that the free ends of the pivoted arms U will also rise as the finished material is wound upon the reel T to accommodate the increasing diameter of the roll, as will be apparent.

The presser-rollers F are situated on all sides of the drum or cylinder G—that is to say, they are placed below, as well as above—and preferably disposed at equal distances around the same. The advantage of this disposition of the presser-rollers is that it gives an equal pressure upon the drum or cylinder and entirely around the same, and the drum or cylinder is practically supported or “floated” by said presser-rolls F, so that although the drum or cylinder is mounted in journal-boxes H, yet there is practically no weight sustained by these journal-boxes in view of the fact that the drum or cylinder is supported and its weight sustained by these presser-rollers.

In Fig. 4 we have shown a detail view of a construction substantially similar to that above described, except that an additional auxiliary roller F' is employed, the same being interposed between the first presser-roller F and the drum or cylinder G. The said roller F', as well as the first presser-roller F, is of chilled iron and is used on the first pressure nip for the purpose of crushing any material that is irregular and which should not pass through the machine, such as a pin, nail, tack, or the like. Such an article would be crushed or pressed very flat and serious damage to the cotton-fiber roll thereby avoided.

The construction shown in Fig. 5 embodies the presser-rollers F and attached plungers K, the cylinders L, and the pipe connections N; but in addition thereto an auxiliary roller F² is provided and bears upon the first presser-

roller F, the same being carried in journal-boxes D', adapted to move in guideways C', which latter may be secured to or made integral with the uprights or frames B. The guideway C' is arranged at an angle to the guideway C and presser-roller F, with which it coacts, and the outer end thereof is provided with a removably-secured cross-bar W, having a threaded opening therein to receive a screw X, carrying a hand-wheel, said screw bearing upon the journal-boxes D' and so moving and keeping the auxiliary roller F² against the presser-roller F.

In Figs. 6 and 7 we have shown a modified form of our invention, wherein auxiliary plungers K'' and cylinders L'' are employed to simultaneously withdraw the presser-rollers from contact with the main drum or cylinder G. These auxiliary cylinders are arranged adjacent to each of the cylinders L and have therein the rods J'' and attached plungers K'', said rods being secured to or being made integral with yoke-straps S'', which embrace or surround the axes of each of the presser-rollers F, but in such manner as not to interfere with their free movement within the guideways C. The outer ends of each of the auxiliary cylinders L'' are preferably open, and their opposite ends are provided with ports M'' to receive pipes (not shown) by which steam, compressed air, or other fluid is admitted into the cylinders when desired, thus causing the plungers therein to move outwardly and through their attached yoke-straps withdraw the presser-rollers F from contact with the cylinder or drum G, it being of course understood that at such periods the pressure upon the plungers K in the cylinders L will be removed.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for the purpose described, a central, rotatable, driven drum, a plurality of surrounding presser-rollers situated on all sides of and supporting said drum, said rollers being rotated by said drum and at the same speed by reason of their peripheral contact therewith.

2. In a machine for the purpose described, a central, rotatable, driven drum, a plurality of surrounding presser-rollers, said presser-rollers being situated on all sides of and supporting said drum, and means for holding said rollers under pressure against said drum, said rollers being rotated by said drum and at the same speed by reason of their peripheral contact therewith.

3. In a machine for the purpose described, a central, rotatable, driven drum mounted in movable bearings, a plurality of surrounding presser-rollers, said rollers being situated on all sides of and supporting said drum, and means for holding said rollers under pressure against said drum, said rollers being rotated by said drum and at the same speed by reason of their peripheral contact therewith.

4. In a machine for the purpose described, a central, rotatable, driven drum, a plurality of surrounding presser-rollers situated on all sides of and supporting said drum and mounted in bearings movable radially relative thereto, and means for moving said rollers and holding them under pressure against said drum, said rollers being rotated by said drum and at the same speed by reason of their peripheral contact therewith.

5. A machine for the purpose described, comprising a cylinder or a drum, means for rotating the same, a plurality of rotary presser devices situated on all sides of and adapted to coact with said cylinder or drum, said presser-rollers supporting said cylinder or drum, and means for automatically causing said presser devices to bear upon the cylinder or drum, whereby said presser devices are rotated thereby and at the same speed.

6. A machine for the purpose described, comprising a cylinder or drum, means for rotating the same, rotary presser devices situated on all sides of and coacting with said cylinder or drum, said presser-rollers supporting said cylinder or drum, cylinders having movable plungers connected with said presser devices, and means for moving said plungers to cause the presser devices to bear upon the cylinder or drum, whereby they are rotated thereby and at the same speed.

7. In a machine for the purpose described, comprising a frame having a central, rotatable, driven drum, a plurality of guideways radially disposed relative thereto and situated on all sides of the same, movable journal-boxes in said guideways, presser-rollers carried by said journal-boxes and contacting with said drum and supporting the same, and means for causing said presser-rollers to bear upon said drum and for retaining them in such a position, whereby the rollers are rotated by said drum and at the same speed by reason of their peripheral contact therewith.

8. In a machine for the purpose described, comprising a frame having a central, rotatable, driven drum, a plurality of guideways radially disposed relative thereto and situated on all sides of said drum, movable journal-boxes mounted in said guideways, presser-rollers carried by said journal-boxes and adapted to contact with said drum and support the same, plungers secured to said journal-boxes, cylinders for said plungers, and means for introducing fluid-pressure into said cylinders to move the presser-rollers against

the drum, whereby said presser-rollers are rotated by said drum and at the same speed by reason of their peripheral contact therewith.

9. In a machine of the character named, a centrally-disposed drum, a plurality of presser-rollers disposed at intervals about the periphery of said drum, a series of rollers located intermediately of said presser-rolls, rods attached to the latter, pistons in which rods are mounted, cylinders for said pistons, means for introducing fluid-pressure into said cylinders, and means for actuating said pistons and their presser-rollers in a reverse direction.

10. In a machine for the purpose described, a drum, coacting presser-rollers movable toward and away from said drum, said presser-rollers being situated on all sides of and supporting said cylinder or drum, and means for moving said presser-rollers simultaneously toward the drum.

11. In a machine for the purpose described, a drum and coacting presser-rollers movable toward and away from the same, said presser-rollers being situated on all sides of and supporting said cylinder or drum, and means for simultaneously moving said presser-rollers toward and away from said drum.

12. In a machine for the purpose described, a central rotatable drum, a plurality of surrounding presser-rollers, movable toward and away from said drum and situated on all sides of and supporting the same, and means common to said presser-rollers for moving the same simultaneously and exerting an equal pressure upon the same.

13. In a machine for the purpose described, a rotatable drum, coacting main presser-rollers, and an auxiliary presser-roller between which and a main presser-roller the material to be treated is passed before passing between said drum and presser-rollers.

14. In a machine for the purpose described, a rotatable drum, coacting main presser-rollers, and an auxiliary presser-roller coacting with the first of said presser-rollers, the material to be treated being passed between said first presser-roller and said auxiliary presser-roller before passing between the drum and its coacting presser-rollers.

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