

No. 771,644.

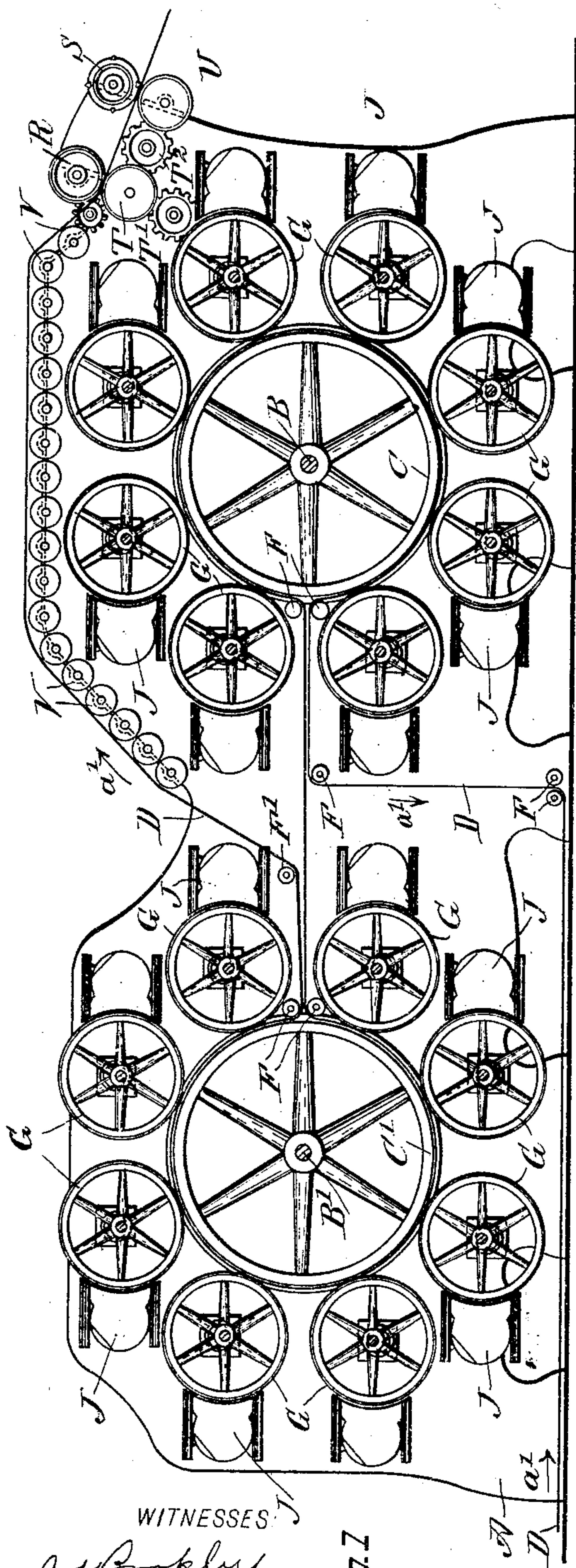
PATENTED OCT. 4, 1904.

F. E. KEMPF.  
MULTICOLOR PRINTING PRESS.

APPLICATION FILED MAY 7, 1903.

NO MODEL.

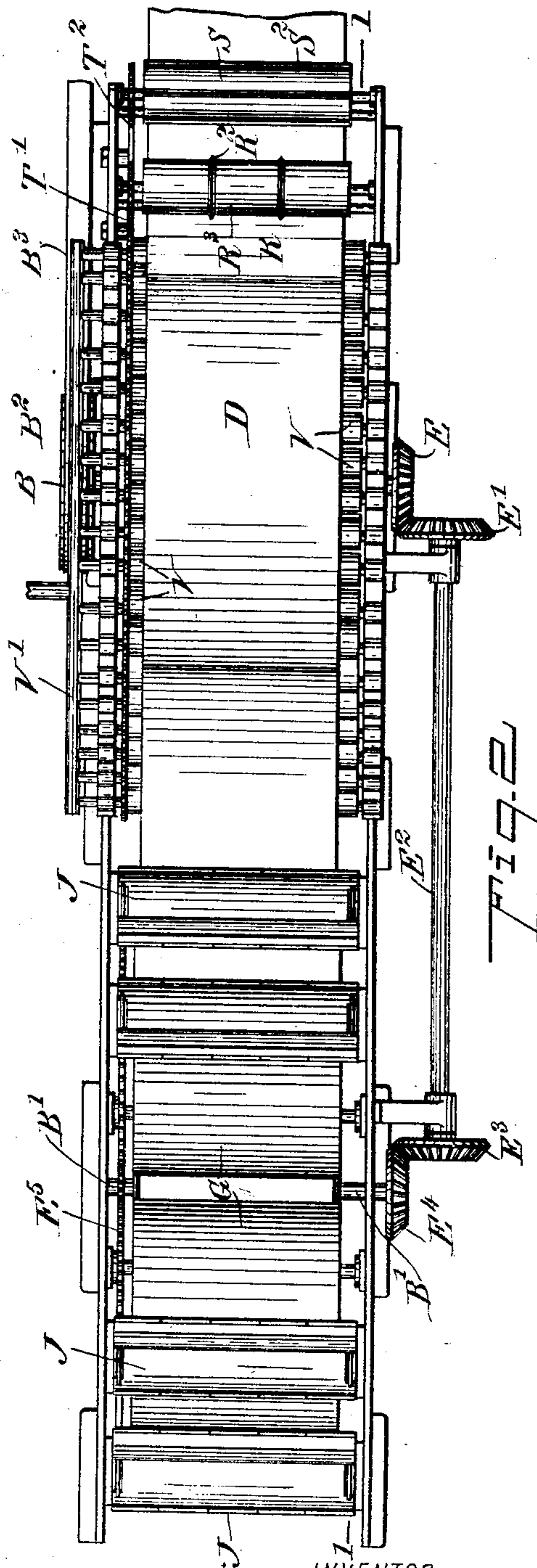
4 SHEETS—SHEET 1.



WITNESSES

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Rev. J. H. Propoy

7102



7-29-27

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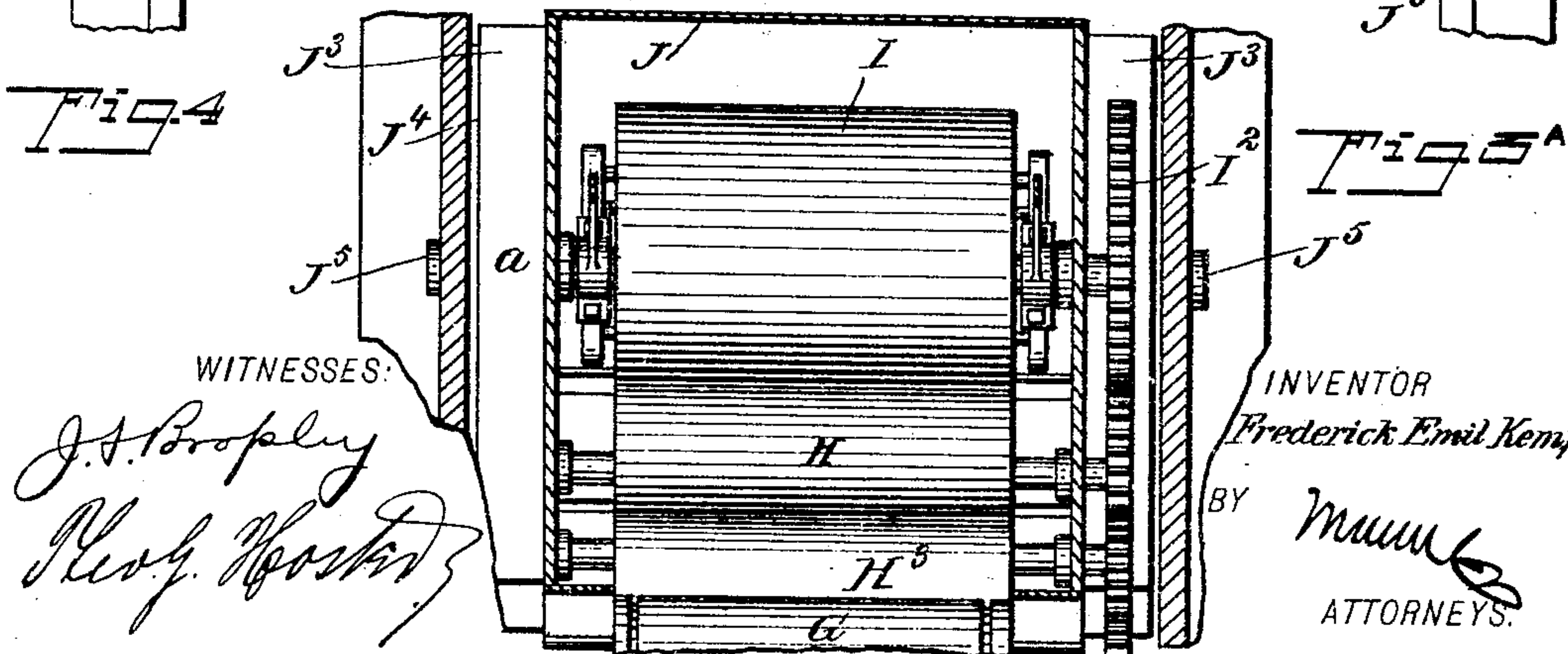
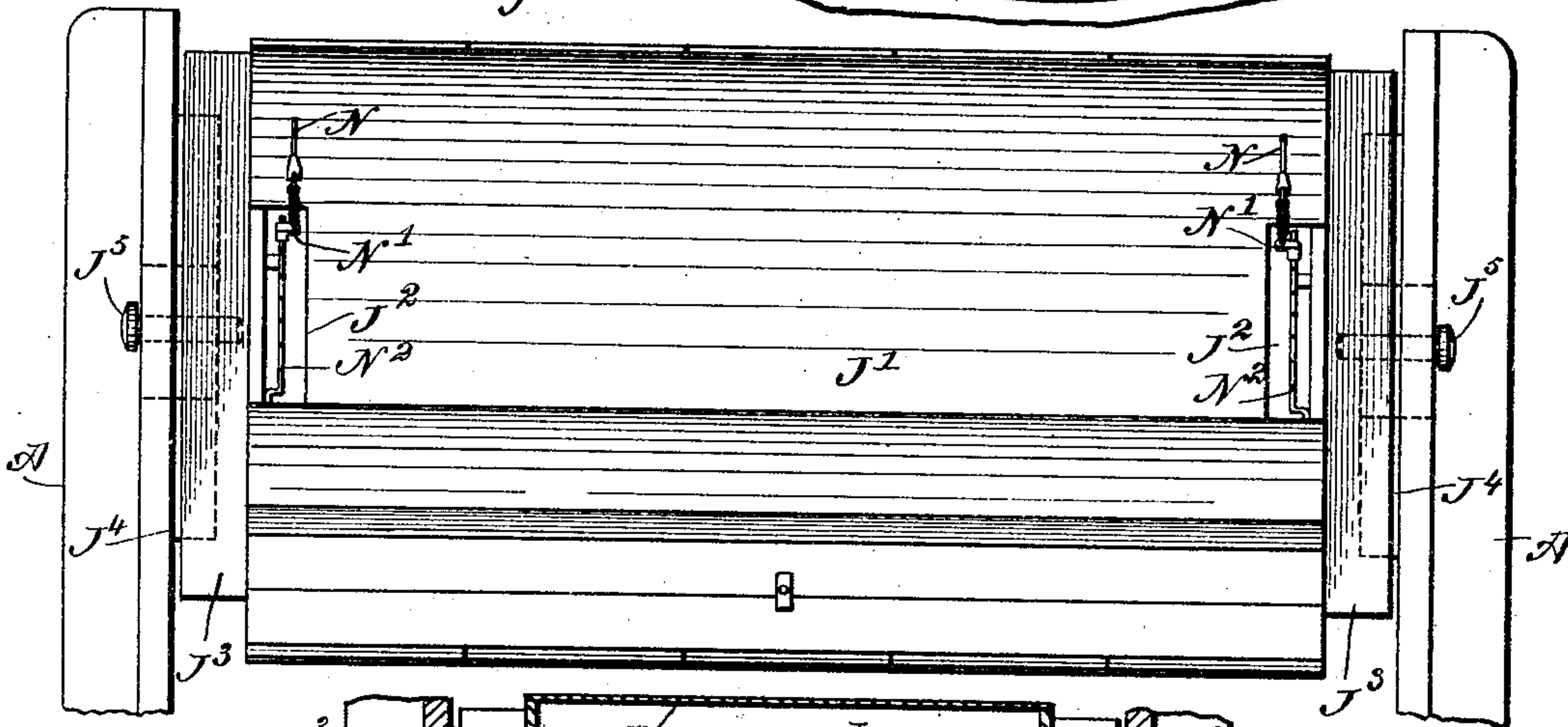
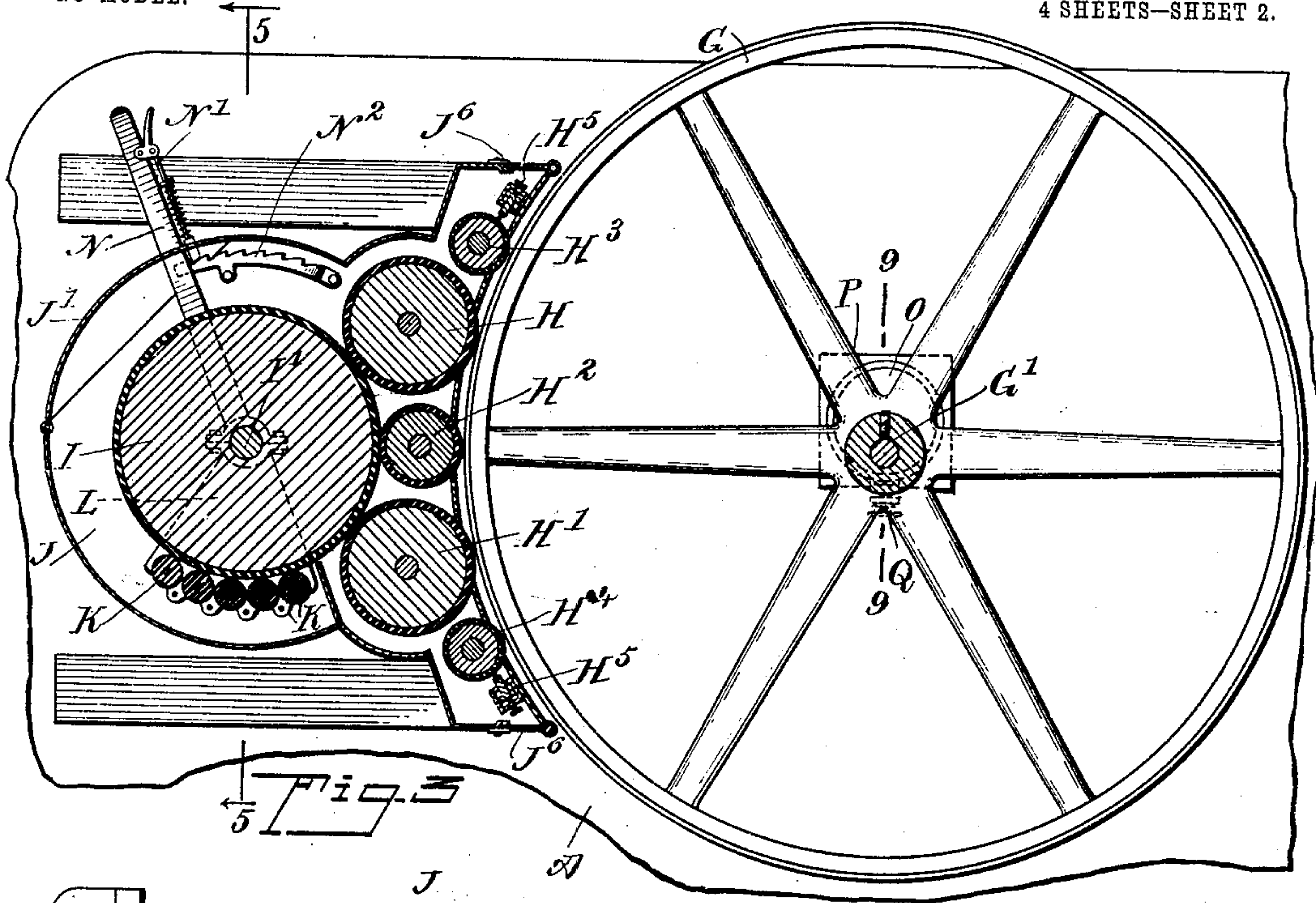
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4 SHEETS—SHEET 2.



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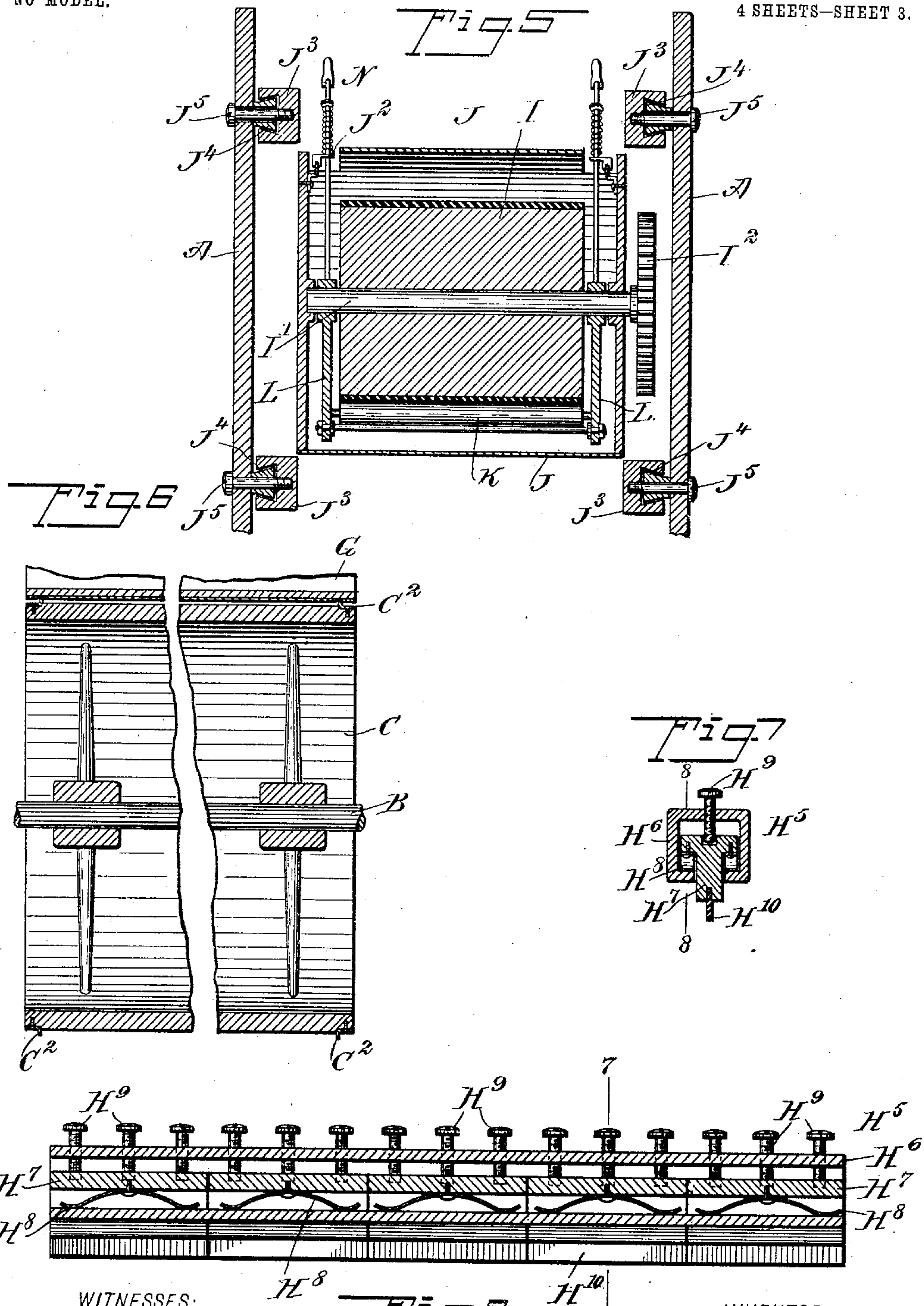
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NO MODEL.

4 SHEETS—SHEET 3.



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**Fig. 8**

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4 SHEETS—SHEET 4.

Fig. 8

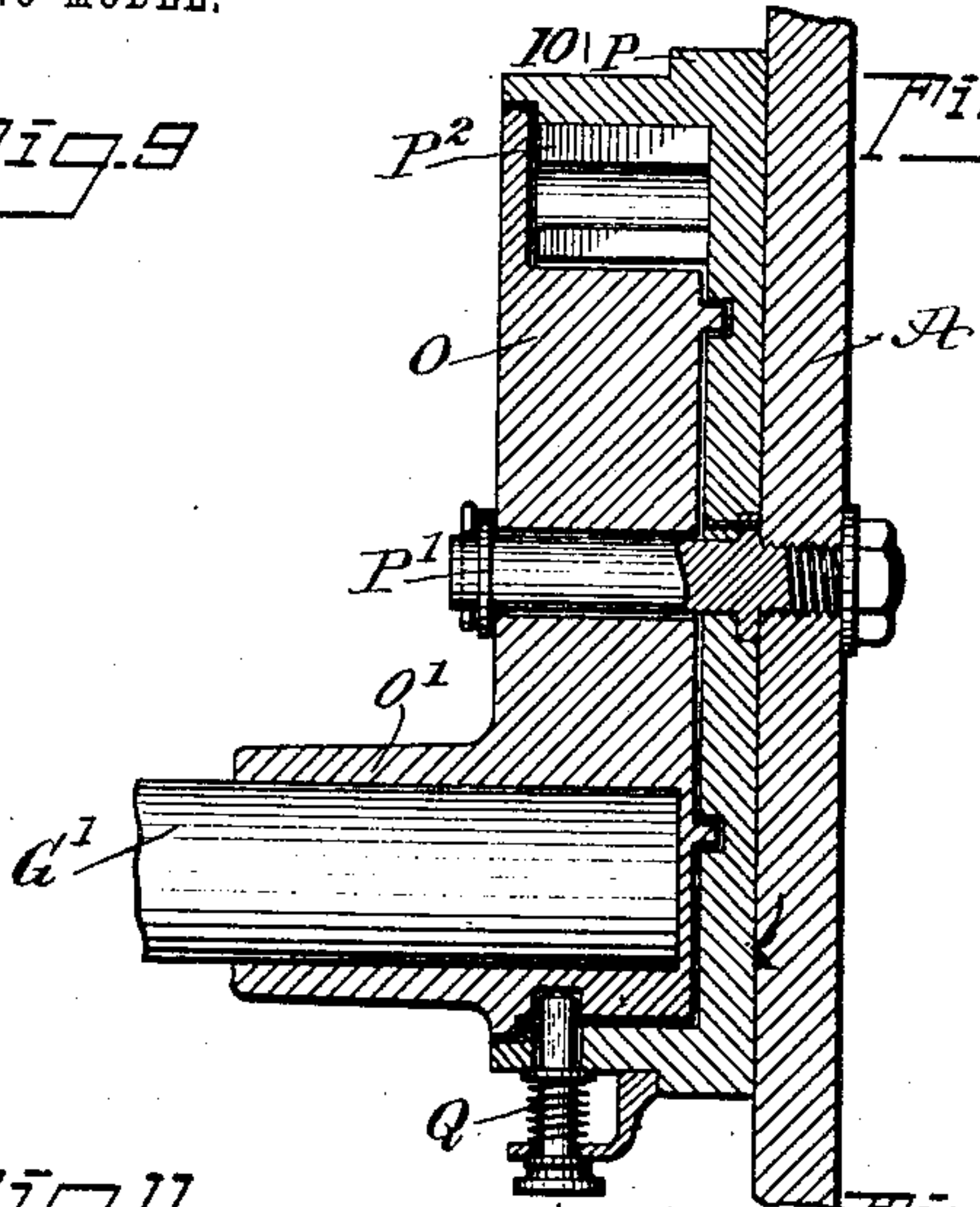


Fig. 10

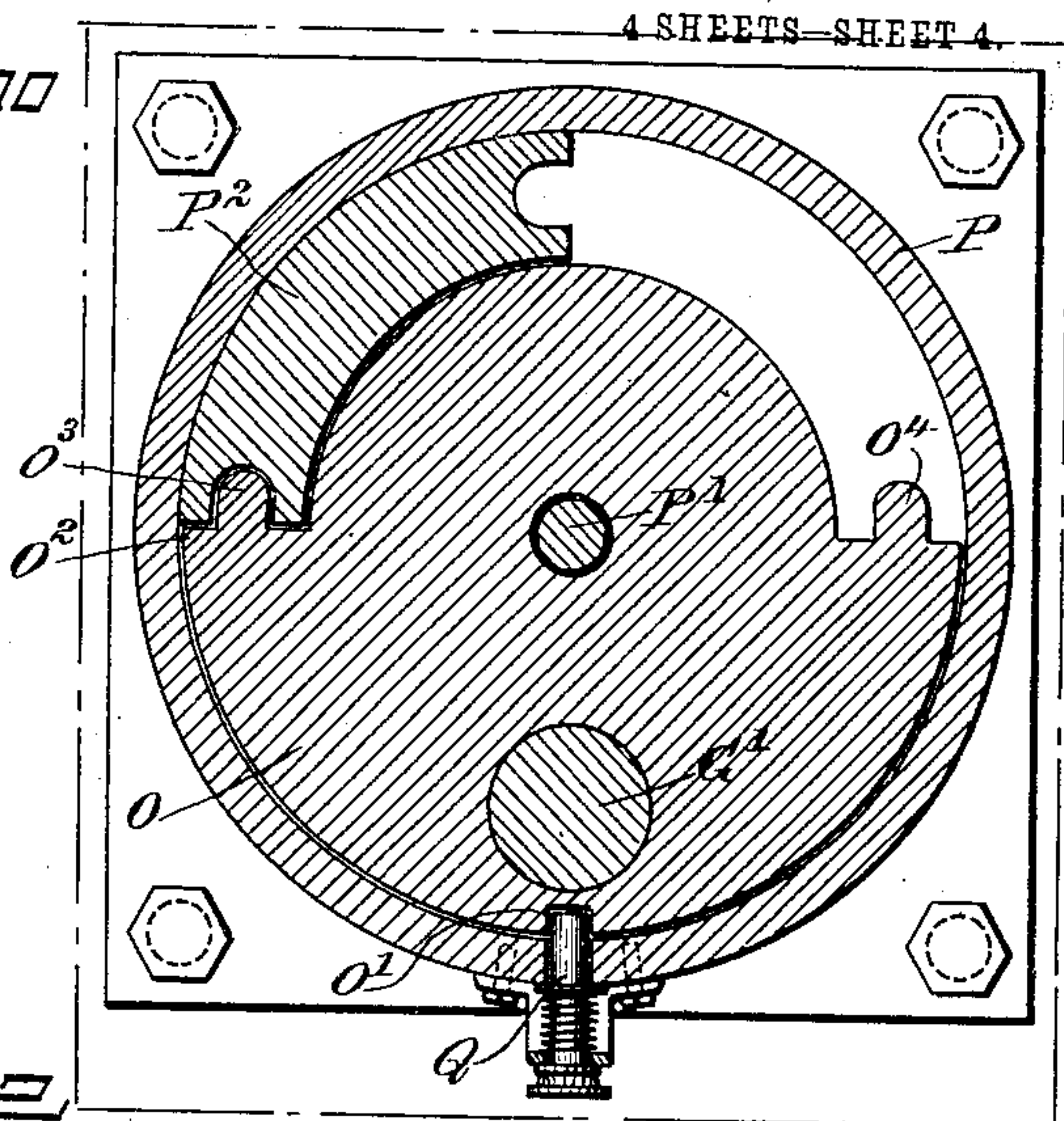


Fig. 11

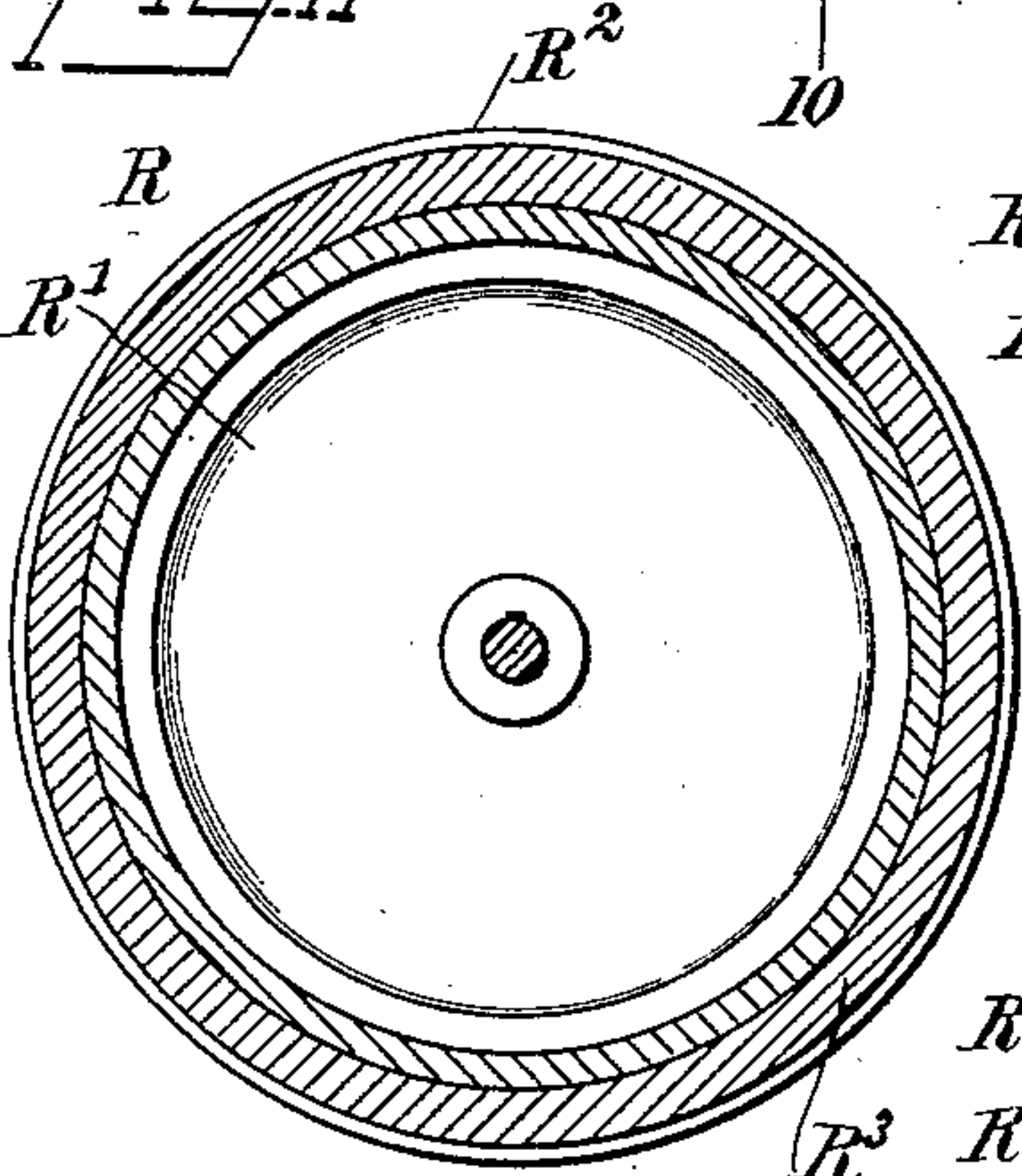


Fig. 12

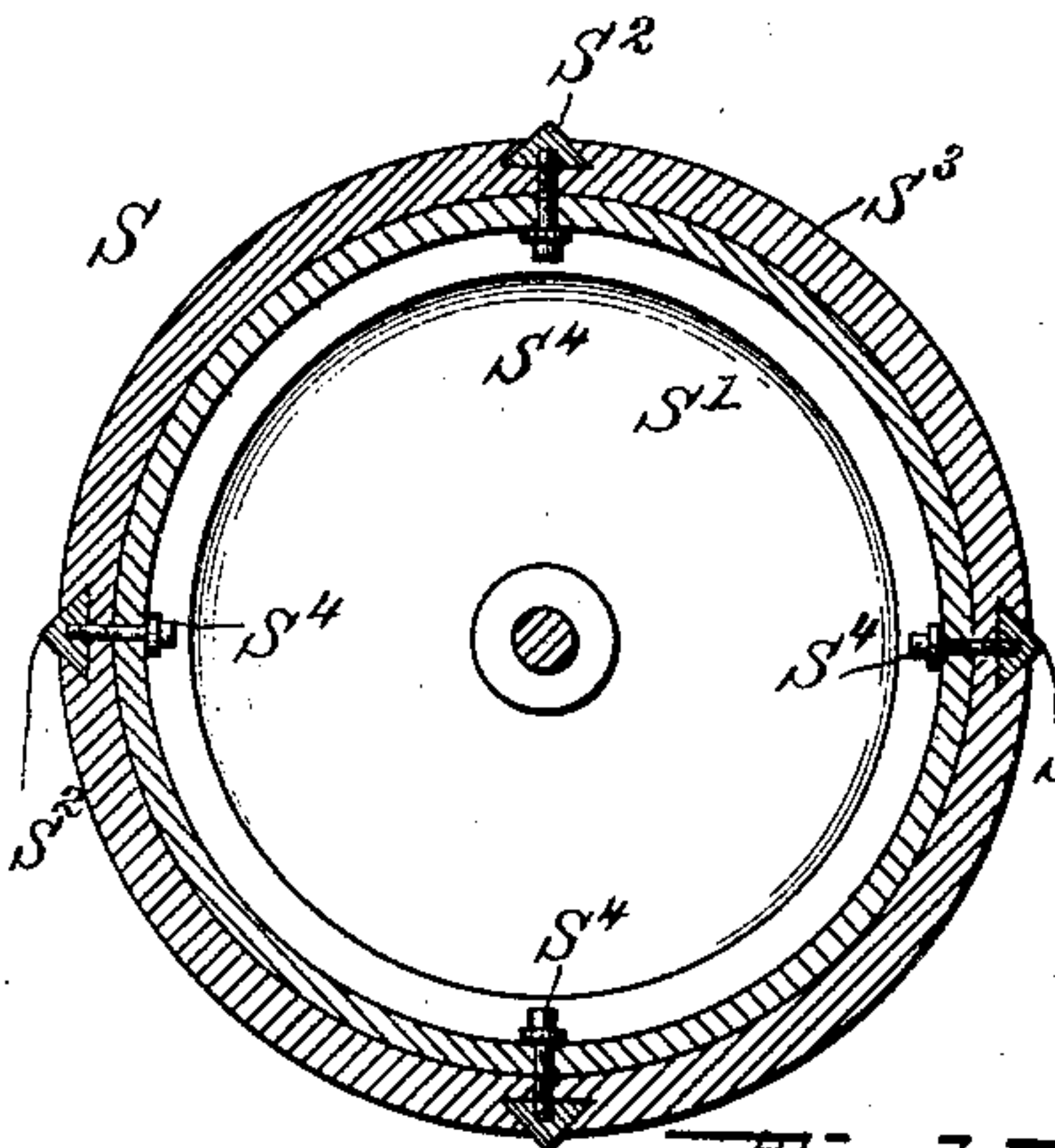
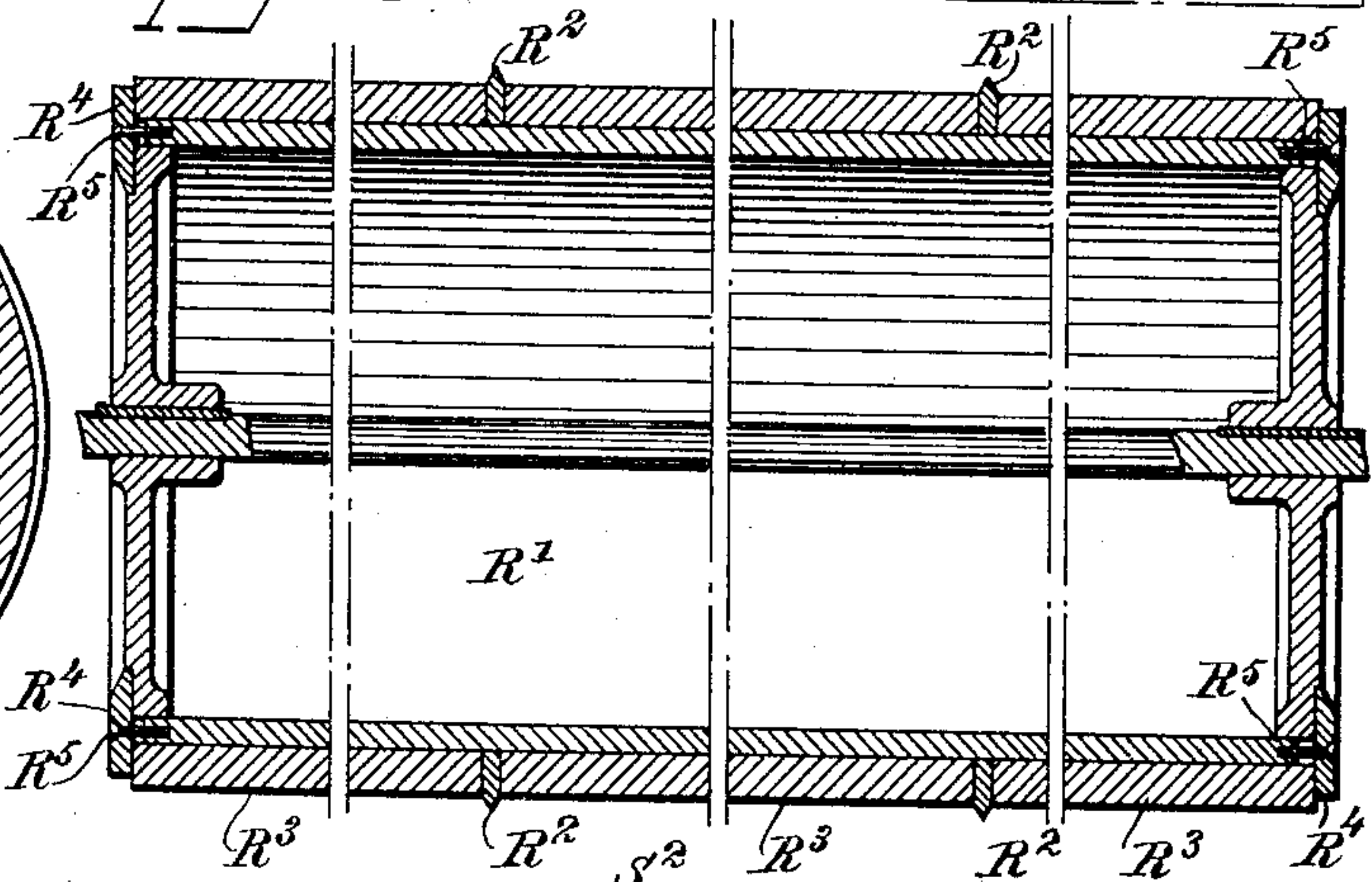


Fig. 13

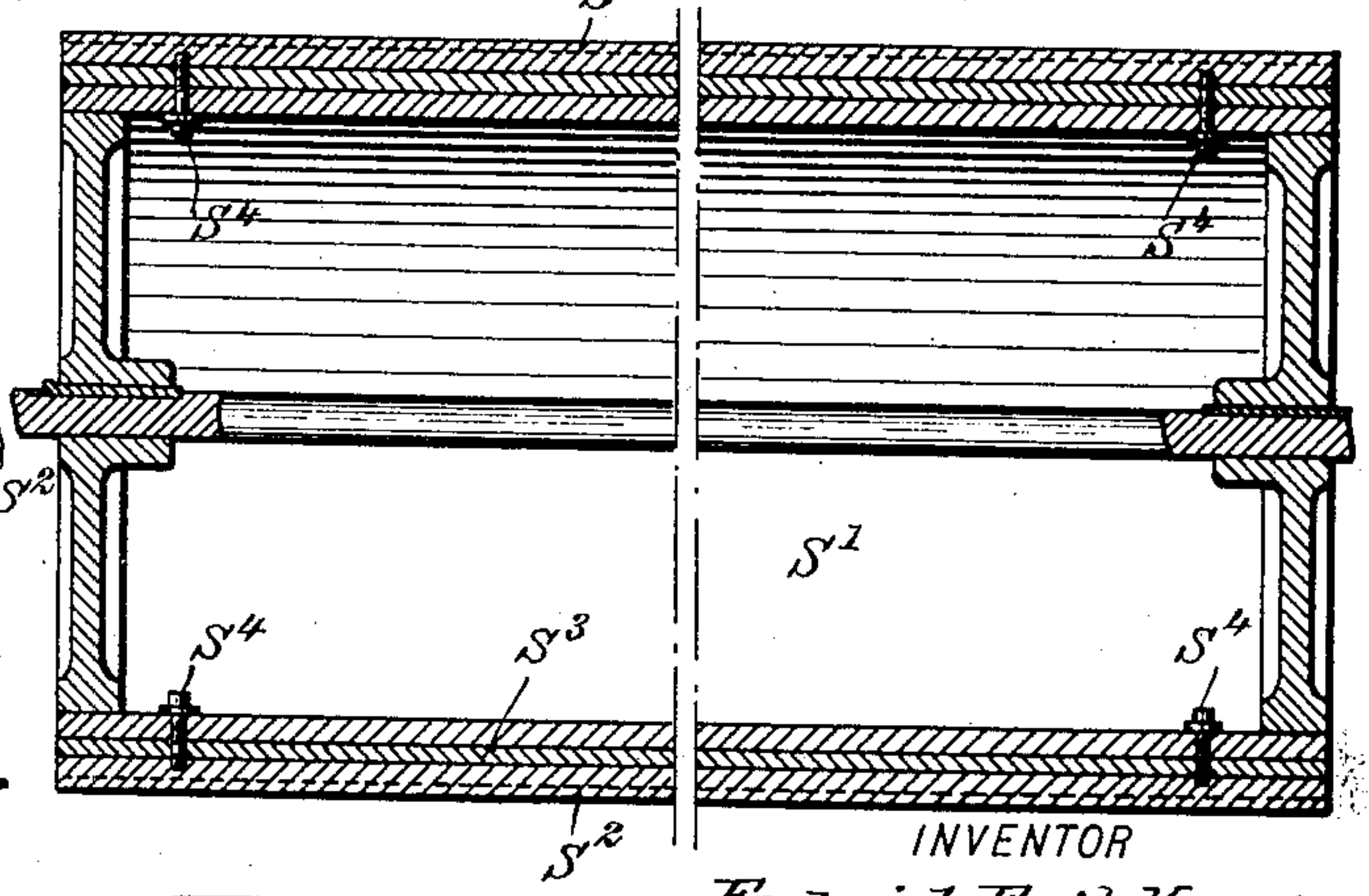


Fig. 14

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# UNITED STATES PATENT OFFICE.

FREDERICK EMIL KEMPF, OF BOSTON, MASSACHUSETTS.

## MULTICOLOR-PRINTING PRESS.

SPECIFICATION forming part of Letters Patent No. 771,644, dated October 4, 1904.

Application filed May 7, 1903. Serial No. 156,043. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK EMIL KEMPF, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Multicolor-Printing Press, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved multicolor-printing press designed to permit printing in any desired number of colors on one or both sides of the sheet and arranged to allow quick adjustment of the several parts to enable the operator to conveniently and easily "make ready" and insure perfect impressions.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claim.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the improvement on the line 1 1 of Fig. 2. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged sectional side elevation of one of the printing-cylinders and its inking device. Fig. 3<sup>a</sup> is a sectional plan view of the same. Fig. 4 is a plan view of the inking device. Fig. 5 is a transverse section of the same on the line 5 5 of Fig. 3. Fig. 6 is an enlarged sectional plan view of the web-guides on the impression cylinder extending into grooves on the printing-cylinder. Fig. 7 is an enlarged sectional side elevation of the scraper for a leveling-roller, the section being on the line 7 7 of Fig. 8. Fig. 8 is a transverse section of the same on the line 8 8 of Fig. 7. Fig. 9 is an enlarged transverse section of one of the bearings for the printing-cylinder, the section being on the line 9 9 of Fig. 3. Fig. 10 is a sectional side elevation of the same on the line 10 10 of Fig. 9. Fig. 11 is an enlarged sectional side elevation of the slitting-drum for slitting the endless printing-web. Fig. 12 is a longitudinal sectional elevation of the same. Fig. 13 is an enlarged sectional side

elevation of the cutting-drum for cutting the slitted and printed webs into sheets, and Fig. 14 is a longitudinal sectional elevation of the same.

The improved multicolor-printing press is mounted on a suitably-constructed frame A, in the sides of which are journaled shafts B and B', carrying impression-cylinders C C', around which passes a web D to allow printing both sides of the web, as hereinafter more fully described.

The shaft B is provided with a pulley B<sup>2</sup>, connected by a belt B<sup>3</sup> with other machinery to impart a rotary motion to the shaft B and its impression-cylinder C. On the shaft B is also secured a bevel gear-wheel E in mesh with a bevel gear-wheel E', secured on a longitudinally-extending shaft E<sup>2</sup>, journaled on the outside of one of the sides of the frame A, as plainly indicated in Fig. 2, and on the said shaft E<sup>2</sup> is secured a bevel gear-wheel E<sup>3</sup> in mesh with a bevel gear-wheel E<sup>4</sup>, secured on the shaft B' of the second impression-cylinder C', so that when the shaft B and the impression-cylinder C are rotated then a similar rotary motion is given by the gearing described to the shaft B' and its impression-cylinder C', so that the two impression-cylinders rotate in unison and the web D is caused to travel around the said impression-cylinders in the direction of the arrow a'. (Shown in Fig. 1.) The web D to be printed on both sides is guided to and from the impression-cylinders by guide-rollers F, arranged in such a manner that the web after it is printed on one side while passing around the impression-cylinder C travels in a reverse direction over the impression-cylinder C' to be printed upon on the other side.

As the printing devices are alike on both impression-cylinders, it suffices to describe but one in detail. Around each impression-cylinder C and C' are grouped the printing-cylinders G, (eight in number, as shown in Fig. 1,) each having clamped or otherwise secured on its peripheral face the printing plates or type carrying the matter to be printed in a desired color upon the web D, and the said printing-cylinders G are connected by a gearing E<sup>5</sup> with the corresponding impression-



cylinder C or C' to rotate the printing-cylinders in unison with the impression-cylinders. Each printing-cylinder G is normally in contact with the web D and in peripheral contact with the spaced inking-rollers H H', the transferring-roller H<sup>2</sup>, and the leveling-rollers H<sup>3</sup> H<sup>4</sup>, the said rollers H, H', and H<sup>2</sup> being also in contact with a central distributing-roller I, mounted to turn in a fountain casing or trough J, secured to the sides of the frame A. (See Figs. 3, 4, and 5.) The transferring-roller H<sup>2</sup> is located between the inking-rollers H and H', and the leveling-roller H<sup>3</sup> is arranged above the inking-roller H, and the leveling-roller H<sup>4</sup> is placed below the inking-roller H'. The lower portion of the peripheral face of the central distributing-roller I is engaged by a plurality of feed-rollers K, extending into the ink or color contained in the fountain-casing J, and the said feed-rollers K are journaled in a swing-frame L, fulcrumed loosely on the shaft I' of the distributing-roller I. The swing-frame L is provided with levers N, extending downwardly through suitable slots J<sup>2</sup> in the cover J' of the casing, and the said levers N are provided with locking-levers N', engaging notched segments N<sup>2</sup>, held on the casing to lock the said levers N and swing-frame L in a desired position. Now by the operator manipulating the levers N a swinging motion can be given to the swing-frame L, so as to keep all or only a few of the feed-rollers K in the ink or color contained in the fountain-casing J to permit of feeding more or less ink to the distributing-roller I, which in turn delivers the ink to the inking-rollers H H' and the transferring-roller H<sup>2</sup>, all in contact with the peripheral face of the printing-cylinder G. The inking-rollers H H', the transferring-roller H<sup>2</sup>, and the leveling-rollers H<sup>3</sup> are geared with the gear-wheel E<sup>5</sup> on the printing-cylinder G, and the said inking-rollers H H' and the transferring-roller H<sup>2</sup> are geared with a gear-wheel I' on the distributing-roller I, so that all the rollers I, H, H', H<sup>2</sup>, and H<sup>3</sup> and the printing-cylinder G rotate in unison. (See Fig. 3<sup>a</sup>.) Each of the leveling-rollers H<sup>3</sup> and H<sup>4</sup> is provided with a scraping device H<sup>5</sup> (see Figs. 3, 7, and 8) to allow more or less color or ink on the type or plate on the periphery of the printing-cylinder G to print heavier or lighter at any desired part in the width of the web D. For this purpose each scraper H<sup>5</sup> (see Figs. 3, 7, and 8) is provided with a casing H<sup>6</sup>, secured to the casing J and having a slotted bottom through which extend scraper-sections H<sup>7</sup>, mounted on springs H<sup>8</sup> and adjusted nearer to or farther from the peripheral face of the corresponding leveling-roller H<sup>3</sup> or H<sup>4</sup> by set-screws H<sup>9</sup>. A scraper edge H<sup>10</sup>, in more or less contact with the roller H<sup>3</sup> or H<sup>4</sup>, is of rubber, leather, or other flexible material. Now by the arrangement described any one of the scraper-sections H<sup>7</sup> may be adjusted independent of the other sec-

tions to scrape off more or less ink or color from the leveling-roller H<sup>3</sup> or H<sup>4</sup>, and as the leveling-roller is in contact with the type or printing-plate on the printing-cylinder G more or less ink or color is taken up by this leveling-roller from the type or plate to insure a heavier or lighter impression on the web for any desired part throughout its width. By having a plurality of rollers H, H', and H<sup>2</sup> for delivering ink or color to the printing-cylinder an even and uniform distribution of the ink or color takes place. Access is had to the scraping devices H<sup>5</sup> by suitable doors J<sup>6</sup> in the top and bottom of the casing J. (See Figs. 3 and 4.)

The casing J is provided at its sides with grooved lugs J<sup>3</sup>, engaging longitudinally-extending dovetailed bars J<sup>4</sup>, attached by screws J<sup>5</sup> onto the inner faces of the sides of the main frame A, as plainly illustrated in Figs. 4 and 5, and the said screws extend through elongated slots in the sides of the frame A to allow convenient longitudinal adjustment of the fountain-casing J to bring the inking device and mainly the rollers H, H', H<sup>2</sup>, H<sup>3</sup>, and H<sup>4</sup> in proper relation to the printing-cylinder G.

Each printing-cylinder G has its shaft G' journaled at each end in a bearing O', formed or secured eccentrically on a disk O, (see Figs. 9 and 10,) mounted to turn on stud P' within a casing P, bolted or otherwise secured to one face of a frame side, and the said disk O is normally locked in position in the casing P by a suitable spring-catch Q, engaging one of a plurality of recesses O<sup>2</sup> O<sup>3</sup>, formed in the peripheral face of the disk O. Now when the spring-catch Q is withdrawn the disks O can be swung around in their casing P, so as to carry the shaft G' along to move the printing-cylinders G in or out of contact with the web D and the corresponding inking-roller H. Thus when the printing-cylinder G is out of contact with the web and the inking-roller H the operator is enabled to quickly adjust the web and then bring the printing-cylinder G back into position, so as to insure a proper impression of the printing-cylinder on the web held on the impression-cylinder.

In order to limit the swinging motion of each disk O in its casing P, I provide a fixed segmental stop P<sup>2</sup> within the casing and extending in a recess formed on one-half of the peripheral portion of the disk O, suitable tongues O<sup>3</sup> O<sup>4</sup> being provided on the disk to engage corresponding grooves on the ends of the stop P<sup>2</sup>. (See Fig. 10.)

It is understood that by the arrangement described any one of the inking devices can be readily rendered inactive whenever desired by swinging the corresponding printing-cylinder G into an outermost or inactive position relative to the web and the rollers H, H', H<sup>2</sup>, H<sup>3</sup>, and H<sup>4</sup>. In order to prevent the web D from shifting transversely during its travel



around the impression-cylinders C C', each of the latter is preferably provided near each side with an annular flange or guide C<sup>2</sup>, (see Fig. 6,) preferably made in sections and bolt-  
 5 ed or otherwise fastened to the rim of the corresponding cylinder C. The web D extends between the flanges, and hence is prevented from moving transversely, thus insuring a proper register of the various color-imprints. The flanges C<sup>2</sup> extend into annular grooves in the rims or the plates of the printing-cylinders G.

After the web is printed on both sides and leaves the last guide-roller F adjacent to the  
 15 impression-cylinder C, as shown in Fig. 1, it then passes over the guide-roll F' to and over a plurality of transverse drying-cylinders V, arranged one alongside the other and journaled in suitable bearings on the top of the frame  
 20 A over the first printing device. The drying-cylinders are connected through their hollow shafts with a steam-supply pipe V', connected with a boiler or other steam-supply. Now the web printed on both sides while passing  
 25 over the drying-cylinders V is thoroughly dried and in proper condition for the action of a slitting device R for cutting the web lengthwise into strips, which then pass to a cutting device S to be cut transversely into  
 30 sheets, both devices R and S being held on the right-hand side of the machine and supported on the frame A, as will be readily understood by reference to Figs. 1 and 2.

The slitting device R consists, essentially, of  
 35 a revoluble slitting-drum R', having spaced circular knives R<sup>2</sup> (see Figs. 2, 11, and 12) operating in conjunction with the peripheral face of a roller T, rotating in unison with the slitting-drum R' and driven by a suitable gearing T' (see Figs. 1 and 2) from one of the  
 40 printing-cylinders G of the impression-cylinder C, and the slitting-drum R' is geared with the drying-rollers V to rotate the latter in unison. The spaced circular knives R<sup>2</sup> are  
 45 clamped between collars R<sup>3</sup>, held on the peripheral face of the drum R', and the outer ends of the outermost collars are engaged by clamping-rings R<sup>4</sup>, secured by bolts R<sup>5</sup> to the

rim of the drum R', as will be readily understood by reference to Fig. 9.

The cutting device S is provided with a revoluble drum S', carrying transverse knives S<sup>2</sup>, secured in a collar S<sup>3</sup> in position on the rim of the drum S'. The knives S<sup>2</sup> operate in conjunction with a roller U, driven by a gearing  
 55 T' from the roller T, so that when the machine is in operation the knives R<sup>2</sup> of the slitting device R cut the printed sheet lengthwise into strips, and then the strips are cut transversely  
 60 by the knives S<sup>2</sup> into sheets.

The inking apparatus herein shown and described is not claimed in this application, but forms the subject-matter of a separate application for Letters Patent filed by me September 9, 1903, Serial No. 172,473, and the printing-couple appliance and the slitting and cutting attachment for printing-presses, also  
 65 herein shown and described, are not claimed in this application, but form the subject-matter of separate applications for Letters Patent filed September 12, 1903, and bearing,  
 70 respectively, Serial Nos. 172,906 and 172,907.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A multicolor-printing press comprising a central impression-cylinder, printing-cylinders grouped around the impression-cylinder, for inking impressions on a web passing  
 80 around the impression-cylinder, an inking device having inking-rollers for contact with a printing-cylinder, an eccentric device in which a printing-cylinder is journaled, to allow of moving the printing-cylinder in proper relation with the impression-cylinder and inking-  
 85 rollers, and means adjustable lengthwise on the frame of the machine and carrying the inking device, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK EMIL KEMPF.

Witnesses:

EDWARD A. DARLING,  
 CHACE E. DAY.