

No. 652,431.

Patented June 26, 1900.

G. G. GOEDIKE.  
PRINTING PRESS.

(Application filed May 2, 1899.)

(No Model.)

5 Sheets—Sheet 1.

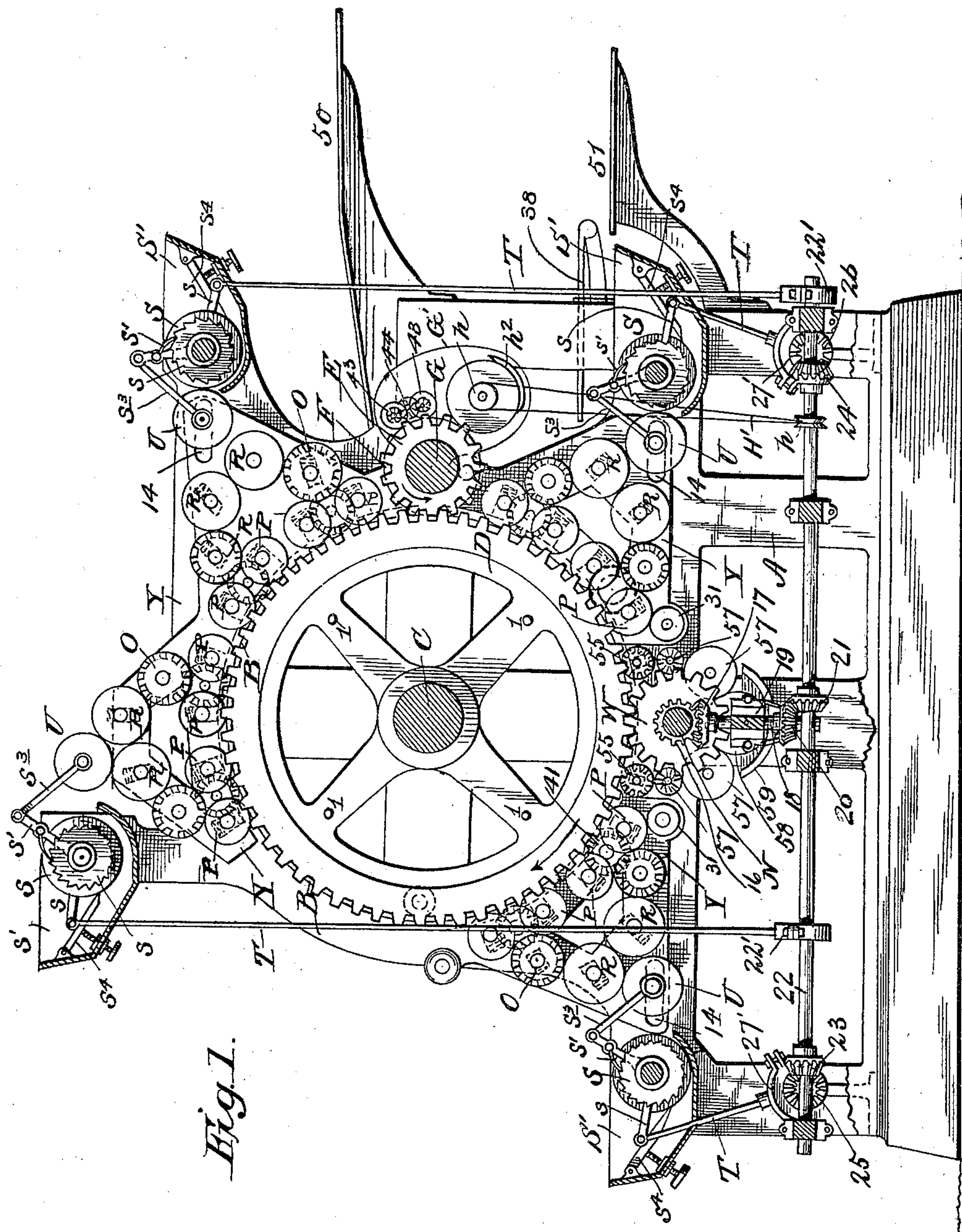


Fig. 1.

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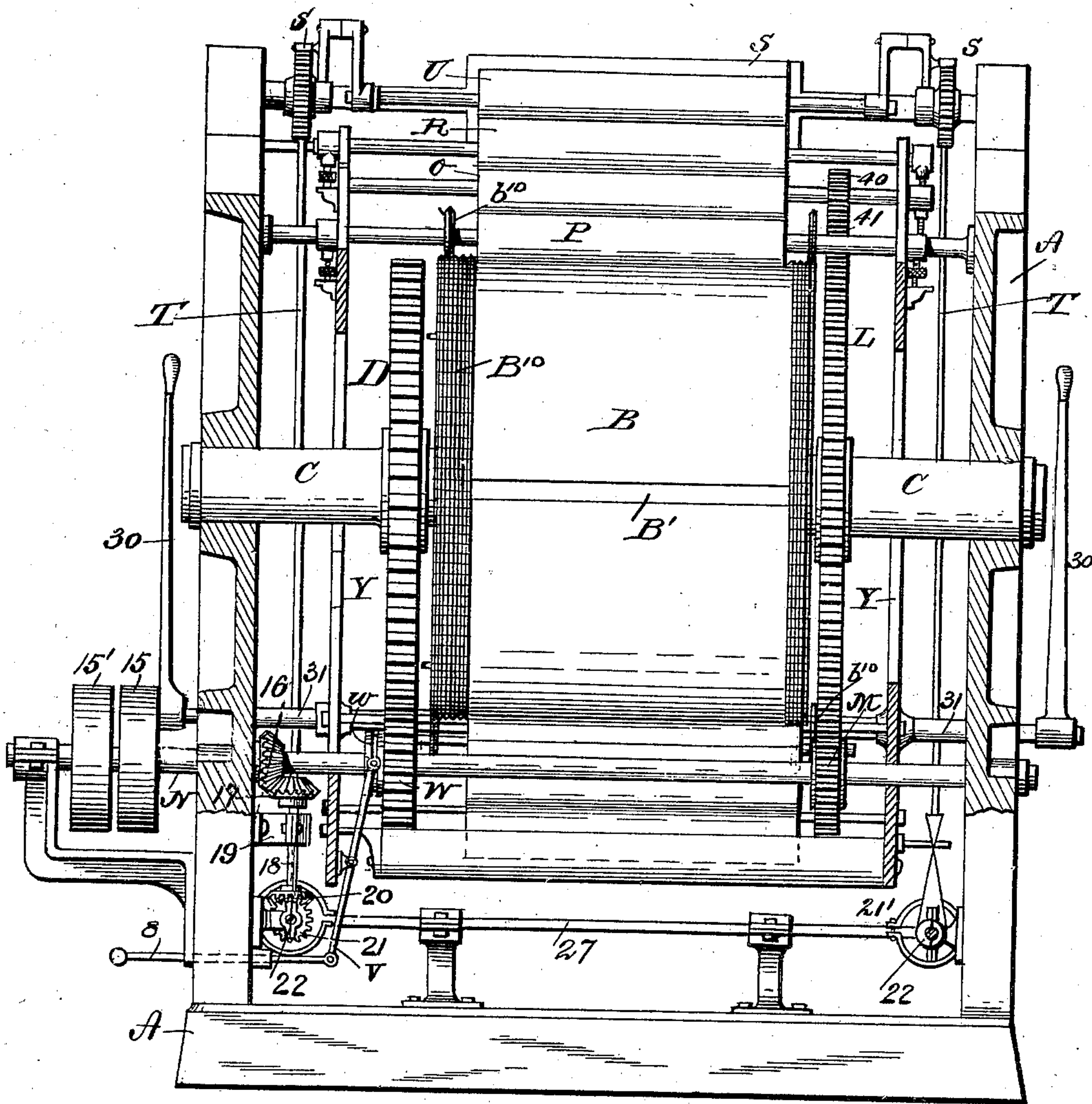
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5 Sheets—Sheet 2.

Fig. 2.



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5 Sheets—Sheet 3.

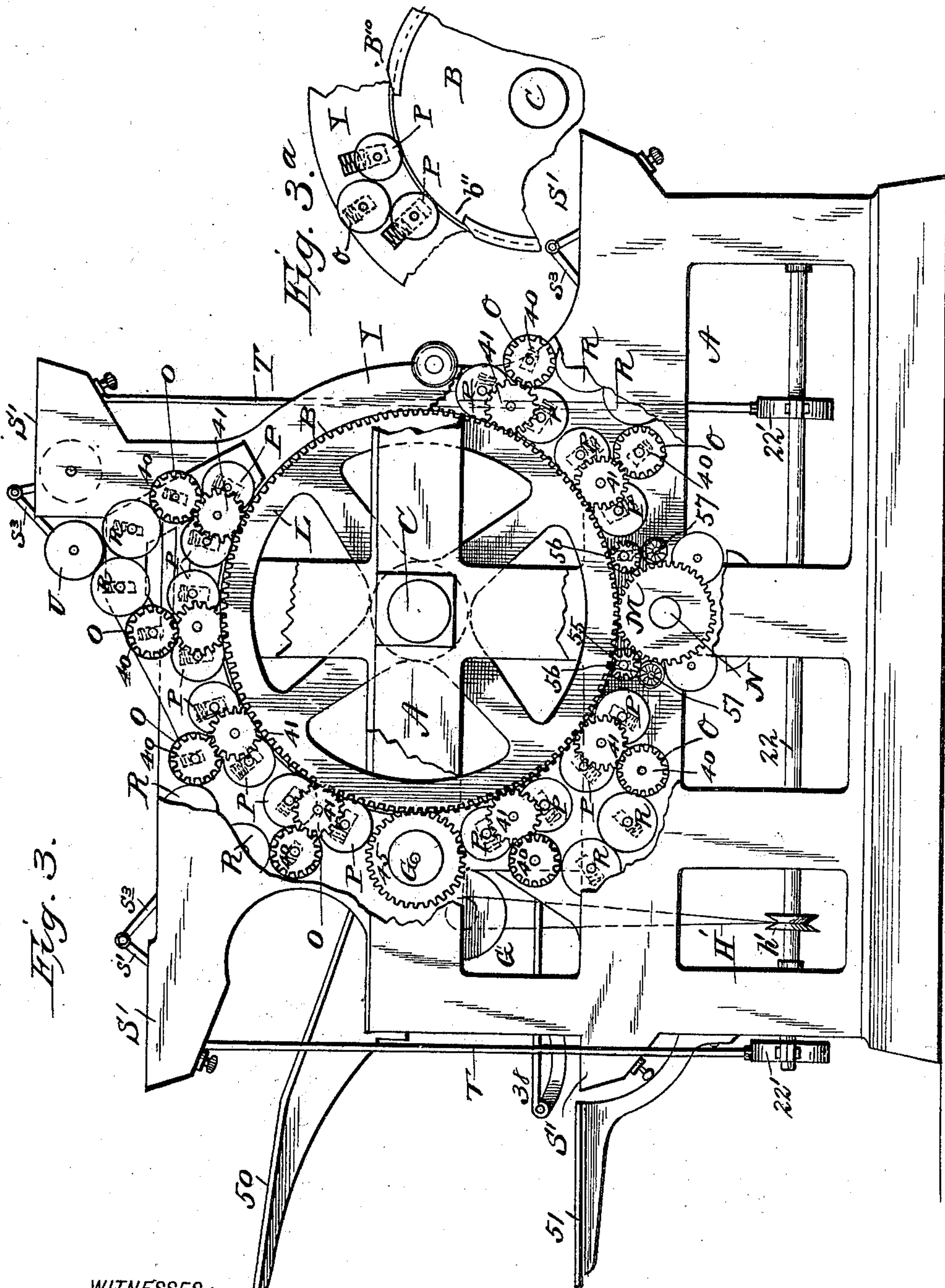


Fig. 3.

Fig. 3a.

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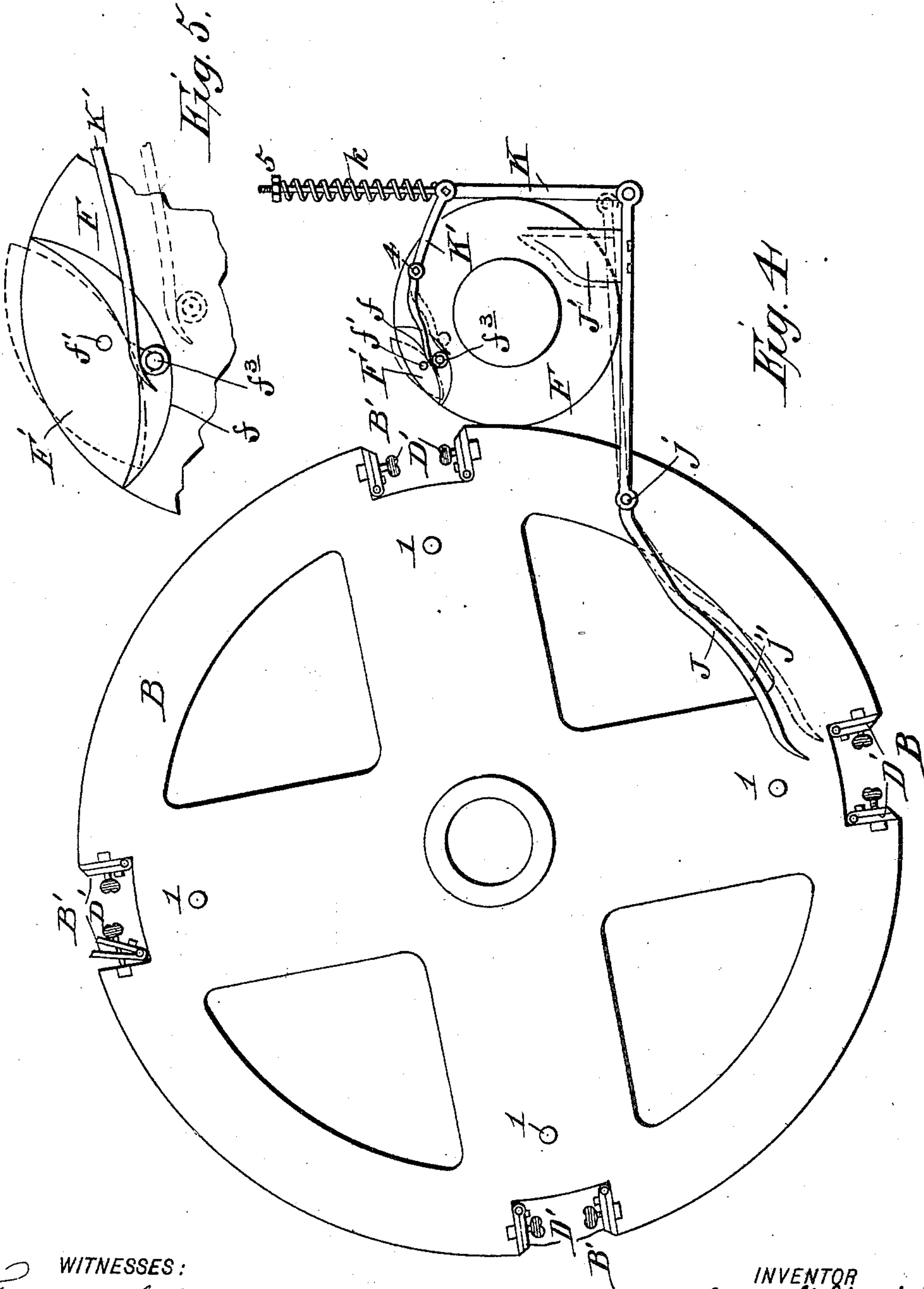
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5 Sheets—Sheet 4.



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**Patented June 26, 1900.**

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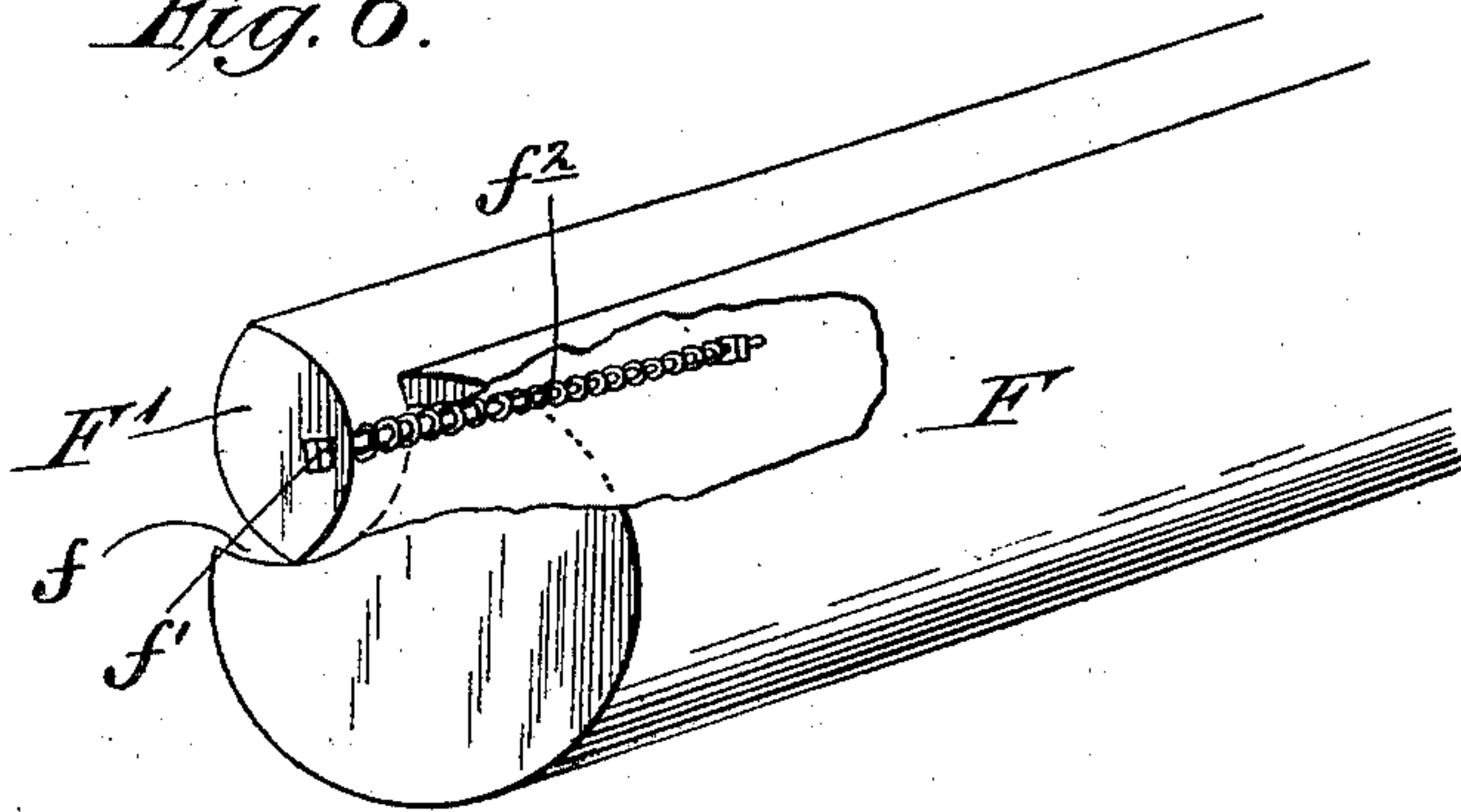
**PRINTING PRESS.**

(Application filed May 2, 1899.)

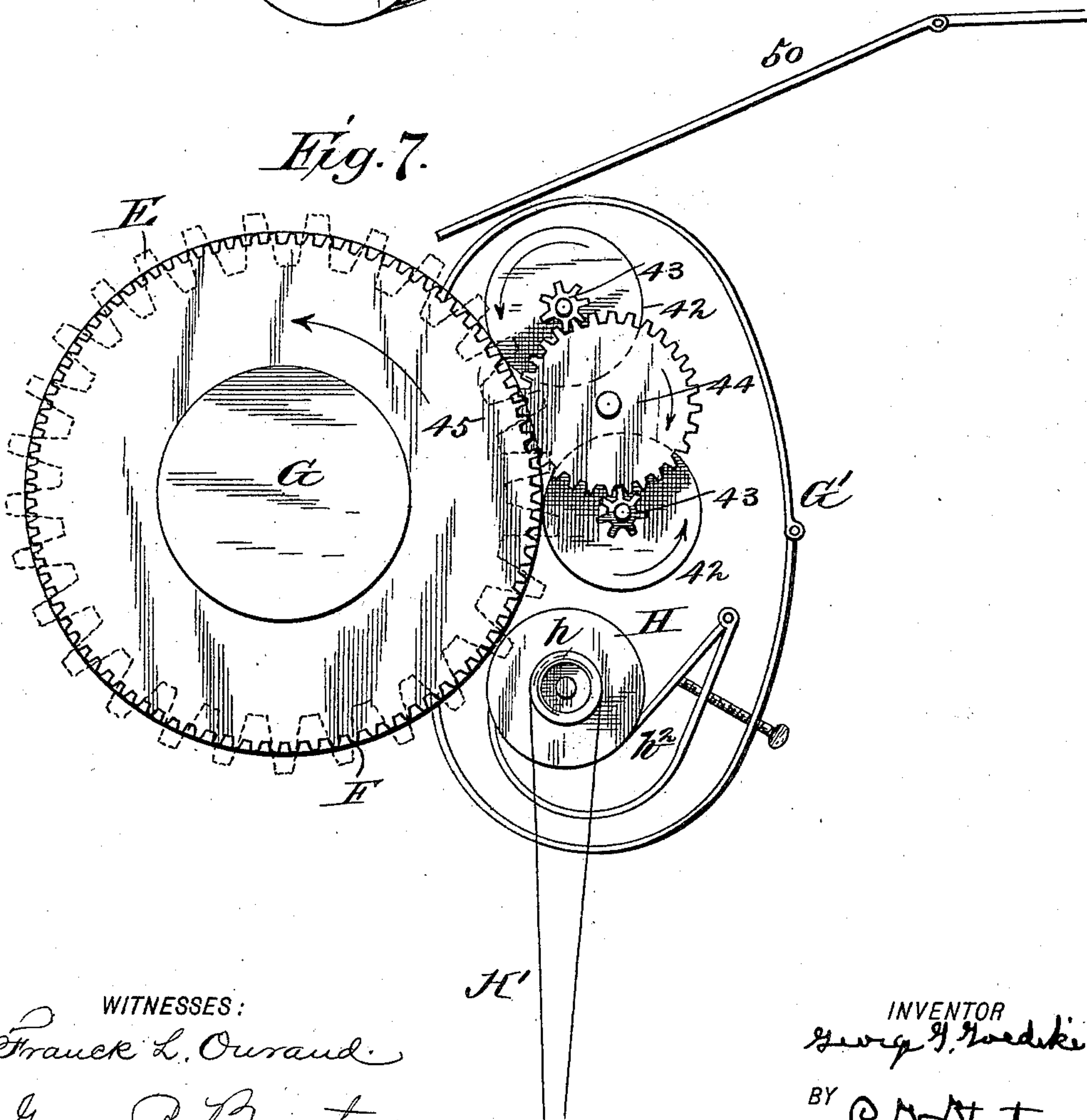
(No Model.)

**5 Sheets—Sheet 5.**

*Fig. 6.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

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## PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 652,431, dated June 26, 1900.

Application filed May 2, 1899. Serial No. 715,315. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE GUSTAVE GOEDIKE, a subject of the Queen of Great Britain, residing at Hamilton, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Printing-Presses, of which the following is a description, reference being had to the accompanying drawings and to the letters and figures of reference marked thereon.

My invention relates to rotary multicolor-printing machines.

The objects of this invention are to provide a machine of this character which will print colors rapidly one upon the other without waiting for one color to dry before the next is applied, to provide an anti-offset or ink-drying mechanism for drying the fresh impressions as made, and to provide a powder-dusting mechanism for so drying the fresh impressions.

These objects I accomplish by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine, partly in section and with one side of the frame removed. Fig. 2 is a front end elevation, partly in section. Fig. 3 is a view similar to Fig. 1 of the opposite side of the machine. Fig. 3<sup>a</sup> is a detail of the plate-cylinder and three inking-rolls. Fig. 4 is an enlarged detail side elevation to better show the gripper mechanism and the means for clamping the printing-plates upon the printing-cylinder. Fig. 5 is a detail of the gripper; and Fig. 6 is a perspective of the impression-cylinder, broken away to show the spring for holding the gripper closed. Fig. 7 is a detail view of the powder-dusting mechanism.

A represents the framework of the machine, within which the printing-cylinder B is mounted on the shaft C, journaled at its ends in bearings on the sides of the frame. The shaft C has a large fast gear-wheel D of the same diameter as the printing-cylinder, which meshes into a small drive-pinion W, splined or feathered on the drive-shaft N, journaled in the sides of the frame below and parallel with shaft C. The pinion W has a hub w,

provided with an annular groove engaged by the upper end of a yoke-lever V, pivoted between its ends to the inner side of the frame, as shown in Fig. 2, and provided with an operating-rod 8, extending out through the frame. The shaft N has the usual fast and loose pulleys 15 15'.

The impression-cylinder F is mounted on a shaft G in front of the printing-cylinder B and is about one-fourth the diameter thereof. The shaft G carries a pinion E of the same diameter as cylinder F, and this pinion meshes into the large gear D, so that the impression-cylinder will revolve four times for every revolution of the printing-cylinder. These proportions may be varied, however, so long as the impression-cylinder revolves once for every printing-surface on the printing-cylinder. These printing-surfaces may be of any desired character, such as are used in lithographing, typographical printing, relief-plates, &c.

The printing-cylinder B is provided with four equidistant longitudinal grooves B', between which are the segmental surfaces on which the printing-plates rest. These plates are secured at their longitudinal edges by means of any suitable form of clamps D', mounted within the grooves B', as shown in Fig. 4. One end of the cylinder B is provided just beyond the bases of the grooves B' with removable pins I, one for every groove, and for a purpose to be presently set forth.

The shaft C at its end opposite the fixed gear D is provided with a large loose gear-wheel L in mesh with and driven by a pinion M on the drive-shaft N.

There are four sets of inking mechanisms, and every one has two pairs of rolls P P, which apply the ink to the proper printing-surface, and intermediate of every pair of rolls P P is a pinion 41, meshing with the large loose gear L and engaging a gear 40 on the end of a roll O, one of which is in frictional contact with every pair of rolls P P. These rolls P P receive ink from the rolls O, which in turn contact with and receive ink from the pair of contacting rolls R R. Every pair of rolls R R is supplied with ink by a reciprocating roll U, which travels back and



forth between them and the main steel roll S, one of which is mounted in every one of the four ink-troughs S'. The shafts of all of these rolls S, except the rear upper one, are mounted in slots 14 of the brackets Y, in which all of the inking-rolls O P R are mounted in adjustable spring-pressed boxes or bearings. This upper rear roll U rests above and between the rolls R R and travels back and forth to the roll S.

22 22 are parallel longitudinal shafts mounted in bearings in the lower portion of the frame and geared to the end counter-shafts 27 27 by the bevel-gears 23 25 and 24 26. This shafting is driven from the drive-shaft N through the medium of a vertical shaft 18, mounted in bracket 19 and geared to shaft N by bevel-gears 16 17 and provided on its lower end with a bevel-gear 20, meshing into a bevel-gear 21 on one of the longitudinal shafts 22. The rolls U S of each inking mechanism are operated from this shafting, as will now be described.

On the ends of the shafts of each roll S are loosely mounted a pair of bell-crank levers s, the horizontally-extending arms of which are connected by rods T with eccentrics 22' 22' and 27' 27' on the shafts 22 27, respectively, so that as the shafts rotate the bell-crank levers s will be rocked. The vertically-extending arms of the levers s are provided with pawls s', which engage ratchet-wheels s<sup>2</sup> on the ends of said roll-shafts. Furthermore, the upper ends of every pair of bell-crank levers are connected by a link s<sup>3</sup> to a roll U, and so as the bell-cranks are rocked they will reciprocate the rolls U from the trough-rolls S to the first or distributing rolls R R in addition to rotating the rolls S through the pawls and ratchets. Every ink-trough S has an adjustable scraper s<sup>4</sup> to remove surplus ink therefrom. The upper brackets Y are stationary, but the two lower brackets are pivoted at their inner adjacent ends by means of rods 31, mounted in the frame A. The ends of these rods are provided with lever-arms 30, by means of which the brackets may be swung out of position to carry the rolls P away from the printing-cylinder and permit of their removal for cleaning, &c.

Any suitable mechanism may be employed to automatically move the respective groups of inking-rolls away from the printing-cylinder and allow them to return again at the proper time to ink the desired printing-surface; but I prefer the mechanism shown in the drawings, which will now be described.

At the ends of the plate-cylinder B are placed a series of ribs or rings B<sup>10</sup>, which act on wheels b<sup>10</sup>, placed on the shafts of ink-rolls P P, one rib being provided at each end of cylinder for every pair of ink-rolls and one wheel being provided at each end of the said ink-rolls, so that the ink-rolls will be moved evenly away from the printing-surfaces. Every rib or ring B<sup>10</sup> has a cut-away portion b<sup>11</sup> alongside of one of the printing-surfaces,

so as to allow the inking-rolls to be pressed by their springs into contact with the surface to be inked. This mechanism operates in the usual manner to hold the inking-rolls away from those printing-surfaces not to be inked by them and allow them to be pressed into contact with the surfaces they are intended to ink. The damping-rolls 55 55, to be presently described, are moved in and out from the printing-surfaces in like manner by similar ribs and wheels. (See Fig. 3.)

At opposite sides of the drive-shaft N are the damping-rolls 55 55, provided with pinions 56, which mesh into the large gear L on shaft C. Below and contacting with the rolls 55 are the rolls 57, in frictional engagement with distributing-rolls 58, which in turn contact with opposite sides of a lowermost roll 58 within the water-trough 59. This mechanism provides for moistening the printing-surfaces and is necessary where lithographic printing is desired.

G' is a casing to contain the drying-powder, and it is located in front of the impression-cylinder F, between the feed-table 50 and the receiving-table 51, with its open side receiving a portion of the cylinder, as clearly shown in Fig. 7. In the lower end of the casing G' is a roll H, which applies the powder to the fresh impression on the paper carried by the impression-cylinder, and this roll H is operated by a belt H', passed around a pulley h on its shaft and also passed around a pulley h' on shaft 22. Surplus powder is removed from the roll H by a scraper h<sup>2</sup>. Above the roll H are two rolls 42 42 to remove surplus drying material from the printed paper. Each of these rolls 42 has a pinion 43 in mesh with a larger intermediate pinion 44, which in turn is in mesh with a gear-wheel 45 on the shaft G of cylinder F. By this means the drying material is applied successively to every impression and the surplus removed prior to the next impression. Thus the impressions may follow in rapid succession and all offset prevented.

The impression-cylinder F is provided with a longitudinal concave groove f, in which is mounted the gripper F', of elliptical cross-section. This gripper F' is mounted on a pivot-rod f', on which is a torsional spring f<sup>2</sup>, acting to close the gripper. (See Fig. 6.) The gripper is further provided with an operating crank-arm or projection f<sup>3</sup>.

J is a lever pivoted between its ends, as at j, to one side of the frame, with its downwardly-inclined end j' in the path of the pin or pins I (see Fig. 4) and its opposite straight end extending alongside the impression-cylinder F, where it is provided with an inclined projection or cam J' to engage the crank-arm f<sup>3</sup>, and open the gripper F', so as to release the printed sheet, which is received by the flier 38 and deposited on the table 51.

K is a vertical spring-depressed rod having a collar 5 at its upper end for adjusting the tension of its spring k.



$\bar{K}'$  is a lever pivoted between its ends, as at 4, to the frame above the rod J and pivoted at its outer end to the rod K. The inner end of the rod  $\bar{K}$  crosses the path of the crank  $f^3$ , so that when the impression-cylinder is in position to receive a sheet a pin I, acting on lever J, will raise rod K, which in turn will rock the lever  $\bar{K}'$  and cause its inner end to bear down on the crank-arm  $f^3$  and open the gripper against the action of its spring  $f^2$ . (See Figs. 4, 5, and 6, which clearly illustrate such actions.) The gripper  $\bar{F}'$  will be opened to receive and discharge a sheet once for every pin I on the printing-cylinder, so that one sheet may receive four impressions, or four sheets may be fed and each sheet receive a single impression.

The operation, briefly stated, is as follows: The shaft N imparts motion to the machine, and a sheet is fed to the impression-cylinder, where it is gripped and carried around four times (a single pin I being employed) to receive the four successive impressions of the printing-surfaces on the cylinder B. The drying mechanism will prevent any offset, so that the work will be done very rapidly. As soon as the last impression has been made the lug or cam J' will be thrown up and engage the crank or projection  $f^3$ , which will cause the gripper to release the sheet and discharge it upon the flier 38, operated in any well-known manner. In the meantime the several inking mechanisms will have successively applied the ink to the proper printing plate or surface and then moved outwardly away from the cylinder till again brought into action.

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

1. In a multicolor-printing machine, the combination with the large printing-cylinder having a plurality of printing-surfaces, and the smaller impression-cylinder revolving once for every one of such printing-surfaces, of a powder-receptacle having its open side partially embracing the impression-cylinder between its feed and delivery tables, a powder-

applying device in the lower part of the receptacle to apply powder to the printed sheet at each impression to allow the impressions to be made rapidly one upon the other, and means in the upper part of the receptacle to remove the surplus powder from the printed sheet; substantially as described.

2. In a multicolor-printing machine, the combination with the large printing-cylinder having a plurality of printing-surfaces, and the smaller impression-cylinder revolving once for every one of such printing-surfaces, of a powder-receptacle having its open side partially embracing the impression-cylinder between the feed and delivery tables, a driven roll in the lower part of the receptacle to apply powder to the printed sheet at each impression to allow the impressions to be made rapidly one upon the other, and other driven rolls in the upper part of the receptacle to remove the surplus powder from the sheet; substantially as described.

3. In a multicolor-printing machine, the combination with the large printing-cylinder having a plurality of printing-surfaces, the smaller impression-cylinder revolving once for every one of such printing-surfaces, and gearing connecting said two cylinders, of a powder-receptacle having an open side partially embracing the impression-cylinder between the feed and delivery tables, a driven roll in the lower end of the receptacle to apply powder to the printed sheet at each impression, two upper rolls in the receptacle to remove the surplus powder from the printed sheet, pinions on the shafts of said upper rolls, and a larger intermediate pinion meshing with the said two pinions and with a gear-wheel on the impression-cylinder; substantially as described.

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

GEORGE GUSTAVE GOEDIKE.

Witnesses:

W. T. EVANS,  
F. R. MARTIN.