

No. 684,223.

Patented Oct. 8, 1901.

E. F. GRANDY.  
PRINTING PRESS.

(Application filed Mar. 5, 1901.)

(No Model.)

5 Sheets—Sheet 1.

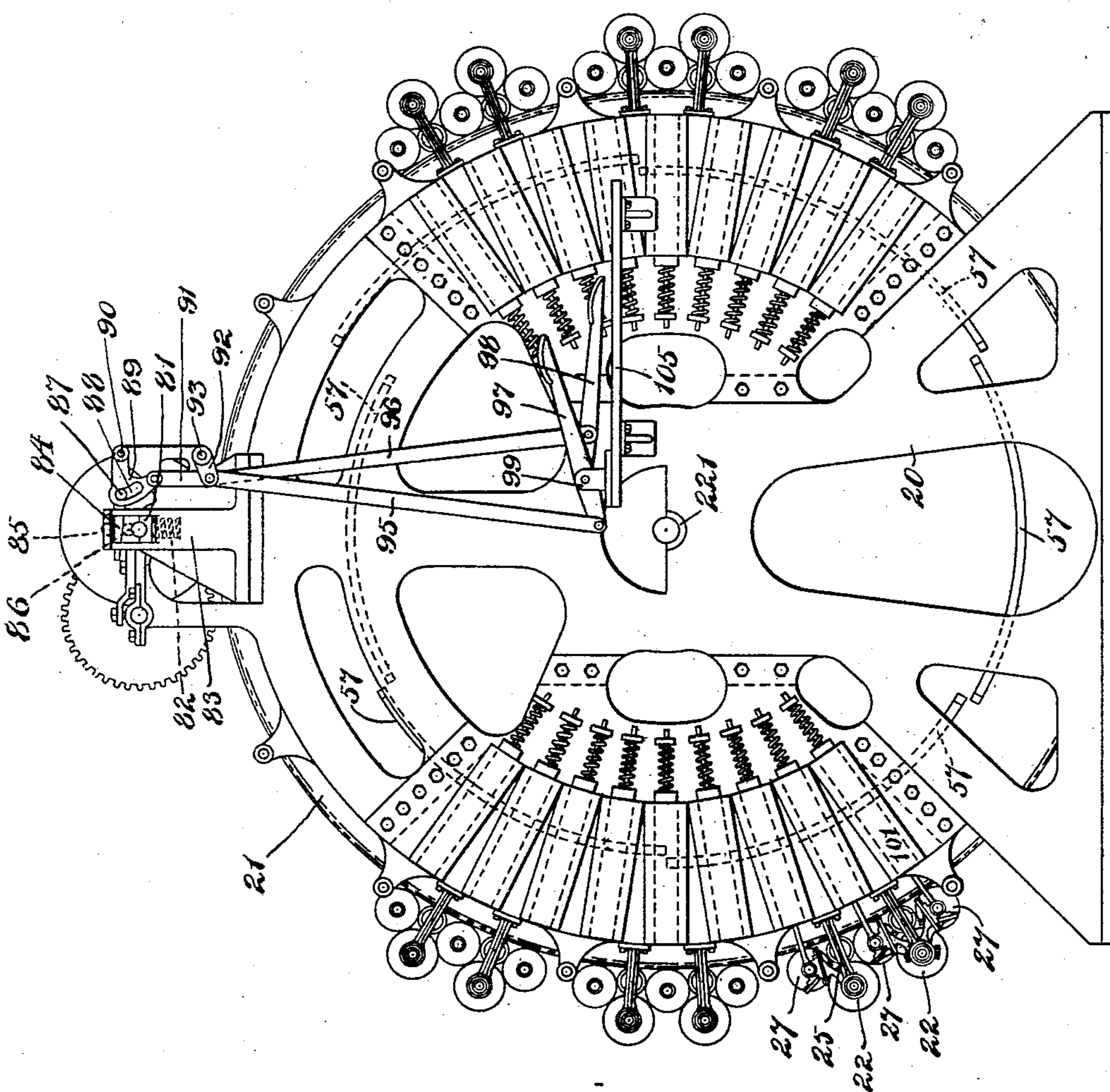


FIG. 1.

WITNESSES:

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George Pezzetta

INVENTOR:

E. F. Grandy  
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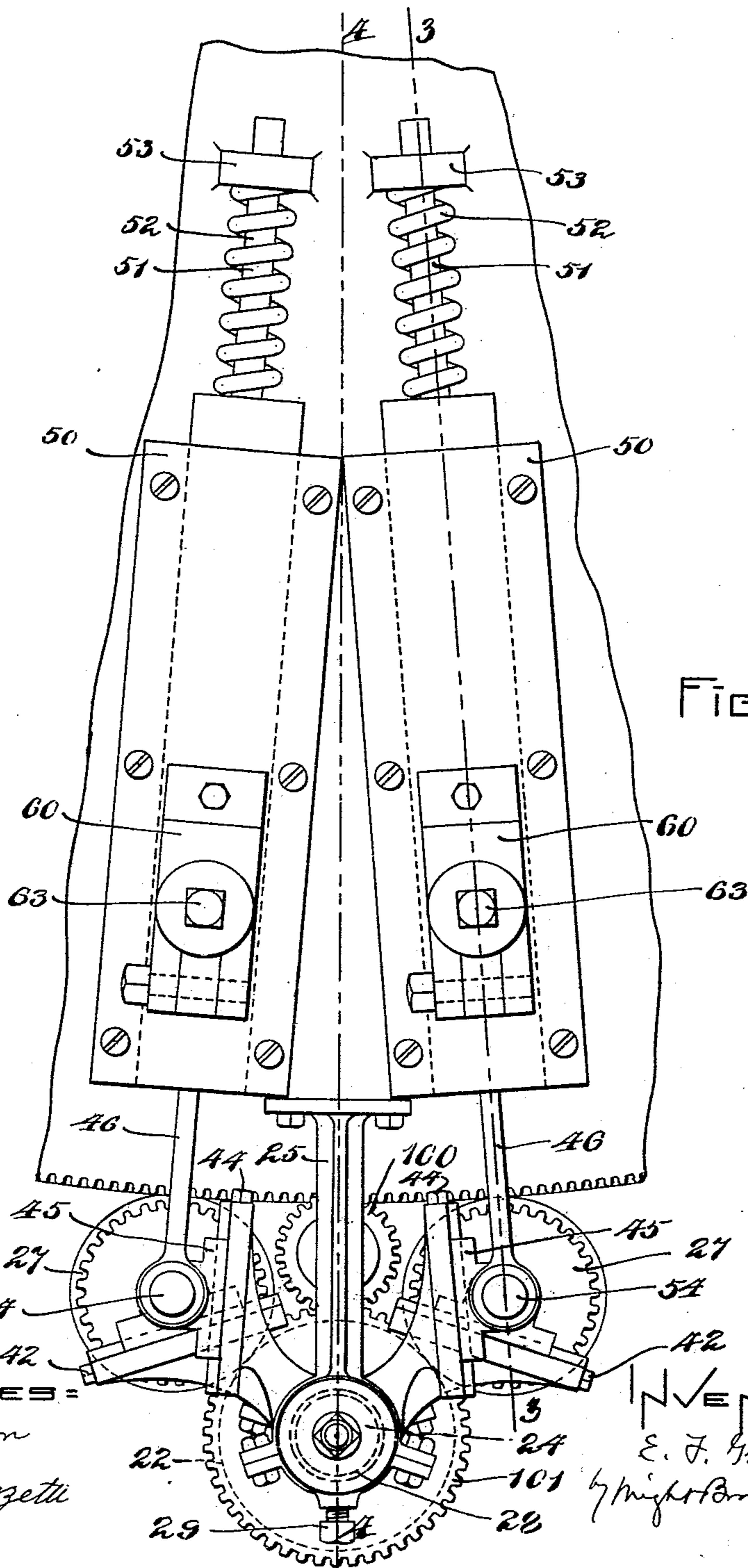


FIG. 2.

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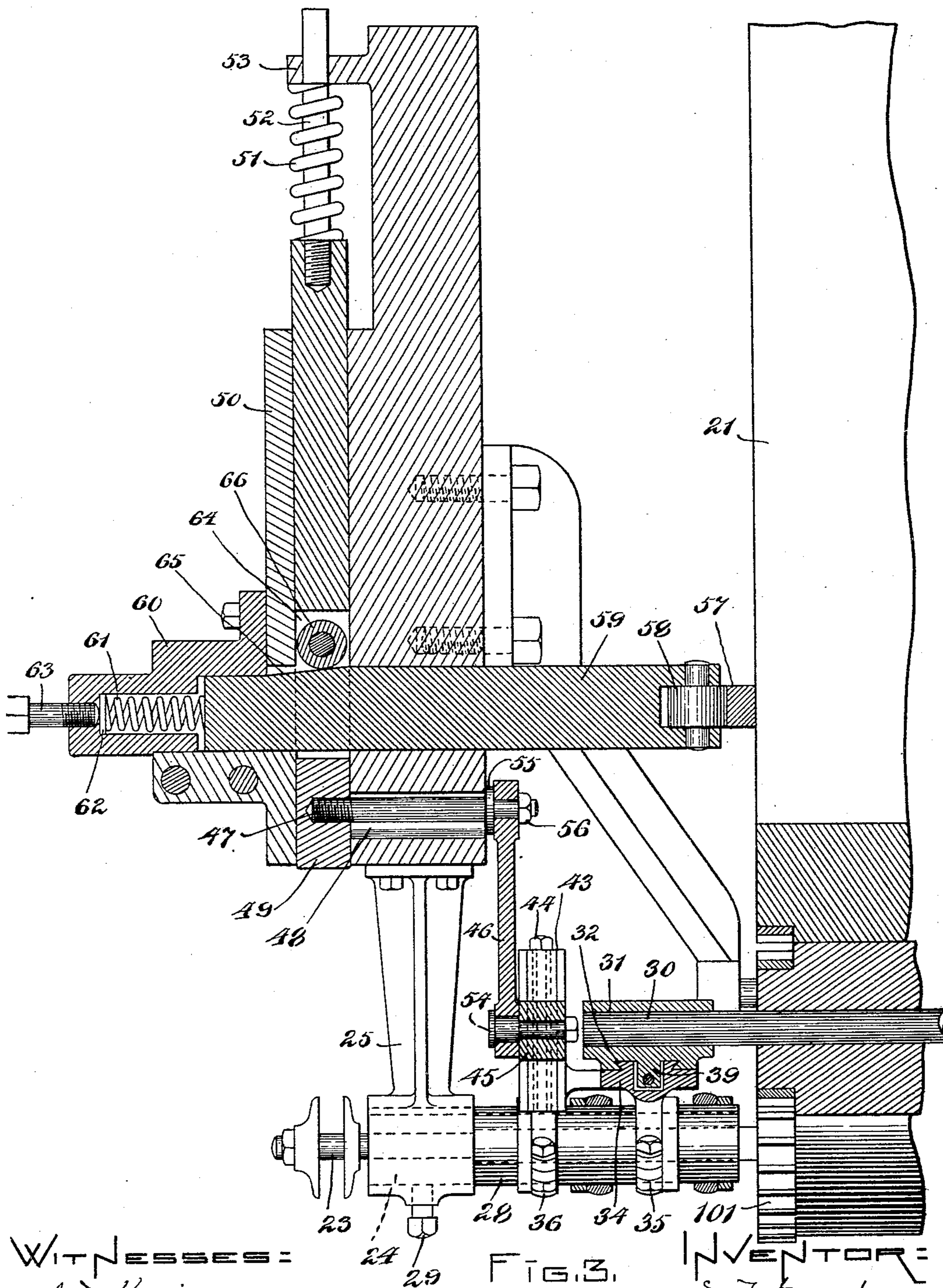
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(No Model.)

5 Sheets—Sheet 3.



WITNESSES:  
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FIG. 3.

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No. 684,223.

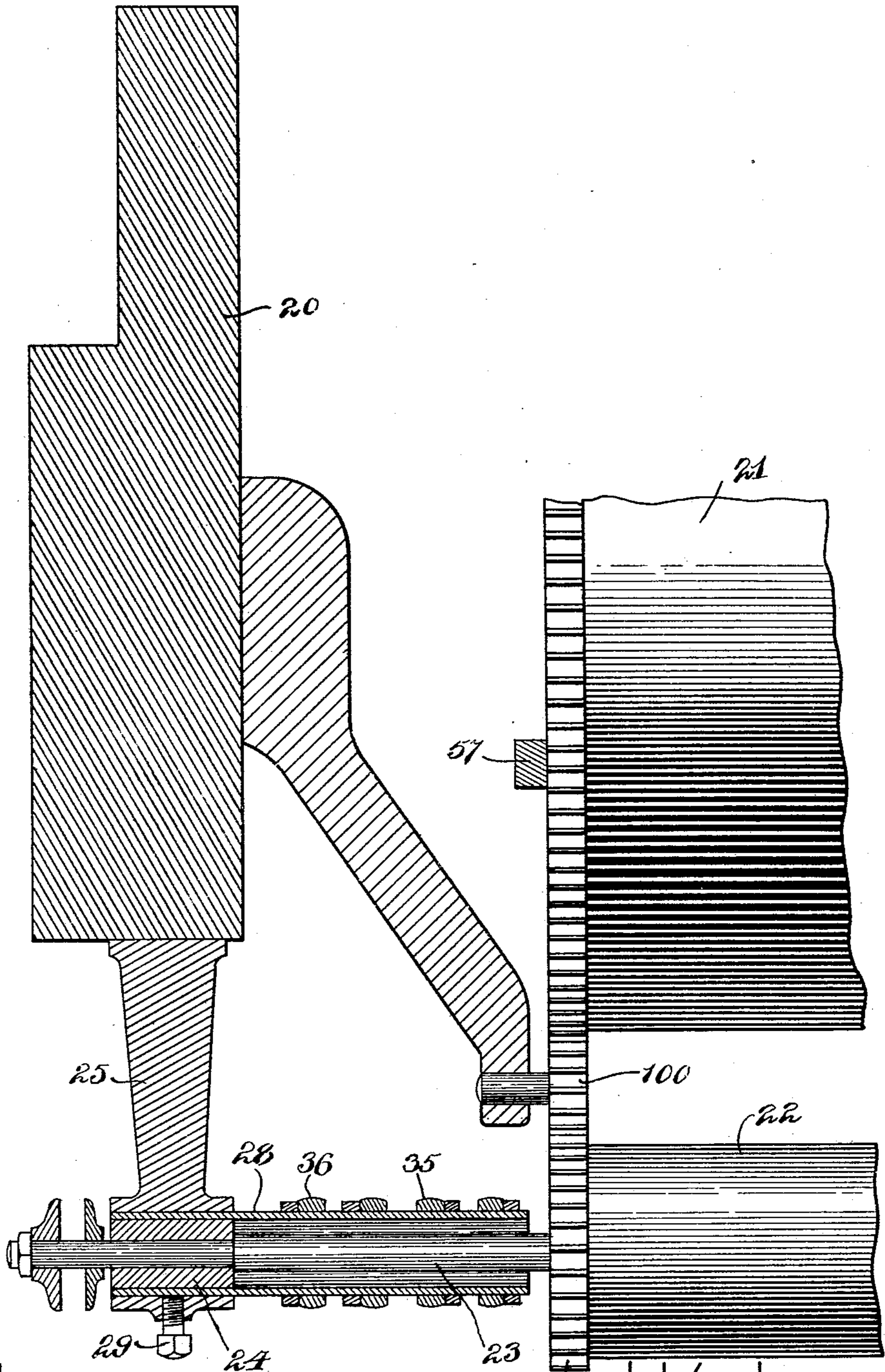
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E. F. GRANDY.  
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(Application filed Mar. 5, 1901.)

(No Model.)

5 Sheets—Sheet 4.



WITNESSES:

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FIG. 4.

INVENTOR:  
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No. 684,223.

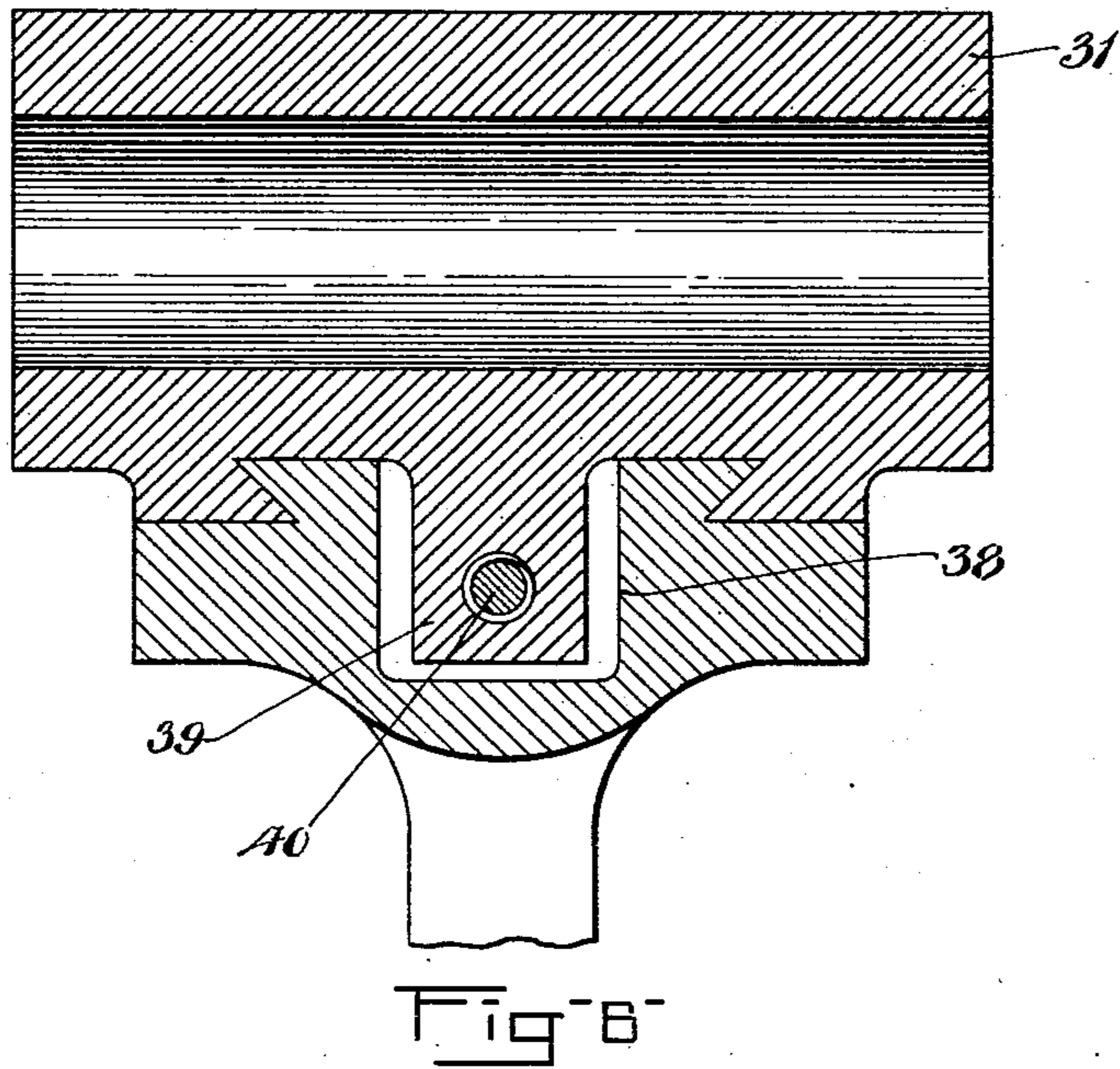
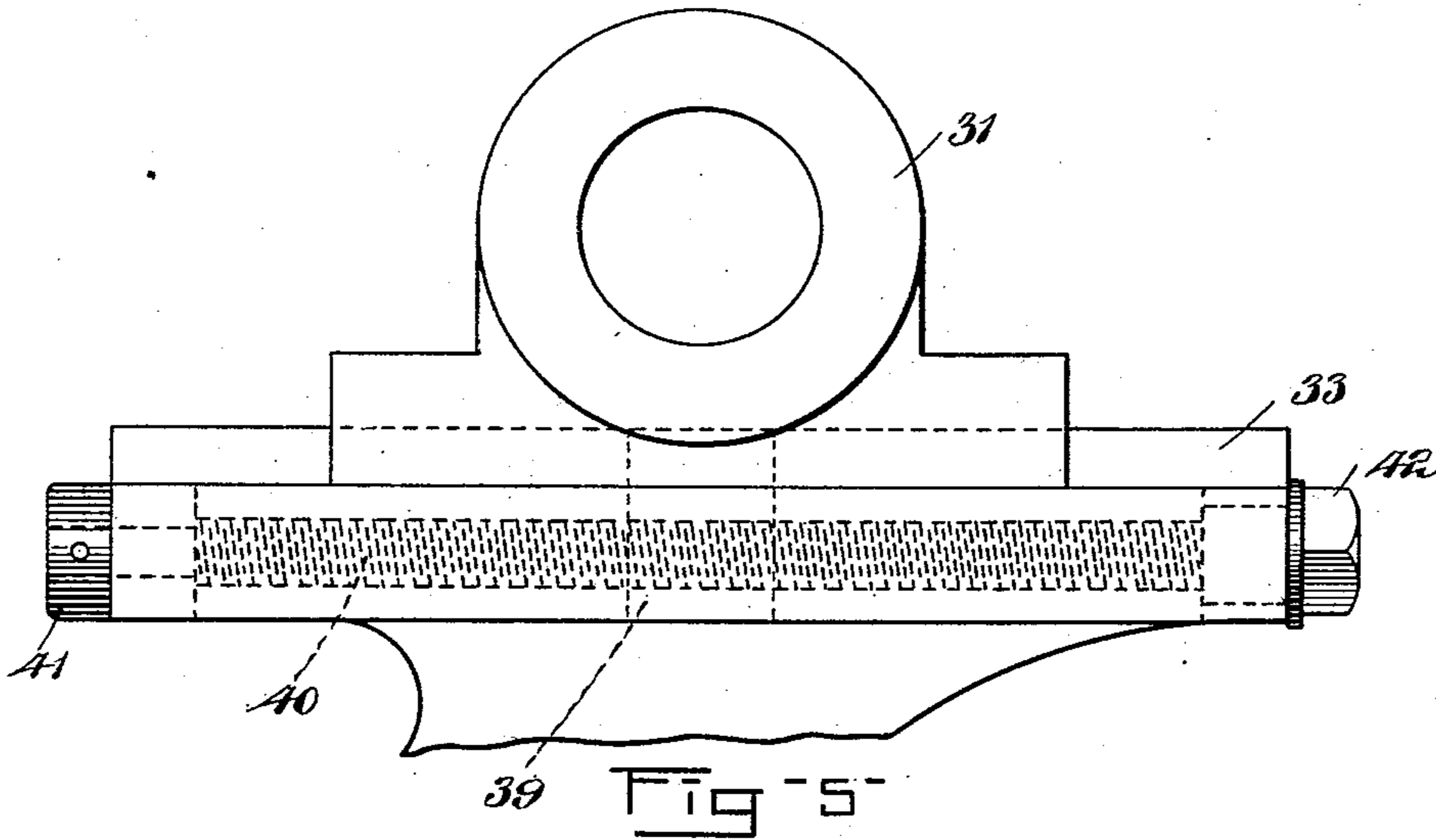
Patented Oct. 8, 1901.

E. F. GRANDY.  
PRINTING PRESS.

(Application filed Mar. 5, 1901.)

(No Model.)

5 Sheets—Sheet 5.



WITNESSES:  
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INVENTOR:  
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# UNITED STATES PATENT OFFICE.

EDWARD F. GRANDY, OF BOSTON, MASSACHUSETTS.

## PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 684,223, dated October 8, 1901.

Application filed March 5, 1901. Serial No. 49,939. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD FRANKLIN GRANDY, of Dorchester, Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

This invention has relation to multicolor cylinder-presses of the type illustrated in the patent to Henry E. Grandy, No. 484,421, dated October 18, 1892. Such presses included a form-cylinder having a plurality of printing-plates in its periphery, with each of which were adapted to coact a series of form-inking rolls. Each series of rolls was adapted to receive and transfer ink of a particular color to a predetermined plate, mechanism having been provided for automatically bringing the ink-rolls into contact with the plate on the cylinder at the proper time. The form-inking rolls and the distributing-rolls occupied a fixed relation to each other and were bodily movable by a cam mechanism toward and from the periphery of the form-cylinder.

The object of the present invention is to provide certain improvements in the press thus briefly described—first, in the ink-rolls and the mechanism for moving them by means of which the distributing-rolls can occupy a fixed relation to the form-cylinder, and thus relieve the cam mechanism from the great weight hitherto borne by it, and thereby reduce the power necessary to operate the distributing-rolls, and, second, to improve the cam mechanism itself, whereby the movement of the ink-rolls may be accomplished evenly and smoothly and without jarring.

On the accompanying drawings, forming a part of this specification, Figure 1 represents a portion of a printing-press embodying my improvements. Fig. 2 represents an enlarged view of the form-inking rolls and the distributing-rolls which coact therewith. Fig. 3 represents a longitudinal section on the line 3 3 of Fig. 2. Fig. 4 represents a section on the line 4 4 of Fig. 2. Figs. 5 and 6 represent in detail one of the adjusting devices for one of the form-inking rolls.

Referring to the drawings, 20 indicates a suitable frame, in which are journaled trunnions 221 of the form-cylinder 21. This cylinder is provided for the reception of a plu-

rality of forms or printing-plates upon its periphery. On the ends of the cylinder there are a plurality of face-cams 57, which are of segmental form and which respectively occupy the same segment of a circle that the corresponding printing-plate occupies. These cams are provided with inclined ends, (not shown,) and they are arranged at different radial distances from the axis of the cylinder. Motion is imparted to the cylinder in the usual manner. Mounted upon the frame are a plurality of series of inking-rolls, there being one series for each printing plate or cam 57, each series of printing-rolls being controlled by a certain cam and being unaffected by the other cams.

The form-rolls are indicated at 27 27, and they are arranged in contiguity with the distributing-rolls 22 22, the latter occupying a fixed position with relation to the axis of the form-cylinder.

The distributing-rolls receive their motion from the form-cylinder, the latter being provided with gear-teeth intermeshing with and driving idler-gears 100, which in turn intermesh with gears on the shaft of the distributing-rolls.

Hitherto, as has been explained, it has been the custom to move the distributing-rolls toward and from the cylinder, so that it was necessary to form the gears with relatively long teeth to permit of relative movement. By mounting the distributing-rolls, however, on stationary bearings it is unnecessary to change the relationship of the gears, whereby the noise caused by operating the cylinder is greatly reduced according to the present invention.

The form-rolls 27 27 are, as stated, in contiguity with the distributing-rolls, and they are automatically moved toward and from the periphery of the cylinder, so as to engage and ink the printing-plates thereon, said rolls swinging in the arc of a circle about the axes of the distributing-rolls.

Each roll 22, as shown in Figs. 2, 3, and 4, is fixed on a shaft 23, which carries the gears 101, intermeshing with the gears 100. The shaft 23 is journaled at each end in a block 24 in a bracket 25, secured rigidly to and projecting outward from the frame 20. Between the block 24 and the bracket 25 there

is interposed a sleeve 28, which is held against rotation by a set-screw 29 passing through the bracket 25 into firm engagement therewith.

5 The bearings for the rolls 27 are upon the ends of arms which are fulcrumed upon the said sleeves 28. The shaft upon which each roll 27 is journaled is indicated at 30. It is mounted at each end in a sleeve-bearing 31,  
10 which is provided with an elongated transverse dovetail groove 32 to receive a complementary tongue 33 upon a bar 34. This bar is arranged in parallelism to the shafts 30 and 23, and it is provided with two eyes or straps  
15 35 36, which encircle the sleeve 28. The tongue 33 is elongated, as shown in Fig. 5, and it is formed with a groove 38 to receive a lug 39 from the sleeve 31.

Arranged in the groove 38 there is a screw  
20 40, having similar ends properly journaled in the stock at the end of the groove 38, as shown in Fig. 5, said screw passing through a threaded aperture in the lug 39. One end of the screw is provided with a collar 41, affixed  
25 thereto, while at the other end of the screw there is a head of wrench-retaining formation by which the screw may be rotated to adjust the sleeve or bearing 31. Thus adjustment for the sleeve 31 is provided whereby  
30 the roll 27 may be kept properly in contact with the distributing-rolls 22. The bar 34 has an elongated dovetail tongue 43 arranged transversely thereto and projecting radially relatively to the cylinder. This tongue is  
35 grooved, and in the groove lies a screw 44, similar to that at 40. The screw is engaged with the lug of a grooved block 45, (see Fig. 3,) so that said block may be adjusted radially of the cylinder and on a line transverse to the  
40 line of adjustment of the sleeve-bearing 31.

The block 45 at each end of the press is connected by a link 46 with a pin 47, which passes through a slot 48 in the frame 20, said pin being inserted in a slide 49, arranged in  
45 a radial guide 50 in the frame 20, as shown in Figs. 1 and 3. The slide is normally held outward to the extreme of its radial movement by a spring 51 encircling a pin 52 on the end of the slide and a lug 53 on the frame  
50 20. When the slides 49 are reciprocated, they swing the roll 27 in a curved path about the axis of roll 22 and toward and from or into and out of engagement with the cylinder 21. The link 46 has a loose or pivotal  
55 connection with the block 45 through the medium of a pivoted pin 54, and it is likewise pivotally connected to the pin 47, being held between a flange 55 and a nut 56 thereon. In order to move the slide inward against the  
60 pressure of the spring 51, I employ mechanism actuated by the face-cams 57 on the ends of the cylinder 21.

In Fig. 3 one of the cams 57 is illustrated in section, and it is shown as bearing against  
65 a roll 58, journaled in the end of a wedge 59, which passes through the frame 20, being

either angular or provided with means to hold it against rotation. The end of the wedge projects into a socket provided by a hollow bracket or casting 60, secured to the  
70 guide 50. This hollow bracket is readily removable, being secured in place by screws or bolts in any desired way. The rolls 58 are each held yieldingly against the cams 57 or the ends of the cylinder by a spring 61, arranged in a socket and having one end bearing  
75 against the wedge 59 and its other end resting against a disk 62, which is adjustable by means of a set-screw 63 to vary the tension of the spring. The wedge passes through  
80 an aperture or slot 64 in the slide 49, and it is provided with an incline 65, against which the roll 66 is held yieldingly by a spring 51. From this description it will be observed that when the wedges are forced outward or in the  
85 direction of the arrow in Fig. 3 the inclines 65, bearing against the roll 66, will force the slides 49 inwardly and move the roll 27 into engagement with the form-cylinder without affecting its contiguity with the roll 42.  
90

The connections interposed between the slide 45 and the roll 27 are, as has been shown, readily adjustable to compensate for the wear on the roll 27 or the transferring-roll 22, whereby the form-roll 27 may be adjusted to  
95 ward and from the form-cylinder and also toward and from the distributing-roll. The form-rolls 27 may be arranged in pairs to operate in conjunction with a single distributing-roll, or there may be the single form-roll  
100 for each distributing-roll, this being a matter of convenience and discretion.

In addition to preparing an accurate adjustment of the form-rolls relatively to the form-cylinder and the distributing-rolls the mechanism which I have provided insures a movement of the form-rolls toward and from operative position without jarring and with a smooth easy motion. By the employment of the face-cams and the wedges operated  
105 thereby the power necessary to actuate the form-roll connections is greatly reduced, when considered in connection with the devices hitherto employed for a similar purpose, and, moreover, the face-cams being on the cylinder  
115 end take up but little room. The wedges bear against the faces of the cams and are attached to the cylinder ends, and there is no danger, therefore, of loosening the cams, and thereby decreasing the accuracy and efficiency of the  
120 mechanism. Moreover, the mounting of the distributing-rolls upon fixed bearings relieves the cam-actuated mechanism from their weight, this being of great assistance in the reduction of the power necessary to actuate  
125 the mechanism.

It is not necessary to illustrate the operation of the mechanism further than has been already done, save to state that each series of printing-rolls is drawn into operative rela-  
130 tion to a printing-plate as the corresponding cam engages the mechanism for moving said

roll, and consequently each plate receives ink of its proper color. In connection with this mechanism I provide improved devices for moving the feeding or paper cylinder toward and from operative position. The said cylinder is shown in Fig. 1, to which reference may now be had. It is indicated at 80, and its trunnions are journaled in split boxes 81, supported upon springs 82 in standards 83. The standards are formed with guides, in which the boxes are adapted to reciprocate. The springs 82 normally hold the boxes raised with the feeding or paper cylinder in inoperative position. To move said cylinder, I employ wedges 84, interposed between rolls 85 on the top of the standard and rolls 86 on the boxes 81. The wedges are formed with rolls or projections 87, extending into segmental slots 88 in levers 89, which are fulcrumed at 90. The slots 88 are eccentric with respect to the fulcrums 90, so that the oscillation of the lever effects a longitudinal or reciprocatory movement of the wedges 84. The levers are connected by links 91 with levers 92 upon the ends of a shaft 93. One of the levers 92 is connected by two connecting-rods 95 96 with two foot-levers or treadles 97 98, respectively, which are fulcrumed at 99 upon the platform 105. The levers 98 97 are of the first and second classes, respectively, that at 97 being depressed by the foot for swinging the levers 89 upward, while that at 98 is employed for swinging the said levers 89 downward. From this it will be seen that by depressing the proper lever the boxes 81 and the paper-feeding cylinder 80 may be raised to operative or lowered to inoperative position, as occasion may require.

The employment of the wedges for varying the position of the boxes in the feed-cylinder reduces the power necessary to move them and provides for the said parts being actuated with an even smooth movement. I do not herein claim, however, the above-described paper-feeding mechanism, as I have filed an application therefor.

Having thus explained the nature of the invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

1. In a color-printing press, a form-cylinder adapted to carry a plurality of forms, a distributing-roll in fixed relation to said cylinder, a form-roll in contiguity to said distributing-roll, and automatic mechanism including cams on said cylinder for moving said form-roll into and out of operative relation

with said cylinder without destroying its contiguity to said distributing-roll.

2. In a color-printing press, a form-cylinder, a distributing-roll in fixed relation to said cylinder, a form-roll in contiguity to said distributing-roll, and automatic mechanism actuated by said cylinder and including cams on said cylinder for swinging said form-roll about the axis of the distributing-roll into and out of operative relation to the printing-cylinder.

3. In a color-printing press, a form-cylinder adapted to carry a plurality of forms, a distributing-roll in fixed relation to said cylinder, a form-roll in contiguity to said distributing-roll, bearings for the form-roll adapted to swing about the axis of the distributing-roll, and cylinder-operated mechanism including cams on said cylinder for moving said bearings.

4. In a color-printing press, a form-cylinder, a form-roll, a distributing-roll, movable bearings for the distributing-roll, a slide connected to each bearing to move it, and a cylinder-actuated wedge for operating each slide.

5. In a color-printing press, a form-cylinder, a plurality of distributing-rolls, and a form-roll in operative relation to each distributing-roll, a plurality of face-cams on the end of the cylinder, and means actuated by said face-cams for moving said ink-roll into and out of operative position, said face-cams being at different distances from the axis of said cylinder.

6. In a color-printing press, a form-cylinder, an ink-roll movable toward and from the periphery of the cylinder, a face-cam on the cylinder, a wedge actuated by said cam, and a connection between said wedge and said ink-roll.

7. In a color-printing press, a form-cylinder, an ink-roll, movable bearings for the ink-roll, a spring-pressed slide connected to said bearings, a spring-pressed wedge for moving said slide against the pressure of its spring, and a cam for moving said wedge against the pressure of its spring.

8. In a color-printing press, a form-cylinder, a transferring-roll having bearings fixed with relation to the cylinder, levers fulcrumed on the axis of said transferring-roll, a slide connected to each lever, and a cylinder-actuated wedge for moving each slide.

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

EDWARD F. GRANDY.

Witnesses:

C. F. BROWN,  
A. D. HARRISON.