

No. 810,392.

PATENTED JAN. 23, 1906

H. BRADSHAW.  
SHEET REGISTERING MACHINE.

APPLICATION FILED OCT. 26, 1904.

4 SHEETS—SHEET 1.

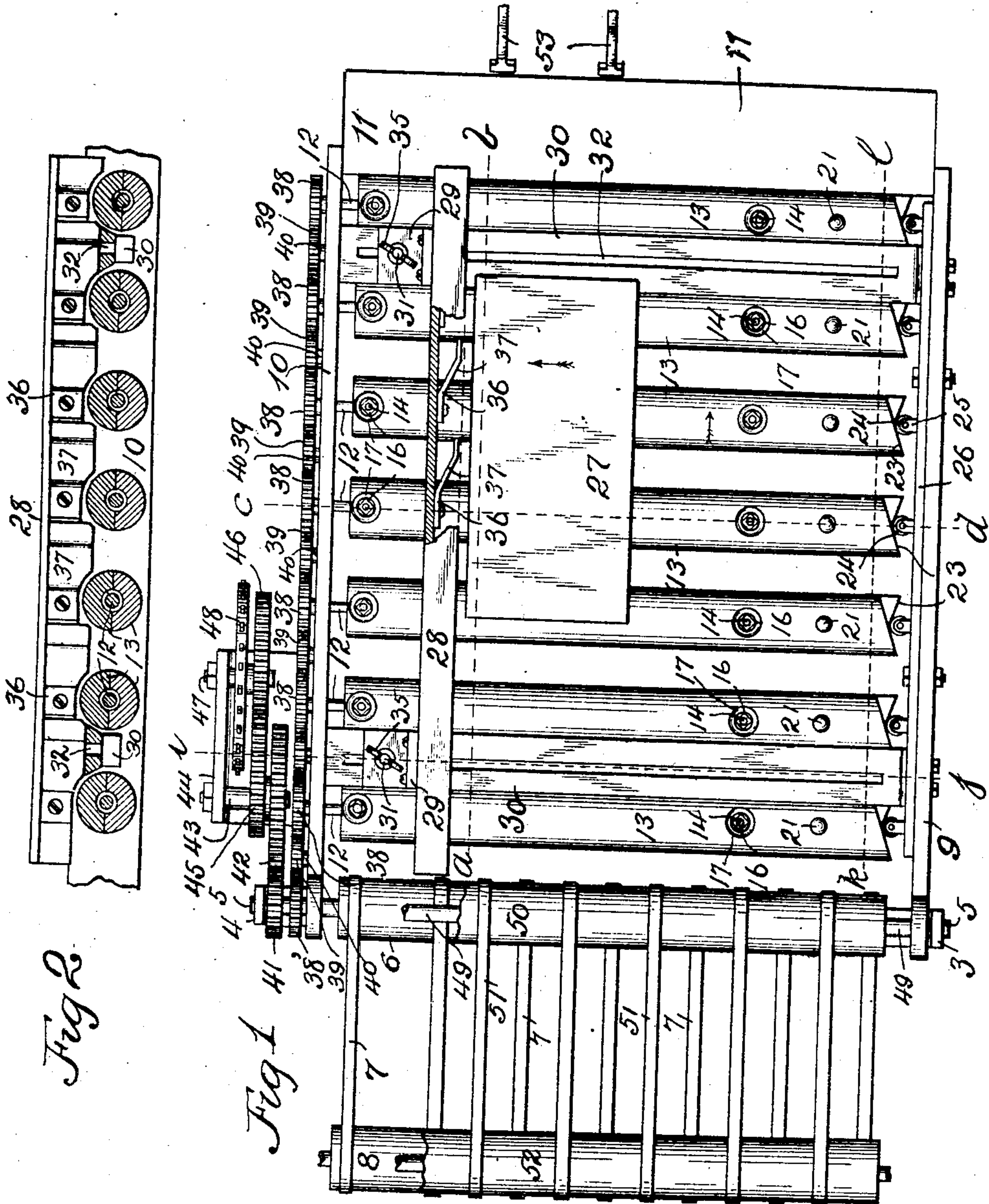


Fig. 2.

Fig. 1.

Witnesses

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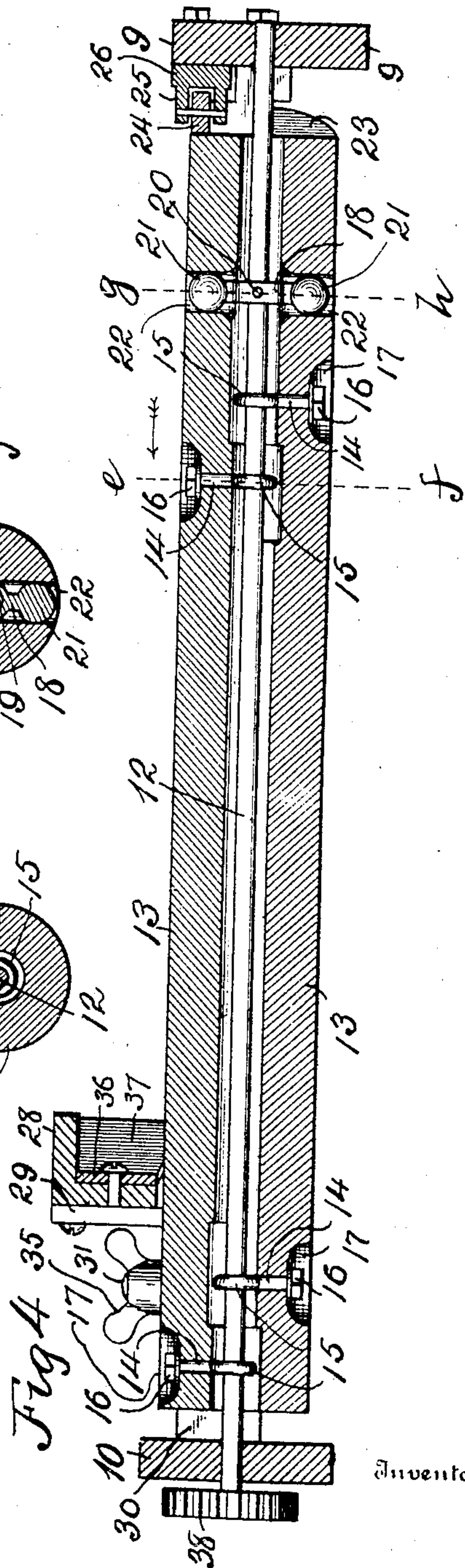
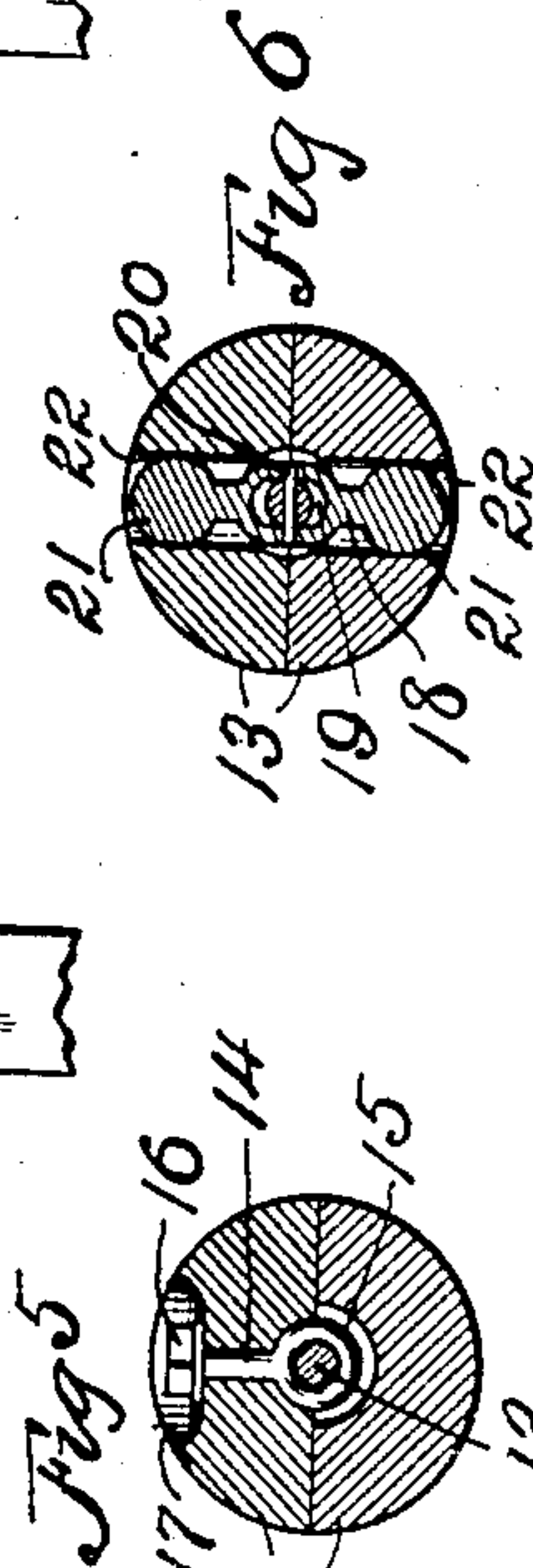
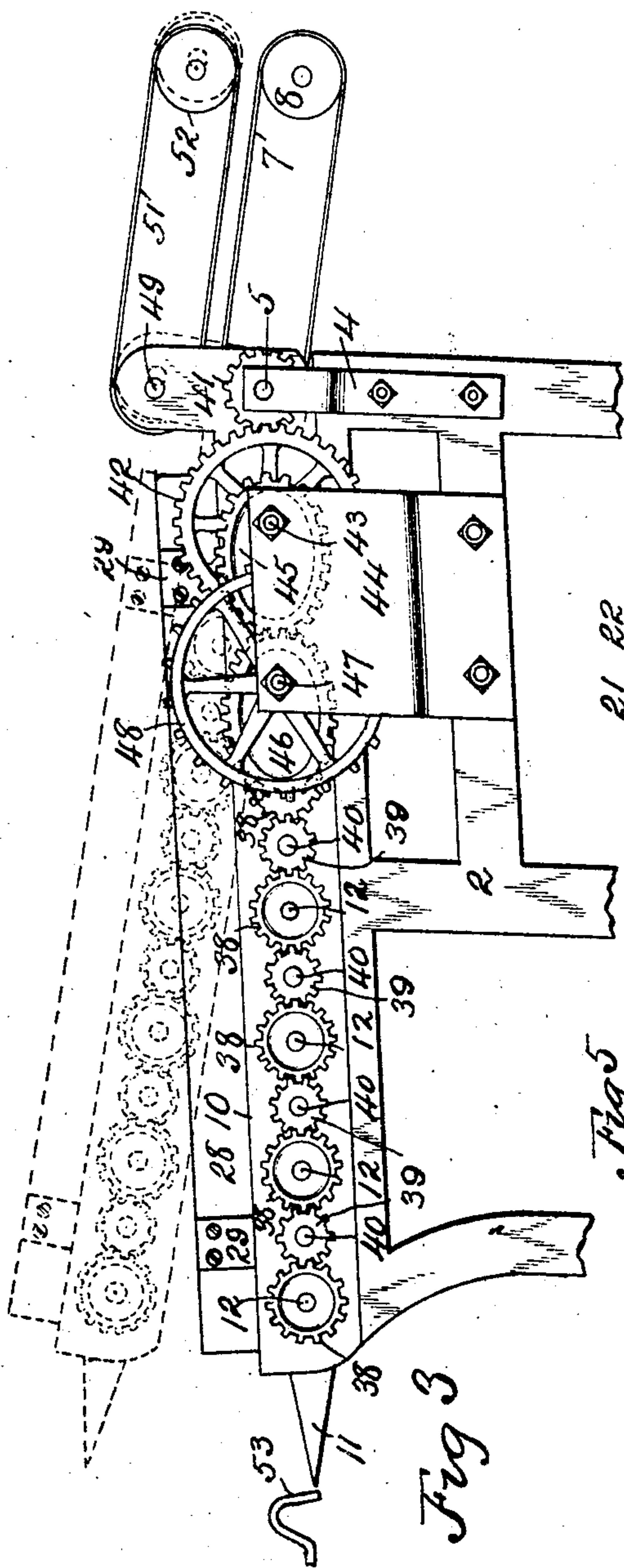
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4 SHEETS—SHEET 2.



Witnesses

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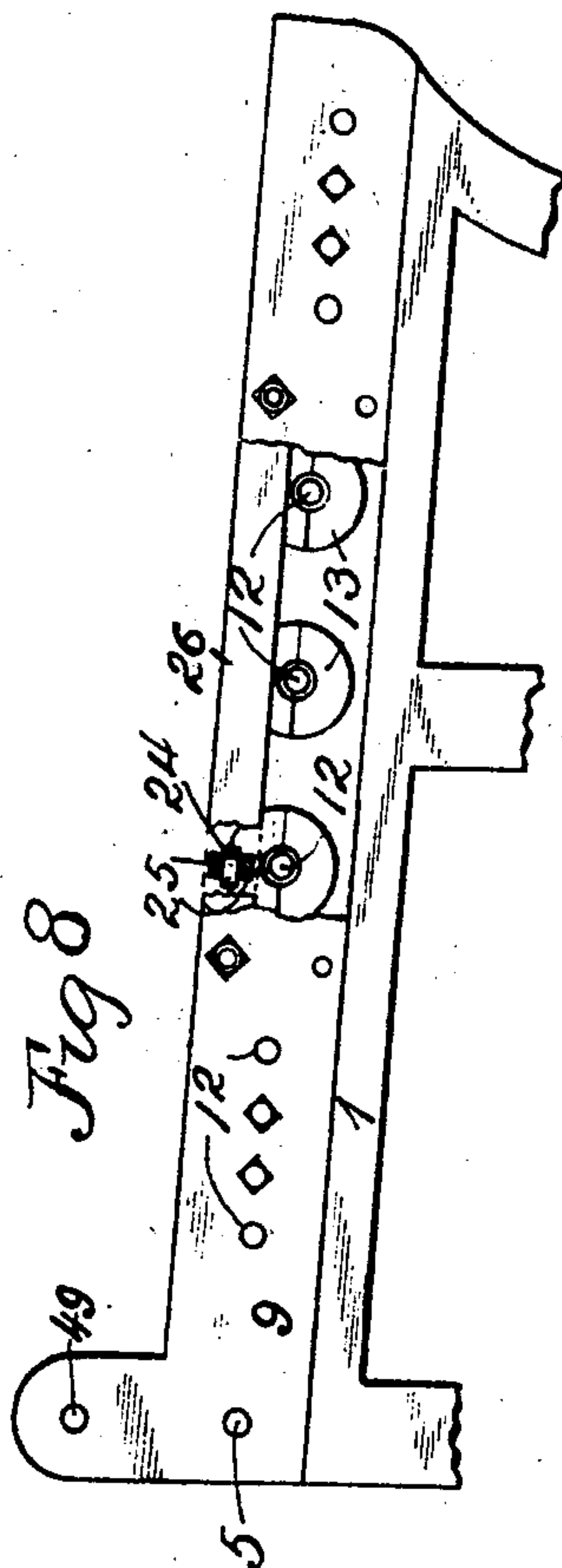
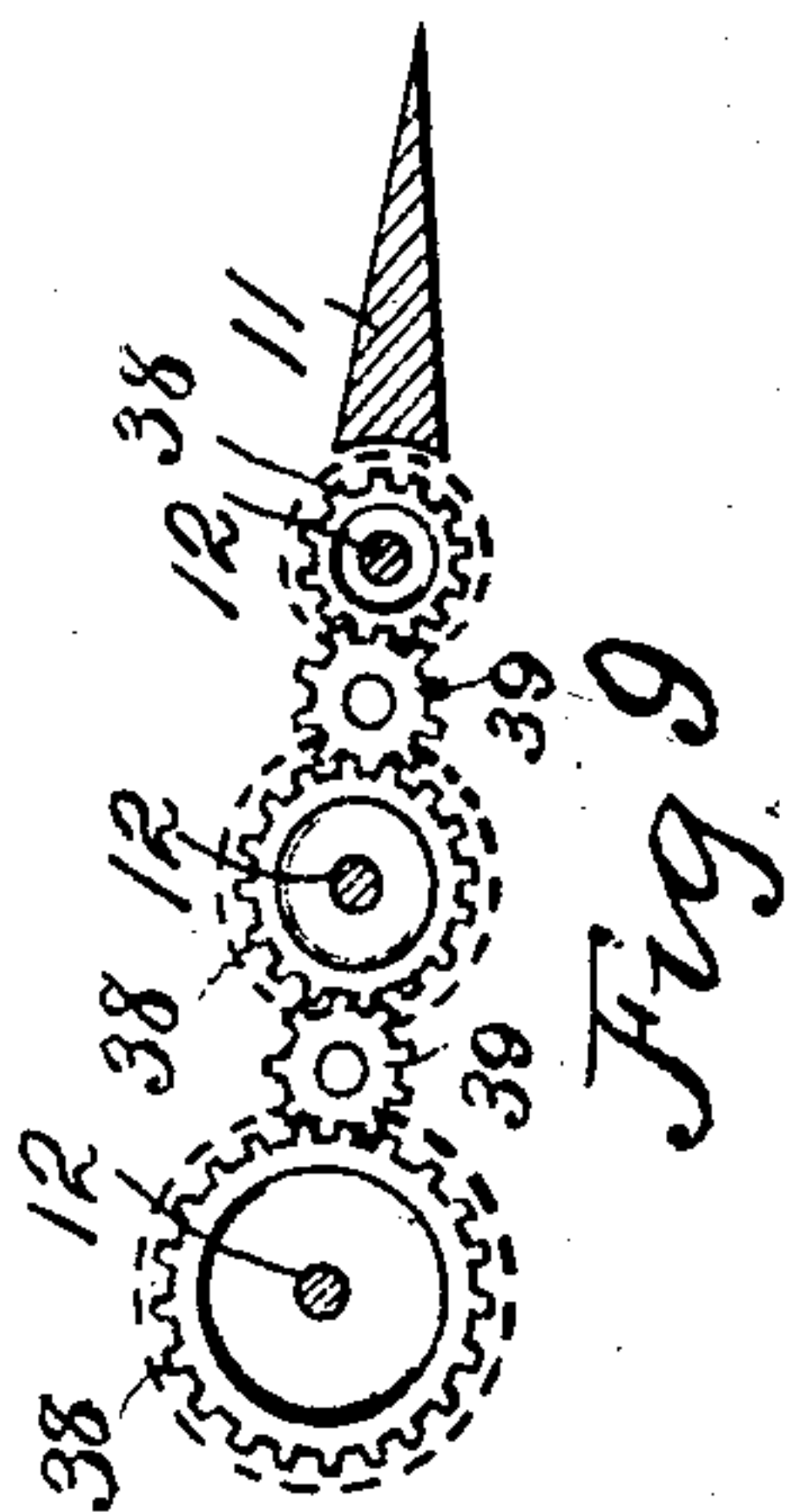
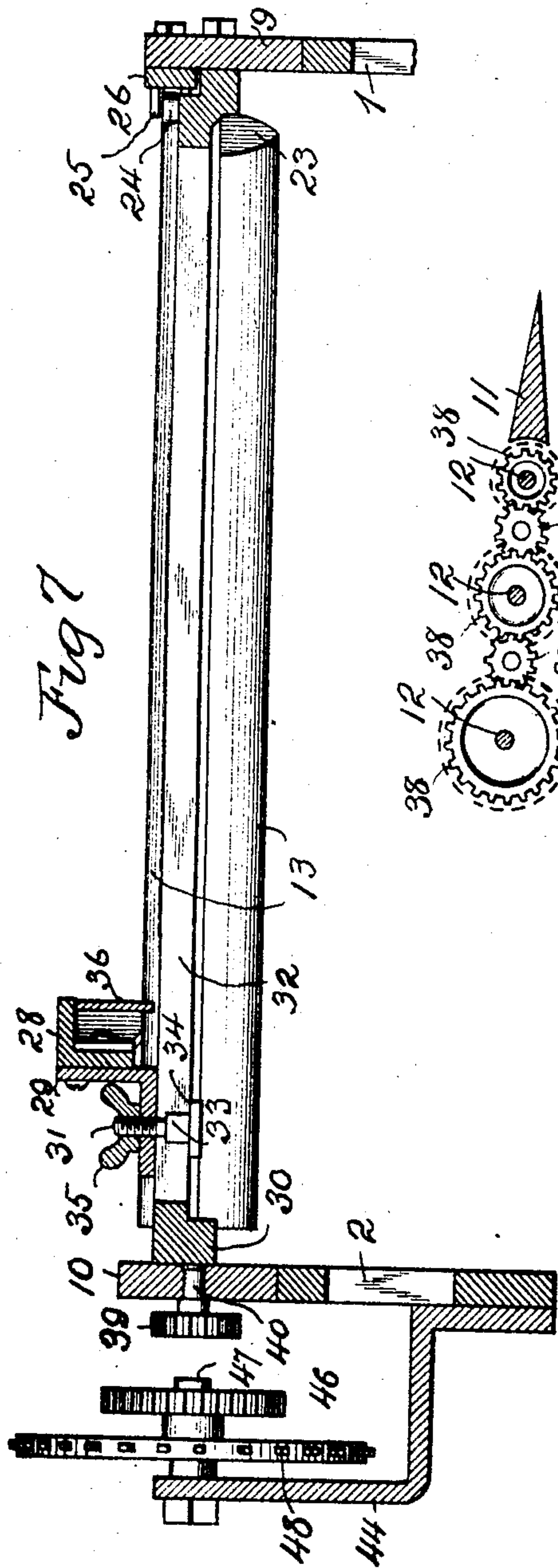
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4 SHEETS—SHEET 3.



Witnesses

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4 SHEETS—SHEET 4.

Fig 10

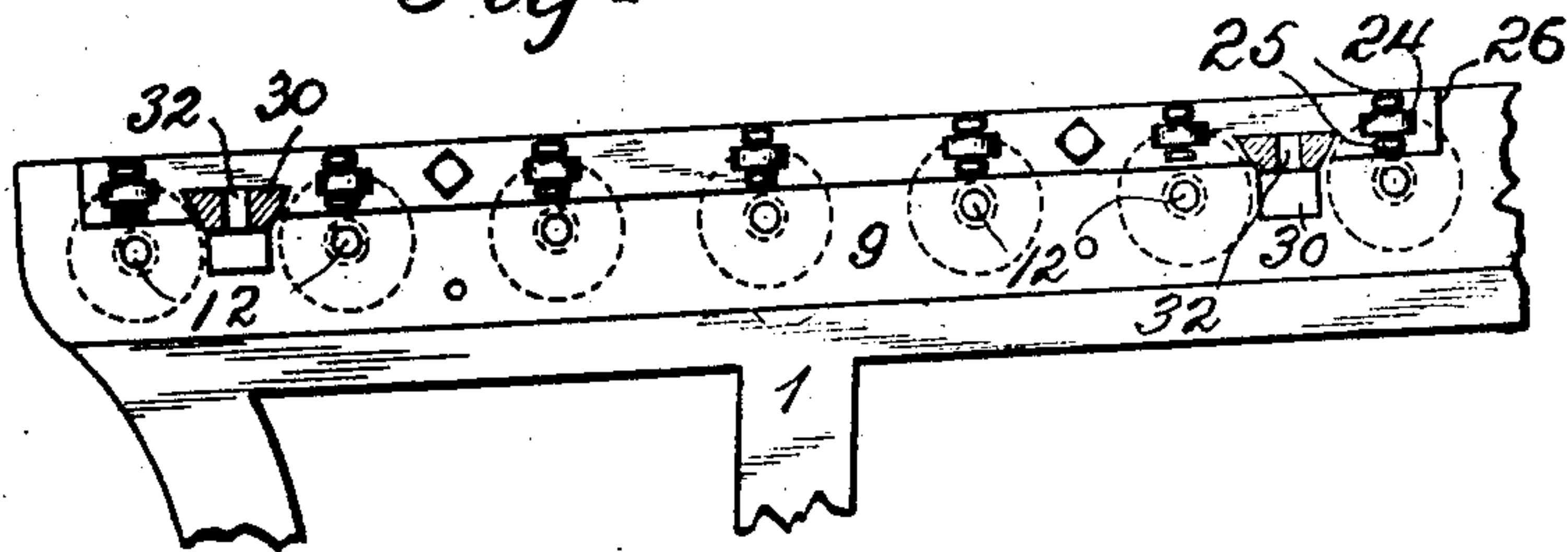


Fig 11

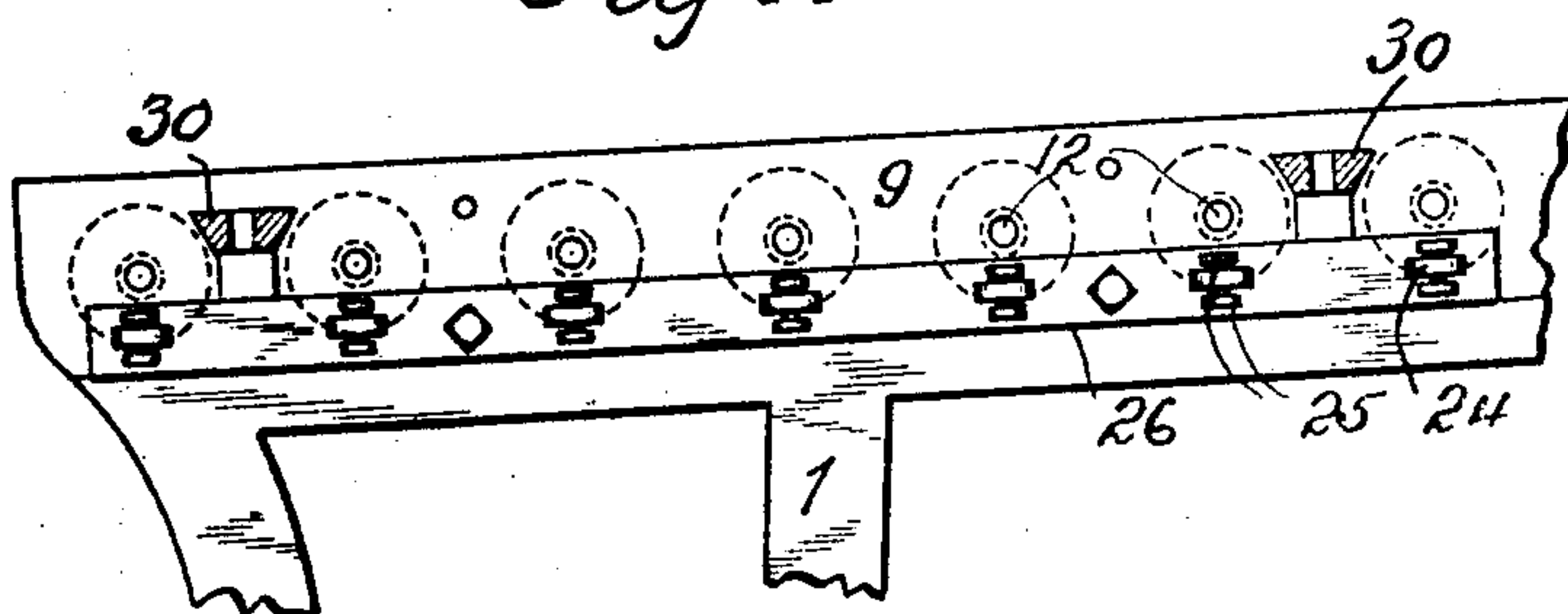
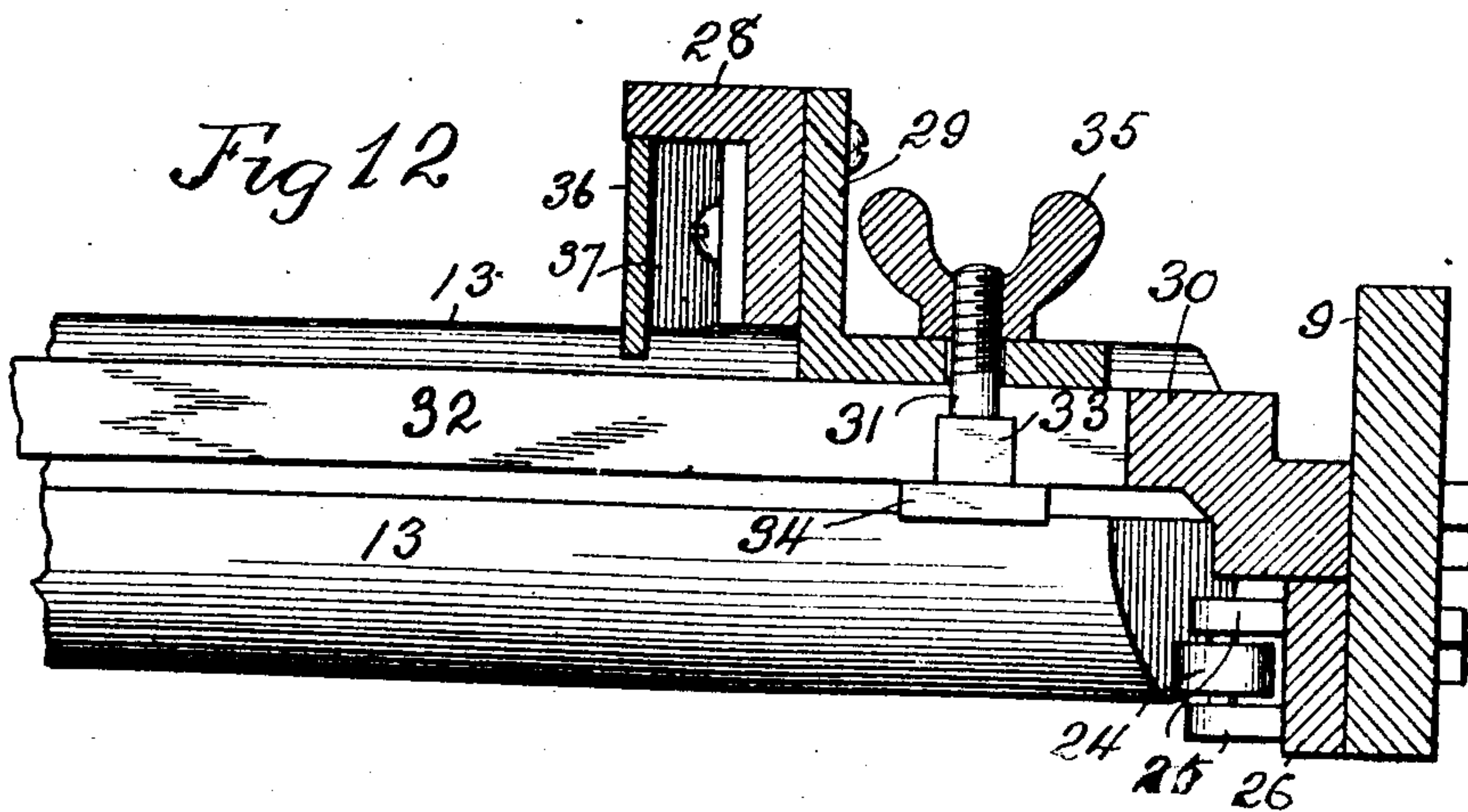


Fig 12



Witnesses  
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F. C. Priestly

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# UNITED STATES PATENT OFFICE

HARRY BRADSHAW, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF  
TO WARREN D. HOUSE, OF KANSAS CITY, MISSOURI.

## SHEET-REGISTERING MACHINE.

No. 810,392.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed October 26, 1904. Serial No. 230,120.

*To all whom it may concern:*

Be it known that I, HARRY BRADSHAW, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Sheet-Registering Machines, of which the following is a specification.

My invention relates to improvements in sheet-registering machines adapted to be used in connection with a printing-press or ruling-machine.

My invention provides a plurality of rotary sheet-supporting devices for carrying the sheets in a forward direction, means being provided by which said devices while supporting the sheets are laterally moved so as to carry the sheets against the side guide or gage.

My invention provides, further, one or more sheet-supporting rollers, each comprising two longitudinal members movable parallel with the axis of rotation, means being provided whereby said members may be reciprocated simultaneously in opposite directions, thus imparting a lateral as well as a forward motion to the sheets of paper supported by said rollers.

My invention provides, further, a novel form of side guide adapted to be used with the sheet-supporting rollers and adapted to be disposed at the right or left ends of the rollers.

My invention provides, further, novel means for timing and effecting the reciprocation endwise of the roller members.

My invention provides, still further, means by which the rate of rotation of the rollers may be periodically varied, so as to limit the speed of the sheets at certain points.

Other novel features are hereinafter fully described and claimed.

In the accompanying drawings, which illustrate my invention, Figure 1 is a plan view of the machine, some of the parts being broken away, the arrangement of the parts being such that the sheets will be moved to the left against the side guide. Fig. 2 is a vertical section view taken on the dotted line *a b* of Fig. 1, the remote parts being removed. Fig. 3 is a left side elevation view of the machine, the lower end of the supporting-framework being broken away. In this view the framework carrying the divided

rollers is shown in dotted lines in the raised position, in which position the frame is disposed when it is desired to have access to certain parts of the printing-press. Fig. 4 is a vertical sectional view taken on the dotted line *c d* of Fig. 1 and showing one of the sheet-supporting rollers in longitudinal section. Fig. 5 is a cross-section taken on the dotted line *e f* of Fig. 4. Fig. 6 is a cross-section taken on the dotted line *g h* of Fig. 4. Fig. 7 is a vertical sectional view taken on the dotted line *i j* of Fig. 1. Fig. 8 is a right side elevation view of the roller-supporting framework, a portion of which is broken away, and the upper end of the supporting-frame. Fig. 9 is an end elevation view of a modified form in which the forward rollers are of different diameters, the smallest roller being in front, so as to bring the forward end of the sheet as closely as possible to the periphery of the press-cylinder. (Not shown.) Fig. 10 is a vertical sectional view taken on the dotted line *k l* of Fig. 1. Fig. 11 is a view similar to Fig. 10 of a modification in which the cam-actuating rollers are disposed below the shafts of the sheet-supporting rollers. Fig. 12 is a view of the modification shown in Fig. 11 and taken on a vertical plane corresponding to the dotted line *i j* of Fig. 1, the cam-roller-supporting plate being shown in the position represented in Fig. 11 and the side guide being disposed upon the right side of the machine.

Similar characters of reference denote similar parts.

1 denotes the right vertical plate of the supporting-frame; 2, the left side plate, disposed parallel with the plate 1. The plates 1 and 2 are provided, respectively, at their rear ends with the vertical extensions 3 and 4, provided with transverse holes, in which is rotatively mounted a horizontal shaft 5, supporting a roller 6, connected by a lower set of tapes 7 with a horizontal roller 8, rotatively mounted in suitable bearings. (Not shown.) The sheet-supporting-roller frame comprises two forwardly-extending parallel plates 9 and 10, respectively, having secured at their forward ends a transverse board or plate 11 and having their rear ends pivotally mounted upon the shaft 5. In the plates 9 and 10 are rotatively mounted a series of horizontal transverse shafts 12, forming each a part of a sheet-supporting roller, one of which is shown in longitudinal section in Fig. 4. Each sheet-



supporting roller comprises two semicylindrical longitudinal members 13, disposed with their flat sides together and forming each pair a cylindrical roller. Said members 13 are each longitudinally slidable on its supporting-shaft 12, being connected thereto by means of two radially-disposed eyebolts 14, each having at its inner end an eye 15, encircling shaft 12, said eyebolts being disposed in radial openings provided in each member 13. The outer end of each bolt 14 is screw-threaded and has mounted thereon a nut 16, disposed inside the periphery of the member 13 in a recess 17, provided therefor. A transverse lever 18 is provided at its middle with a longitudinal slot 19, embracing the shaft 12. A transverse pin 20, extending through the lever 18 and the shaft 12, provides a fulcrum on which the lever 18 may swing. The ends of the lever 18, preferably spherical in form, as denoted by 21, are located, respectively, in radial cylindrical holes 22, provided one in each member 13. By means of the lever 18 when one member 13 is slid lengthwise on the shaft 12 the opposite member will be moved in opposite directions. The right end of each roller 13 is beveled, so as to form a cam-face 23, adapted to come in contact with a horizontally-disposed cam-roller 24, mounted between two inwardly-extending projections 25, extending inwardly from a plate 26 and disposed one above the other. The plate 26, as shown in Figs. 1, 4, 7, 8, and 10, is secured lengthwise on the plate 9 above the shafts 12. When the shafts 12 are rotated in the direction indicated by the arrow on the roller the third from the front in Fig. 1, the rollers 24, coming in contact alternately with the opposite members 13 of the adjacent sheet-supporting rollers, will force such members 13 toward the left side of the machine when the shafts 12 are rotated. With the plate 26 disposed as shown in Figs. 1, 4, and 7 above the shafts 12 as the rollers carrying the sheets are rotated each member 13 as it passes to a position above the supporting-shaft 12 will be forced toward the plate 10, thus moving the sheet 27 laterally in the direction indicated by the arrow in Fig. 1 toward a side guide disposed transversely to the sheet-supporting rollers. The sheet-supporting rollers thus while being rotated carry the sheet forward and at the same time laterally toward the side guide.

The side guide and mechanism supporting it comprises the following parts: Disposed transversely above the sheet-supporting rollers is a right-angled plate 28, secured near its ends, respectively, to the vertical portions of two right-angled brackets 29, the horizontal portions of which rest upon the upper sides of two plates 30, having their ends secured, respectively, to the plates 9 and 10 and disposed, respectively, adjacent the forward and rear ends of said plates. A vertical bolt

31 has its screw-threaded upper end mounted in a vertical hole provided in the horizontal portion of each bracket 29. The lower end of each bolt 31 extends through a longitudinal slot 32, provided one in each plate 30, said portion of the bolt 31 being provided with a squared portion 33 to prevent rotation of the bolt, but permitting longitudinal movement in the slot 32. The bolt 31 below the plate 30 is provided with a head 34 for preventing upward movement of said bolt. On the screw-threaded upper end of the bolt 31 is mounted a wing-nut 35, which bears upon and holds the bracket 29 to the plate 30.

On the inner side of the vertical portion of the plate 28 are secured the rear ends of a series of sheet-guiding plates 36 (best shown in Figs. 1 and 2) and disposed one above each sheet-supporting roller, the forward end of each plate 36 being inclined inwardly, as denoted by 37. That portion of each plate 36 in advance of a vertical plane bisecting the adjacent roller extends downwardly to prevent the forwardly-moving sheet 27 from passing under the plates 36 as the sheet moves from one roller to another. On the left end of each shaft 12 is mounted and rotatable therewith a spur gear-wheel 38. A series of spur gear-wheels 39 are mounted, respectively, rotatively upon a series of studs 40, mounted upon the outer side of the plate 10 and disposed, respectively, in alternate order between the shafts 12. The intermediate spur-gears 39 mesh, respectively, with the spur-gears 38, thus communicating rotation one gear to the other and to the shafts 12. Upon the shaft 5 and rotatable therewith is mounted a spur-gear 38, which meshes with the rear spur-gear 39 and imparts rotation thereto. To the left of the spur-gear 38 on the shaft 5 is mounted and rotatable therewith a spur-gear 41, which meshes with a spur-gear 42, rotatively mounted on a horizontal stud 43, the outer end of which is rigidly secured to the inner side of an upwardly-extending bracket 44, the lower end of which is secured to the plate 2. Secured to the outer side of the gear 42 and rotatable therewith is an elliptical gear 45, which meshes with an elliptical gear 46, rotatively mounted upon the inner end of a horizontal stud 47, secured at its outer end to the inner side of the bracket 44. A sprocket-wheel 48 is rotatively mounted on the stud 47 and is secured to the outer side of the elliptical gear 46. The sprocket-wheel 48 is driven by means of any suitable sprocket-chain. (Not shown.) When the sprocket-wheel 48 is rotated, rotation is imparted to the sheet-supporting rollers by means of elliptical gears 45 and 46, gears 41 and 42, shafts 5 and 12, and gears 38 and 39. Rotatively mounted in the rear ends of the plates 9 and 10 and disposed above the roller 6 and parallel therewith is a shaft 49, on



which is mounted a roller 50, connected by tapes 51 with the roller 52, disposed parallel with and mounted above the roller 8 in any suitable bearings. (Not shown.) 53 denotes the forward stops or gages, which are connected with the printing-press and which limit the forward movement of the sheets.

In operating my invention the side-guide plate 28 is adjusted parallel with the sheet-supporting rollers to the proper position by first loosening the wing-nuts 35, then moving the plate 28 and brackets 29 to the desired position, and then tightening the wing-nuts 35. The supporting-rollers for the sheets are then rotated in the direction indicated by the arrow in Fig. 1 in the manner hereinbefore described. The sheets enter the machine between the belts 7 and 51 and between the rollers 8, 52, 6, and 50, respectively, passing upon the upper side of the members 13 of the sheet-supporting rollers. The members 13 are disposed on the shafts 12 relatively to each other in positions such that the movement of corresponding members lengthwise will occur simultaneously—that is, corresponding members will occupy similar positions relative to the actuating cam-rollers 24. With the plate 26 disposed as shown in Figs. 4 and 7 when the shafts 12 are rotated the members 13 as they pass to the upper position, in which position they support the sheets, will be forced by means of the rollers 24, acting on the inclined cam ends 23, toward the plate 10, thus carrying the sheets 27 to the left or toward and against the plates 36 of the side guide. The members 13 by their rotatory movement carry the sheets forward along the guiding-plates 36 toward and against the gages 53, by which the sheets are held properly registered until gripped and carried away by the press-grippers. (Not shown.) While the upper members 13 are moving toward the plate 10 they will force the lower members 13 toward the plate 9 by means of the levers 18, pivoted to the shafts 12, respectively. The members 13 will thus be reciprocated lengthwise during their revolution around the axis of the shaft 12. The disposition of the elliptical gears 45 and 46 relative to the other parts will be such that when the sheets approach the gages 53 the speed of rotation of the shaft 12 will be reduced, so as to bring the sheets gently against the gages 53, the mechanism being timed so that when the sheets are seized between the rollers 6 and 50 the sheets will be forced rapidly ahead, the speed of the sheets decreasing just prior to the time the forward edge of the forward sheet reaches the gages 53.

In the form shown in Fig. 9 the forward rollers are reduced in size, for the reason hereinbefore stated; but the peripheral speed of the rollers remains the same, owing to the fact that the spur-gears 38, mounted on the

shafts 12, supporting the smaller rollers, have a corresponding reduction in size.

Various modifications of my invention may be resorted to without departing from its spirit.

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

1. A sheet supporting and registering device revoluble around an axis and movable simultaneously lengthwise thereof and disposed during a portion of each revolution out of contact with the sheets to be registered.

2. A sheet supporting and registering device revoluble around an axis and reciprocable simultaneously lengthwise thereof and disposed during lengthwise movement in one direction out of contact with the sheets to be registered.

3. A sheet supporting and registering device comprising two devices revoluble around a common axis and movable simultaneously in opposite directions lengthwise of the axis.

4. A sheet supporting and registering cylindrical roller rotatable around its axis and comprising two longitudinal members movable simultaneously in opposite directions lengthwise of the axis of the roller.

5. The combination with a sheet-supporting device, of means for simultaneously revolving the said device and moving it lengthwise of the axis of revolution, the sheet-supporting device being disposed during a portion of each revolution out of contact with the sheets to be registered.

6. The combination with a sheet-supporting device, of means for revolving said device and simultaneously reciprocating it lengthwise of the axis of revolution, the sheet-supporting device being disposed during lengthwise movement in one direction out of contact with the sheets.

7. The combination with a sheet-supporting device comprising two members, of means for revolving said members around a common axis and simultaneously moving them in opposite directions lengthwise of the axis.

8. The combination with two sheet-supporting members, of means for revolving said members around a common axis, and means for simultaneously reciprocating said members in opposite directions lengthwise of the axis.

9. The combination with a sheet-supporting cylindrical roller comprising two longitudinal diametrically opposite members, of means for rotating said roller, and means for simultaneously reciprocating in opposite directions lengthwise of the axis of the roller, said two members.

10. A sheet-supporting roller comprising a longitudinal support, two longitudinal members disposed on diametrically opposite sides of said support and slidable lengthwise there-



on, and means by which lengthwise movement of one member in one direction imparts movement in the opposite direction to the other member.

5 11. A sheet-supporting roller comprising a rotatable shaft, two longitudinal members slidable lengthwise on and rotatable with said shaft, and means by which said members may be reciprocated simultaneously  
10 lengthwise in opposite directions.

12. A sheet-supporting roller comprising a rotatable shaft, two longitudinal members slidable lengthwise on said shaft and rotatable therewith, and a lever fulcrumed on the  
15 shaft and having its ends engaging respectively said members.

13. A sheet-supporting roller comprising a rotatable shaft, two members disposed diametrically opposite thereon and slidable  
20 lengthwise on and rotatable with the shaft, and a lever pivoted transversely on the shaft and having its ends pivotally connected with said members respectively.

14. A sheet-supporting roller comprising a rotatable shaft, two longitudinal members disposed diametrically opposite and slidable  
25 lengthwise on and rotatable with the shaft, each member being provided with a radial hole, and a lever pivoted transversely on the shaft and having its ends mounted respectively  
30 in the holes in said members.

15. A sheet-supporting roller comprising a rotatable shaft, two semicylindrical longitudinal members slidable lengthwise on and rotatable with the shaft and provided each  
35 with a round hole on its inner side, and a lever pivoted transversely upon said shaft and having spherical ends mounted respectively in said round holes in said members.

40 16. The combination with a sheet-supporting device, of means for revolving said device around an axis, the device being a portion of each revolution out of contact with the sheets, means for simultaneously moving said  
45 device lengthwise of the axis, and a side guide disposed transversely of said axis.

17. The combination with a sheet-supporting device, of means for revolving said device around an axis, means for reciprocating said  
50 device lengthwise of the axis, the device being disposed during lengthwise movement in one direction out of contact with the sheets, and a side guide disposed transversely of the axis.

18. The combination with a sheet-supporting device, of means for revolving said device around an axis, a side guide disposed transversely to the axis, means for moving said device toward the side guide when the device  
55 has been revolved to a position in which the sheet is supported thereby, and means for moving said device in the opposite direction.

19. The combination with two sheet-supporting devices revoluble around a common axis, of means for so revolving said devices, a  
65 side guide disposed transversely to the axis of

revolution of said devices, and means for simultaneously moving said devices lengthwise of said axis and in opposite directions to each other.

20. The combination with two horizontal  
70 devices adapted to alternately support a sheet of paper, of means for revolving said devices around a common axis, means for moving each of said devices lengthwise of said axis in a certain direction when it is in  
75 position to support a sheet, and means for moving said devices lengthwise in the opposite direction.

21. The combination with two horizontal devices adapted to alternately support a  
80 sheet of paper, of means for revolving said devices around a common axis, a side guide disposed transversely of said axis, means for moving each of said devices lengthwise of the axis toward said guide when it is positioned  
85 to support the sheet, and means for retracting said devices lengthwise in the opposite direction.

22. The combination with a sheet-supporting device, of means for revolving said device  
90 around an axis, means for moving said device lengthwise of the axis, and a side guide disposed transversely to the axis and adjustable to and fro in a direction parallel with the axis.  
95

23. The combination with two horizontal devices adapted to alternately support a sheet of paper, of means for revolving said devices around an axis, means for moving  
100 each of said devices lengthwise in a certain direction when it is in position for supporting a sheet, and means for moving each of said devices in the opposite direction lengthwise when it is in position not supporting a sheet.  
105

24. The combination with two horizontal devices adapted to alternately support a sheet of paper, of means for revolving said devices around an axis, a side guide disposed transversely to said axis, means for moving  
110 each of said devices toward said side guide and lengthwise of said axis when the device is positioned so as to support a sheet, and means for moving each of said devices lengthwise away from the guide when the device is  
115 in position not adapted to support the sheet.

25. The combination with two devices adapted to alternately support a sheet, of means for revolving said devices around an axis, a side guide disposed transversely to  
120 the axis and adjustable in a direction parallel with the axis, and means for simultaneously moving said devices in opposite directions lengthwise of said axis.

26. The combination with two devices  
125 adapted to support alternately a sheet of paper, of means for revolving said devices around an axis, a side guide adjustable lengthwise of the axis, means for moving each of said devices toward the guide lengthwise of  
130



the axis when said device is revolved to a position adapted to support the sheet, and means for moving each of said devices away from the guide when it is in position not adapted to support a sheet.

27. The combination with a plurality of devices adapted to support thereon a sheet of paper, of means for rotating each of said devices around its axis, said devices being disposed parallel with each other, and means for imparting lengthwise movement to each of said devices.

28. The combination with a plurality of devices adapted to support thereon a sheet of paper, said devices being disposed parallel with each other, of means for rotating each of said devices around its axis, and means for reciprocating said devices lengthwise.

29. The combination with a plurality of rollers comprising each two members disposed parallel with each other and adapted to alternately support a sheet of paper, of means for rotating said rollers each around its axis, and means for reciprocating lengthwise in opposite directions the two members of each of said rollers.

30. The combination with a plurality of rollers comprising each two longitudinal members adapted to support alternately a sheet of paper, of means for rotating each of said rollers, means for reciprocating simultaneously lengthwise in opposite directions the two members of each roller, and a side guide disposed transversely to said rollers.

31. The combination with a plurality of devices adapted to support thereon a sheet of paper, of means for imparting rotation to each of said devices, means for reciprocating

said devices lengthwise of their several axes, a side guide adjustable lengthwise of and disposed parallel with the axes of said devices.

32. The combination with a sheet-supporting roller comprising two longitudinal members movable lengthwise parallel with each other, a shaft on which said members are mounted, of means for rotating said shaft, and means for reciprocating said members simultaneously in opposite directions lengthwise of the shaft.

33. The combination with a sheet-supporting roller comprising two semicylindrical members disposed parallel with each other and having each a beveled end, a shaft on which said members are mounted, a lever pivoted to the shaft and having its ends engaging respectively said members, of means for rotating said shaft, and a device for engaging alternately the beveled ends of said members for forcing them lengthwise when the shaft is rotated.

34. The combination with a plurality of rollers comprising each two longitudinal members, a shaft on which the members are longitudinally slidable, a lever pivoted to the shaft and having its ends engaging said members respectively, of means for rotating said shafts, and means for engaging alternately the members of each roller and forcing them lengthwise on the shaft carrying them.

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

HARRY BRADSHAW.

Witnesses:

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HENRY F. ROSE.