

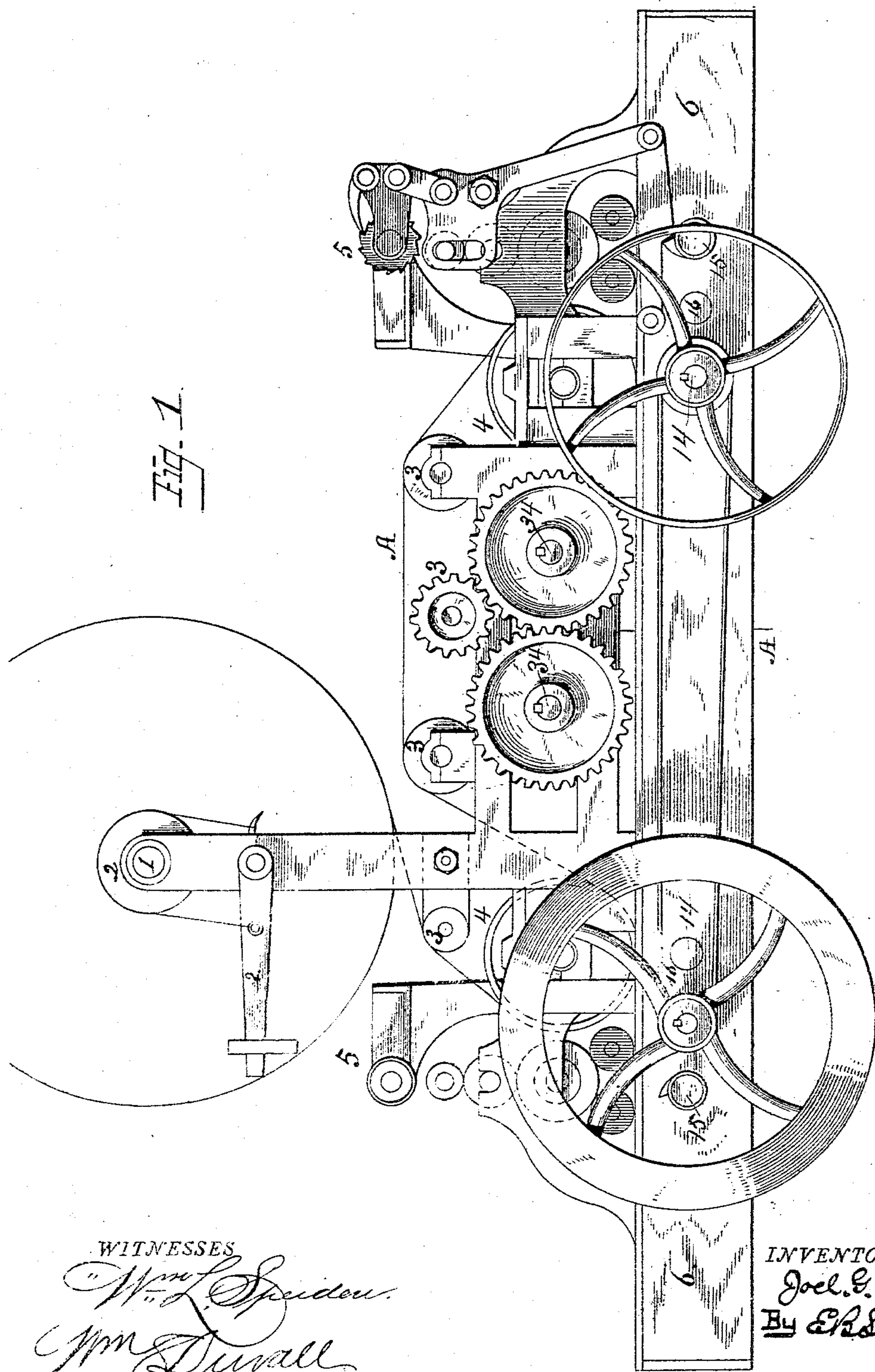
(No Model.)

4 Sheets—Sheet 1.

J. G. NORTHRUP.  
PRINTING MACHINE.

No. 321,630.

Patented July 7, 1885



WITNESSES  
*Wm L. Spiden*  
*Wm D. Wall*

INVENTOR  
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By *E. R. Stocking*  
Attorney

(No Model.)

4 Sheets—Sheet 2.

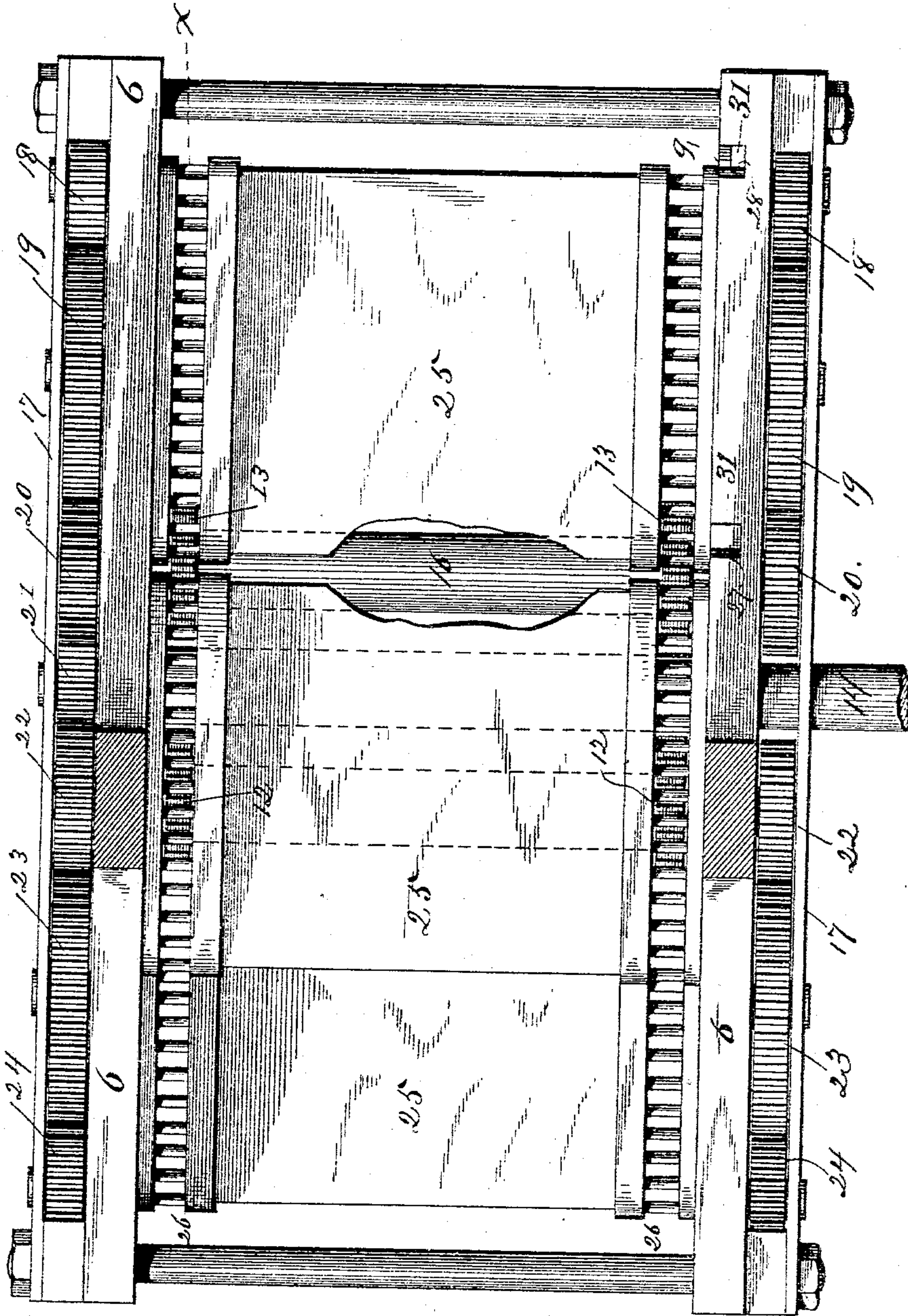
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Fig. 2.



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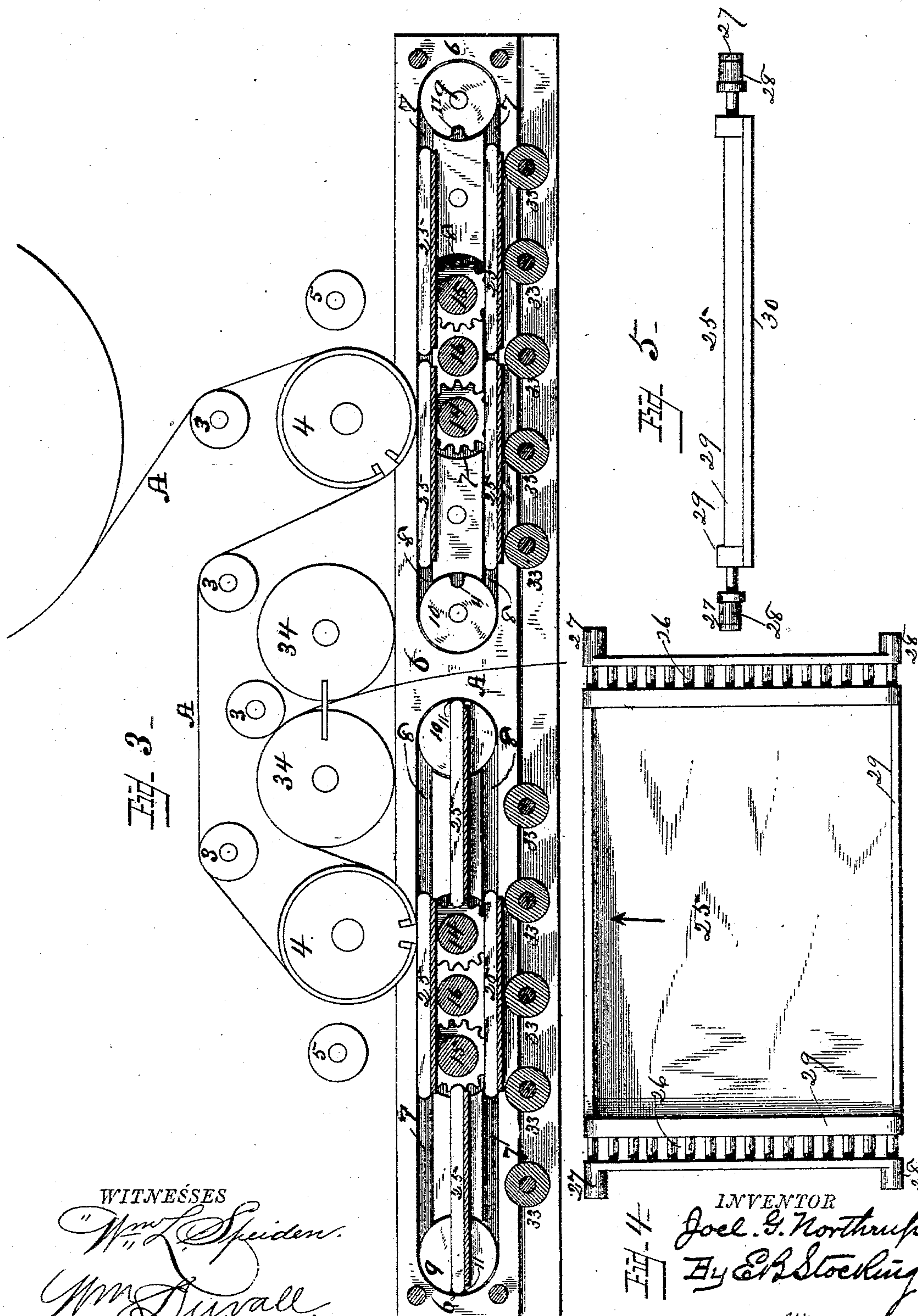
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WITNESSES

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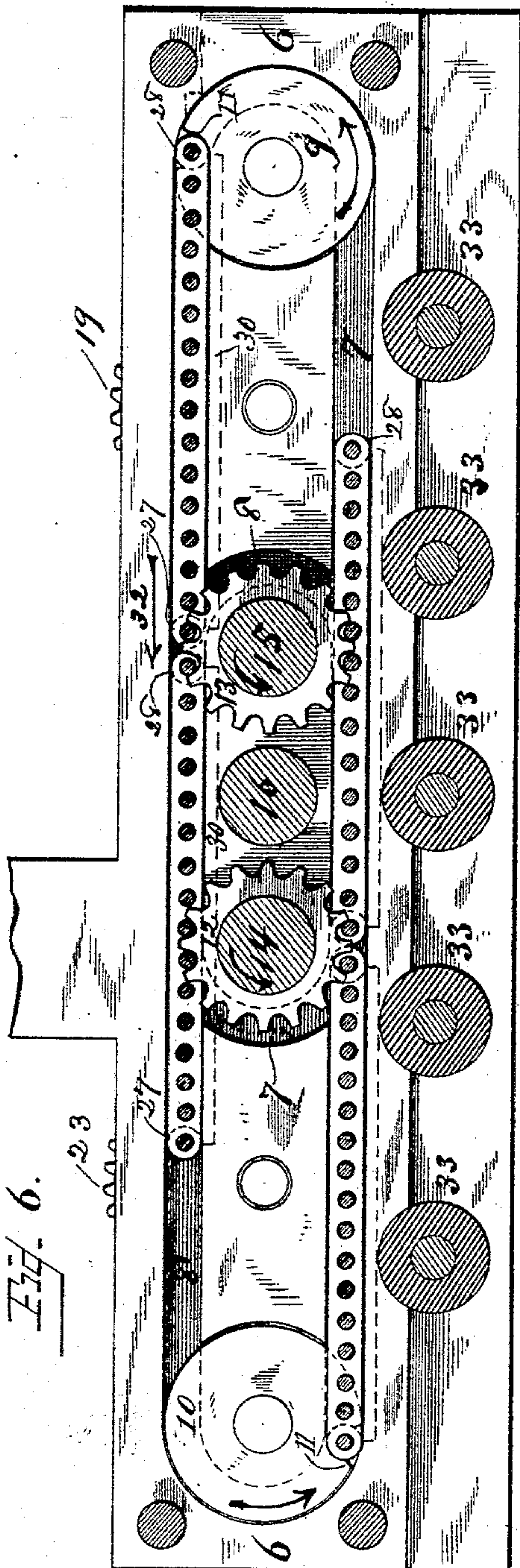
(No Model.)

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J. G. NORTHRUP.  
PRINTING MACHINE.

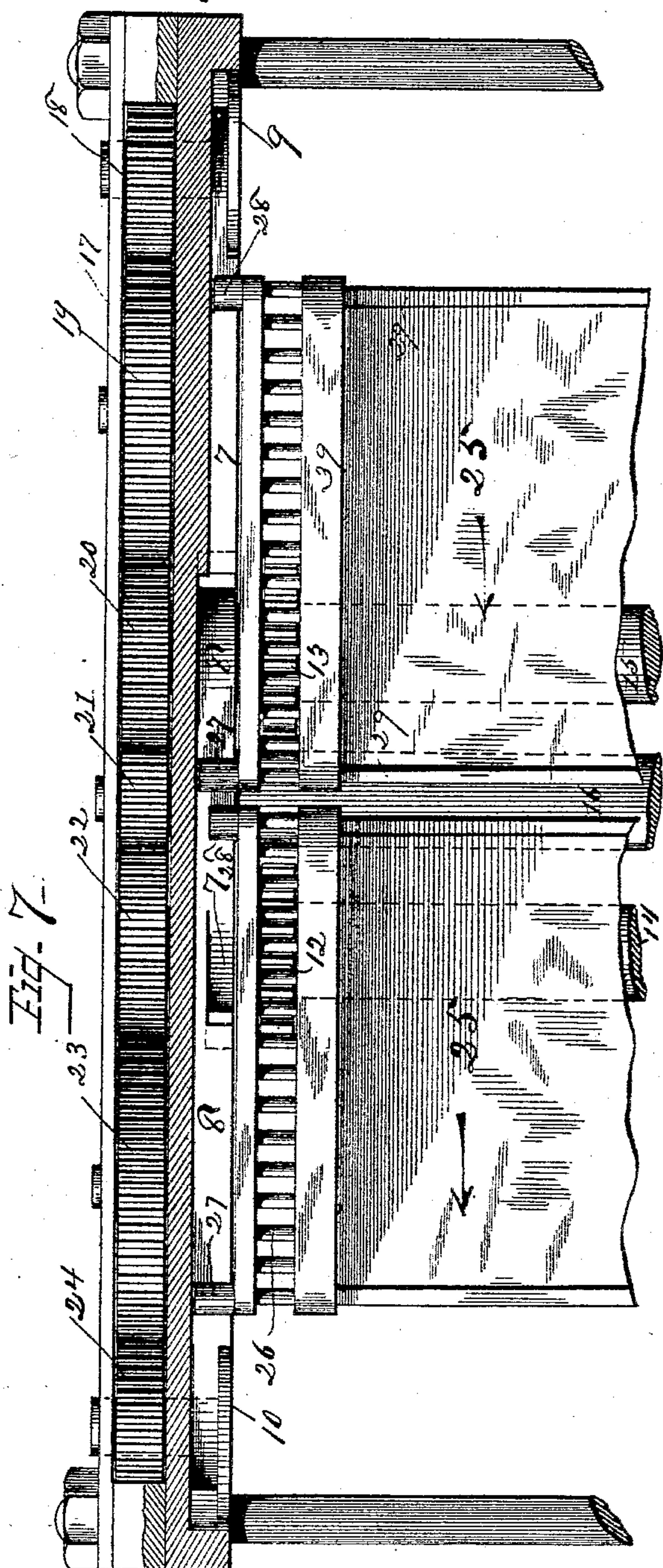
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# UNITED STATES PATENT OFFICE.

JOEL G. NORTHRUP, OF MARCELLUS FALLS, NEW YORK.

## PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 321,630, dated July 7, 1885.

Application filed June 2, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOEL G. NORTHRUP, a citizen of the United States, residing at Marcellus Falls, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention has relation to certain improvements of that class of machines which comprise a series of type-beds, each provided with a rack arranged at each side thereof, a system of pinions arranged to mesh in said  
15 racks so as to carry said beds successively beneath impression-cylinders, the beds being maintained in a horizontal position, and changed in direction of movement by causing each end of each bed to pass through or along  
20 a curved path; and the invention consists in certain features of construction hereinafter described, and particularly pointed out in the claim.

Referring to the drawings, Figure 1 is a side elevation of a printing-machine embodying my invention. Fig. 2 is a plan of the bed portion of one-half of the press, (shown in Fig. 1,) with the impression-cylinder, web-guide rolls, and inking mechanism removed.  
30 Fig. 3 is a side elevation of the impression-cylinders, web-guide rolls, and severing-rolls, and a central vertical section of the type-beds, and the means employed for operating the same. Fig. 4 is a plan of one of the type-beds, and Fig. 5 an end elevation of the same.  
35 Fig. 6 is a vertical section on the line X of Fig. 2. Fig. 7 is a partial plan with one of the side frames in partial horizontal section, taken at about the line Y of Fig. 6.

40 Like letters indicate like parts in all the figures.

Within any suitable frame-work is supported a web-shaft, 1, having thereon the usual weighted friction devices, 2, web-guiding rolls 3, impression-cylinders 4, and suitable inking mechanism, 5, all of which are of the usual construction.

50 The bed portion of the frame-work comprises, at each side of the machine, a beam or plate, 6, (see Figs. 6 and 7,) having in its face two continuous grooves or tracks, 7 and 8, the

former being shallower than the latter, and each overlapping the other.

At the outer end of each of the tracks is mounted a rotatable disk, 9 and 10, respectively, each of the disks being provided with a peripheral notch, 11. The ends of the tracks are curved upon a circle drawn from the center of the shaft of each of the disks, and their inner ends are curved in the same proportion and to agree with the pitch-line of gears 12 and 13. The shafts or journals of the disks and of the rolls 14 and 15, upon which the gears 12 and 13 are respectively mounted, and of the roll 16, are all extended through the beam or plate 6, and through an outer plate, 17, and between these plates and on the shafts are mounted a train or series of gear-wheels in the following order: Upon the disk 9 a gear, 18, meshing with an intermediate gear, 19, which meshes with a gear, 20, mounted upon roll 15, an intermediate gear, 21, mounted on roll 16, a gear, 22, mounted on roll 14, another intermediate gear, 23, and finally a gear, 24, mounted upon the shaft or disk 10.  
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Referring to Figs. 4 and 5, the former is a plan of one of the type-beds 25 employed in this machine, each of which is provided with a rack, 26, extending along its sides, and with a long trunnion, 27, at each of its front corners, the arrow indicating the direction of the movement of the bed in the machine, and with a shorter trunnion, 28, at each of its rear corners. The longer trunnions are intended to ride in the deeper track 8, and the shorter trunnions in the shallower track 7. A frame-work, 29, and a bottom plate, 30, constitute the body portion of each of the beds. Now, it will be seen by referring to Figs. 2, 3, 6, and 7 that when a series of these beds are placed within the frame-work for the bed portion of the press, by introducing the longer trunnions 27 and the shorter trunnion 28 of one side directly into the upper horizontal portions of the tracks 7 and 8, and passing the opposite longer and shorter trunnions into the opposite tracks through the slots 31 in the beam 6, (see Fig. 2,) that the shorter trunnions will fall into the notches 11 of the disks 9, while the racks will mesh with the gears 13 upon roll 15. Now, by rotating any of the shafts mentioned, motion will be conveyed through the system of  
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90  
95  
100



gearing described to the rolls 14, 15, and 16, the gears 12 and 13 rotating in the direction indicated by the arrows thereon, so as to draw the bed in the direction indicated by the arrow 32. When this bed has been advanced sufficiently, another may be introduced in a like manner, until a desired number—as, for example, four—have been entered into the tracks. Now, it will be seen that by rotating any of the shafts so that the gears 12 and 13 shall advance, the beds meshing therewith at their tops in the direction of the arrow 32, that the longer trunnions 27 are carried to the curved end of the deeper bed 8 and mesh with the notches 11 of the disk 10 at each side of the frame-work, while the shorter trunnions 28 will follow the gear 12 and pass down the curved end of the shallower bed 7, so that in its passage from the upper to the lower horizontal tracks each bed is maintained in a horizontal position, and the change of direction in advancing and returning is made with a rotary motion at both ends of each bed by means of the gear and the disk, and said bed is held continually in mesh with its gear and disk during the movement from the upper to the lower track. In a like manner are the beds advanced to the opposite end of the frame, to be again raised to the upper or horizontal track. The advancing shorter trunnion 28 meshes with the notches 11 of the disk 9 by reason of the intermediate gear, 19, so that the bed is elevated in a perfectly horizontal position.

While the beds are in the upper tracks the bottom plate, 30, thereof rests upon the rolls 14 and 15, and also upon the shaft 16, so that a solid foundation is provided for the bed at the time the impression is taken, as the impression-cylinder is arranged directly over the shaft 14, or it may be over the shaft 16. As there is usually a space between the frame-work and the form of type thereon, it will be seen that each of the beds will have passed beneath the impression-cylinder to such a distance as to insure the meshing of two or three of the bars of its rack with the gears 12 before the impression is taken, whereby accuracy in register as also secured.

A series of rolls, 33, is arranged below the lower horizontal tracks for the purpose of sustaining the beds in their return movement. It will be clearly seen, by reference to Fig. 7, that the overlapping of the tracks, taken in connection with the difference in their depths, permits this horizontal movement of the beds

from the upper to the lower track from the fact that the longer trunnions 27 overreach and pass by the curved ends of the shorter track 7.

As shown in Figs. 1 and 3, two series of forms are employed in this instance, each independent of the other, the web being conducted over the guide-rolls 3 to one impression-cylinder 4, operating in connection with one series of beds, and from thence over the other impression cylinder 4 operating in connection with the other series of beds at the opposite end of the machine, and from thence over one of a pair of transverse severing-rolls, 34, a guide-roll, 3, being arranged to bear upon the web when on said roll to insure its passage therein between. From thence the severed portion of the web is conducted to any desired point by any desired means—as, for example, to a folding mechanism.

If desired, one series of beds alone, with a suitable impression-cylinder and accompanying inking mechanism, may be employed to print either upon sheets or upon a continuous web.

The impression-cylinder operating in connection with each series of beds is driven by a gear mounted upon its shaft and meshing with a gear mounted upon roll 14, or, as hereinbefore stated, with a similar gear mounted upon either of the rolls 14, 15, or 16.

The rolls 33 are intended to relieve the trunnions from undue strain by reason of the weight of the form upon the beds, so that in some instances these rolls may be dispensed with and the trunnions depended upon to support the beds during their return movement.

Having described my invention and its operation, what I claim is—

In a press of the class described, the combination of the beds 25, having the marginal open racks 26, the long trunnions 27, and short trunnions 28, with the side frames, 6, having the narrow tracks 7 and wide tracks 8, and one of which said side frames, 6, having slots 31, leading into said ways, the rolls 14, 15, and 16, arranged to support said beds, gears 12 13, the disks 9 and 10, having each a single slot, 11, and a series of gears connecting the disks and rolls, substantially as shown and described.

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

JOEL G. NORTHRUP.

Witnesses:

JAMES D. MATHER,  
JAMES H. MATHER.