

No. 746,464.

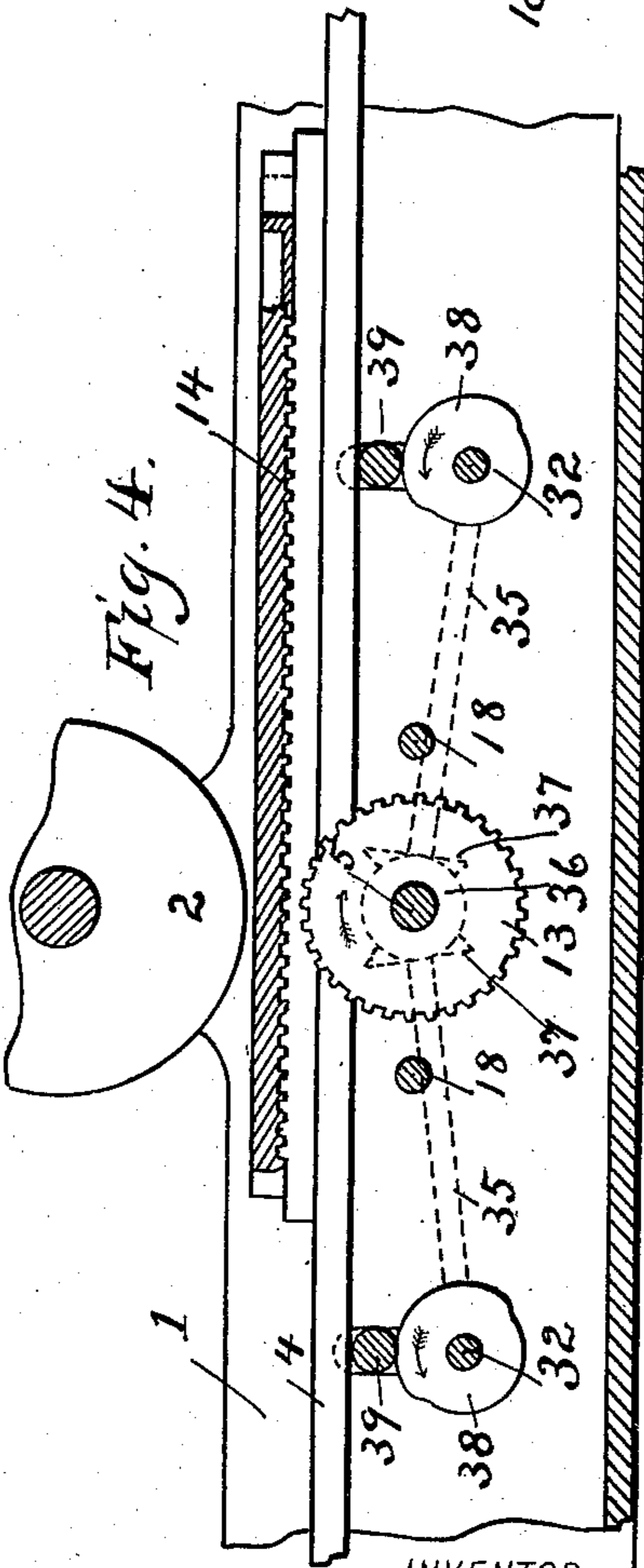
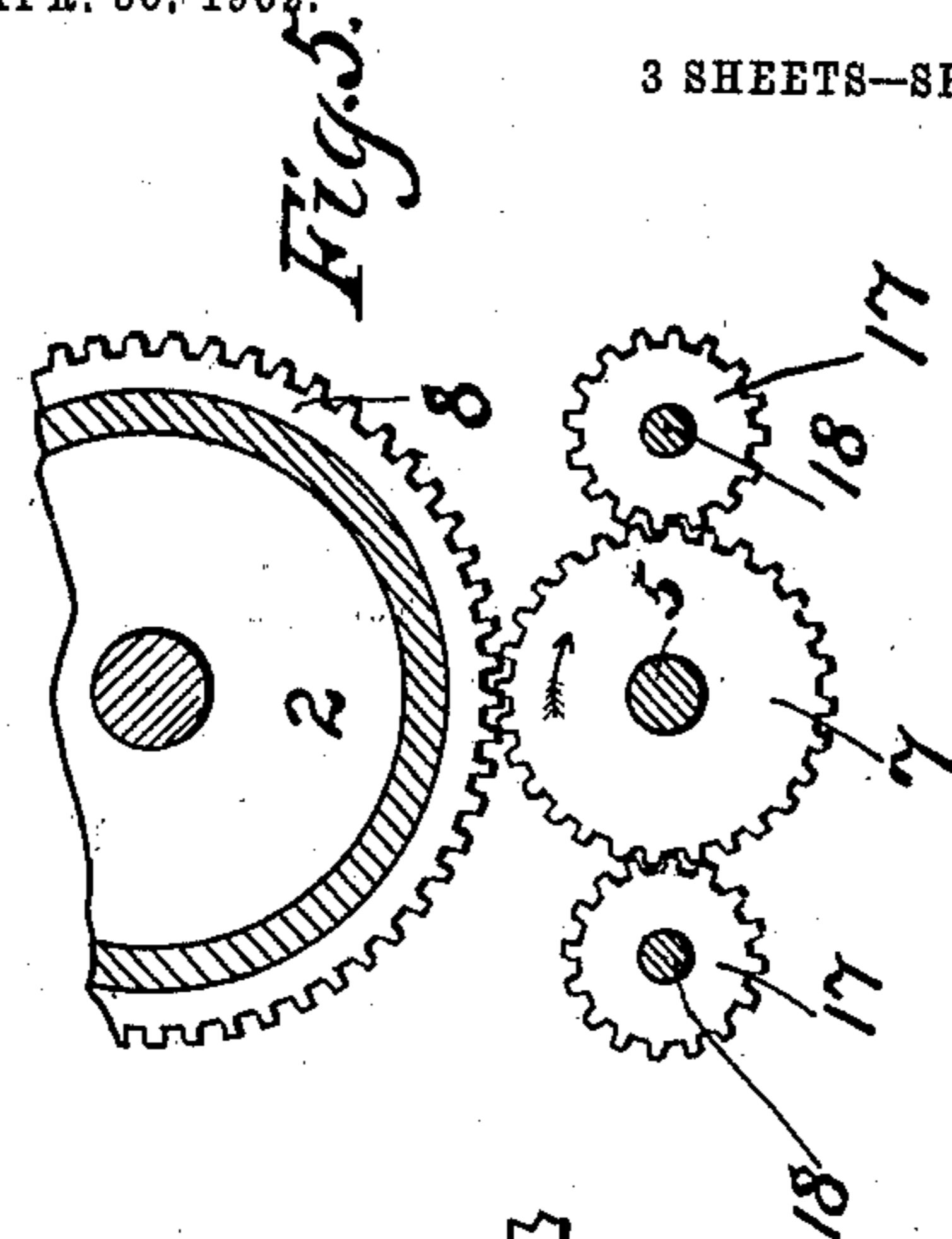
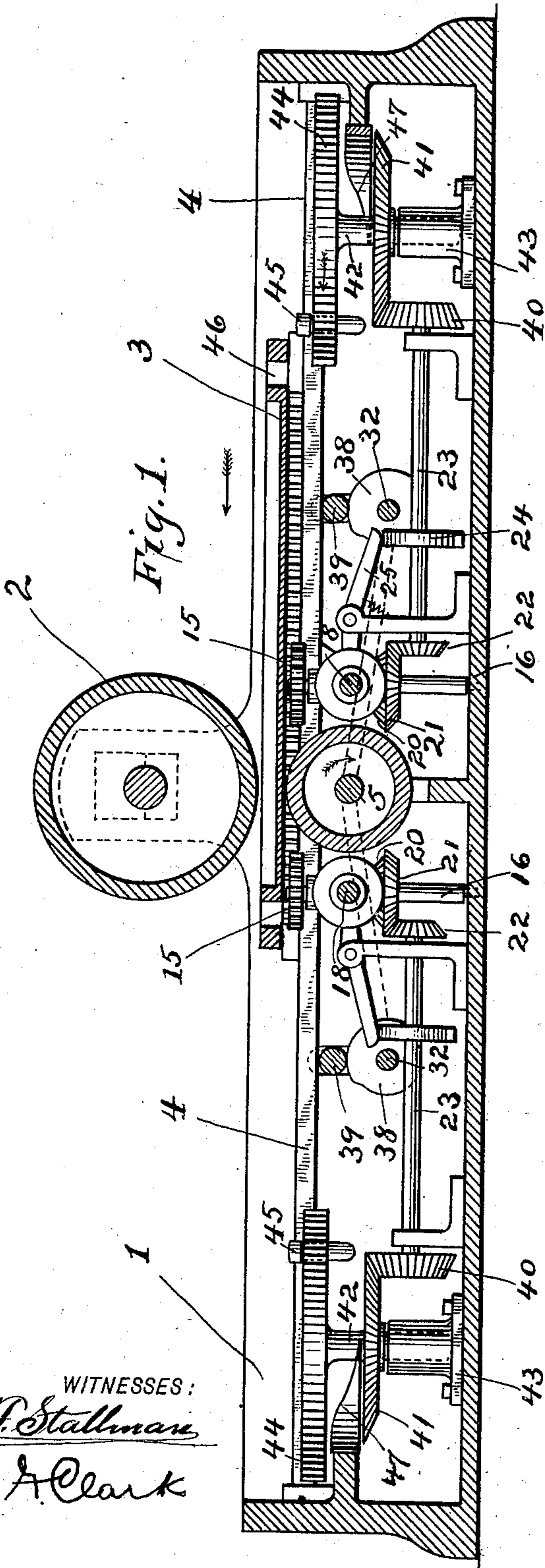
PATENTED DEC. 8, 1903.

C. H. COCHRANE.
PRINTING PRESS.

APPLICATION FILED APR. 30, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:
F. Stallman
A. A. Clark

INVENTOR
Charles H. Cochran
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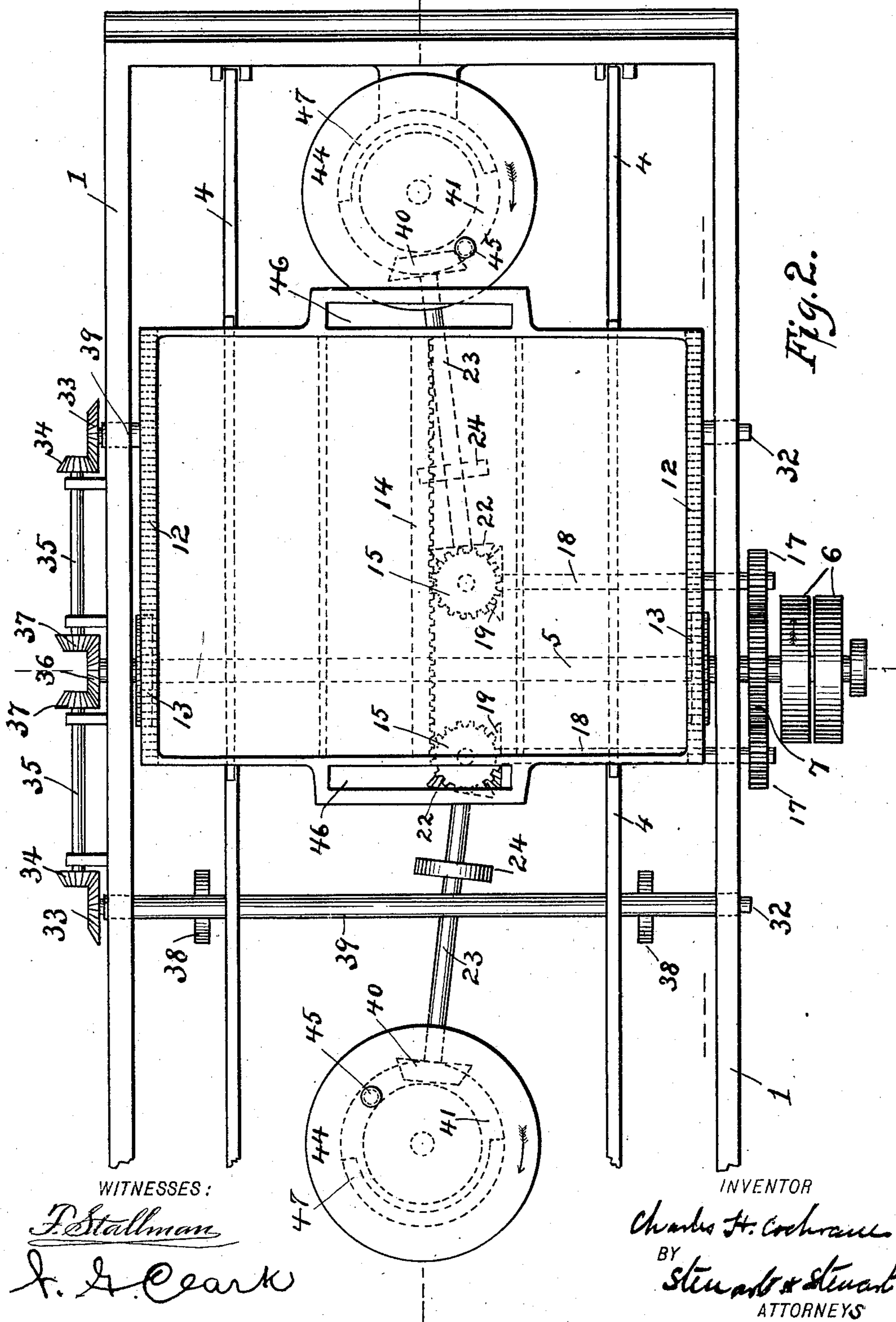
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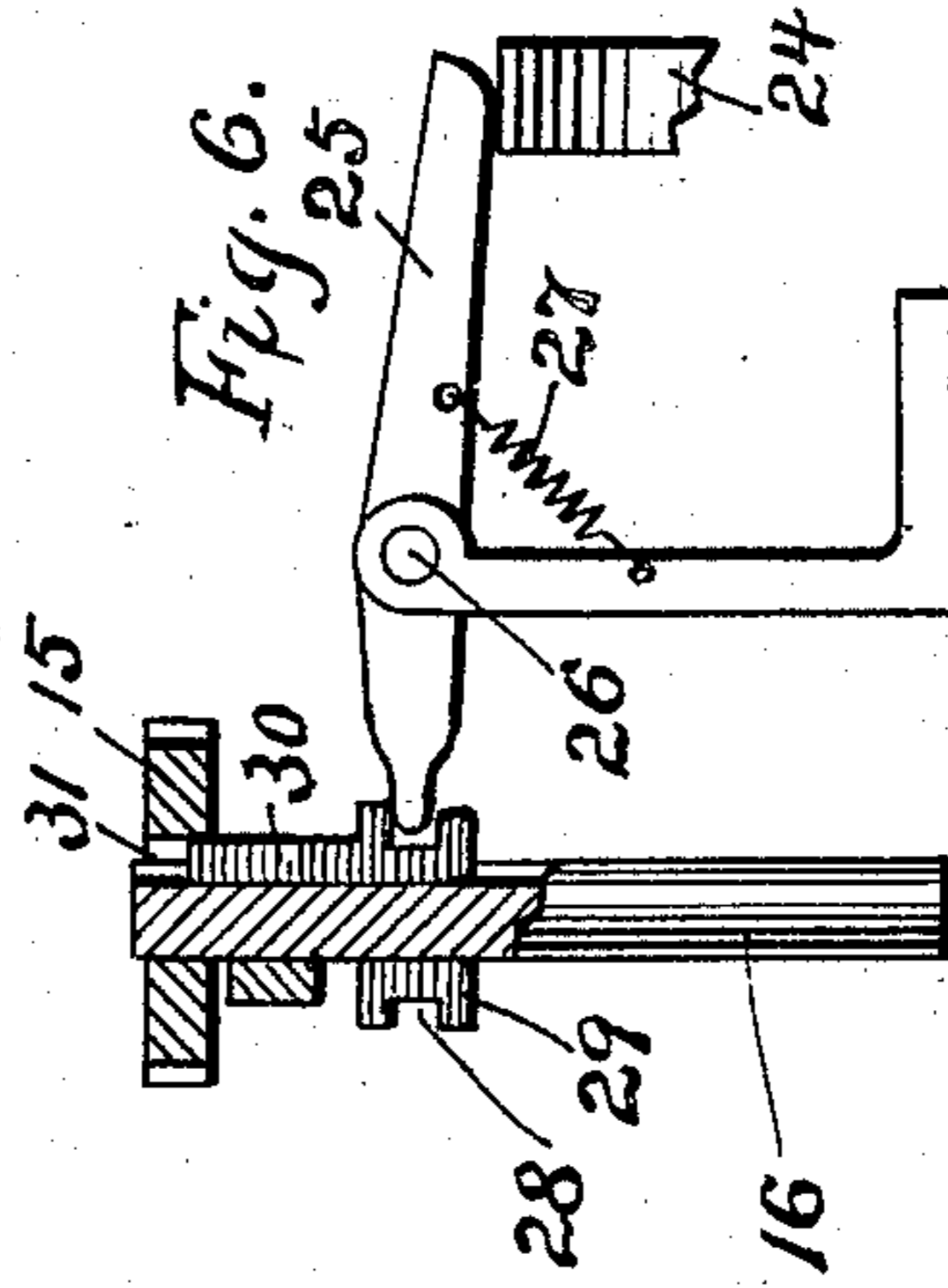
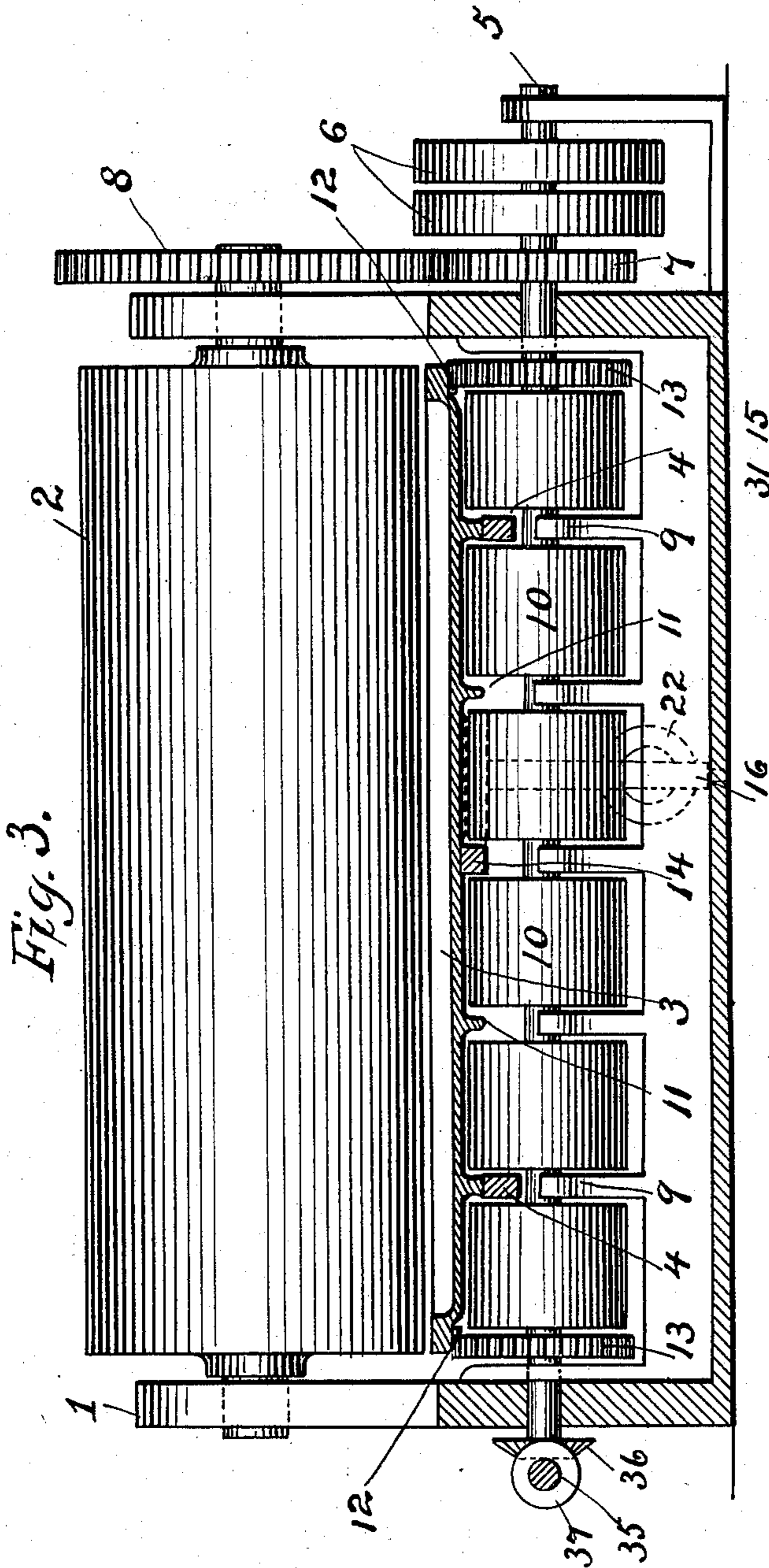
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3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES H. COCHRANE, OF NEW YORK, N. Y.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 746,464, dated December 8, 1903.

Application filed April 30, 1902. Serial No. 105,399. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. COCHRANE, a citizen of the United States of America, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

My invention relates to certain new and useful improvements in printing-presses of the type known as "bed-and-cylinder" machines, and while I have shown my invention applied to that type of machine commonly called "multirevolution" I desire to be understood that my improvements are equally applicable to any other type of press that it may be desired to apply them to.

In the ordinary type of the bed-and-cylinder machines in which a reciprocating type-bed is employed the bed reciprocates back and forth on two or more tracks which are braced together underneath the printing-cylinder at the line of impression to withstand the strain of impression, the bed being built very heavy to withstand this great strain without yielding, and because of the great weight of these beds and because they have to be stopped at each end of their stroke the speed of these presses has been limited.

By my invention I build the bed very light, the bed running on a pair of tracks which act merely as guides, the bed being supported under the line of impression by a driven roller, which in reality takes the strain of impression from the bed. This roller must be heavy in order to stand the strain of impression without yielding, and it is driven at a constant speed. By this construction the only part which has to be started and stopped is the bed, which is made light, as the heavy roller which supports the bed during the impression is run at a constant speed. It is therefore apparent that the parts can be run with less power than is required to drive a press of the ordinary construction, because of the reduced weight of material to be started and stopped. This roller is driven at the same peripheral speed as the cylinder, so that, in fact, I have a rotary printing-couple, which, however, prints from a flat type-surface.

I am aware that it has been proposed to place idler-pulleys under the bed at the line

of impression to aid in supporting the bed; but these idler-pulleys have in practice been found to be very objectionable in that in a short time they will flatten, and for this reason their use has been practically abandoned.

Referring to the drawings, in which like reference characters designate the same parts wherever they occur, Figure 1 is a longitudinal section of so much of a bed-and-cylinder multirevolution press as is necessary to illustrate my invention. Fig. 2 is a top plan view with the cylinder removed to more clearly show the driving mechanism. Fig. 3 is a cross-sectional view showing the supporting-pulleys. Fig. 4 is a detail sectional view showing how the bed is lifted when it makes its return stroke. Fig. 5 is a detail view of the gearing by which the press is driven. Fig. 6 is a detail view of the clutch for one of the gears which drive the bed during its return.

1 indicates the frame of the machine, which may be of any desired form. Mounted in the frame is the impression-cylinder 2, which is provided with the usual throw-off mechanism to raise the cylinder from contact with the bed while the bed is making its return stroke. I have not illustrated this mechanism, as it may be of any ordinary type and forms no part of my invention.

3 indicates the bed, which is made very light, it only being necessary that it have sufficient strength to support a form of type placed therein. This bed is guided on the tracks 4, which tracks are raised upon the return stroke of the bed, as will be hereinafter described.

5 designates the main driving-shaft of the machine and is provided with the usual fast and loose pulleys 6.

7 indicates a gear secured to the shaft 5 and meshing with the gear 8 on the shaft of the impression-cylinder to drive the same in the ordinary well-known way.

The main shaft 5 is preferably supported along its length by the brackets 9, standing up from the frame of the machine, and mounted on this shaft between these brackets are the supporting-wheels 10. It will of course be understood that while I have shown a series of supporting-wheels a single wheel or roller might be substituted therefor which would be the full equivalent thereof, or any

other form of supporting means might be used, as may be found desirable. These supporting-wheels 10 are secured to the main driving-shaft 5, and on these wheels the bed rests during the printing stroke of the bed. These wheels are arranged directly under the impression-cylinder 2, so that they support the bed at the line of impression and entirely take the strain of impression from the bed.

11 indicates stiffening-ribs which preferably are placed along the bottom of the bed to stiffen the same without materially adding to its weight.

12 indicates a pair of racks, one on each side of the bed, and with these racks mesh the gears 13, carried on the main driving-shaft, to drive the bed at the same speed as the peripheral speed of the cylinder during impression, the racks 12 being lifted out of engagement with the gears 13 during the return stroke of the bed by means to be hereinafter described.

14 indicates a bar provided with a rack secured to the under side of the bed, the rack being on the side of the bar, and 15 indicates a pair of gears loose on the vertical shafts 16.

17 indicates a pair of gears secured to the shafts 18, which are mounted transversely of the machine and parallel with the main driving-shaft 5. These shafts carry on their inner ends the beveled gears 19, which mesh with beveled gears 20, secured to the vertical shaft 16.

21 indicates a second set of beveled gears secured to the vertical shafts 16, and meshing with these beveled gears are beveled gears 22, which are carried by the shafts 23.

24 indicates cams secured to the shafts 23, and 25 indicates levers pivoted at 26, one end of which being adapted to rest on top of the cams 24 and held thereagainst by means of the springs 27. The other ends of the levers 25 engage in grooves 28, cut in the collars 29, feathered to the shafts 16.

30 indicates feathers carried by the collars 29 and adapted to engage holes 31 in the gears 15 when the collars are raised by the low part of the cams 24 coming under the levers 25 and allowing the springs 27 to operate. By this means it will be seen that the gears 15 are connected to the shafts 16 and will be driven thereby, the cams on the shafts 23 being so timed that the gears 15 will be driven by the shafts 16 during the return stroke of the bed.

32 indicates a pair of shafts running transversely of the machine and provided on one end with beveled gears 33, which mesh with the beveled gears 34, carried by shafts 35, which are driven from a beveled gear 36 on the main driving-shaft 5 by means of the beveled gears 37. The shafts 32 carry cams 38. On these cams rest the rollers 39, and on top of these rollers rest the tracks 4. The cams 38 are so timed that the high parts of these cams will be under the rollers 39 during the return stroke of the bed 3 and will lift the bed dur-

ing this return stroke, disengaging the racks 12 from the gears 13 and supporting the bed just clear of the supporting-wheels 10.

40 indicates beveled gears secured to the outer ends of the shafts 23, and these beveled gears mesh with beveled gears 41, secured to the vertical shafts 42, which are suitably supported in brackets 43.

44 indicates disks carried on the upper ends of the shafts 42, these disks each carrying a pin 45, which is free to move in the disks.

46 indicates slots carried by projections secured to the ends of the bed, with which the pins 45 are adapted to engage when the pins are lifted by the stationary cam-faces 47 to catch the bed and reverse the same.

It will be seen by the mechanism described I have provided a very direct and efficient means to reciprocate a bed in which the parts are all directly connected by gearing and which because of the lightness of the bed it is possible to drive the bed at a much higher speed than has heretofore been possible without danger of breaking the parts of the press, the bed being perfectly supported at the line of impression by the supporting-rollers 10.

By the form of press which I have described and by the use of the horizontal disks which form the reversing mechanism I am enabled to build a press in which the bed is very close to the floor, and in this way the strain on the bed is very much lessened, and the same can be run at a higher speed without vibration.

While I have described what I believe to be the preferred form of my invention, I desire to have it understood that many changes might be made therein and different forms of mechanism be substituted for the particular mechanism which I have shown for performing certain parts of the operation without departing from my invention, the chief object of my invention being to lighten the weight of a bed in order that it may be driven at a very high speed, the machine in which I have chosen to show my invention merely illustrating one form in which my invention may be used.

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

1. In a printing-machine, the combination with an impression-cylinder of a bed, means constantly driven in one direction situated under the line of impression and adapted to support and drive the bed during the impression.

2. In a printing-machine, the combination with an impression-cylinder of a bed, and a constantly-driven rotating support below the bed.

3. In a printing-machine, the combination of a reciprocating bed and an impression-cylinder on one side of said bed and a constantly-driven rotating support on the other.

4. In a printing-machine, the combination with an impression-cylinder of a bed, means positively and constantly driven at the same

peripheral speed as the impression-cylinder and adapted to support the bed at the line of impression.

5 In a printing-machine, the combination with a bed with a constantly-rotating support adapted to drive and support the bed during the impression stroke of the bed.

6. In a printing-machine, the combination with a constantly-rotating impression-cylinder of a reciprocating bed, means driven constantly at the same peripheral speed as the impression-cylinder and adapted to support the bed during its printing movement at the line of impression; and means adapted to raise the bed off from its supporting means while it is making its return movement.

7. In a printing-machine, the combination with an impression-cylinder of a bed, constantly-driven means adapted to support the bed on the line of impression; said impression-cylinder being driven from said supporting means and in unison therewith; means whereby, during the printing stroke of said bed, said bed will be in contact with and driven by said supporting means, and whereby, on the return stroke, said bed will be lifted clear of said supporting means and driving means independent of said supporting and driving means for returning said bed.

8. In a printing-machine, the combination with an impression-cylinder of a bed, a constantly-rotating supporting means under said bed adapted to support said bed at the line of impression; tracks upon which said bed is adapted to be guided; means for lowering said tracks during the printing stroke of said bed, whereby said bed is driven from and supported by said supporting device; and raising said tracks during the return stroke of said bed whereby said bed is clear of said supporting device; and means for driving said bed during its return movement.

9. In a printing-machine, the combination with an impression-cylinder of a bed, a supporting device consisting of a series of wheels mounted on a shaft; means for constantly driving said shaft, and means for driving said impression-cylinder therefrom; means whereby said bed will be allowed to rest upon and be driven from said supporting means during the printing movement, and to be raised clear of said supporting means during the return movement, and means for driving said bed during said return movement.

10. In a printing-machine, the combination with an impression-cylinder of a bed, constantly-rotating supporting device for said bed adapted to support said bed at the line of

impression; means whereby said bed will be supported by said supporting device during the printing stroke, but will be free from said supporting device during the return stroke.

11. In a printing-machine, the combination with an impression-cylinder of a bed, of a cylinder adapted to support and drive said bed on the line of impression during its printing stroke; means for disengaging said bed and supporting-cylinder during its return stroke, and means adapted to drive said bed during said return stroke.

12. In a printing-machine, the combination with a bed and constantly-rotating driving means adapted to drive the bed during the impression-stroke of the bed, and support the bed at the line of impression and reversing means adapted to engage and reverse the bed at either end of its stroke.

13. The combination with a reciprocating bed and means for driving said bed throughout the greater portion of its movement in either direction of a rotating member provided with a pin, a slot in said moving bed which is adapted to be engaged by said pin, and means for raising said pin to engage said slot during a certain portion of the revolution of said rotating member to slow down and arrest the movement of the reciprocating bed in one direction and start and accelerate the same in the other direction.

14. The combination with a reciprocating bed and means for driving said bed throughout the greater portion of its movement in either direction of a rotating member carrying a pin, a slot carried by said reciprocating bed; a cam underneath said rotating member and in position to raise said pin during a part of the rotation of said rotating member whereby said pin will engage the slot in the reciprocating bed to slow down and arrest the movement of the reciprocating bed in one direction and start and accelerate it in the other direction.

15. In a printing-machine, the combination with a bed of a rotating support adapted to drive and support said bed during its printing movement, means of disengaging the support during the return stroke of the bed, and means of engaging and driving the bed during the return stroke.

Signed by me at New York city, county and State of New York, this 26th day of April, 1902.

CHARLES H. COCHRANE.

Witnesses:

FRANCIS M. PHELPS,
SIDNEY R. PERRY.