

No. 682,780.

Patented Sept. 17, 1901.

C. BAREUTHER.  
PRINTING MACHINE FOR YARN OR WARP THREADS.

(Application filed June 15, 1899.)

(No Model.)

7 Sheets—Sheet 1.

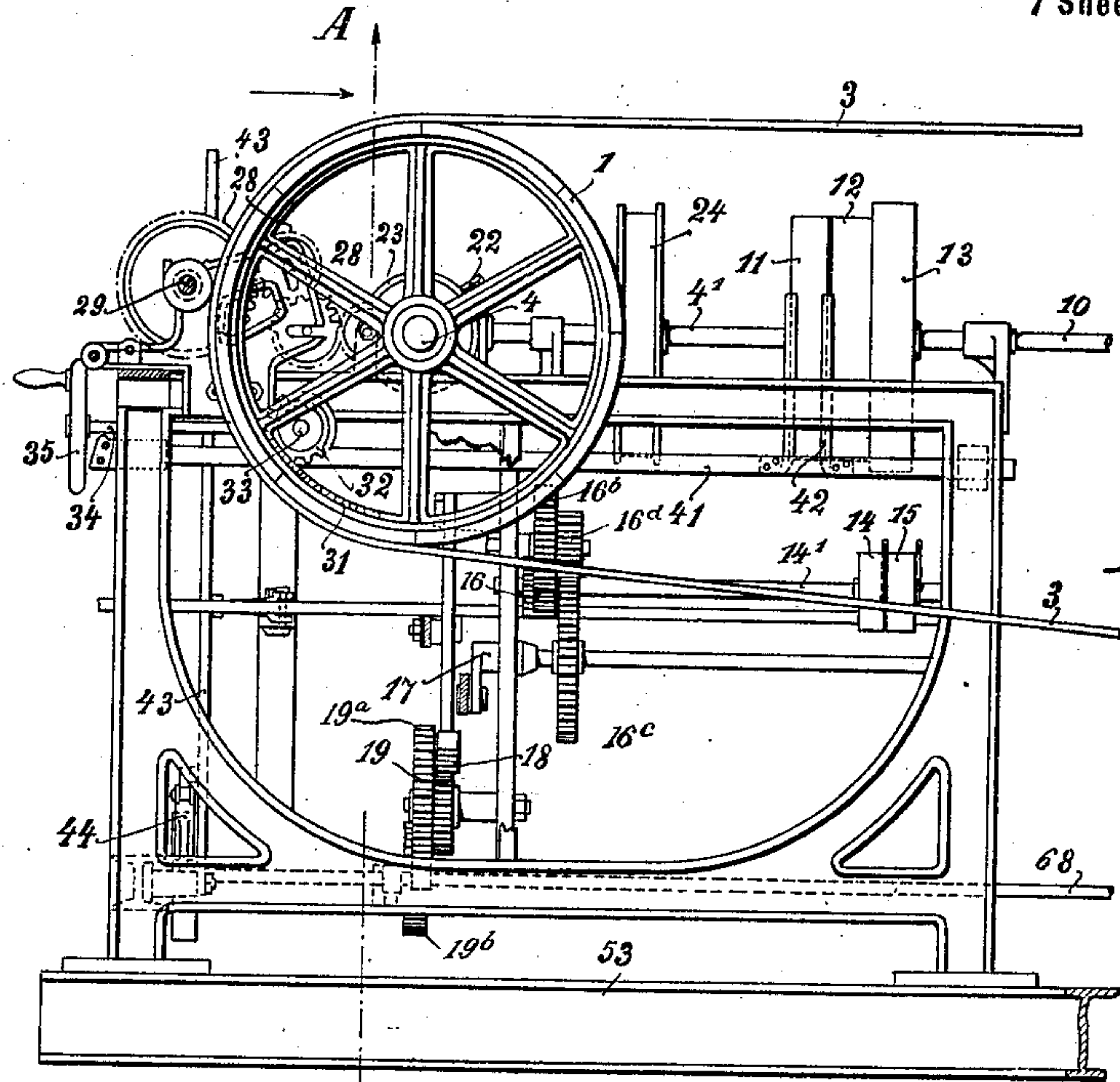


Fig. 1<sup>a</sup>

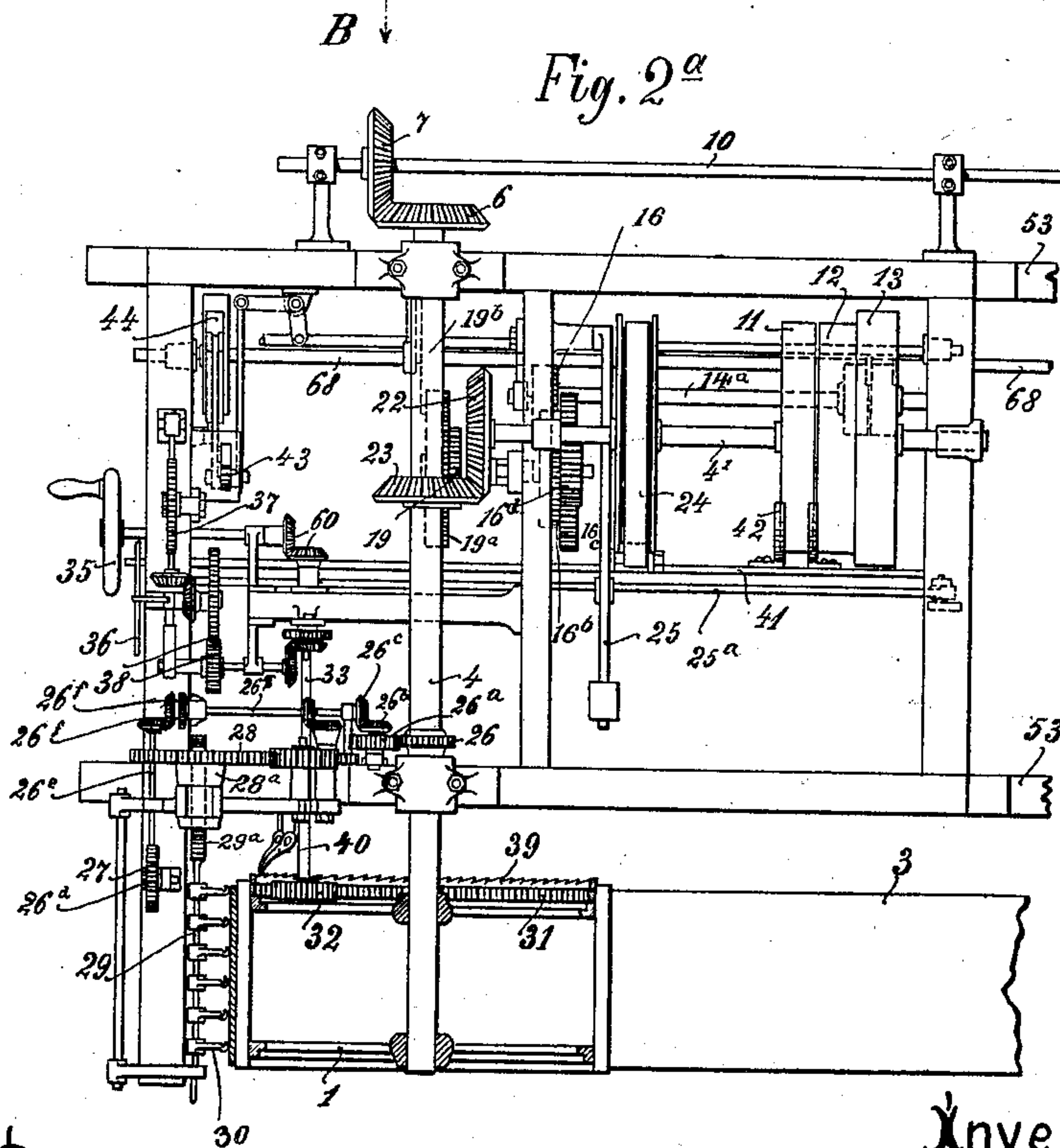


Fig. 2<sup>a</sup>

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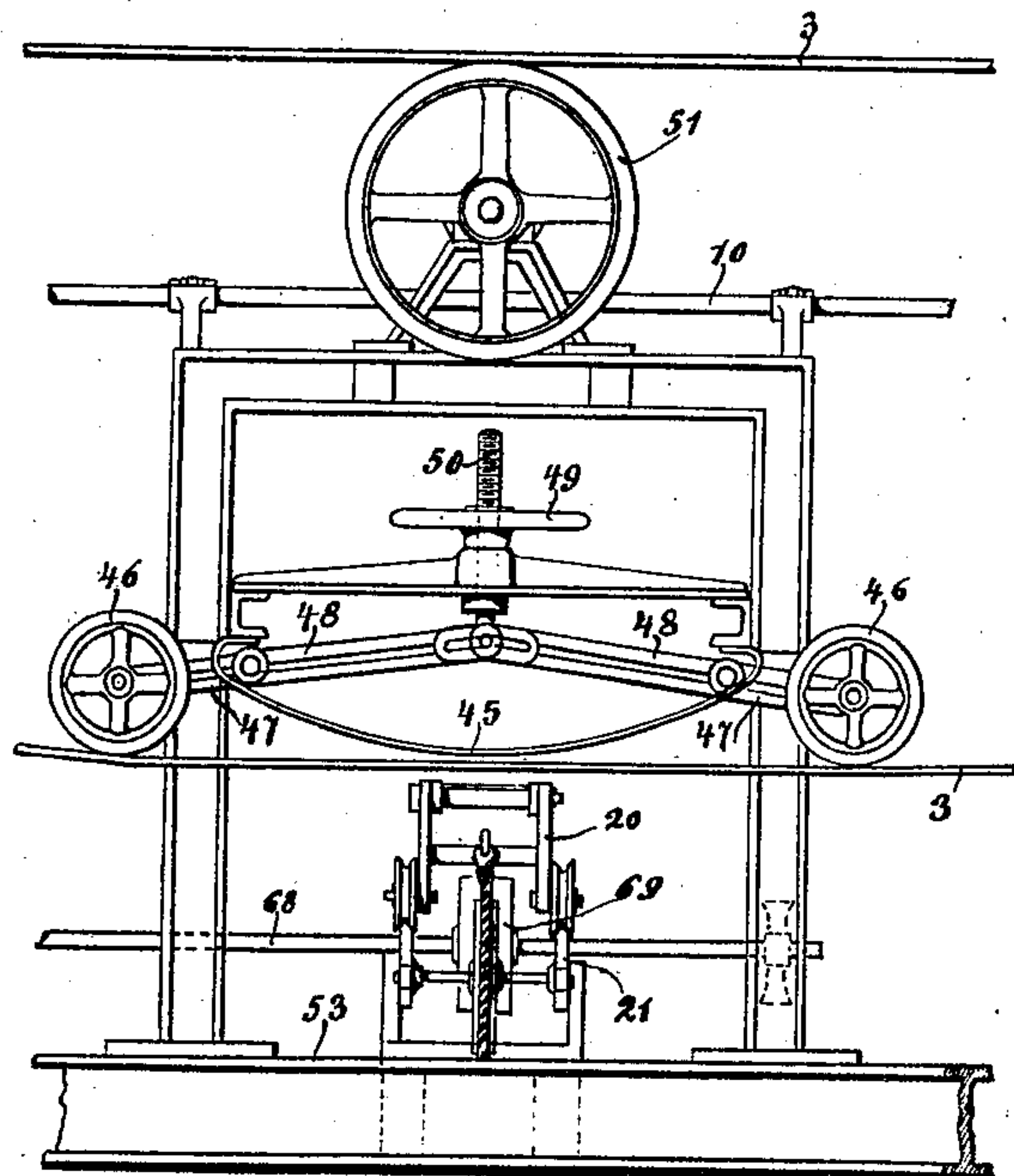


Fig. 1<sup>b</sup>

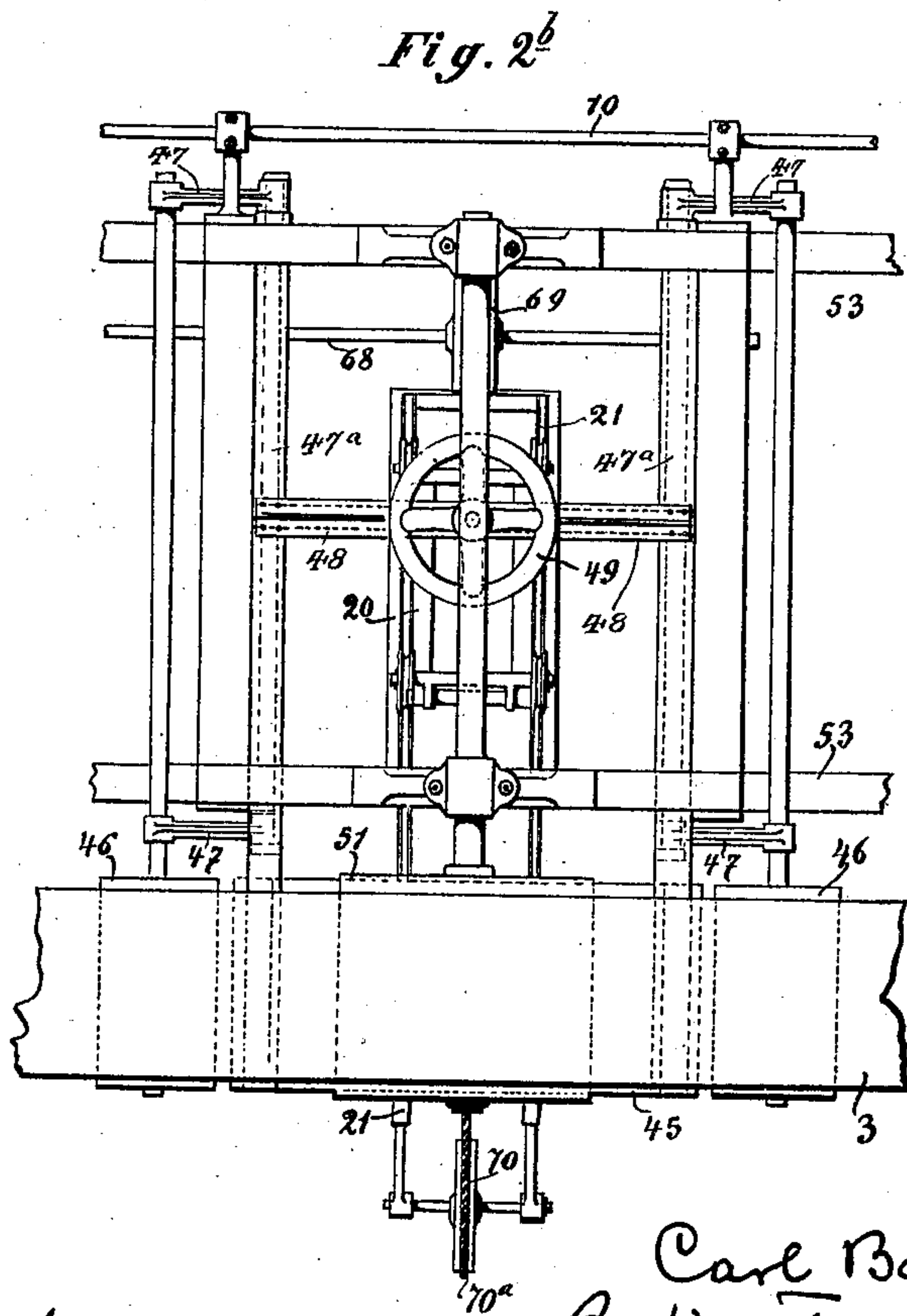


Fig. 2<sup>b</sup>

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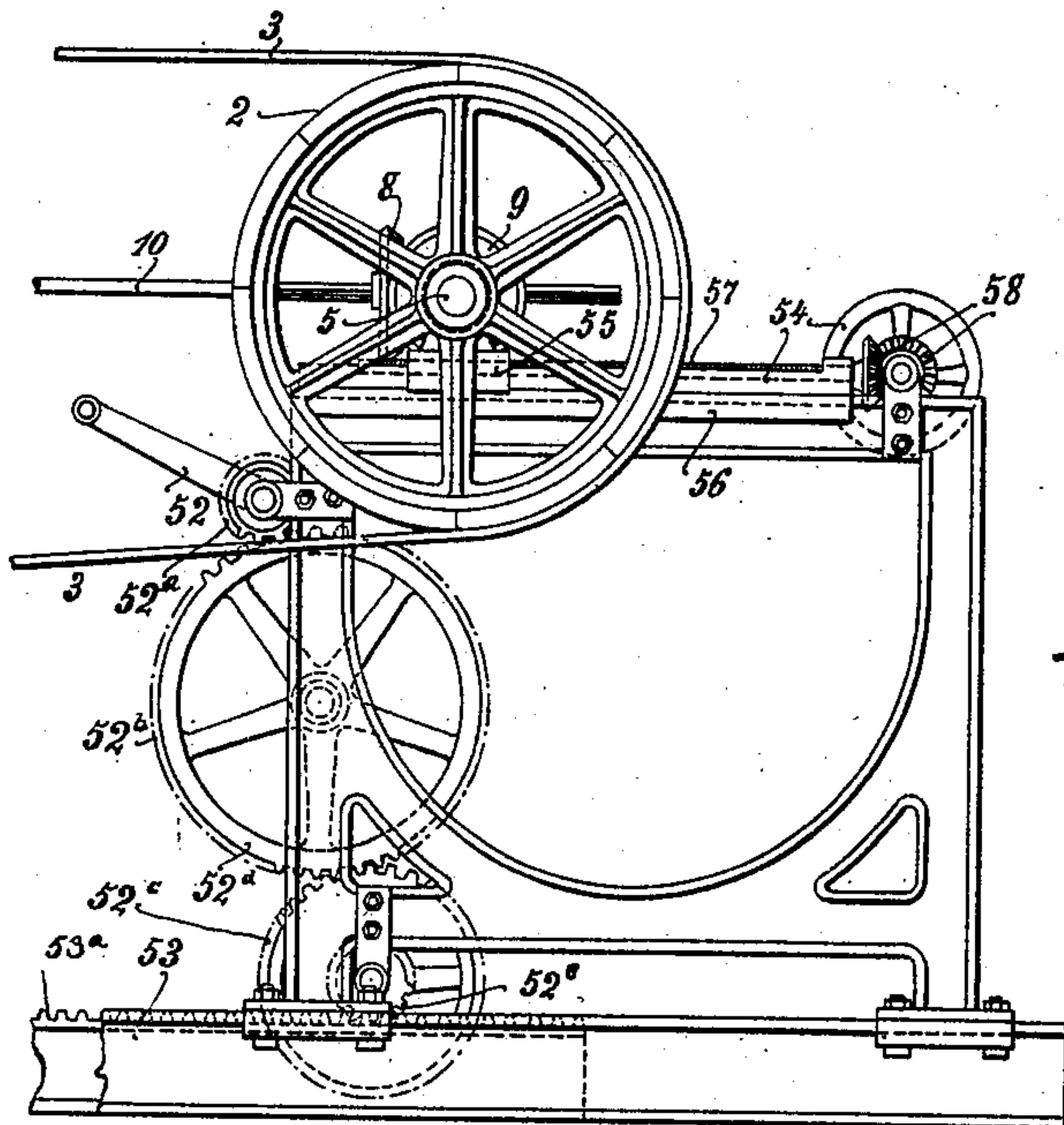


Fig. 1c

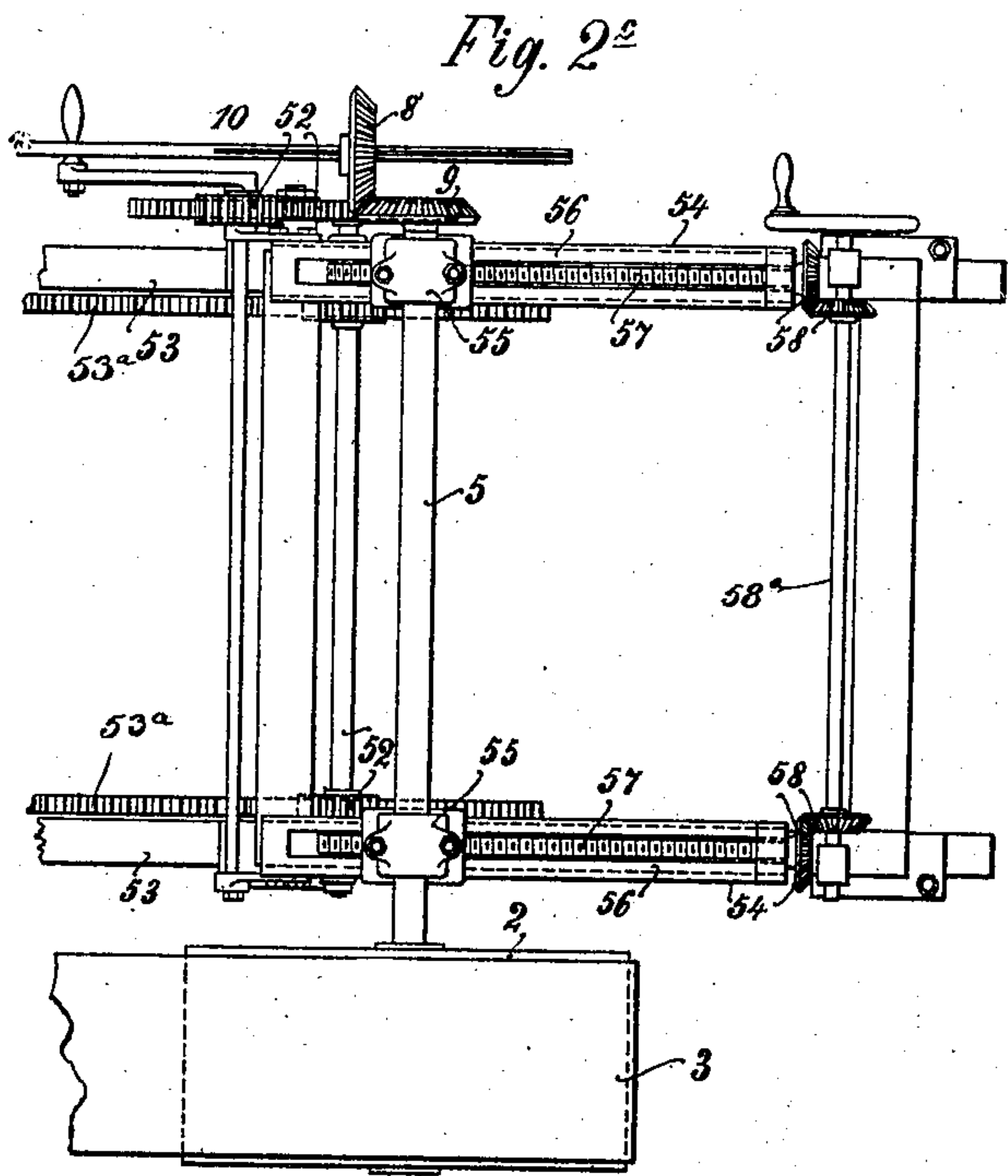


Fig. 2c

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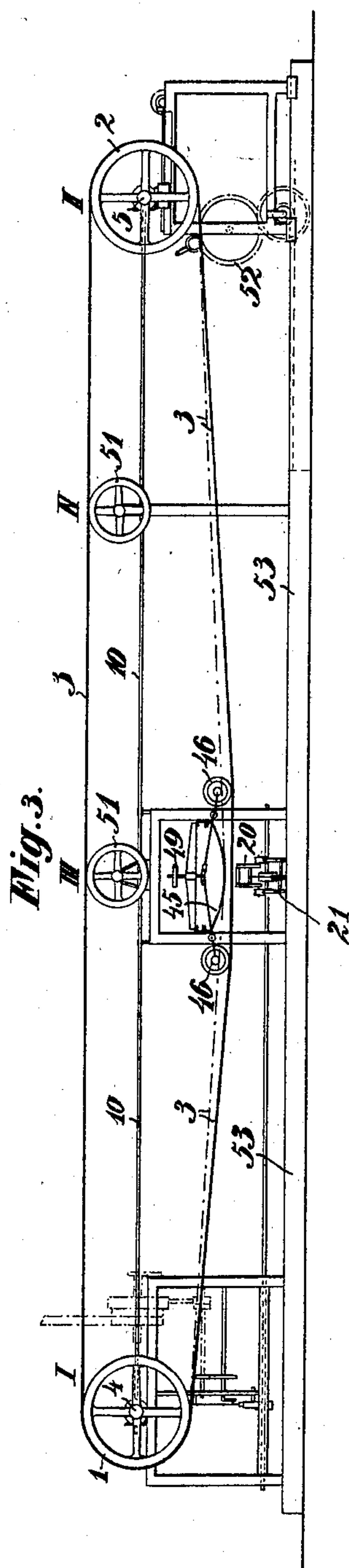
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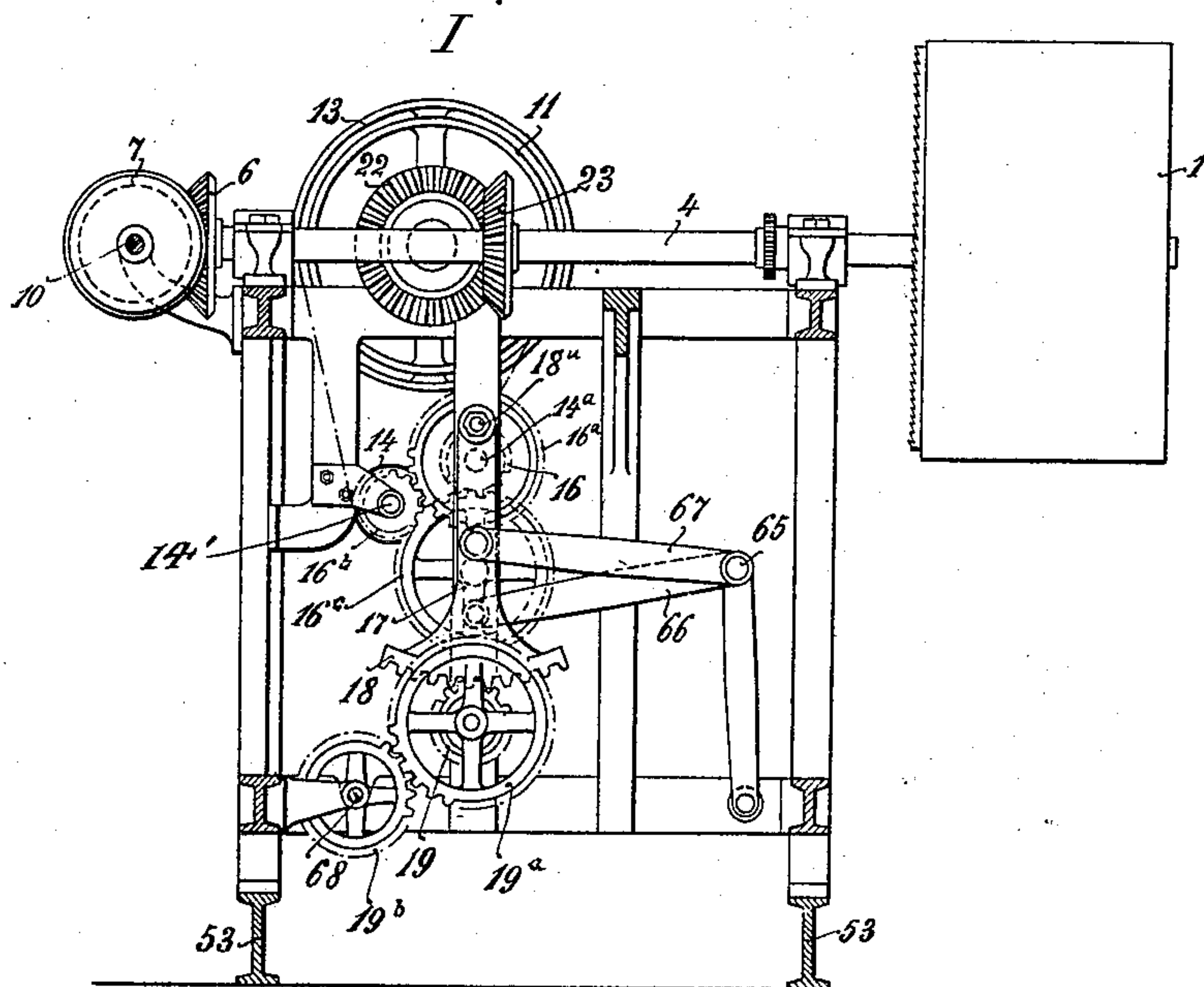
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Fig. 4.



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Fig. 5.

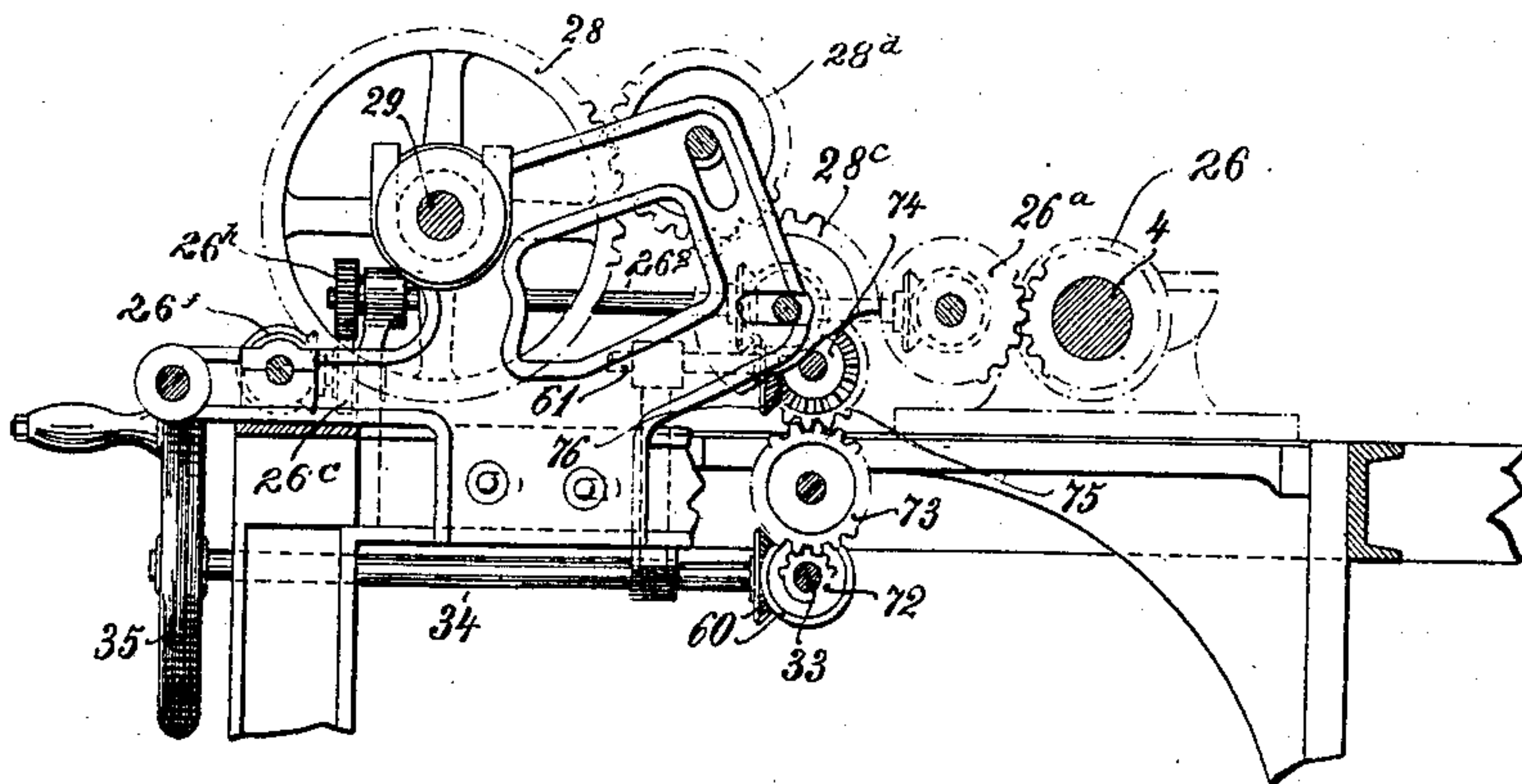
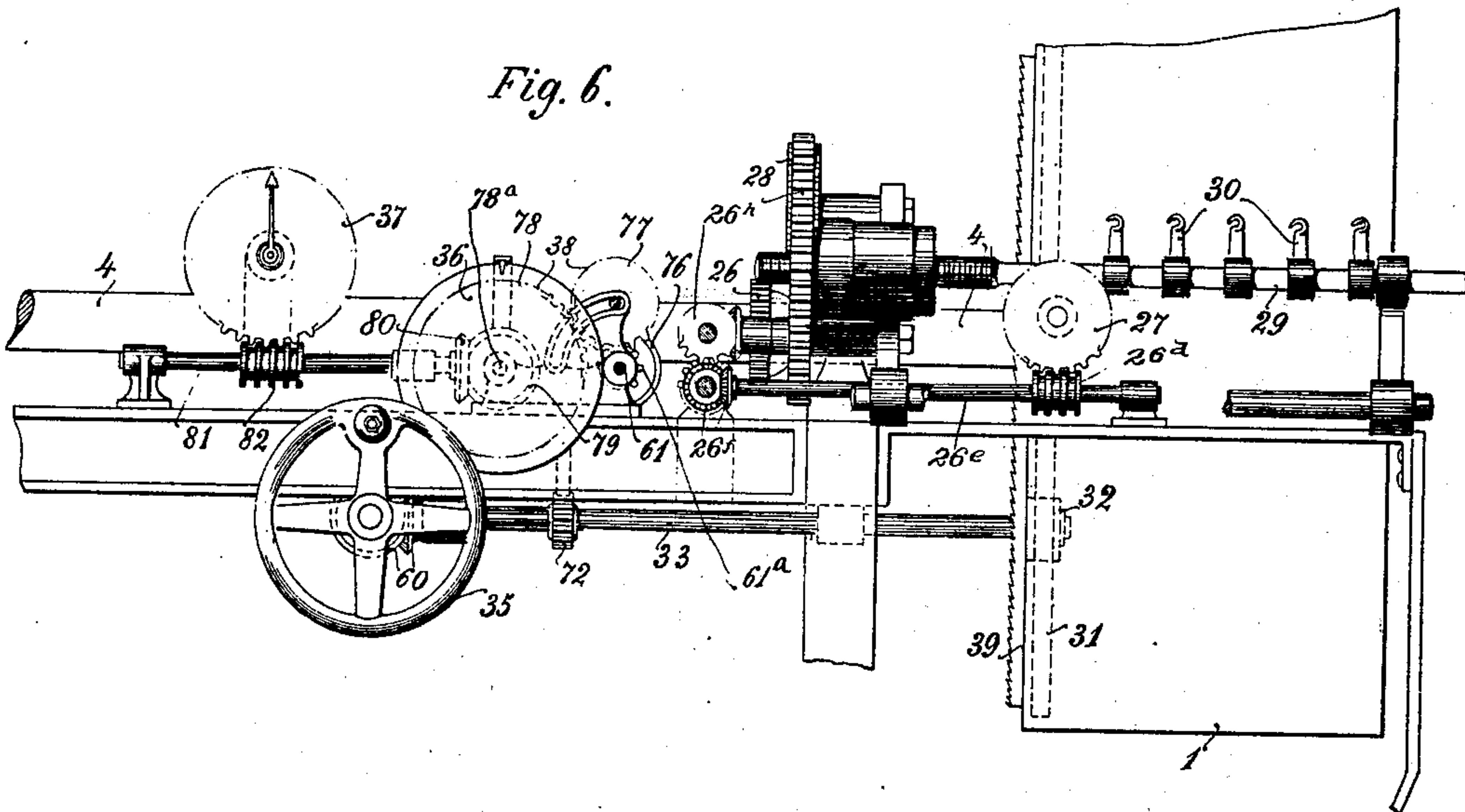


Fig. 6.



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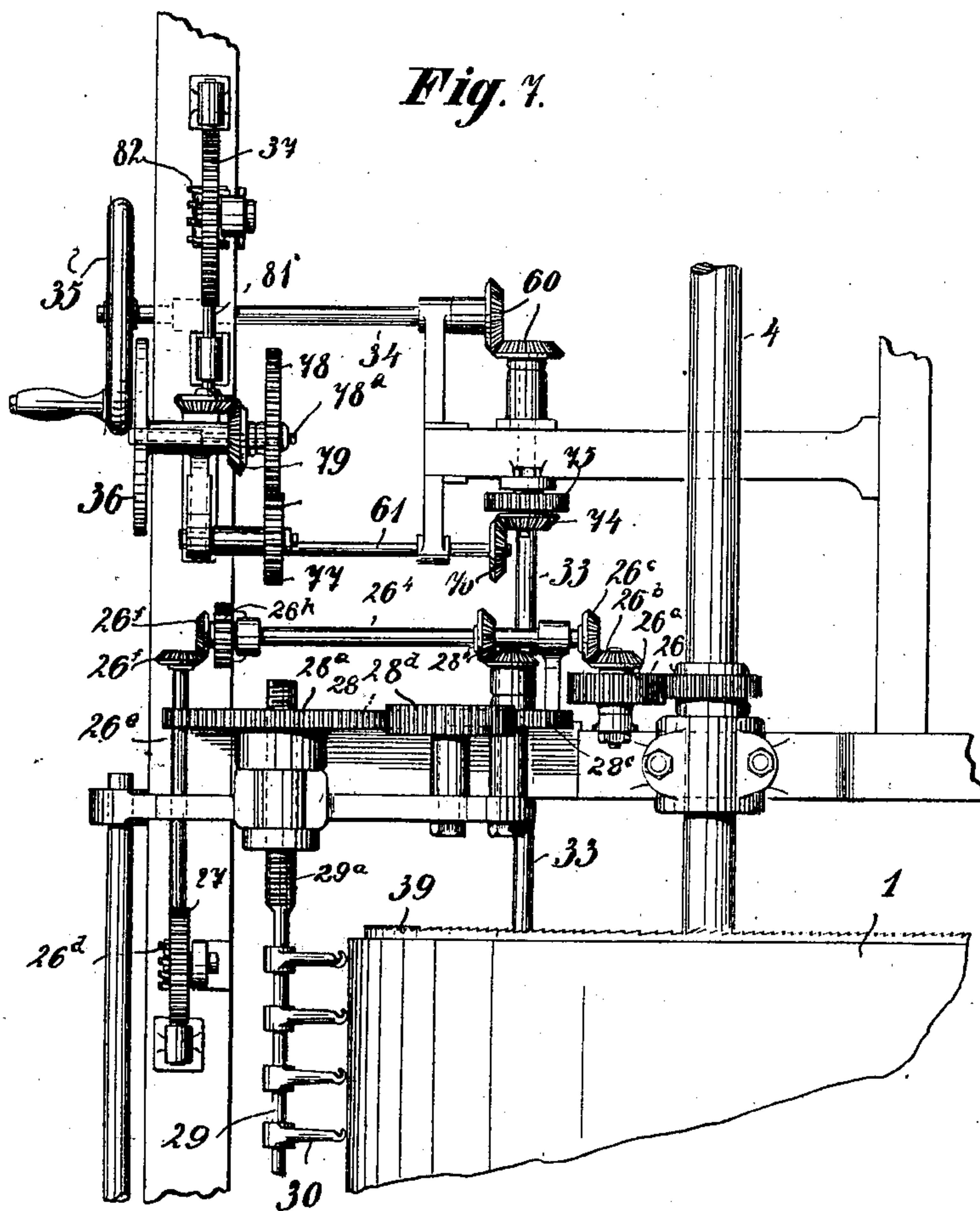
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(No Model.)

7 Sheets—Sheet 7.



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# UNITED STATES PATENT OFFICE.

CARL BAREUTHER, OF EGER, AUSTRIA-HUNGARY.

## PRINTING-MACHINE FOR YARN OR WARP-THREADS.

SPECIFICATION forming part of Letters Patent No. 682,780, dated September 17, 1901.

Application filed June 15, 1899. Serial No. 720,628. (No model.)

*To all whom it may concern:*

Be it known that I, CARL BAREUTHER, a subject of the Emperor of Austria-Hungary, residing at Eger, in the Kingdom of Bohemia and Empire of Austria-Hungary, have invented certain new and useful Improvements in Printing-Machines for Yarn or Warp-Threads, (for which I have applied for patents in England, No. 7,987, dated April 15, 1899, and in Germany, dated April 8, 1899,) of which the following is a specification.

Yarn for the manufacture of carpets, figured plush, &c., is printed on printing-drums the peripheries of which depend upon several considerations—such, *e. g.*, as the length of the unit of design or that part which is to be continuously repeated, the length of the pieces of the fabric to be produced, and the character of the fabric—*i. e.*, whether it is to be tightly or loosely woven. Consequently a point is frequently reached where it is impracticable or at least very difficult to employ drums having the proper peripheries.

It is the object of my invention to obviate this difficulty by dispensing with the drums now usually employed and to enable small or large quantities of yarn to be printed, even up to forty meters or more, with facility.

The machine does not require much room, is simpler in operation than the machines now employed, and many of the parts of the old machine are preserved.

In the accompanying drawings, Figures 1<sup>a</sup>, 1<sup>b</sup>, and 1<sup>c</sup> are side elevations, respectively, of the driving portion, printing portion, and end frame of the machine. Figs. 2<sup>a</sup>, 2<sup>b</sup>, and 2<sup>c</sup> are plan views of the same, respectively. Fig. 3 is a diagrammatic side elevation of the entire machine. Fig. 4 is a vertical sectional view on the line A B of Fig. 1<sup>a</sup> looking in the direction of the arrow. Fig. 5 is a side view of the mechanism for operating the thread-guide. Fig. 6 is an end elevation of a portion of the machine, showing the devices for controlling the printing devices. Fig. 7 is a plan view of the same.

The machine consists of a fixed frame I with working stand and the driving devices, an adjustable frame II, located at the opposite end of the apparatus, and an intermediate frame III, carrying the printing devices. An endless belt 3 runs about a driving-pul-

ley 1 in the frame I and about a pulley 2 on the frame II and through the printing devices on the frame III. The pulley is mounted on the transverse shaft 4, which is driven from the longitudinal shaft 4' through bevel-gears 22 23.

4' is the main driving-shaft, which carries the fast pulley 11 and the two loose pulleys 12 and 13, the latter being keyed or connected together.

24 is a band-brake on the shaft 4', by which the rotation of the said shaft may be arrested when the driving-belt (not shown) is shifted from the pulley 11, the shifting of the belt being effected by the fork 42, carried by the shifter-rod 41. The band-brake is operated by a weighted lever 25, controlled by a movable rod 25<sup>a</sup>. By moving the rod 25<sup>a</sup> the lever is released and the brake thrown on. (See Fig. 2<sup>a</sup>.) The rods 41 and 25<sup>a</sup> may be shifted by hand or in any convenient manner.

The yarn is wound on the endless belt 3 from a common spooling-frame through a thread-carrier, the beginning of the thread being secured to a fastening or cord to which the end of the thread is connected after the yarn has been wound to the required extent. In practice a spooling-frame provided with a series of reels is used, the threads being disposed uniformly over the entire width of the belt in the usual manner. The thread-carriers 30 are carried on a rod 29, provided with an externally-threaded shank 29<sup>a</sup>, engaging the internally-threaded hub 28<sup>a</sup> of a gear 28, which is driven by intermediate gears 26 26<sup>a</sup> 26<sup>b</sup> 26<sup>c</sup> 28<sup>b</sup> 28<sup>c</sup> 28<sup>d</sup> from the shaft 4. (See Fig. 7.) By this means a longitudinal movement is imparted to the rod 29 and thread-carrier for the purpose of disposing the threads uniformly over the belt 3.

27 is an indicator-disk, which indicates the number of times the yarn is wound upon the belt 3. Each of the threads as it comes from the reel is wound around the belt a number of times, and the number is indicated by the indicator 27. It is driven from the shaft 4' through suitable gearing to properly time its action. As shown, (see Figs. 2<sup>a</sup>, 5, 6, and 7,) the indicator-disk is provided with a gear driven by a worm 26<sup>d</sup> on a transverse shaft 26<sup>e</sup>, which is driven by bevel-gears 26<sup>f</sup> from the shaft 26<sup>g</sup>, driven by the bevel-gears 26<sup>b</sup>



26<sup>c</sup>, before referred to. The bevel-gears 26<sup>f</sup> are driven by the shaft 26<sup>e</sup> through a gear 26<sup>h</sup> on the shaft 26<sup>e</sup>, engaging a gear 26<sup>i</sup>, Fig. 5, on the short shaft of one of the bevel-gears 26<sup>f</sup>. As the disk 27 is operated from the shaft 4, which drives the drum 1, it will indicate by its revolutions the extent of movement of the belt 3 and the amount of yarn wound thereon. In addition to the means for thus driving the drum 1 and belt 3 by power I employ hand-operated means for moving the drum 1 and belt to any extent desired and indicating devices in connection therewith to indicate the extent of movement. These devices are as follows: The drum 1 is provided with an internal gear 31, which engages a pinion 32 on a transverse shaft 33, which through bevel-gears 60 is driven by a shaft 34, provided with a hand-wheel 35. When the main driving-belt is thrown off the pulley 11, the drum and belt may be moved to any extent desired by hand. A ratchet 39 on the drum 1 and a pawl 40, engaging therewith, prevent accidental backward movement.

36 and 37 are indicators-disks designed to indicate the extent of movement of the belt 3 and the yarn carried thereby when it is moved by the hand-wheel 35. They are driven by suitable mechanism to operate them synchronously with the movement of the belt. As shown, the disk 36 is carried on a stud 78<sup>a</sup>, provided with a gear 78, which through intermediate gears 77 61<sup>a</sup>, Fig. 6, is driven from a shaft 61, driven by the shaft 33 through intermediate gears 76 74 75 73 72, Figs. 5, 6, and 7. As the shaft 33 is driven by the pulley 1 in the manner heretofore described, it is obvious that the indicator-disk 36 will be driven therewith, and by properly regulating the gearing the disk 36 may be moved to a small extent proportional to a given extent of movement of the drum 1 and the belt 3. For example, in practice the disk 36 may be provided with one hundred lines and the gearing may be so regulated that with each centimeter of movement of the drum 1 and the belt 3 the disk 36 will be moved the extent of one line, thus indicating at any moment the number of centimeters in length the belt 3 and yarn carried thereby has traveled or is to be moved for the purpose of printing at the proper place.

37 is a second indicator-disk driven at a lower speed than the disk 36 through suitable speed-reducing gearing. As shown, the disk 37 is provided with a gear engaging a worm 82 on a transverse shaft 81, which is driven from the spindle 78<sup>d</sup> of the disk 36 by bevel-gears 79 80, Figs. 6 and 7. By properly proportioning the gearing the disk 37 may be made to make a partial revolution with each revolution of the disk 36. Thus, for example, the disk 37 may be provided with a scale of one hundred lines and may be moved a distance of one line with each revolution of the disk 36, thus indicating the extent of move-

ment of the belt 3 and yarn in one hundred centimeters. When the belt is power-driven, the indicator 27 shows the extent of movement; but when the power devices are thrown out of operation and the belt is moved backward by the hand operating devices the extent of movement is indicated by the indicators 36 37, so that any part of the yarn may be brought into desired position.

Referring now to the end frame II, this frame is movable longitudinally on guides 53 of the main frame to adjust its position with reference to the frame I. To enable the frame II to be easily adjusted, the guides 53 are provided with toothed racks 53<sup>a</sup>, which engage pinions 53<sup>c</sup>, carried by the frame II. Pinions 52<sup>a</sup> on a shaft in the upper part of the frame operated by a handle 52 transmit power through intermediate gears 52<sup>b</sup> 52<sup>c</sup> to the gears 52<sup>e</sup>, thus moving the frame II longitudinally on the guides 53 into the desired position with reference to the frame I to suit the length of the strands of yarn to be printed.

The pulley 2 is carried on a shaft 5, journaled longitudinally in horizontally-adjustable bearings 55, which may be moved by means of screws 57 57, operated simultaneously through bevel-gears 58 from a hand-operated shaft 58<sup>a</sup>. By these means the position of the shaft 5 and pulley 2 may be adjusted horizontally in the frame II to enable the belt 3 to be slackened and the yarn removed without changing the adjustment of the frame II. The shaft 5 is driven from the shaft 4 of the driving-machine through a shaft 10, journaled longitudinally on the frame of the machine and operatively connected with the shafts 4 and 5, respectively, by bevel-gears 6 7 and 8 9. (See Figs. 2<sup>a</sup>, 2<sup>b</sup>, and 2<sup>c</sup>.) The bevel-gear 8 is keyed on the shaft 10, so as to move longitudinally thereon when the shaft 5 is adjusted.

Referring now to the printing devices III, 20 is a color-carriage movable transversely on guides 21.

45 is an elastic impression-plate, preferably of sheet metal, carried by the frame III transversely above the color-carriage 20. The belt 3 passes between the carriage 20 and plate 45.

The color-carriage is connected at its opposite ends with the opposite ends of a rope or cable 70<sup>a</sup>, which runs over sheaves or pulleys 69 70, one of which, as 69, is fast upon a longitudinal shaft extending to the frame I and driven therefrom in any suitable manner. As shown, the devices for driving the shaft 68, and thereby operating the sheave 69 and reciprocating the carriage 20, are as follows:

14<sup>a</sup> is a counter-shaft in the frame I, carrying the fast and loose pulleys 14 15, which are driven by a belt (not shown) from the pulley 13 on the shaft 4.

16 is a pinion on the shaft 14<sup>a</sup>, engaging and driving a gear-wheel 16<sup>b</sup>, on the shaft of which is a second pinion 16<sup>a</sup>, which engages



a gear-wheel 16<sup>c</sup>, fast upon a crank-shaft 17<sup>a</sup>. (See Figs. 2<sup>a</sup> and 4.) The crank 17 is connected by the link 66 to the rocking arm 66<sup>a</sup>, which is in turn connected by the link 67 with the rocking segment-arm 18, pivoted at 18<sup>a</sup>, which engages the toothed wheel 19 on a short stud in the frame and through the intermediate gears 19<sup>a</sup> 19<sup>b</sup> transmits a reciprocating rotary movement to the shaft 68. A suitable brake 44, Figs. 1<sup>a</sup> and 2<sup>a</sup>, controlled by a hand-lever 43, controls the shaft 68 and may be operated to bring the shaft to an instant stop when desired. Connected with this brake 44 and operated therewith is a shifter-rod 44<sup>a</sup>, which shifts the belt from the pulley 14 to 15, or vice versa. Such brake and belt-shifting devices are well known and any convenient form may be used for the purpose of throwing the shaft 68 into and out of operation.

46 46 are rollers bearing on the belt 3 at each side of the color-carriage. These rollers may be raised or lowered and their pressure regulated. To permit this, their shafts are journaled in arms 47 of a rock-shaft 47<sup>a</sup>, having arms 48, which may be adjusted by the screw-spindle 50 through the hand-wheel 49.

The operation of the machine is as follows: The frame II is adjusted to the desired distance from the frame I to suit the length of the strands of yarn to be colored. The end of the yarn is then fastened to the belt 3, which is preferably covered with a layer of paper or oil-cloth, and the shaft 4 is thrown into operation. The yarn is wound upon the belt 3, being properly disposed thereon by the movement of the screw 29, and the end of the yarn is fastened to the belt in any suitable manner. The disk 27 indicates the number of strands of yarn that have been wound on the belt 3. The driving-belt is then shifted from the pulley 11 and the further movement of the belt 3 is arrested. By the operation of the hand-wheel 35 the operator can move the belt 3 and the yarn carried thereby to any desired extent to bring the desired portion of the yarn into position to be colored. The operator then operates the hand-lever 43 and throws the shaft 68 into operation, so that a reciprocating movement is imparted to the color-carriage 20, and the yarn is colored. The shaft 68 is then thrown out of operation by the operation of the lever 43 and the belt is moved again by the hand-wheel 35 to bring the next portion of yarn in position to be colored and the coloring operation is repeated.

The indicators 36 and 37 show the extent of movement of the belt 3 and yarn, and thus guide the operator in indicating the amount of movement necessary. Thus the operator, following a pattern-card, can move the belt 3 and yarn carried thereby to the extent necessary to produce the desired pattern. If desired, additional guide-rolls 51 may be employed for sustaining the belt 3, and when

the yarn is wound in long strands it may be tied to the belt by transverse threads to prevent it from sagging.

The details of construction shown may be varied without departing from the invention.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a yarn-coloring machine, the combination with the coloring devices, of an endless traveling belt upon which the yarn to be colored is carried, power devices for operating said belt, an indicator and power-transmitting connection between said indicator and devices for operating the belt to indicate the extent of movement of the belt when moved by said power devices, hand-operated devices for moving said belt when the power devices are out of action, an auxiliary indicator and power-transmitting connections between said indicator and hand-operated devices for indicating the extent of movement of said belt under the action of said hand-operated devices.

2. In a yarn-coloring machine, the combination with the coloring devices, of an endless traveling belt upon which the yarn to be colored is carried, power devices for operating said belt, an indicator and power-transmitting connection between said indicator and devices for operating the belt to indicate the extent of movement of the belt when moved by said power devices, hand-operated devices for moving said belt when the power devices are out of action, an auxiliary indicator and power-transmitting connections between said indicator and hand-operated devices for indicating the extent of movement of said belt under the action of said hand-operated devices said auxiliary hand-operated indicator consisting of two separate indicating-disks with intermediate speed-reducing driving connections.

3. In a yarn-coloring machine, the combination with the endless belt upon which the yarn is wound in longitudinal strands, of a color-carriage adapted to apply color to the yarn while carried by said belt and the elastic impression-plate 45, between which and the color-carriage the endless belt passes.

4. In a machine of the character described, the combination with the endless belt upon which the yarn is wound in longitudinal strands, of the color-carriage adapted to apply color to the yarn while carried by said belt, an impression-surface located adjacent to the point of action of said color-carriage, and pressure-rollers bearing upon said endless belt adjacent to said impression-surface.

5. In a machine of the character described, the combination with the endless belt upon which the yarn is wound in longitudinal strands, of the color-carriage adapted to apply color to the yarn while carried by said belt, an impression-surface located adjacent to the point of action of said color-carriage, and pressure-rollers bearing upon said end-



less belt adjacent to said impression-surface and means to raise and lower said pressure-rollers.

6. In a machine of the character specified, 5 the combination of an endless traveling belt, upon which the yarn to be colored is wound in longitudinal strands, coloring devices for applying color to the yarn when carried by said belt, power devices for operating said 10 belt to wind the yarn thereon, hand-operated devices for moving said belt when the power devices are out of action, an indicator, and power-transmitting connections between said indicator and the hand-operated devices for 15 moving said belt.

7. In a machine of the character specified, the combination of an endless traveling belt, upon which the yarn to be colored is wound in longitudinal strands, coloring devices for 20 applying color to the yarn when carried by said belt, power devices for operating said belt to wind the yarn thereon, hand-operated devices for moving said belt when the power devices are out of action, an indicator, and

power-transmitting connections between said 25 indicator and the hand-operated devices for moving said belt; a second indicator and speed-reducing driving connections for operating said second indicator at a relatively lower speed than the first indicator. 30

8. In a machine of the character specified, the combination of an endless traveling belt upon which the yarn to be colored is wound in longitudinal strands, a color-carriage for applying color to said yarn while carried by 35 the belt, driving devices for operating said carriage, means to throw said driving devices out of action, hand-operated devices for moving said endless traveling belt, an indicator and driving connections between said indi- 40 cator and the hand-operated devices for moving the belt.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

CARL BAREUTHER.

Witnesses:

EDUARD WEIGEL, Jr.,  
EDUARD HARTMANN.