

No. 670,113.

Patented Mar. 19, 1901.

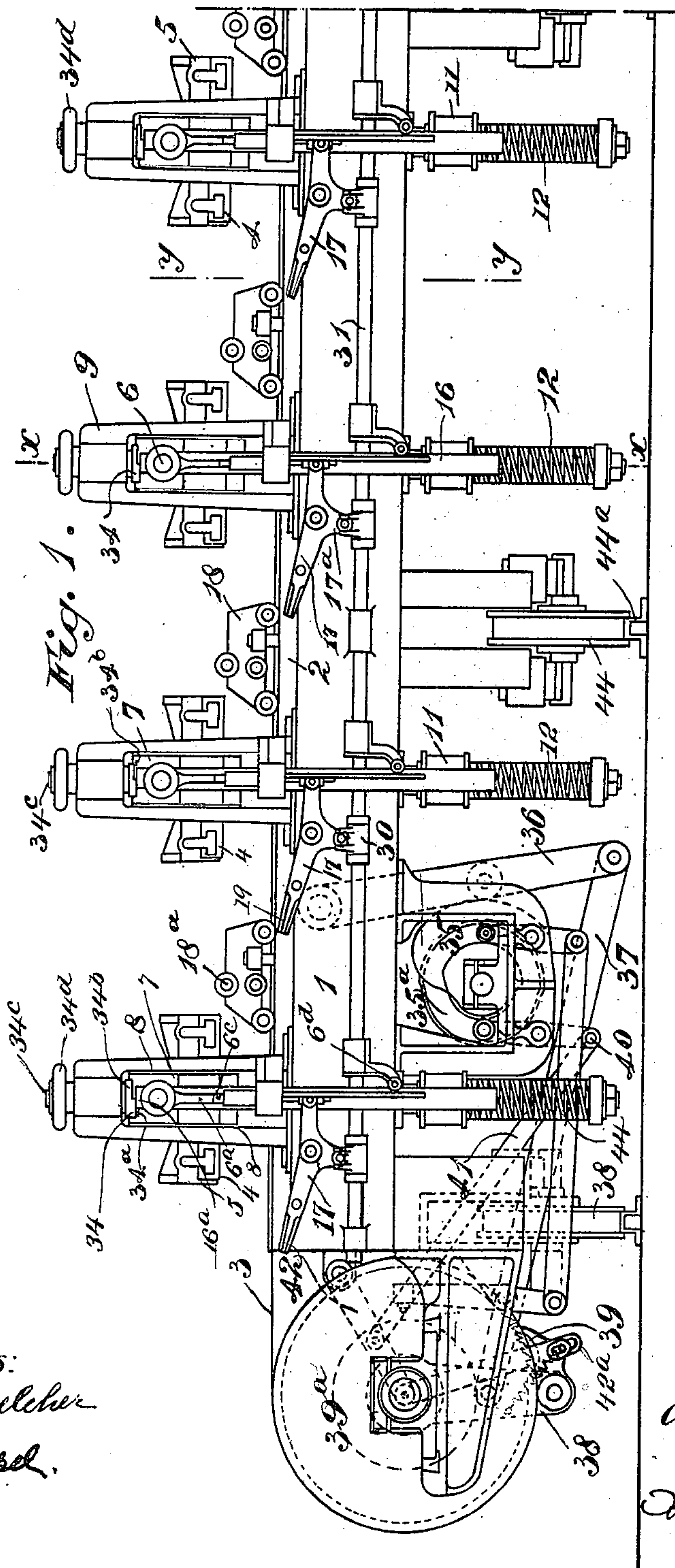
C. H. SCOTT.

MACHINE FOR PRINTING FLOOR CLOTH, LINOLEUM, OR THE LIKE.

(No Model.)

(Application filed June 24, 1898.)

10 Sheets—Sheet 1.



Witnesses:
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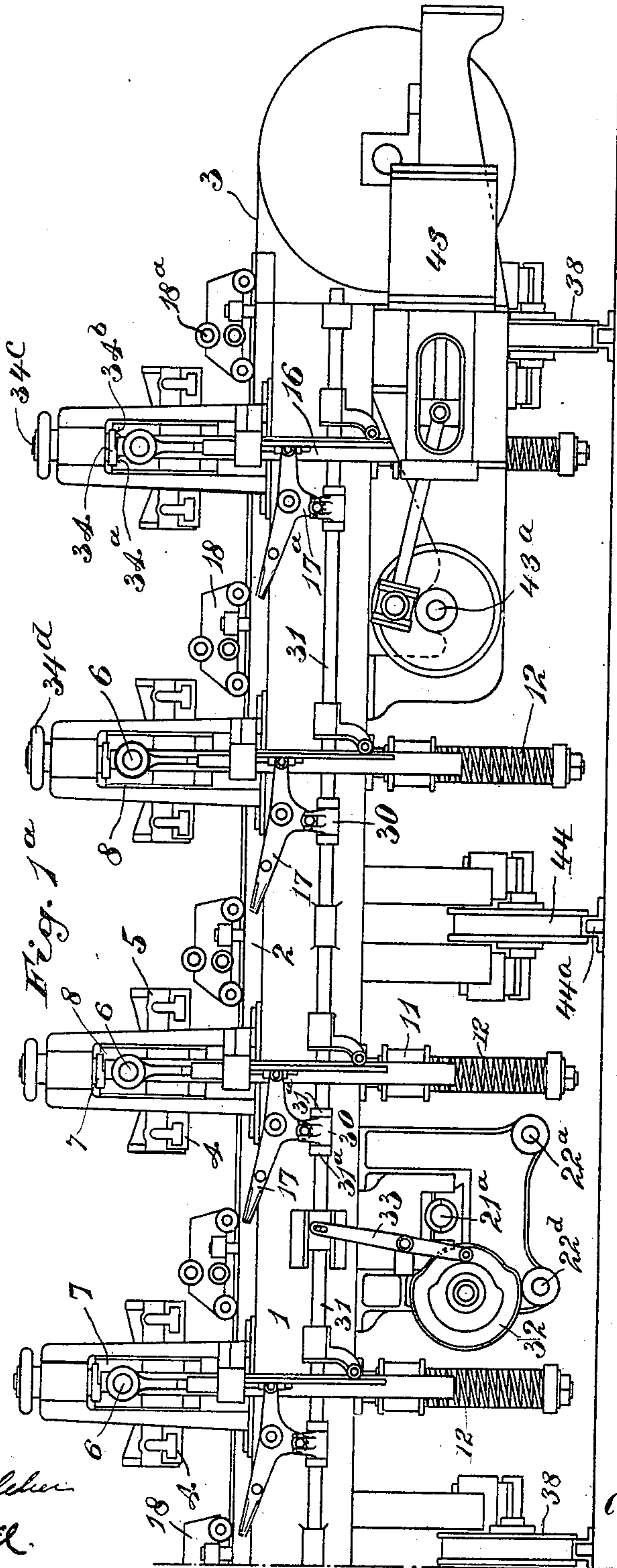
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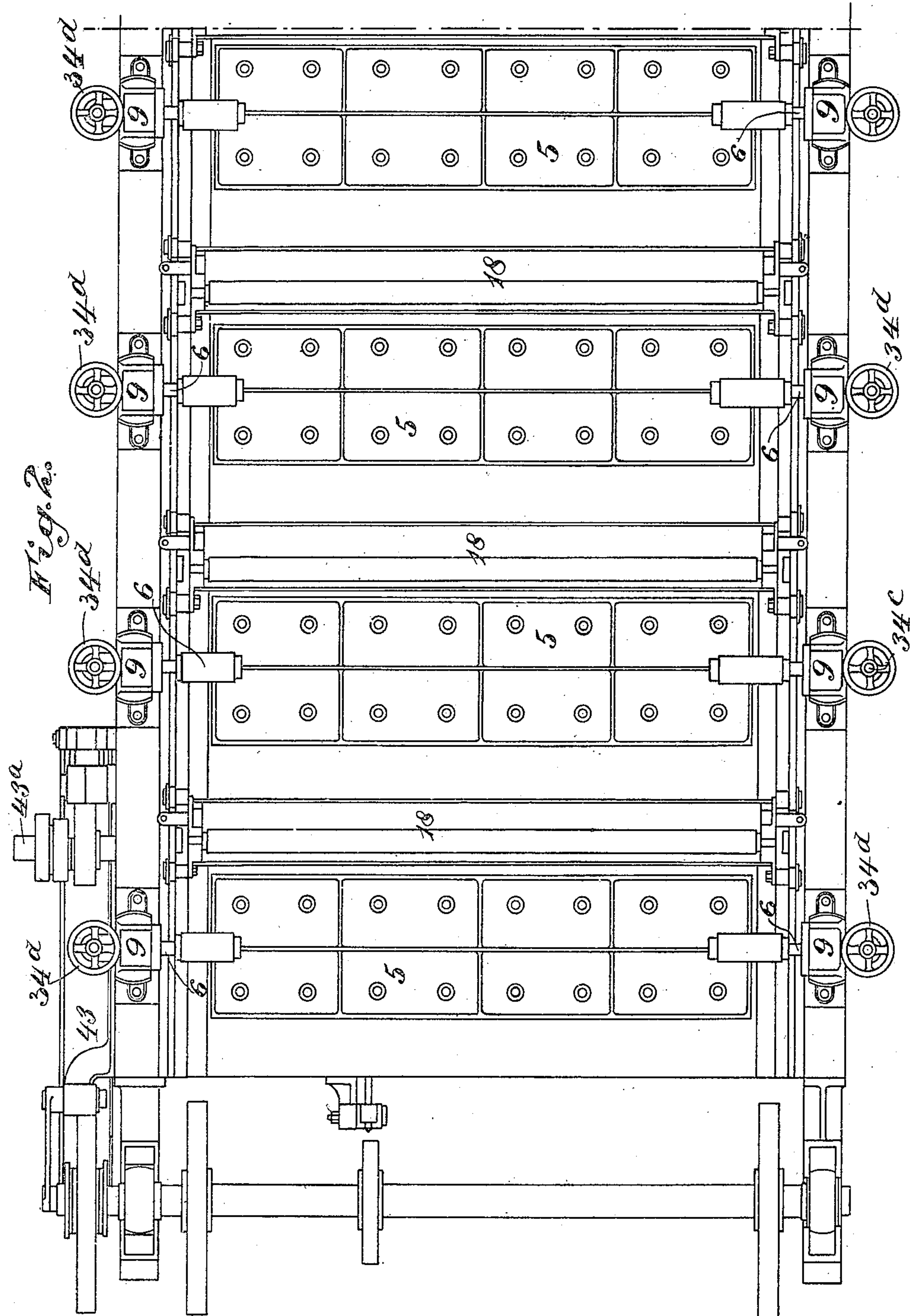
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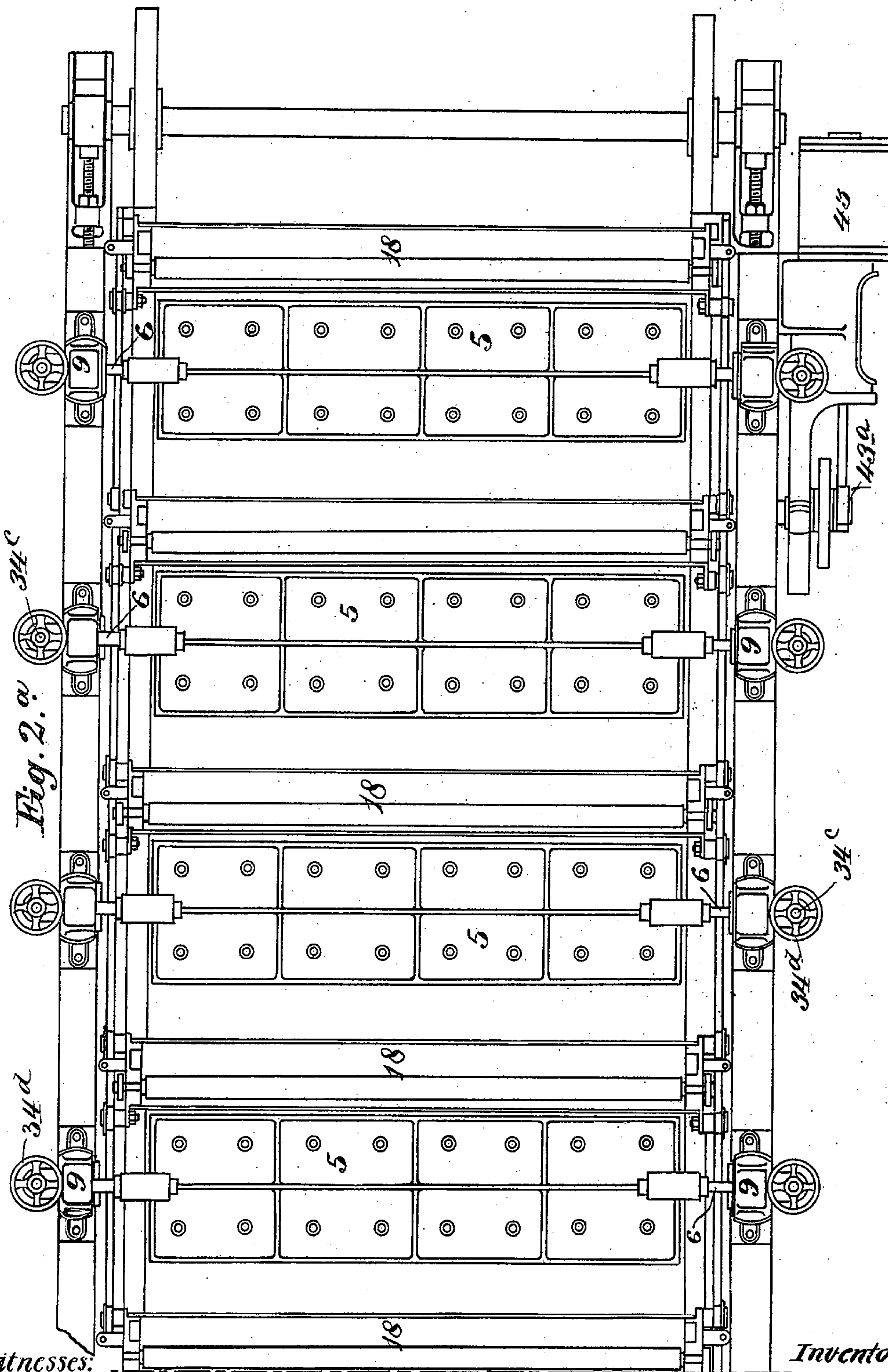
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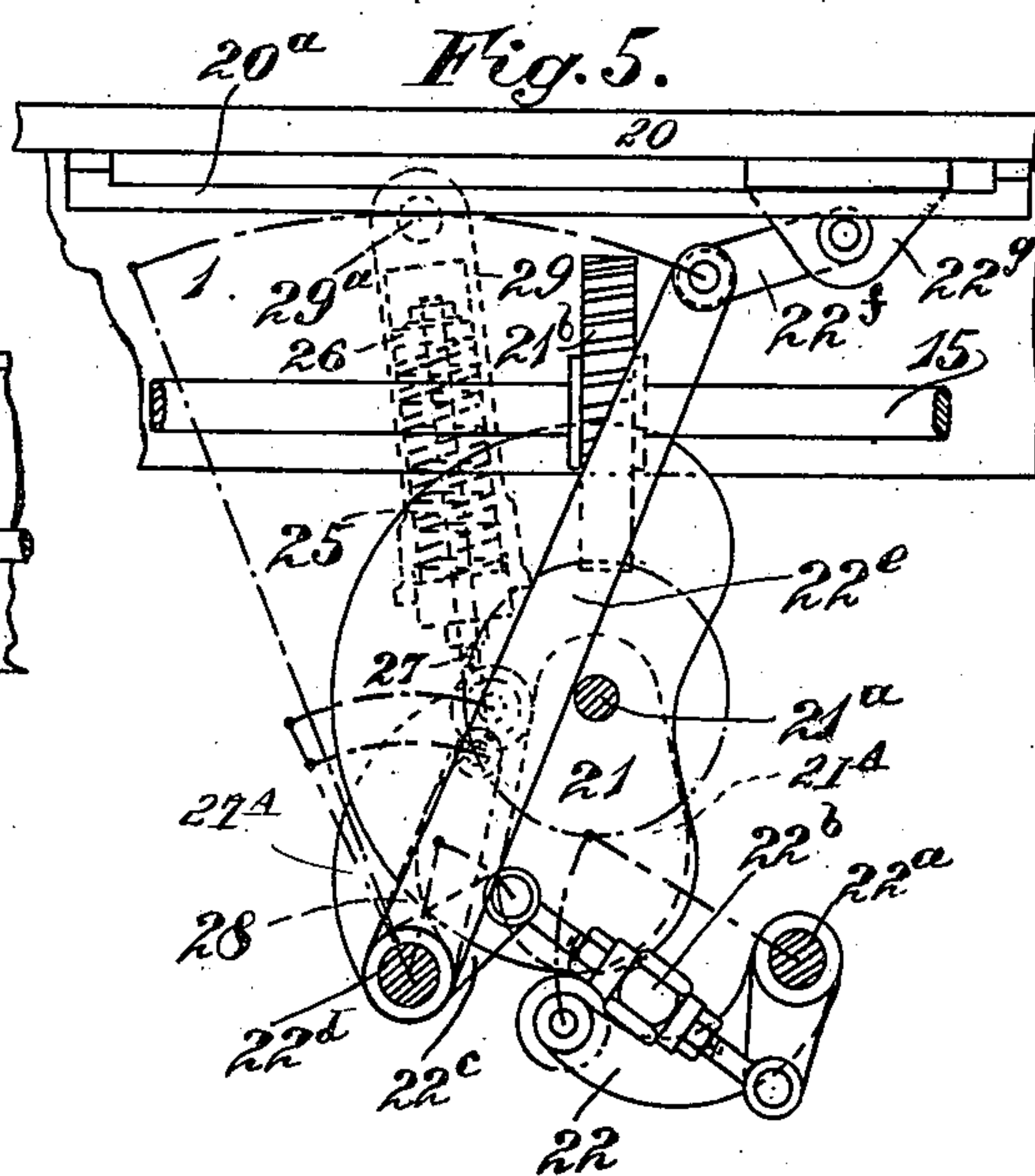
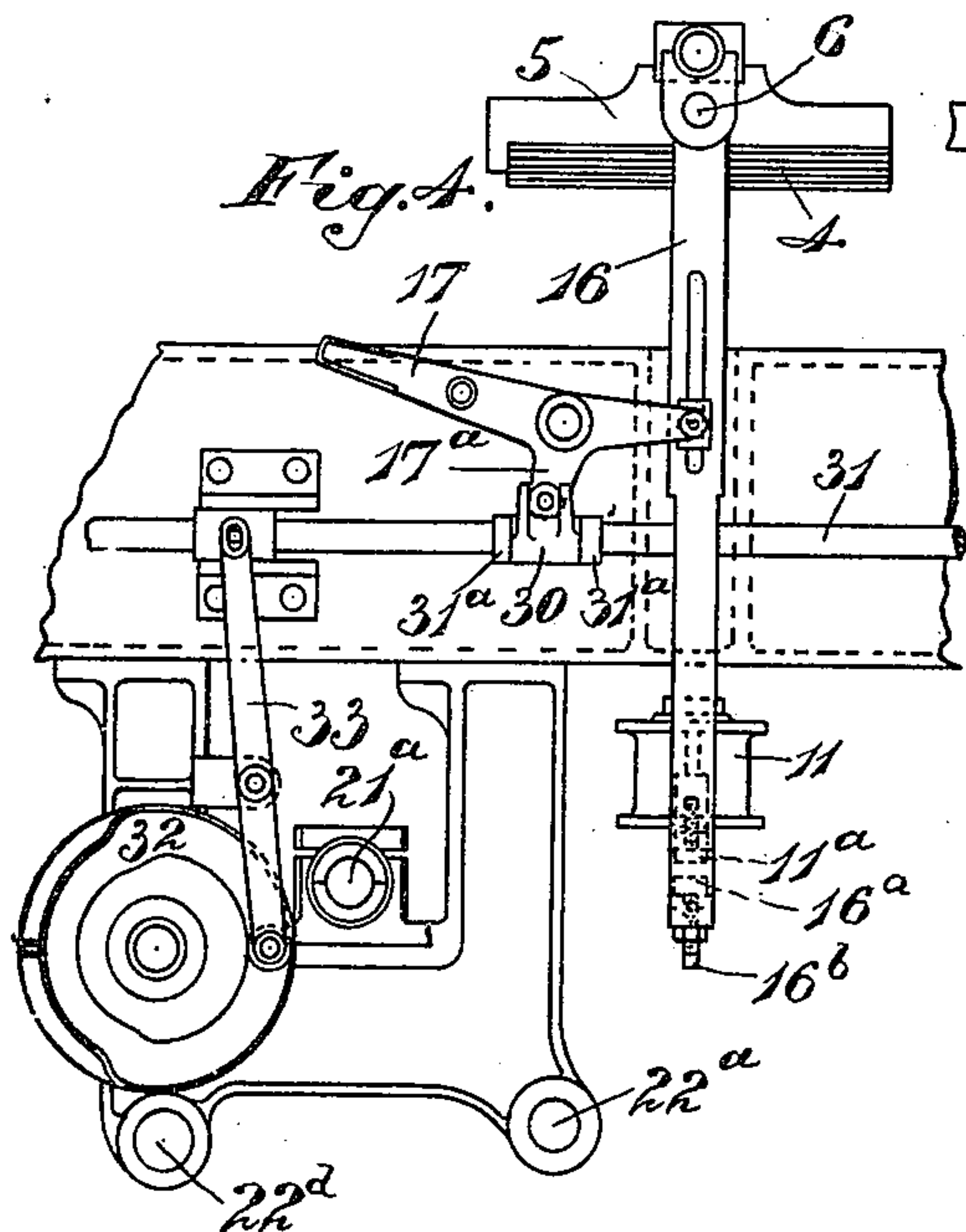
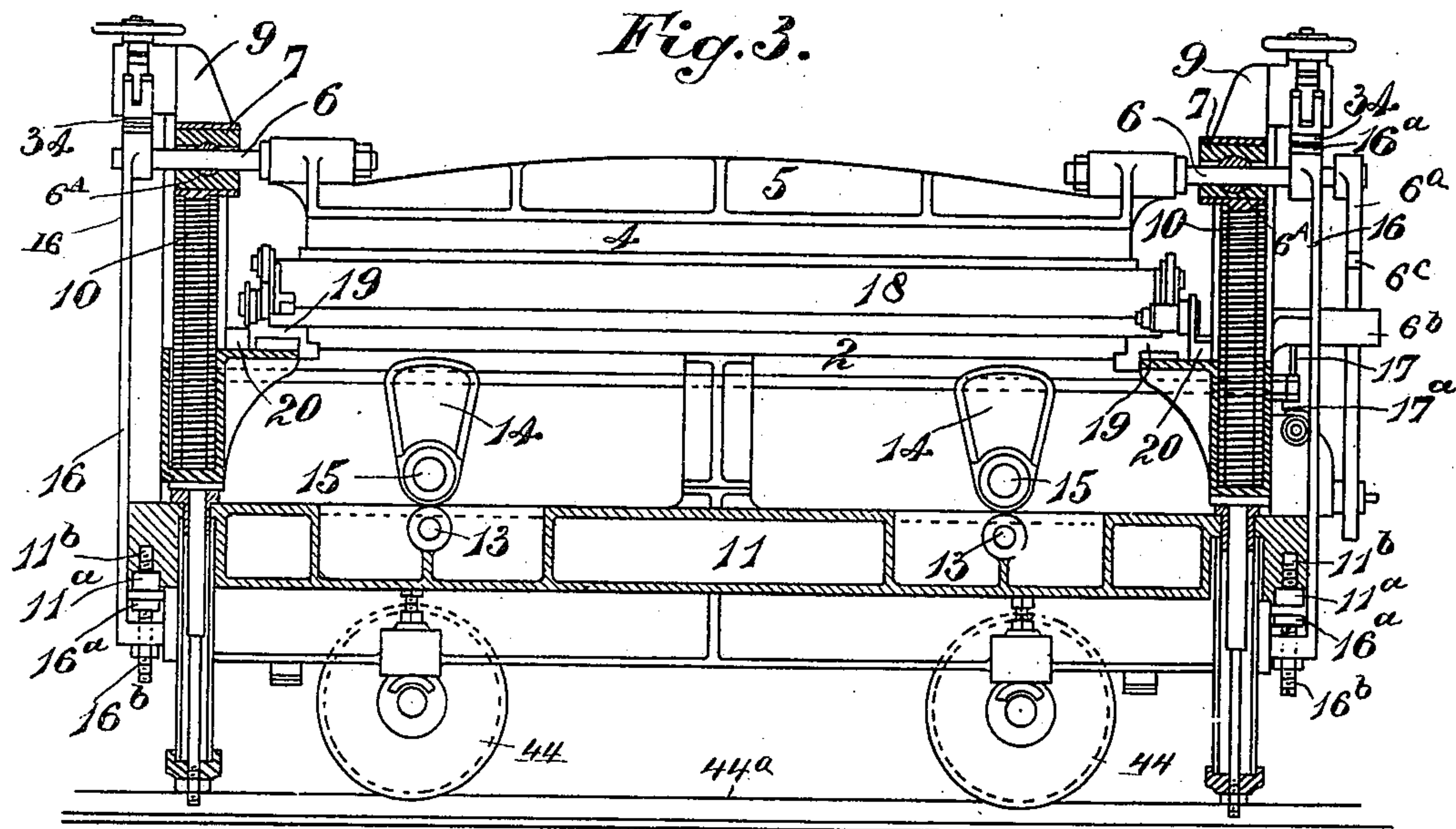
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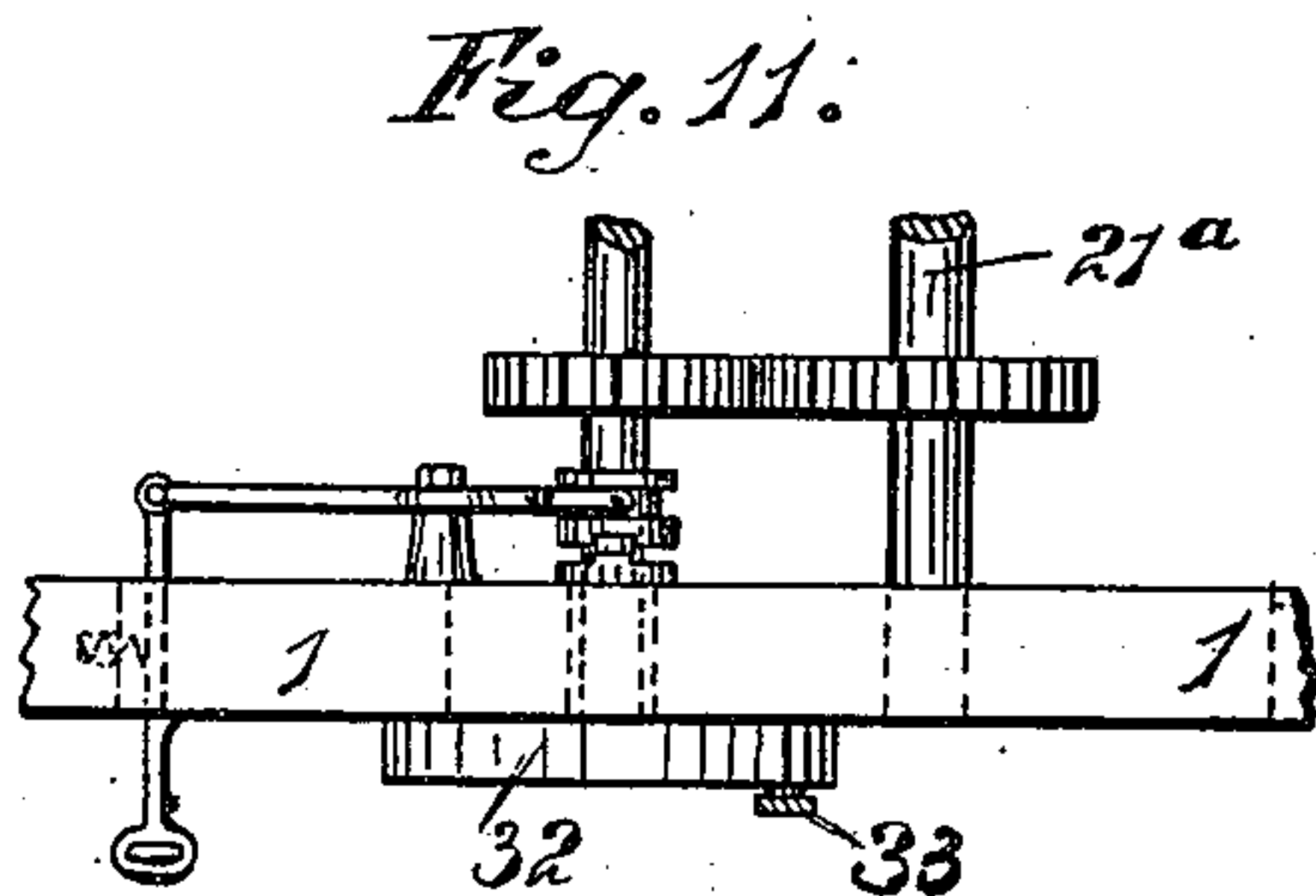
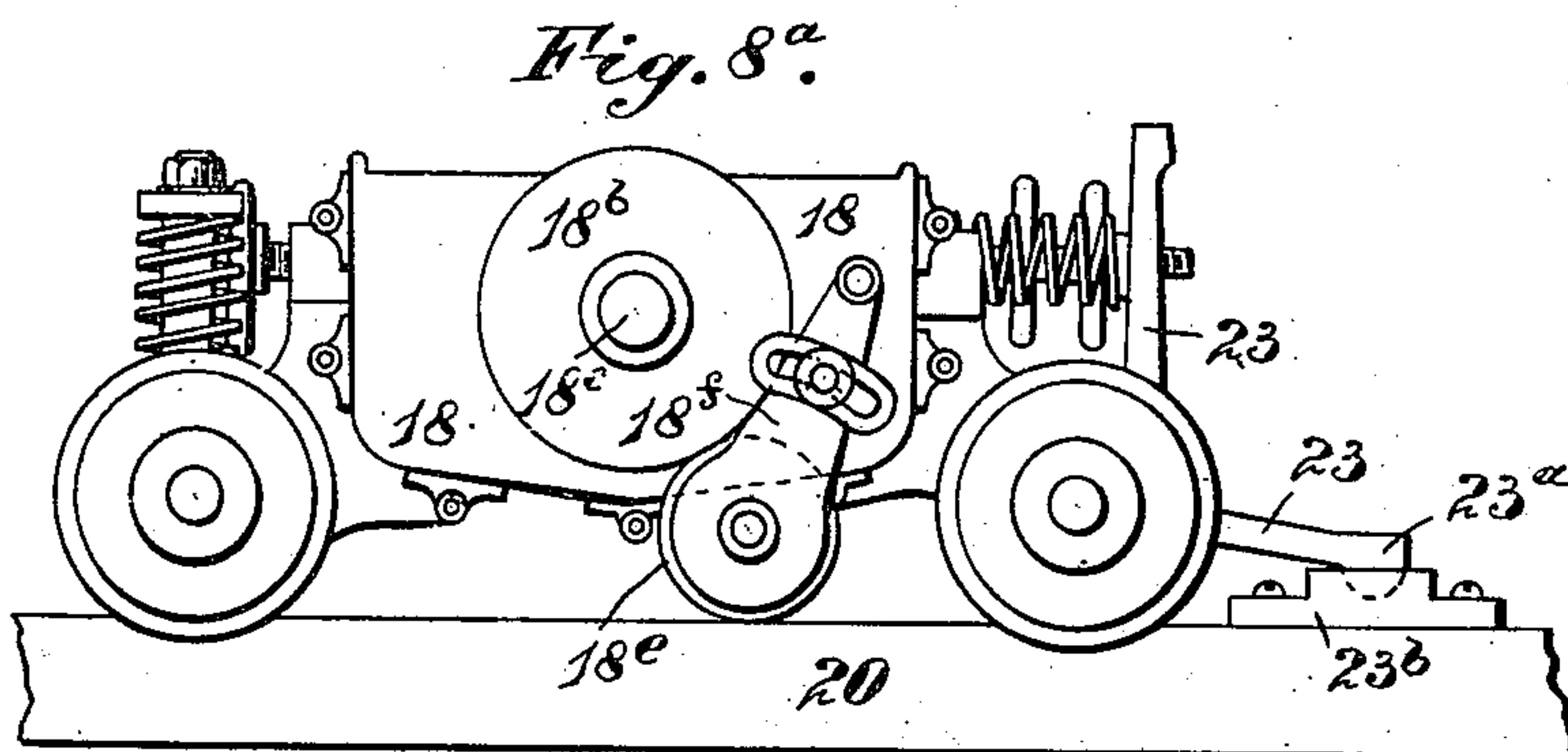
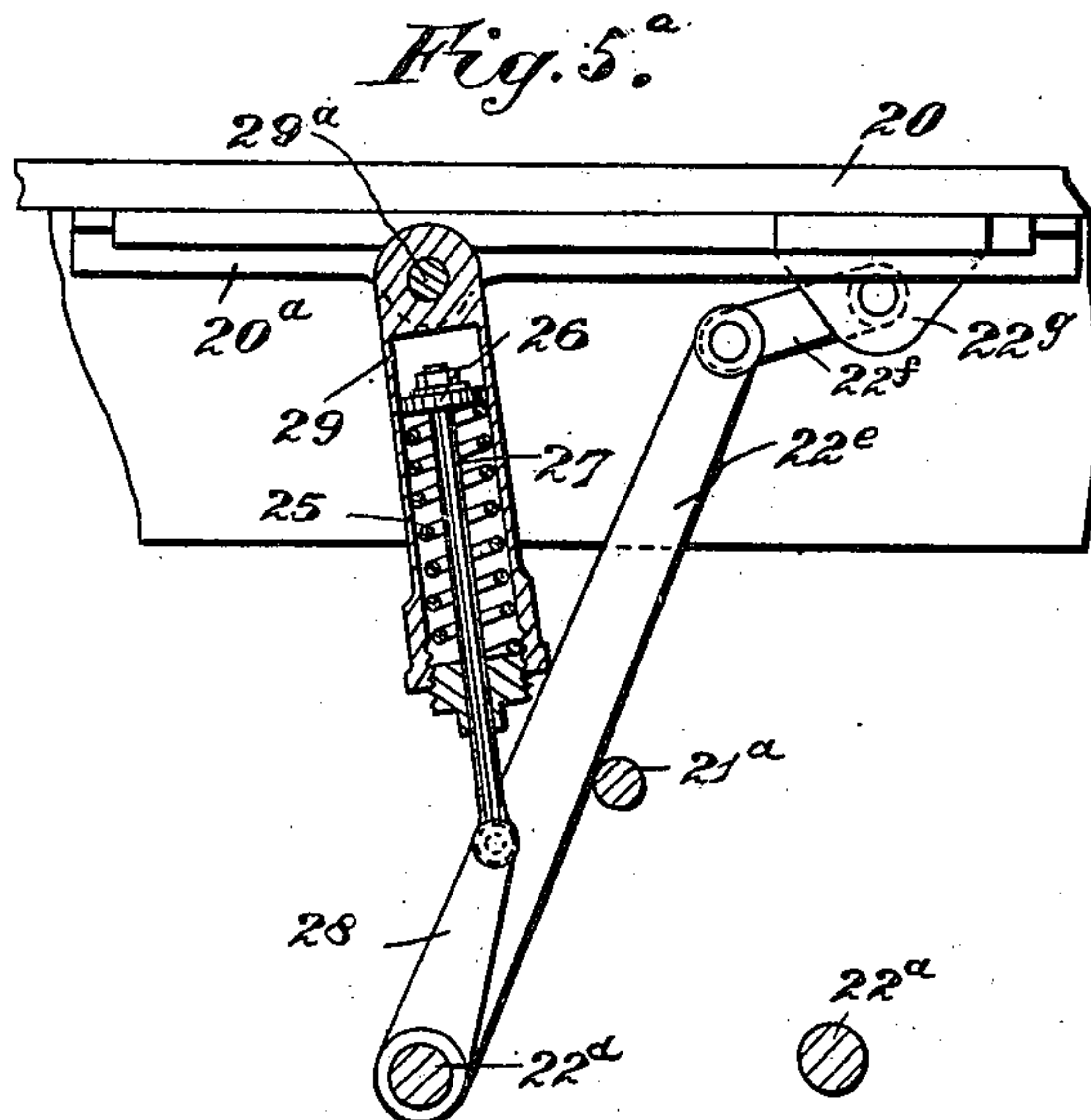
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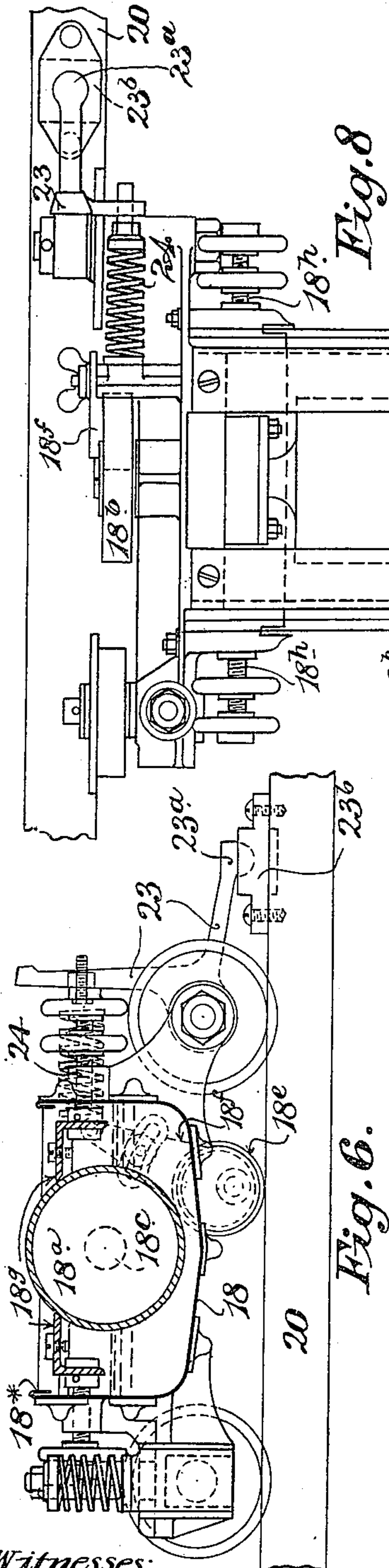


Fig. 6.

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Fig. 8

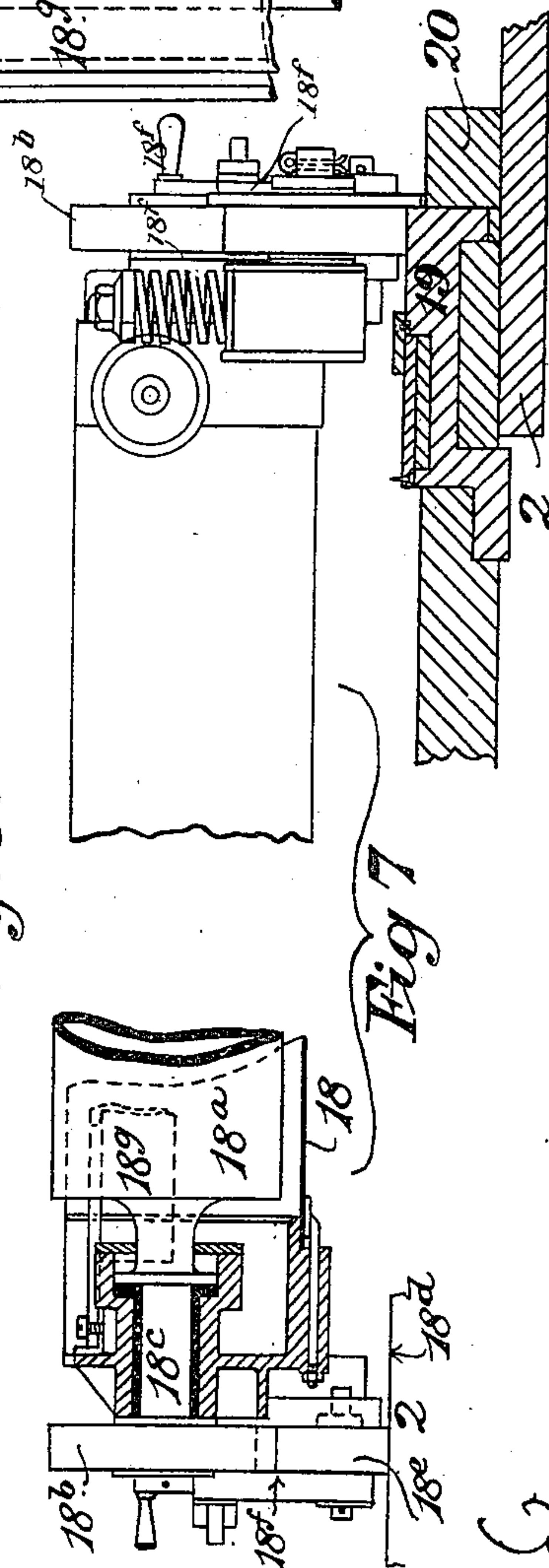


Fig. 7

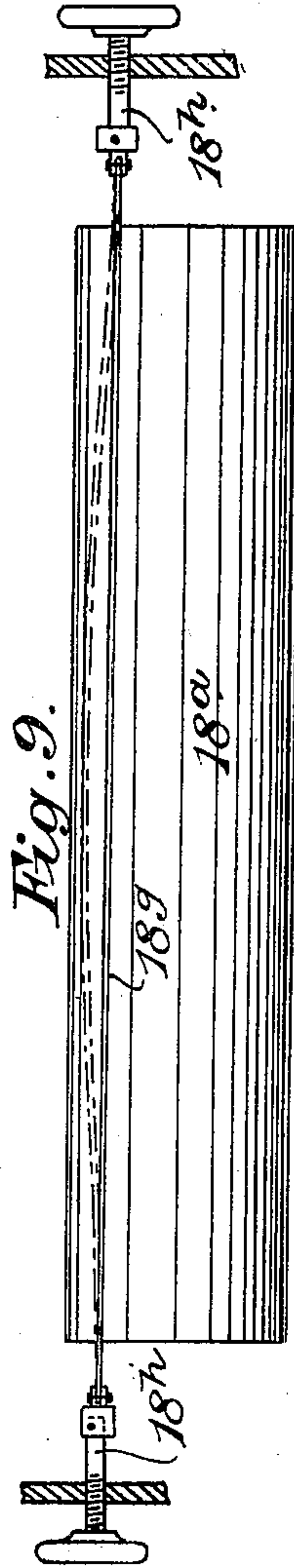


Fig. 9.

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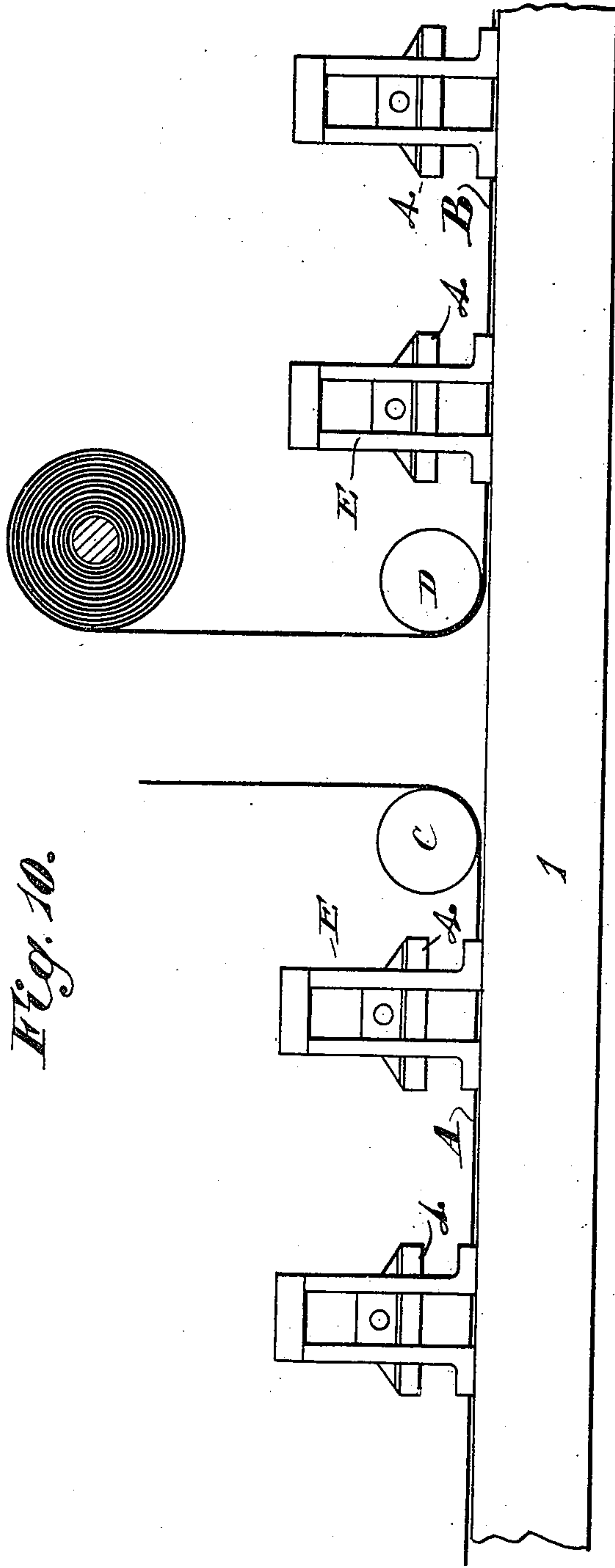
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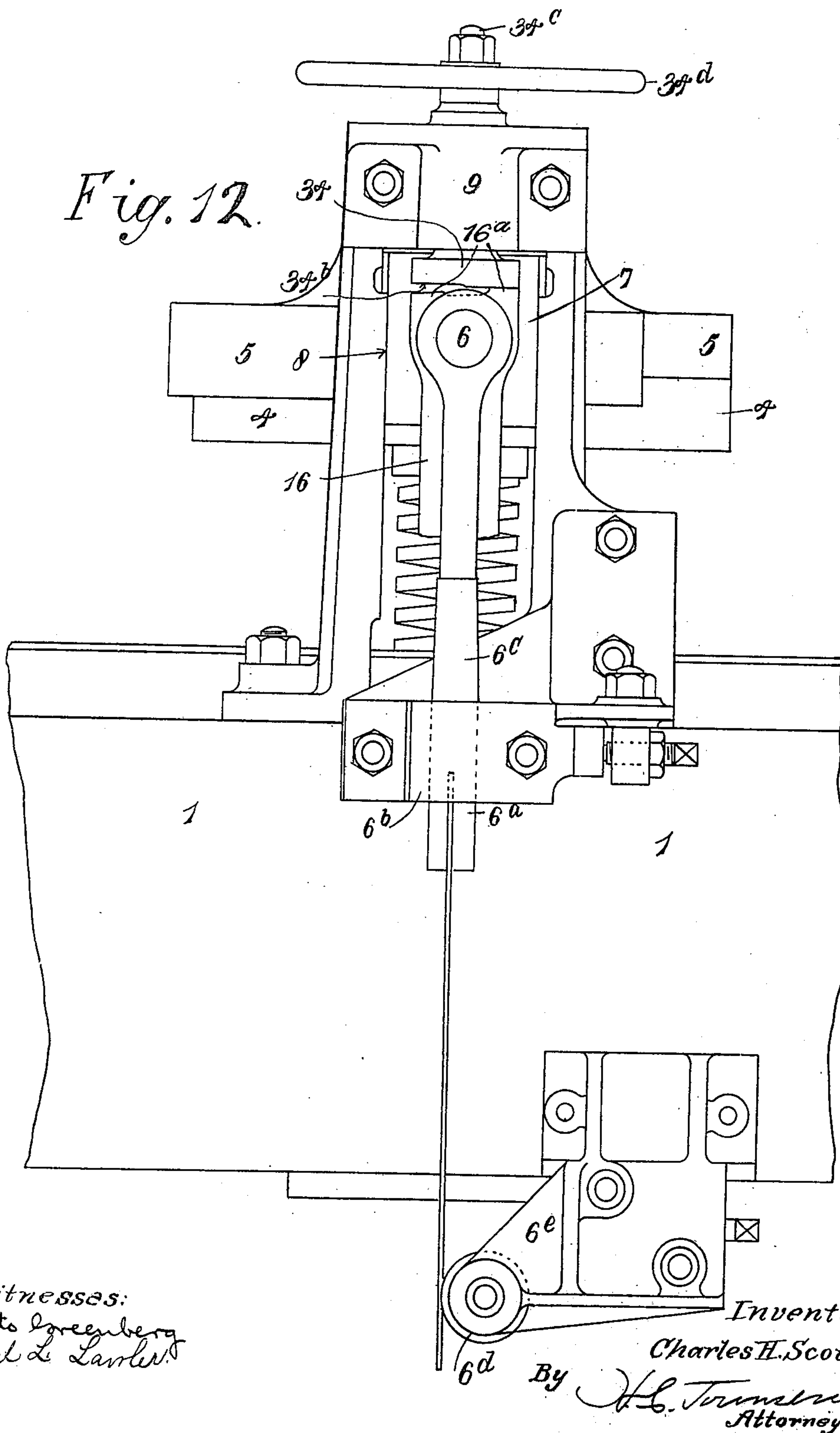
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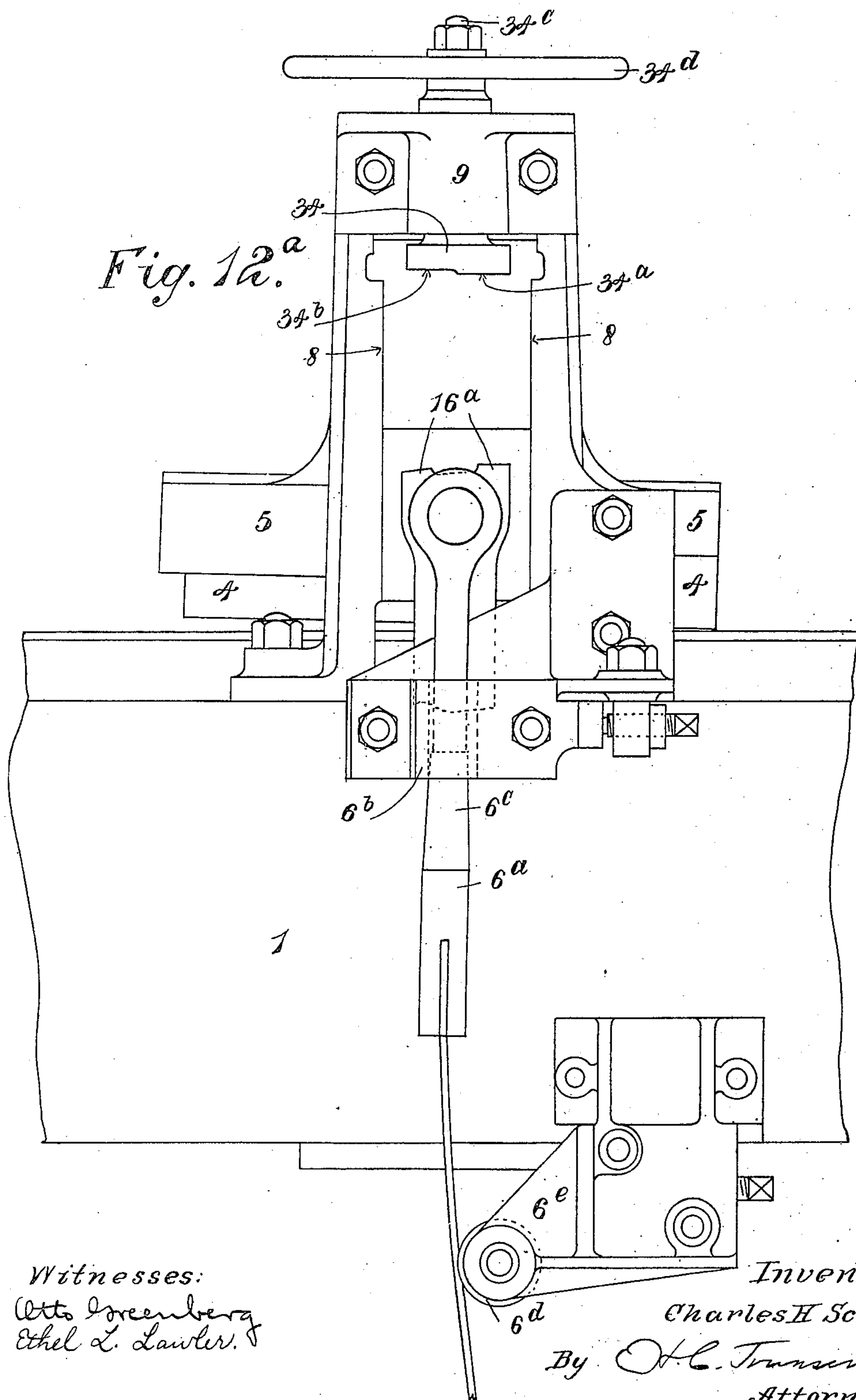
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(No Model.)

10 Sheets—Sheet 10.



UNITED STATES PATENT OFFICE.

CHARLES HERBERT SCOTT, OF GLOUCESTER, ENGLAND.

MACHINE FOR PRINTING FLOOR-CLOTH, LINOLEUM, OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 670,113, dated March 19, 1901.

Application filed June 24, 1898. serial No. 684,389. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HERBERT SCOTT, a subject of the Queen of Great Britain and Ireland, residing at Gloucester, in the county of Gloucester, England, have invented Improvements in Machines for Printing Floor-Cloth, Linoleum, and the Like, (which invention has been patented to me by Letters Patent of Great Britain, No. 1,214, dated January 15, 1898,) of which the following is a specification.

This invention has reference to machines for printing floor-cloth, linoleum, and the like by means of printing-blocks; and it has for its objects to simplify and cheapen the construction and improve the working of such machines, as I shall now describe with reference to the accompanying drawings, wherein—

Figures 1 and 1^a show in side elevation, Figs. 2 and 2^a in plan, and Fig. 3 in cross-section, partly on the line *xx* and partly on the line *yy* of Fig. 1, a printing-machine embodying my invention. Fig. 4 is a part side elevation showing the printing-lever-disengaging mechanism. Fig. 5 is a longitudinal section showing tiering mechanism with an energy-accumulator. Fig. 5^a is a vertical section taken through the center of the energy-accumulator. Fig. 6 is a longitudinal section, Fig. 7 a cross-section, partly in end elevation, and Fig. 8 a part plan, showing an improved construction of color-box with improved driving mechanism for the tiering-roller thereof. Fig. 8^a is a part side elevation of the color-box and driving mechanism. Fig. 9 shows the tiering-roller with an improved construction of doctor therefor. Fig. 10 is a diagrammatic view showing a slightly-modified construction of the machine. Fig. 11 shows in elevation a detail hereinafter referred to. Figs. 12 and 12^a are part side elevations, to a larger scale than the other figures, showing parts of the machine in two different positions.

The printing-machine comprises a frame 1, fitted with a bed or table 2, over which the floor-cloth, linoleum, or the like to be printed is traversed in an intermittent or step-by-step manner by suitable means, such as bands 3, to which an intermittent motion is imparted by suitable mechanism and which are pro-

vided with spikes or equivalent to engage with and move the material to be printed.

The printing-blocks 4 are arranged in sequence above the table 2 and are pitched at a distance apart equal to two or three times the width of the pattern to be printed. Each printing-block (which is or may be made in one piece) is fitted to a transverse cast-iron back 5, (hereinafter called a "pressure-plate,") provided at the ends with trunnions 6, that are connected by universal joints to slide-blocks 7, which are arranged to work vertically in guideways 8, formed in standards 9, fixed to each side of the machine, and are supported by springs 10, the arrangement being such that either end of the printing-block 4 can be moved vertically to a small extent independently of the other and that the said block can be oscillated without putting any undue friction on the machine. In the example shown each trunnion 6 is mounted to turn in a bearing 6^a, which is mounted to turn in the corresponding slide-block 7 about an axis at right angles to that of the trunnion, so that the trunnion can move about axes at right angles to one another. By the arrangement described the printing-block can be lowered and lifted in such a way that one corner thereof can, as hereinafter described, be caused to touch the material to be printed before the remainder and can also be caused to leave the material first, whereby better printing is insured and smudging of the color by the block when being lifted off prevented.

Beneath the bed of the machine and on the vertical center line of each printing-block 4 is placed a transverse beam 11, which is supported at its ends by springs 12 and is fitted with rollers 13, against which work cams 14, fixed on two longitudinal shafts 15, common to all the transverse beams 11. Each beam 11 is guided in a suitable manner at the ends, so that the rotation of the shafts 15 causes the cams 14 thereon to depress the beam, which is afterward raised by its springs 12 when the cams allow this to be done. To the trunnions 6 of each pressure-plate 5 are pivoted arms or links 16, the lower ends of which are adapted, as by bending or hooking, to be engaged with and disengaged from the ends

of the corresponding transverse beam 11 below the combined pressure-plate 5 and printing-block 4, the arrangement being such that when the arms 16 are permitted to hang vertically the pressure-plate 5 will be connected to the transverse beam 11, so that the former will move up and down with the latter; but by moving the arms 16 to one side of the vertical line, as by hand-levers 17, the pressure-plate 5 will be disconnected from the transverse beam 11 below it, so that it and the corresponding printing-block 4 will not then be operated by the said beam, but will remain at rest. To enable the connection between the lower end of each pivoted arm 16 and the corresponding transverse beam to be adjusted vertically, the abutting parts 16^a and 11^a may be carried by vertically-adjustable screws 16^b and 11^b, respectively. The hand-lever 17, connected to an arm 16 on one side of the machine, is fixed upon one end of a transverse shaft, the other end of which is suitably connected to the arm 16 at the opposite side of the machine, so that both arms work together.

To cause each printing-block to first bear at one corner upon the material being printed, one of the cams 14 of each pair is set slightly in advance of the other, and to one of the trunnions 6 of the printing-block is fixed a rod 6^a, that works through a fixed guide 6^b, has a conical or reduced part 6^c, and is pressed sidewise by a roller 6^d, carried by a bracket 6^e. The roller 6^d presses on the extension of the rod 6^a, which consists of a steel spring which bends to one side until the reduced part 6^c enters the guide 6^b. The arrangement is such that one end of the printing-block will be caused to descend slightly in advance of the other, and when the block descends sufficiently to bring the conical or reduced part 6^c into the guide 6^b the rod 6^a will be moved to one side by the roller 6^d, the combined effect being to cause one corner of the printing-block to first bear upon the material, after which the block adjusts itself evenly over the printing material. Similarly on the upward stroke of the block one corner of the block will be the first to leave the material.

Color is applied to the lower side of each printing-block 4 by means of a tiering-roller 18^a, mounted in a color or tiering box 18, arranged to travel on ways 19 on the bed 2 and adapted to be suitably reciprocated below the said block. The several tiering-boxes 18 are reciprocated by longitudinal rods or bars 20, that are arranged at the sides of the machine and are themselves reciprocated by suitable means. The means employed for this purpose in the example shown (see Fig. 5) comprises two rotary cams 21 21^A, fixed upon a cross-shaft 21^a, that is driven from one or each of the longitudinal shafts 15—as, for example, through worm-gearing 21^b. The cam 21 is arranged to act upon one arm of a bent lever 22, that is pivoted at 22^a, and has its

other arm connected by a link 22^b to an arm 22^c, fixed upon a cross-shaft 22^d, to which are also fixed two arms 22^e, each of which is connected by a link 22^f to a lug 22^g on the corresponding rod or bar 20. The cam 21^A is arranged to act against a lever-arm 22^A, also fixed upon the said cross-shaft 22^d. As will be seen, the form and arrangement of the cams and adjacent mechanism are such that when the parts are in the position shown in Fig. 5 upon the shaft 22^d rotating in a counter-clockwise direction the two cams 21 21^A will rotate idly through about half a revolution. During the next quarter of a revolution the cam 21^A will act upon the lever-arm 22^A and move the arms 22^e, rods or bars 20, and connected tiering-boxes to the left, and during the last quarter of a revolution the cam 21 will act upon the bent lever 22 and move the arms 22^e and attached mechanism to the right. The connection between each tiering-box 18 and the slide rods or bars 20 is effected through disengaging gear, such as a pair of bell-crank levers 23, one arm of each of which is acted upon by a spiral spring 24 and has its other arm shaped to form a catch 23^a, Figs. 6 and 8, that is adapted to engage with a recessed block 23^b on the adjacent rod or bar 20, the arrangement, as will be seen, being such that should a printing-block 4 by accident be down on the material being printed when the corresponding tiering-box 18 advances toward it such box will be disengaged from the slide rods or bars and come to rest, thus obviating damage.

To enable the momentum of the color-box-operating mechanism when moving in either direction to be taken up and utilized to assist the cams 21 to afterward move the boxes in the opposite direction, there is or are provided in connection with such operating mechanism one or more energy-accumulators, which acts or act to absorb the momentum of the said mechanism and color-boxes and so bring them to rest without shock and to give out this stored energy to assist in moving the parts in the opposite direction on the return stroke. A device suitable for this purpose is shown in Fig. 5. It comprises a coiled spring 25, that bears at one end against a piston 26, connected by a rod 27 to a lever-arm 28, fixed on the shaft 22^d. The other end of the said spring bears against the closed free end of a cylinder 29, that incloses the said spring, and is pivoted at its other end—viz., at 29^a—to a fixed part 20^a of the machine. By this arrangement when the tiering boxes and rods are moved—say to the left in Fig. 5—the distance between the point of connection 29^a between the cylinder 29 and the part 20^a and the point of connection between the piston-rod 27 and the arm 28 will gradually increase after the latter point has passed an imaginary center line between the centers of motion of the said cylinder and arm, with the result that the spring 25 will then be compressed by the piston 26 and energy will be

stored in the spring. When the arms 22° are moved in the reverse direction, this energy will act through the piston 26 and piston-rod 27 upon the arm 28 and assist in moving the same and the arms 22° to the right until the piston-rod is in a direct line with the lever-arm 28. From this point onward until the arms 22° complete their movement to the right the spring will be again compressed and energy stored therein, this energy when the arms 22° again commence to move to the left acting to assist such movement. Thus it will be seen that the energy-accumulator will act to absorb the momentum of the said color-box-operating mechanism when moving in each direction and to give out energy when the said mechanism commences to move in the opposite direction.

To enable any one of the printing-blocks 4 to be put and held out of action, so that one or some of the printing-blocks 4 may make two or more downstrokes and impressions for one stroke and impression of another block or blocks, the several hand-levers 17, used for moving the pivoted arms 16 for the purpose of connecting the pressure-plates 5 to and disconnecting them from the transverse beams 11 below, are each furnished with an extra arm 17^a, that is adapted to be engaged with a sleeve 30 on a longitudinal shaft 31, which is arranged to be moved backward and forward by suitable means, such as a cam 32 and a lever 33, Figs. 1 and 4, which is oscillated by the said cam and is jointed to the said shaft. Each sleeve 30 is arranged between collars 31^a on the shaft so as to reciprocate with the shaft, but can be partly turned on the shaft, which it fits in such a way that it can be readily thrown in and out of gear by hand with its corresponding lever 17 17^a and will be held in place on the shaft by friction in either of the positions into which it is moved, the arrangement being such that when one or more sleeves is or are thrown into gear with its or their lever or levers 17 17^a the corresponding printing block or blocks 4 will be disconnected from its or their transverse beam 11 and will remain at rest while the remaining block or blocks is or are making another downstroke.

In connection with the mechanism for forwarding the cloth there is provided a cam which moves the feeding-pawl out of gear in such a manner, as hereinafter described, that the cloth will be rendered stationary during the second stroke or succeeding strokes of one or more blocks when it or they is or are intended to make two or more impressions.

Each hand-lever 17 17^a may be fixed to the frame of the machine by a pin, so as to hold the corresponding pair of arms 16 in the operative or inoperative position at will. When so fixed, the corresponding sleeve 30 should of course be disconnected from it.

To prevent the printing-blocks 4 that remain idle from receiving fresh color from their tiering-boxes, the upper ends of each

pair of arms 16, pivoted to the trunnions 6 of a pressure-plate 5, are adapted to abut against stops 34, that are carried by the standards 9, in which the slide-blocks of the pressure-plate work, and which are each formed with a stepped lower surface, as shown, the arrangement being such that when the pair of arms 16 are in the vertical or operative attitude and the corresponding printing-block 4 is at the end of its upstroke the upper ends of the arms or projections 16^a thereon will bear against the lower portion 34^a of the stepped surface of the stops 34 and hold the printing-block in the proper position to receive color from the tiering-roller 18^a of its color-box 18; but when the arms 16 are moved to one side of the vertical—i. e., their inoperative attitude—the upper ends of the arms or the projections 16^a thereon are brought opposite to the higher portion 34^b of the stepped surfaces of the stops 34, so that the printing-block 4 can be raised a little higher by its springs 10 and held out of contact with the tiering-roller 18^a of the corresponding color-box, which then consequently moves idly. The stops 34 may be made vertically adjustable—as, for example, by screws 34^a and hand-wheels 34^b—for the purpose of regulating the height of the printing-blocks 4 above their color-boxes 18.

The feeding mechanism for intermittently moving the bands 3 with floor-cloth, linoleum, or like material in a forward direction, is or may be controlled by two cams 35 35^a, one of which—viz., 35—serves—as, for example, through a lever 36, link 37, arm 38, ratchet-tooth 39, and ratchet-wheel 39^a—to move the bands and material forward one step for each stroke of the printing-blocks 4, the other cam 35^a serving—as, for example, through a lever 40, link 41, lever-arm 42, and link 42^a—to hold the ratchet-tooth 39 out of engagement with the ratchet-wheel 39^a when the material being printed is to receive two or more successive impressions from one or some of the printing-blocks.

Suitable means operated by a handle or otherwise are provided for throwing each of the cams 21, 21^a, 32, 35, and 35^a into the operative or inoperative position at will. Each cam may, as shown in Fig. 11, be loose on a transverse shaft 45, to which it is adapted to be connected when desired by a clutch 46, feathered upon the shaft and adapted to be operated by a clutch-lever 47 from a hand-operated rod 48.

It will thus be understood that when the levers 17 17^a are disengaged from the sleeves 30, so as to leave the arms or links 16 in their central and operative positions, and the cam 35^a is put out of action by hand all the blocks 4 will print once for each forward movement of the material being printed, and that by engaging one or more sleeves 30 by hand with the levers 17 17^a of the corresponding pair or pairs of arms or links 16 the corresponding block or blocks 4 can be held out of action,

while the other block or blocks go on printing once for each forward movement of the material; also that by holding one or more of the blocks 4 out of action, as just described, and putting the cam 35^a into action to stop the feeding of the material the block or blocks that is or are not held out of action can be caused to make two or more downstrokes for each forward movement of the material, according to the time the said cam 35^a is kept in action, so that should, by accident, any one of the printing-blocks 4 not print properly the whole of the other blocks and the feeding mechanism can be thrown out of gear and the block then brought down again, so as to rectify any error that has been made in the printing without interfering in any way with the sequence of movements of the machine.

To reduce the weight, and consequently the momentum, of each color-box 18 and also liability of the color splashing over the sides of the box, the said box may be made of sheet-metal, stamped, it may be, to shape, and provided with an overhanging upper edge 18 on its inner side, as shown in Fig. 6. In this color-box instead of driving the color or tiering roller 18^a by means of one or more gear-wheels working in a rack on the frame of the machine, as heretofore usual, I prefer to drive it by means of metal rollers 18^b, keyed one on each end of the roller-shaft 18^c and driven from a plane surface 19 on the bed 2 of the machine by means of intermediate wheels 18^e, covered with india-rubber or other equivalent soft substance. The intermediate wheels 18^e are adjustably mounted, as on adjustable arms 18^f, so that they can be pressed between the plane surface of the bed 2 and the metal wheels 18^b on the tiering-roller shaft 18^c, so as to produce sufficient friction for transmitting the necessary driving power. I find that by this construction the tiering-roller 18^a works smoother, and consequently deposits the color on the surface of the printing-block with greater regularity than has heretofore been usual. Instead of driving each end of the tiering-roller, as described, one end only may be so driven. The color or tiering roller 18^a is fitted with one or more doctors 18^g to regulate the amount of color deposited on it.

With a view of regulating the amount of color put on the sides or middle of the roller I sometimes make the doctor or each doctor 18^g of a thin steel bar constructed in such a way, as shown, for example, in Fig. 9, that it can be shortened horizontally by means of one or more screws 18^h, so as to make the bar assume a curved form, as shown in dotted lines. The bar is not made quite straight, so that in its straightest position it is slightly curved, being a little higher in the middle, the action of the screw being to increase this curve more or less. The surface of the bar is therefore made to such a curve that in the middle position it will be equidistant from the roller, at the lowest position it will be nearer the roller at the middle than at the sides,

and at the highest position it will be nearer the roller at the sides than at the middle, so that the relative quantity of colors deposited by the ends or middle of the roller can be adjusted at will. By this means the relative amounts of color put on the middle and ends of the tiering-roller can be varied. The whole of this improved doctor is arranged so that it can be set up to the roller without interfering with the adjustment hereinbefore mentioned.

The machine is or may be fitted with its own engine 43, which drives the longitudinal cam-shafts 15, hereinbefore referred to, preferably through a cross-shaft 43^a and worm-gearing, the only other gear-wheels employed being those used for operating the color-box-reciprocating mechanism and the feeding mechanism, which may, as in the example shown, be done from the said longitudinal shafts.

The machine may be mounted on traveling wheels 44, arranged to run on rails 44^a for convenience of working in the drying or hanging rooms usually employed for drying printed cloth.

For the purpose of printing patterns which contain fewer colors than the machine is usually made for and for enabling a greater output to be obtained from one machine than usual two of the printing-blocks 4 may be so spaced apart, as shown diagrammatically in Fig. 10, as to render it possible to print one piece of linoleum with half or other portion of the blocks while another piece is being printed with the remaining blocks. Thus supposing the machine to be designed to print eight colors the two center blocks may be spaced apart to the extent of two or more times the breadth of a block, so that a piece of cloth A that has been printed by the first four blocks can be drawn upward through the space between the two center blocks and thence led away, and at the same place a second piece of linoleum B can be led down through the said space, be printed by the last four blocks, and then be taken off the end of the machine in the usual way.

C and D are guide-rollers located between the two standards E F, that are spaced at the greater distance apart, the said rollers serving to guide the two pieces A B of material in the direction shown.

What I claim is—

1. In a machine for printing floor-cloth, linoleum and the like, the combination of a vertically-movable printing-block, means for raising and supporting said blocks, pivoted arms connected at their upper ends to said block, means adapted to engage the lower ends of said pivoted arms and lower said printing-block and means for turning said pivoted arms about their pivots and bringing them into or out of position to be engaged by said lowering means.

2. A machine for printing floor-cloth, linoleum and the like, comprising a series of ver-

5 tically-movable printing-blocks each provided at opposite sides with a pair of depending pivoted arms, means for raising and supporting each block, means for separately lowering each block through its pair of pivoted arms, means for turning each pair of pivoted arms about their pivots and bringing their lower ends in or out of position to be engaged by the corresponding lowering means, a movable body common to all the blocks, and means whereby each pair of pivoted arms can be connected to said body and be automatically moved thereby into the inoperative position and hold the corresponding block out of action.

15 3. In a machine for printing floor-cloth, linoleum and the like, the combination of a vertically-movable self-adjusting printing-block, a vertically-movable transverse beam arranged below said block, means for raising and lowering said transverse beam, and means for connecting said printing-block to and disconnecting it from said beam, substantially as described for the purpose specified.

25 4. In a machine for printing floor-cloth, linoleum and the like, the combination of a vertically-movable combined printing-block and pressure-plate provided with trunnions, vertically-guided slide-blocks to which said trunnions are connected by joints adapted to admit of said block automatically adjusting itself on the material to be printed, springs adapted to raise the combined printing-block and pressure-plate, a transverse beam arranged below said printing-block, means for raising and lowering said beam, and means whereby the combined printing-block and pressure-plate can be put in and out of connection with said beam.

40 5. In a machine for printing floor-cloth, linoleum and the like, the combination of a vertically-movable combined printing-block and pressure-plate with trunnions, vertically-guided slide-blocks to which said trunnions are connected by universal joints, springs for raising the said block and plate into and supporting them in the raised position, a vertically-movable transverse beam arranged below said printing-block, and arms or links pivoted to said trunnions and adapted at their lower ends to be engaged with and disengaged from said transverse beam, substantially as described for the purpose specified.

55 6. A machine for printing floor-cloth, linoleum and the like comprising a series of vertically-movable printing-blocks, a series of vertically-movable transverse beams arranged below said blocks, means for raising and lowering said transverse beams, connecting means whereby each of said printing-blocks can be connected to its corresponding transverse beam, a movable body common to all of said connecting means, and a series of coupling devices for independently connecting each of said connecting means to said movable body, said coupling devices being adapted to break and make connection be-

tween said connecting means and movable body for the purpose set forth.

70 7. A machine for printing floor-cloth, linoleum and the like comprising a series of vertically-movable printing-blocks, a series of vertically-movable transverse beams arranged below said blocks, means for raising and lowering said transverse beams, pivoted arms connected to each of said blocks and adapted to be moved in and out of engagement with the corresponding transverse beam below, a longitudinal rod common to said pivoted arms, means for operating said rod, a series of levers whereby said pivoted arms can be moved into the operative and inoperative positions, and means whereby each of said levers can be independently put in and out of connection with said rod, substantially as described for the purpose specified.

85 8. In a machine for printing floor-cloth, linoleum and the like, the combination of a series of vertically-movable combined printing-blocks and pressure-plates and springs for raising the same, a series of transverse beams arranged below said blocks and springs for raising said beams, pivoted arms connected at their upper ends to said combined blocks and plates and adapted at their lower ends to engage said beam, longitudinal rotary shafts common to said beams and provided with cams adapted to depress said beams against the action of their springs, and means for rotating said shafts, substantially as described.

90 9. In a machine for printing floor-cloth, linoleum and the like, the combination of a series of vertically-movable combined printing-blocks and pressure-plates and springs for raising the same, a series of transverse beams arranged below said blocks and springs for raising said beams, pivoted arms connected at their upper ends to said combined blocks and plates and adapted at their lower ends to engage said beam, longitudinal rotary shafts common to said beams and provided with cams adapted to depress said beams against the action of their springs, means for rotating said shafts, feeding means for moving the material to be printed over the bed of the machine and below said printing-block, driving mechanism for moving said feeding means in an intermittent manner, and means for throwing said driving mechanism into and out of driving connection with said cam-shaft, substantially as described for the purposes specified.

10. A machine for printing floor-cloth, linoleum and the like, comprising a series of vertically-movable printing-blocks carried by pressure-plates provided with trunnions, pairs of vertically-guided slide-blocks to which the trunnions of each pressure-plate are jointed so as to permit the corresponding printing-block to swivel in various directions, springs upon which said slide-blocks are mounted, a series of transverse beams arranged below said printing-blocks, means for

raising and lowering said beams, arms pivoted to said trunnions and adapted to be swung in and out of connection with projections on said beams, levers pivoted to the bed of the machine and whereby said pivoted arms can be independently operated, a longitudinal shaft and means for reciprocating the same, and coupling devices mounted to move endwise with said shaft and adapted to be put in and out of connection with said levers, substantially as described for the purpose specified.

11. The combination with a vertically-movable printing-block and a vertically-movable transverse beam arranged below said block of pivoted arms connected to said block and adapted to engage said beam, the abutting parts of said arms and beam being capable of vertical adjustment substantially as described for the purpose specified.

12. The combination with a vertically-movable printing-block, means for raising the same, a vertically-movable body below said block and movable devices for connecting said block to said body, of stationary abutting surfaces arranged at different levels, and against one or other of which said movable devices abut according to whether they are in the operative or inoperative position, substantially as described for the purpose specified.

13. The combination with a combined printing-block and pressure-plate provided with trunnions, spring for raising the same, a vertically-movable transverse beam below said block, and arms pivoted on said trunnions and adapted to engage said beam when in the vertical position, of vertically-adjustable stops provided with stepped lower surfaces and arranged above abutting parts on the upper ends of said pivoted arms, substantially as described for the purpose specified.

14. In a machine for printing floor-cloth, linoleum and the like, the combination of a series of vertically-movable printing-blocks, a series of color or tiering boxes, means for reciprocating said boxes below said blocks, and disengaging devices arranged between said reciprocating means and each of said boxes and adapted to disengage its corresponding box from said reciprocating means when said box approaches the corresponding printing-block while the same is in its lowered position.

15. In a machine for printing floor-cloth, linoleum and the like, the combination of a series of vertically-movable printing-blocks, a series of color or tiering boxes, means for reciprocating said boxes below said blocks, and one or more energy-accumulators adapted to absorb the momentum of the color-boxes and their reciprocating mechanism at each stroke thereof and to give out stored energy on the next stroke of said boxes.

16. In a machine for printing floor-cloth, linoleum and the like, the combination of a series of vertically-movable printing-blocks,

a series of color or tiering boxes, longitudinal rods adapted to reciprocate said boxes below said blocks, means for reciprocating said rods, and energy-accumulators arranged between said rods and a stationary part of the machine, each of said energy-accumulators comprising a piston and cylinder pivotally connected the one to the corresponding rod and the other to said stationary part, and a spring located between said piston and the free end of said cylinder, substantially as described for the purpose specified.

17. A machine for printing floor-cloth, linoleum and the like comprising a frame having a bed, a series of vertically-movable color-blocks arranged above said bed, a series of vertically-movable transverse beams arranged below said blocks and bed, means for raising and lowering said beams, pivoted arms whereby each of said printing-blocks can be independently connected to and disconnected from its corresponding beam, a longitudinal rod, coupling devices whereby said pivoted arms can be connected to and disconnected from said rod, reciprocating gear for said rod and means for throwing said gear in and out of action, a series of color-boxes arranged to travel below said blocks, longitudinal bars for reciprocating said boxes, automatic disengaging gear between each of said boxes and said bars, reciprocating gear for said bars and means for throwing the same in and out of action, feeding means for moving the material to be printed over said bed, mechanism for moving said feeding means in an intermittent manner, and means for throwing said feeding mechanism into and out of action, substantially as described for the purposes set forth.

18. In a printing-machine of the kind herein referred to, a color-box arranged to reciprocate on the bed of the machine and below the vertically-movable printing-blocks of said machine, and provided with a tiering-roll, and friction driving mechanism for said roll, said driving mechanism comprising at one or at each side of the box, a roller fast on one end of the tiering-roll, an intermediate roller having its periphery covered with soft or yielding material and an adjusting device whereby said intermediate roller can be pressed against the roller on the end of the tiering-roll and against a plane surface on the bed of the machine, substantially as described for the purpose specified.

19. In a color or tiering box for a printing-machine, the combination with the tiering-roller, of a doctor capable of being bent to a curved form so that the distance between it and said tiering-roller at different parts along the same can be varied, and means for bending or shortening said doctor, substantially as described for the purposes specified.

20. In a color or tiering box for a printing-machine, the combination with the tiering-roller of a doctor comprising a thin bar of spring material, and means whereby said bar

can be screwed up and thereby bent, so as to vary the distance of its center from the center of said roller, substantially as described for the purpose specified.

- 5 21. A machine for printing floor-cloth, linoleum and the like, comprising a bed or frame, a series of vertically-movable printing-blocks arranged at intervals along said bed, vertical
10 guideways for said printing-blocks, means for operating said printing-blocks, means for feeding linoleum or the like below said printing-blocks, two of said printing-blocks with their guideways being spaced apart to a greater ex-

tent than the others and sufficiently to admit of two pieces of linoleum or the like being simultaneously drawn vertically between them and guide-rollers located between said printing-blocks and their guideways to direct the said pieces of linoleum, substantially as herein described for the purpose specified. 15 20

Signed at Gloucester, England, this 9th day of May, 1898.

CHARLES HERBERT SCOTT.

Witnesses:

JOHN WATKINS HULBERT,
CHARLES COOKE BROWN.