

No. 669,469.

Patented Mar. 5, 1901.

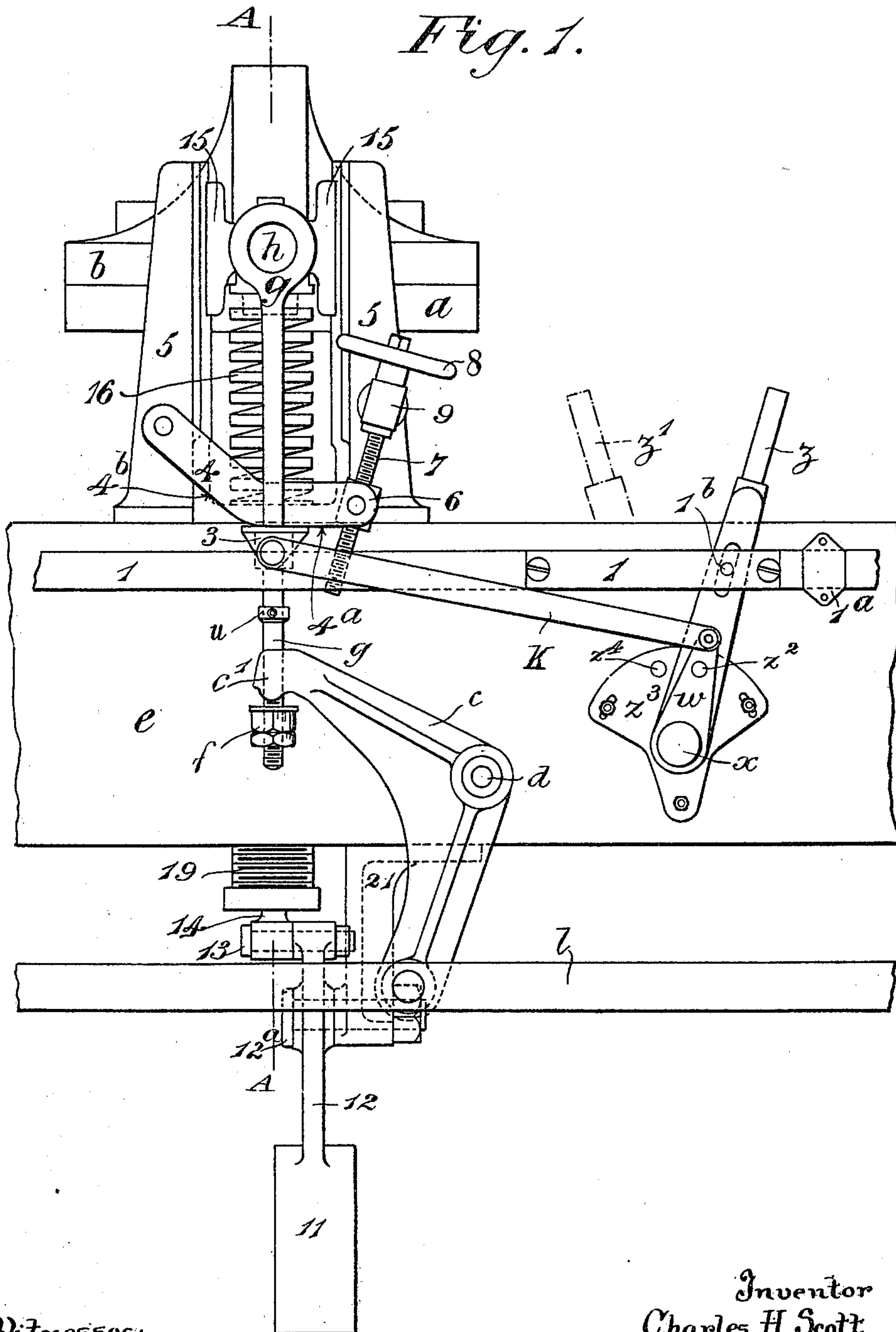
C. H. SCOTT.

MACHINE FOR PRINTING FLOOR CLOTH OR THE LIKE.

(Application filed Dec. 27, 1900.)

(No Model.)

6 Sheets—Sheet 1.



Witnesses:

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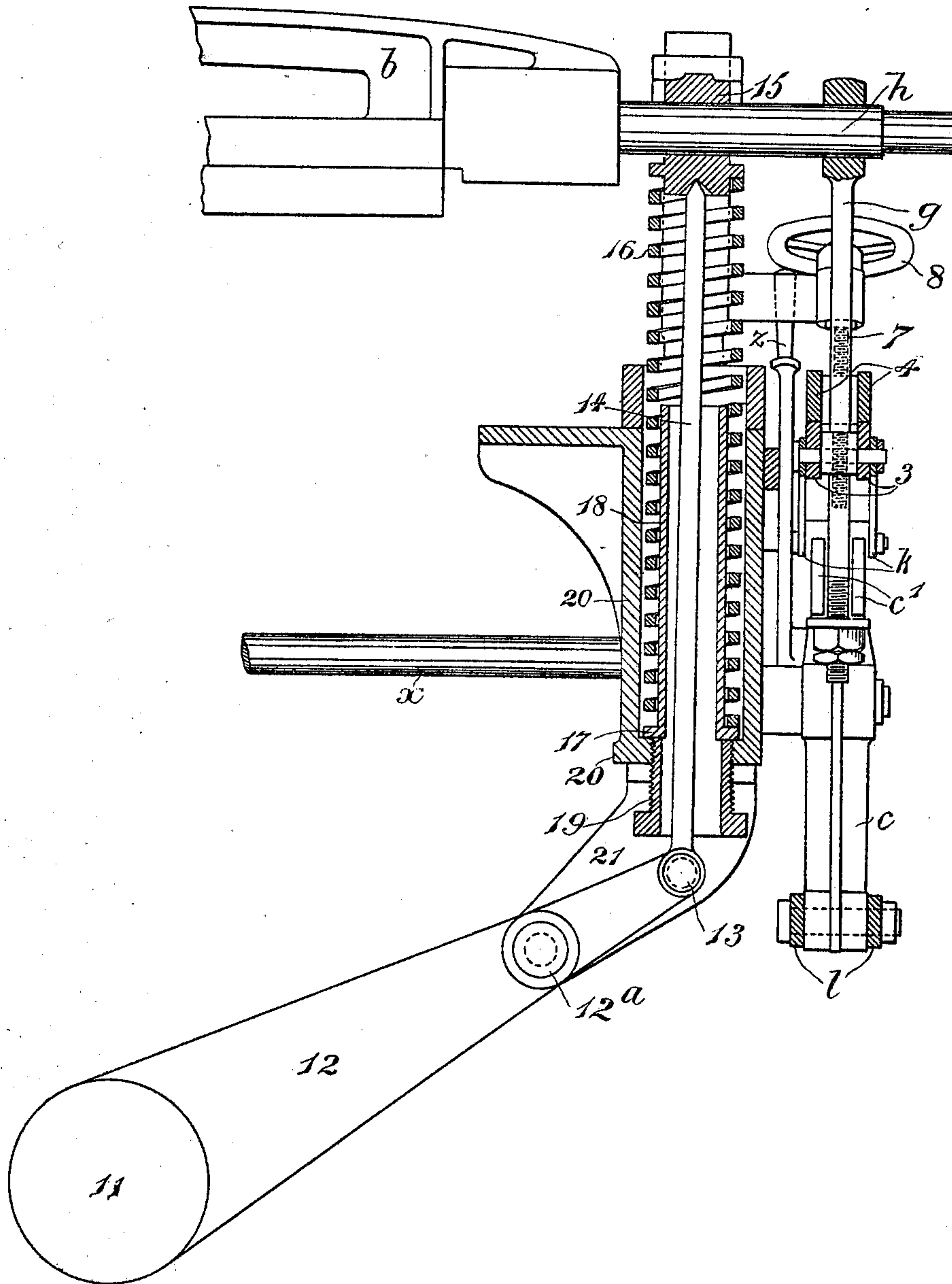
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Fig. 2.



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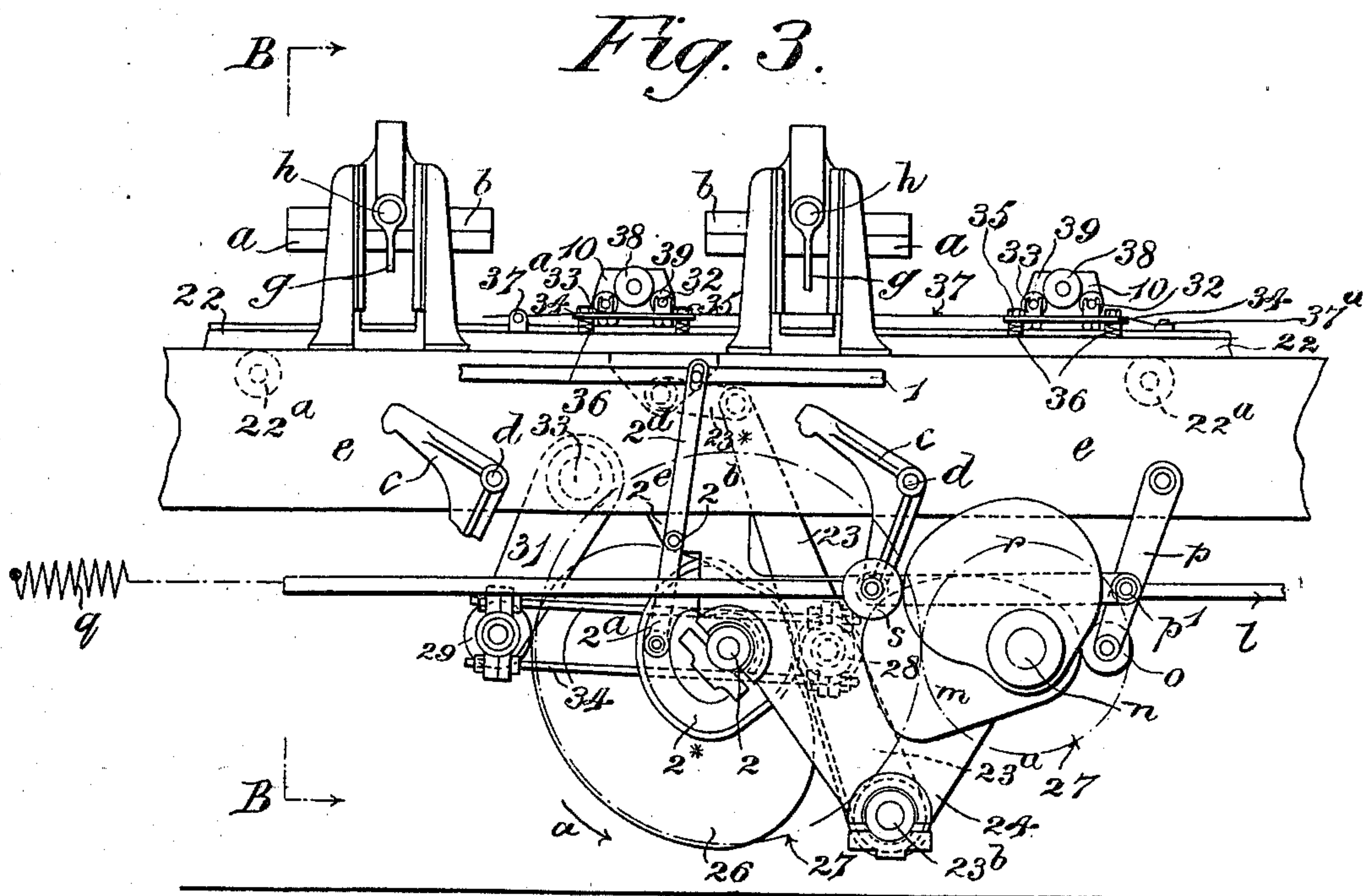
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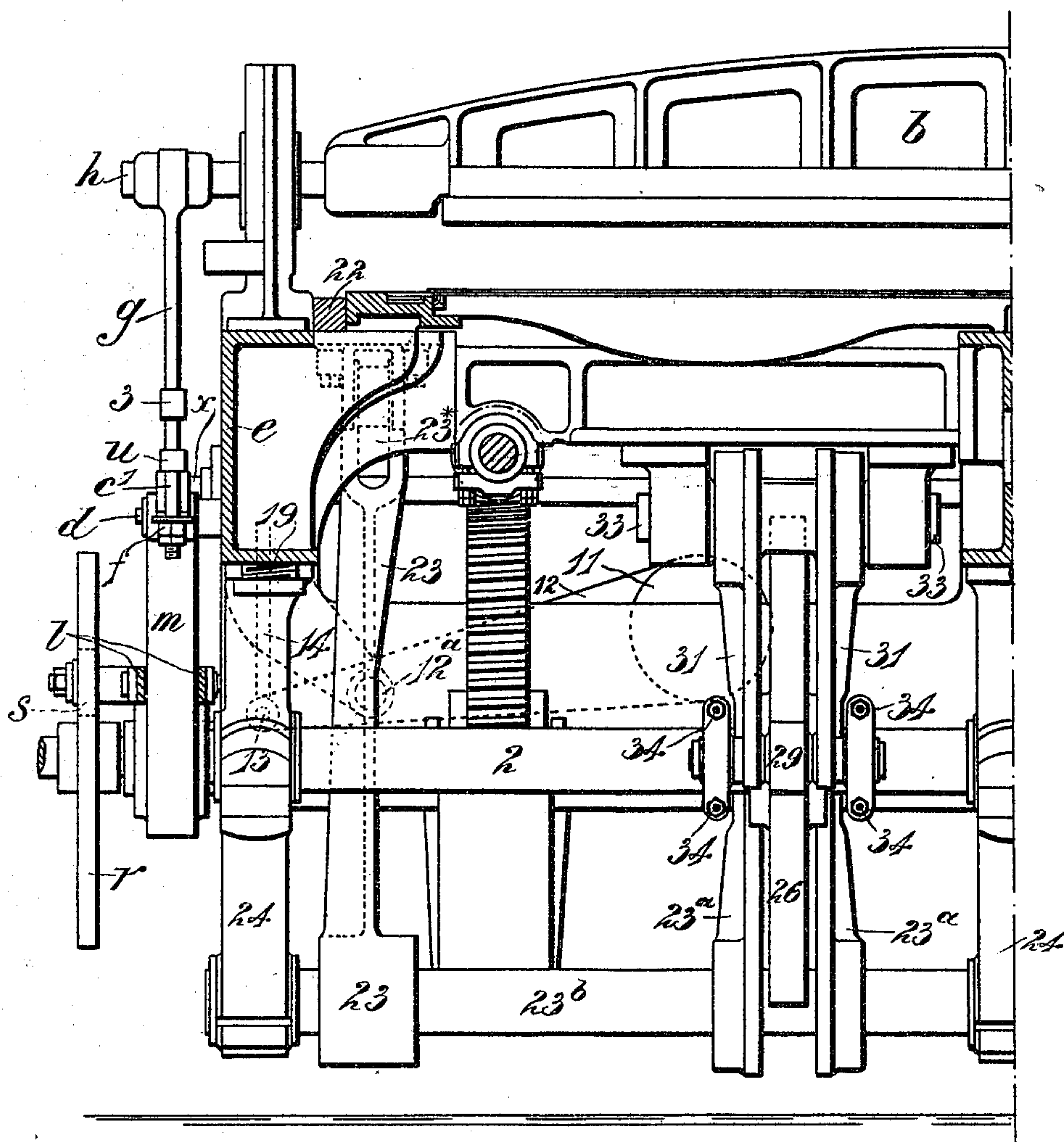
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6 Sheets—Sheet 4.

Fig. 4.



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6 Sheets—Sheet 6.

Fig. 5.

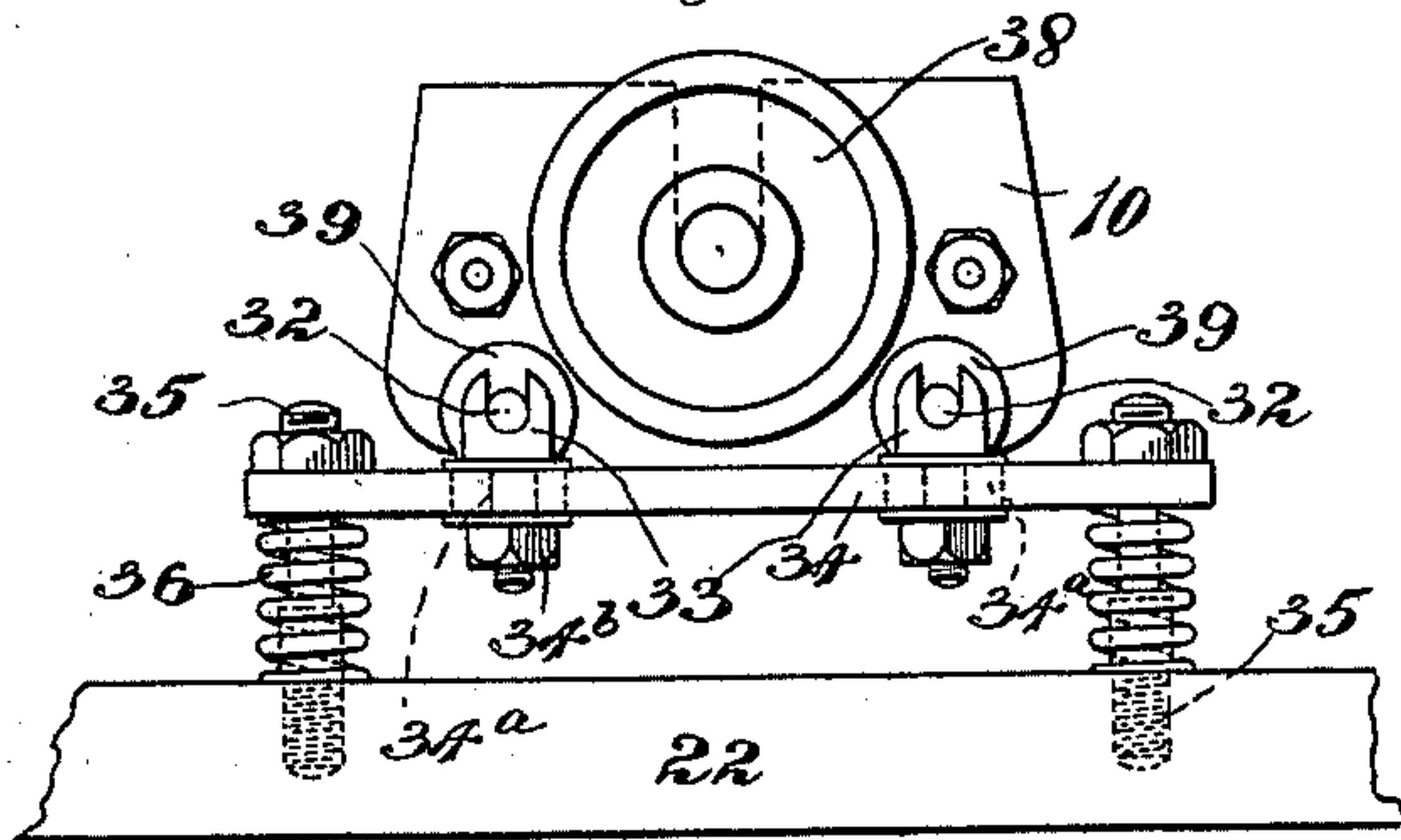


Fig. 6.

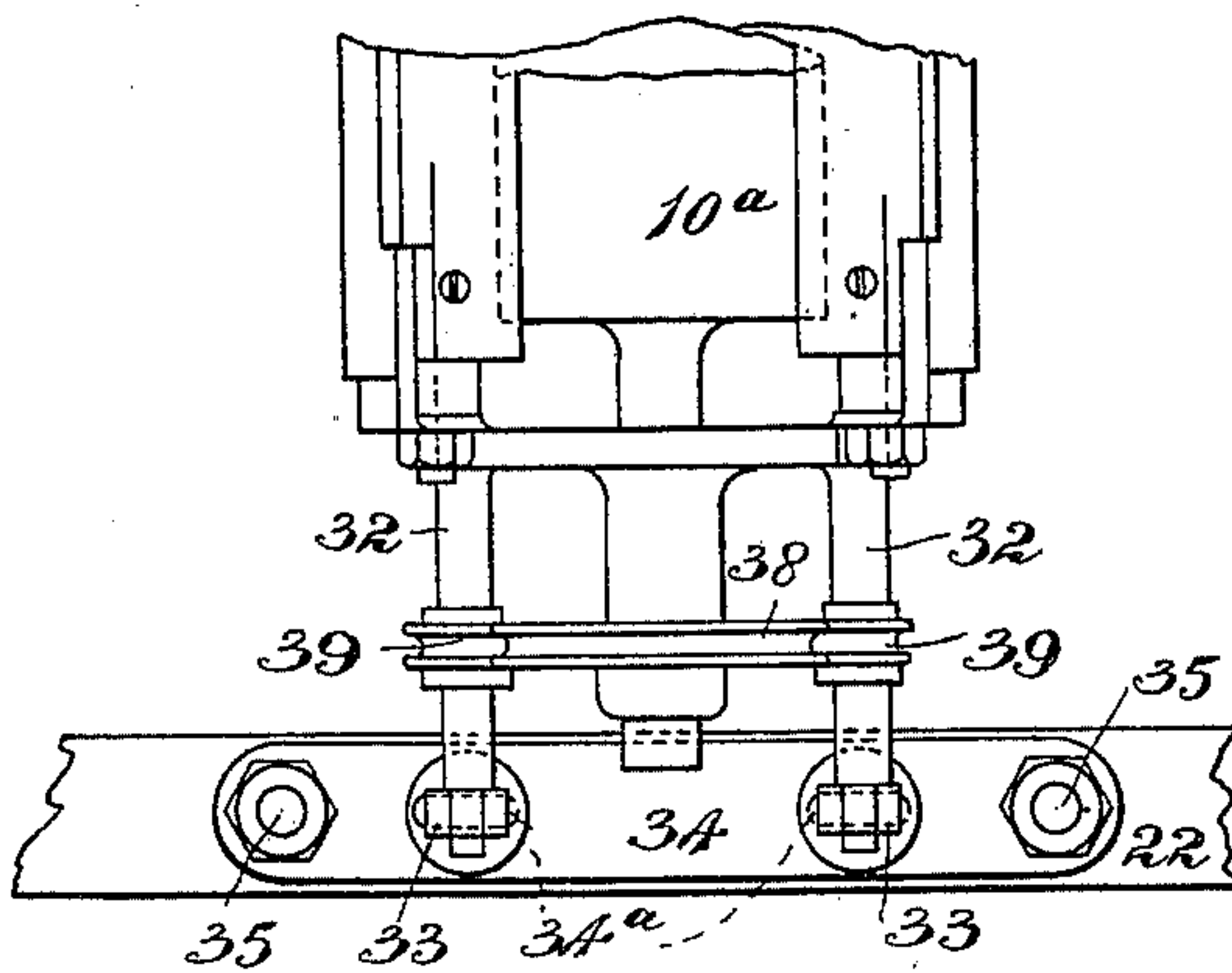
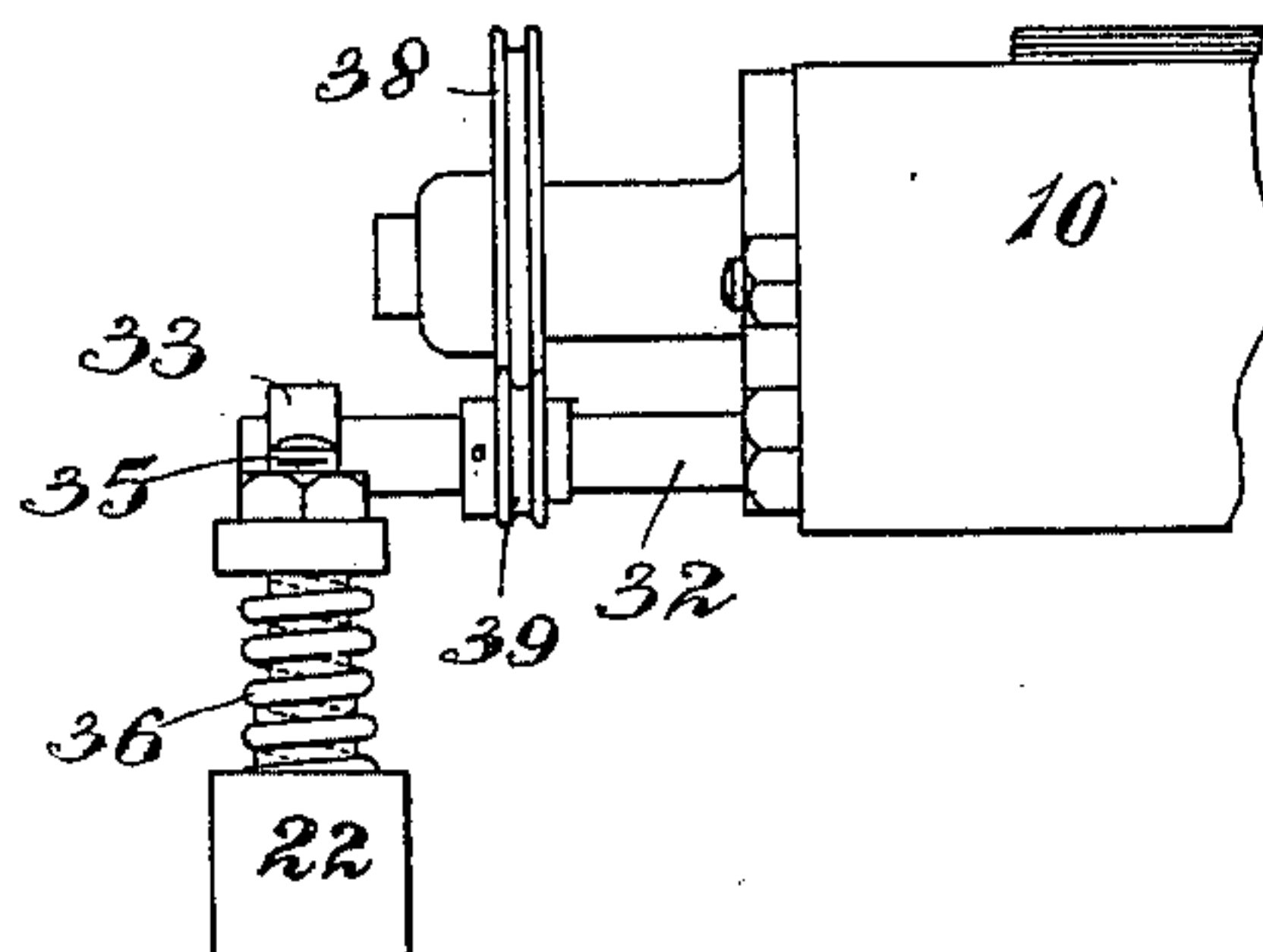


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES HERBERT SCOTT, OF GLOUCESTER, ENGLAND.

MACHINE FOR PRINTING FLOOR-CLOTH OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 669,469, dated March 5, 1901.

Application filed December 27, 1900. Serial No. 41,252. (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, of which the following is a specification.

This invention has reference to improvements in that type of machine for printing floor-cloth, linoleum, and the like wherein a number of vertically-movable printing-blocks are arranged at intervals above a table over which the material to be printed is moved in an intermittent manner and color is applied to the lower sides of the blocks from color-boxes arranged to reciprocate below the blocks when the same are raised—as, for example, in the construction of printing-machine described in the specification of another application for Letters Patent filed by me, Serial No. 684,389.

The present invention has for its object to further improve the construction and working of such machines.

It consists for these purposes in improved means for depressing the printing-blocks, in improved means for enabling any one or other of the said blocks to be put out of action and held out of action while other blocks go on printing, in improved means for limiting the upward movement of each printing-block, in improved means for raising and supporting each printing-block, in improved means for reciprocating the color-bodies, in improved means for supporting the color-boxes, and in certain details of construction, all as hereinafter described, and pointed out in the claims.

In the accompanying illustrative drawings, Figure 1 is a side elevation, and Fig. 2 is a cross-section on the line A A of Fig. 1, showing part of a printing-machine of the kind referred to having some of my present improvements embodied therein. Fig. 3 is a side elevation showing to a smaller scale than Figs. 1 and 2 part of the machine with some additional improvements embodied therein. Figs. 4 and 4^a together show part of the machine in cross-section on the line B B of Fig. 3, but drawn to a larger scale than that figure. Figs. 5, 6, and 7 are respectively side, plan, and

end views showing part of one of the color-boxes and its mounting to a larger scale than Fig. 3.

According to this invention each printing-block *a*, with its transverse beam or carrier *b*, is caused to make its downstroke by means of a pair of bell-crank levers *c*, that are pivoted at *d* to opposite sides of the frame *e* of the machine and act upon abutments *f*, conveniently in the form of nuts, as shown, carried by a pair of rods or links *g*, that are mounted to oscillate on trunnions *h* on opposite sides of the block-carrier *b*, and are connected to a pair of radius-rods *k* at opposite sides of the machine. These rods or links *g* are hereinafter called "pivoted" rods. The several levers *c* at each side of the machine are connected to a common longitudinal rod or, as shown, pair of rods *l*, that is or are moved endwise in a direction to cause the levers to depress the printing-blocks by a rotary cam *m*, fixed on a transverse driving-shaft *n* and acting against an abutment *o*, preferably in the form of an antifriction-roller, connected to the said levers. In the example shown the cam *m* at each side of the machine acts against an antifriction-roller *o*, carried by a pair of lever-arms *p*, connected to the corresponding pair of rods *l* at *p'*. Movement of the two pairs of longitudinal rods *l* in the opposite direction to return the parts to their inoperative positions is normally effected by springs, one of which is shown diagrammatically at *q*; but the transverse driving-shaft *n* is or may be provided with an additional pair of rotary cams *r*, adapted to act against the said rods, preferably, as shown, through antifriction-rollers *s*, carried by one of the pairs of levers *c*, so as to positively actuate the said rods *l* and automatically return the levers *c* and connected parts to their inoperative positions in the event of the springs *q* failing to do so.

The upper arms of the bell-crank lever *c*, which act upon the abutments *f* and which may be bifurcated, as shown at *c'*, Fig. 2, and the radius-rods *k*, jointed to such links, are, as shown, made of such length and so relatively arranged as to prevent, or practically so, any sliding movement between the said abutments and the parts of the levers that bear against them.

To insure that each printing-block *a* shall rise when relieved of downward pressure of the corresponding pair of bell-crank levers *c*, each of the two pivoted rods *g*, jointed to the block, is provided with a second abutment *u*, conveniently in the form of a collar, as shown, so arranged that if it be not raised by the rising of the block it will be acted upon by the upper arm of the corresponding bell-crank lever *c* so as to raise the block.

To enable any one of the printing-blocks *a* to be thrown out of action while the others go on working, the two radius-rods *k*, that are jointed at one end to the pair of pivoted rods *g* of each block *a*, are jointed at their other ends to two lever-arms *w*, fixed to the ends of a transverse rock-shaft *x*, provided with a hand-lever *z*, which when turned into the position shown in full lines in Fig. 1 will hold the pair of pivoted rods *g* in the operative position shown and when turned into the opposite position (shown by the dotted lines *z'*, Fig. 1) will move the said pair of pivoted rods out of the path of the corresponding bell-crank levers *c*. The hand-lever *z*, with connected parts, can be fixed in the operative position by a pin passed through juxtaposed holes *z*², formed in one of the lever-arms *w*, the lever *z*, and a plate *z*³, adjustably fixed to the frame *e*, and can be fixed in the inoperative position by passing the said pin through the holes in the arm *w* and the hand-lever and into a second hole *z*⁴, formed in the said plate *z*³. To enable any one of the printing-blocks to be automatically thrown out of action in an intermittent manner, so that it will make only one downward stroke for each two downward strokes of the other block or blocks, there is provided at one side of the machine and in proximity to the several hand-levers *z* a longitudinal bar 1, that is carried by fixed guides, only one of which is shown in Fig. 1 at 1^a. The bar is held stationary during one downward movement and the next upward movement of the bifurcated upper arms of the bell-crank levers *c* and is moved to and fro during the next downward and following upward movement of the said lever-arms by suitable means, such as a cam. In the example shown there is used for this purpose a cam 2^x, that is fixed upon a transverse rotary shaft 2 and operates a lever-arm 2^a, fixed upon a short shaft 2^b, which is mounted in a fixed bearing 2^c and has fixed to it a second lever-arm 2^d, suitably jointed to the rod 7. To the bar 1 the hand-lever *z* corresponding to the printing-block *a* to be put out of action can be readily connected, as by a pin 1^b, Fig. 1, so that the said hand-lever and the pivoted rods *g*, connected thereto, will be moved by such bar into the inoperative position at the required times. The longitudinal bar 1 is caused to commence its movement to the left, Fig. 1, slightly before the longitudinal rods *l* commence to move to the right, so as to insure that the abutments *f* on the pivoted rods *g*, connected to the said bar 1, shall be moved

out of the paths of the descending upper ends of the levers *c* of the block *a* to be held out of action.

Upward movement of each printing-block *a* is limited by another abutment 3 on each pivoted rod *g* coming into contact with an adjustable stop comprising, for example, a pair of similarly-bent bars 4, that are pivoted at one end to a fixed support—as, for example, to one of the guide-standards 5 of the corresponding printing-block *a*—and are provided at the other end with a swiveling nut 6, in which works an adjusting-screw 7, that is provided with a hand-wheel 8 and is free to turn, but not to move endwise, in a swiveling bearing 9, carried, it may be, by the adjacent guide-standard 5. Each adjustable stop 4 is so shaped and arranged, as shown, that one portion thereof is horizontal, or approximately so, and another portion is inclined, so that when the pivoted rods *g* are held in their vertical or approximately vertical and operative position the said abutments 3 thereon will on rising come into contact with the lower horizontal sides 4^a of the adjustable stops 4 and hold the corresponding printing-block at such a height that its lower side will be coated with color when the corresponding color-box 10, Fig. 3, reciprocates below it, and when the pivoted rods *g* are moved into their inoperative positions the said abutments 3 will come into contact with the lower inclined sides 4^b of the stops 4 and hold the block *a* at a higher level, so that it will not then receive any color from the color-box.

Instead of supporting each printing-block *a* by coiled springs, as in the arrangement described in my said previous specification, whereby excessive pressure is necessary to complete the final portion of each downstroke of the block, the block is supported according to this invention by a pair of balance-weights 11, each of which may, as in the arrangement shown in Figs. 1 and 4, be carried by one end of a lever 12, pivoted at 12^a, and the other end of which is jointed at 13 to a rod 14, which acts against the lower side of the slide block or bearing 15, carrying the trunnion *h*, at the corresponding side of the printing-block *a*. To secure the necessary quickness of ascent of the printing-block, there is arranged below each of said slide blocks or bearings 15 a coiled spring 16, Fig. 1, which is, however, of less stiffness than heretofore usual in machines of the kind referred to, the two springs, one at each side of the machine, not being sufficiently powerful by themselves to support the printing-block and its carrier. The lower end of each spring 16 bears against a flange 17 on a tubular holder 18, that extends into the said spring 16 and can be adjusted vertically by a vertically-adjustable screw-threaded tube 19, which is screwed into the lower end of a vertical socket 20, that incloses a part of the spring 16, and to an extension 21 of which the corresponding weighted lever 12 may, as shown, be pivoted. As will

be seen, the arrangement is such that the upward pressure exerted by the springs 16 can be adjusted to suit printing-blocks of different weights.

5 The color-boxes 10, Fig. 3, are moved to and fro below the printing-blocks α by longitudinal rods 22, that are supported on rollers 22^a and are reciprocated by oscillating levers 23 through links 23^x, as in the construction of printing-machine described in my
10 said former specification; but according to my present invention these levers are positively operated in each direction by a single cam 26. For this purpose the cam 26 is fixed
15 upon the transverse shaft 2, which is driven through suitable gearing—such as the spur-gearing 27, Fig. 4^a—from the main transverse driving-shaft n and is supported in bearings 24, which also carry the transverse shaft n
20 and also the rock-shaft 23^b, hereinafter referred to. The said cam is arranged to rotate between two antifriction-rollers 28 and 29, one of which—viz., 28—is carried by a pair of lever-arms 23^a, fixed at their lower ends to
25 a transverse rock-shaft 23^b, upon which the oscillating levers 23 are also fixed, while the other roller, 29, is carried by a pair of lever-arms 31, that are journaled at their upper ends upon a cross-shaft 33 and are suitably
30 connected to the pair of lever-arms 23^a, as by adjustable tie rods or links 34. The arrangement is such that the cam 26 in rotating in the direction of the arrow α , Fig. 3, acts
35 against the two rollers 28 and 29 alternately and moves the pair of oscillating levers 23 first in one direction and then in the opposite direction. The center of motion of the
40 pairs of lever-arms 23^a and oscillating levers 23 is located at one side of and below the cam-shaft 2, and the center of motion of the pair of lever-arms 31 is located at the opposite side of the cam-shaft and at the same
45 distance above the axis of such shaft as the center of motion of the pairs of lever-arms 23^a and oscillating levers 23 is below such axis. The cam 26 is arranged to rotate in the direction shown, so that the portion of the cam in contact with each roller 28 and 29
50 moves from the center about which the levers carrying the roller turn toward the roller itself. This gives a much smoother motion to the roller than would be the case if the cam revolved in the reverse direction. Also, owing to the fact that the lever-arms
55 31 on one side are pivoted at a point above the cam and the lever-arms 23^a on the other side are pivoted at a point below the cam, this smooth motion is obtained in whichever direction the color-boxes 10 are moving.

60 The feeding-mechanism used for moving the material to be printed through the machine may be of any suitable kind. To prevent complication of the drawings no feeding mechanism is shown.

65 To allow of small horizontal and vertical movements of the color-boxes 10 in relation to the longitudinal bars 22 used to reciprocate them, each of such boxes is supported

by pins 32, that are fixed to the opposite sides of the box and rest in two pairs of side supports 33, (see Figs. 5, 6, and 7,) that are
70 formed as bolts, the shanks of which extend through slots 34^a in longitudinal bars 34 and are fixed to the said bars by nuts 34^b, that bear lightly against the under sides of the
75 slotted bars. These bars are connected to the two longitudinal bars 22 by studs or bolts 35, that extend through said bars 34 and are encircled by coiled springs 36, located between the slotted bars 34 and the longitudinal bars 22. As will be seen, the arrangement
80 is such as to allow of small longitudinal slip between the slotted portions of the bars 34 and each color-box 10 in the event of such box striking against its corresponding
85 printing-block α and also of a small depression of the color-box and bars 34 against the action of the springs 36 in the event of the main color-roller therein being too high to
90 pass under the block without being depressed. The color-roller 10^a in each color-box 10 is or may be driven by means of two lengths 37 of flexible material—for example, catgut—each
95 of which is fixed at its ends 37^a to a stationary part of the machine, Fig. 3, and extends around a driving-pulley 38 on the adjacent side of the color-roller and under suitable
guide-rollers 39, which may be carried by the pins 32.

As will be obvious, one or some of the improvements hereinbefore described may be
100 used without the others in machines of the type referred to for printing floor-cloth, linoleum, and the like.

What I claim is—

1. In a machine for printing floor-cloth, linoleum, and the like, the combination with
105 a vertically-movable printing-block, and means for raising and supporting the same, of pivoted rods connected at their upper
110 ends to said block, radius-rods connected to said pivoted rods, levers pivoted to opposite sides of said machine and adapted when
115 turned in one direction to engage said pivoted rods and move the same and said block downward and when turned in the opposite direction to allow said pivoted rods and block to rise, and means for oscillating said levers.

2. A machine for printing floor-cloth, linoleum and the like, comprising a series of
120 vertically-movable printing-blocks each provided at opposite sides with a pair of depending pivoted rods, means for raising and supporting each block, a pair of radius-rods
125 jointed at one end to each pair of pivoted rods, movable supports to which the other ends of said radius-rods are jointed and whereby the pivoted rods can be moved into and maintained in the operative or inoperative position at will, pairs of levers mounted to oscillate in a vertical plane each pair of levers
130 being adapted, upon being oscillated, to first engage the pivoted rods of the corresponding block, when these rods are in their operative

position, and move said rods and block downward, and afterward to relieve said pivoted rods and block of downward pressure and allow them to rise, connecting means between the several pairs of levers at each side of the machine, and means for causing all the levers to oscillate simultaneously.

3. A machine for printing floor-cloth, linoleum and the like, comprising a series of vertically-movable printing-blocks each provided at opposite sides with a pair of depending pivoted rods, means for raising and supporting each block, a pair of radius-rods jointed at one end to each pair of pivoted rods, movable supports to which the other ends of said radius-rods are jointed and whereby the pivoted rods can be moved into and maintained in the operative or inoperative position at will, pairs of levers mounted to oscillate in a vertical plane each pair of levers being adapted, upon being oscillated, to first engage the pivoted rods of the corresponding block, when these rods are in their operative position, and move said rods and block downward, and afterward to relieve said pivoted rods and block of downward pressure and allow them to rise, connecting means between the several pairs of levers at each side of the machine, a movable body common to the several movable supports, means for moving said body to and fro during each alternate oscillation of the said levers, and means whereby the movable supports corresponding to each pair of radius-rods can be connected to said movable body.

4. In a machine for printing floor-cloth, linoleum and the like, the combination with a series of vertically-movable printing-blocks each provided with a pair of pivoted rods, means for raising and supporting each block, and a series of oscillating levers adapted to engage said pivoted rods and alternately depress said blocks and allow them to rise, of a pair of radius-rods jointed to each pair of pivoted rods, a pair of pivoted arms to which the pair of radius-rods are also jointed, a handle lever for moving said pair of pivoted arms and connected pair of pivoted rods into the operative or inoperative position at will, and means for fixing said pivoted arms in either of said positions, substantially as described.

5. In a machine for printing floor-cloth, linoleum and the like, the combination with a series of vertically-movable printing-blocks each provided with a pair of pivoted rods, means for raising and supporting each block, and a series of oscillating levers adapted to engage said pivoted rods and alternately depress said blocks and allow them to rise, of a pair of radius-rods, jointed to each pair of pivoted rods, a pair of pivoted arms to which the pair of radius-rods are also jointed, a longitudinal bar common to all the pairs of pivoted arms, means whereby any one or other of said pairs of pivoted arms can be connected to said longitudinal bar, and means whereby said bar can be moved to and fro during

alternate complete oscillations of said levers, substantially as described for the purpose specified.

6. In a machine for printing floor-cloth, linoleum and the like, the combination with a vertically-movable printing-block provided with a pair of pivoted rods, means for raising and supporting said block, means for lowering said block through said pivoted rods, and means for turning said pivoted rods laterally into their operative or inoperative position, of abutments on said pivoted rods, and a pair of adjustable stops each having a horizontal or approximately horizontal abutting surface and an inclined abutting surface for contact with the abutment on the corresponding pivoted rod when the same is respectively in its operative and inoperative position, and means for adjusting each stop vertically, substantially as described.

7. In a machine for printing floor-cloth, linoleum and the like, the combination with a vertically-movable printing-block provided with a pair of pivoted rods, means for raising and supporting said block, means for lowering said block through said pivoted rods, and means for turning said pivoted rods laterally into their operative or inoperative position, of abutments on said pivoted rods, and a pair of adjustable stops each consisting of a pair of bars pivoted at one end to a fixed support and having a horizontal or approximately horizontal lower side and an adjacent inclined lower side and against one or other of which sides the abutment on the corresponding pivoted rod will bear when it rises, and adjusting means for each stop, said means comprising a nut pivoted to the free end of the stop, a screw engaging said nut, and a bearing pivoted to a fixed support and in which said screw can turn but cannot move endwise, substantially as described.

8. In a machine for printing floor-cloth, linoleum and the like, the combination with a vertically-movable printing-block, of means for raising and supporting the same, said means comprising balance-weights adapted to take the greater part of the weight of the said block, and auxiliary supporting-springs arranged to assist the lifting action of said weights, substantially as described.

9. In a machine for printing floor-cloth, linoleum and the like, the combination with a vertically-movable printing-block, a carrier to which said block is attached and provided with trunnions, blocks or bearings for said trunnions, and guide-standards for said blocks or bearings, of a pair of levers pivoted to the frame of the machine and each provided at one end with a weight, a rod jointed to the opposite end of said lever and acting against the lower side of the corresponding block or bearing, and a coiled spring also acting against the lower side of the corresponding block or bearing, substantially as described.

10. In a machine for printing floor-cloth, linoleum and the like, the combination with

a vertically-movable printing-block, a carrier to which said block is attached and provided with trunnions, blocks or bearings for said trunnions, and guide-standards for said blocks or bearings, of a pair of weighted levers pivoted to the frame of the machine and acting against the lower side of said blocks or bearings, coiled springs arranged to also act against the lower side of said blocks or bearings, and vertically-adjustable supports for said springs, substantially as described.

11. In a printing-machine of the type herein referred to, the combination of color-boxes, longitudinal rods to which said color-boxes are connected, and levers connected to said longitudinal bars and adapted to reciprocate the same, of driving means comprising a rotary cam, antifriction-rollers between which said cam rotates and one of which is connected to the oscillatory levers a pivoted support for the other roller, and connecting means between said oscillatory levers and pivoted support, the axes of movement about which the roller-supports turn being arranged one above and the other below the axis of the rotary cam, substantially as described.

12. In a printing-machine of the type herein referred to, the combination with color-boxes, longitudinal rods to which said color-boxes are connected, a cross-shaft and levers fixed to said cross-shaft and adapted to reciprocate said longitudinal bars, of driving means comprising a rotary cam arranged above said cross-shaft, two oppositely-arranged antifriction-rollers between which said cam rotates, two pairs of lever-arms carrying said rollers, one of said pairs of lever-arms being fixed to said cross-shaft and the other pair being mounted to turn about an axis above that

of said cam, and connecting means between said pairs of lever-arms, substantially as described.

13. In a machine for printing floor-cloth, linoleum and the like, the combination with longitudinal reciprocating bars, of color-boxes and supporting means therefor, said supporting means comprising two side bars, studs fixed to the longitudinal bars and extending through said side bars, side supports connected to said side bars so as to be capable of sliding endwise thereon to a limited extent and upon which the color-box is supported, and springs which support said side bars and color-box but allow these parts to be depressed, substantially as described.

14. In a machine for printing floor-cloth, linoleum and the like, the combination with a pair of longitudinal reciprocating bars, of color-boxes each provided at its ends with lateral pins, and supporting devices between said color-boxes and bars, each of said supporting devices comprising a pair of side bars arranged above the longitudinal bars and formed with slots, side supports bolted to said side bars and on which said lateral pins rest, said side supports having parts extending through said slots, studs fixed to the longitudinal bars and extending through said side bars, and coiled springs encircling said studs and arranged between said longitudinal and side bars, substantially as described for the purpose specified.

Signed at Gloucester, England, this 8th day of December, 1900.

CHARLES HERBERT SCOTT.

Witnesses:

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WM. J. H. PALIN.