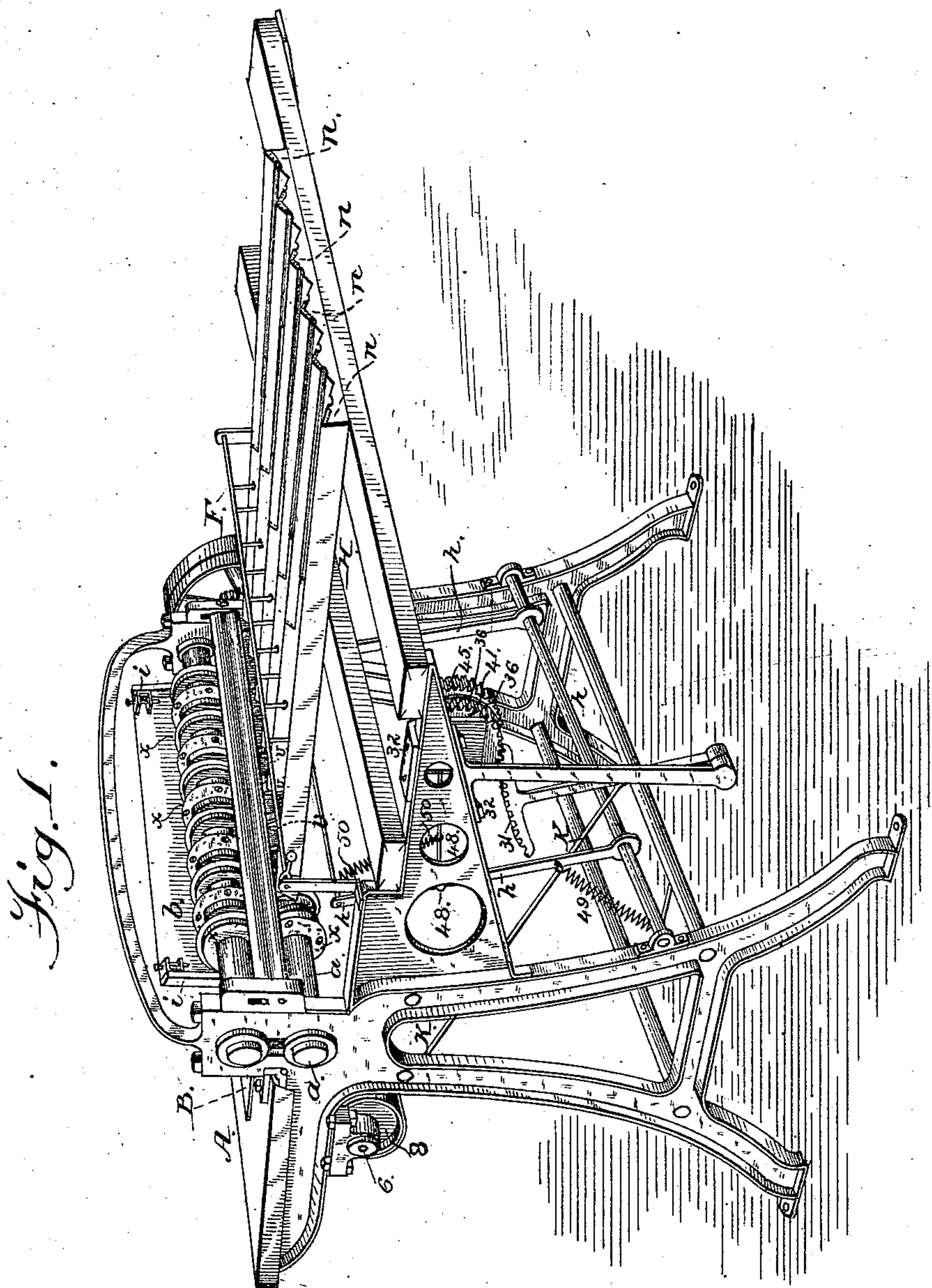


A. JOHNSON.
Card Cutter.

No. 241,372.

Patented May 10, 1881.



Witnesses;
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Inventor
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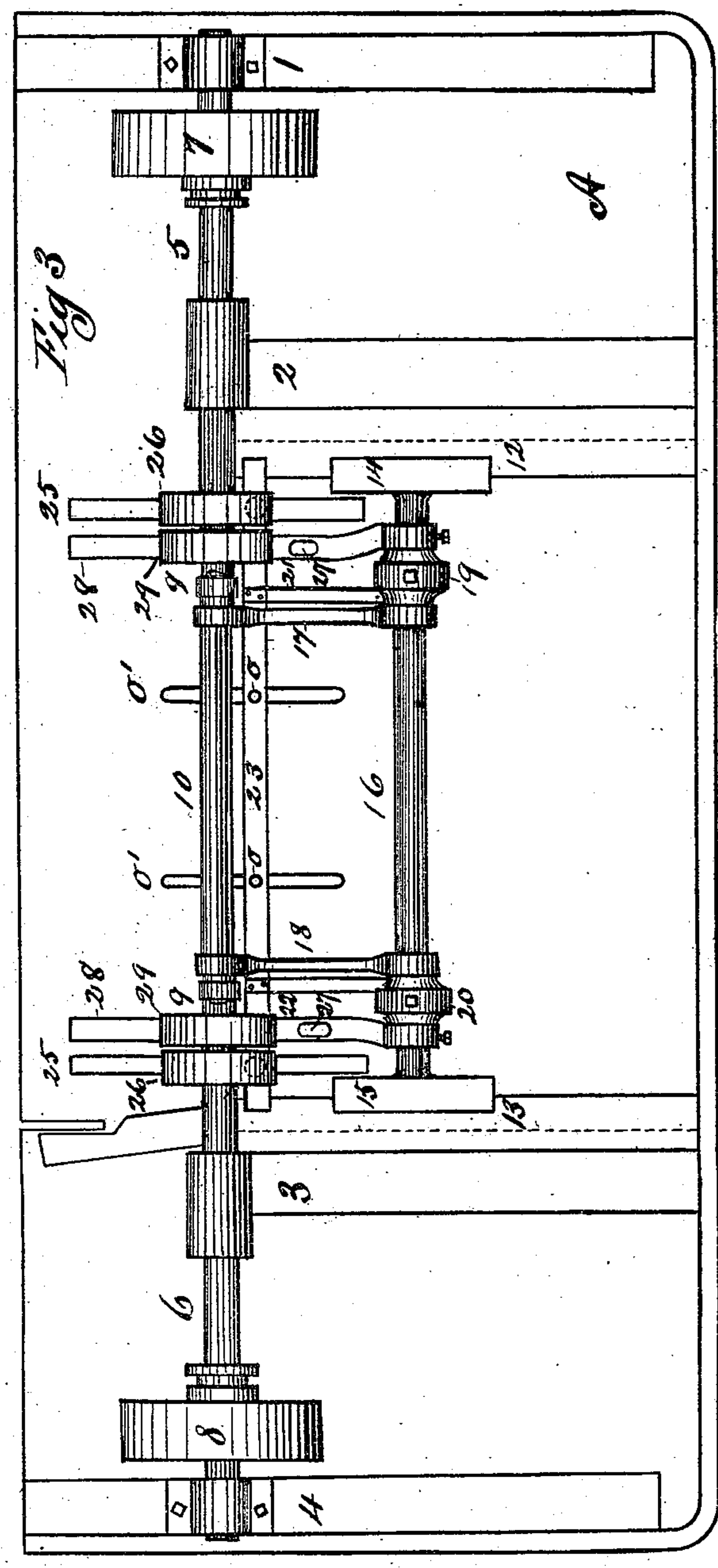
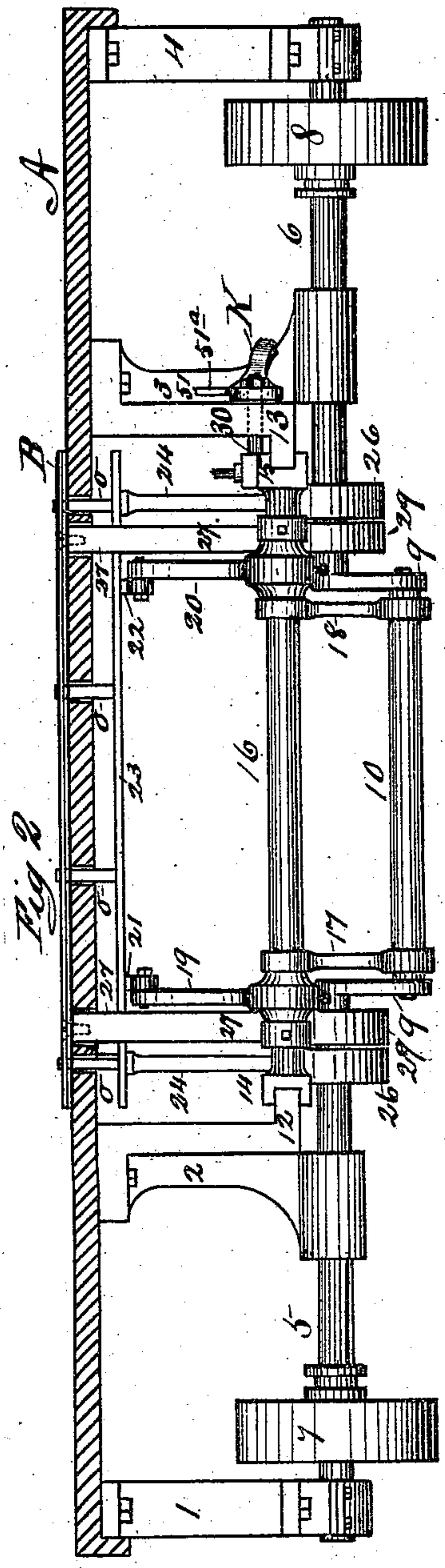
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5 Sheets—Sheet 2.

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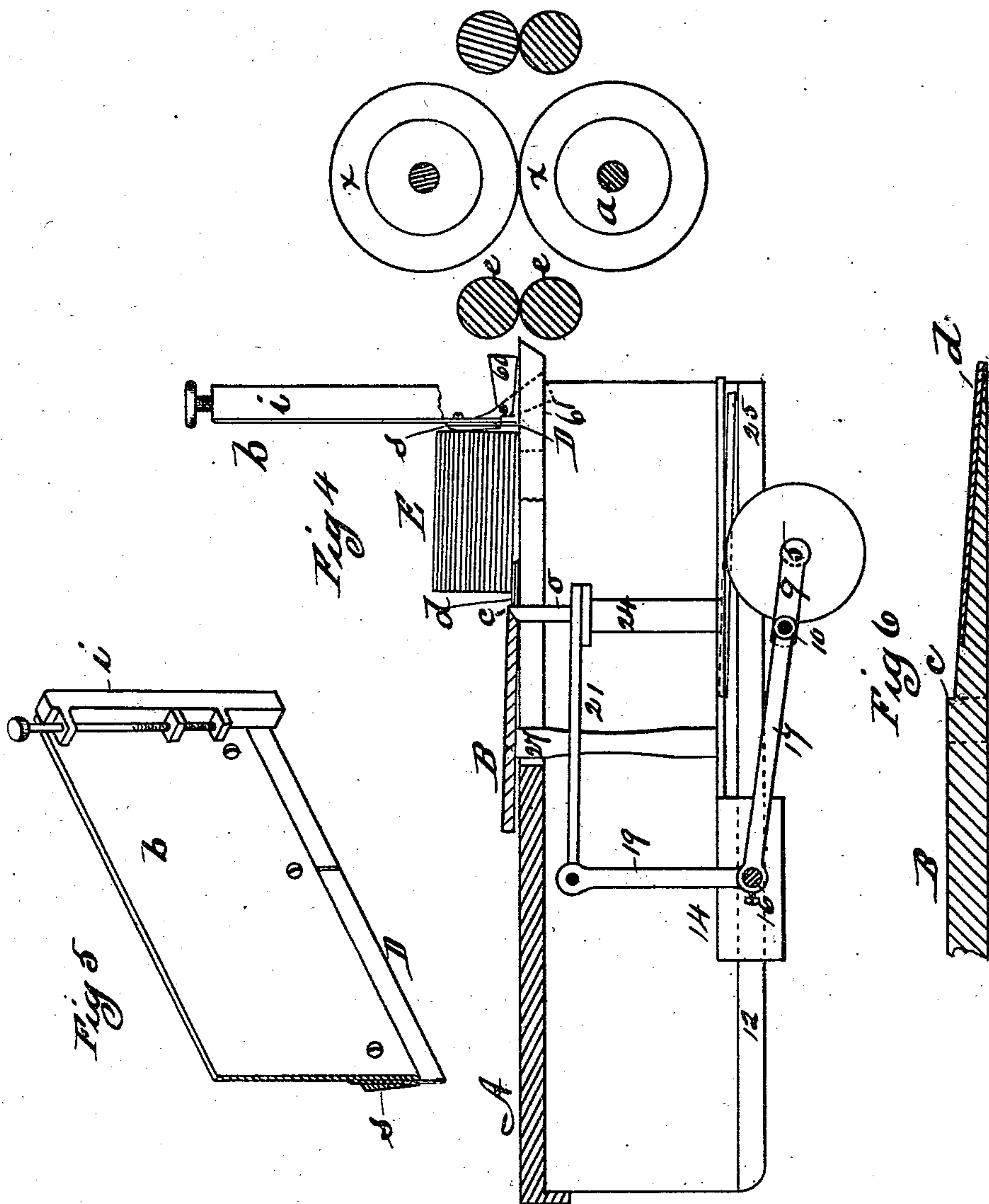
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5 Sheets—Sheet 3.

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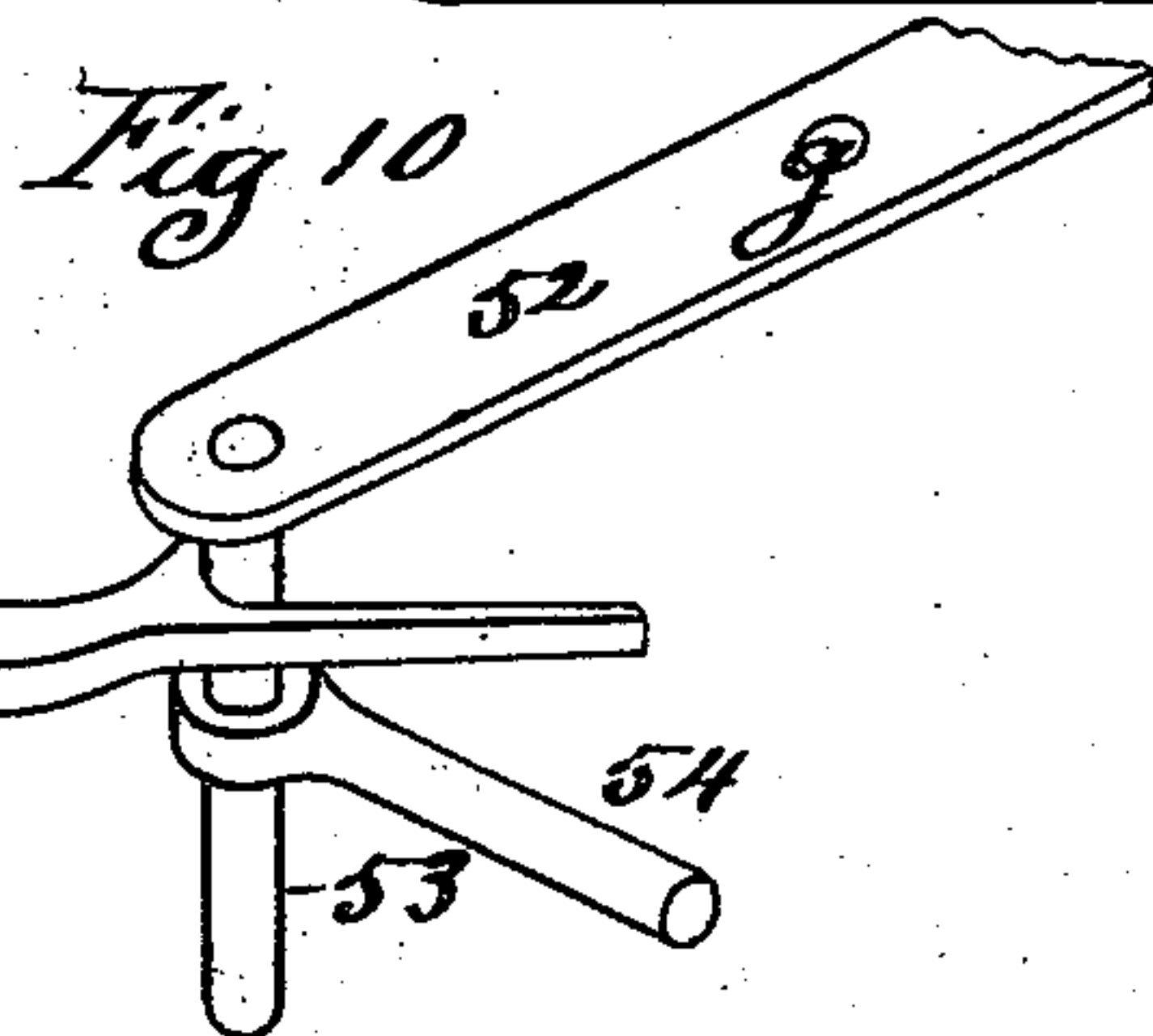
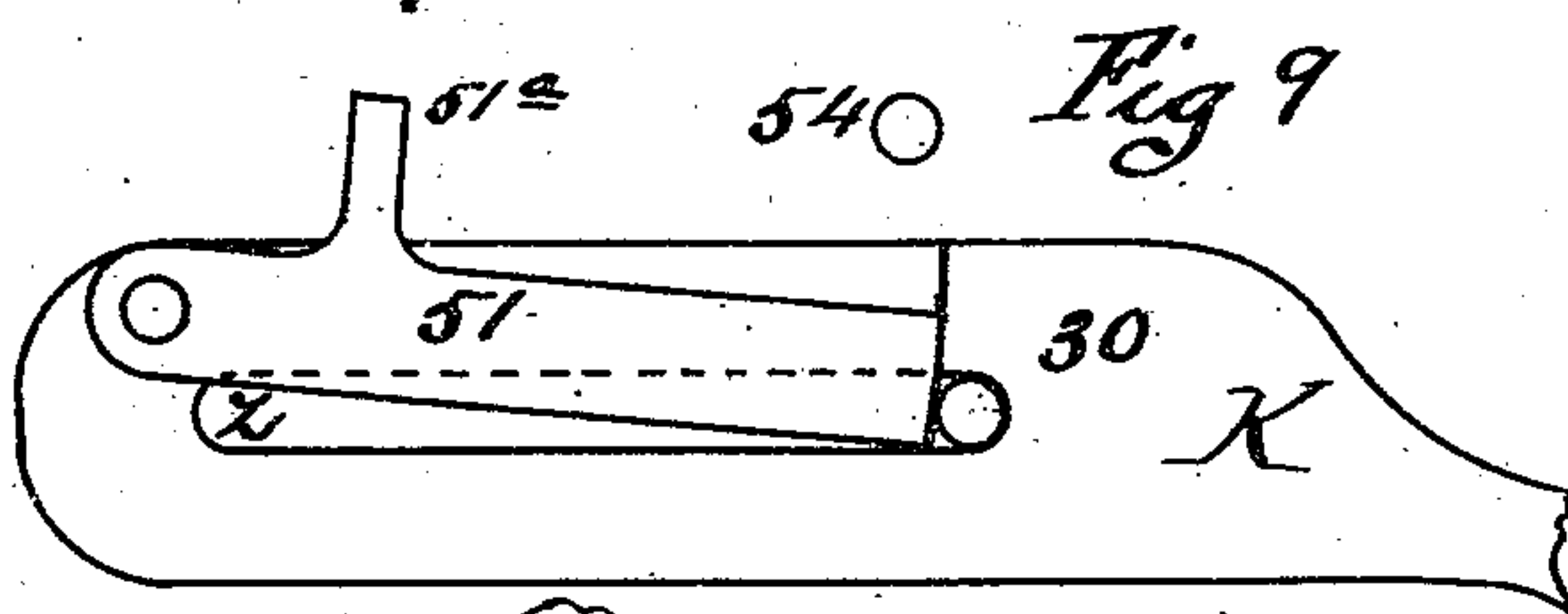
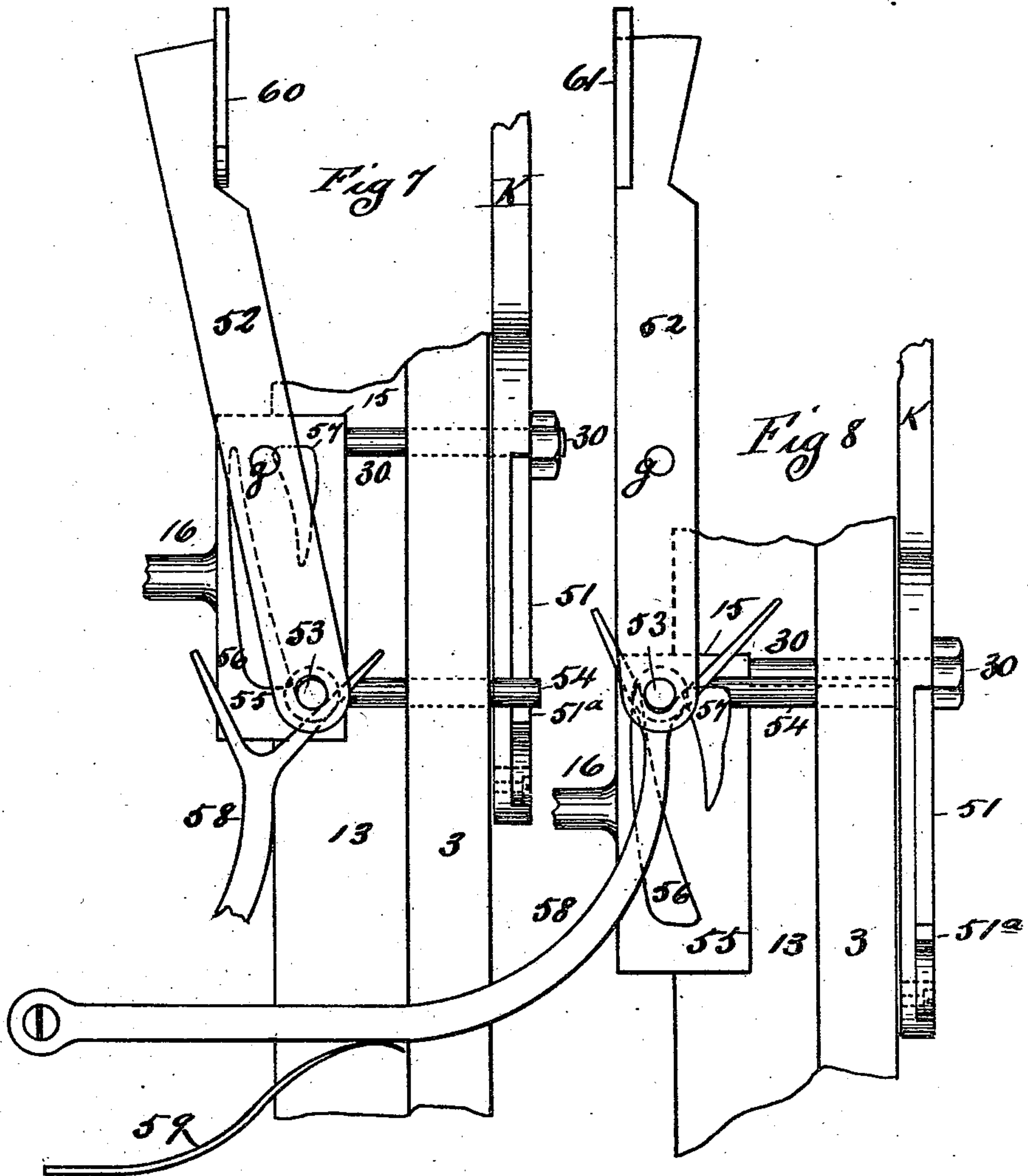
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5 Sheets—Sheet 4.

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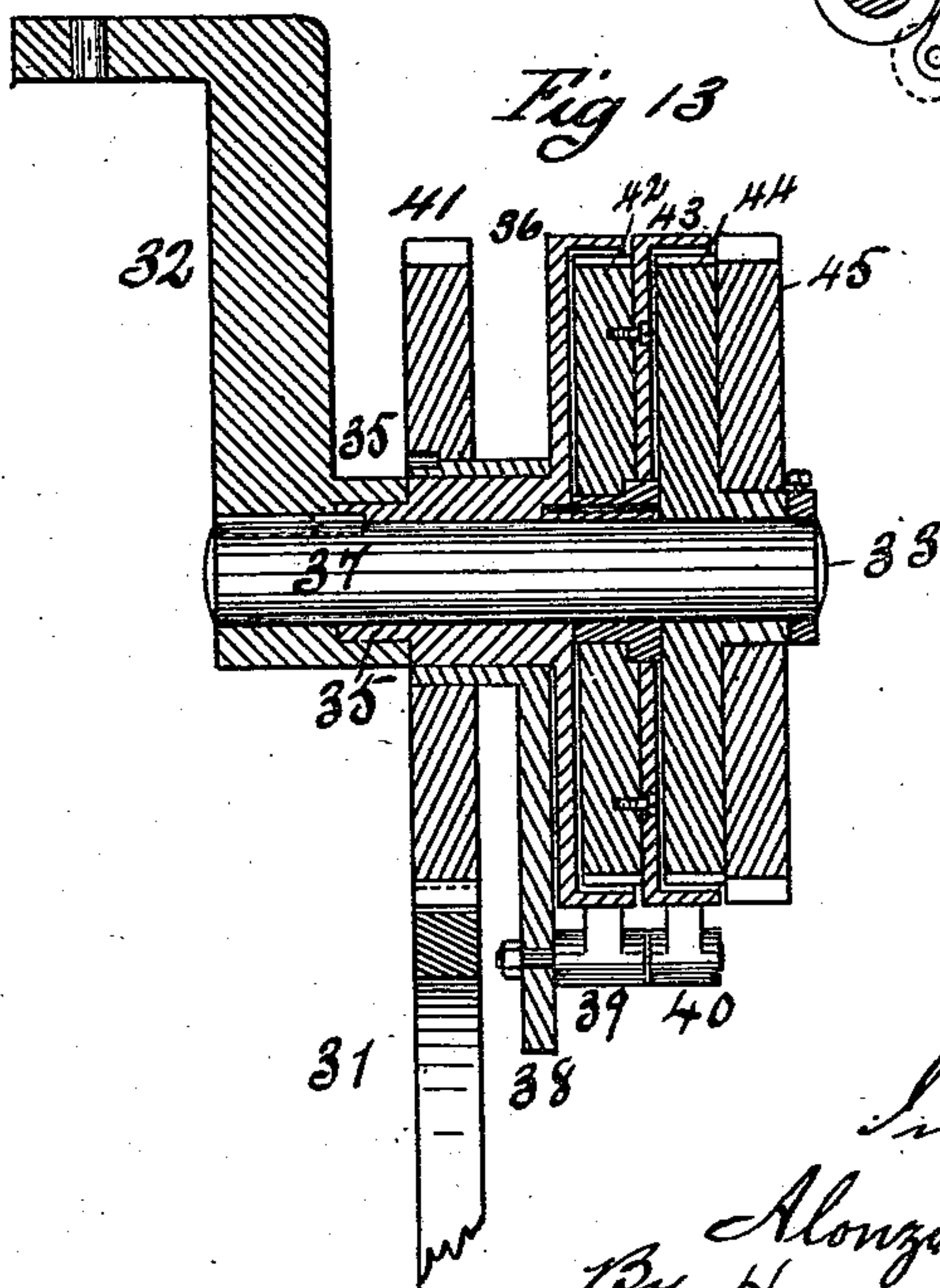
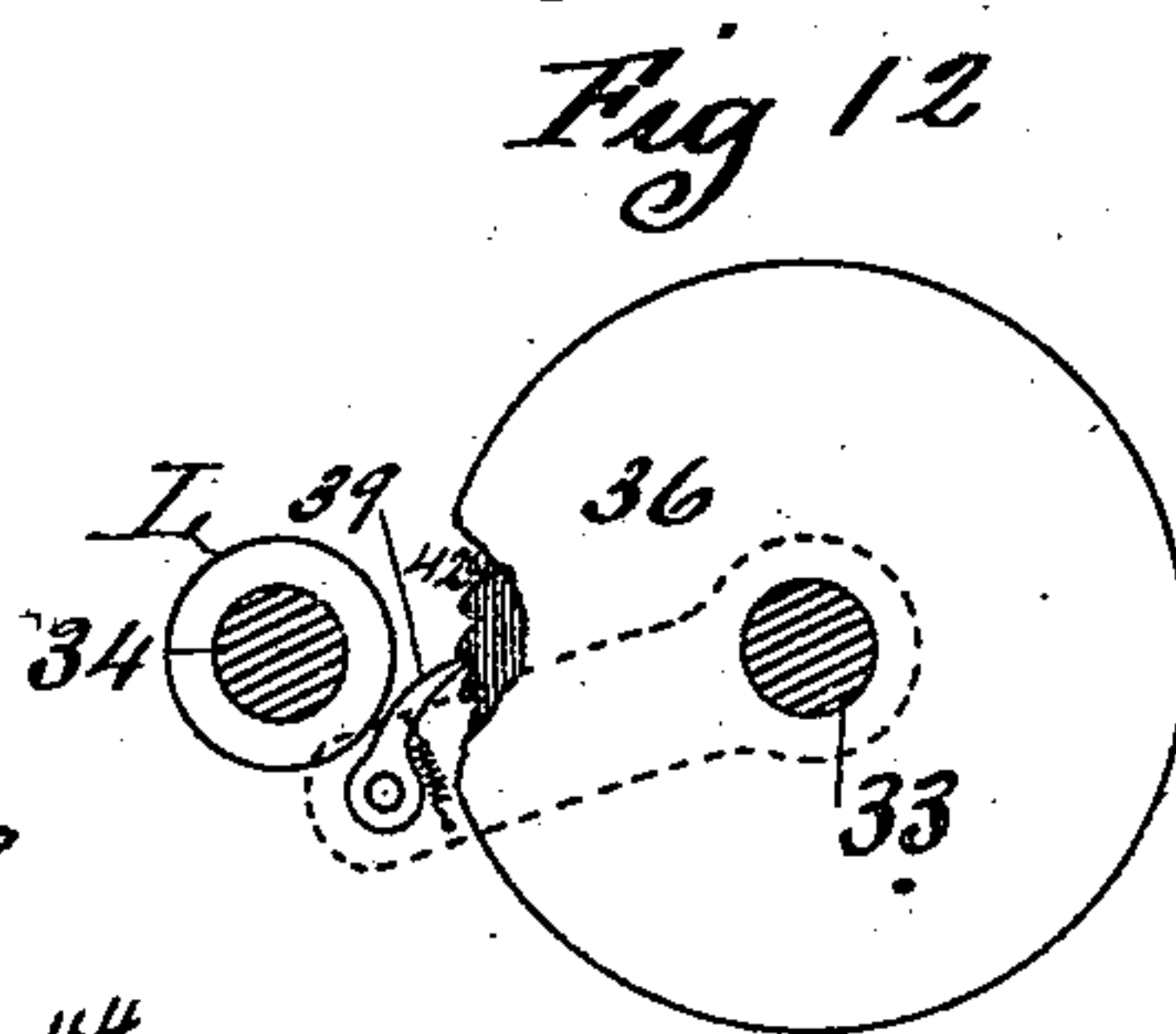
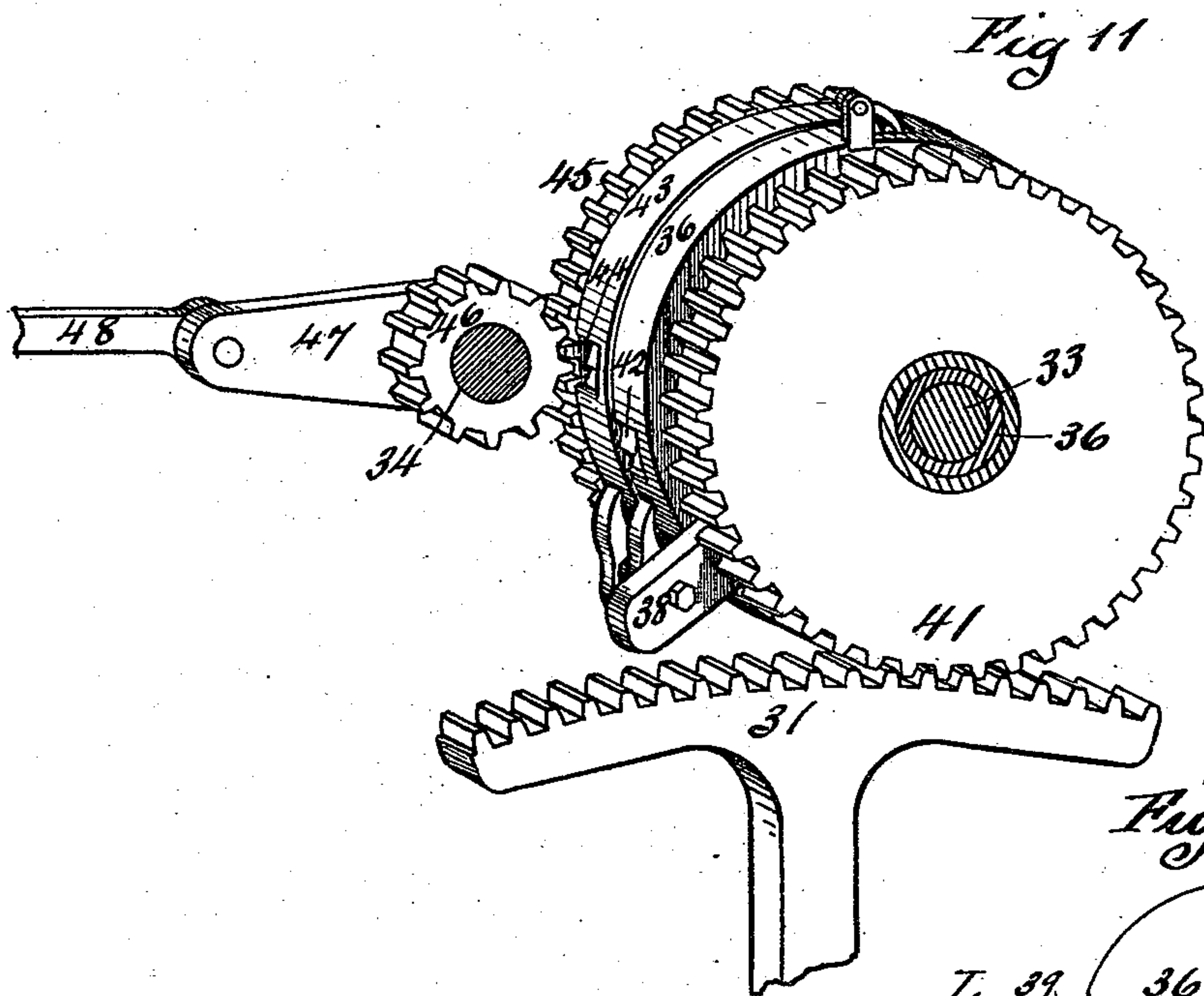
(No Model.)

5 Sheets—Sheet 5.

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Patented May 10, 1881.



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UNITED STATES PATENT OFFICE.

ALONZO JOHNSON, OF SPRINGFIELD, MASSACHUSETTS.

CARD-CUTTER.

SPECIFICATION forming part of Letters Patent No. 241,372, dated May 10, 1881.

Application filed October 25, 1880. (No model.)

To all whom it may concern:

Be it known that I, ALONZO JOHNSON, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Rotary Card-Cutters, of which the following is a specification.

This invention relates to improvements in devices for automatically feeding strips of card-stock to the cutters of a card-cutting machine, in devices for automatically counting said strips as they are so fed, to improvements in the table of such machines upon which the cut cards are deposited, and in devices for facilitating the gathering and banding of said cards; and the object thereof is to provide a machine which will automatically feed rapidly from a pile, or otherwise, one strip of card-stock at a time to the cutters, which will automatically and accurately count said strips as they are fed, and operate to remove a predetermined number of cut cards away from the delivery-rollers as often as such a number shall have been there deposited, and to provide a receiving-table for said cut cards from which they can be conveniently and rapidly removed in packs of a certain number.

I attain the above-named objects by the construction and devices illustrated in the accompanying drawings, in which—

Figure 1 is an isometrical view of a complete machine embodying my improvements. Fig. 2 is an elevation, partly in section, of the front end of the machine, showing the operative parts thereunder. Fig. 3 is a plan view of the parts shown under the table in Fig. 2, with the table turned over. Fig. 4 is a side elevation, partly in section, of the central portion of the table, of a portion of the feed-plate-actuating devices under the latter, of the feed devices upon the table, and showing the relative position of the feed-rollers, cutters, and delivery-rollers to the feed devices. Fig. 5 is a view of the vertical pile-plate with one only of its supporting parts, and detached from the machine. Fig. 6 is an enlarged transverse section of the part of the feed-plate which operates against the card-strips. Fig. 7 is a plan view of the stop-motion and counter-operating devices located under the table of the machine, shown in the position occupied by them when oper-

ating to stop the counting. Fig. 8 is a plan view of the same parts, showing their positions while the counting device is operating. Fig. 9 is a side elevation of the end of the counter-rod shown in Figs. 7 and 8. Fig. 10 is a view of the front end of the stop-motion lever and the forked end of the spring-lever shown in Figs. 7 and 8. Fig. 11 is an isometric view of the counting device, actuating-gear sector, and a pinion, its arm, and a portion of a connecting-rod pivoted between said arm and the card-removing devices, operating by said counting devices above the card-receiving table. Fig. 12 is a side elevation of a portion of the devices shown in Fig. 11, showing the arrangement of a pawl-governing roller over one of the ratchets shown in said Fig. 11. Fig. 13 is a view, in vertical section, of the counting device and its hanger, showing the position of the parts thereof upon their supporting-stud.

Like letters refer to like parts in the several figures.

The general construction and operation of a portion of the feed-actuating mechanism of this machine will be found in the Patent to Saml. Brown, December 22, 1868, No. 85,064. The arrangement of the cutter-shafts, cutters, and feed and delivery rollers is that ordinarily employed, and my improvements are adapted to co-operate with those and the devices described in said patent. In this machine the figures designated *i* in said patent and their general actuating mechanism are employed, but their function is not the same as there set forth.

Hung in suitable hangers, 1 2 3 4, under the feed-table A of the machine, are two short shafts, 5 6, provided with clutch-pulleys 7 8, and each with a crank, 9 9, which cranks have fixed between them a shaft, 10, which, with said cranks and shafts 5 6, make substantially a crank-shaft complete. Said pulleys 7 8 are driven by belts from the lower cutter-shaft, *a*, of the machine, as in said patent.

On the inner sides of the hangers 2 and 3 are provided two horizontal ways, 12 13, and a cross-head to slide on said ways is formed from two grooved blocks, 14 15, united by a cross-bar, 16, to which said blocks are solidly attached. Fitted properly on said cross-bar 16

and shaft 10 are two connecting-rods, 17 18, so that the revolution of said crank-shaft causes said cross-head to be reciprocated horizontally under the table A on the ways 12 and 13.

5 Two posts, 19 20, are secured in a vertical position on cross-bar 16, and to their upper ends are connected pivotally two horizontal rods, 21 22, and these last-named rods are connected to a plate, 23, and said plate carries a
10 series of lifting posts or fingers, *o o o o*, which project from said plate up through slots *o'* in table A, as shown. Secured under each end of said plate 23 and to it are two posts, 24, and to the lower end of each of said posts is rigidly fixed a flat bar, 25, and said bars lie on
15 two cam-rollers, 26, on shafts 5 and 6.

Through the operation of the above-described reciprocatory mechanism, connected, as described, with plate 23, carrying said posts or
20 fingers, and the co-operation of cams 26, said fingers *o* are caused to have a longitudinal reciprocating motion and a rising-and-falling motion in the slots *o'* in table A.

Lying on top of table A is a metallic feed-plate, B, perforated to allow the ends of fingers *o* to project up through it slightly above its upper surface. The rear edge of said feed-plate is slightly elevated above the surface of
25 table A, as seen in Fig. 4, and just back of its opposite edge, which lies next to the feed-rollers, is formed a feed-edge, *c*, and from said edge *c* the plate inclines to its edge proper, which is finished quite thin, as seen in Fig. 6, and into the said inclined face of said plate is fixed
30 a strip of thin rubber or like frictional-surfaced material, *d*.

As seen in Fig. 4, the ends of fingers *o* pass up through plate B, on the line of the edge *c* thereof. Feed-plate B is adapted to be moved
40 back and forth on table A, and at each forward motion to push a strip of card-board between the feed-rolls, moving simultaneously with the fingers *o*, actuated by the cross-bar 16, through its connection therewith, as follows: Two posts,
45 27, are rigidly secured to the under side of said plate, and, passing down through slots in table A similar to slots *o'*, are attached by their lower ends to two bars, 28, which are secured to said cross-bar and lie upon supporting-roll-
50 ers 29 on shafts 5 and 6.

Between the edge of the feed-plate B and the feed-rollers *e* is set vertically a pile-plate, *b*, supported by two posts, *i i*, and adapted to be adjusted vertically thereon by a screw-rod,
55 as shown in Fig. 5. Said pile-plate *b* is provided with a flexible lower edge, D, consisting of rubber or other material of like nature, which is secured against one of the faces of said plate by a strip, *s*, screwed on, as shown.

60 Projecting rearwardly from behind the delivery-rollers of the machine is a card-receiving table, H, having formed in it a series of longitudinal V-shaped grooves. The grooves of said table are so located relative to said cutters that the end of each groove is opposite
65 the edges of three pairs of cutters—that is, one pair is opposite the deepest point of the groove,

and one pair opposite each of the highest points thereof. The inclined faces of the latter are provided with semicircular grooves from the rear end of the table toward the rolls, as shown, and the flat faces of the first-named grooves above the last-named ones are covered with thin india-rubber or other like frictional-surfaced material *n*.

A series of card-pushing arms, *v*, secured to an oscillating frame, *h*, located under table H, project up through the end of the latter-named table, one through each of the inclined faces of the grooves thereof. Said card-pushing arms
80 move from just under the delivery-rolls toward the rear end of table H, and back in slots in the sides of the grooves therein, as shown in Fig. 1, and their movements are governed by a strip-counting mechanism located under both
85 tables of the machine, and consisting of the following devices.

A reciprocating endwise motion is given to a connecting-bar, K, one end of which is connected to the sliding block 15, under table A, by a bolt, 30, secured to said block and projecting from it through a suitable slot in the hanger 3, Figs. 2, 7, and 8. Said bar K is connected to the vertical arm of a geared sector, 31, and the lower end of said arm is pivoted to a pending support secured to the machine, as shown in Fig. 1. Thus, when the aforesaid cross-head parts under table A are slid to and fro, as described, an oscillating motion is given to sector 31.

A shaft-hanger, 32, is secured against the inner side of the frame of the machine, as seen in Fig. 1, and said hanger supports a short shaft, 33, and one other one, 34, parallel to and by the side of the latter, but somewhat longer. This latter shaft, 34, is shown only in section in Figs. 11 and 12. Where shaft 33 enters the hanger 32 a socket, 35, is provided around said shaft, formed by a cup-shaped projection from said hanger. A ratchet-case, 36, having a long hub, as shown in Fig. 13, the end of which is reduced to enter said socket 35 in said hanger, is fixed on shaft 33, and at the base of said socket a pin, 37, is fixed, which prevents the hub of said ratchet-case from turning therein. A pawl-arm, 38, carrying two pawls, 39 40, is provided with a hub, which fits on the hub of the said ratchet-case 36, and may freely turn thereon. On the said hub of the pawl-arm a gear-wheel, 41, is securely pinned, as shown in Fig. 13, and with the last-named gear-wheel the geared sector 31 engages. Thus the aforesaid oscillatory movements of said sector cause the gear 41 to rotate reciprocally, and impart like motions to the said pawl-arm and pawls. Said ratchet-case 36 has an opening made in its periphery of such length only as to permit the pawl 39 to move the ratchet-wheel 42 within it one tooth for each forward movement of the pawl-arm and pawl. Said ratchet 42 turns on a collar on shaft 33, which is secured by a pin, as shown in Fig. 13, to the hub of case 36, so that the first-named hub, as well as the latter one, cannot revolve on said shaft.

Against the face of ratchet-wheel 42 is secured a second ratchet-case, 43, as shown, so that the last-named ratchet-wheel and case revolve together.

5 A second ratchet-wheel, 44, provided with a hub, as shown, is fitted to turn on shaft 33, within the case 43, the periphery of which is likewise provided with a like opening to that above described in case 36. On the hub of
10 said ratchet-wheel 44 is fixed a gear-wheel, 45, and outside of the latter, on shaft 33, is a collar securing the above-mentioned parts on said shaft. Pawl 40 rides on the periphery of case 43, as does pawl 39 on case 36. Thus each
15 movement of the ratchet-wheel 42, one tooth at a time, carries the case 43 around with it until, after making the requisite part of one revolution, the opening in its periphery comes around within the reach of pawl 40 as it swings
20 back and forth on the periphery of case 43, when pawl 40 engages with a tooth in wheel 44, and the latter and gear 45 are then rotated together to the extent of the forward movement of the pawls.

25 It will be understood that pawl 40 engages with wheel 44 at the beginning of the forward movement of the sector 31, so that at the end of the movement of the latter the requisite degree of rotary movement for the purposes hereinafter named has been imparted to gear 45.

30 A post is fixed upon the upper side of case 36, to which is hung a stop-pawl, as shown in Fig. 11, and said pawl acts through an opening in said case under its point upon ratchet-wheel 42, to prevent it from turning backward.

35 Upon the shaft 34, above named, is hung a gear-wheel, 46, with which gear 45 engages, and to which is secured, against its side, an arm, 47. To arm 47 is pivoted a connecting-rod, 48, whose opposite end is pivoted to the oscillating frame *h* under table H. Thus when gear 45 is revolved, as above described, gear 46 makes one revolution, swinging arm 47, and, through its connection by rod 48 with the frame *h*,
45 causing the latter to swing and throw the ends of the card-pushing arms *v* quickly from the delivery-rolls. Said arms are carried back to their starting-point quite under said rolls by the joint action of arm 47 and springs 49 and
50 50. This last-named spring is connected to rod 48 and to the upper part of frame *h*, and prevents the weight of rod 48 from tending to throw the ends of the arms *v* by reaction or by gravity in front of the delivery-rolls.

55 Recalling, now, the before-described action of the reciprocating parts under table A, and the simultaneous action therewith of the feed-plate B and fingers *o* resulting from their connection with said parts, it will be seen, since
60 the sector 31 is connected by rod *k* to said reciprocating parts, that each time the said feed-plate is moved forward and back the pawl 39 acts upon ratchet-wheel 42, and that after a certain number of such actions pawl 40 carries
65 ratchet-wheel 44 and gear 45 around, causing the card-pushing arms *v* to be thrown forward, as above described.

As before mentioned, the feed-plate B is adapted to operate to push a strip of card-board between the feed-rolls at each forward
70 movement, and simultaneously with each of said motions the counting device is operated as aforesaid; but to prevent any registering action of the said counting device when from
75 any cause said feed-plate acts without pushing a strip of card-board between said rolls, the following devices are applied above and on the under side of table A, to prevent rod K from being operated when no card-strip is fed to the rolls, as aforesaid. 80

As shown in Fig. 9, a longitudinal slot, *z*, is made in the flattened end of bar K, and bolt 30 is held to one end of said slot by a latch, 51, pivoted on the side of said bar, so long as
85 the card-strips pass regularly to the feed-rolls; but when the feed-plate moves forward without so carrying said strips latch 51 is caused to be lifted up by the operation of devices hereinafter described, letting bolt 30 move back
90 and forth in slot *z* without moving bar K.

A flat lever, 52, is pivoted against the under side of table A. Said lever is provided with a vertical pin, 53, projecting downward from near its front end, and upon said pin 53 is fitted, so it may swing thereon, a horizontal
95 pin, 54.

Upon the top of the grooved block 15 is fixed a cam-block, 55, having two guides, 56 57, projecting above its face. The lever 52 is so placed relative to said cam-block that the lower
100 end of pin 53 may be acted upon by said guides 56 57, as seen in Figs. 7 and 8, causing lever 52 to be oscillated against the under face of table A, and causing the horizontal pin 54 to be moved back and forth over the top edge of
105 the bar K, and in the path of the vertical arm 51^a on latch 51, as said bar moves back and forth, as aforesaid.

While lever 52 is unobstructed it is vibrated on its pivot *g* with each back and forward move-
110 ment of block 15, guide 56 operating against the side of pin 53 when it is moved from the position shown in Fig. 8 to that shown in Fig. 7, and so moving pin 54 back and forth through hanger 3, as aforesaid. When pin 53 is so op-
115 erated upon by guide 56 it moves against the action of the forked lever 58, and when lever 52 is swung to the position shown in Fig. 7 said lever 58, actuated by its spring 59, causes the forward end of lever 52 and pin 53 to swing
120 by the wide end of guide 56 to a central position between its arms, as in Fig. 8, when the said guide moves forward with said pin on its outer edge, and said lever 58 forces pin 53
125 to be again acted upon by guide 56, as aforesaid.

The vibratory movements of lever 52 are interrupted and the end of pin 54 is left project-
130 ing beyond the side of hanger 3, so that it will be hit by arm 51^a on latch 51, and thus lift up said latch and interrupt the operation of the counting device, as follows.

Hung on plate *b*, above table A, in such a po-

sition that each strip of card-board as it is fed to the rolls by plate B must lift it up, is a stop-latch, 60, its free end adapted to drop edge-wise through a slot, 61, in table A, under the edge of plate *b*. The down position of said latch is shown in dotted lines in Fig. 4. The rear end of lever 52 vibrates back and forth by said slot 61; but when no card-strips pass under latch 60 its lower end hangs down below the under side of table A and holds lever 52 in the position shown in Fig. 7, keeping the end of pin 54 in the path of arm 51^a on latch 51, as aforesaid.

Guide 57 is so placed and formed as to move against pin 53 while it stands in the position seen in Fig. 7, and as it passes it to swing lever 52 slightly away from latch 60, that the latter may be free to be lifted by a passing card-strip should one be fed along.

The general operation of this machine in feeding, cutting, and counting cards will be easily understood after the following detailed description of its various operative devices. A quantity of strips of card-board, E, is placed in a pile upon table A, as seen in Fig. 4. The rear edge of said pile rests upon the inclined border of feed-plate B, just forward of its feed-edge *e*, and upon its frictional-surfaced material *d*, and the opposite edge of said pile rests directly upon table A, its rear side close against the strip *s* on plate *b*. The lower flexible border, D, of plate *b* is adjusted relative to the contiguous surface of table A, so that its lower edge is even with the said surface, or a very slight distance above it, to the end that a strip of card-board in passing under it may be acted upon evenly and slightly by the yielding nature of said flexible frictional-surfaced border D, to retain it somewhat backward against the feed-edge *e*, and to insure a steady forward movement of said strip. The rear edge of the feed-plate, as before mentioned, is elevated somewhat, so that the extreme edge of the pile of strips may bear hardest upon said feed-plate, and thus cause the edge *e* to catch un-failingly against the edge of the lower strip of the pile and be carried forward with it. After said pile of card-board strips has been so placed on the machine it is started up. Feed-plate B moves forward, carrying with it the lower sheet or strip of the pile, and as soon as the rear edge of said strip has been so carried a little way beyond the edge of the pile the fingers *o* rise up, lifting the pile up away from the bottom sheet, so that only a small part of its weight, and that near plate *b*, rests upon the latter, thus permitting it to be easily moved forward without danger of injury to it. As said sheet is moved along latch 60 lies upon the top of it, falling after it has passed, to be again lifted by the succeeding strip. When said sheet has moved forward so as to be caught by the feed-rolls *e e* it is by them fed to the cutters, and the cut pieces are taken thence by the delivery-rolls in the usual way. In this machine, however, the cut cards drop upon the grooved

table H, two at a time, upon the end of the grooves next to the delivery-rolls, over beyond the arms *v*, lying one upon each of the inclined faces of said grooves.

As has been before stated, the counting device operated by sector 31 acts when a card-strip is fed to the cutters, and when such a number of cards has been fed and laid upon each face of the grooves in table H as it is devised to remove and band together, the arms *v* are by the mechanism above described caused to swing, throwing said cards to the rear end of the table H, from whence they can be conveniently removed. The frictional strips *n* on the faces of the grooves in said table serve to retard said cards as they slide back, and prevent their shooting off from the table. A swinging frame, F, is hung over said table, the arms of which hang in the way of the cut cards as they are thrown along the grooves, and they also serve to impede the force of the said cards as they are thrown by arms *v*, and to prevent the cards from being thrown too far by the delivery-rolls.

If desired, this machine may be employed to cut card-strips by laying said strips, one at a time in succession, between the feed-edge *e* of the feed-plate and the pile-plate *b*, and when thus used it will feed and count accurately.

What I claim as my invention is—

1. In feeding mechanism for card-cutting machines, the feed-plate B, having its forward edge inclined, and provided with the feed-edge *e*, in combination with mechanisms, substantially as described, for moving said feed-plate toward and from the feed-rolls of said machine, substantially as set forth.

2. The feed-plate B, having its forward edge inclined and partially covered with the frictional surfaced material *d*, and provided with the feed-edge *e*, substantially as and for the purpose set forth.

3. The combination, with the table A and with appliances, substantially as described, for moving it under the pile of card-strips toward and from the feed-rolls, of the feed-plate B, having its rear edge elevated above the surface of said table, whereby the weight of said pile of card-strips is made to bear most strongly upon said feed-plate just forward of the feed-edge *e* thereon, substantially as and for the purpose set forth.

4. The combination, with the feed-plate B and with appliances, substantially as described, for moving them reciprocatingly in a vertical and a horizontal direction, of the fingers *o*, substantially as and for the purpose set forth.

5. In combination with the cam-block 55, the lever 52, carrying pins 53 and 54, the stop-latch 60, and the spring-actuated lever 58, substantially as and for the purpose set forth.

6. The latch 51, provided with arm 51^a, pivoted on bar K, in combination with the pin 54, and with appliances, substantially as described, for causing said pin to remain extended across the top edge of said latch when the feed-plate

B operates without carrying a card-strip to the feed-rolls of the machine, substantially as and for the purpose set forth.

7. In combination, the bar K, provided with a slot to receive the end of bolt 30, and having latch 51, pivoted above said slot, sector 31, gear 41, and reciprocating mechanism, substantially as described, under table A, carrying said bolt 30, substantially as and for the purposes set forth.

8. In combination, the swinging frame *h*, carrying-arms *v*, gear 46, carrying arm 47, gear 45, gear 41, and sector 31, and mechanism, substantially as described, whereby, after a certain number of vibratory movements of said sector-arms *v* are swung from under the deliv-

ery-rolls of the machine and back again, substantially as and for the purpose set forth.

9. The table H, having longitudinal V-shaped grooves therein, in combination with the vibratory arms *v*, substantially as and for the purpose set forth.

10. In combination, the table H, having V-shaped grooves therein, partially covered with frictional-surfaced material *n*, the swinging frame F, and the vibratory arms *v*, substantially as set forth.

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Witnesses:

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