

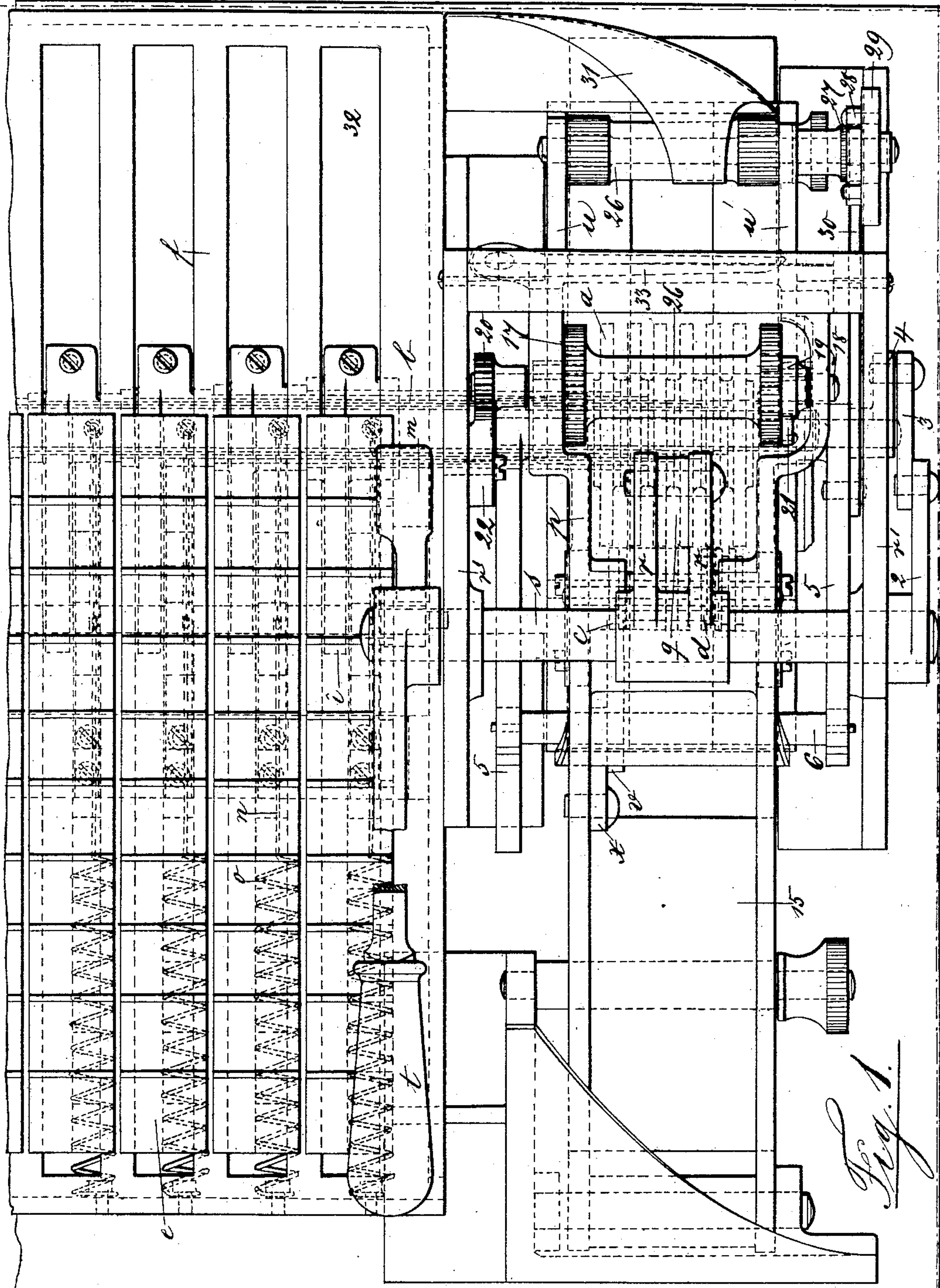
(No Model.)

9 Sheets—Sheet 1.

T. EKROTH.
CASH REGISTER.

No. 470,423.

Patented Mar. 8, 1892.



Witness

Chas. H. Smith
J. Stail

Inventor

Teodor Ekroth
per Lemuel W. Serrell atty

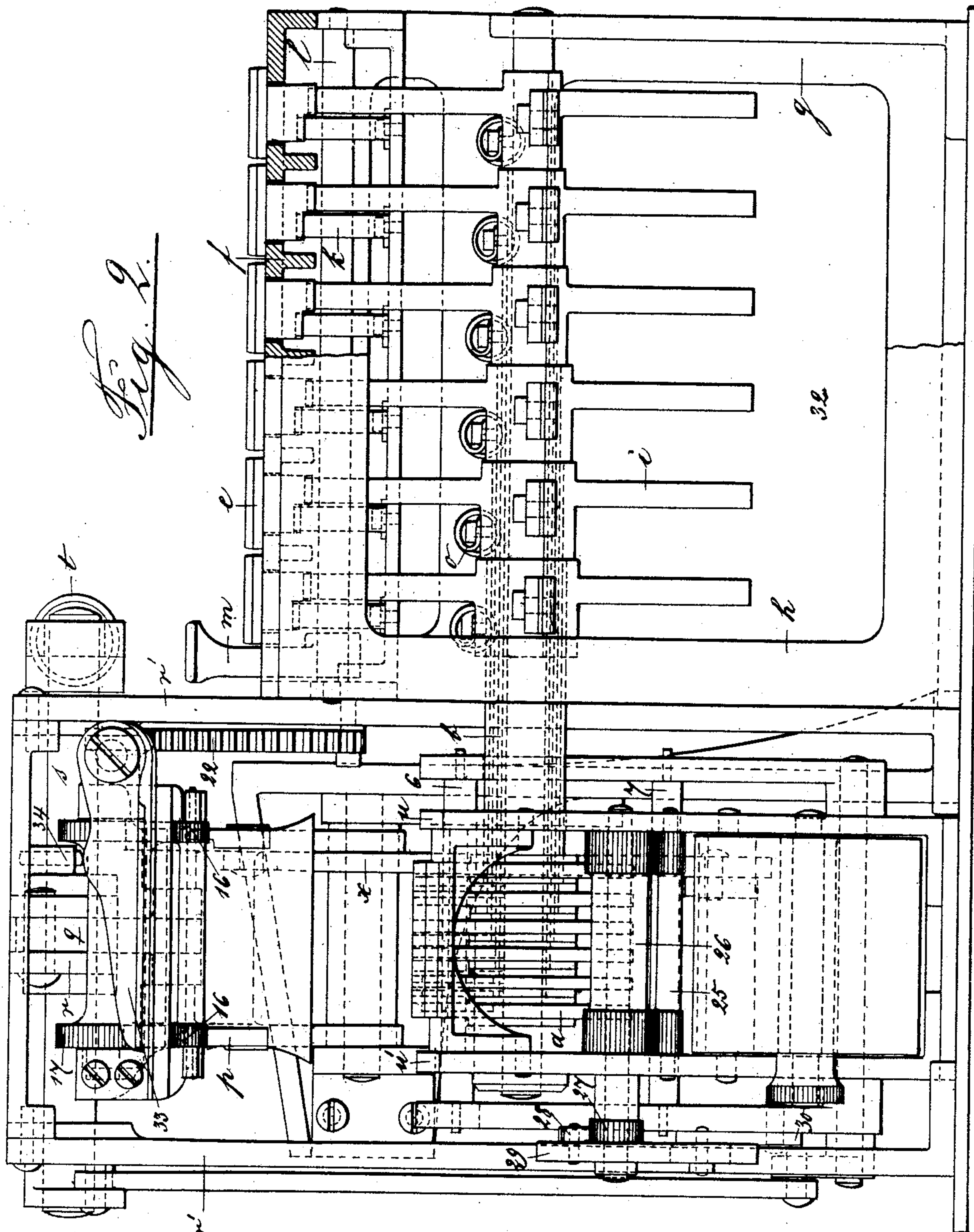
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Witnesses

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(No Model.)

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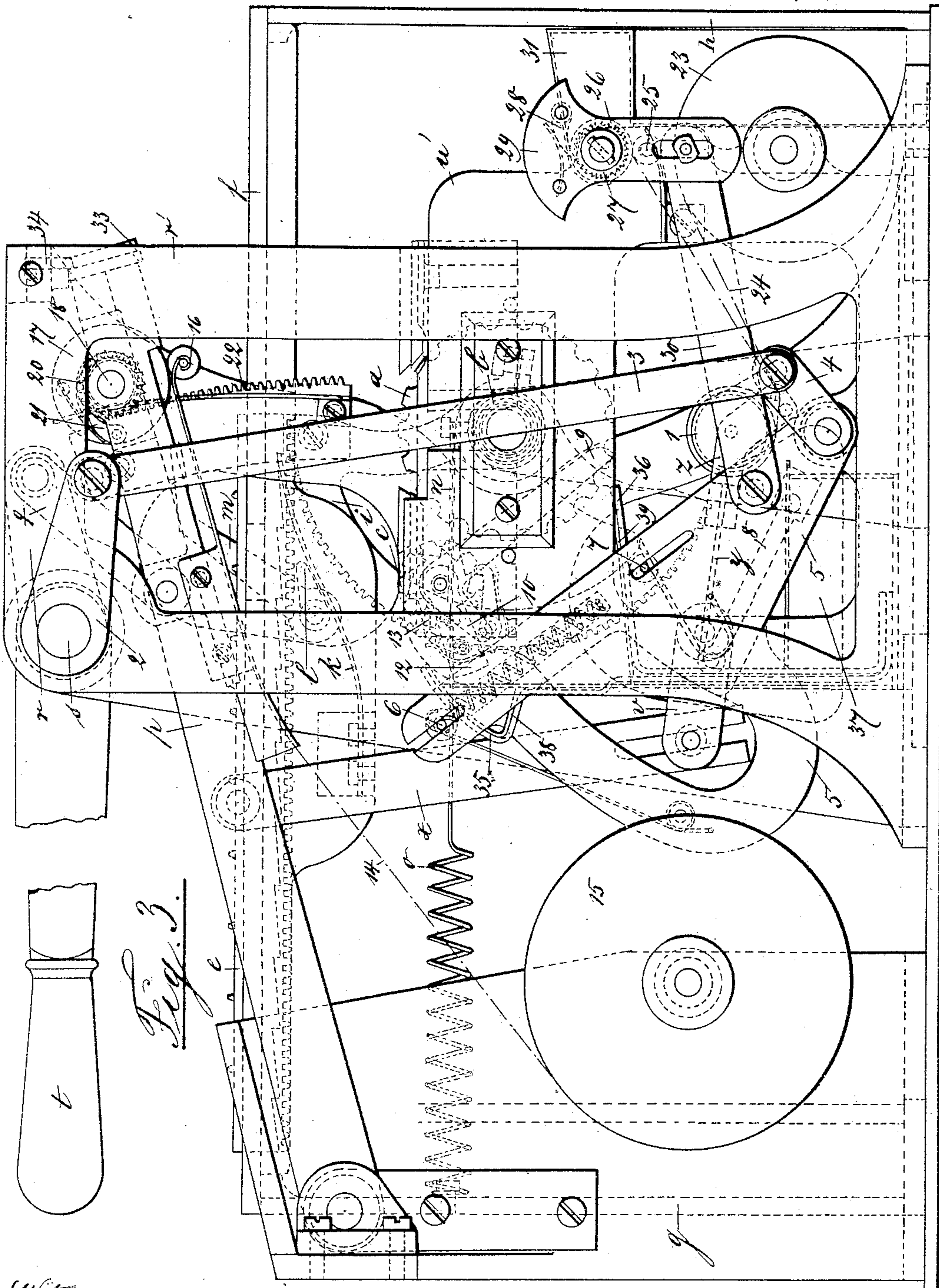


Fig. 3.

Witness

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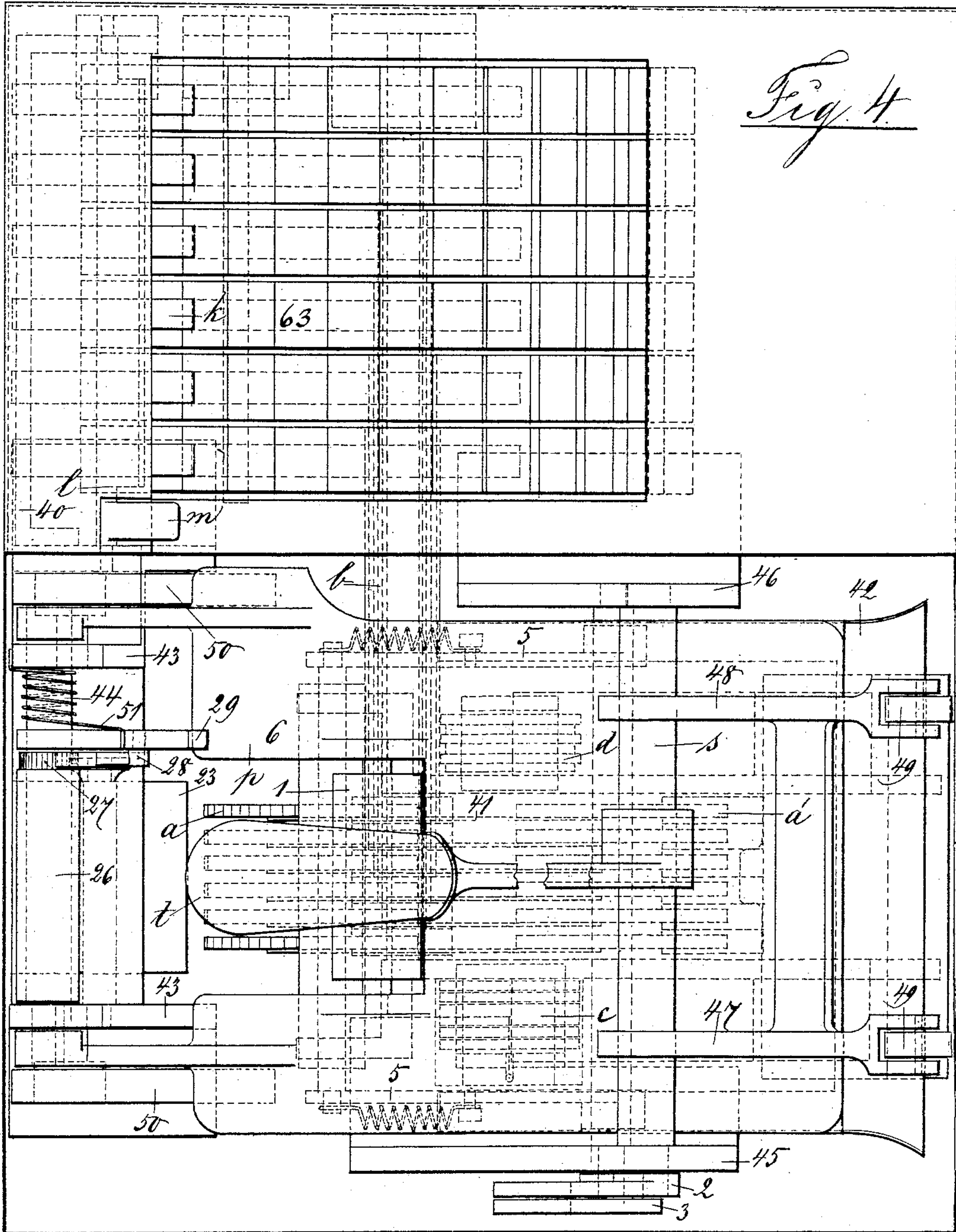
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9 Sheets—Sheet 4.

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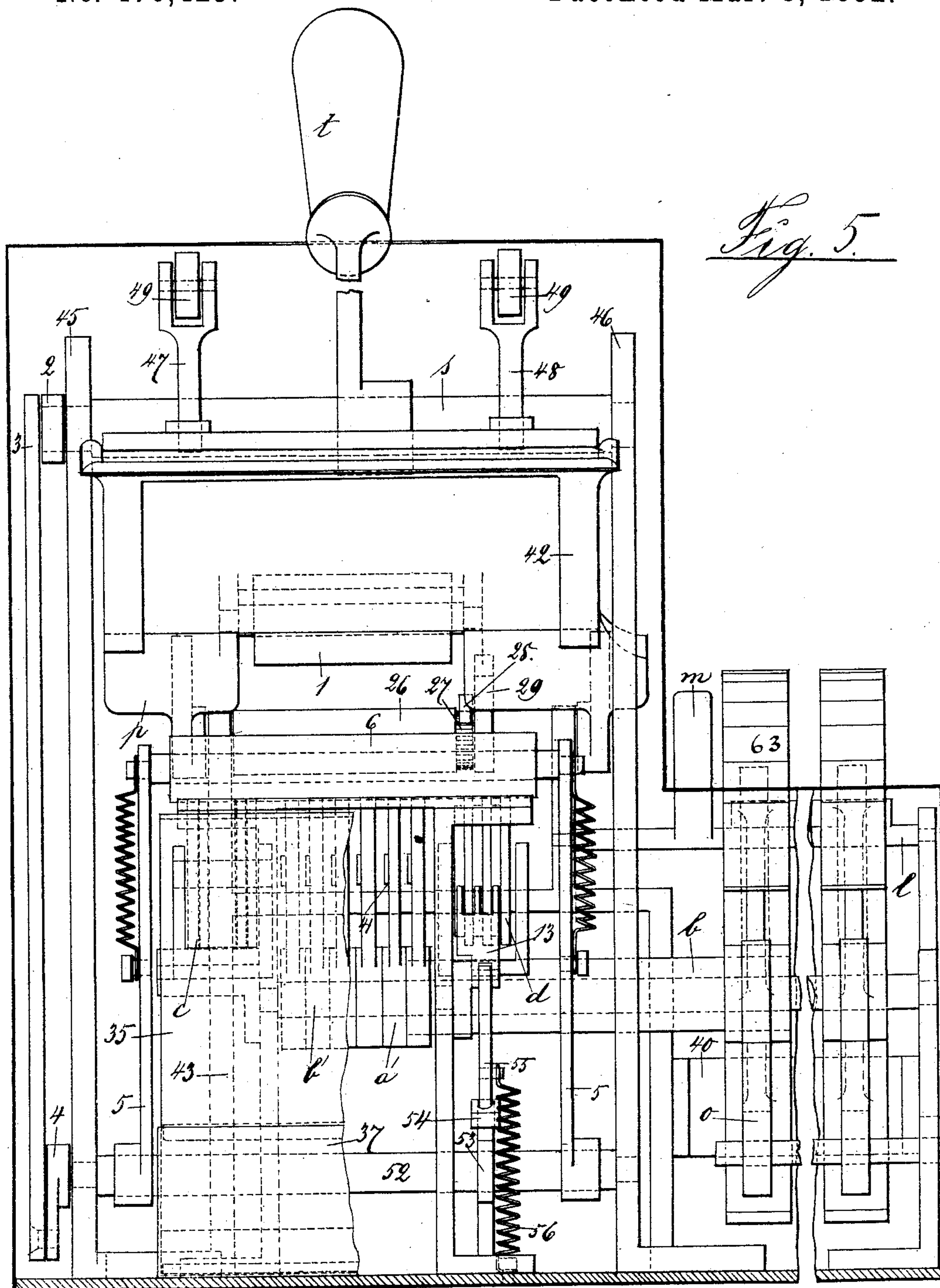
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9 Sheets—Sheet 5.

T. EKROTH.
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Patented Mar. 8, 1892.



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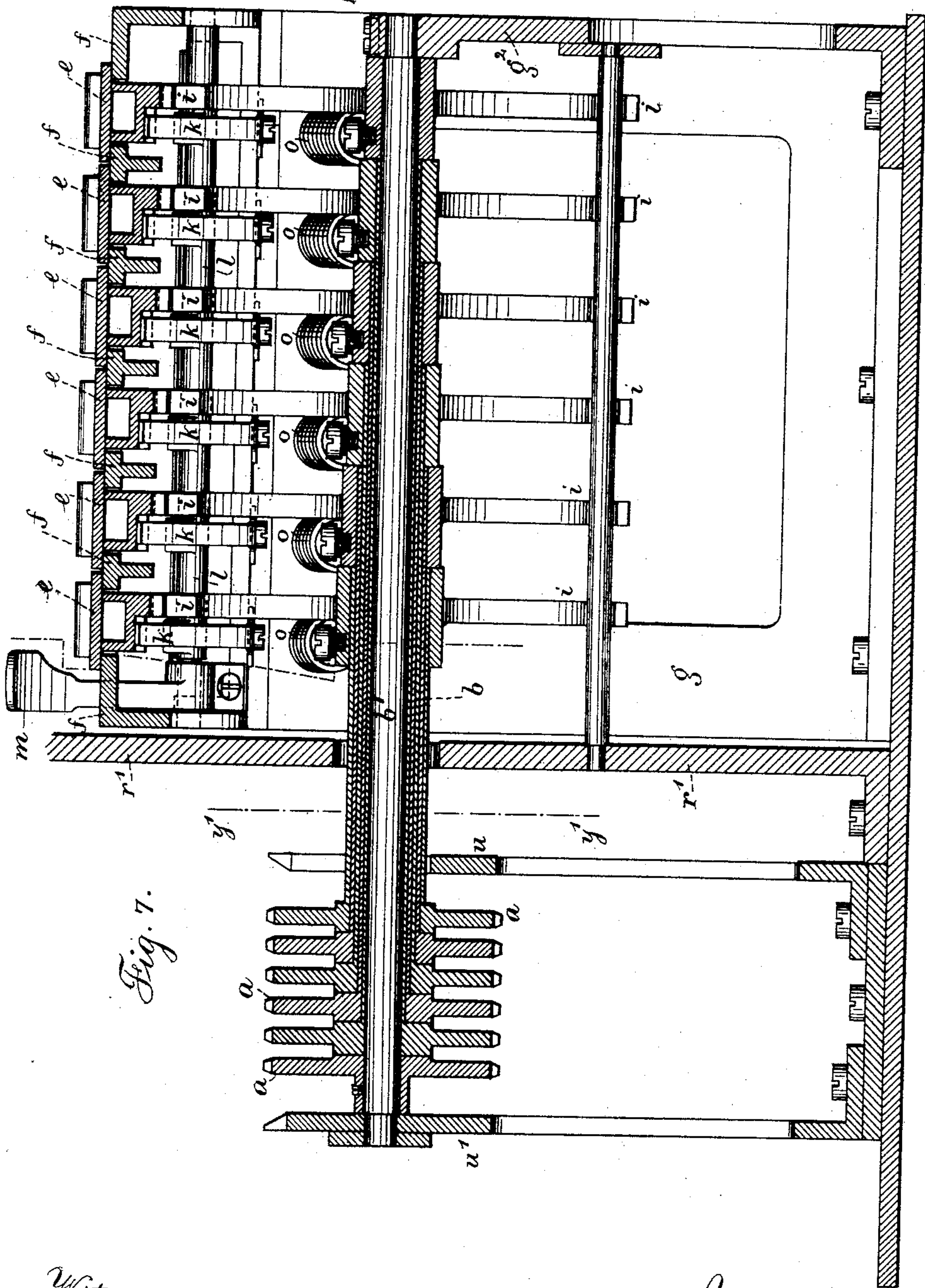
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9 Sheets—Sheet 7.

T. EKROTH.
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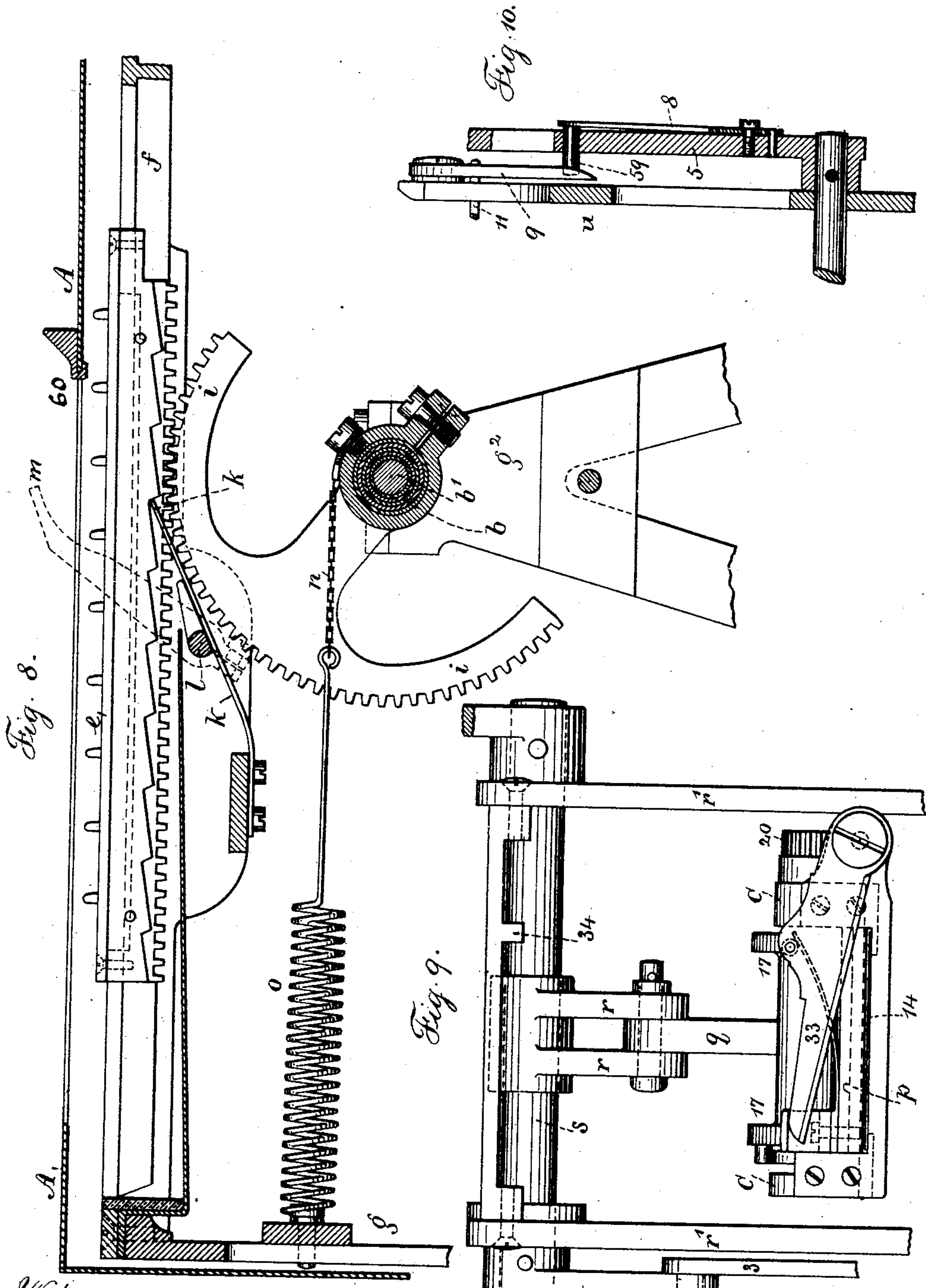
(No Model.)

T. EKROTH.
CASH REGISTER.

9 Sheets—Sheet 8.

No. 470,423.

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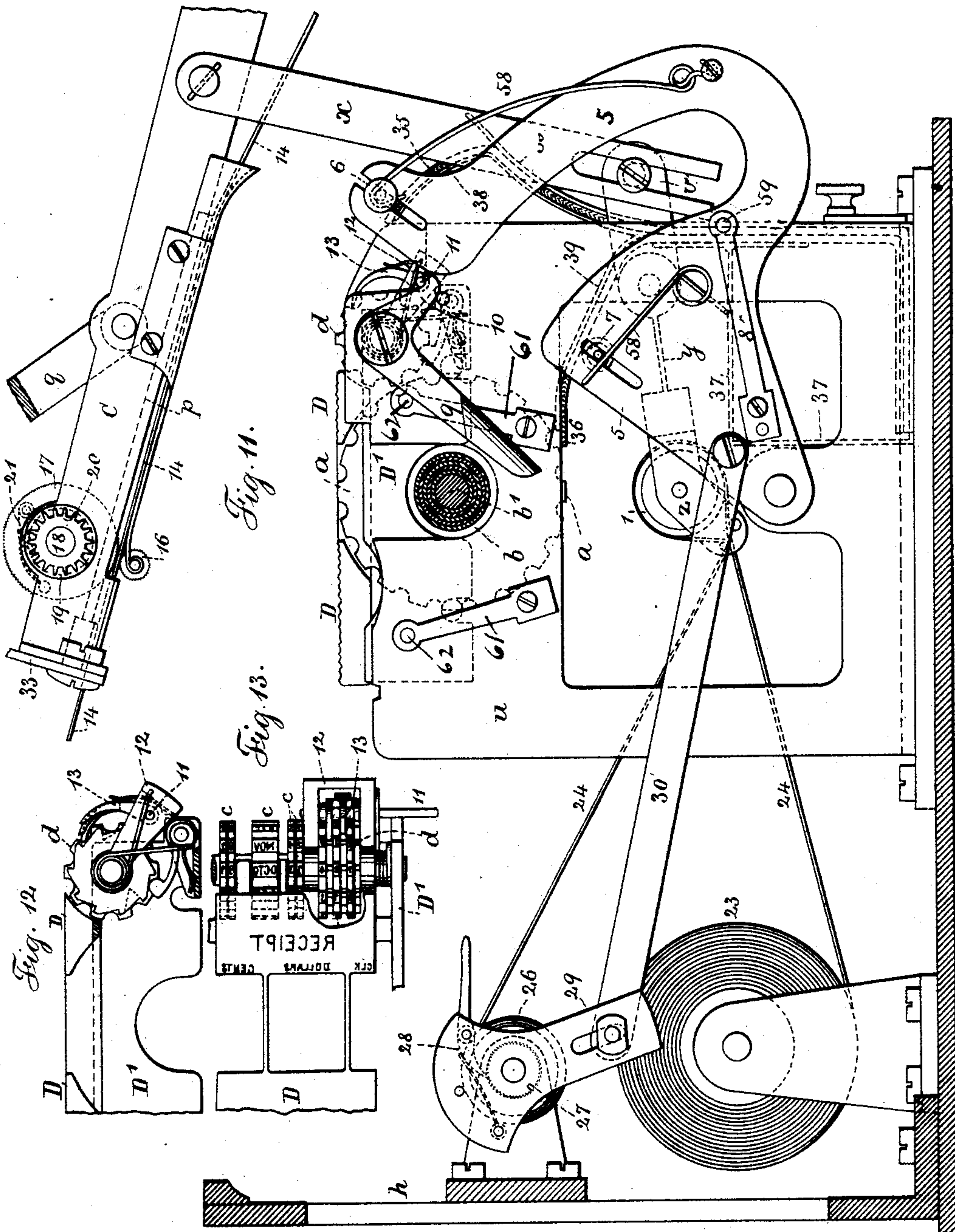
Witnesses:
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UNITED STATES PATENT OFFICE.

TEODOR EKROTH, OF STOCKHOLM, SWEDEN.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 470,423, dated March 8, 1892.

Application filed August 14, 1890. Serial No. 361,968. (No model.) Patented in Germany April 2, 1890, No. 56,653; in Belgium April 3, 1890, No. 90,075; in England April 3, 1890, No. 5,229, and in Finland April 10, 1890, No. 356.

To all whom it may concern:

Be it known that I, TEODOR EKROTH, a subject of the King of Sweden, residing at Stockholm, Sweden, have invented an Improvement in Cash-Registers, (for which Letters Patent have been granted in Belgium April 3, 1890, No. 90,075; in Finland April 10, 1890, No. 356; in Great Britain April 3, 1890, No. 5,229, and in Germany April 2, 1890, No. 56,653,) of which the following is a specification.

The object of this invention is to indicate the amount in dollars and cents or other currency of a purchase and then to make a printed record thereof and simultaneously to print a slip or receipt to be given to the purchaser, and upon this slip or receipt the name of the person or firm carrying on the business will usually be printed, and also a number to denote the successive sales recorded on the machine and either a letter or other character to denote the person effecting the sale. The amount of the sale is simultaneously printed on a separate strip of paper, so that the total sales can be computed by adding up the sales that are printed successively.

In carrying out my invention I make use of a range of slides or swinging segments having numbers to indicate values, and there are a corresponding number of type-wheels connected to the slides or segments by tubular sleeves of successively-increasing diameters, and the printing is effected by a lever and impression-plate above the type-wheels, and a second impression is taken upon a strip of paper around an impression-roller that is brought up below the type-wheels, it being understood that upon the type-wheels similar characters are applied upon the opposite edges, and I also provide for inking the impression-surfaces and for feeding along a strip of paper from a roll and cutting the same off by shears after being printed upon, so as to form a check or receipt to give to the customer.

In the drawings, Figure 1 is a general plan view of the apparatus, the inclosing case being removed and some portions of the mechanism broken off. Fig. 2 is an elevation at one end of the apparatus, the case being removed and portions of the supporting-bed in section.

Fig. 3 is an elevation at one side of the machine, the case being removed. Fig. 4 is a plan view. Fig. 5 is an end elevation, and Fig. 6 is a side view representing the invention with swinging sectors instead of slides. Fig. 7 is a section longitudinally of the main shaft. Fig. 8 is a detached view of one of the slides and a toothed sector therewith connected, the main shaft being in section. Fig. 9 is a detached view of the shears. Fig. 10 is a detached sectional view of the spring-pin for actuating the counting mechanism. Fig. 11 is an elevation with the shaft in section at the line $y'y'$ of Fig. 7. Fig. 12 is a side elevation, and Fig. 13 a plan, of the counting-wheels.

The type-wheels a are all alike—that is to say, each type-wheel has two sets of numerals in regular order, so that the same number is duplicated upon the opposite edge of the wheel, and the shaft b' is supported in suitable frames or standards, such as those shown at $u'g^2$, and around the shaft b' are tubular axles or sleeves b of successively-increasing diameter and of decreasing length, and the sleeves are connected successively to the type-wheels and to the cog-segments i , as indicated in Fig. 7, so that the outer type-wheel and the outer cog-segment are fastened to the shaft b' , the next type-wheel and cog-segment are fastened to the first tubular sleeve around the shaft b' , and so on, and these cog-segments are acted upon by the number-plates e , which have upon their under surfaces rack-teeth gearing with the cog-segments i . Hence each type-wheel is moved by its corresponding number-plate.

The number-plates e are supported by and slide between the guide-bars f , that are fastened at their ends to the frames of the machine, and the inclosing case A is provided with an opening sufficiently large to expose all of the number-plates e , as indicated in Fig. 8, when such number-plates are in their normal position, and upon the number-plates there are cross ribs or projections between one number and the next, so that the finger of the operator can be placed upon the number-plate and at the desired number and the number-plate slid along until the finger comes in contact with the inclosing case at the edge

60 of the opening, and in so doing the corresponding numbers upon the connected type-wheel will be placed in position for impressions to be taken, as hereinafter set forth, and in the normal position the number-plates all stand at zero, and they are to be moved in succession by the attendant to denote dollars and cents or francs and centimes.

I have represented two columns or number-plates adapted to cents or centimes and three number-plates adapted to dollars or francs up to nine hundred and ninety-nine, and another number or indicating plate, which is connected with the outer or largest tubular axle, which may be used to indicate by either a number or a letter the party making the sale or recording the purchase.

By the description thus far given it will be understood that the type-wheels can be placed in the desired position by the number-plates, and that thereafter two impressions can be taken from the type-wheels, one being taken at the upper side and the other at the under side of the type-wheels, and that these impressions will be alike.

Each of the number-plates is provided upon the under side with notches corresponding in number and position to the numbers or characters upon their faces, as illustrated in Fig. 8, and there is a range of spring-pawls k , which catch and hold the number-plates as they are moved to position, and upon the hub of each of the cog-segments i a cord or chain n is connected and also connected to a spring o , so that the respective plates and type-wheels are firmly held in position by the pawls and springs during the impression, and there is a rock-shaft l across above the spring-pawls k and provided with toes, so that when the handle m is depressed and the rock-shaft l moved the spring-pawls k are disengaged and the number-plates e and type-wheels are returned by the springs o to their normal positions, and there may be pieces of leather or rubber for the plates e to strike against to lessen the concussion. There is a frame r' adjacent to or connected with the guides f , and the cross-shaft s is provided with a lever-handle t and with toggle or crank-arms r and link q connected to an impression-frame C, pivoted at its back end to the standard C', so that by the movement of the handle t this frame C can be raised or lowered to give the impression and to feed the paper, and there is an impression-plate p , carried by the frame C, and preferably having an elastic under face, so as to give an impression upon the strip of paper 14, that is led off from the roll 15 of paper, and this paper passes beneath the impression-plate p , and it is supported at its edges by guides (see Figs. 3 and 11) and small rolls 16, and above the rolls 16 is a cross-axis 18 and feed-roller 17, which is adapted to press only upon the strip of paper near the edges and above the rolls 16, and upon the axis 18 of the feed-roll is a pinion 20 in gear with a stationary segmental rack 22 upon one of the frames r' . The feed-

roll 17 is loose upon the axis 18, and there is a ratchet-wheel 19 upon the axis and a pawl 21 upon the feed-roll 17, so that when the impression-frame C is being raised by the handle t the rack 22 rotates the pinion 20, axis 18, and feed-roll 17, and the strip of paper 14 is projected from the end of the frame C, and when the impression-frame C is being brought down the axis 18 and pinion 20 are revolved in the opposite direction and turn without rotating the feed-roll 17, and it is to be understood that the parts are proportioned so that the proper length of paper strip 14 is projected for delivering the printed matter, and I provide a shear 33, that in its normal position is raised by a spring to allow the strip 14 of paper to pass out freely, and at the extreme upward movement the shear 33 comes in contact with the stationary projection 34 to move such shear and cut off the paper that has been projected. A second roll 23 of paper is provided, and such paper passes around the roll 1 and is kept in position by guide-wires, and from thence it is led to the wind-up or feeding roll 26, and this roll 1 becomes an impression-roll, the same being upon a fork z at the end of a yielding lever y , the other end v of which is acted upon by a slotted link x , connected at its upper end to the impression-frame C, as illustrated in Fig. 11, so that when the impression-frame C is brought down to print upon the strip 14 the roll 1 is simultaneously brought up to print upon the strip 24 from the roll 23, and the motion that is given to the wind-up roll 26 is to be sufficient for separating one impression from the other, so that the amounts printed upon the strip 24 can be added up from time to time to compute the total amount of the sales recorded on the machine.

The mechanism for inking the type and for actuating the roll 26 consists of the crank-arm 2, link 3, and arm 4 to a rock-shaft carrying the swinging frames 5, that are provided with slots for the inking-rolls 6 and 7 and springs 58 for pressing the inking-rolls upon the surfaces to be inked. The roll 7 passes beneath the type-wheels a , and the roll 6 passes above such type-wheels and the type-wheels are between the yoke-frame $u u'$, the swinging frames 5 being outside of such yoke-frames $u u'$, and the roller 7 passes across through openings in such frames, and there is adjoining the type-wheels and resting upon the top of the yoke-frames $u u'$ a printing-plate D, which may be in the form of an electrotpe or stereotype supported by the removable side plates D', to which the printing-plate is connected, and these removable side plates sit between the yoke-frames $u u'$ and may be held in position by springs 61 with pins 62 or other suitable devices, and these removable side plates carry also the axis for the dating-wheels c , which wheels are to be similar to those used in hand-stamps—that is to say, one wheel has upon its periphery the names of the months or the

abbreviations of the same, and two other wheels have numbers for the days of the month. These are to be moved by hand after the printing-plate and side plates have been lifted out from the machine, and there may also be wheels with numbers to denote the years. Upon the same axis there are numbering-wheels *d*. I have represented three of them in Fig. 13, and there is a swinging crutch or frame 12, having a pin 11 projecting from one side, whereby such crutch is made to swing upon the axis of the numbering-wheels *d*, and this crutch carries a spring-pawl 13 with three forks, the points of which are at increasing distances from the numbering-wheels, and upon each numbering-wheel are teeth adjacent to the numbers and the notches adjacent to the "0" upon the units and tens number-wheels are of successively-increasing depths, so that one fork of the pawl 13 moves the units-wheel each stroke, and when it has made one rotation its pawl drops into the notch adjacent to the "0" a sufficient distance for the next pawl to move the tens-wheel one notch, and in this manner the tens-wheel is turned progressively up to "90," and the notch thereof adjacent to the "0" is sufficiently deep for the spring-pawls to descend and cause the third prong of the pawl to take the third or hundreds wheel, and in this way a computation is continuously effected, so that each impression upon the paper 14 is numbered and the date is printed at the same time as the amount of the sale is indicated by the type-wheels *a*.

Any suitable device may be employed for giving motion to the pin 11 and crutch 12. I have shown a bent lever with an arm 10 to act upon the pin 11, the longer end 9 of which arm is beveled at one edge, and there is a spring 8 upon the swinging frame 5, carrying a pin 59, which passes through the frame and acts upon the arm 9 when such swinging frame 5 is being moved backwardly; but the spring-pin 59 slides over the incline on the arm 9 when the frame 5 is swinging in the opposite direction, so that this pin 59 gives motion to the arms 9 10 and to the crutch and pawls each time an impression is made upon the paper.

In order to apply ink to the rolls 6 and 7 I make use of the pads or inking-webs 35 and 36, the lower ends of which are in the ink-holder 37, and the ink ascends these webs 35 and 36 by capillary action, and there are plates 38 and 39 for supporting the webs 35 and 36, and the roller 6 runs over the inking-web 35 and the inking-roller 7 runs under the inking-web 36, and in this manner such rollers 6 and 7 are supplied so as to ink the type-wheels *a* and the printing-surface of the plate D and the dating-wheels *c* and the numbering-wheels *d*, before referred to.

The inclosing case should be adapted to inclosing the whole of the apparatus, except where the openings are provided to give access to the number-plates *e*, and there is also

to be an opening, through which the strip 14 can be projected before it is cut off. The strip 24 of paper may be wound upon the roller 26, as shown in Fig. 11, or it may pass between the rolls 25 and 26, as shown in Fig. 3. In the latter instance the paper may pass off through the trunk of receiver 31, Figs. 1 and 3, into the portion 32 of the apparatus and within the case; but when the paper is wound upon the roller 26 the parts 31 and 32 are not required. Under either condition the roll 26 is rotated progressively by the action of the link 30, extending from the swinging frame 5 to the rocker 29, which has the axis of the roll 26 for its pivot, and this rocker 29 carries a pawl 28, acting upon a ratchet-wheel 27 at the end of the roller 26, so that the paper is drawn along the proper distance each movement of the printing apparatus.

The inking-webs 35 and 36 and the supports 38 39 and ink-holder 37 may all be connected together, so as to be removable from the apparatus for cleaning or otherwise.

In Fig. 11 a latch or button is represented for retaining the ink-holder in position between the frames *u u'*.

Figs. 4, 5, and 6 represent modifications of the before-described mechanism, in which segments 63 take the place of the number-plates. These segments 63 are to be made similar to ratchets and the numbers are to be placed upon the flat surfaces of the respective teeth, so that the operator can draw back the tooth having the proper mark and in so doing turn the corresponding type wheel or segment, and the spring-pawls *k*, Fig. 6, can be made to hold these number-segments, and with this construction the springs *k* will be connected to a cross-bar 40, and the rock-shaft *l*, with its handle *m* and the toes thereon, are located between the springs and the teeth, as indicated in Fig. 6, for releasing all the springs simultaneously to allow the tooth-segments to be restored to their normal position, and volute springs *o* may be made use of in place of helical springs. In this modification of the invention I have represented sectors *a* having the type upon the peripheries thereof in place of having complete type-wheels. These sectors are connected by the tubular or sleeve axes, as before described; but for making the second or computing record a second set of similar segments *a'* are represented upon the shaft or axle *b'*, each pair of type-segments being connected by a link 41, so as to swing together, and the printing is performed in one plane, and the inking-roller 6 is moved across the surfaces to be inked by lever-arms 5 from the rock-shaft 52, which receives its motion by the arm 2, link 3, and crank 4, similar to that in Fig. 3, and the impression-plate *p* is pivoted on the stand 43 and acted upon by the lever-arms 47 48 and rollers 49 in place of the toggle-links shown in Fig. 3. With this modification separate slips of paper are to be inserted from time to time into the holder 42 beneath the impression-plate and withdrawn

after being printed upon, and I remark that the dating-wheels *c* are similar to those before described and the numbering-wheels *d* are also the same as before described; but the
 5 pawl acting upon the numbering-wheels *d* can receive its motion from the slide 55, that is acted upon by an arm 53 from the rock-shaft 52, and the spring 56 gives a movement to the slide 55 in the opposite direction from
 10 that received by the arm 53. The strip of paper upon which the record is kept passes from the roll 23 over a roll 1 upon the impression-frame *c*, and from thence it passes to the roll 26, that surrounds the axis 44 loosely,
 15 and the paper is wound upon this roll 26 progressively by the action of the pawl 28 and ratchet-wheel 27 as the printing or impression frame is raised or lowered, and I have represented a spring 50 for raising the lever carry-
 20 ing the impression-frame.

I have described and shown the types as either upon wheels or segments to more clearly define the respective shapes, and I make use of the term "type-carrier" as ap-
 25 plying to both forms of devices. In like manner the number of plates *e*, when in a curved form, are described as segments 63 and are their equivalents.

I claim as my invention—

30 1. The combination, with the type-carriers and the tubular axes therewith connected, of number-plates connected with the tubular axes, an impression frame and plate for printing from the types, spring-pawls for holding
 35 the number-plates in position, a rock-shaft provided with toes for disengaging the spring-pawls, and springs for returning the parts to their normal position, substantially as set forth.

40 2. The combination, in a registering apparatus, of number-wheels, each having two sets of characters, tubular axes for the same and cog-segments connected with the respective tubular axes, number-plates having rack-
 45 teeth in gear with the cog-segments and ratchet-teeth, pawls for holding the number-plates in the position to which they may be moved, a rock-shaft provided with toes and lever for disengaging the pawls, springs for
 50 restoring the parts to their normal positions and impression plate and frame for moving

the same, an impression-roller, and means for moving the same whereby two impressions are taken simultaneously at opposite sides of the type-wheel, substantially as set forth. 55

3. The combination, with the type-wheels having corresponding characters at their opposite edges, of mechanism for setting the type-wheels, an impression-plate and mechanism for moving the same and for present-
 60 ing a strip of paper to be printed upon, an impression-roller below the type-wheels, a yielding lever and connection for moving the impression-roller, a feeding mechanism for drawing along a strip of paper as it passes
 65 around the impression-roller, and inking-rolls and frames for moving the same both above and below the type-wheels, substantially as set forth.

4. The combination, with the type-wheels 70 having corresponding characters at opposite edges, of the tubular axes for the same, and number-plates for moving the type-wheels, a removable printing-plate adjacent to the upper surfaces of the type-wheels, frames for
 75 supporting such removable printing-plate, a series of numbering-wheels, mechanism for turning the same progressively each stroke of the apparatus, inking-rollers and swinging frames for carrying the rollers above and be-
 80 low the type-wheels, and mechanism for pressing strips of paper upon the inking-surfaces above and below the type-wheels, substantially as set forth.

5. The combination, with the type-carriers, 85 of number-plates, tubular axes connecting the respective type-wheels and plates, spring-pawls and ratchet-teeth for holding the parts in position, mechanism for releasing the spring-pawls, springs for restoring the parts
 90 to their normal positions, numbering-wheels and pawls for moving the same progressively, and printing mechanism for impressing simultaneously the types and numbers, substantially as set forth. 95

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

TEODOR EKROTH.

Witnesses:

NERE A. ELFWING,
 GEORG ERIKSON.