

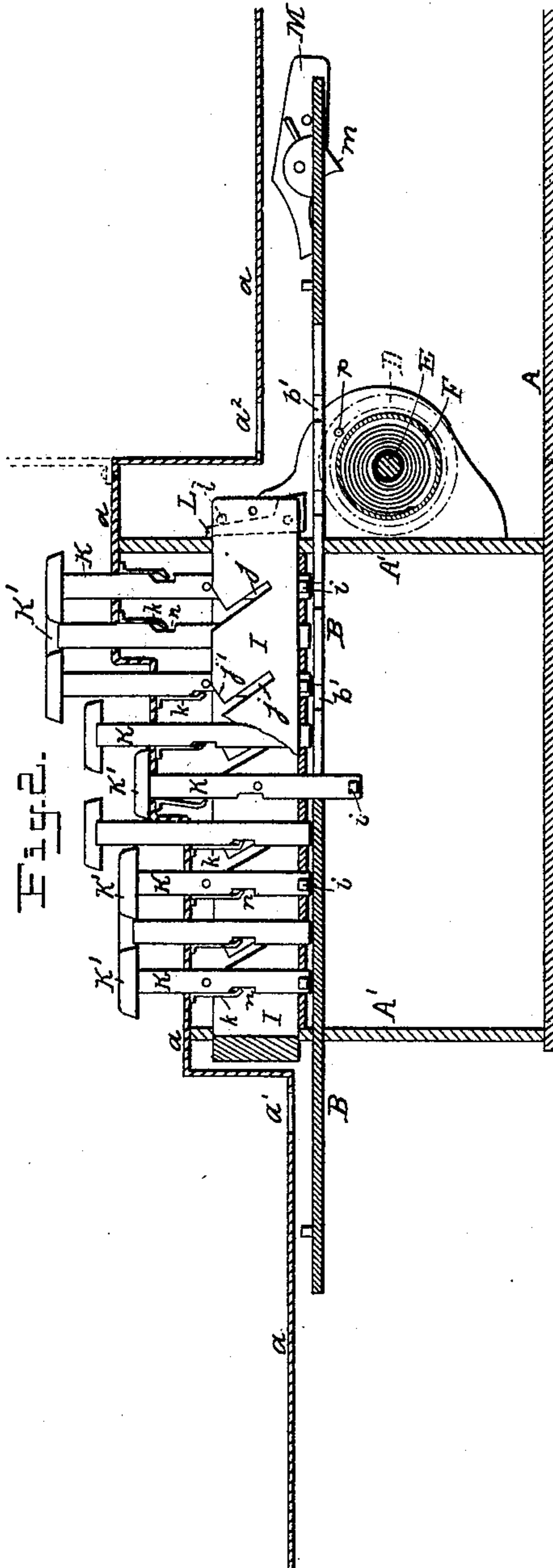
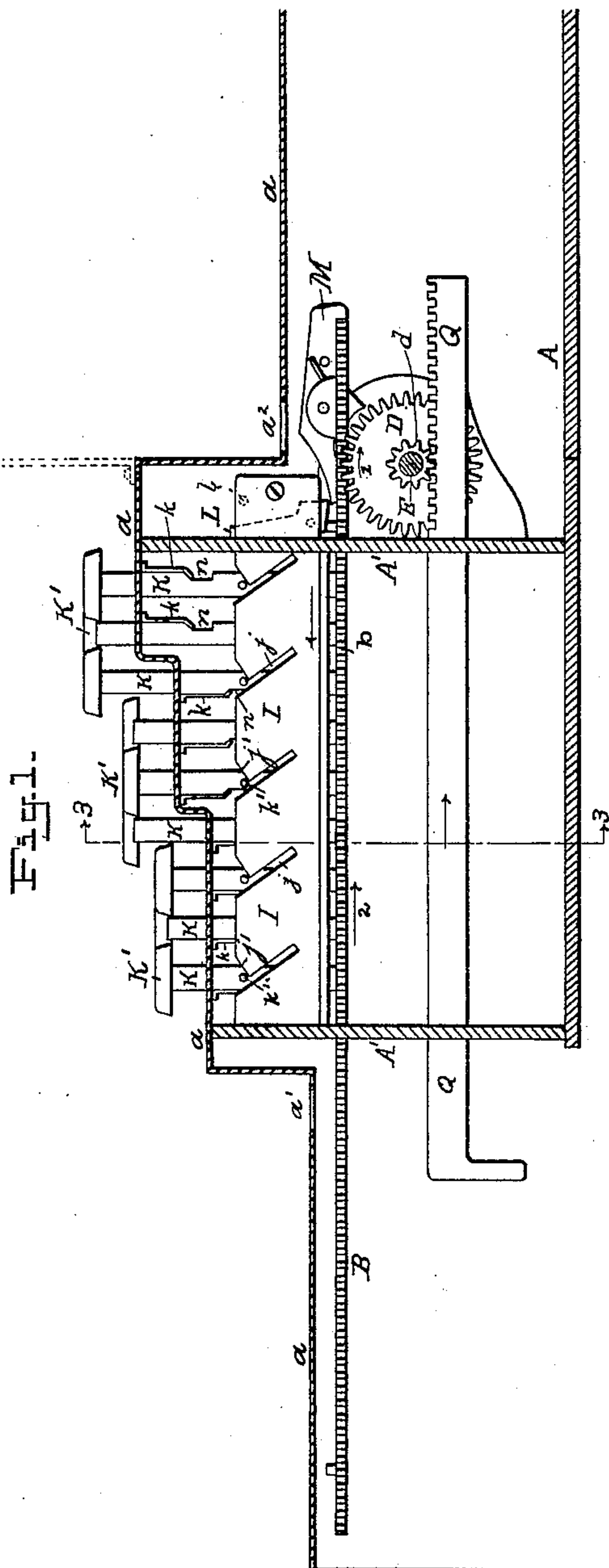
(No Model.)

4 Sheets—Sheet 1.

M. R. LONGACRE.
CASH REGISTER AND INDICATOR.

No. 406,749.

Patented July 9, 1889.



WITNESSES:

E. J. Griswold
George Baumann

INVENTOR

Matthias R. Longacre
BY
Horsman and Horsman
his ATTORNEYS

(No Model.)

4 Sheets—Sheet 2.

M. R. LONGACRE.
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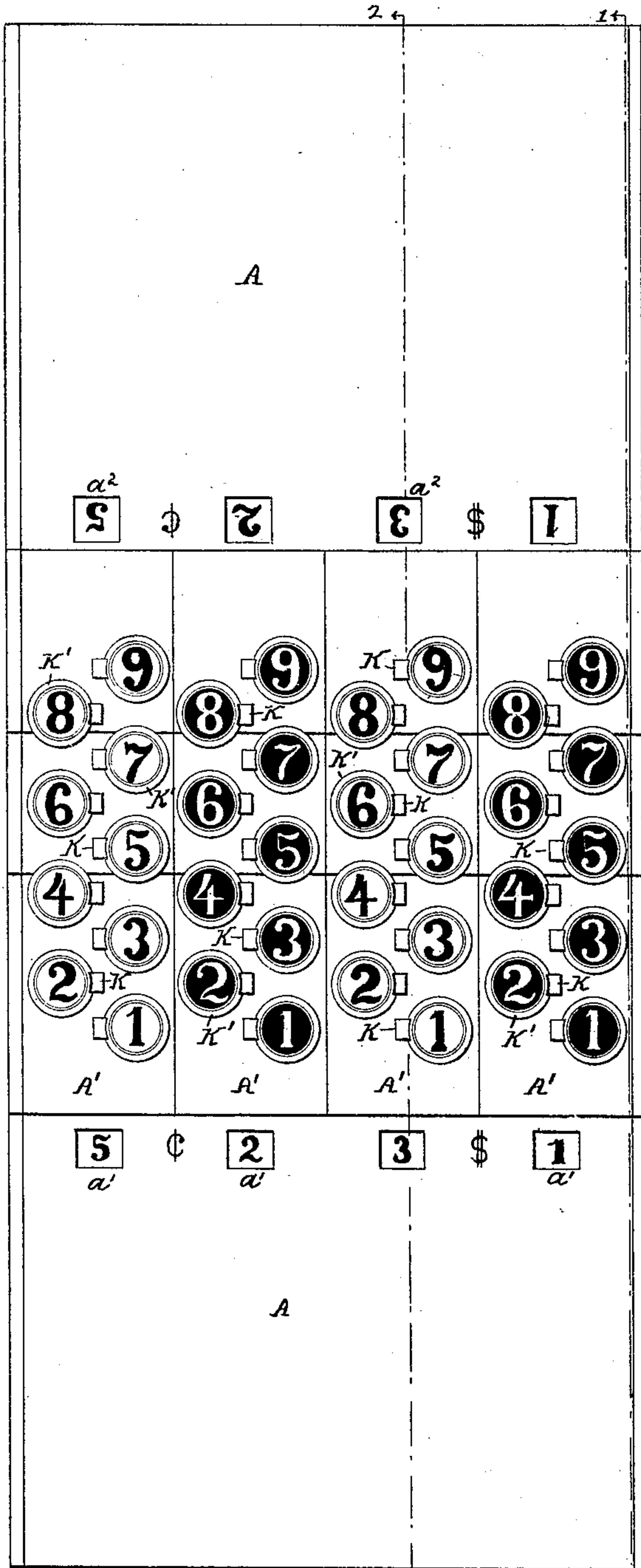
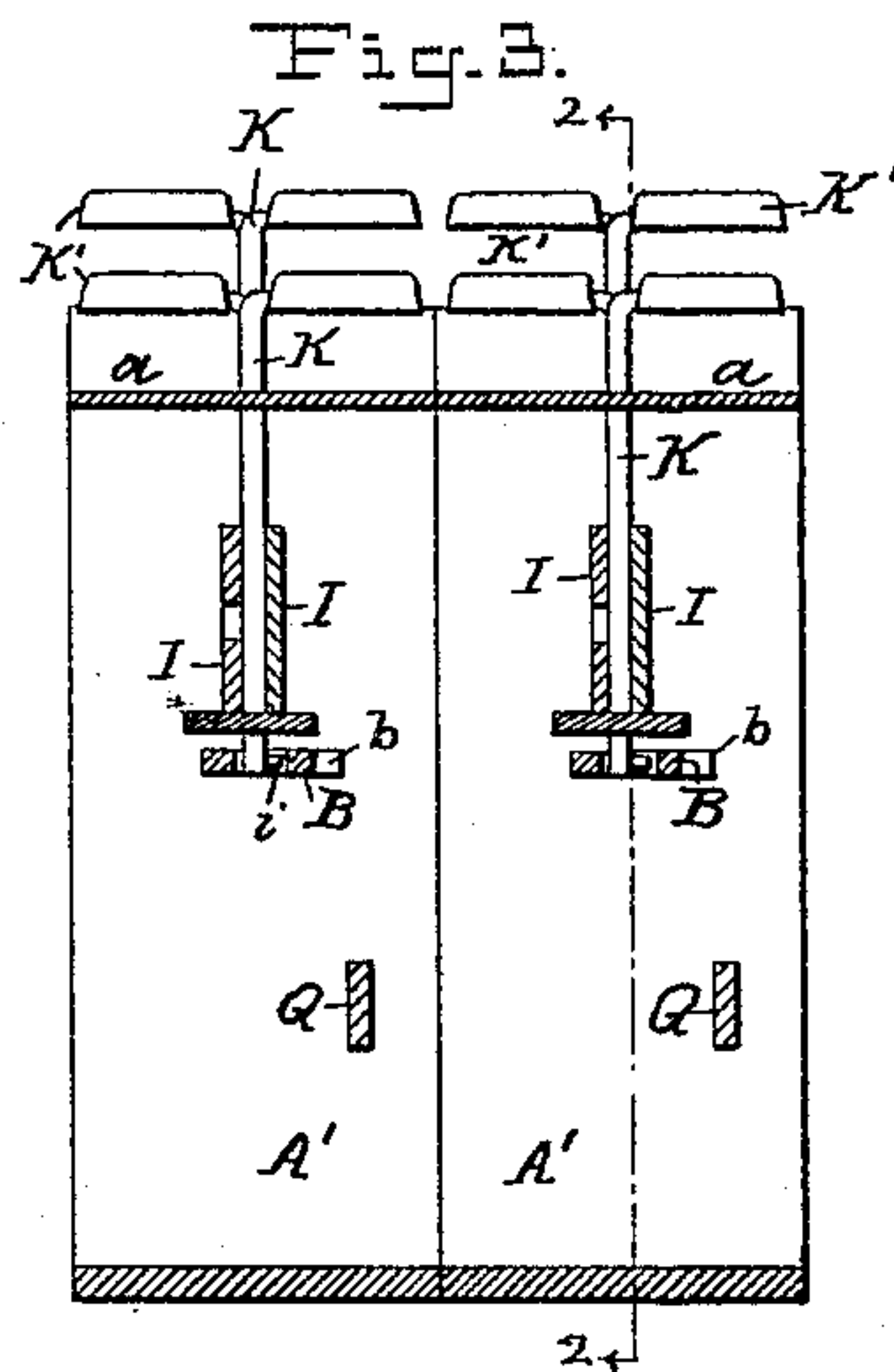


Fig. 4.



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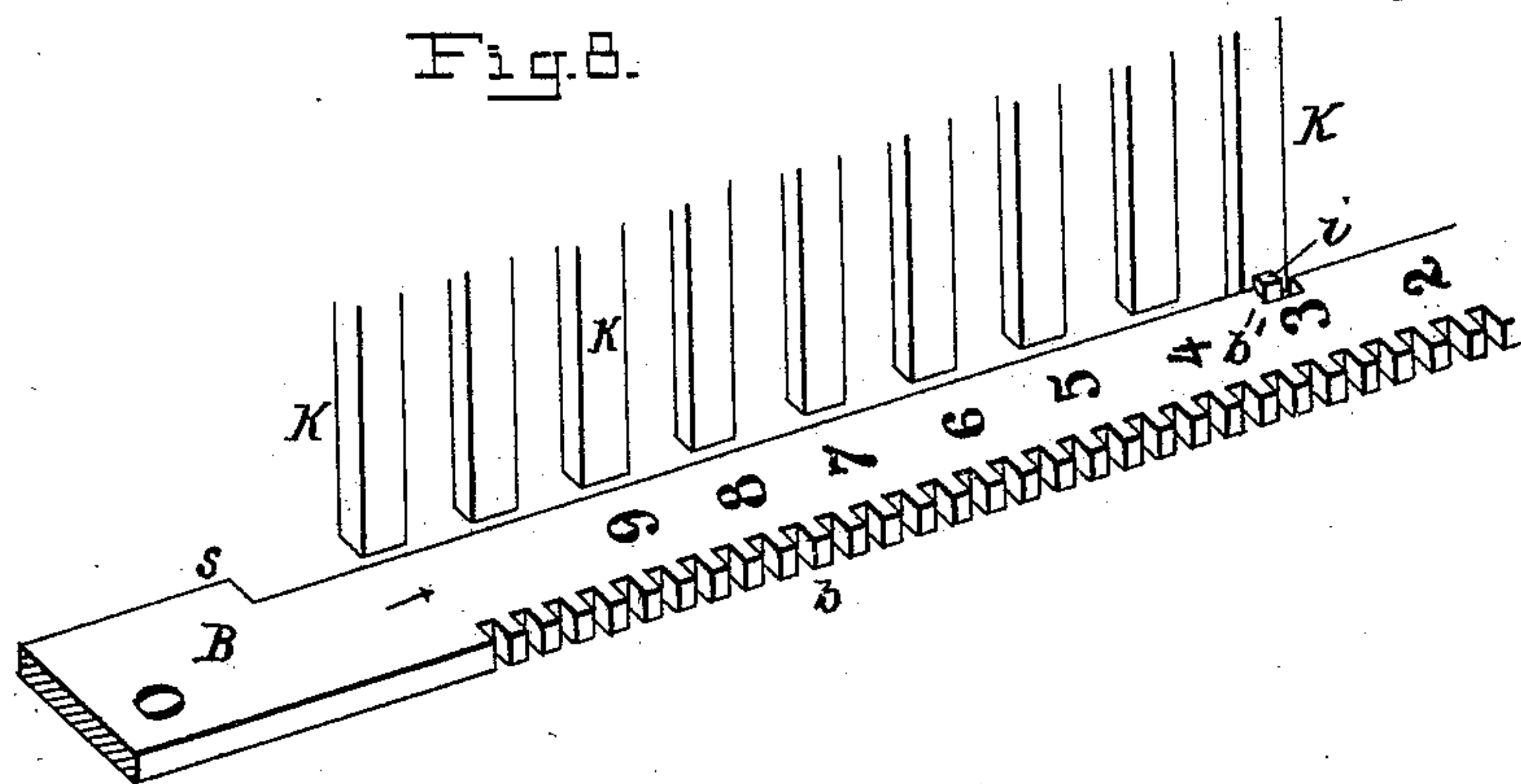
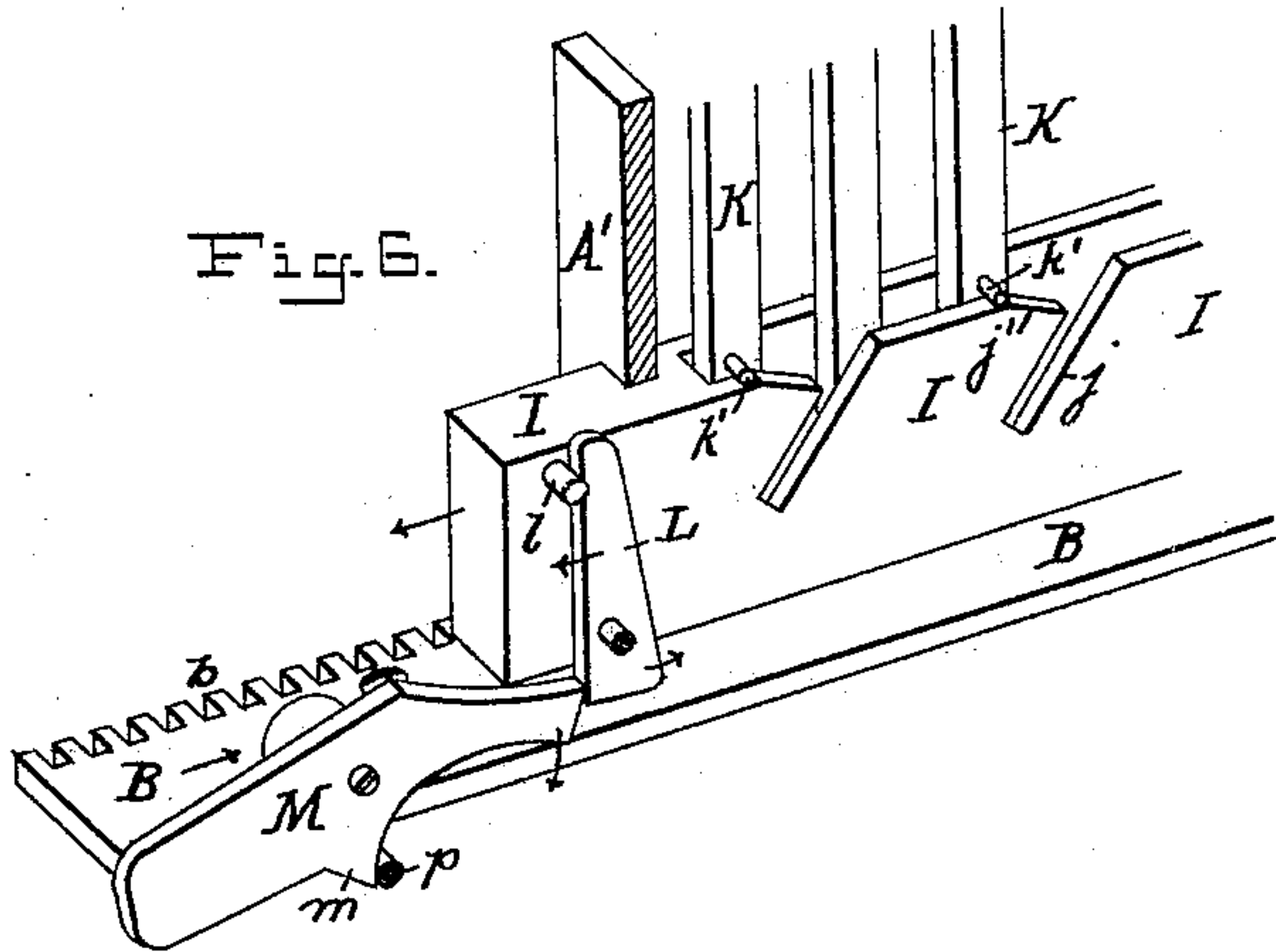
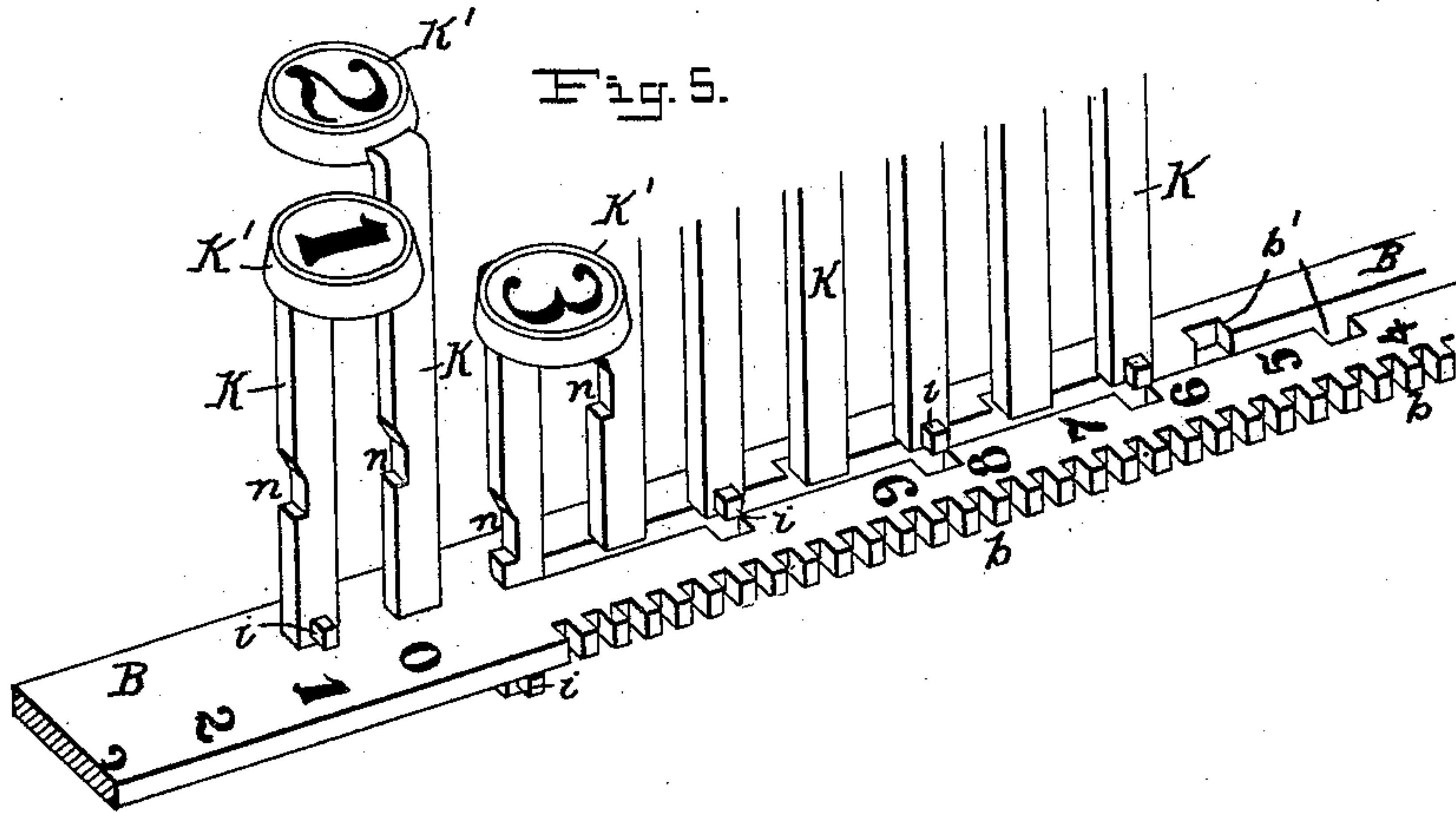
(No Model.)

4 Sheets—Sheet 3.

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WITNESSES:

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(No Model.)

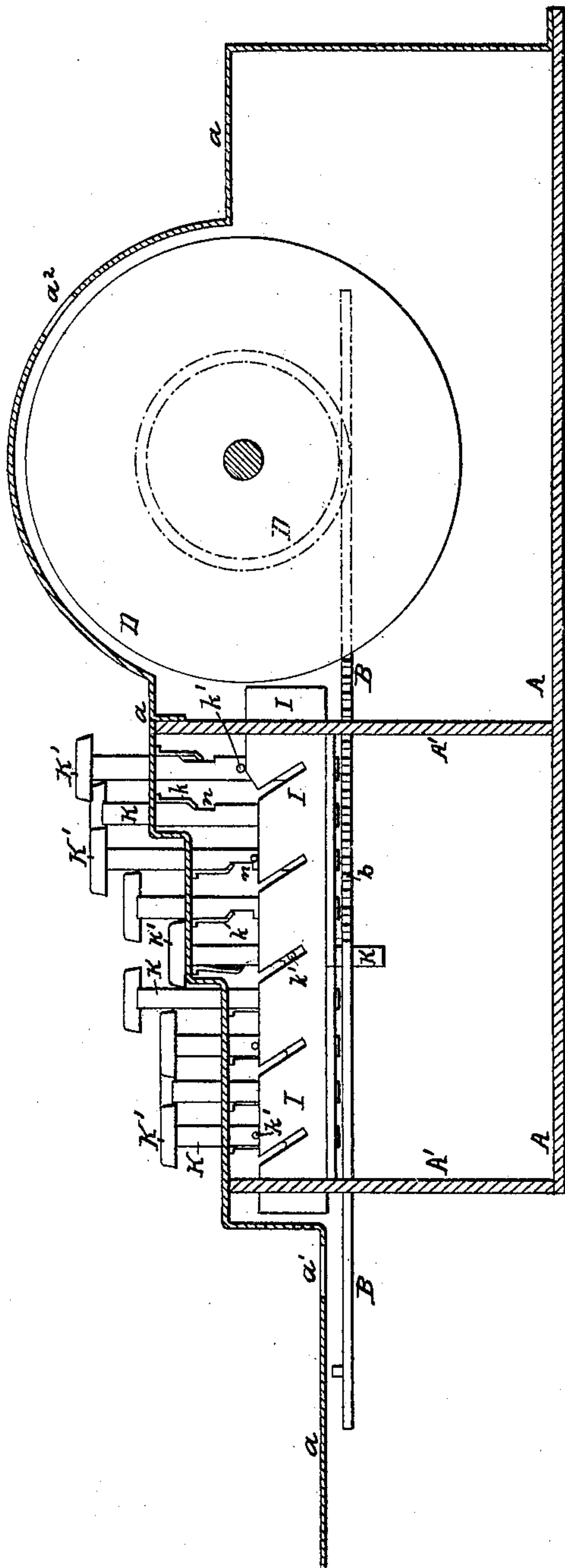
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M. R. LONGACRE.
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Fig. 7.



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UNITED STATES PATENT OFFICE.

MATTHIAS R. LONGACRE, OF PHILADELPHIA, PENNSYLVANIA.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 406,749, dated July 9, 1889.

Application filed April 5, 1889. Serial No. 306,081. (No model.)

To all whom it may concern:

Be it known that I, MATTHIAS R. LONGACRE, a citizen of the United States, and a resident of Philadelphia, Philadelphia county, Pennsylvania, have invented Improvements in Indicating-Machines, of which the following is a specification.

My invention consists of certain improvements in the cash registers and indicators for which I have obtained Letters Patent of the United States No. 369,193, dated August 30, 1887, and for which I have applied for Letters Patent of the United States October 18, 1888, Serial No. 288,497.

The objects of my present invention are to simplify the construction and operation of the mechanism, to reduce the number of parts, and to construct and arrange the details so that the machine will occupy less space than has been heretofore necessary.

My present invention conforms in its main principles of construction and operation to the cash registering and indicating mechanism of my former patent and pending application to the extent that it has among its principal elements the sets or series of numbered operating-keys for the several columns of figures, together with the sliding number-plates or other moving indicators impelled by springs and controlled by the keys to show the numbers through openings in the case when the keys are operated. As in my former machines, there is also a locking bolt or bar for each set of keys and means for restoring the parts to their normal positions; but by my present improvements I entirely dispense with the hinged retaining-frame, which in each key-bar of my former machines normally held the sliding number-plate against the action of the impelling-spring, but which could be operated by any one of the keys to release the sliding number-plate. In my present machine each moving indicator is retained in its normal position at zero against the action of its impelling-spring directly by the keys themselves, either one or more or all of them, and released by operating any one of the keys.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of sufficient of an indicating-machine to illustrate my improvements, the section being taken on the

line 1 1, Fig. 4. Fig. 2 is a vertical section on the line 2 2, Figs. 3 and 4, but showing one of the keys depressed and the moving indicator and the locking-bar moved to their new positions. Fig. 3 is a transverse section on the line 3 3, Fig. 1, of one of the key-bars. Fig. 4 is a plan view of the machine. Fig. 5 is a perspective view, drawn to a larger scale, of a part of the sliding number-plate or indicator and some of the key-stems. Fig. 6 is a perspective view of the back end of the locking-bar and sliding number-plate with some of the keys. Fig. 7 is a view of a modification. Fig. 8 is a perspective view illustrating a simplified form of a part of the devices shown in Fig. 7.

In the illustration of my present invention I have, as before, shown the moving indicator primarily as a sliding rack or number plate carrying upon its face the figures 0 to 9, which figures are to show through a suitable opening or openings in the case of the machine when one of the keys of that set is operated. It is not, however, essential that the numbers should be upon the sliding plates themselves, although I prefer to arrange them in that way. The indicating-numbers may be upon wheels to be operated by the moving plates, or upon the plates as well as the wheels, as is the preferable plan, so that the numbers upon one may be arranged to be seen by the salesman and the numbers on the other seen by the customer. It is preferable to have in the machine four of these moving indicators, two being provided for the two columns of cents and two for two columns of dollars.

As the construction and operation of the several moving indicators with their sets of keys are alike, a description of one will apply to all, and in the following explanation it will suffice to describe one set of these devices, or, in other words, one section for one column of figures.

A is the fixed casing or frame, which may or may not, as in my former machines, be combined with a sliding drawer. In this frame are mounted in this instance several interchangeable key-bars representing successive denominations, as units, tens, hundreds, &c., each of which carries a sliding rack-plate or number-plate B, the nine num-

bered operating-keys K, which directly control the position and movement of the sliding number-plate, and the locking-bar I. Each key-bar, with its keys, sliding plate, and locking-bar, is complete in itself and independent of the other bars, with which it is interchangeable.

Each number-plate B is shown in this instance as a flat plate having upon one edge for a portion of its length a rack *b*, into which gears a spur-wheel D, mounted to turn freely upon a shaft E in the casing. To this shaft is secured one end of a coiled spring F, while the other is connected to the inner periphery of the spur-wheel, Fig. 2, and the parts are in the present case shown as so arranged that the spring tends to turn the wheel D in the direction of the arrow 1, Fig. 1, so as to impel the number-plate in the direction of the arrow 2 when released by the operation of one of the keys. I do not, however, wish to restrict myself in this regard, as the number-plate may be arranged to be impelled by the spring in whichever direction convenience may dictate.

Each key-bar carries nine numbered operating-keys K, passing vertically through the frame of the bar and guided therein. In the machines of my former invention the keys with their heads bearing numbers have been arranged in one line for each set or series; but it is found that by bringing the key-stems close together the necessary movement of the sliding plate can be shortened by nearly one-half, the manipulation of the keys facilitated, and the size of the machine materially lessened and its practical value correspondingly increased. I accomplish this by placing the numbered head of each key out of line with its respective stem and arranging each series of numbered heads alternately on one side or the other of the line of the key-stems of that series, as will be readily understood by reference to Fig. 4.

In order to avoid possible confusion between the keys of one set and the keys of an adjoining set, one series may have the numbers in black upon a white ground, while the adjoining series have the numbers in white upon a black ground, or they may be otherwise arranged so as to obtain similar contrasts between the adjoining sets.

For convenience of manipulation of the keys I have arranged them in banks one above the other, as illustrated in Figs. 1 and 2, and in the case illustrated the keys of the higher numbers are on the upper banks; but this order of arrangement of the keys is not essential. In the present instance I have shown three banks of keys with stems of different lengths, there being three keys in each bank for each set. The cover-plate *a* of the machine is also preferably stepped.

I prefer to make the stems for the keys of the rectangular section illustrated in the drawings, and each key has upon its side a pin or projection *k'* to engage with an inclined

groove or notch *j* in the locking-bar I. I prefer, as will be seen on reference to Figs. 3 and 6, to make this locking-bar double, so that the stems of the keys pass through it, and in that case I make the inclined notches *j* for the pins *k'* of the successive keys alternately on opposite sides of the double locking-bar, so that, for instance, the pin *k'* of the first key will find its notch on one side of the locking-bar, while the pin of the second key will find its notch on the other side of the locking-bar, as will be seen on reference to Fig. 2.

Each key is sustained in the normal position illustrated in Fig. 1 by means of a yielding retainer *k*, carried by the top plate or any fixed part of the key-bar, and having a bent end entering a notch *n* in the stem of the key. Whenever it is desired, however, to depress any of the keys, this support *k* will yield and allow the key to descend, as illustrated in the case of the fifth key in Figs. 2 and 7. When the keys are maintained in their normal elevated positions by means of these yielding supports, as shown in Fig. 1, their several pins or projections *k'* will be out of the inclined notches *j* and in line with opposite bevels or inclines *j'* at the mouths of the several notches for all the keys which are to act as retainers as well as stops. The result is, that when one of the keys is depressed its pin *k'* will enter the corresponding inclined notch *j*, and in doing so will positively move the locking-bar I in the direction of its arrow, Fig. 1. As the locking-bar moves in that direction, however, the bevels or inclines *j'* will come into contact with the pins *k'* of the other keys and raise them until they ride upon the horizontal portion of the locking-bar, where by they are locked in this elevated position, Fig. 2. When the locking-bar on the restoration of the parts to their normal positions is returned in a direction opposite to that pointed out by the arrow, Fig. 1, the depressed key will be raised (owing to the riding of its pin *k'* up its inclined notch *j*) until its yielding support *k* again engages the notch *n* in the stem of the key. At the same time this return movement of the locking-bar permits the other keys to fall back again (by gravity in this instance) to their normal positions, from which they had been raised by the inclines *j'*, as shown in Fig. 1. I have used the term "locking-bar" in this specification for convenience in a partially descriptive sense, although it will be seen that the bar performs other functions besides locking the keys.

As I have before said, in my present invention I entirely dispense with the hinged retaining-frame or equivalent retainer for the moving indicating part, and I make one or more of the keys perform that duty. In Figs. 1, 2, and 5 I have shown the machine as constructed so that all the keys directly act as the retainers for the sliding number-plate, as well as stops therefor.

I preferably cut a longitudinal slot in the sliding number-plate B, as shown in Fig. 5,

and form in one or both edges of this slot notches b' , Fig. 5, to act in conjunction with projections i upon such of the key-stems as are to act as retainers for the sliding number-plate.

In Fig. 5 all the stems there illustrated are provided with these projections, and the slotted number-plate is provided with a corresponding set of notches b' , and these notches are for convenience arranged alternately on opposite sides of the longitudinal slot, and the projections i on the key-stems are located correspondingly. The projection i is on the side of each stem at the bottom, and when the key is in its normal position (illustrated in Fig. 1) the lower end is just within the longitudinal slot of the sliding number-plate, and its projection i engages with the corresponding notch b' in the sliding number-plate. When one of the keys is depressed—say, for instance, No. 5, as shown in Fig. 2—the first effect (owing to the consequent movement of the locking-bar in the direction of its arrow, Fig. 1) is to raise all the other keys out of engagement with the sliding number-plate. I prefer to arrange the parts so that the raised keys come out of engagement with the number-plate before the key being depressed becomes disengaged from it; but as the key being depressed moves farther down it also has its projection i carried out of engagement with the notch in the sliding number-plate, and the latter under the influence of the spring F in the wheel D then moves in the direction of its arrow, Fig. 2, until the end of the slot in the sliding number-plate comes against the stem of the depressed key, which then thus acts as a stop and determines the position of the number-plate and the number or numbers which shall show through the opening or openings in the case.

I prefer, as in my former machine, to provide two sets of openings to show the numbers on the moving indicators, one of these openings a' being for the operator and the other a'' for the customer, both sets of numbers in such case being upon the sliding number-plate, but facing in opposite directions, as will be readily understood, and in such case the operator will have to read his figures from right to left, or backward.

Instead of having the second set of numbers upon the number-plate to be exhibited to the customer, I may put such numbers upon the periphery of the wheel D , which would then preferably be enlarged in diameter and its position changed, say, to that shown in Fig. 7, so that the numbers could be conveniently seen through an opening in the case. It will be understood that the first set of numbers upon the sliding number-plates may also be dispensed with and the numbers upon the wheels D only be employed.

To restore the indicating and other parts to their normal positions, I may provide a sliding bar Q , Figs. 1 and 2, guided in the frame and having its outer end formed into a

rack gearing into a small pinion d on the wheel D , so that by pushing this rack-bar in the direction of its arrow, Fig. 1, the sliding number-plate will be returned to its normal position. The several keys which act as retainers for the sliding number-plate will fall again into engagement with the latter.

To effect the return movement of the locking-bar I , any suitable means may be provided, and I have shown in this instance a trigger M , carried by the sliding number-plate, Figs. 1, 2, and 6. This trigger is weighted at its rear end or is acted on by a spring, so as to normally occupy the position illustrated in Fig. 2, so that when the sliding number-plate is returned to its normal position the end of the trigger will come into contact with the lower end of a lever L , pivoted to the frame, so that the upper end of the latter, striking the pin l , will move the locking-bar in a direction opposite to that pointed out by its arrow in Fig. 1. As soon as that has been accomplished, a finger m on the under side of the trigger will come into contact with a fixed pin p , Figs. 2 and 6, on the frame and throw the nose of the trigger out of engagement with the lever L , so that the latter will fall back to the position illustrated in Fig. 1, and the locking-bar is then free to be moved in the direction of its arrow, Fig. 1, when a key shall be next depressed.

In the modification illustrated in Fig. 7 only one of the keys acts as a retainer for the sliding number-plate to keep it at its normal position with the indicating-figures at zero. With but one key acting as a retainer it will be understood that only one notch b is needed in the sliding number-plate, and that only one key has a projection i , while all the other keys have their lower ends cut short, so that they only coact with the sliding number-plate when they are depressed, as illustrated in the case of the fifth key, Fig. 7.

The bevels or inclines j' are dispensed with for such of the keys as are not to act as retainers, and in this case I have shown the last key to the right in this figure as the retainer-key, and for this there is an incline or bevel j' . If one of the non-retainer keys be depressed—the fifth key, for instance—as shown, the locking-bar will be moved in the direction of its arrow by the entrance of the pin k' into its inclined notch j , and consequently the bevel j' will raise the retainer-key out of engagement with the sliding number-plate. The latter is then impelled forward by its spring F until arrested by the fifth key, which has been depressed into the path-way and stops it at the desired position. The remaining keys are not affected, but remain in their normal elevated positions, in which they are locked by the movement of the locking-bar, so that they cannot then be depressed, as will be seen on reference to Fig. 7.

Although I have described the sliding number-plate as slotted, I do not wish it to be understood that such feature is essential. For

instance, as shown in Fig. 8, the sliding number-plate may be set a little to one side of the line of key-stems and a stop *s* formed on the side of the plate to act in place of the end of the longitudinal slot, Fig. 5, to come into contact with the stem of the depressed key. If only one of the keys is to act as a retainer as well as a stop, a single notch *b* at the proper point in the edge of the sliding plate will suffice.

With the above-described indicating mechanism I may combine any suitable form of totalizing mechanism—such, for instance, as found in my former machines; but the totalizing devices form no essential part of my present invention.

I claim as my invention—

1. An indicating apparatus having a moving indicator and means to move it from its normal position at zero, with a series of keys, one or more engaging with the said indicator to retain it in its normal position, and any one of the keys being adapted when operated to act as a stop for the moving indicator, all substantially as described.

2. An indicating apparatus having a number of moving indicators for successive columns of figures, as units, tens, hundreds, &c., and each having combined with it a means to move it from its normal position at zero, and a series of keys, one or more engaging with the said indicator to retain it in its normal position, and any one of the keys being adapted when operated to act as a stop for the moving indicator, all substantially as described.

3. An indicating apparatus having a moving indicator and its impelling-spring, with a series of keys, one or more engaging with the said indicator to retain it in its normal position, and any one of the keys being adapted when operated to act as a stop for the moving indicator, and devices, substantially as set forth, to restore the parts to their normal positions, all substantially as set forth.

4. In an indicating apparatus, the combination of a moving indicator and its impelling-spring with a series of keys, each of which is adapted to arrest the moving indicator, and one or more of the keys engaging with the moving indicator to retain it in its normal position, and a locking-bar to act in conjunction with the keys, all substantially as described.

5. An indicating apparatus having interchangeable key-bars representing successive denominations, as units, tens, hundreds, &c., each carrying a moving indicator and a series of keys, one or more engaging with the indicator to retain it in its normal position at zero, and any one of the keys serving as stops, all substantially as described.

6. An indicating apparatus having interchangeable key-bars, each carrying a moving indicator and its impelling-spring, with a series of keys, one or more engaging with the indicator to retain it in its normal position,

and a locking-bolt to act in conjunction with the keys, all substantially as described.

7. In an indicating apparatus, the combination of a moving indicator and its impelling-spring with a series of keys, one or more engaging with the indicator to retain it in its normal position, and any one of the keys serving to arrest the moving indicator when depressed, and a locking-bar having a positive motion imparted to it by the depressed key, all substantially as set forth.

8. In an indicating apparatus, the combination of a moving indicator and its impelling-spring with a series of keys to normally retain and also to arrest the indicator when released, and having pins or projections, with a locking-bolt having inclined notches for the pins or projections to move the bar upon the depression of a key, all substantially as described.

9. In an indicating apparatus, the combination of a moving indicator and its impelling-spring with a series of keys to normally retain and also to arrest the indicator when released, and having pins or projections, with a locking-bar having inclined notches for the pins or projections to move the bar upon the depression of a key, and yielding retainers to hold the keys in their normal elevated positions, all substantially as described.

10. The combination of a moving indicator having a notch or notches with a series of keys, one or more having a projection or projections to engage with such notch or notches to retain the indicator in its normal position, and an impelling-spring for the indicator, any of said keys being adapted to act as a stop for the moving indicator, all substantially as described.

11. The combination of a moving indicator and its impelling-spring with a series of keys having pins or projections, one or more engaging with the indicator to retain it in its normal position, and any one of the keys acting as stops for said moving indicator, with a locking-bar having inclined grooves for said pins or projections, and also having bevels or inclines *j'* for such of the keys as act as retainers, all substantially as described.

12. The combination of a moving indicator, its impelling-spring, and a series of keys to normally retain the indicator, and also to arrest it, with a locking-bar acting in conjunction with the keys and devices, substantially as set forth, to return the parts to position.

13. The combination of a moving indicator, its impelling-spring, and a series of keys to normally retain the indicator, and also to arrest it, with a locking-bar acting in conjunction with the keys, yielding retainers to hold the keys in their normal elevated positions, and devices, substantially as set forth, to return the parts to position.

14. An indicating apparatus having a number of moving indicators and corresponding series of keys representing successive denominations, as units, tens, hundreds, &c., with

the numbered heads of each series of keys out of line with their respective key-stems and arranged alternately on one and the other side of the line of their stems, substantially
5 as and for the purpose described.

15. An indicating apparatus having a number of moving indicators for different columns of figures, and each indicator with a series of numbered keys therefor, the num-

bers of adjoining series being contrasted in color, as and for the purpose set forth.

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

MATTHIAS R. LONGACRE.

Witnesses:

HUBERT HOWSON,
HARRY SMITH.