

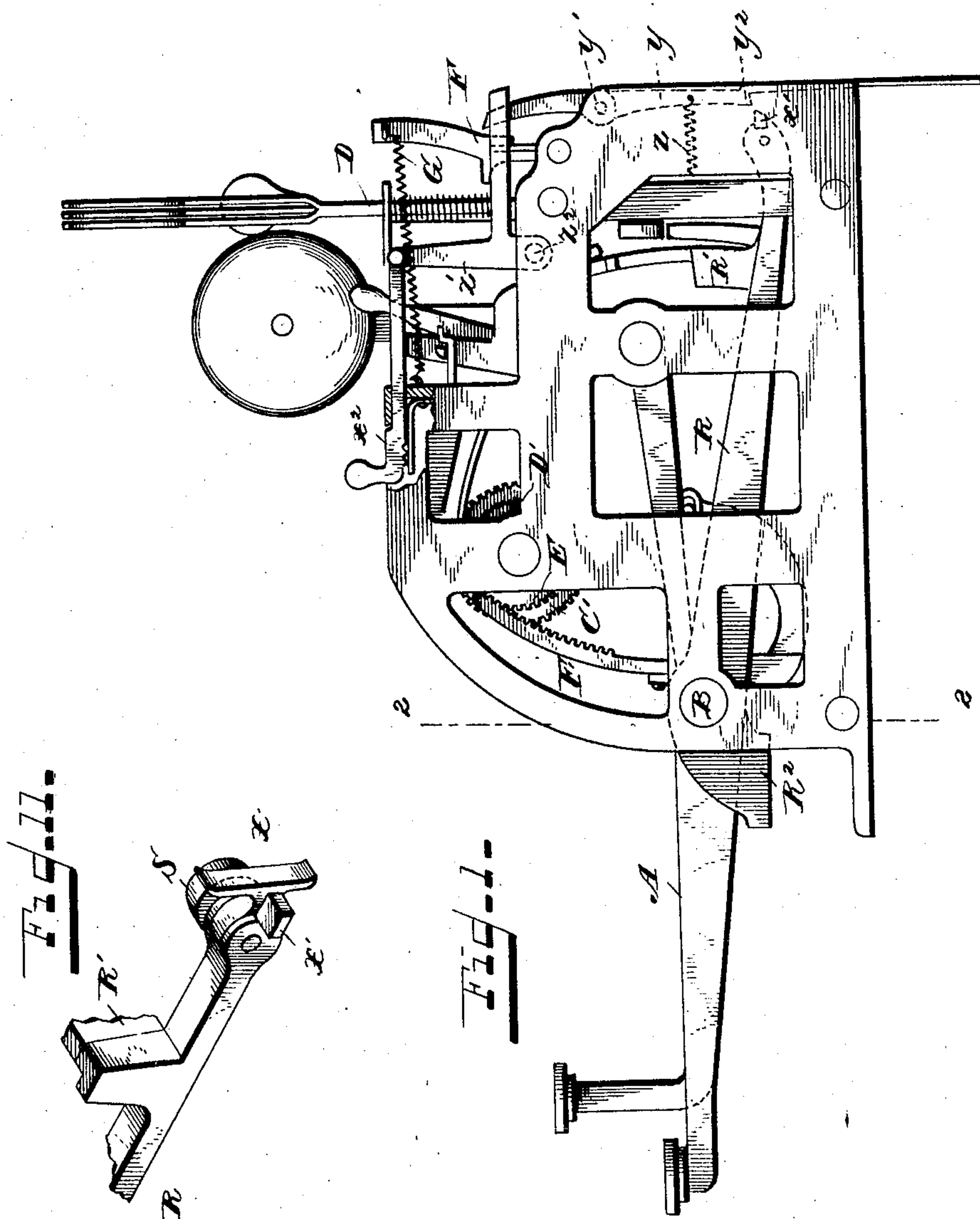
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6 Sheets—Sheet 1.

E. B. PARKHURST.
CASH REGISTER AND INDICATOR.

No. 453,746.

Patented June 9, 1891.



Witnesses.
J. Thomson Cross
Delia Drussell

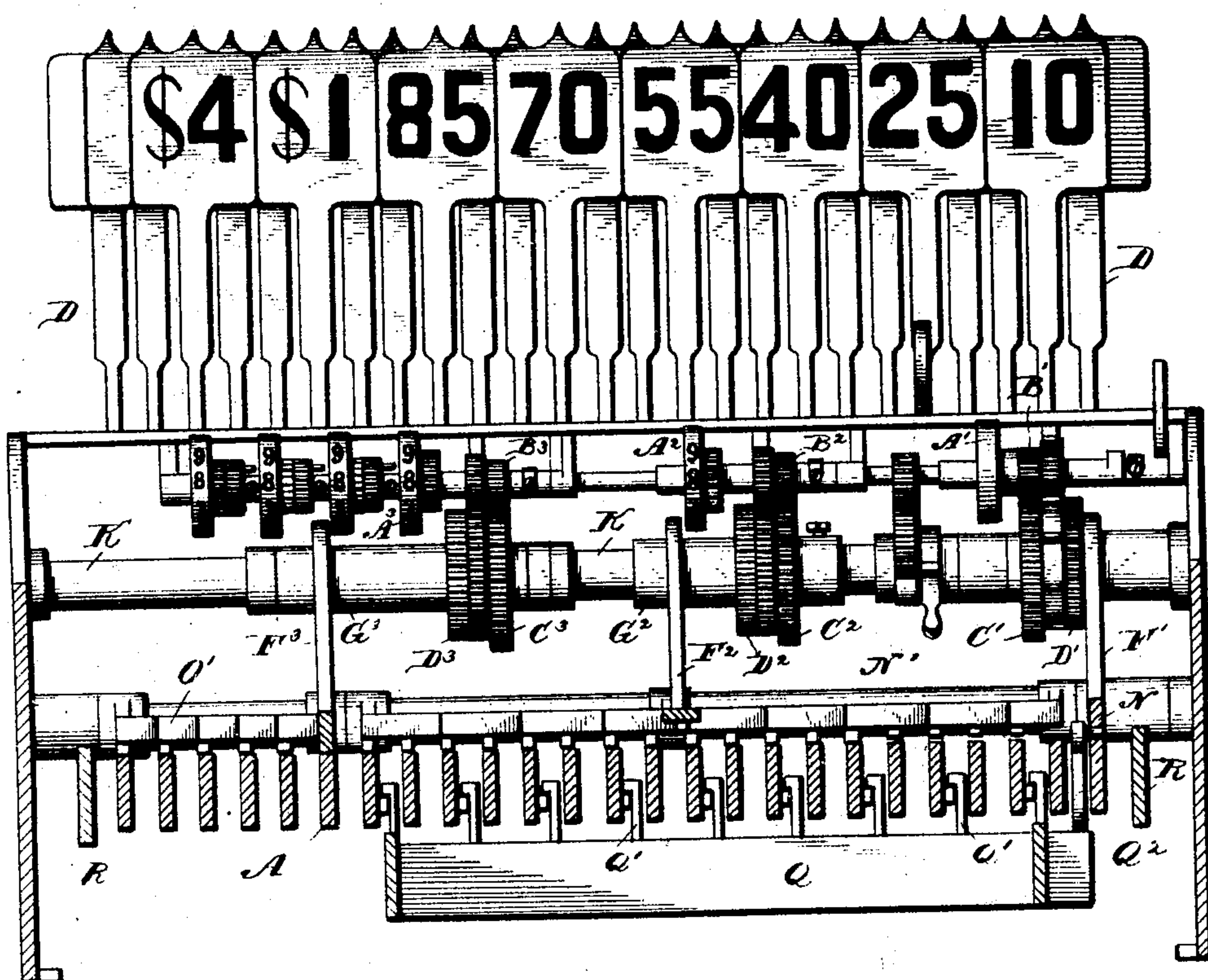
Inventor.
Edward B. Parkhurst
per *Beck & Rector*
his Attorneys.

6 Sheets—Sheet 2.

No. 453,746.

Patented June 9, 1891.

File - 2.



Thomson Cross
Deha Dressell

Edward P. Parkhurst
by Beck & Rector
his Attorneys

(No Model.)

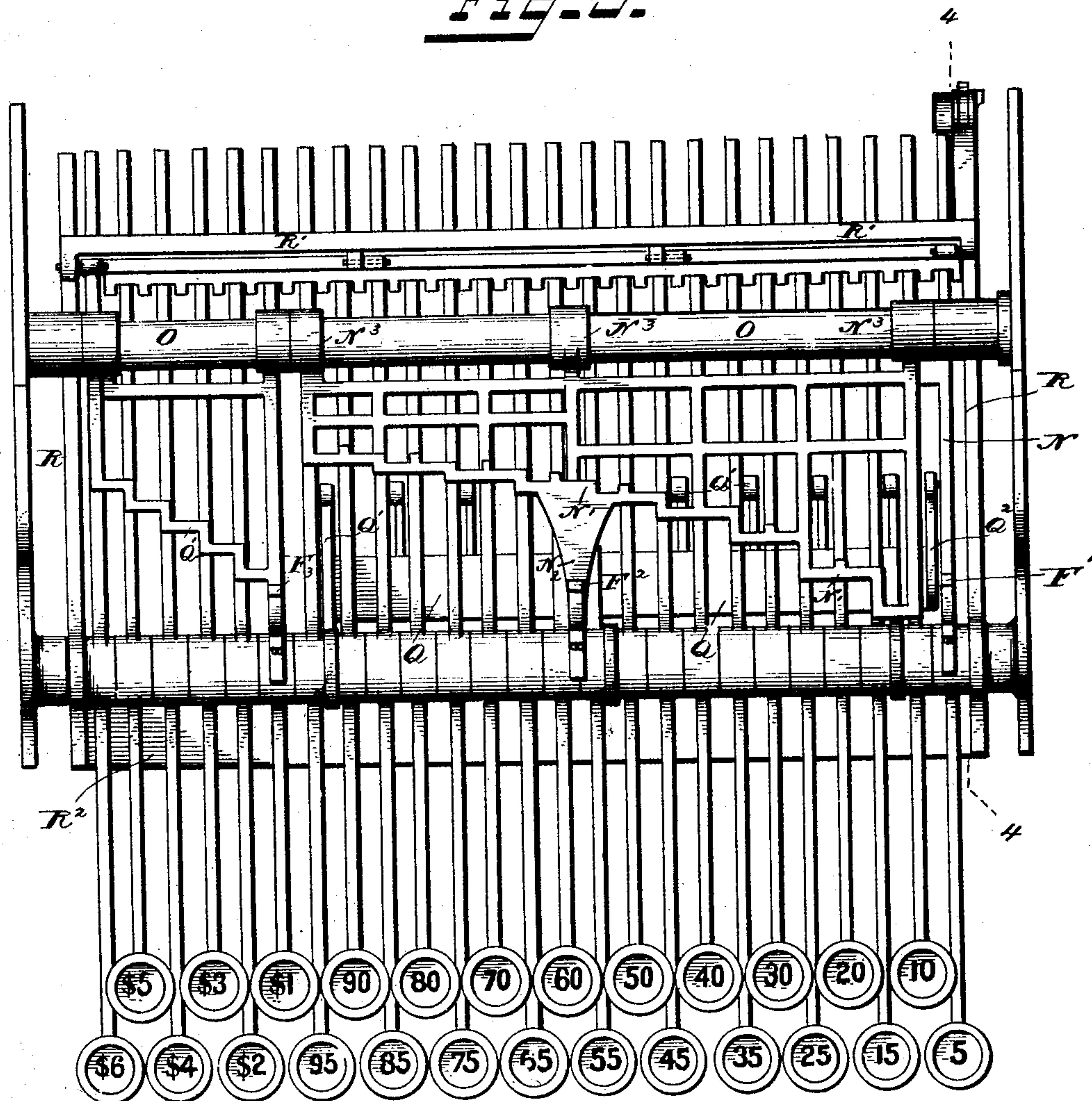
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Fig. 3.



Witnesses.

J. Thomson Cross

Delia Dressell

Inventor.

Edward B. Parkhurst

per

Beck & Rector

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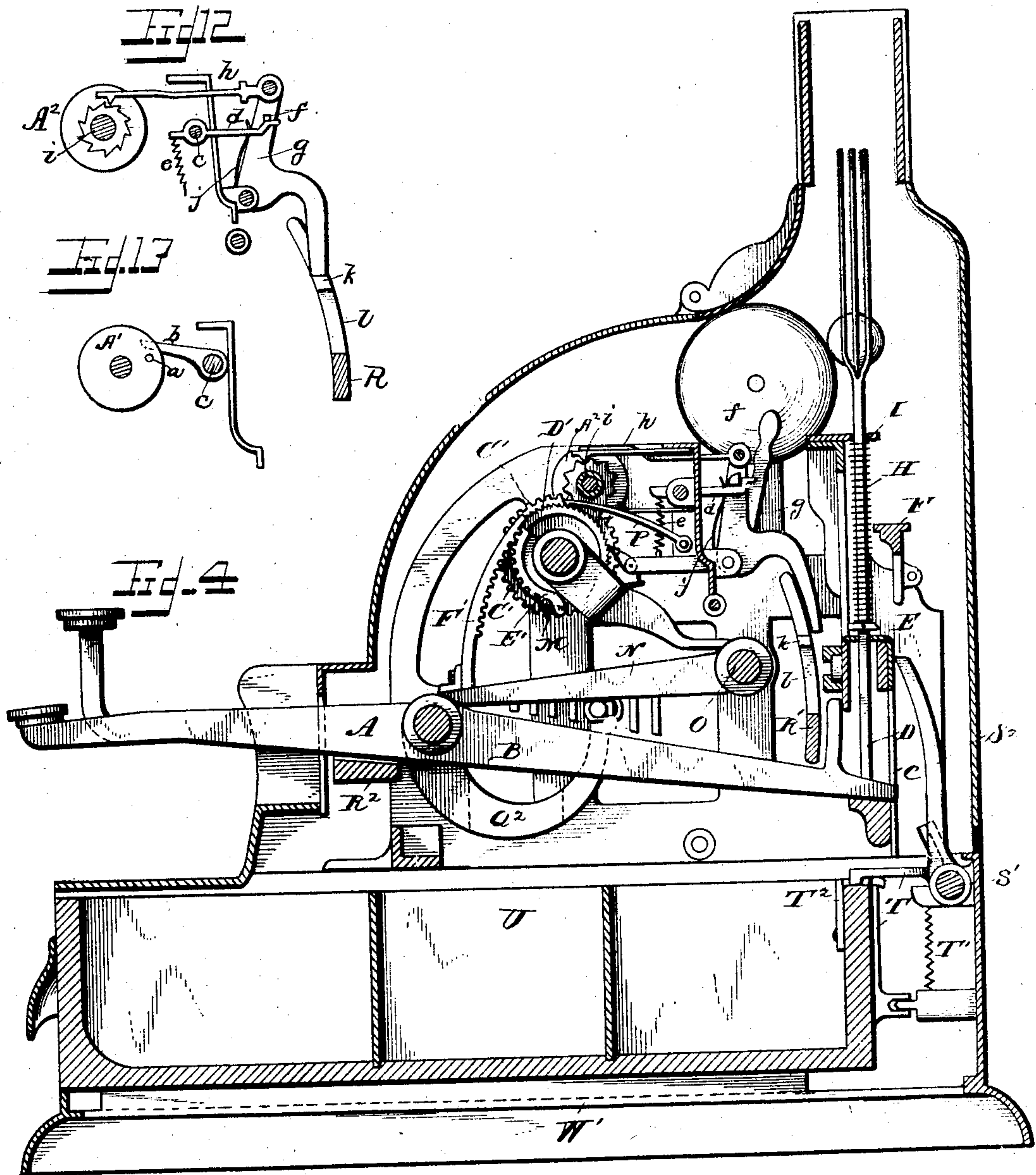
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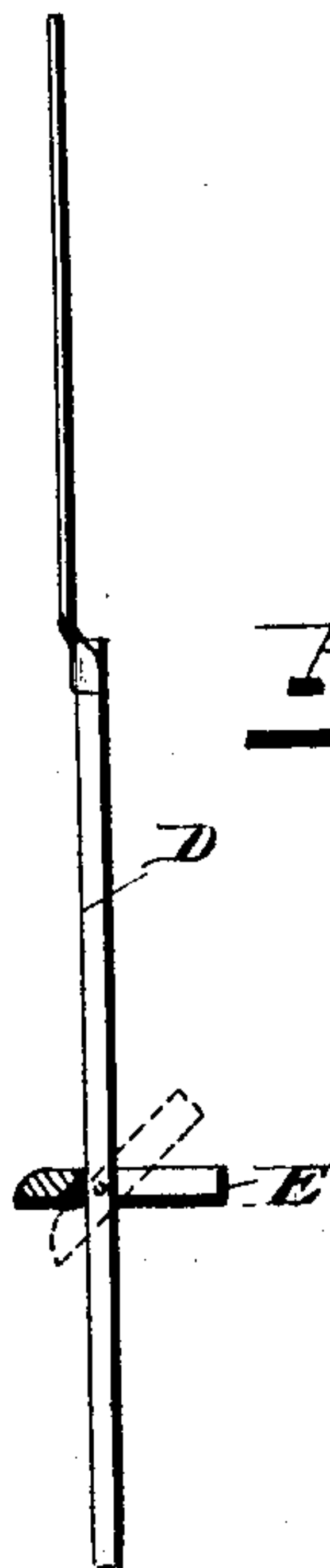
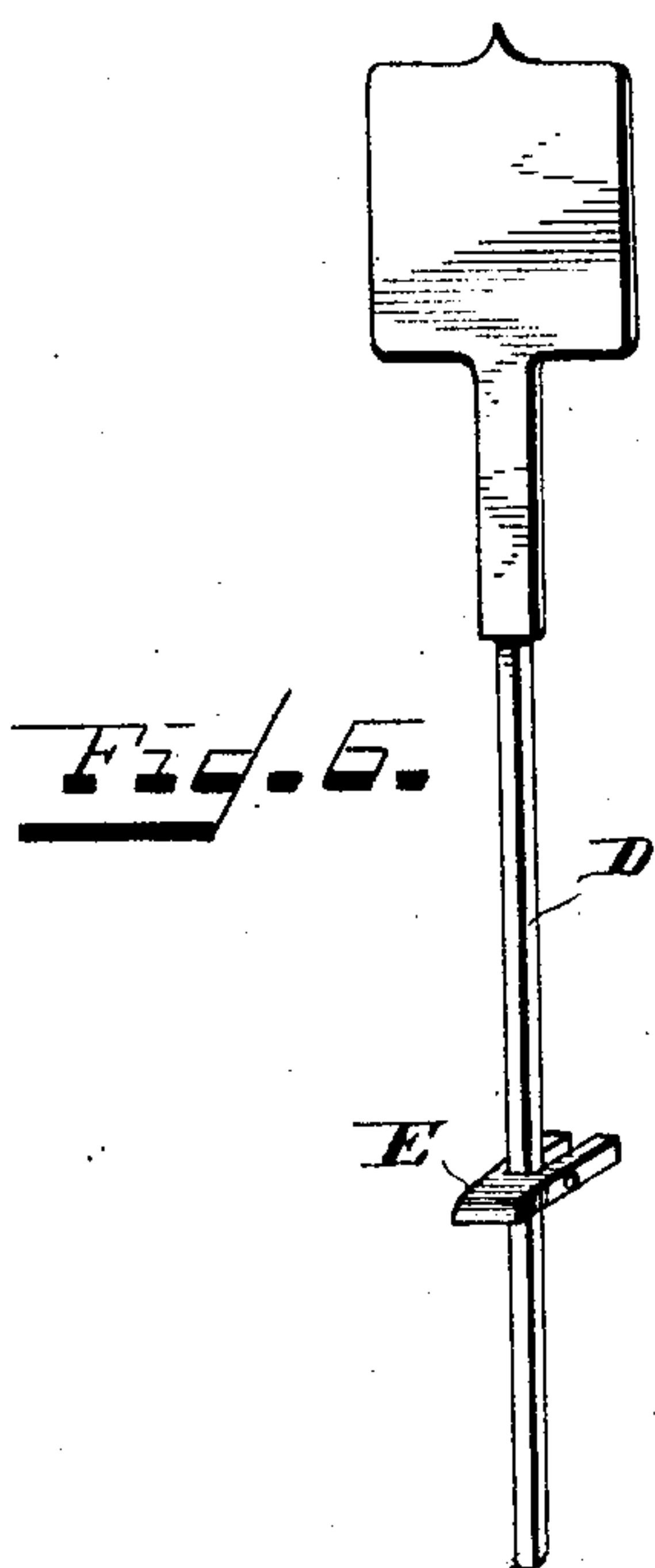
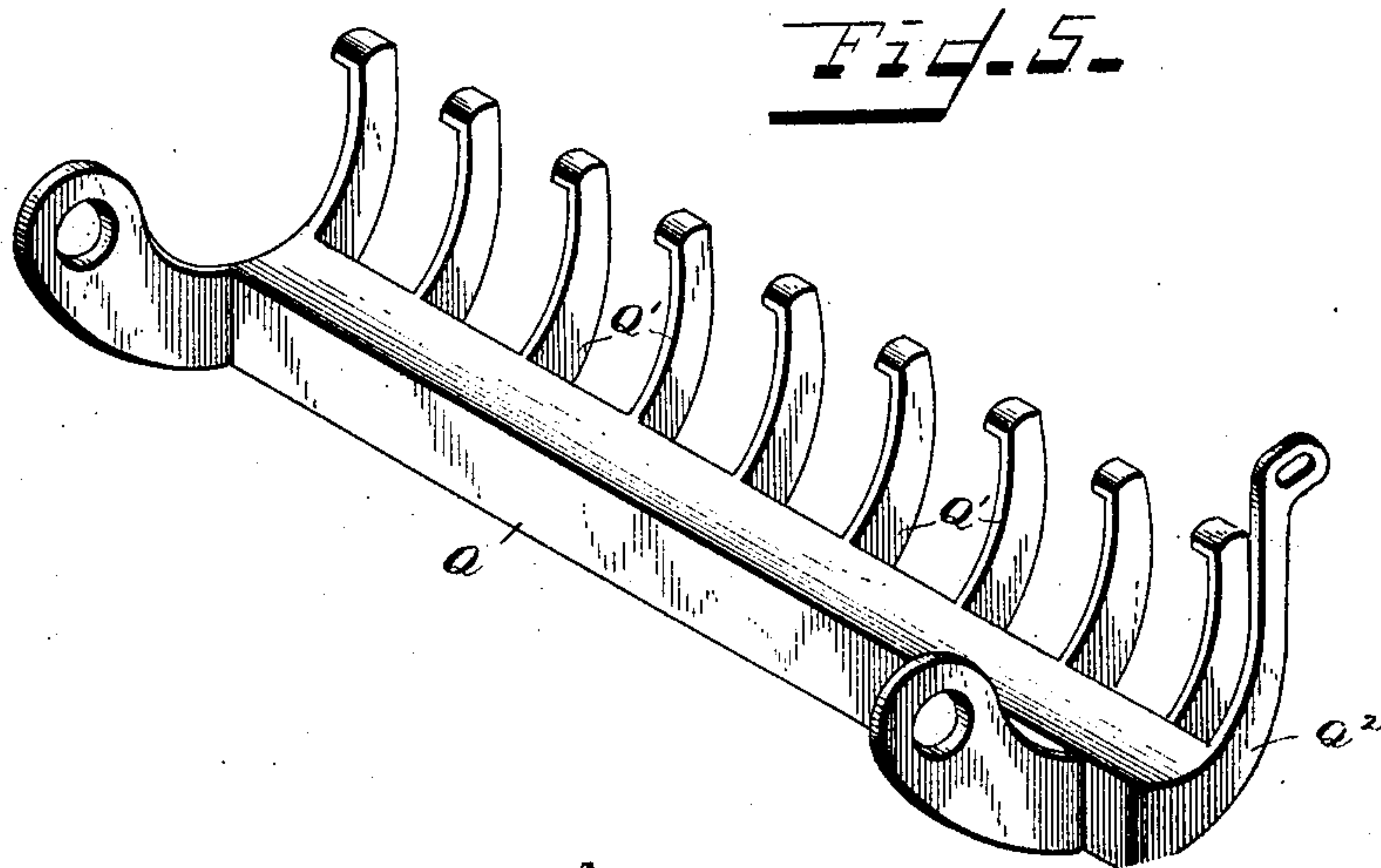
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J. Thomson Cross.
Delia Dressell.

Inventor:
Edward B. Parkhurst
by *Peck & Rector*
his attorneys

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6 Sheets -Sheet 6.

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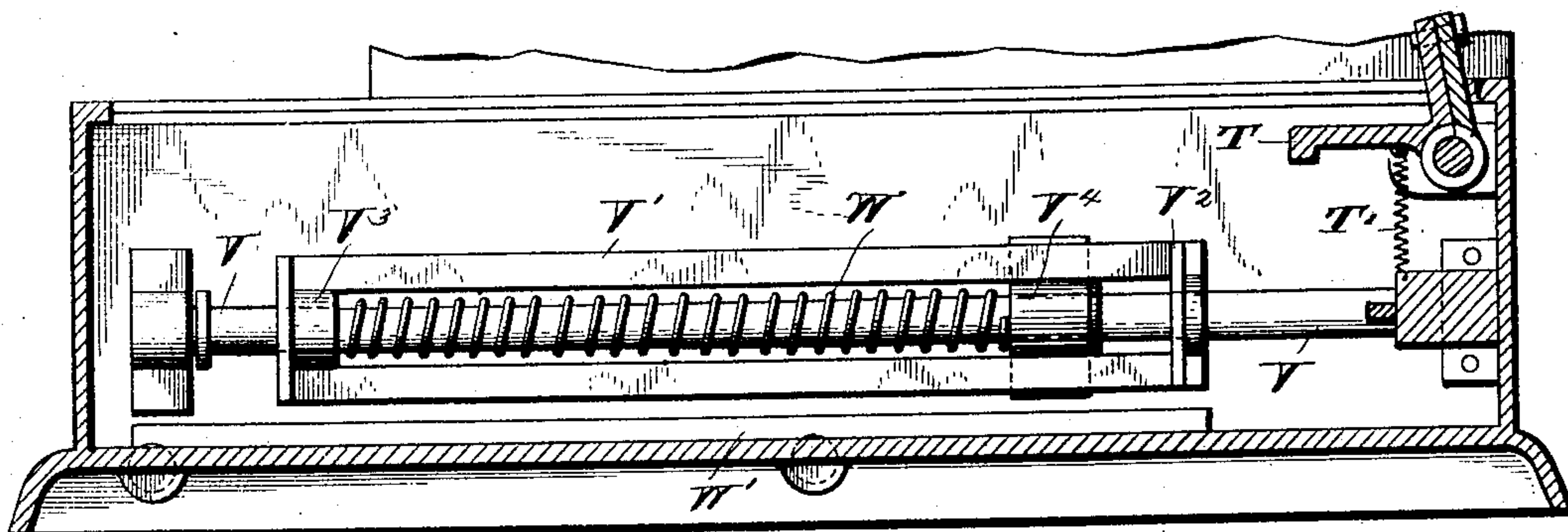


Fig. 8.

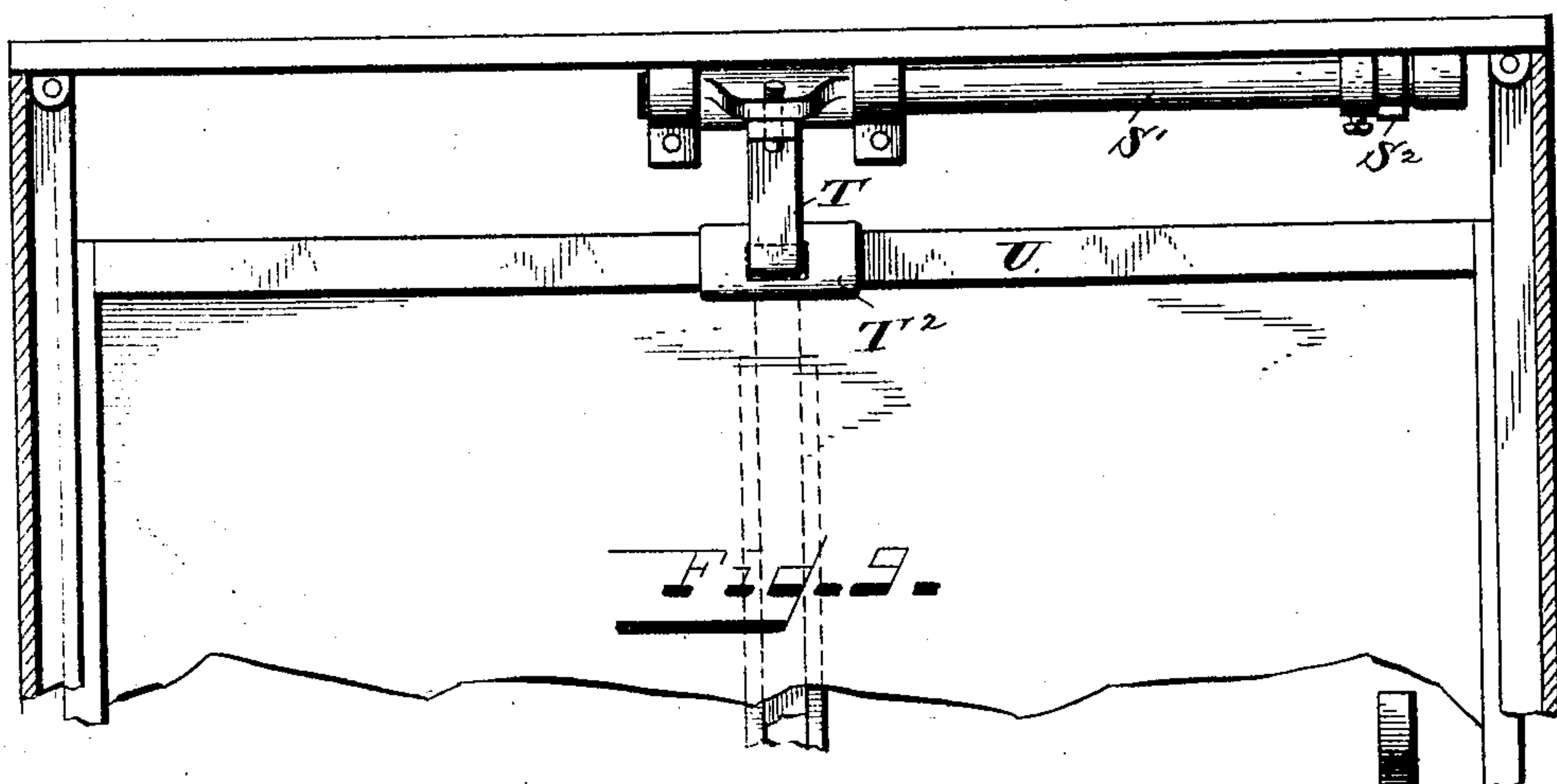


Fig. 9.

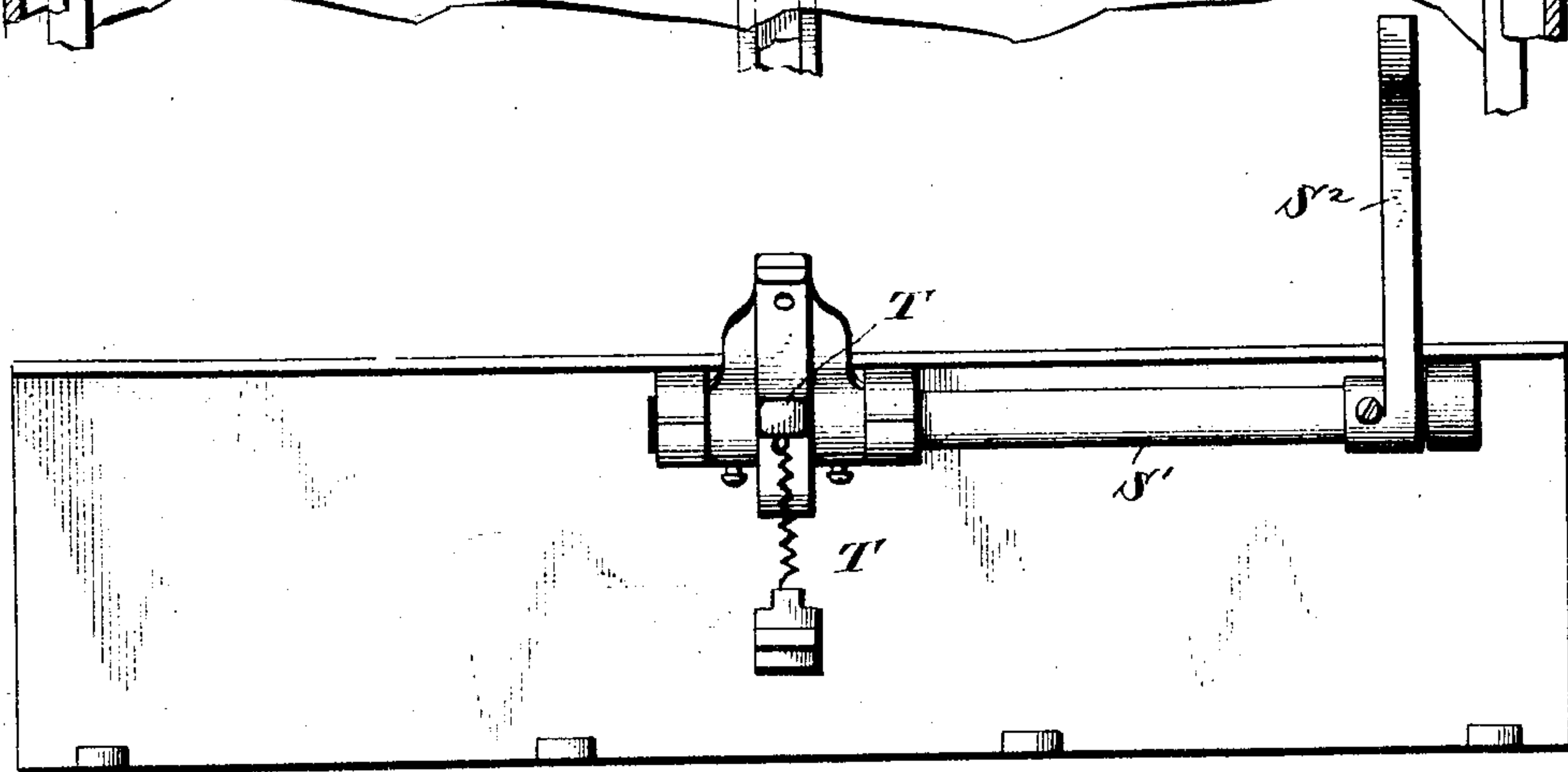


Fig. 10.

Witnesses.

J. Thomson Cross
Deba Dressell

Inventor.

Edward B. Parkhurst
per *Beck & Rector*
his Attorneys.

UNITED STATES PATENT OFFICE.

EDWARD B. PARKHURST, OF WOBURN, MASSACHUSETTS, ASSIGNOR TO THE
NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 453,746, dated June 9, 1891.

Application filed January 19, 1891. Serial No. 378,272. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. PARKHURST, a citizen of the United States, residing at Woburn, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Cash Registers and Indicators, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My present invention relates, mainly, to registering, indicating, and automatic drawer mechanisms of such machines, and its novelty will be hereinset forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the machine removed from its case or cabinet. Fig. 2 is a sectional front elevation on the dotted line 2 2 of Fig. 1. Fig. 3 is a top plan view of the machine with the registering-wheels, indicators, and various other parts removed to show the graduated registering frames or bars which actuate the registering-wheels. Fig. 4 is a sectional side elevation of the machine in its case on the line 4 4 of Fig. 3. Fig. 5 is a perspective view of the five-cent bar for registering the fives of odd-numbered keys on the five-cent wheel. Fig. 6 is a perspective view of a tablet-rod and its pivoted collar, which engages the supporting-bar. Fig. 7 is a side elevation of the same. Fig. 8 is a sectional side elevation of the drawer-compartment on the line 8 8 of Fig. 9. Fig. 9 is a top plan view of the rear portion of the drawer-compartment, drawer, and latch therefor. Fig. 10 is a front elevation of the rear of the drawer-compartment, the drawer-latch, and the shaft and arm for operating the same. Fig. 11 is a perspective view of the rearwardly-projecting arm of the vibrating frame or key-board carrying the key-arresting pawl and the roller for operating the drawer, latch-arm, and shaft. Figs. 12 and 13 are detail views of the transfer devices between the registering-wheels.

The same letters of reference are used to indicate identical parts in all the figures.

The working parts of the machine are inclosed in the usual case or cabinet, having in its upper rear portion a glass-covered read-

ing-opening to expose the indicators and in its lower portion a drawer-compartment containing a money-drawer.

The working parts of the machine are mainly supported in a frame-work composed of two side frames and suitable cross-pieces, as usual. The operating-keys A are pivoted on a through-shaft B at the front of the machine. Their front ends, projecting outside the case, are provided with numbered finger-buttons, while their rear ends have play up and down in slots in a vertical guide-plate C and carry the tablet-rods D, which are provided at their upper ends with indicating-tablets bearing numbers corresponding to those on the finger-buttons of their respective keys. Each of these rods is provided with a projection E, which, when the rod is lifted, is engaged by the supporting-bar F to support the rod and hold its indicator exposed to view at the glass-covered opening above. This bar F is pivoted at its ends in the side frames of the machine. When any key is operated and its tablet-rod lifted, the upper edges of this bar, by mechanism interposed between it and the keys, is pushed backward to release and let fall any rod that may be supported by it, and is then released and pulled forward again by a suitable spring to catch under the projection on the lifted rod and support the latter. The mechanism interposed between the keys and bar for this purpose is not illustrated, since it is common in this class of machines, and any one of a great variety of well-known forms of it may be employed. The spring for resetting the bar is shown at G in Fig. 1, consisting of a spiral spring secured at its front end to the frame-work and at its rear end to an upwardly-extending arm on the bar.

Heretofore the projections E on the tablet-rods D have been made rigid with the bar, consisting of lugs or shoulders formed integral with the bar or of pins or collars rigidly secured to it. I propose to pivot the projections on the rods in such manner that their rear ends may tilt downward or inward to facilitate their passage by the bar F, but cannot tilt upward from their normal position, thereby forming rigid supports for the rods

when resting on the bar. To this end I make each projection in the form of a slotted plate E, Figs. 6 and 7, the plate straddling the rod and pivoted thereto by a horizontal pin passing through the plate and rod. The upper rear edge of the plate is rounded or beveled off, while the inside rear end of the slot is beveled, as shown, to permit the rear end of the plate to tilt downward and inward, as shown by the dotted lines in Fig. 7. It cannot tilt upward, however, for the upper edge of the rear wall of the slot is in contact with the rod when the plate is in horizontal position and prevents upward movement of its rear end. Spiral springs H, Fig. 4, surrounding the rods D and confined between plates E and the upper guide-plate I, through which the rods pass, yieldingly hold the plates in horizontal position.

The registering wheels A^1 , A^2 , A^3 , &c., Fig. 2, are mounted on sleeves strung on a shaft J. The wheel to the right A^1 is the five-cent wheel and bears a 0 and a 5 at diametrically-opposite points on its periphery. The next wheel to the left A^2 is the ten-cent wheel and bears a series of numbers in multiples of from 0 to 9. The next wheel A^3 is the dollar-wheel and is substantially the same as the wheel A^2 . The three succeeding similar wheels to the left represent tens, hundreds, and thousands of dollars, respectively.

The operating-keys, as shown in Fig. 3, consist of a series of cent-keys and a series of dollar-keys. The cent-keys, which are on the right, represent both the even and odd multiples of five from 5 to 95, while the dollar-keys in this instance represent multiples of one from 1 to 6. Through the mechanism hereinafter described the five-cent key actuates the five-cent wheel A^1 , turning it one-half of a complete revolution at each operation of the key. The other cent-keys all actuate the ten-cent wheel A^2 . The keys representing even multiples of five act on this wheel alone and register their exact values on it, while the keys representing odd multiples of five above the first power act on the wheel A^2 , and also, through the intervention of what is termed a "five-cent bar" upon the wheel A^1 . They register their tens on the wheel A^2 and their five on the wheel A^1 . Thus the fifteen-cent key will turn the wheel A^2 one number to register ten cents and the wheel A^1 a half-revolution to register five cents, while the ten-cent key will turn the wheel A^2 one number, the twenty-cent key two numbers, and so on. By means of suitable transfer mechanism interposed between the wheel A^1 and the wheel A^2 the former at each complete revolution transfers ten cents to the wheel A^2 , so that the total registered on the two wheels may always be read off in a single amount. The dollar-keys act on the dollar-wheel A^3 . At each complete revolution of the wheel A^2 the latter transfers one dollar to the wheel A^3 , which in turn at each of its own complete revolutions transfers ten dollars to the next

wheel to its left, the latter adding onto the fourth wheel, and that onto the last wheel in the same manner.

The mechanism through which the cent-keys actuate the wheel A^2 and the dollar-keys the wheel A^3 is substantially the same as that shown and described in my prior patent, No. 444,368, dated January 6, 1891, and its particular construction forms no part of my present invention. It may be briefly described as follows: Tight upon the sleeve of each of the wheels A^1 , A^2 , and A^3 is a small pinion B^1 , B^2 , B^3 , respectively. These pinions mesh with larger pinions or gears C^1 , C^2 , and C^3 , loosely mounted on a shaft K. Beside and rigid with each of the gears are two ratchets having oppositely-facing teeth. The ratchet next to each of the gears is merely a stop-ratchet engaged by a pawl at the completion of the positive stroke of a key and need not be further described. The other ratchets D^1 , D^2 , and D^3 are the actuating-ratchets for the gears. Mounted on the shaft K are also three segment-racks, one for each of the gears C^1 , C^2 , C^3 , and its associated ratchet D^1 , D^2 , D^3 . They are not shown in Fig. 2, being immediately behind the parts F^1 , F^2 , and F^3 . The right-hand one E^1 is shown in Fig. 4. It carries a pawl M, spring-pressed into engagement with the ratchet D^1 and meshes with a curved rack F^1 , rigidly secured to the forward end of an arm N, hung on a shaft O. Whenever the rack F^1 is lifted, the pawl M turns the ratchet D^1 and gear C^1 ; but when the rack returns the pawl slips idly over the ratchet and the latter and the gear are held at the point to which they were turned by a retaining-pawl P, Fig. 4. The segment-rack which actuates the ratchet D^2 and gear C^2 is secured on a sleeve G^2 , Fig. 2, and in the drawings is hidden behind the rack F^2 , with which it meshes, the two racks having the same relative location as the racks E^1 and F^1 in Fig. 4. Its sleeve G^2 carries a pawl, (not shown,) which engages the ratchet D^2 just as the pawl M engages the ratchet D^1 in Fig. 4. The segment-rack for the ratchet D^3 and gear C^3 is secured to a sleeve G^3 on the shaft K and is hidden in Fig. 2 by its intermeshing rack F^3 . The sleeve G^3 carries a pawl, which engages the ratchet D^3 just as the pawl on the sleeve G^2 engages its ratchet E^2 . The rack F^2 is carried by a forwardly-projecting plate N^2 on a graduated registering-bar N' , a plan view of which is shown in Fig. 3. This bar is hung on the shaft O by the side arms and a central arm at N^3 , and these side and central arms are connected and braced by other arms or bars, the whole forming a rigid frame swinging on the shaft O. Its front end is supported at the lower end of the rack F^2 on the hubs of the keys. The bar N' extends diagonally across the series of cent-keys in a series of retreating steps from right to left. There is one of these steps immediately above each even-numbered key and the odd-numbered key of next highest value. Thus the first

step extends over the ten and fifteen cent keys, the second over the twenty and twenty-five cent keys, and so on. Each step except the first is provided with two pendent projections of equal length, Fig. 4, one over each of its subjacent keys. The projections on each succeeding step from right to left increase in length, so that although the rear left-hand end of the bar N' is much higher above the keys than its right-hand end, yet the lower ends of the pendent projections are all substantially the same distance from the plane of the upper sides of the keys. It results from this diagonal arrangement of the bar N' across the keys in a series of steps that the bar, and consequently the rack F^2 , will be lifted different distances by the keys which engage different steps of the bar, so that the keys of lower value, which engage the right-hand portion of the bar near their fulcrums, will lift the bar a less distance than will the keys of higher value which engage the rear left-hand portion of the bar at points farther from their fulcrums. The bar will be lifted the same distance, however, by the two keys which engage each of its steps, so that an even-numbered key and the next higher odd-numbered key will each lift the bar the same distance. The object of these steps is to cause the two such keys to turn the gear C^2 , and consequently the pinion B^2 and wheel A^2 , the same distance to register equal values on the wheel. This will register the total value of the even-numbered key and the tens of the odd-numbered key, but will leave the five of the latter to be registered on the five-cent wheel, which is accomplished in the manner and by the means to be now described.

Hung on the pivotal shaft B of the keys by two side arms is what is called the "five-cent bar" Q . (Shown in full in perspective in Fig. 5 and in front elevation in Fig. 2.) This bar extends beneath all of the cent-keys excepting the five-cent key, and has a series of upwardly-projecting hooked fingers Q' , one beside each of the odd-numbered keys. Each of the latter has a lug on its side projecting beneath the hook of the finger beside it, so that when the front end of the key is depressed and its rear end lifted it lifts the bar Q with it. At the right-hand end of the bar is an upwardly-extending arm Q^2 , having a slot-and-pin connection at its upper end with the arm N , which carries the rack F' , which actuates the five-cent wheel, as seen in Fig. 4. It results from this construction that whenever any one of the odd-numbered keys is operated the bar Q is lifted, and with it the arm N and rack F' , and the gear C' is turned, thereby turning the pinion B' and five-cent wheel A' . The adjustment of the parts is such that a full stroke of either of the odd-numbered keys turns the wheel A' one-half revolution, as does also a full stroke of the five-cent key, which acts on the arm N directly.

There is interposed between the wheel A'

and the wheel A^2 a transfer mechanism, by means of which the wheel A' at each complete revolution turns the wheel A^2 one number. This transfer mechanism may be of any usual or suitable construction—such, for instance, as that illustrated in my prior patent, No. 444,368, before mentioned. Such a transfer mechanism is illustrated in Figs. 4, 12, and 13. As shown in Fig. 13, the five-cent wheel A' has projecting from one of its sides a pin a , which in the revolutions of the wheel is adapted to strike the forward end of an arm b , fast upon a rock-shaft c , and to thereby throw up the forward end of the arm b and rock said shaft. The shaft c extends from a point adjacent to the wheel A' to a point adjacent to the wheel A^2 , and near the latter has fast upon it a rearwardly-extending latch d , Fig. 12. A spiral spring e , connected to the front end of this latch, tends to throw its rear end upward and to hold the shaft c and arm b in the position shown in Fig. 13. The rear end of the latch d co-operates with a lug f upon the side of a bell-crank g , pivoted at its angle to the frame-work. To the upper end of the bell-crank is pivoted the rear end of a pawl-arm h , whose forward toothed end engages a ratchet i , secured to the side of the wheel A^2 . A spring j , pressing against the forward side of the upper arm of the bell-crank, tends to throw the latter rearward to the position shown in Fig. 12; but the bell-crank is normally held in the position shown in Fig. 4 by the engagement of its lug f with the latch d . In this position the lower end of its lower arm rests above and immediately in rear of a lug k upon the side of an arm l , extending upward from a bar R' , which extends across the entire series of keys A , Fig. 4, and is lifted by the operation of any one of them. In such position of the parts, when the wheel A' completes a revolution and its pin a strikes and lifts the forward end of the arm b it rocks the shaft c and throws the rear end of the latch d downward and disengages it from the lug f upon the side of the bell-crank g , whereupon the spring j throws the bell-crank rearward to the position shown in Fig. 12, thereby drawing the pawl-arm h backward over one tooth of the ratchet i and bringing the lower end of the lower arm of the bell-crank g immediately above the side of the arm l , all as shown in Fig. 12. In this position of the parts, when the next key is operated and the bar R' thereby lifted, the engagement of the lug k with the lower arm of the bell-crank g will throw forward the upper arm of said bell-crank and the bar h will turn the ratchet i and wheel A^2 forward one notch and number to effect the transfer, as will be readily understood. When the bell-crank is thus thrown forward, the lug f is carried in front of the shoulder on the rear end of the latch d , and the spring e throws up the rear end of said latch, which thereupon holds the bell-crank g in the forward position (shown in Fig. 4) until the wheel A' completes another revo-

lution and its pin a strikes the arm b and again rocks the shaft c and disengages the latch from the lug on the bell-crank, as before explained.

5 The novel form of the five-cent bar Q and its combination with the odd-numbered keys of themselves form a novel feature of my invention; but the general combination of the wheels A' and A^2 , keys A , bar Q , and
10 the interposed mechanism is not limited to the particular form or construction of any of those elements, but contemplates, broadly, the combination of a series of keys representing both even and odd multiples of five, a five-
15 cent wheel bearing a 0 and 5 or a series of naughts and fives, a ten-cent wheel bearing multiples of one, a transfer mechanism between the two wheels, a suitable operative connection between all of the keys and the ten-
20 cent wheel, and a five-cent bar common to all the odd-numbered keys and operatively connected with the five-cent wheel, for the purpose described. It is of course evident that the wheel A' might have two fives and two
25 naughts on it and be turned only one-fourth of a revolution at each operation of the five-cent or other odd-numbered key, in which case it would transfer to the wheel A^2 at each half-revolution.

30 The dollar-wheel A^3 is actuated through the interposed mechanism by a registering bar or frame O' , similar to the bar N' , but having a separate step for each key and carrying a rack F^3 , meshing with the segment-rack on the
35 sleeve G^3 .

The next feature of my invention relates to the automatic drawer and the means for locking and unlocking the same upon the operation of any key. Hung by side arms R on the
40 shaft B is a cross-bar R' , extending across the entire series of keys, Figs. 1 and 3, and resting upon their upper sides near their rear ends, as seen in section in Fig. 4. The side arms R at their forward ends are connected by a cross-
45 bar R^2 beneath the keys, the two arms R and cross-bars R' and R^2 forming a vibrating frame or key-board, which is rocked whenever the front end of any key is depressed. The right-hand arm R is extended rearwardly of
50 the bar R' and carries a roller S , Fig. 11. Journaled in bearings secured to the rear side of the drawer-compartment, Figs. 4, 8, 9, and 10, is a shaft S' . Secured to the right-hand end of this shaft is an upwardly-extending arm S^2 , in line with and immediately in
55 rear of the roller S . To the opposite end of the shaft S' is rigidly secured a forwardly-projecting latch or hook T , which, under tension of a spring T' , normally engages a keeper
60 T^2 , secured on the upper rear wall of the money-drawer U . It results from this construction and arrangement of the parts that when any key is operated and the cross-bar R' and rear end of the arm R are lifted the
65 roller S rides up the front side of the arm S^2 and pushes the same rearward, thereby rocking the shaft S' , disengaging the latch T from

the keeper T^2 , and releasing the drawer. When thus released, the drawer is automatically thrown open by a spring or springs, a
70 novel form and application of which constitute another feature of my invention. In each side of the drawer-compartment is secured a rod V , Figs. 8 and 9, each rod extending from front to rear of the compartment. Mounted
75 loosely on each rod is a slotted plate V' , having an inwardly-bent flange V^2 at its rear end. Surrounding each end and confined between bearing-sleeve V^3 at the front end of the plate
80 V' and a collar or other projection V^4 , secured on the rod, is a coiled spring W . The sides of the drawer are grooved out to receive the inner convex surface of the rod and spring and the front bearings of the plates; but the
85 flanges at the rear ends of the plates are of such width that they project into the path of the drawer and are engaged by its rear end, so that when it is closed it forces the plates
90 V' rearward against the resistance of the springs and puts the latter under tension. When the drawer is unlocked, at the operation of any key the springs throw it open. By
95 the employment of the two coiled springs applied, as described, at each side of the drawer the pressure tending to throw the latter outward is exerted equally on each side of the
100 drawer, so that the latter is not so apt to bind in its compartment, and the action of the springs on the drawer is more gradual and continued than where the stiff leaf-springs
105 behind the drawer are employed, as heretofore. The drawer runs on rollers supported in the bottom of the compartment, and is provided on its under side with a rib or strip,
110 which is confined in a longitudinal guideway W' , Figs. 4 and 8, and holds the drawer from lateral play. When the drawer is pushed in, the rear beveled side of the keeper-plate T^2 rides under the hook of the latch T , and the latter engages the keeper and holds the drawer closed.

As shown in Fig. 11, the rear extension of the arm R carries a double-toothed pawl X . This pawl co-operates with a rack (not shown) to compel the complete movement of the key-
115 board and keys in each direction, as fully described in my former application above referred to. This rear extension of the arm R also is provided with a lug X' , which co-operates with a locking-arm Y , pivoted at Y' to
120 the frame of the machine and extending down into the drawer-compartment. This arm has a shoulder Y^2 immediately in rear of and slightly above the lug X' . When the drawer is closed, it holds this arm rearward with the
125 shoulder Y^2 out of engagement with the lug X' ; but when the drawer is opened a coiled spring Z pulls the arm forward with its shoulder over the lug, thereby locking the key-board down and holding all the keys from op-
130 eration. When the drawer is closed, it pushes the arm to the rearward again and releases the key-board and keys. The arm Y projects above its pivotal support at Y' , and its upper

end is engaged by the hooked end of the horizontal arm of a bell-crank lever Z' , pivoted to the frame-work at Z^2 . The vertical arm of this lever is connected to the rear end of a sliding rod X^2 , having a handle at its forward end. When the rod is pulled forward, the bell-crank is rocked on its pivot and the hooked rear end lifted out of engagement with the end of the locking-arm Y . The lower end of the latter is then free to swing forward, when the drawer is opened, to lock the keyboard and keys, as before described; but when it is desired to hold the locking-rod out of operation, so that the machine may be operated without closing the drawer, the slide-rod X^2 is pushed rearward and the hooked rear end of the lower arm of the bell-crank lever engages the upper end of the locking-arm Y and holds it out of operation, as will be readily understood. A spring engaging notches in the lower side of the front end of the rod X^2 yieldingly holds the latter in each of its adjusted positions.

Having thus fully described my invention, I claim—

1. In a cash-register, the combination of a series of keys representing both even and odd multiples of five, a ten-cent-registering wheel, a five-cent-registering wheel bearing a 0 and a 5 on its periphery and transferring to the ten-cent wheel at each alternate operation, suitable connections between all of the keys and the ten-cent wheel, and a five-cent bar common to the odd-numbered keys and actuating the five-cent wheel, substantially as and for the purpose described.

2. In a cash-register, the combination of the keys A , representing both even and odd multiples of five, the wheel A^2 , the graduated registering-bar N' , having a series of steps at different distances from the fulcrums of the keys, one step over each even-numbered key and the next higher odd-numbered key, a suitable connection between the bar N' and wheel A^2 , a five-cent bar, as Q , common to the odd-numbered keys, and the five-cent wheel A' , actuated by the bar Q and transferring to the wheel A at each alternate operation, substantially as and for the purpose described.

3. In a cash-register, the combination, with a series of keys representing both even and odd multiples of five, of the five-cent bar Q , arranged beneath the same and having a series of hooks Q' , extending up beside the odd-numbered keys and engaged by them, and a five-cent-registering wheel actuated by the

five-cent bar, substantially as and for the purpose described.

4. In a cash register and indicator, the combination of a series of operating-keys, as A , a backwardly and forwardly movable indicator-supporting bar, as F , and a series of indicator-supports, as D , mounted in stationary guides and each provided with a pivoted supporting projection, as E , arranged to co-operate with the movable bar F .

5. In a cash register and indicator, the combination of a series of operating-keys, as A , a backwardly and forwardly movable indicator-supporting bar, as F , a series of indicator-supports, as D , mounted in stationary guides and each provided with a pivoted supporting projection, as E , arranged to co-operate with the bar F , and a series of spiral springs, as H , one surrounding each rod D and confined between its projection E and the guide for the rod, substantially as and for the purpose described.

6. In a cash-register, the combination of a money-drawer, a latch for the same, a rock-shaft upon which the latch is rigidly mounted, a movable bar common to and actuated by a series of keys, and a connection between the movable bar and rock-shaft, whereby the latter is rocked to cause the latch to release the drawer at the operation of any key of the series, substantially as and for the purpose described.

7. In a cash-register, the combination of a money-drawer, a latch, as T , for holding the same closed, a rock-shaft, as S' , upon which the latch is mounted, an arm, as S^2 , secured on the rock-shaft, a vibrating frame carrying a roller S , engaging the arm S^2 , and a series of keys actuating the vibrating frame, substantially as and for the purpose described.

8. In a cash-register, the combination, with a money-drawer, a latch for the same, and suitable connections between the latch and the operating-keys for releasing the drawer at the operation of any key, of the rods V , secured in the drawer-compartment at each side of the drawer, the sliding plates V' , mounted on said rods and engaged by the drawer, and the spiral springs W , surrounding the rods V and bearing against the plates V' , substantially as and for the purpose described.

EDWARD B. PARKHURST.

Witnesses:

HENRY THEOBALD,
THOMAS CORWIN.