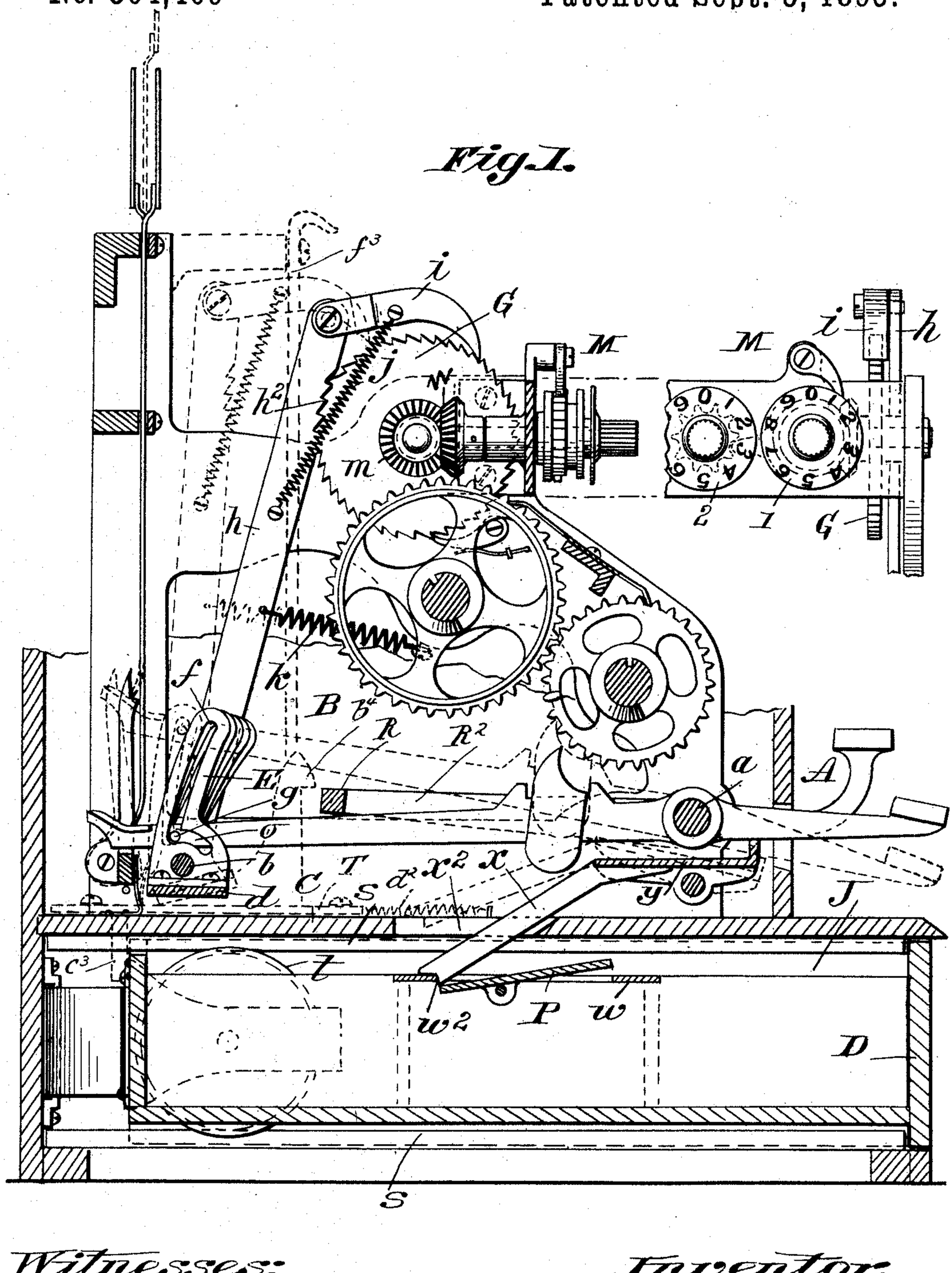
(No Model.) 4 Sheets—Sheet 1.

F. L. BAILEY.

CASH REGISTERING MACHINE.

No. 504,409 Patented Sept. 5, 1893.

Fig. 1.



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per Chapin & Co. Attorneys

(No Model.) 4 Sheets—Sheet 2.

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Fig. 2.

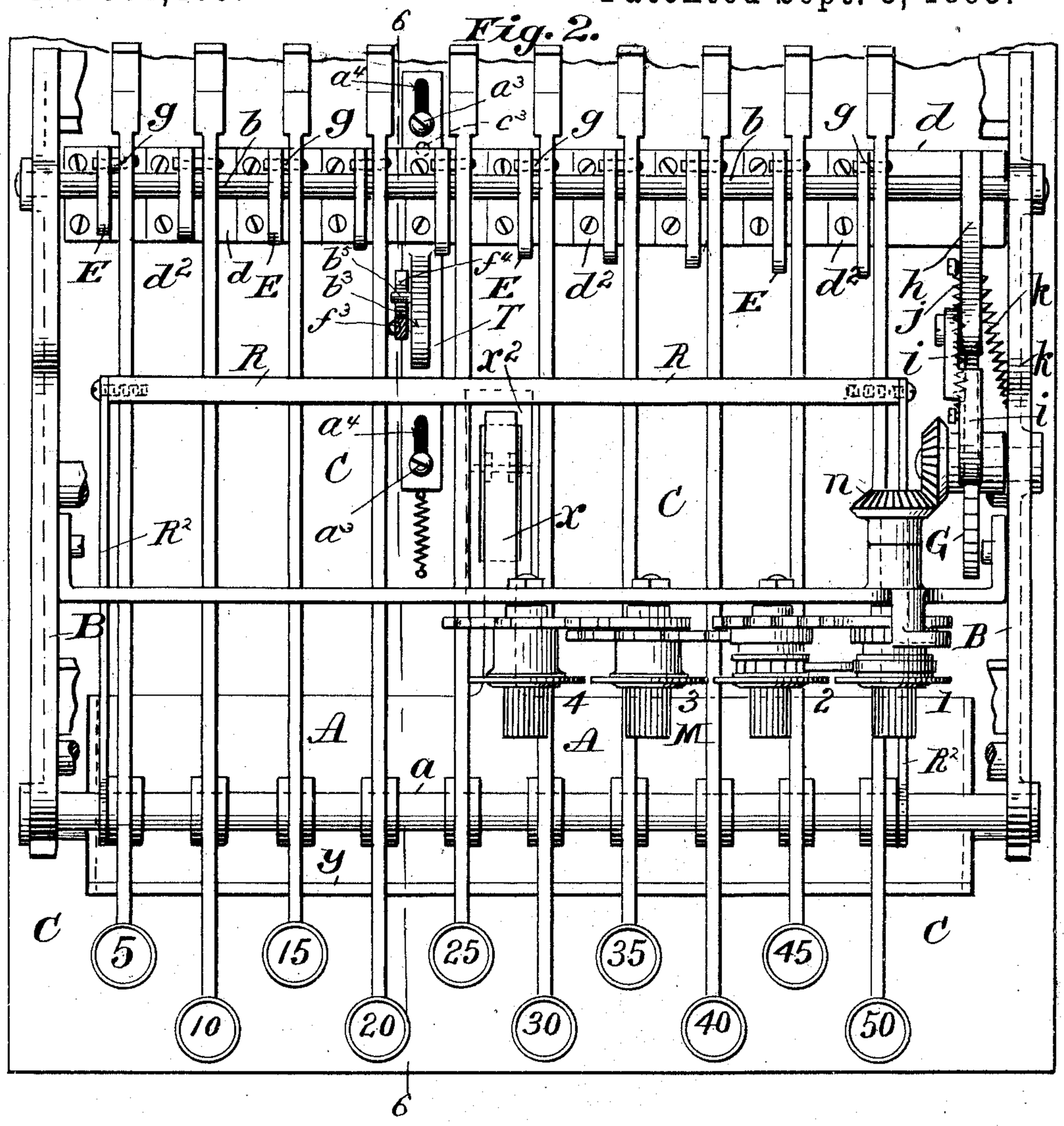
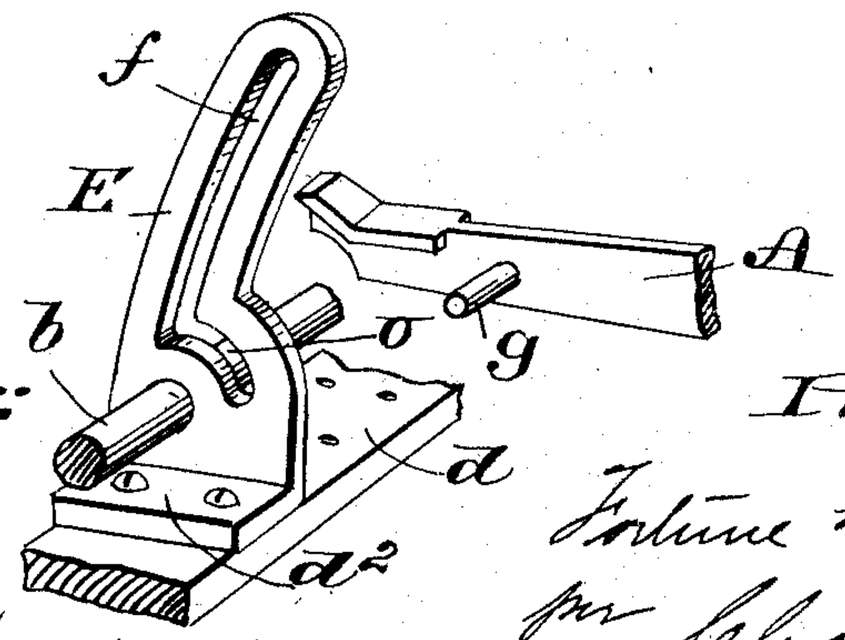


Fig. 3.



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(No Model.) 4 Sheets—Sheet 3.

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CASH REGISTERING MACHINE.

No. 504,409. Patented Sept. 5, 1893.

Fig. 4.

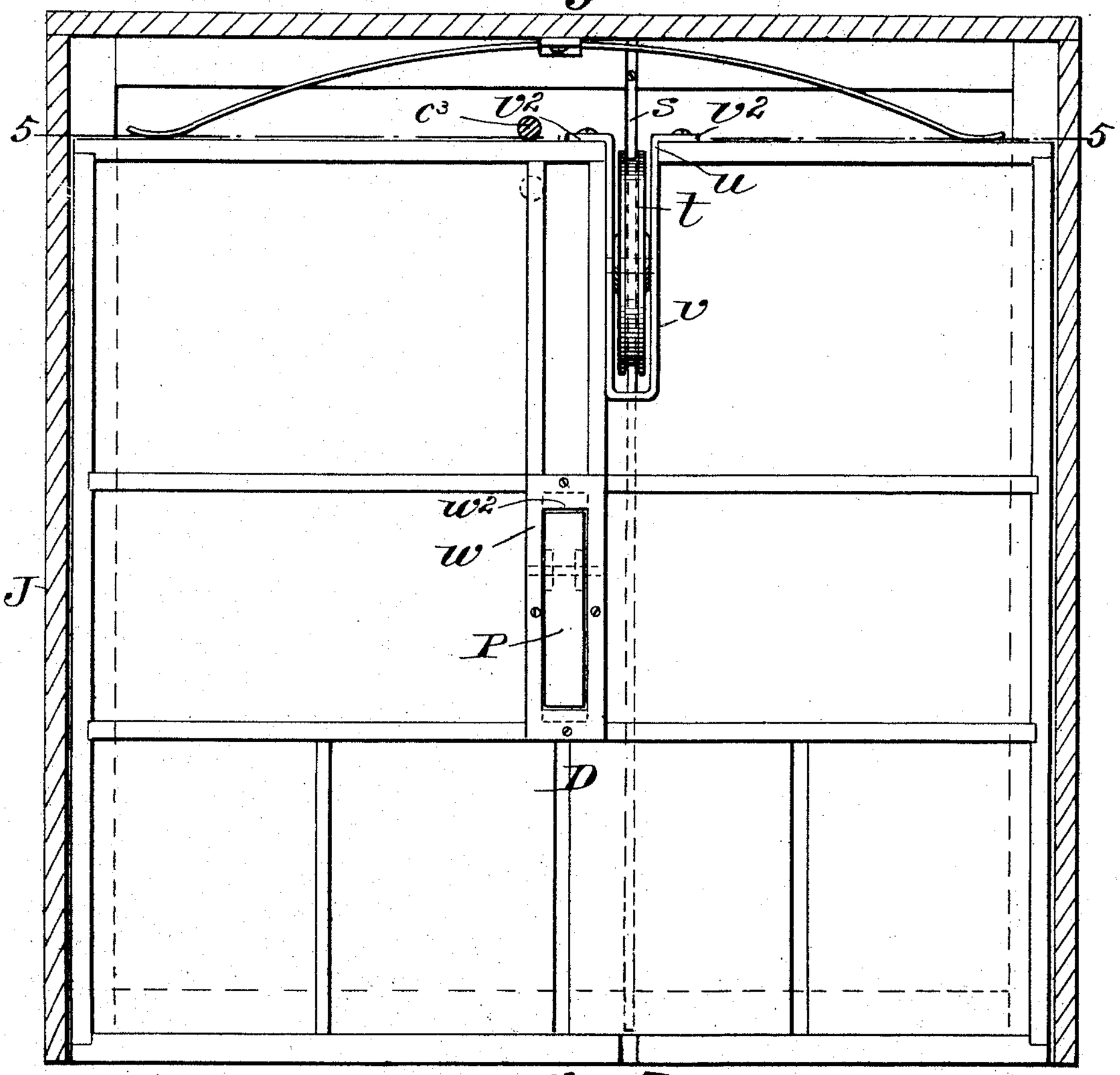
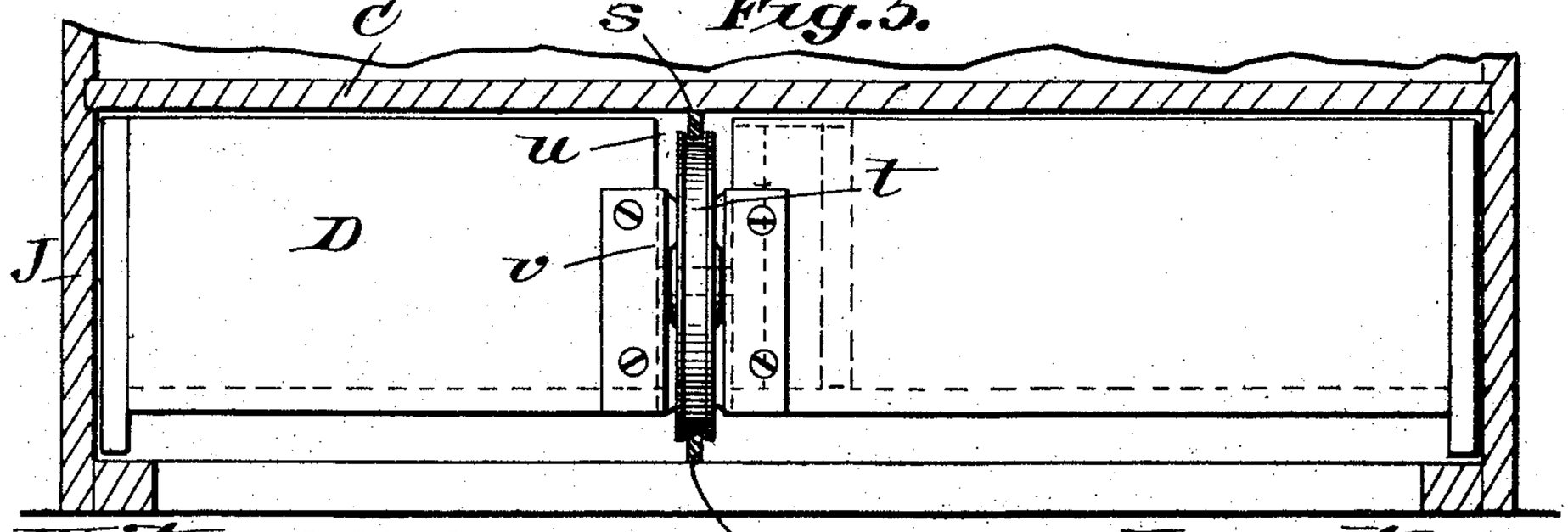


Fig. 5.



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(No Model.) 4 Sheets—Sheet 4.

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CASH REGISTERING MACHINE.

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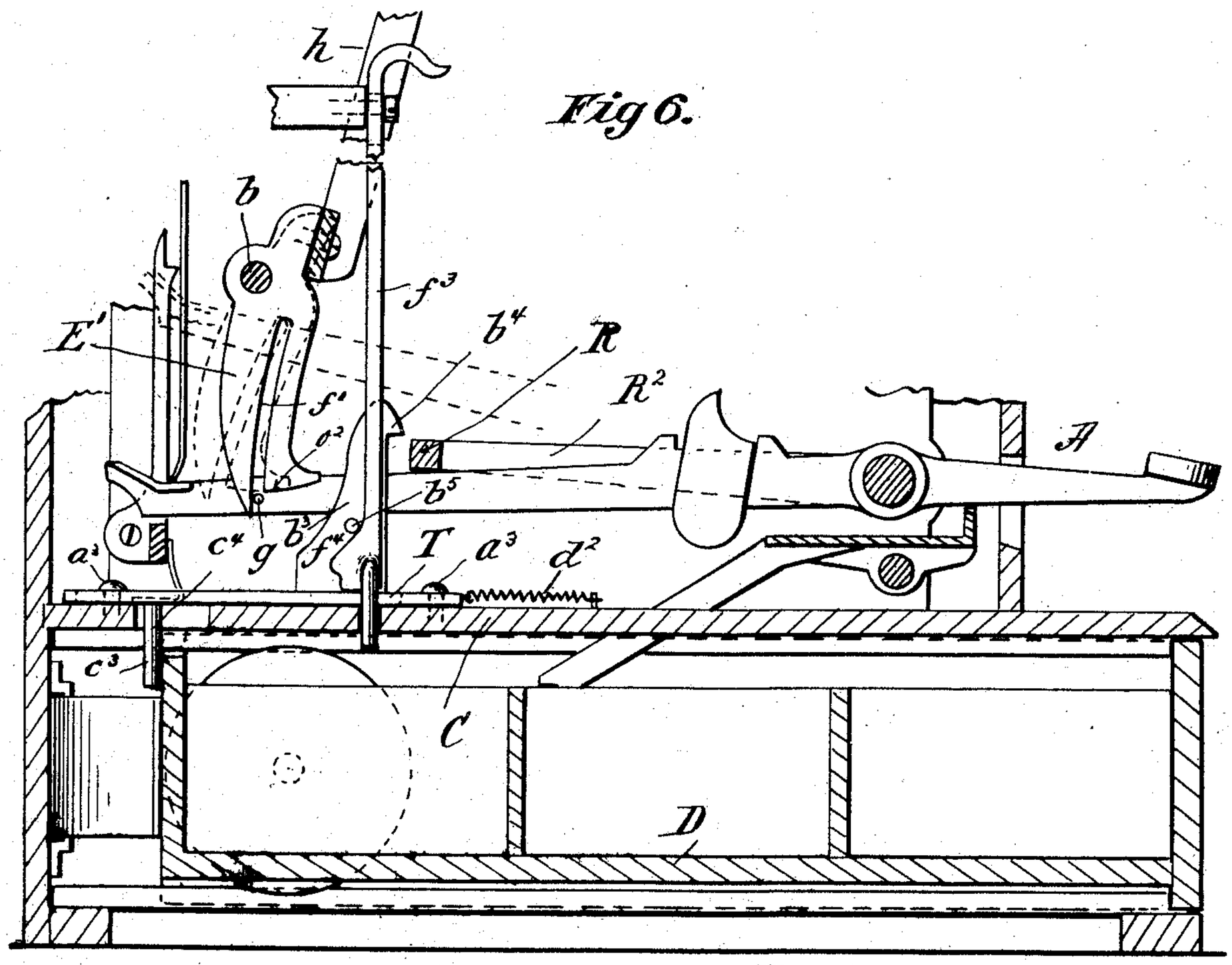

Fig 6.

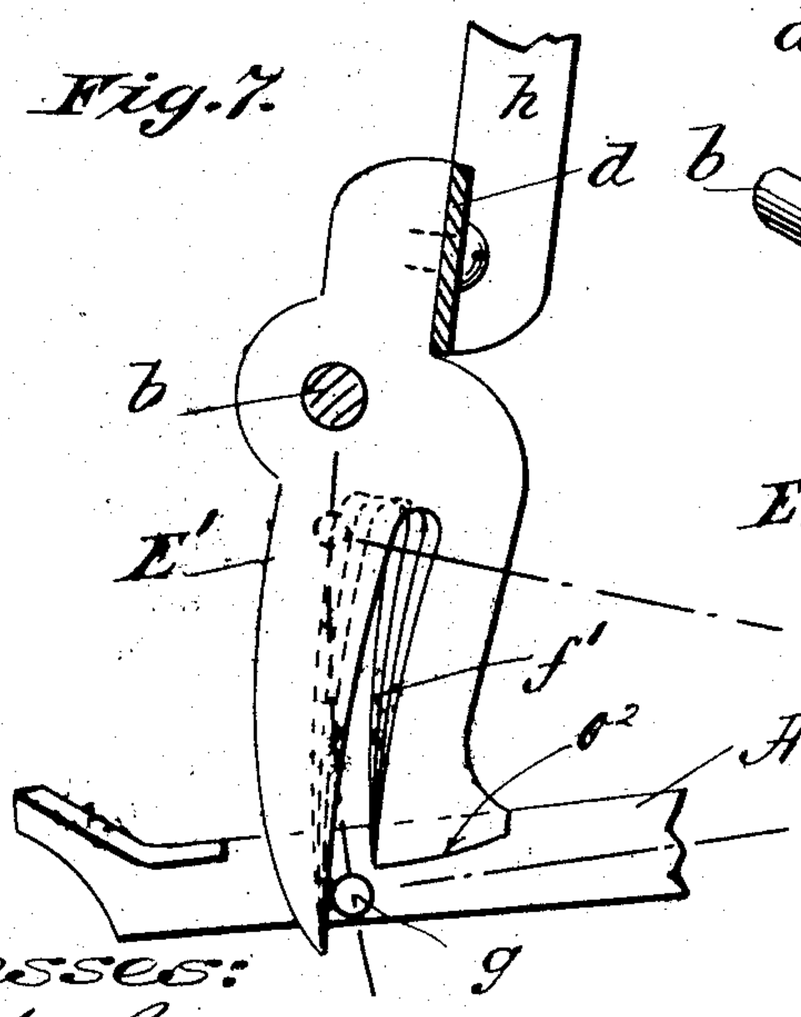

Fig. 7.

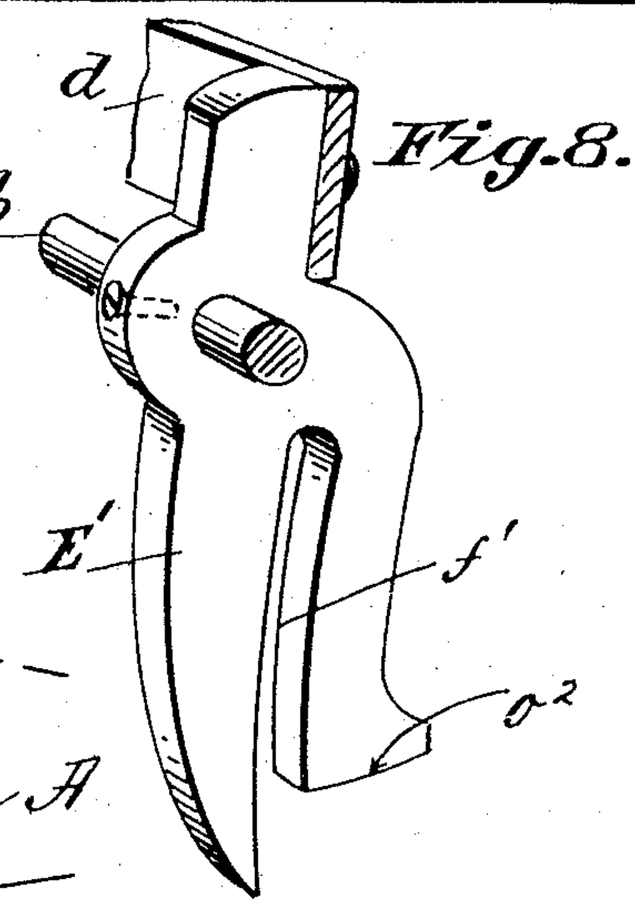

Fig. 8.

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per Chapin & Co. Attys

UNITED STATES PATENT OFFICE.

FORTUNE L. BAILEY, OF NORTHAMPTON, MASSACHUSETTS, ASSIGNOR TO THE BOSTON CASH REGISTER COMPANY, OF SAME PLACE.

CASH-REGISTERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 504,409, dated September 5, 1893.

Application filed March 29, 1893. Serial No. 468,130. (No model.)

To all whom it may concern:

Be it known that I, FORTUNE L. BAILEY, a citizen of the United States, residing at Northampton, in the county of Hampshire and State of Massachusetts, have invented new and useful Improvements in Cash-Registering Machines, of which the following is a specification.

The objects of this invention are to provide improved drawer locking devices, and a safety device in relation thereto, for preventing the opening of a drawer except through means of the key; improved devices for guiding the drawer evenly and easily; improved register-operating devices whereby each key-lever may move the register its proper proportionate distance to accord with the amount indicated by the key;—and there is comprised as a part of, or in conjunction with, the register-operating device improved means for preventing the register wheel from "running away" from its actuating part, that is moving by momentum a distance in excess of that intended, as might occur on the somewhat violent operation of any of the key-levers. And there is, furthermore, comprised in conjunction with the register operating mechanism means whereby all of the keys, except the one being operated, are locked against movement. And there is, furthermore, an improved construction of device to hold all of the keys locked when the drawer has been opened, whereby it becomes impossible to operate any key unless the drawer is closed.

To these ends the invention consists in constructions and combinations of parts all substantially as will hereinafter fully appear and be set forth in the claims.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a sectional elevation of a cash registering machine of the type known as a combined detail adder and total adder, all of the various features of improvement being here more or less clearly shown or indicated. Said figure also comprises, as a projection at the right, a face view of a part of the total adding mechanism. Fig. 2 is a plan view of the principal parts, as seen above the base or table, the inclosing case being understood as removed and the detail registers, or adding wheels, and their supports being also removed, as they constitute no part of this invention. Fig. 3 is a perspective view of one of the cam-slotted arms and its rocking support, and as detached therefrom the rear end of the key-lever. Fig. 4 is a plan view below the base or table showing the cash-drawer thereunder, and the guide therefor, and the safety plate for the drawer-lock; and Fig. 5 is a vertical cross section taken on the line 5—5, Fig. 4, as seen looking forwardly. Fig. 6 is a sectional elevation on the line 6—6, Fig. 2, this view involving a modification of the form of cam-slotted rocking members, to be hereinafter referred to while Figs. 7 and 8 are enlarged face and perspective views of the latter.

In the drawings, A represents the set of key-levers mounted upon the horizontal shaft, *a*, which is supported by the framing, B, the latter being screwed or otherwise secured to the base or table, C, below which the drawer, D, slides in suitable housing therefor.

Between the rear portions of the framing there is, horizontally extended, and at a short distance above the table, C, the horizontal shaft, *b*, on which a series of arms, E, are fulcrum-supported, all of the arms having their bottoms a short distance below the shaft, *b*, rigidly connected upon the common rocking-bar, *d*, the rocking movement being imparted to the latter by one of the arms, E, which incidentally imparts rocking movements to all of the rest of the arms. Each of the arms, E, has a cam-groove, *f*, the widths of the various arms and the cam-grooves, respectively therein, being graded in regularly increasing pitch so that each successive arm may,—on the given and uniform arc-play of the stud, *g*, of the key-lever, respectively therefor within its cam-groove,—have a regularly increased degree of swinging movement, and to consequently impart the corresponding degree of rocking movement to the common bar, *d*. In both Figs. 1 and 2 it will be noted that the said arms, E, are widened as just above explained.

G represents a ratchet-wheel which is to be regarded as comprised in, or as an adjunct to, the total adding registering mechanism. The said rocking-bar, *d*, has at its one end the

upwardly extended pawl-carrying arm which is adapted to swing forwardly and rearwardly as the bar rocks. The pawl, *i*, is pivotally connected upon the upper end of said arm, *h*, its tooth taking into the aforesaid ratchet-wheel, G, the spring, *j*, holding it to its ratchet-tooth engagement at all times whether the pawl is moved forwardly to drive, or is being retracted to take a new tooth. Another spring, *k*, having one end secured to the arm, *h*, and its other to a suitable fixed part of the frame insures the forward driving movement of the pawl-carrying arm and pawl when the key has been depressed and released, this spring serving to reswing the bar, *d*, and the several arms, E, back to normal position.

The ratchet-wheel is movable concurrently with the bevel gear-wheel, *m*, which meshes into the bevel gear, *n*, of the total adding registering mechanism which is indicated generally by the letter, M, the same comprising several register wheels or disks, 1, 2, 3 and 4, the amounts registered by one being, on its complete rotation, accumulated into the next higher, as well known,—this class of registers constituting no part of this invention and a very particular description thereof is not deemed expedient. In fact, and manifestly, other descriptions of cash registers may be substituted for the one indicated.

As an example of a machine equipped with the devices described, we will assume that the first one of the key-levers will cause, by the impingement of its stud, *g*, against the wall of the arm, E, such a swinging of that arm, a rocking of the bar, *d*, and swinging of the arm, *h*, and pawl, *i*, rearwardly as to cause the latter to pass back over one whole tooth of the ratchet-wheel; the next key-lever insuring the retraction of the pawl twice as far, the third three times as far, and so on, the last key,—being for instance the fifty-cent key,—causing the retraction to the extent of ten of the teeth. Therefore, of course, the depression and release of each key will, through the novel mechanism described, result in the rotational movement of the ratchet-wheel, G, and operation of the register in the extent desired and proportionately corresponding to the amount assumed to be represented by the keys. It will be noticed that each of the arms has the arc-formed slot, *o*, which is concentric with the center of swinging movement of the arm these slots merging into the aforesaid cam slots, *f*. As each key is depressed, (its stud, *g*, rising in, and exerting a forcing action on the border of, the slot of the respective arm therefor, and the common bar, *d*, with all the other arms, swinging in the extent determined by the depressed key) the upper borders of the slots, *o*, for all of the other arms, E, of the series, ride over the studs of the non-depressed keys and serve as very effectual locks against the depression of any one or more of the non-depressed keys. The upper ends of the slots, *f*, form the means of limitation for the swinging movements of the key-levers.

In carrying out this invention with respect to the register-operating mechanism, the graded set of cam-slotted arms, E, have foot-lugs, d^2, by which they are screwed to the bar, *d*. It is, of course, to be understood that the arms graded for the greater swinging movements have the lengths of their slots, *o*, correspondingly increased so that as the bar is swung by any one of the key-levers, all of the other arms, swinging in consonance therewith, will have free play by their slots over the studs of the passive key-levers.

The case or housing, J for the drawer, D, under the table, C, has the upper and lower horizontal parallel strips, *s*, *s*, extending from front to rear between the sides. The drawer has, at its rear, the flanged roller, *t*, which is journaled for rotation in a vertical plane coincident with the direction of movement of the drawer. And this roller is of such diameter as to have the flanges at its upper and lower edges overlie the opposite sides of the said strips, *s*, *s*, the lower strip supporting the weight of the drawer through the roller. As seen more especially in Figs. 4 and 5, the rear wall of the drawer, which may form the boundary of one of the bill-compartments, is cut out, as indicated at *u*, and the metallic carrier, *v*, for the roller, is let within the drawer through this recess, *u*. This roller-carrier consists of a metallic strip or casting which is of U-form having the laterally turned extremities, v^2, v^2, which are screwed to the outer side of the rear wall of the drawer. This part, *v*, in addition to serving as the journal support for the roller also serves to reinforce the recessed back wall of the drawer.

In the middle of the drawer, at its top, is the horizontal rectangularly recessed plate, *w*, the rear boundary, w^2, of the recess constituting the abutment which is engaged by the arm, *x*, of the rocker-plate, *y*. The rocker-plate extends under and is common to all of the key-levers, and is normally in the position seen in the full lines in Fig. 1,—that is when no key is depressed,—but as a key is depressed the rocker-plate is swung, as indicated in the dotted lines in Fig. 1, carrying the end of the arm, *x*, out of engagement with the catch-abutment of the drawer. The arm, *x*, plays through the aperture, x^2, therefor, in the table, C, of the machine.

P represents a flat, rectangular, metallic plate pivotally supported within the aforesaid apertured plate, *w*, and having the tendency to be self-leveling so as to lie horizontally in the plane of the plate, *w*; but it will be apparent (see Fig. 1) that so long as the key is in its normal position, the drawer being closed and the arm, *x*, is in its indicated locking engagement with the abutment edge, w^2, the said plate, P, will be tilted into the forwardly and upwardly inclined position shown in Fig. 1. It will therefore be appar-

ent that a person cannot, by running a thin blade or other thin article through the crack, if any there be, at the upper edge of the drawer, reach the locking arm, *x*, to force it from its drawer-locking engagement.

In the operation of the register actuating mechanism, comprising the ratchet-wheel, G, and the pawl-carrying-arm, *h*, with the driving spring, *k*, it will be understood, that as any one of the key-levers is depressed the pawl-carrier moves rearwardly enabling the pawl to take as many new teeth as properly corresponds to the amount represented by that key-lever which causes the retractile movement of the pawl-carrying-arm; and that the driving movement is imparted to the ratchet-wheel after the key-lever has been fully depressed and released by the spring, *k*, which causes the pawl-carrying arm to come to bearing against the edge of the ratchet-wheel; and it will also be perceived that by reason of the one or more teeth, h^2,—formed at the forward edge of the pawl-carrying-arm,—coming to engagement with the ratchet-wheel just as said arm completes its forward driving movement there can be no over-running of the ratchet-wheel by momentum, to result in over-registration. Of course in lieu of the driving spring, *k*, for effecting the return of the pawl-carrying-arm *h*, and, as one therewith the series of swinging arms, *e*, and the key-levers, the return movements of these parts might be positively imparted through the key-lever by the hand.

In the drawings, Figs. 6, 7, and 8, the swinging cam-slotted arms, E′, are of somewhat different form, they being so fulcrumed that the cam-slots, *f′*, thereof are below the shaft or support-rod, *b*. The slots, *f′*, of these arms are open to the bottom, while the common uniting bar, *d*, is secured to all of the arms above the fulcrum, the pawl-carrying-arm, *h*, being connected to the said bar substantially as in the other arrangement indicated in Figs. 1 and 3. The part, o^2, serves in this form of the arm as the key-lock substantially the same as the upper border of the slot, *o*, in the form of the members shown in Fig. 3.

In the cash-registering machine here illustrated, the bar, R,—which is mounted on the arms, R^2, which are fulcrumed on the shaft, *a*, on which the key-levers are mounted,—ranges across all of the key-levers and is swung upwardly as any key-lever is operated; and of course when this bar is in its normal position and locked against movement none of the key-levers may be operated.

T indicates a plate capable of a fore-and-aft sliding movement under the key-levers, this part being constrained for its movement by the shanks of the screws, a^3, passing through the slots, a^4, and into suitable stationary supporting parts of the machine. This plate has the upright, b^3, with the hooked extremity b^4; and the spring, d^2, exerts the action upon the said plate, T, to forwardly draw it so that the hook, b^4, will engage the aforesaid bar, R, and therefore lock all of the keys against movement. The said plate, T, has the depending stud, c^3, which passes downwardly through a slot, c^4, in the base, C, of the machine to be rearwardly moved by the drawer, D, as the latter is closed, so that always when the drawer is closed the hooked upright, b^3, b^4, is out of engagement with the bar, R.

A person, having made the proper registration by the depression of one or more keys, and, having through well known mechanism released the drawer-catch, permitting the drawer to open, manifestly, after the keys and bar, R, then return to their normal positions, unless the drawer is forced closed, the hooked upright, b^3, will be moved into its bar-engaging position and another registration may not be made. If it is desired to restrain this last described device from its automatic operation, so that, at pleasure, registrations may be successively made even while the drawer remains open, the proprietor, or authorized person having access to the interior of the cabinet, may upwardly draw the vertical rod, f^3, on which is the cam incline, f^4, so that said incline, in its impingement against the pin, b^5, will rearwardly force the hooked bar and its plate, T, and restrain these parts against sliding movements so long as the rod, f^3, remains in its elevated position.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a cash registering machine, the combination with a ratchet-wheel forming part of a registering mechanism and a reciprocatory pawl-carrier having a pawl to engage the ratchet-wheel, of a rocking bar having a series of projecting members provided with variously graded cam slots, which bar is connected with said pawl carrier, and a series of key-levers having projections respectively engaging the said slots whereby the operations of the various key-levers will insure varying extents of rocking movements of the said bar and correspondingly varying extents of movements of the pawl-carrier, substantially as described.

2. In a cash registering machine, the combination with the key-levers, each having a stud, as *g*, of a rocking-bar having a series of projecting members provided with variously graded cam-slots, *f*, within which said studs protrude, and the arc-slots, *o*, concentric with the center of movement of said bar, a registering mechanism and operative mechanism therefor, which is controlled as to degree by the extent of rocking movement of said bar, substantially as described.

3. In a cash registering machine, the combination with the ratchet-wheel comprised in the registering mechanism, of a series of key-levers having the lateral projections, the rocking-bar having a series of projecting members provided with the variously graded cam-slots within which said projections of the key-le-

vers protrude, and having the arm, *h*, with the pawl, *i*, and the driving-spring, *k*, applied to the said pawl-carrying arm, substantially as described.

4. In a cash registering machine, the combination with the series of key-levers having the lateral studs, *g*, of the horizontal bar or shaft, *b*, the bar *d;* mounted to rock on said shaft and having the arms E with the variously graded cam-slots, *f*, and the arc-slots, *o*, merging into said slots, *f*, the ratchet-wheel and the arm, *h*, fixed to said bar, *d*, and having the pawl, *i*, and the driving-spring, *k*, all arranged substantially as described.

5. In a cash registering machine, the combination with the series of key-levers with the lateral studs, of the bar or shaft, *b*, the bar *d* having the members, E, with the slots, *f*, *o*, and having the foot-lugs, d^2, said bar having the arm, *h*, with the pawl, *i*, the ratchet-wheel, G, and the driving-spring, *k*, all substantially as shown.

6. In a cash registering machine, the combination with one or more registering disks, as 1, 2, one thereof having a gear-wheel connected therewith, of the ratchet-wheel, G, with the gear-wheel, a series of key-levers having the projections, *g*, the rocking-bar having the series of members, E, with the variously graded cam slots, and having the pawl-carrying-arm, *h*, with the pawl, *i*, and all arranged substantially as and for the purposes described.

7. In a cash registering machine, the combination with the cash drawer and housing therefor having the upper and lower tracks or strips, *s*, *s*, of the drawer having the recess, *u*, in its rear wall, the journal support, *v*, for the roller consisting of the U-formed metallic part with the laterally turned lugs, v^2, v^2, and the roller journaled in said part and having flanges for engaging the said track-strips, substantially as shown.

8. In a cash registering machine, the combination with the drawer having a catch-abutment and a locking-arm to engage it which is operated by means of the key-levers and a shield or plate supported by the cash drawer and adapted to be impinged upon by the locking-arm as the latter assumes its locking position, and to be thereby swung into a guarding position relative to the said arm, substantially as described.

9. In a cash registering machine, the combination with the drawer having the plate, *w*, with the aperture therein and the plate, P, hung to have a swinging movement within said aperture, of the series of key-levers, the rocker-plate, *y*, and the locking-arm, *x*, arranged as shown.

10. In a cash registering machine, the combination with the series of key-levers, and the common bar, R, arranged to have a swinging movement in unison with any of the key-levers, of the cash drawer movable under the key-levers, and the slide having a part to engage the said common bar and having a downwardly extended member which projects into the course of the drawer, substantially as and for the purpose set forth.

11. In a cash register, the combination with the series of key-levers, and the common bar, R, of the slide-plate, T, having the hooked upright, and the depending stud, c^3, the drawer and the spring, substantially as described.

12. In a cash register, the combination with the series of key-levers and the common bar, R, of the slide-plate, T, having the hooked upright provided with the projection b^5, and the depending stud, c^3, the spring, d^2, the rod, f^3, with the cam incline, f^4, and the drawer, all substantially as and for the purposes set forth.

13. In a cash registering machine, the combination with a series of key-levers having the projections, *g*, and a fulcrum-rod, of a series of arms mounted on the fulcrum-rod, and having the depending portions provided with the cam-slots in which operate the projections, *g*, the bar, *d*, uniting all of the arms and the pawl-carrying-arm, *h*, substantially as described.

14. In a cash registering machine, the combination with a series of key-levers having projections, *g*, and the fulcrum-rod, *b*, of a series of arms intermediately mounted on the fulcrum-rod, and each having the depending portion formed with the cam-slot opening to the lower end and the portion, o^2, the bar, *d*, uniting the arms above their fulcrums, and having the pawl-carrying-arm, *h*, substantially as described.

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