

W. C. MORISON.
Automatic Coin-Counting Device.

No. 227,038.

Patented April 27, 1880.

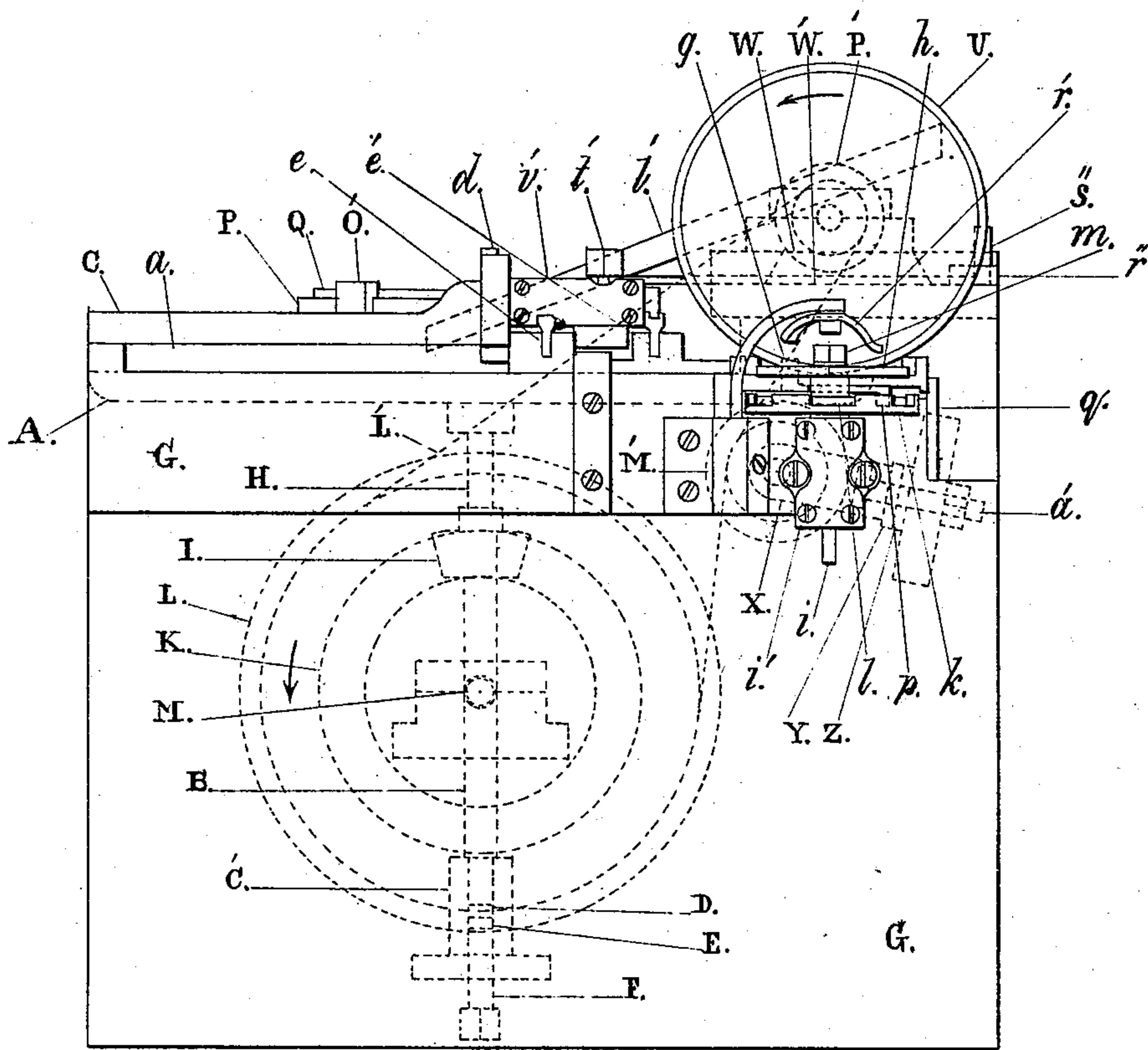


Fig. 1.

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William C. Morison

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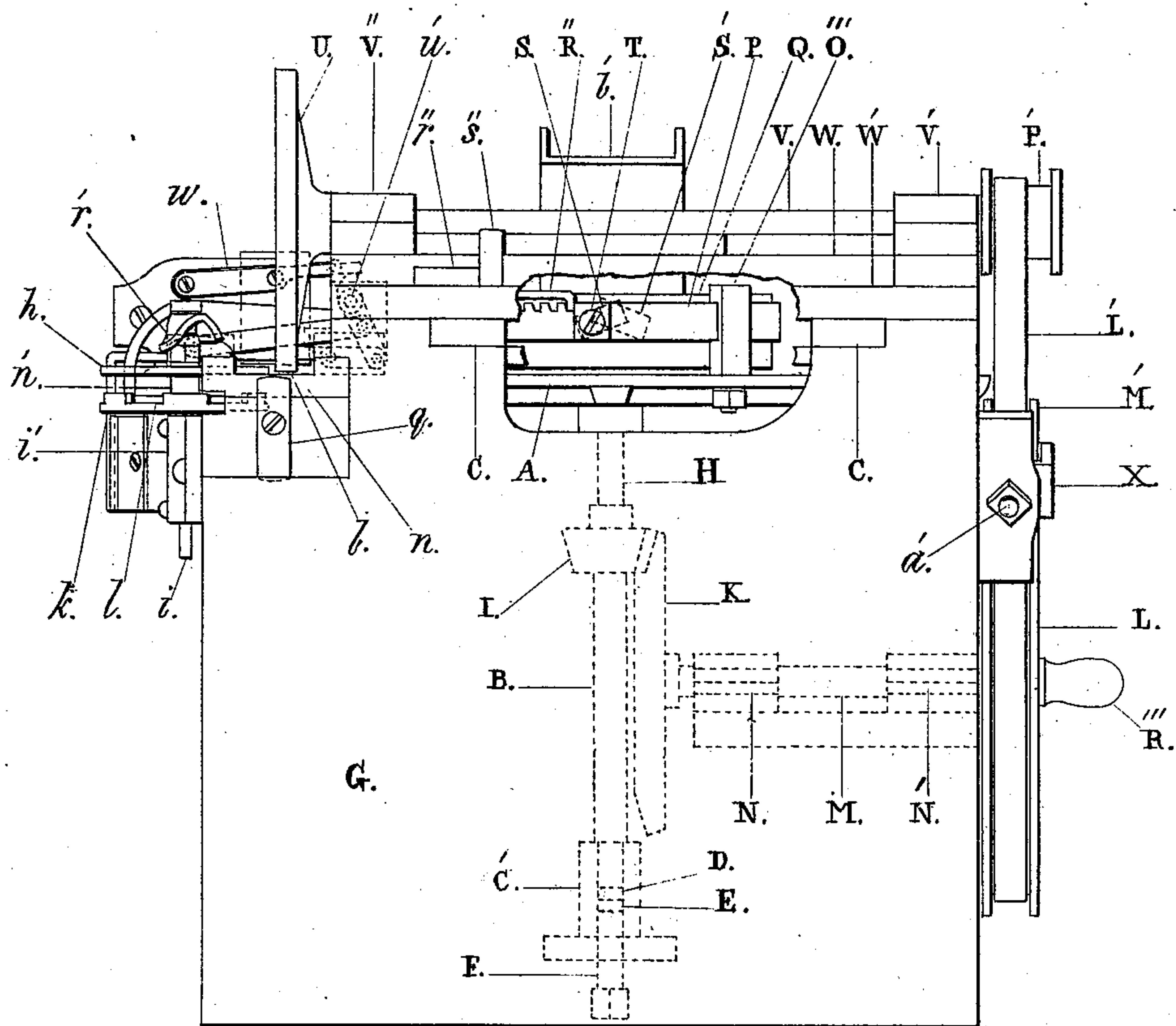


Fig. 2.

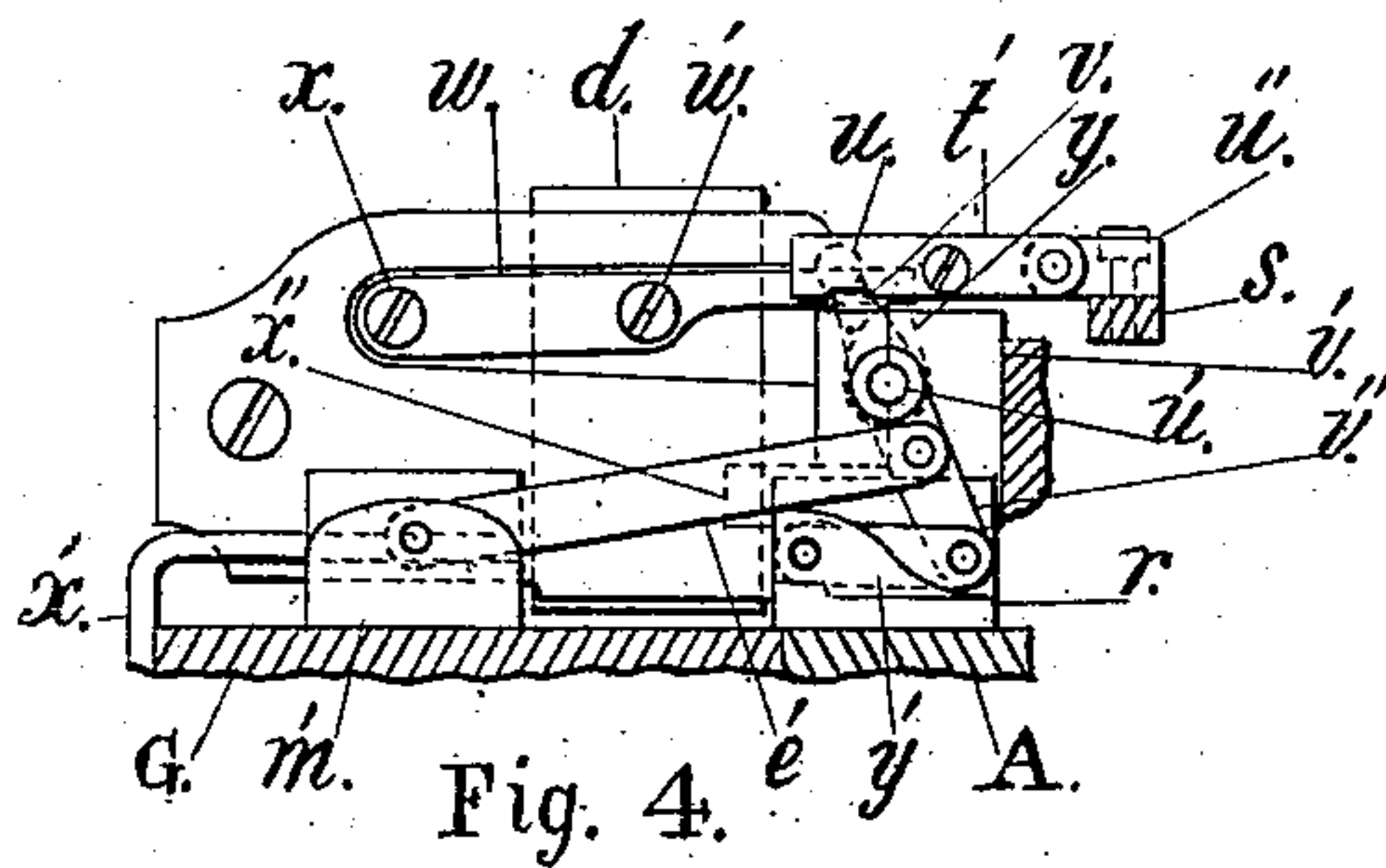
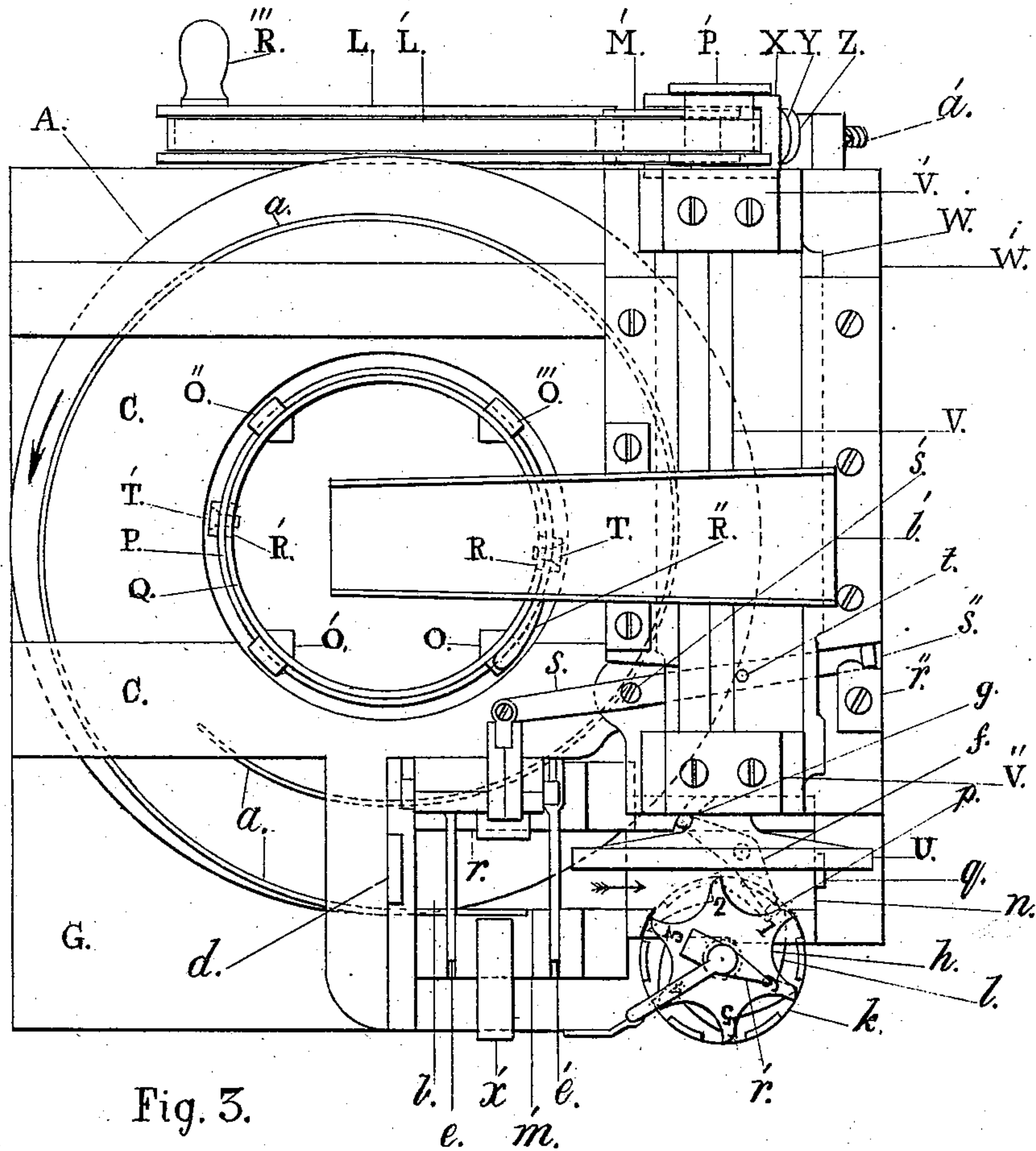
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UNITED STATES PATENT OFFICE.

WILLIAM C. MORISON, OF SAN FRANCISCO, CALIFORNIA.

AUTOMATIC COIN-COUNTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 227,038, dated April 27, 1880.

Application filed September 15, 1879.

To all whom it may concern:

Be it known that I, WILLIAM C. MORISON, of the city and county of San Francisco, State of California, have invented a new and useful Automatic Coin-Counting Machine, of which the following is a specification.

My invention relates to automatic coin-counting machines.

The object of said invention is to enable coins of any given denomination to be automatically and rapidly counted by causing each piece of coin, in turn, to operate a register as it is being passed out of the machine. The said coins, having been dropped into a hopper, are led by a chute to the central portion of a revolving disk, whence they are carried outward by centrifugal force. The coins, in passing outward, pass under a ring which is adjusted to permit but one thickness of coin to pass under it at a time. The coins, being thus separated into one thickness or layer, are guided eccentrically toward the outer edge of said disk and into the outlet-channel, where each piece of coin, in turn, is, by a revolving wheel with a yielding periphery, brought in contact with and caused to rotate a registering arrangement through a certain portion of a circle. To prevent registration when the register is not acted upon by the passing coins, the register is provided with a check-piece, which is acted upon alternately, first, by a piece of coin immediately before said coin touches the registering arrangement, then by a portion of the registering arrangement itself. In the interval of time between each piece of coin acting upon the check-piece the registering arrangement not only places it in position to be acted upon by the succeeding coin, but also in position to prevent the farther movement of the register after the last piece of coin has passed. When the said check-piece is again acted upon by an approaching coin the said register is again free to move.

By means of this invention, fitted with a suitable register, any number of coins of any given denomination may be automatically counted with rapidity and certainty, as fully explained in the following description and accompanying drawings, in which the letters of reference indicate like parts, and of which—

Figure 1 is a side elevation. Fig. 2 is an end

elevation with a small portion broken out. Fig. 3 is a plan. Fig. 4 is an enlarged view of some details in position on the machine, with a small portion broken out.

The present model machine, illustrating my invention, is too small for counting larger coins than quarter-dollars, for which denomination of coins it is adjusted; but the said machine, suitably enlarged, may readily be adapted for counting coins of any denomination. As the register is provided with only one dial-plate, with six numbers (1 to 6) on its face, and with one pointer, it cannot register more than six pieces of coin; but by connecting the shaft of the said register with suitable wheels, dial-plates, and pointers, in the usual manner known to mechanics, it may be rendered capable of registering any number of coins.

The disk A is fixed to the shaft B, which is supported in the piece C' by the friction-disks D E and the set-screw F, C' being fixed to G, the rigid frame of the machine. The shaft B is steadied at its upper end by its bearing H, fitted to a suitable journal connected with the frame G. To the shaft B is fixed the pinion I, which gears with the wheel K, which latter is fixed to the inner end and the wheel L to the outer end of the shaft M, which, by means of its bearings N N', works in suitable journals connected with the frame G. The lower end of each of the uprights O O' O'' O''' terminates in the form of a bolt, which passes through A equally distant from the center of A, and by means of a nut on each of said bolts the said uprights are secured to A. Each of said uprights is provided with a recess and a projection, the first to receive the ring P, which is thus supported, and the last to fit into a corresponding space in the lower edge of the ring Q, so that the ring P may be turned and maintained at the same level, while the ring Q may be moved vertically, though not horizontally, within the ring P. The ring Q is supported by means of the countersunk headed screws T T' and the pieces R R'. Said screws, passing through suitable holes in the ring P and tapped into the pieces R R', retain said pieces in the inclined slots S S', to which they are respectively fitted in the ring Q. One end of the check-piece R'' is fixed to the upright

O, while the free end, which is elastic, fits between teeth or notches formed in the upper edge of the ring P, so as to retain P in the position desired. By raising R'' from said notches the ring P may readily be turned, and by means of the pieces R R', fitted to the inclined slots S S', the ring Q may be raised or lowered and the space between the lower edge of Q and the disk A be regulated as desired, to permit but one thickness of coin to pass under Q at a time.

The chute *b'* is attached to a piece fixed to the rigid piece W'. By means of the handle R''', fixed to the wheel L, the said wheel is caused to revolve, and thus a rotary movement is imparted to the shaft M, the wheel K, the pinion I, and the disk A.

By means of the belt L' and the tightening-pulley M' motion is imparted by the wheel L to the pulley P' and the wheel U, respectively fixed to the outer and inner end of the shaft V, which revolves in the journal-boxes V' V'', said boxes being fixed to the piece W, which last is capable of sliding on W' between guides fixed to W', the piece W being fixed to the frame G.

The pulley M' works on a pin fixed to the forked piece X, which is maintained in position by means of the skeins Y Z and the bolt *a'*, with its nut connecting with the frame G. The periphery of the wheel U is covered with leather or other suitable yielding material, that may, without injury to the coins, enable U to force said coins (which are impelled to it by and from the revolving disk A) past the registering arrangement and out of the machine, thus causing the said coins to operate the said register.

The piece *a* is formed eccentrically, and is fixed to the frame C with its lower edge projecting below C and nearly touching the disk A. A portion of *a* is elastic and free, and extends into the channel *b*, where it fits and presses into a recess in the side of the piece *m'*, so that it may guide the coins fairly into said channel. The frame C is fixed to the frame G.

At the entrance of the outlet-channel *b*, which is on a level with the face of the disk A, is placed the upright piece *d*, capable of sliding between guides on the side of the frame C, and suitably raised above A to permit but one thickness of coin to pass under it at the same time. The side pieces, *r m'*, prevent more than one width of coins entering the said channel at the same time, and also guide the coins to the projection *g* on the check-piece *f*, the piece *h*, and the wheel U. The piece *r* is capable of sliding upon a part of both A and *b*, while the piece *m'* slides upon *b* alone.

The piece *x''*, which is fixed to and projects from one of the sides of the frame C, fits a recess formed in the upper surface of *r*, and serves as a guide for *r*, at the same time preventing *r* from rising.

A piece fixed to one of the sides of the frame

C forms a guide for the inner end of *m'*, while the other required guide is supplied by the piece *x'*, (partly broken out in Fig. 4,) fixed to and projecting over the frame G, and fitted to the side of a projection on the top of *m'*, *x'* at the same time preventing *m'* from rising.

The piece *h* has six similar recesses, into one of which nearly half the diameter of each coin in turn enters and fits after said coin has passed the projection *g*, thus enabling the wheel U, in forcing the coin past the register, to cause said coin to rotate *h* and thus operate the register.

The piece *h* has six numbers (1 to 6) on its face, and by means of the pointer *r'* serves as the recording portion of the register. The pointer *r'* is fitted to the smooth portion of a suitable screw tapped into the end of a curved piece, which sustains it over *h*. The lower end of said piece is a plain upright shaft connected with the frame G, and capable of being turned to enable the nut *m* and *h* to be removed. Said screw, being placed over the center of *h*, enables the pointer to be turned so as to cover any desired number on *h*.

The lower end of the shaft *i* is fitted to the journal-box *i'*, which is fixed to G. To the shaft *i*, above said box *i'*, is fixed the circular piece *k*; also, on said shaft, above *k*, the following pieces are held in position laterally by two pins connecting with *k*: first, on the upper side of *k* the piece *l*, by a pin fitted into it and fixed in *k*, the plain circular piece *n'*, then the piece *h*. A pin passing through and fixed in *n'* projects on both the under and upper side of *n'*, fitting respectively into *l* and *h*, all being held down upon *k* by the nut *m*, fitted to a screw-thread on the upper end of *i*. The piece *m'* maintains a space for the insertion of the plate *n* on the inner side of *n'*, to enable *h* and *l* to revolve, the former on the upper and the latter on the under side of said plate. The check-piece *f* works in a recess formed in the under part of the plate *n*, and on a pin and supporting-piece suitably fixed to *n*, and has the projection *g* at one end on its upper surface, which extends above *n*, and the projection *p* at the other end on its under surface. The projection *g* is moved by each coin in turn out of its path as said coin passes on to U. The projection *p* is pushed by one of six similar projections on the piece *l* into one of the spaces between six similar upright projections on the edge of the circular piece *k*, which action at the same time causes *g* to be moved into the path of the approaching coin. The said coin moves *g* aside, and in doing so moves *p* out of the space in *k* and into position to be again acted upon by *l*. In that manner the check-piece *f* is acted upon alternately by the passing coins, and by the projections in turn on *l*.

When the last piece of coin has passed and acted upon *g* and the register the nearest approaching projection on *k* strikes *p* and stops the further movement of said register until *g* is again acted upon.

The plate *n*, which is formed with raised pieces to guide the coins outward, fits a space in the frame *G*, and is there retained by the piece *q*, which is connected to *G* by means of a screw, and may be turned aside to enable *n* to be withdrawn.

For each size of coins to be counted the position of the wheel *U* and the pieces *r m'* must be altered in the channel *b*, and also the piece *d* must be adjusted. The said wheel *U* and the pieces *r m'*, and also *d*, are moved as required by one movement of the lever *s*, which works on the upper end and smooth portion of a suitable screw, *s'*, the lower end of which is fixed in the rigid piece *W'*. The lever *s* has on its upper surface at its outer end the projection *s''*, which enables it to be readily moved, but is retained in position by the piece *r''*, connected to the rigid piece *W'* by means of a screw. By means of said lever *s* and the pin *t*, the upper end of which is fixed in the movable piece *W*, while the lower end of said pin is fitted to a slot in *s*, the piece *W* and the wheel *U* are moved. The lever *s* is also connected to the shaft *u'* by means of the piece *u''* working on the upper end and smooth portion of a suitable screw, the lower end of which is tapped vertically into the upper side of the lever *S*. Said piece carries a pin, which forms the horizontal journal for the piece *t'*, which is formed of two pieces screwed together, and which is connected with the shaft *u'* by means of a ball-and-socket joint, *u*, at the end of the arm *v*, fixed to the said shaft, which last works in the journal-box *v'* fixed to the frame *C*.

To the shaft *u'* are also fixed two arms, *v''*, (only one shown,) each connected by means of pins with a long and a short link, the two short links being at the extremities of said arms, while the long links are nearer the shaft.

The two short links *y'* (only one shown) are connected by means of pins to the piece *r*, and the two long links *e e'* are connected by means of pins to the piece *m'*. The said pieces *r m'* are maintained parallel one to the other by the said links.

To the inner end of the shaft *u'* is fixed the cam *y*, by which the lever *w* is supported and worked. Said lever works on a pin, *x*, fixed to a piece attached to *C*, and is furnished with a horizontal slot, to which is fitted the smooth portion of a suitable screw, which is fixed in and projects from the piece *d* sliding between its guides fixed to *C*, thus enabling the said lever to support and work *d*. The inner end of the lever *S*, being moved toward the center of the disk *A*, moves the pieces *r m'* outward, at the same time reducing the space between said pieces, lowering the piece *d*, thus diminishing the space between it and the disk *A*, and also at the same time the wheel *U* is moved toward the register.

When, on account of the size and weight of the disk *A* and its shaft *B*, it is desired to reduce the friction at the end of said shaft

and facilitate the operation of the machine, the disk *A* may be furnished on its under side with a suitable surface, to which suitable conical wheels may be fitted, said wheels working on pins fixed to the frame *G*, or as friction-rollers running on a suitable surface connected with *G*.

I prefer to cover the face of the wheel *U* with leather or other suitable yielding material fixed to said wheel, without the use of metallic springs; but should it be desired to increase the elasticity of said covering, metallic or other suitable springs may be inserted and retained in position between the face of the wheel and said covering, pressing the latter outward to the extent desired.

To enable the register to operate, the pointer *r'* must be set over the number in advance of 1, so that the first piece of coin passing out of the machine will move the figure 1 under the pointer.

The ring *Q* being suitably adjusted, the disk *A* revolved in the direction of the arrow, Fig. 3, and at a proper speed, and the coins being properly supplied to *A*, the said coins will readily pass under *Q* and outward, as required; but if desired, to guard against any possibility of said coins jamming between the lower edge of *Q* and the face of the disk *A*, three or more flexible arms may be fixed to *Q*, suitably raised above *A* and pointing toward the center of *Q*, and having fixed to their inner ends a short distance from and concentrically with *Q*, outside of the space within which the coins are supplied to *A*, one or more plain rings, in thickness and depth similar to *Q*, or three or more sections of such rings, the lower edges of said rings or sections being suitably raised above *A*.

When the inner edge of a coin rests upon one or more coins, and the outer edge of said coin, inclining downward, is inserted between *Q* and *A*, both of which latter being unyielding and the centrifugal action exerted upon the coins being in one direction, the said coins cannot but become jammed.

The object of the above rings or sections of rings supported by flexible arms is to present a somewhat yielding resistance to the outward passing coins when they are in disorder and of more than one thickness or layer, so that the lowest and level coin, upon which the centrifugal action is greatest, may be enabled to raise and pass under the upper coin or coins, and either reach *Q* alone or with one or more coins lying level upon it, in which last case it will readily free itself and pass under *Q* and outward.

It being desired to count coins of any given denomination, the machine must be supplied with the following pieces of suitable sizes—viz, the plate *n*, with the check-piece *f*; the pieces *k, l*, and *h*, and the ring *Q*. The wheel *U* and the pieces *d, r*, and *m'* must be properly adjusted. The disk *A* is then caused to revolve. Coins of said given denomination being placed in a

hopper suitably connected with the chute *b'*, the said coins will duly slide down said chute and drop upon the central portion of the disk A within the ring Q. The said coins will then
 5 be carried outward by centrifugal action under the ring Q to the eccentrically-formed piece *a*, which will direct them into the channel *b*. When each coin in turn passes the projection *g*, part of said coin enters and fits
 10 one of the six similar recesses in *h*, and thus enables the wheel U, in urging it outward and past *h*, to cause the said coin to revolve *h*, and therefore the register, through an arc of sixty degrees, thus operating the register as re-
 15 quired.

A machine may be furnished, if desired, with two or more eccentrically-formed pieces somewhat similar to *a*, though not, like *a*, carried over a full circle, each of said pieces lead-
 20 ing to a separate outlet channel and register, thus proportionally increasing the capacity of the machine.

Having described my invention, what I claim as new, and desire to secure by Letters Pat-
 25 ent, is—

1. The revolving disk A, in combination

with the eccentrically-formed guiding-piece *a*, substantially as and for the purpose described.

2. The revolving disk A, in combination with the eccentrically-formed guiding-piece *a* 30 and the piece *d*, substantially as and for the purpose described.

3. The revolving disk A, in combination with the eccentrically-formed guiding-piece *a*, the ring Q, and the piece *d*, substantially as 35 and for the purpose described.

4. The revolving disk A, in combination with the eccentrically-formed guiding-piece *a*, the ring Q, the piece *d*, and the registering arrangement, consisting of the shaft *i*, the 40 pieces *k*, *l*, and *h*, with the check-piece *f*, substantially as and for the purpose described.

5. The registering arrangement, consisting of the shaft *i*, the pieces *k l h*, and the check-piece *f*, with the plate *n*, in combination with 45 the wheel U, substantially as and for the purpose described.

WILLIAM C. MORISON.

Witnesses:

WM. S. PHELPS,
 WM. H. PHELPS.