(No Model.) 5 Sheets—Sheet 1.

I. PFORZHEIMER.

TICKET REGISTERING MACHINE.

No. 413,207. Patented Oct. 22, 1889.

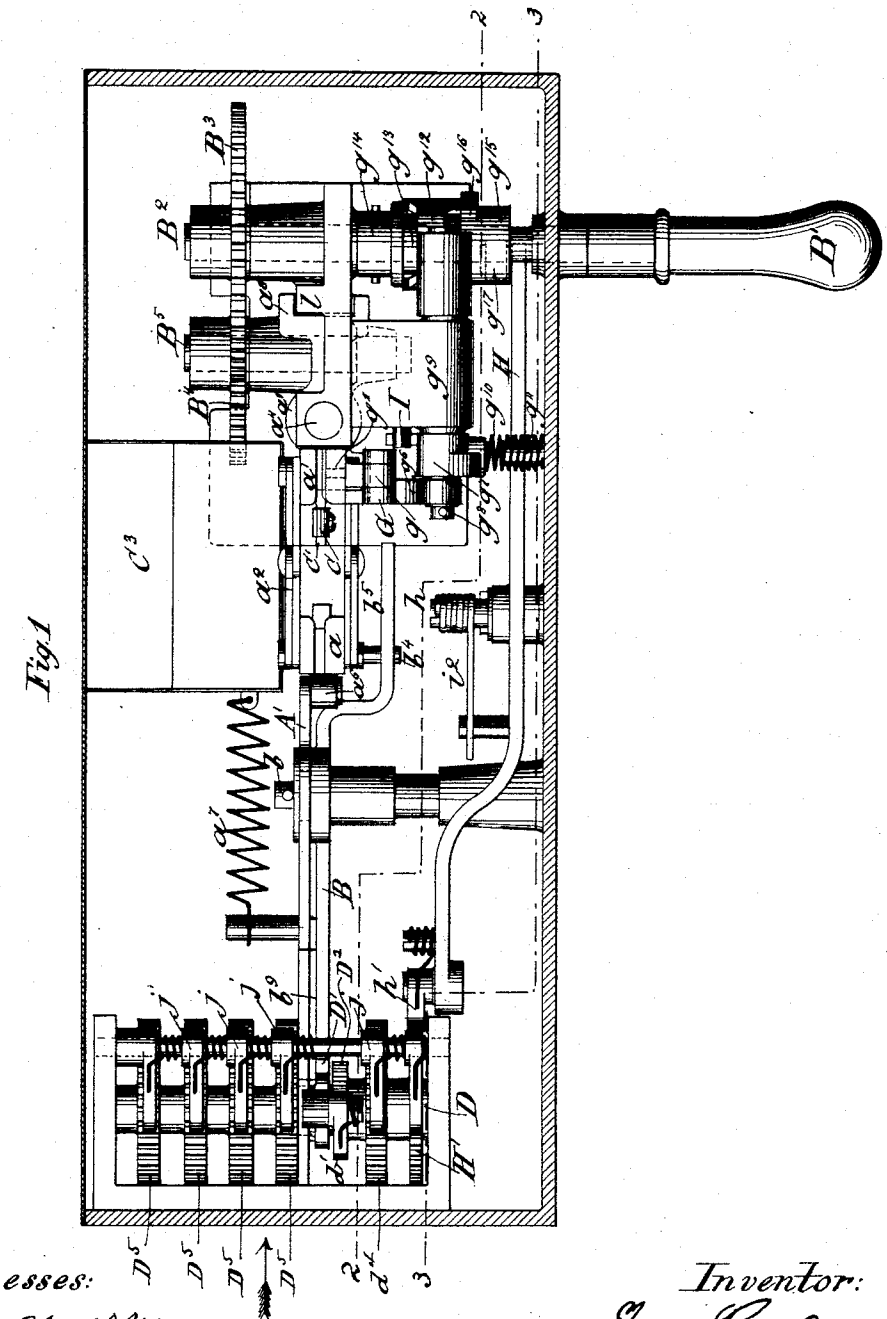


Fig 1

Witnesses:
F. Bergengren
Sohlin Ricker

Inventor:
Isaac Pforzheimer
by attorneys
Brown & Prindle

N. PETERS, Photo-Lithographer, Washington, D. C.

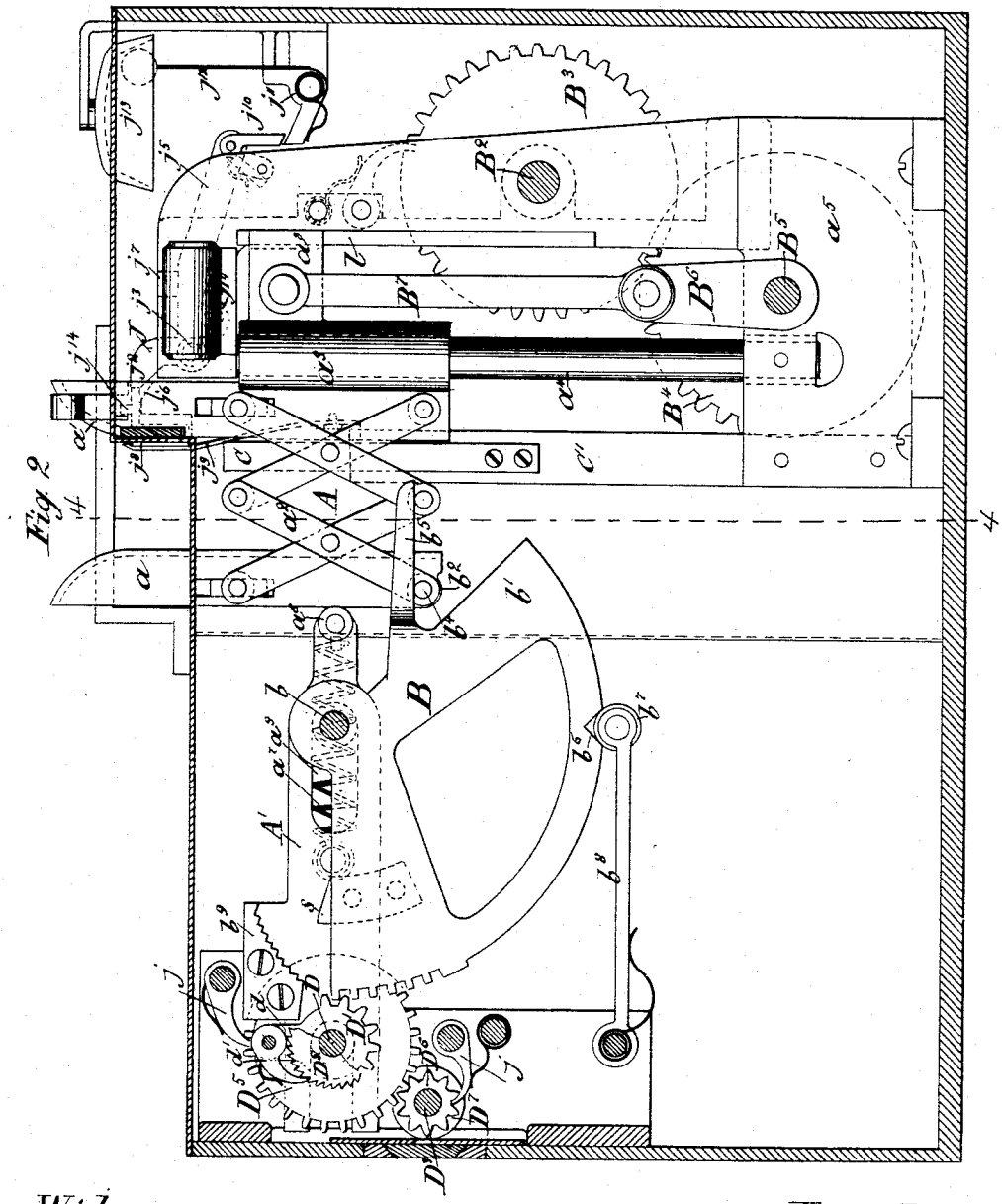
(No Model.) 5 Sheets—Sheet 2.

I. PFORZHEIMER.

TICKET REGISTERING MACHINE.

No. 413,207. Patented Oct. 22, 1889.

Fig. 2



Witnesses:
J. Bergengren
John Bickel

Inventor:
Isaac Pforzheimer
by Attorneys
Brown & Pickwood

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 3

I. PFORZHEIMER.

TICKET REGISTERING MACHINE.

No. 413,207. Patented Oct. 22, 1889.

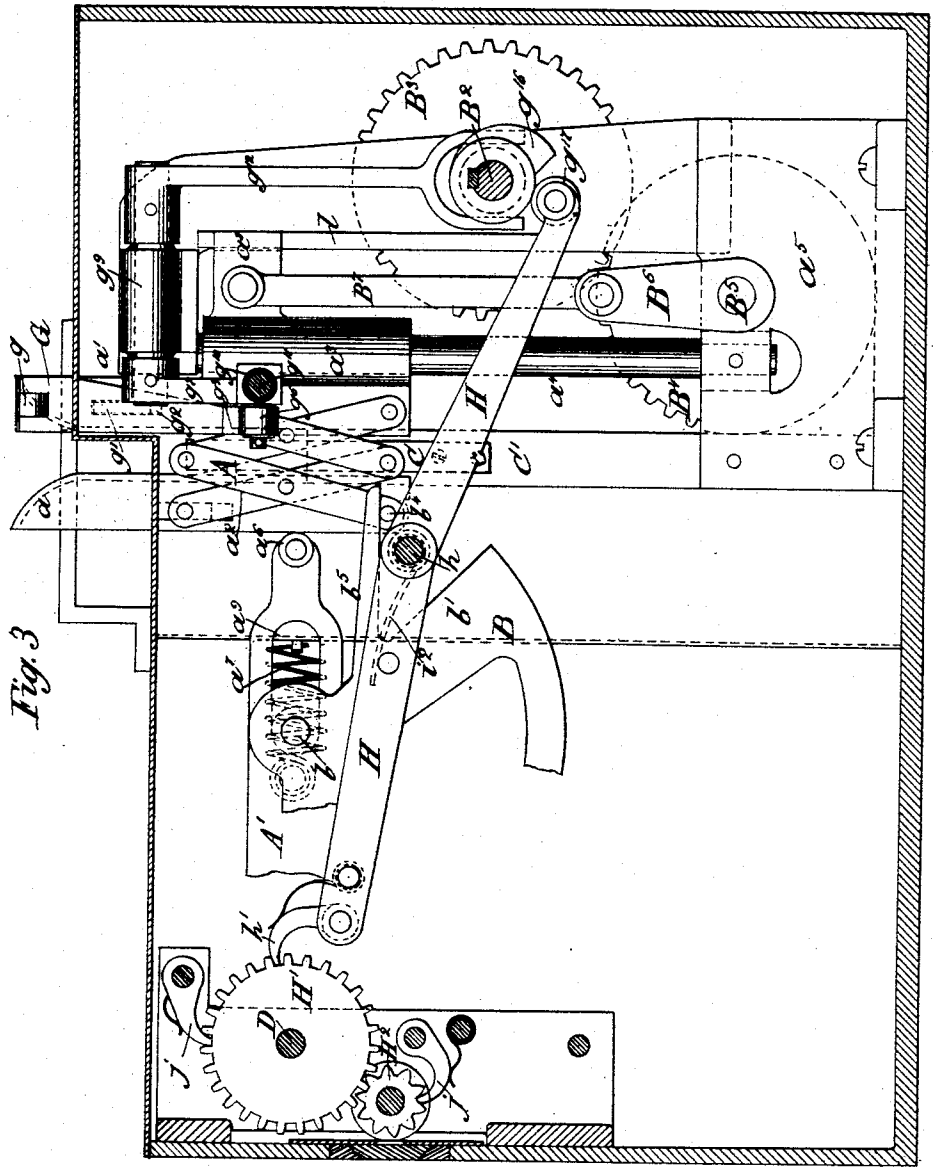


Fig. 3

Witnesses:
F. F. Bergengren
Sabin Becker

Inventor:
Isaac Pforzheimer
by attorneys
Brown & Griswold

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 4.

I. PFORZHEIMER.

TICKET REGISTERING MACHINE.

No. 413,207. Patented Oct. 22, 1889.

Fig 6

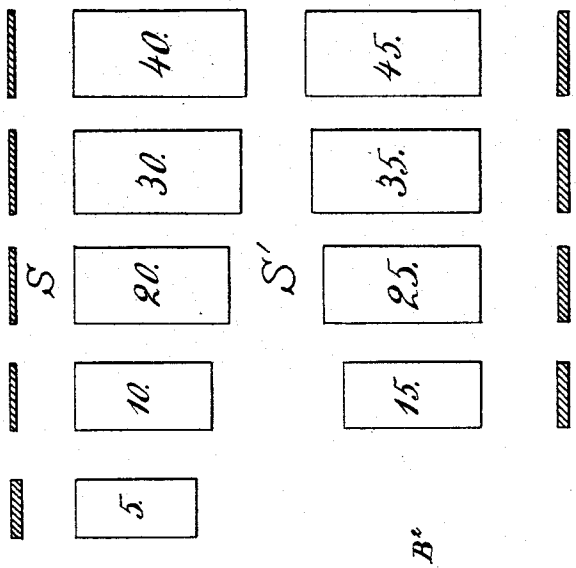
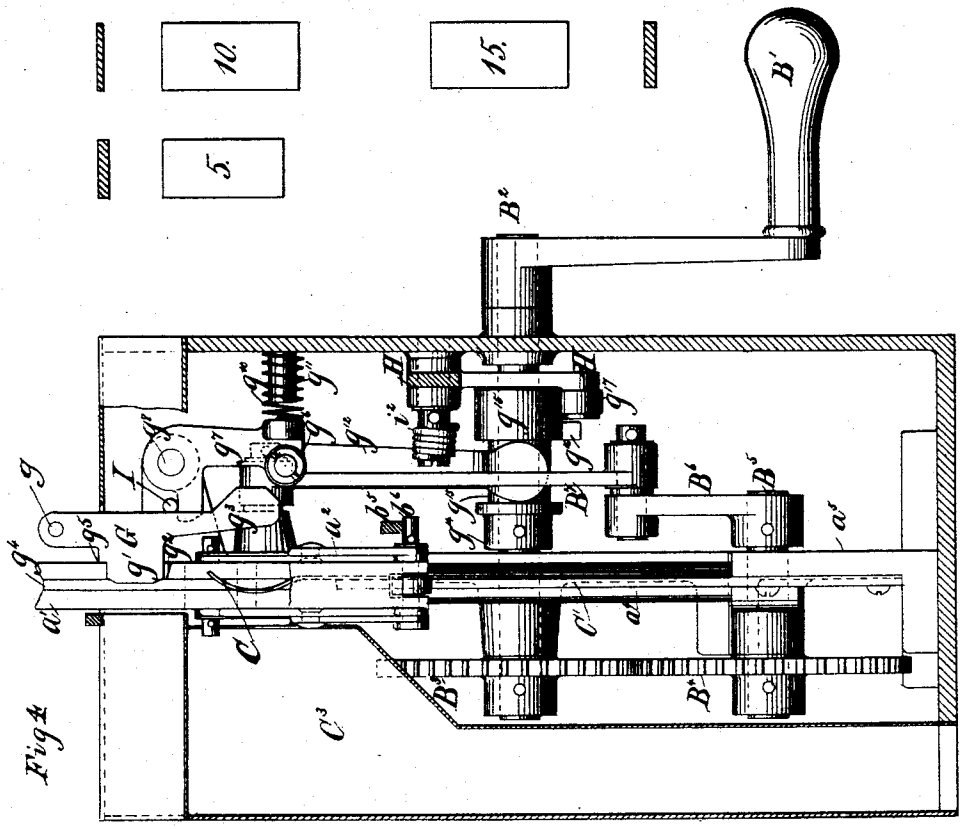


Fig 4



Witnesses
F. F. Bergengren
S. Whitticker

Inventor:
Isaac Pforzheimer
by Attorneys
Brown & Griswold.

N. PETERS. Photo-Lithographer. Washington, D. C.

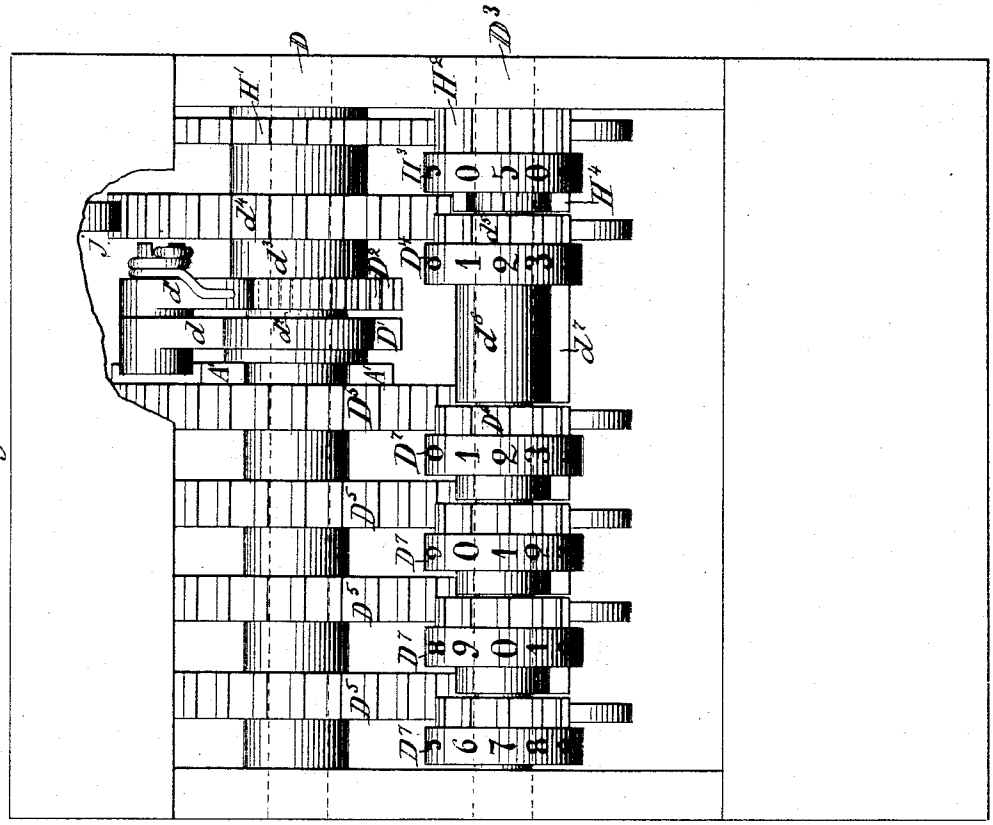
(No Model.) 5 Sheets—Sheet 5.

I. PFORZHEIMER.

TICKET REGISTERING MACHINE.

No. 413,207. Patented Oct. 22, 1889.

Fig. 5



Witnesses:
F. F. Bergengren
John Ricker

Inventor:
Isaac Pforzheimer
by attorneys
Brown & Crowell

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

ISAAC PFORZHEIMER, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO CARL ZALLUD, OF SAME PLACE.

TICKET-REGISTERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 413,207, dated October 22, 1889.

Application filed January 8, 1889. Serial No. 295,752. (No model.)

To all whom it may concern:

Be it known that I, ISAAC PFORZHEIMER, of the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in Ticket-Registering Machines, of which the following is a specification.

My improvement relates to that class of machines wherein the value of a ticket or check—such as is employed, for instance, in restaurants—may be accurately registered, as well as the sum total of value of all the tickets or checks deposited in the machine.

I will describe in detail a machine embodying my improvement and then point out the novel features in claims.

In the accompanying drawings, Figure 1 is a plan or top view of a ticket-machine embodying my improvement, the upper part of a case in which the same is contained being removed. Fig. 2 is a horizontal section thereof, taken on about the irregular line 2 2. Fig. 3 is a vertical section taken on about the line 3 3, Fig. 1. Fig. 4 is a vertical section taken at right angles to the plane of Figs. 2 and 3 on about the line 4 4, Fig. 2. Fig. 5 is an end view on an enlarged scale, looking in the direction of the arrow, Fig. 1, and illustrating certain indicator mechanism. Fig. 6 is a view illustrating kinds of tickets which may be employed in the machine.

Certain parts are omitted from some of the figures in order to render the drawings more clear.

Similar letters of reference designate corresponding parts in all the figures.

My present invention is designed for use with tickets of different widths and of different thicknesses, according to the denomination of the ticket, and, as illustrated more clearly in Fig. 6, such tickets are oblong. They may, however, be of other shape. In this example, also, the tickets S, indicating tens—as, for instance, ten, twenty, thirty, &c.—are thinner than the tickets S′, indicating fives and the old multiples thereof—as, for instance, five, fifteen, twenty-five, &c.

The gradation in the width of the tickets for both series is, however, the same, the widths gradually increasing from the lowest denomination (or five) up to any desired denomination—say, for instance, one dollar.

The tickets are passed into the machine by being inserted between gripper-jaws a a', which extend in this case upwardly for a distance above the top of the machine. The jaw a is movable from side to side of the machine, or toward and from the jaw a'. The jaw a' is stationary. These jaws are united together in this example by lazy-tongs a^2, having the usual slide-connection with said jaws. The jaw a' is provided with a collar or sleeve a^3, which collar or sleeve surrounds a vertical guide-rod a^4, mounted in a frame a^5 within the box or case in which the machine is contained. The jaws a a', together with their connections, constitute a carriage A, which carriage is vertically movable.

A′ designates a slider-bar, which slider-bar bears at one end a roller a^6. This roller bears with a yielding pressure against the jaw a of the carriage. Such pressure is produced by means of a coil-spring a^7, secured near one end to said slider-bar and near the other end to a suitable support within the case. The tendency of the spring a^7 is to force the jaw a toward the jaw a'. The slider-bar A′ therefore constitutes a yielding abutment for the jaw a.

I will first describe the means for registering tickets in the tens series, or, in other words, the comparatively thin tickets.

B designates a movable device, here shown as a segment mounted upon a stud b, extending inwardly from the case of the machine. This segment is provided upon its periphery and near its upper portion with a number of gear-teeth. A ticket—we will say for twenty cents—having been inserted between the jaws a a', is forced downwardly by hand until it is firmly grasped between said jaws. The jaw a has thereby been moved a distance away from the jaw a'. The arrangement of the segment B is such that a portion b' thereof, presenting a downwardly-inclined surface, is directly beneath the roller b^2 upon the jaw a of the carriage. The carriage, the ticket having been properly inserted, is moved downwardly. This is accomplished by means of a crank B′ upon the outside of the box or case,

which crank is mounted upon a shaft B^2. Upon the shaft B^2 within the case is a gear-wheel B^3, meshing with a gear-wheel B^4, mounted upon a shaft B^5, journaled in the frame a^5. Upon the shaft B^5 is a crank B^6, to which is pivotally connected a link B^7, which latter is connected at its other end with a portion a^8 of the carriage A, which latter acts as a guide to prevent lateral movement of the carriage A and slides upon a guideway l upon a portion of the frame a^5. When the crank B′ is rotated for half a rotation, it will, through the mechanism just described, cause the downward movement of the carriage A to its fullest extent, and its continued rotation will restore the carriage A to its normal position. During the downward movement of the carriage the roller b^2 comes in contact with the inclined surface upon the portion b' of the segment B and rocks the latter a distance depending upon the width of the ticket between the jaws a a', and consequently the distance which the jaw a has been moved over said inclined surface—as, for instance, a ticket for ten cents, being of a certain width, will cause the roller to contact with the inclined surface of the portion b' at a point near the lower extremity of the latter. A twenty-cent ticket, being of greater width, will cause the roller to contact at a point a little higher up, and so on throughout the series, the segment being rocked an increased distance for each increased width, and consequently the increased denomination of the ticket.

C designates a spring mounted upon an upright C′, secured upon the frame a^5. The spring C extends into the path of the downwardly-extending ticket and operates to force it sidewise, thus holding it firmly in certain slots in the jaws, (shown more clearly in Figs. 2 and 4,) and into which the ticket has been forced. The upright C′ constitutes a releasing device. When the carriage A is moved downwardly, the ticket will be brought into contact with the upper end of the releasing device C′ and will be held thereby against further downward movement. The continued downward movement of the jaws will cause them to pass below the ticket, when the ticket will be released and will fall into a receptacle C^3 therefor within the case, and shown more clearly in Figs. 1 and 4.

In Fig. 3 I have shown the carriage A in its normal position, and in Fig. 2 I have shown the same distended, as it will be when a ticket is arranged therein. When the carriage has been moved downwardly to its fullest extent and has rocked the segment B, the latter is restored to its normal position by the upward movement of the carriage. Upon the carriage is a pin or projection b^4, which pin or projection extends beneath an arm b^5, extending from the segment B. When the carriage moves upwardly, the pin or projection b^4, contacting with the arm b^5, raises the latter, and thus rocks the segment again into its normal position. I have shown the segment as provided upon its periphery with a notch b^6, into which extends an anti-friction roller b^7 upon a spring-actuated arm b^8. When the segment is in a normal position, the anti-friction roller b^7 is forced into the notch b^6, and thus retains the segment against accidental displacement.

The slider-bar A′ is provided with a longitudinal slot a^9, through which extends the pin or stud b. The other end portion of the slider-bar is bifurcated and extends loosely above a shaft D. By this means the slider-bar is supported and guided in its longitudinal movements.

Upon the face of the slider-bar, adjacent to the segment B, is secured a serrated metallic piece b^9. The serrations in this metallic piece extend upwardly at an angle, the lowest being the nearest to the segment B and the uppermost being, of course, the farthest therefrom. As the slider-bar A′ is moved rearwardly by the jaw a upon the insertion of a ticket, one of the serrations in the piece b^9 is brought directly into the arc of rotation of the segment B, so that when the segment is rocked a projection or tooth s on the segment will strike into such serration and the further rocking of the segment in that direction will be stopped.

The arrangement of the metal piece b^9 upon the slider-bar A′ and the position of the serrations thereon are such that the proper serration for stopping the rocking of the segment will always be brought into position corresponding with the width of the ticket inserted, and consequently to the degree of movement imparted to the segment through the introduction of such ticket. The metal piece b^9 therefore operates as a graduated stop for the segment, the adjustment of which is dependent upon the width of the ticket.

I will now proceed to describe the means which I employ for registering the value of the ticket in the tens series inserted in the machine. Loosely mounted upon the shaft D is a geared sector D′, meshing with the teeth of the segment B. Also loosely mounted upon the shaft D is a ratchet-wheel D^2. The sector D′ is provided with an upwardly-extending portion d, upon which is mounted a spring-actuated pawl d', engaging with the teeth of the ratchet-wheel D^2. A collar d^2 separates the sector D′ from the ratchet-wheel D^2. The ratchet-wheel D^2 is rigidly connected to a hub d^3, secured to a gear-wheel d^4. The ratchet-wheel D^2 and the gear-wheel d^4 in this example of my improvement have each thirty teeth. The gear-wheel d^4 gears with a gear-wheel d^5, having ten teeth and loosely mounted upon a shaft D^3.

Rigidly secured to the gear-wheel d^5 is a tens registering-wheel D^4. The tens registering-wheel has secured to it a hub d^6, provided with one long tooth d^7. It is apparent that the gear-wheel d^4 at each complete rotation will cause three complete rotations of the gear-wheel d^5. Each rotation of the latter

gear-wheel causes the tooth d^7 upon the hub d^6 to engage with a tooth upon a gear-wheel D^5, also provided with thirty teeth, which latter gear-wheel gears with a gear-wheel D^6, also mounted loosely upon the shaft D^3.

Secured to the gear-wheel D^6 is a hundreds register-wheel D^7. The tooth d^7 on the hub d^6 causes the rotation of the wheel D^5 a distance equivalent to the distance between two of the gear-teeth on said gear-wheel D^5, as the latter gears with the gear-wheel D^6, which consequently causes the rotation of the latter a corresponding distance and displays an additional figure upon the register-wheel D^7. The gear-wheel D^6 has but ten teeth. Consequently at each rotation of the gear-wheel D^5 three complete rotations of the gear-wheel D^6 will be effected.

Further description of the balance of the multiple gear by which the thousands register-wheel, and so on, are operated is unnecessary, because they are in all respects like that just described, it being understood that each of the gear-wheels D^5, &c., having thirty teeth, is loosely mounted upon the shaft D.

I will now describe the means whereby the fives series is registered. It will be borne in mind that the tickets of the fives series are thicker than those of the tens series. I will refer more particularly to Figs. 1, 3, and 4.

G designates a movable device, here shown as a rocking arm, and also shown as pivoted near its upper end upon a support g, extending above the top of the machine. This arm may swing freely, and is maintained in a vertical position by gravity. It is provided upon one side with a projection g', which normally extends through a slot g^2, formed in the side of the jaw a' of the carriage, and into a groove g^4, down which the ticket when inserted must pass. Its degree of extension in said groove is such that when a ticket of the tens series is inserted sufficient space is left between it and the opposite face of the groove g^4 for said ticket to pass down freely, and the latter, being gripped by the spring C, will of course be forced over out of contact with the projection g'. When, on the contrary, a ticket of the fives series is introduced, its thickness is sufficient to force the projection g' rearwardly out of the groove g^4, thus causing the arm G to rock upon its pivot. I have shown the arm G as provided with a shoulder g^5, constituting a stop for preventing the projection g' from extending too far into the groove g^4. The lower portion of the arm G comprises a head or projection g^3. When the arm G has been swung backwardly, the projecting projection or head g^3 will contact with a roller g^6, mounted upon the lower extremity of an arm g^7, which latter is rigidly secured to one end of a rock-shaft g^8, journaled in suitable bearings g^9 upon the frame a^5. When the head or projection g^3 on the arm G contacts with the roller g^6, the arm g^7 is swung backwardly against the resistance of a coil-spring g^{10}, surrounding a pin or stud g^{11} and bearing at one end against the arm g^7 and at the other against the case of the machine. The arm g^7, being thus swung, causes the rocking of the rock-shaft g^8. When the other end of the said rock-shaft is secured, a downwardly-extending arm g^{12}, the lower portion of which is bifurcated, extends about a sleeve g^{13}, having a sliding connection with the shaft B^2, but being non-rotary thereon.

Secured to the sleeve g^{13} near one end is a collar g^{14}, and secured to said sleeve near its other end is a cam g^{15}. This cam comprises a snail-tooth g^{16}. As the rock-shaft g^8 is rocked through the movement of the arm G, the cam g^{15} is caused, through the intermediate mechanism just described, to be shifted into such position that the tooth g^{16} thereon will contact with a roller g^{17}, mounted upon one arm of a lever H, when the shaft B^2 is rotated by the crank B'. The continued rotation of the shaft causes the said cam to operate the lever H and rock it upon its fulcrum h a sufficient distance to cause a spring-actuated pawl h' to rotate a gear-wheel H' a distance equivalent to the distance between two of the teeth on said gear-wheel. The gear-wheel H' is loosely mounted upon the shaft D and is provided with thirty teeth. It gears into a gear-wheel H^3, loosely mounted upon the shaft D^3, which latter gear is provided with ten teeth.

Rigidly secured to the gear-wheel H is a fives register-wheel H^3, and rigidly secured to the fives register-wheel H^3 is a gear-wheel H^4, which latter gear-wheel has five teeth only. The gear-wheel H^4 gears into the gear-wheel d^4. As the gear-wheel H^2 has ten teeth and the gear-wheel H^4 has but five teeth, it follows that the rotation of the gear-wheel H^2 equivalent to the distance between three teeth must be effected before a tooth upon the gear-wheel H^4 will engage the tooth upon the gear-wheel d^4 to rotate the latter. Therefore for each two fives that are registered a single ten will be registered upon the tens register-wheel D^4.

It is to be borne in mind that the width of the tickets of the fives series is the same as that of the tens series. Therefore the tens will all be registered by the mechanism operated through the width of the ticket in manner previously described, where the fives are registered separately and added to the tens upon the register-wheel.

It will be observed that the cam g^{15} only exerts an influence upon the lever H during a half-rotation of the shaft B^2, or during the downward movement of the carriage A. During this movement, of course, the ticket is moved past the projection g' on the arm G, and the latter again falls by gravity into its normal position, while the spring g^{10} operates to rock the arm g^7, the rock-shaft g^8, and its coacting parts into their normal positions and

to shift the cam g^{15} into a position where the tooth g^{16} will not contact with the roller g^{17} upon the rotation of the shaft B^2.

I have shown a stop, consisting of a pin I, for preventing a too-extended movement of the arm g^7 in the direction in which it is moved by the spring g^{10}. I have likewise shown a spring i^2 operating upon the lever H to restore it to a normal position after it has been moved by the cam g^{15}.

Spring-actuated stop-pawls j are employed to prevent the rotation of the various gear-wheels employed in the indicator mechanism in an improper direction.

It is desirable to lock the carriage A against downward movement until a ticket has been properly inserted therein, and it is also advantageous that a signal should be given when the ticket has been thus properly inserted. I have shown in Fig. 2 means for accomplishing this result, of which J designates the lock, shown as consisting of a bell-crank lever, one arm j^2 of which constitutes the bolt of the lock. The lever J is fulcrumed upon a pin or stud j^3, and a spring j^4, acting upon a long arm j^5 of the lever, operates to rock the lever into such position that the bolt j^2 will normally extend into a socket j^6, formed in the adjacent side of the jaw a' of the carriage. When in such position the carriage cannot be moved downwardly. A stop j^7 prevents the rocking of the lever too far in one direction. A trip j^8 extends into the socket j^6 in front of the bolt j^2. This trip is mounted upon a spring j^9, shown as a flat spring extending upwardly and secured near its lower end to the jaw a' of the carriage A. The upper portion of this spring is so bent that it extends into the path of a ticket inserted between the jaws a a'. The ticket when inserted forces the trip inwardly against the resistance of the spring j^9. The inner end of the trip then operates to force the bolt j^2 out of the recess j^6, and consequently to rock the lever J upon its fulcrum. The carriage may then be moved downwardly, as the trip will operate to hold the bolt j^2 beyond the carriage until after the socket j^6 has passed below the bolt.

Upon the long arm j^5 of the lever J is a spring-actuated detent j^{10}. This detent, when the lever J is rocked by the trip, contacts with one arm of a spring-actuated bell-crank lever j^{11}, mounted upon a projection extending from the case. Upon the other arm of the bell-crank lever is a bell-clapper j^{12}. When the arm j^{11} is rocked sufficiently far, the detent j^{10} will pass by it and the bell-clapper will then strike a bell j^{13} and cause an audible signal. When the lever J returns to a normal position, the detent j^{10} will swing past the bell-crank lever j^{11}, and after passing the same will be returned to a position to again operate the signal.

Although I have shown and described an audible signal, it is quite obvious that a visual signal may be employed. Upon the trip j^8 is a stop j^{14}, which contacts with the portion of the jaw a' to prevent a too-extended inward movement of the trip.

The width of a ticket denoting the value of five cents is such that when the carriage A is moved downwardly it will not contact with the segment B. Therefore no operation of the tens indicator-train will take place.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a ticket-registering machine, the combination, with a longitudinally-movable carriage having a movable jaw and adapted to receive tickets of different widths and different thicknesses, of a movable device in the path of said carriage and adapted to be moved by said carriage, a register-train operated from said movable device, a second movable device arranged in the path of a ticket when the latter is inserted in the carriage and moved by the ticket independently of the carriage, a second register-train, and mechanism, substantially such as described, between the second-named movable device and the second-named register-train operated by said second-named movable device, substantially as specified.

2. In a ticket-recording machine, the combination of a register-train, a carriage having jaws adapted to receive tickets of different thicknesses, a movable device extending into the path of a ticket when the latter is inserted between the jaws and adapted to be moved outwardly by said ticket, and mechanism, substantially such as described, between the movable device and the register-train operated by the said movable device, substantially as specified.

3. In a ticket-registering machine, the combination, with a box or case, of a carriage into which a ticket to be recorded is passed, said carriage being provided with a movable jaw, a yielding abutment for said movable jaw, and mechanism, substantially such as described, for imparting longitudinal movement to said carriage, substantially as specified.

4. In a ticket-registering machine, the combination of a carriage adapted to receive a ticket, a movable jaw comprised in said carriage, a yielding abutment for said jaw, mechanism, substantially such as described, for imparting longitudinal movement to the carriage, and a releasing device for releasing the ticket from the carriage, substantially as specified.

5. In a ticket-registering machine, the combination of a carriage adapted to receive a ticket, a movable jaw comprised in said carriage, a rigid jaw also comprised in said carriage, said jaws being provided with grooves into which the ticket is inserted, a yielding abutment for the movable jaw, mechanism, substantially such as described, for causing the longitudinal movement of the carriage, a

releasing device for a ticket, and a spring operating to force a ticket to one side in said grooves, substantially as specified.

6. In a ticket-registering machine, the combination of a carriage, a movable jaw comprised in said carriage, adapted to be moved by a ticket upon its insertion between the jaws, a lock for securing the carriage in its normal position, a trip operated by the ticket upon its insertion to release the lock, and mechanism, substantially such as described, for imparting longitudinal movement to the carriage, substantially as specified.

7. In a ticket-registering-machine, the combination of a carriage provided with a fixed jaw and a movable jaw, a trip on the fixed jaw moved in one direction by a ticket upon its insertion between the jaws, a signal operated from said trip, and a stop for limiting the movement of said trip, substantially as specified.

8. In a ticket-registering machine, the combination of a carriage comprising a movable jaw moved by the insertion of a ticket into the carriage, mechanism, substantially such as described, for imparting longitudinal movement to said carriage, a movable device having a portion extending into the path of said carriage when moved in one direction, and with which said carriage will contact upon being moved, and a register-train operated from said movable device, substantially as specified.

9. In a ticket-registering machine, the combination of a carriage comprising a movable jaw, a yielding abutment for said jaw, mechanism, substantially such as described, for imparting longitudinal movement to the carriage, a segment provided with gear-teeth and having a portion extending into the path of said carriage, and with which the latter will contact when moved in one direction, in order to rock the segment, and a graduated stop on said yielding abutment for limiting the rocking movement of the segment, substantially as specified.

10. In a ticket-registering machine, the combination of a carriage having a movable jaw, of mechanism, substantially such as described, for imparting longitudinal movement to said carriage, a segment provided with gear-teeth and having a portion extending into the path of said carriage, and with which the carriage will contact when moved in one direction, an arm on said segment, and a pin or projection on said carriage contacting with said arm and operating to return the segment to its normal position when the carriage is moved in the other direction, substantially as specified.

11. In a ticket-registering machine, the combination of a carriage having a movable jaw and a fixed jaw, said jaws being provided with longitudinal grooves into which a ticket is passed, a movable device extending into the path of the ticket and moved by the ticket upon its insertion in the groove, a register-train, and mechanism, substantially such as described, between said movable device and the register-train operated by the said movable device, substantially as specified.

12. In a ticket-registering machine, the combination of a carriage adapted to receive a ticket, a movable device arranged in the path of said ticket and adapted to be moved by the latter when the same is inserted in the carriage, a rock-shaft, an arm on said rock-shaft with which said movable device will contact, a second arm on the rock-shaft, provided with a bifurcated portion, a shaft, a sleeve on said shaft embraced by said bifurcated portion, a cam on the sleeve, a lever, and a time-register train, substantially as described, whereby when the rock-shaft is rocked by the movable device said cam will be shifted into a position to operate said lever.

ISAAC PFORZHEIMER.

Witnesses:
FREDK. HAYNES,
JOHN BICKET.