No. 822,824. PATENTED JUNE 5, 1906.

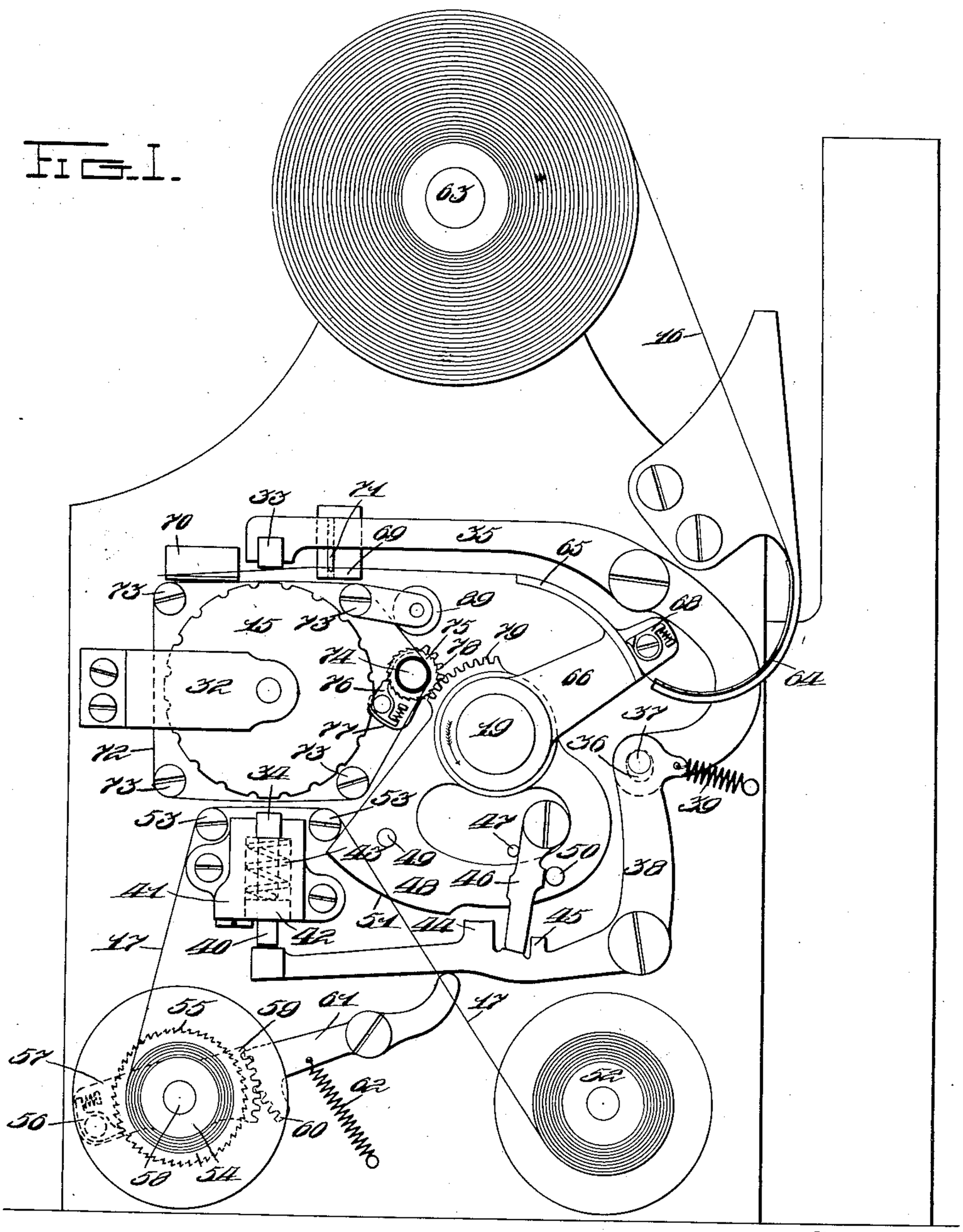
J. P. CLEAL.

CASH REGISTER.

APPLICATION FILED NOV. 8, 1901.

4 SHEETS—SHEET 1.

FIG. 1.



Witnesses

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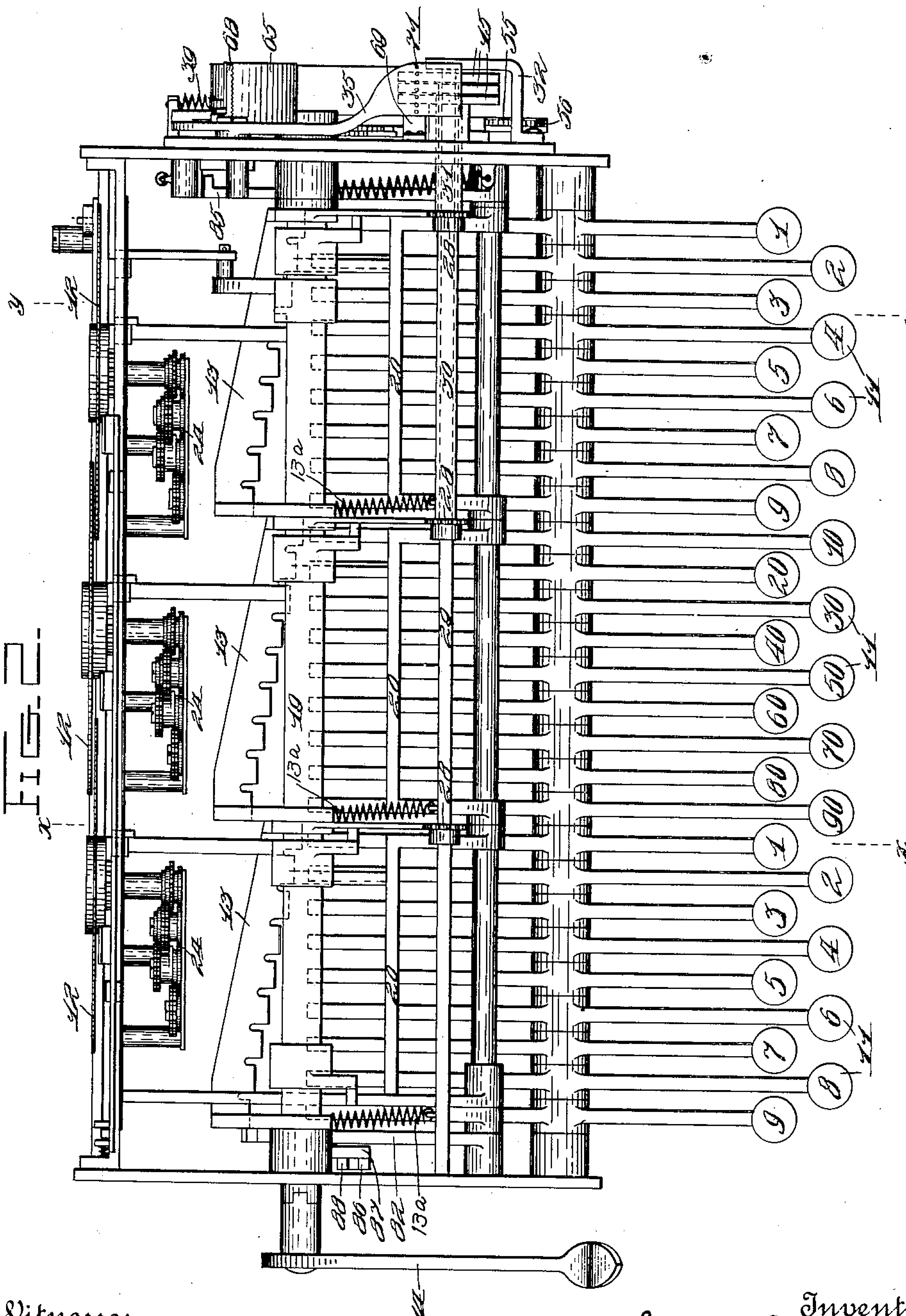
4 SHEETS—SHEET 2.

FIG. 2.



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4 SHEETS—SHEET 3.

FIG. 7.

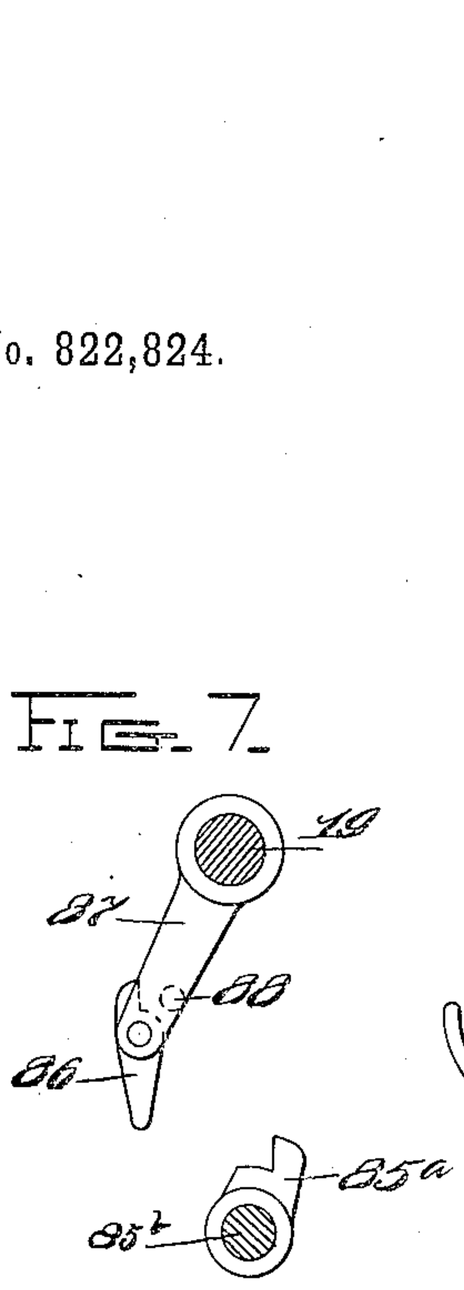


FIG. 3.

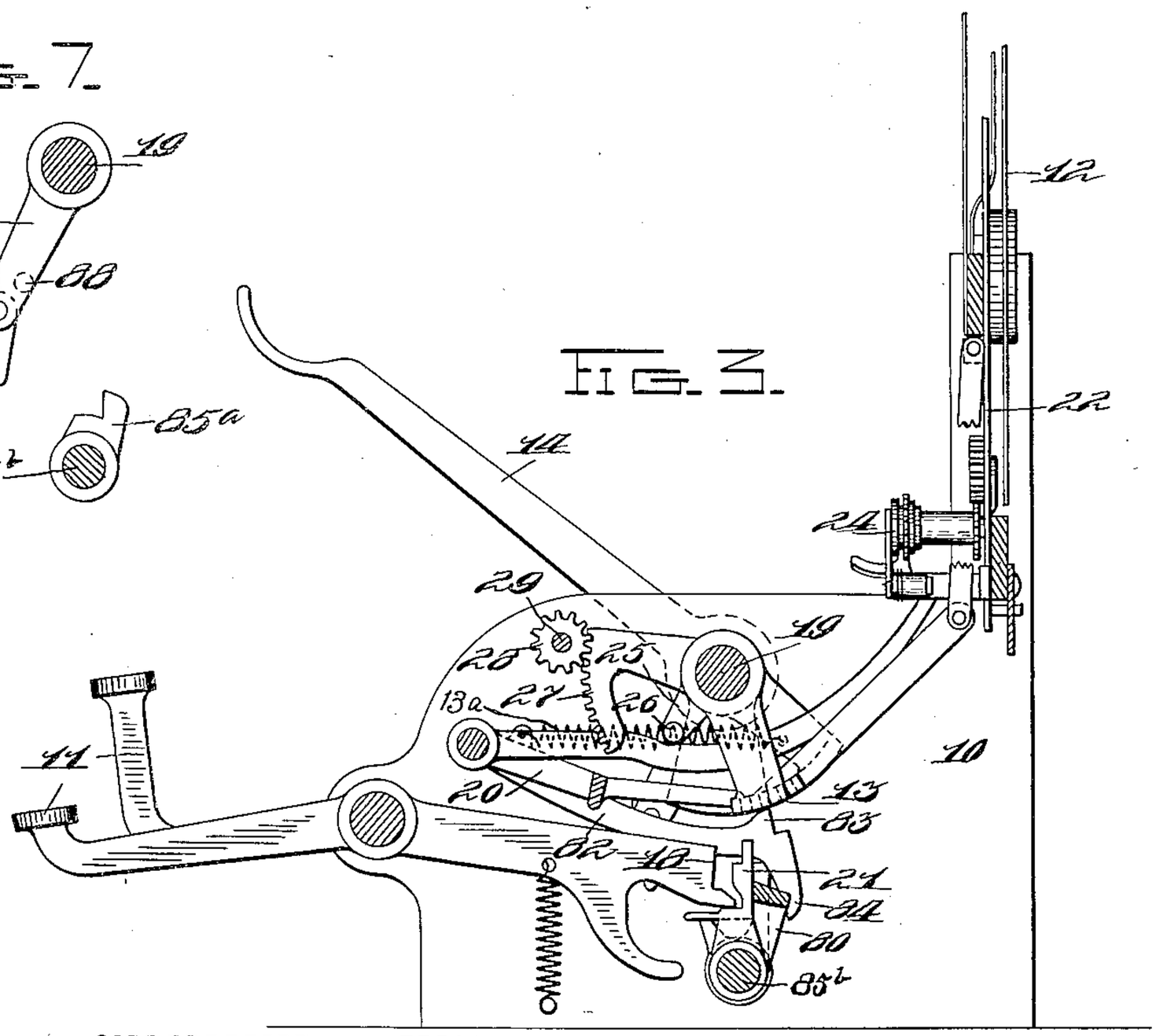


FIG. 8.

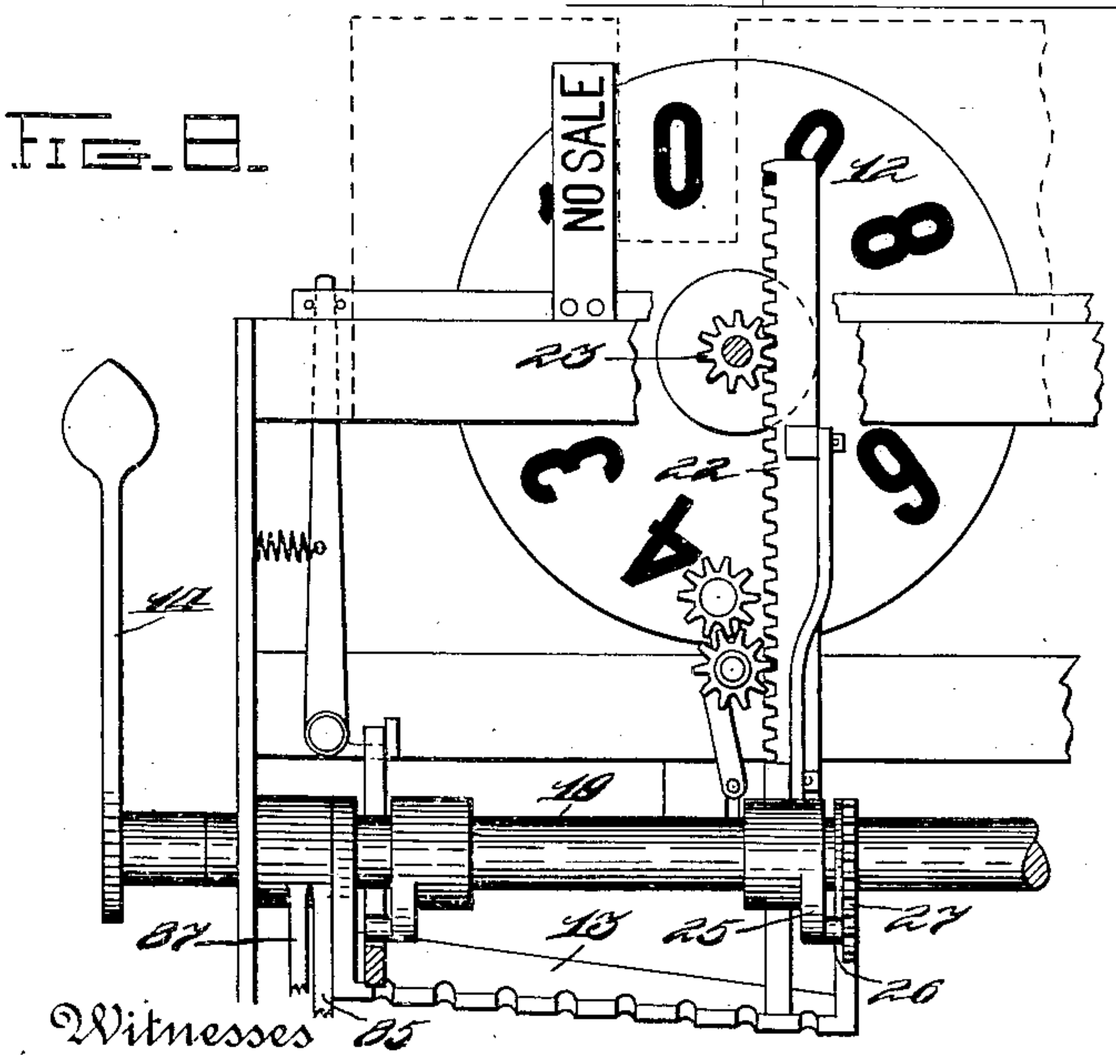
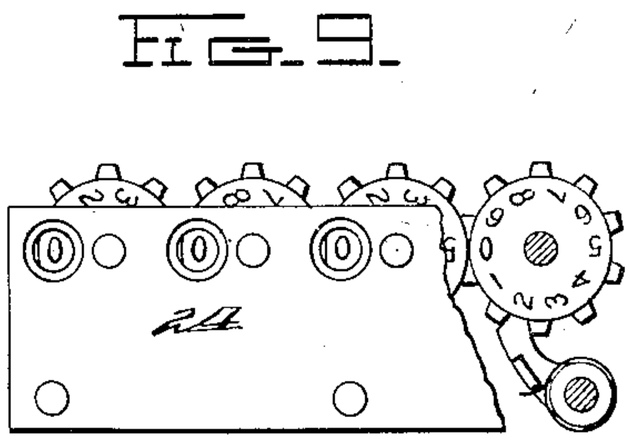


FIG. 9.



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4 SHEETS—SHEET 4.

FIG. 5.

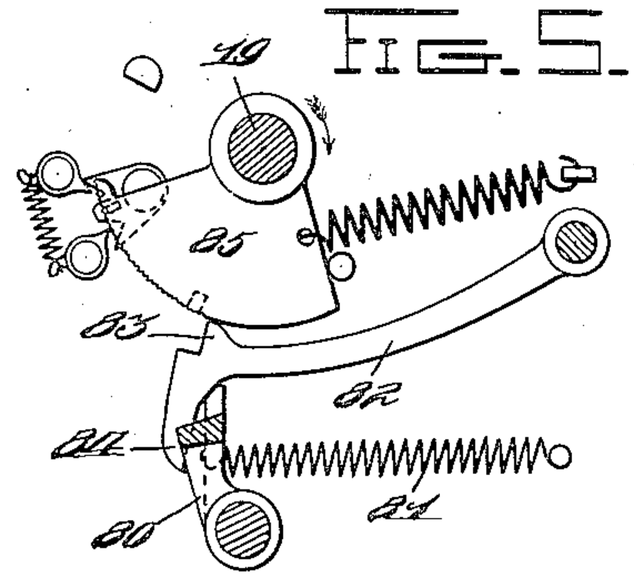
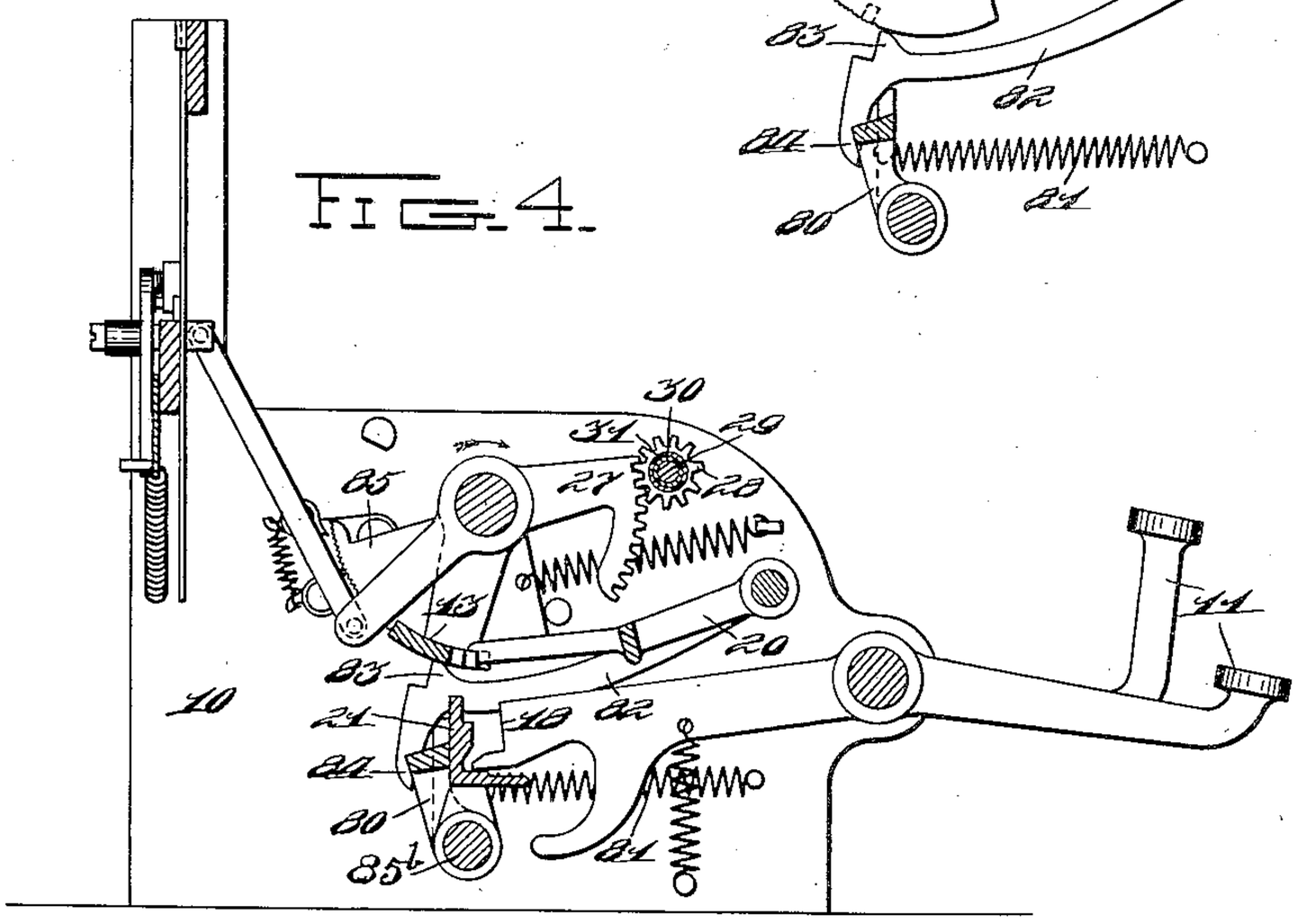


FIG. 4.



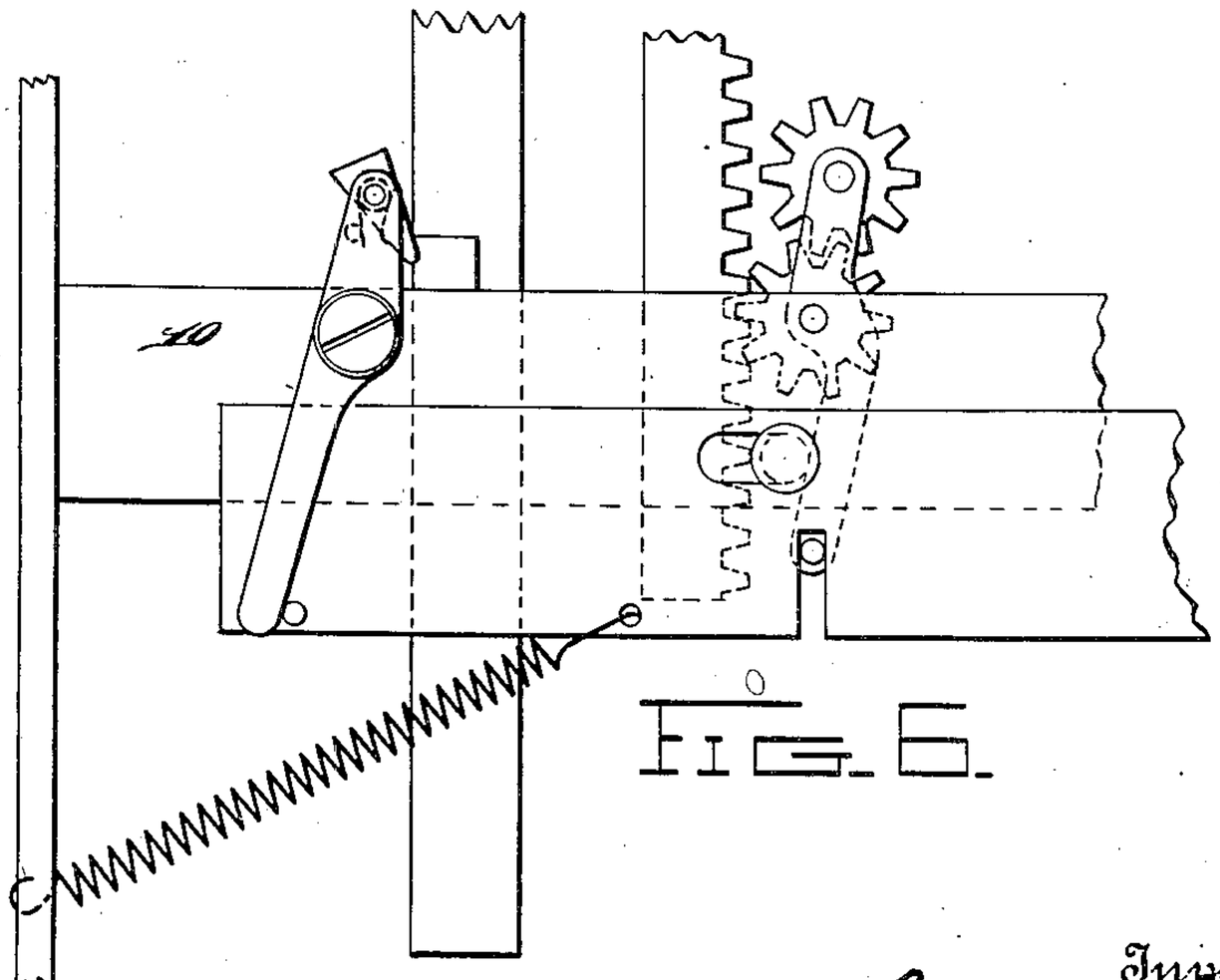


FIG. 6.

Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH P. CLEAL, OF DAYTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO.

CASH-REGISTER.

No. 822,824. Specification of Letters Patent. Patented June 5, 1906.

Application filed November 8, 1901. Serial No. 81,557.

To all whom it may concern:

Be it known that I, JOSEPH P. CLEAL, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash-Registers, of which I declare the following to be a full, clear, and exact description.

This invention relates to improvements in cash-registers, and has more particular relation to improvements in registers of the type patented to John Pfeiffer, No. 642,713, February 6, 1900.

The primary object of the invention is to provide the class of machine mentioned with a printer, and a further object is to add certain locking devices to the machine to prevent fraudulent manipulation of the same.

With these and incidental objects in view the invention consists in certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims and a preferred form of embodiment of which is hereinafter specifically described with reference to the drawings which accompany and form part of this specification.

In the said drawings, Figure 1 represents an end elevation of the printing devices embodying my invention applied to one end of a machine of the class mentioned, the cabinet and cash-drawer being omitted. Fig. 2 represents a top plan view of the same. Fig. 3 represents a transverse vertical section through the machine on the line $x\,x$ of Fig. 2. Fig. 4 represents a similar view taken on the line $y\,y$ of Fig. 2. Fig. 5 represents a detail side elevation of the full-stroke devices and the key-locking mechanism. Fig. 6 represents a detail rear elevation of one of the pairs of idle pinions and its operating mechanism. Fig. 7 represents a detail side elevation of the tripping devices for the key-detents. Fig. 8 represents a detail front elevation, partly broken away, of one of the indicators and the devices coöperating therewith; and Fig. 9 represents a front elevation, partly broken away, of one of the sectional counters.

In the aforesaid drawings, 10 represents the frame of the machine; 11, the amount-keys; 12, the rotary indicators; 13, the registering-frames; 14, the operating-lever; 15, the printing-wheels, and 16 and 17 the check and detail strips, respectively.

The principal parts of the register are substantially the same as shown and described in the aforesaid patent, and I will therefore refer to the same for such detail description of said parts as is not hereinafter given.

Described in a general way the machine to which I have applied my invention consists of the series of pivoted key-levers 11, formed with stop-shoulders 18, which are adapted to coöperate when the keys are operated with the stepped graduated frames 13. These frames are journaled upon a transverse shaft 19 and are spring-drawn by springs 13^a, Fig. 2, so that when released by the tripping of latch-levers 20 they will pass forward until arrested by the shoulders of the operated keys. When a key is operated, it is held in its set position by one of a series of pivoted detent-frames 21, mounted on the shaft 85^b. The registering-frames 13 are connected to the rotary indicators 12 through the medium of vertically-sliding racks 22, which, as better shown in Fig. 8, mesh with pinions 23, fast to the indicators. The indicators thus follow the movements of the registering-frames in both directions. The rack-bars are utilized to transmit movement to the respective counter-wheel trains 24 when moving in one direction, but not when moving in the opposite direction. Movement is transmitted from the rack-bars to the counter-wheel pinions mounted upon movable supports, so that they may be thrown into and out of mesh to secure the desired one-way movement. After the frames 13 have been released and arrested according to the keys operated they are returned to their normal positions by the operating-lever handle 14, which is fast to the shaft 19, the latter carrying a series of arms 25, provided wth pins 26, which engage the respective frames. As each of the registering-frames, as above described, receives a movement corresponding to the value of the operated key in its respective bank I utilize these movements to set the printing-wheels 15 by providing each of the frames 13 with a segmental rack 27. These racks mesh, respectively, with pinions 28, mounted upon a transverse shaft 29, and two nested sleeves 30 and 31, mounted over and supported by said shaft. (See Fig. 2.) Upon the outer ends of the shaft and said nested sleeves are mounted the printing-wheels 15, a bracket 32 supporting the outer

end of the shaft. Each of the type-wheels is formed with two sets of types for printing from zero to nine on both a detail-strip and a check-strip.

The printing from opposite sides of the printing-wheels is effected by two platens 33 and 34, formed of any suitable flexible material. The platen 33 is mounted in a pivoted curved platen-lever 35. The lower end of this lever is formed with an elongated slot 36, into which projects a pin 37, mounted upon a pivoted bell-crank lever 38. This latter lever is connected to the printer-frame by a coil-spring 39, so as to normally hold the levers 35 and 38 in the positions shown in Fig. 1. The forward end of the lever 38 coöperates with a plunger 40, mounted in a housing 41 on the printer-frame and carrying the platen 34 at its upper end. This plunger is provided with a collar 42, against which a coil-spring 43, mounted in the housing 41, abuts to normally hold the plunger in its lower position. (Shown in Fig. 1.) When the lever 38 is depressed and subsequently released and allowed to rise under the stress of the spring 39, its forward end strikes the plunger a sufficiently hard blow to cause the platen 34 to force the ink-ribbon and tape upward against the type. The lever 38 is formed with two upwardly-projecting lugs 44 and 45, which cooperate with a pivoted latch-pawl 46, mounted upon the printer-frame. This pawl is prevented from moving forward past the position shown in Fig. 1 by a stop-pin 47, also mounted on the printer-frame. A slotted segment 48 is fast upon the protruding end of the main operating-shaft 19 and is provided with two tripping-pins 49 and 50, located near opposite ends of the same. The segment is also formed with a cam-periphery 51.

In the operation of machines of the type shown in connection with my present invention the operating-lever 14 is first depressed and is held in its depressed position while the amount-keys are operated. When the keys are operated, the registering-frames are released and assume different positions, according to the keys operated. With this understanding of the operation in mind I will now describe the corresponding movements of the printer. As the handle 14 is drawn down the segment 48 is oscillated, so that its cam edge 51 is brought against the lug 44, and thus gradually depresses the same and the lever 38. Finally the pin 49 strikes the pawl 46 and forces the same over the top of the lug 45, which has moved down with the lever 38. The lever 38 is now latched in its depressed position. The amount-keys are now depressed and the type-wheels thereby set ready for the impressions. When the handle 14 is thereafter released, the segment 48 returns and the pin 50, striking the pawl 46, forces the same from over the lug 45, and thus releases the lever 38, which results in both of the platens being operated, as will be readily understood by reference to Fig. 1 of the drawings, the spring 39 giving the respective platen-levers their movements.

The detail-strip 17 passes from a supply-roller 52 up and over two guide-rollers 53 and down to the feeding and storage roller 54. This latter roller is provided at one end with a ratchet-wheel 55, and this wheel is fed forward by a spring-pressed pawl 56, which is mounted upon a lever 57, journaled upon the supporting-shaft 58 of the storage-roller. The lever 57 is formed with a segmental rack 59, which meshes with a similar rack 60, formed on a lever 61. This lever is pivoted upon the printer-frame and normally drawn into contact with the lever 38 by a coil-spring 62. When the lever 38 is forced downward, the ratchet 55 is rotated and the record-strip fed forward. The check-strip 16 passes from a supply-roller 63 down and about a stationary guiding-plate 64 and over a segmental plate 65, fast to a feeding-arm 66, which in turn is fast to the shaft 19. This arm 66 carries a spring-pressed feeding-pawl 68, which engages the strip 16, lying upon the plate 65, and holds the strip to movement with the plate, but in one direction only. After leaving the plate 65 the strip passes over an apertured block 69, under the platen 33, and out over a check-supporting table 70. The platen-lever 35 carries a series of perforating-pins 71, which lie directly over the perforations of the block 69. These perforate the check-strip and hold the same firmly while it is being torn along the line of perforations to remove the check which has been printed.

The endless ink-ribbon 72 passes about the wheels 15 and is supported by four antifriction-rollers 73 and a feeding-roller 74, covered with absorbent-ink-saturated felt. The roller 74 is provided with a ratchet-wheel 75, which is engaged by a spring-pressed feeding-pawl 76. This pawl is mounted upon one end of a short lever 77, which is loosely mounted upon the journal-roller 74. The opposite end of the lever 77 is formed with a segmental rack 78, which meshes with a similar rack 79, formed on the segment 48. The operation of this feed is practically the same as that of the record-strip-winding roller.

It will be observed that by the above-described construction both of the platens are simultaneously operated and the type-wheels thus relieved of unnecessary shock, as the blows are practically the same from the opposite sides.

In lieu of the single plunger 40 there may be a series of such plungers, one for each type-wheel and each having its individual platen. As has before been stated, the keys upon being operated become coupled to a rocking detent-plate 21, which they first displace from normal position. There is one of these detents for each bank of keys. Extend-

ing back of all the detent-plates is a rocking frame 80, which is normally spring-drawn against the same by a coil-spring 81, which connects it to the main frame. This frame, and consequently the detents and keys, are normally locked in position by a pivoted latching-lever 82, having two noses 83 and 84. The nose 84 projects down back of the frame, but in such manner that when the frame is forced rearward upon the operation of a key it will be forced upward if the lever 82 is free to move upward. This lever, however, is normally held against any upward movement by a segment 85, mounted on the shaft 19 in such manner that its periphery normally lies directly above the nose 83. When the operating-lever 14 is depressed, the segment 85 is rocked with the shaft until when the lever 14 is fully depressed it is entirely free of the nose 83, and the rocking frame and detents may be operated. When the handle commences its return movement, the lever 82 again becomes locked and remains so until the handle is again operated. As there would be a liability of the frame 80 to twist longitudinally if only one locking device therefor were employed, I provide one of the same for each end of said frame. The segments 85 are also utilized as full-stroke rack-segments, as plainly shown in Fig. 5. In order to release any operated keys at the end of the downstroke of the handle by rocking the shaft 85^b, upon which the detents 21 are loosely mounted, I provide said shaft with a short arm 85^a, (see Fig. 7,) lying normally in the path of a pivoted pawl 86, mounted upon an arm 87, which is fast to the shaft 19, so as to oscillate therewith. A pin 88 is mounted upon the arm 87 to act as a stop for pawl 86, whereby said pawl can only turn in one direction upon its pivot. The detents 21 are of course only loosely mounted on the shaft 85^b, so that they may be independently operated by the keys of their respective banks. The shaft is provided, however, with suitable projections arranged to engage and rock the detents backward to release the keys in the manner described in the aforesaid patent. The endless inking-ribbon is held taut at all times by a pivotally-mounted weighted roller 89, which rests upon the same.

While the form of mechanism here shown and described is admirably adapted to fulfil the objections primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein disclosed, for it is susceptible of embodiment in various forms, all coming within the scope of the claims which follow.

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

1. In a cash-register, the combination with a type-carrier, and a spring for moving same, of keys for limiting the setting movement of said carrier, a normally advanced platen for taking impressions from said type-carrier, means for retracting said platen against spring tension and for latching it in retracted position, and means for tripping the latch after the type-carrier has been moved.

2. In a cash-register, the combination with a type-carrier and a spring urging it to set position, of keys for limiting the movement of the carrier, an oscillating lever for restoring the carrier to normal position, a platen for taking impressions from said carrier normally spring-held in advanced position, means operated by the lever for retracting said platen against the spring tension, means for latching the platen in retracted position, and means for releasing the latch after the type-carrier has been set.

3. In a cash-register, the combination with an oscillating type-carrier arranged to remain in set position between operations of the machine, a series of keys for limiting the movements of said carrier, means normally locking said keys, an oscillating lever and connections for restoring said carrier to normal and unlocking said keys, a spring-actuated platen normally in advanced position, but retracted by said restoring and unlocking movement of said lever, means latching said platen when retracted, and means for tripping said latch after the keys have been operated and the type-carrier limited thereby.

4. In a cash-register, the combination with an oscillating operating-handle, a plurality of spring-operated printing devices arranged to be restored by the handle, a plurality of keys normally locked, means operated by the movement of the handle from normal position for unlocking said keys, and means requiring the return of the handle to normal to permit the operation of the printing devices.

5. In a cash-register, the combination with an oscillating operating-handle, of a paper-feed device operated on the initial stroke of the handle, a type-carrier, a spring for moving said carrier differentially, a series of keys, means normally locking said keys, means operated by the handle for releasing the lock for the keys, and means for taking impressions from said type-carrier, and for returning said carrier to normal position.

6. In a cash-register, the combination with an oscillating operating-lever, of a series of keys, a type-carrier having its setting motion limited by said keys, means for locking said keys, means operated by the lever for restoring said type-carrier and unlocking said keys, a spring-actuated platen, means operated by said lever for retracting the platen, a latch for holding said platen in retracted position, and means for tripping the latch.

7. In a cash-register, the combination with a series of type-carriers and springs for moving them differentially, of keys for limiting the movements of the type-carriers, means

normally locking said keys, a handle for restoring the type-carriers to normal and unlocking the keys, a spring-operated platen normally in advanced position, but retracted by the movement of said handle, a latch for holding said platen retracted and means for releasing said latch after the type-carriers have been moved.

8. In a cash-register, the combination with printing and indicating devices connected for movement together in both directions, springs for adjusting said printing and indicating devices and leaving them so adjusted between operations, keys for limiting the movement of said printing and indicating devices, a manipulative means for restoring said devices to normal, a platen for taking impressions from said printing devices, a spring normally holding said platen in advanced position, means for retracting said platen by the movement of said manipulative means, means for latching said platen in retracted position and means for tripping said latch after the printing devices have been adjusted.

9. In a cash-register, the combination with a series of keys and means normally preventing operation of the same, a differentially-movable type-carrier, a spring for moving same, means connected to said type-carrier for limiting its movement as determined by the keys, a spring-operated platen normally in advanced position, a handle and connections for releasing said keys and retracting said platen, a latch holding said platen in retracted position, and means for tripping said latch after the type-carrier has been moved.

10. In a cash-register, the combination with a type-carrier, and a spring for adjusting the same, of keys for limiting the movement of said carrier, a normally advanced platen for taking impressions from said type-carrier, means for retracting said platen and latching it in retracted position, means for tripping the latch after the type-carrier has been adjusted, and a paper-feeding device operated by the handle.

11. In a cash-register, the combination with a series of type-carriers and springs for adjusting them differentially, of keys limiting the movements of the type-carriers, means normally locking said keys, a handle for restoring the type-carriers to normal and unlocking the keys, a spring-operated platen normally in advanced position, but retracted by the movement of said handle, latch for holding said platen retracted, and a paper-feeding device operated by the handle.

12. In a cash-register, the combination with a series of keys, of a series of type-carriers, a series of setting elements arranged when released to be arrested by the keys, a platen, and an operating device arranged to put the platen under tension before the keys are operated and to release said platen after the keys are operated.

13. In a cash-register, the combination with an operating mechanism, a differentially-movable device and a type-carrier controlled thereby; of manipulative means for determining the extent of movement of said differential device; a locking mechanism for said manipulative means; means operated upon the initial movement of said operating mechanism for unlocking said manipulative means; and means operated during the completion of the movement of said operating mechanism for taking an impression from said type-carrier after the same has been set to a position controlled by the manipulative means.

14. In a cash-register, the combination with an oscillating operating-lever, a series of keys, a differentially-movable device controlled by said keys, and a type-carrier connected with said differential device; of a locking mechanism for said keys; means operated upon the movement of the lever in one direction for unlocking said keys; and means operated by the return movement of said lever for taking an impression from said type-carrier.

15. In a cash-register, the combination with an operating mechanism including an operating-handle having initial and final movements, a series of keys, a lock for said keys actuated by the initial movement of the operating-handle, a series of graduated frames arranged to be released and subsequently arrested by the keys, rack-segments carried by said frames, a series of type-wheels, gearing connecting said segments and type-wheels, means for moving the graduated frames by the operating-handle and impression devices also actuated by the operating-handle to take an impression from the types after they have been set.

16. In a cash-register, the combination with a series of keys, of a series of type-carriers, a series of setting elements arranged when released, to be arrested by the keys, an operating device, arranged to have an initial and a final operation, a lock for the keys arranged to be released upon the initial movement of the operating device, a platen, arranged to be set for operation by the initial movement of the operating device and to be released and allowed to operate upon the final movement of said operating device.

17. In a cash-register, the combination with an operating mechanism comprising a series of spring-drawn frames, of an operating-handle for returning said frames to normal position, a series of keys for limiting the movements of said frames, type-carriers connected to said frames, a platen, means for setting the platen for operation upon the downstroke of the operating-handle and releasing the same upon the upstroke of the same.

18. In a cash-register, the combination with an operating mechanism, including a handle having an initial and a final movement, of a series of graduated frames, a series of keys arranged to arrest the frames in different positions, means for locking the keys until after said handle has made its initial movement, type-carriers connected to the frames, and impression devices actuated by the final movement of the operating-handle.

19. In a cash-register, the combination with a series of keys, of an operating-handle and connections, a series of graduated elements arranged to be first returned to normal position by said handle and then set to positions determined by the keys, type-carriers connected to said elements, spring impression devices, means for putting said devices under tension by the initial movement of the handle and means for releasing said impression devices by the final movement of the handle.

20. In a cash-register, the combination with a series of registering elements arranged to be first returned to normal position and then to be reset to a new position, a handle controlling said elements, to return the same to normal position, keys coöperating with the elements, a type-carrier, an impression-platen arranged to be set by the handle when returning the registering elments to normal position, a latch for holding the platen in set position and means connected to the handle for tripping the latch after the handle has permitted the registering elements to take up their new positions.

21. In a printing attachment for cash-registers, the combination with a type-carrier and setting means therefor, of a platen, an operating mechanism, and means controlled by the operating mechanism for positively effecting the latching of the platen in operative position and subsequently releasing said latch to permit the platen to operate.

22. In a cash-register, the combination with a type-carrier and setting means therefor, of a platen, an operating-handle, a latch-pawl for engaging said platen, and devices connected with said operating-handle for first engaging said latch-pawl to positively carry the same into position to latch the platen, and then subsequently releasing the latch.

23. In a cash-register, the combination with a type-carrier and setting means therefor, of a platen, an operating-handle, a latch-pawl for engaging said platen, and means connected with said handle for first operating the platen to put the same under tension and then positively forcing said latch-pawl into engagement therewith to retain the same in operative position, and then subsequently operating the latch to release the platen to cause an impression to be taken.

24. In a cash-register, the combination with a series of keys, of a series of detents for the same, a movable frame engaging said detents, an operating-handle and connections and locking devices engaging the opposite ends of the movable frame and coöperating with the handle, connections to lock said frame and prevent operation of the keys except when the handle is in a predetermined position.

25. In a cash-register, the combination with an operating mechanism, of a series of type-carriers arranged to be set thereby, a platen-lever carrying a platen, a platen-operating lever coupled to the first lever and a platen mounted independently of the second lever and disconnected therefrom but arranged to be struck thereby to force the same against the type-carriers.

26. In a cash-register the combination with an operating mechanism, of a series of type-carriers connected thereto, check-strip-supply devices, a movable arm carrying a segmental plate, a pawl on said arm arranged to engage a check-strip passed over the plate, and means connecting the movable arm to the operating mechanism.

27. In a cash-register, the combination with an operating mechanism, of a series of type-carriers connected thereto, a platen, an arm carrying a segmental plate and a pawl which engages said plate and means for guiding a check-strip over said plate.

28. In a cash-register, the combination with an operating mechanism, of a series of type-carriers connected thereto, a platen, an ink-ribbon, feeding devices for said ribbon, means for operating said feeding devices and a feeding-arm carrying a curved plate and a pawl engaging said plate to hold a check-strip thereon.

29. In a cash-register, the combination with an operating mechanism, a printing mechanism including a platen-lever, a strip-feeding pawl having a ratchet, a pawl-carrier, and pawl engaging said ratchet, and a lever geared to said pawl-carrier to give a reverse movement and spring-pressed into engagement with said platen-lever.

30. In a cash-register, the combination with a series of type-carriers, bearing duplicate sets of type and springs for adjusting them differentially, of keys for limiting the movements of the carriers, means normally locking said keys, a handle for restoring the carriers to normal and unlocking the keys, duplicate spring-operated platens, means for camming the platens to retracted position, a detail-strip-feeding device operated by one platen, and a check-feed positively operated by the handle.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH P. CLEAL.

Witnesses:

JOHN H. WERNER,

WM. H. MUZZY.