

No. 756,083.

PATENTED MAR. 29, 1904.

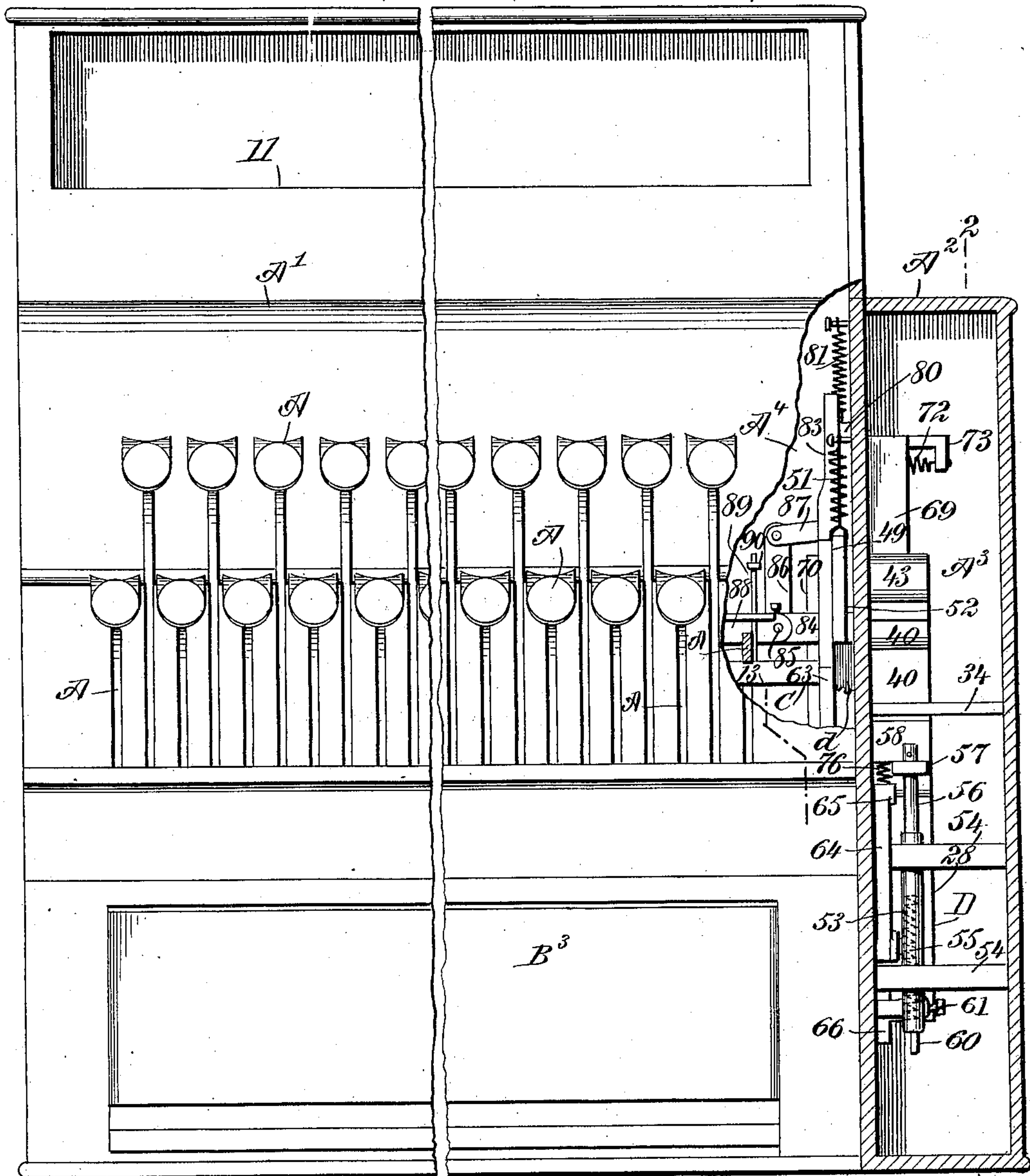
J. C. VAHJEN.
CASH REGISTER.

APPLICATION FILED APR. 28, 1903.

NO MODEL.

5 SHEETS—SHEET 1.

Fig. 1. 3



WITNESSES:

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J. P. Walker

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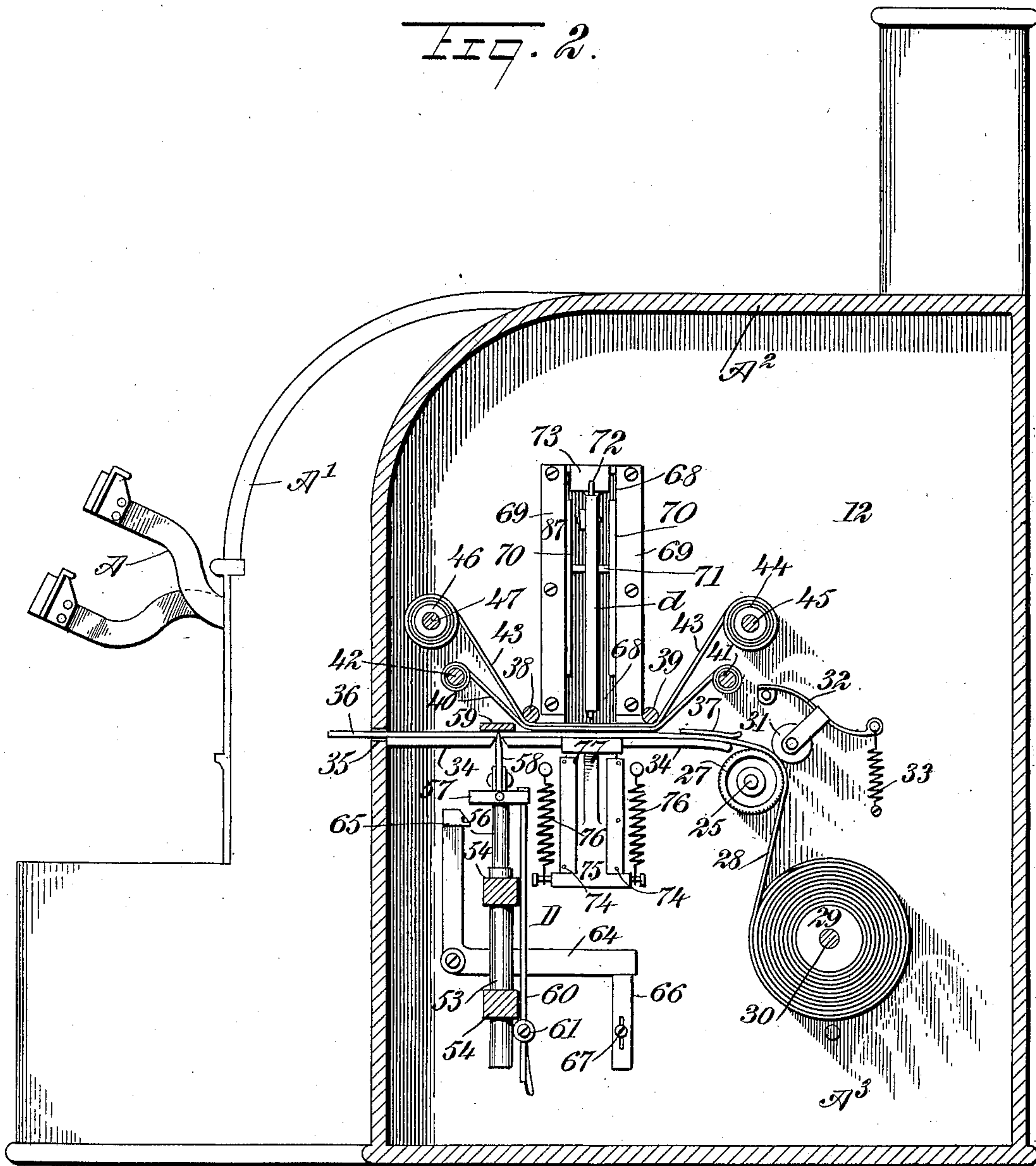
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NO MODEL.

5 SHEETS—SHEET 2.

FIG. 2.



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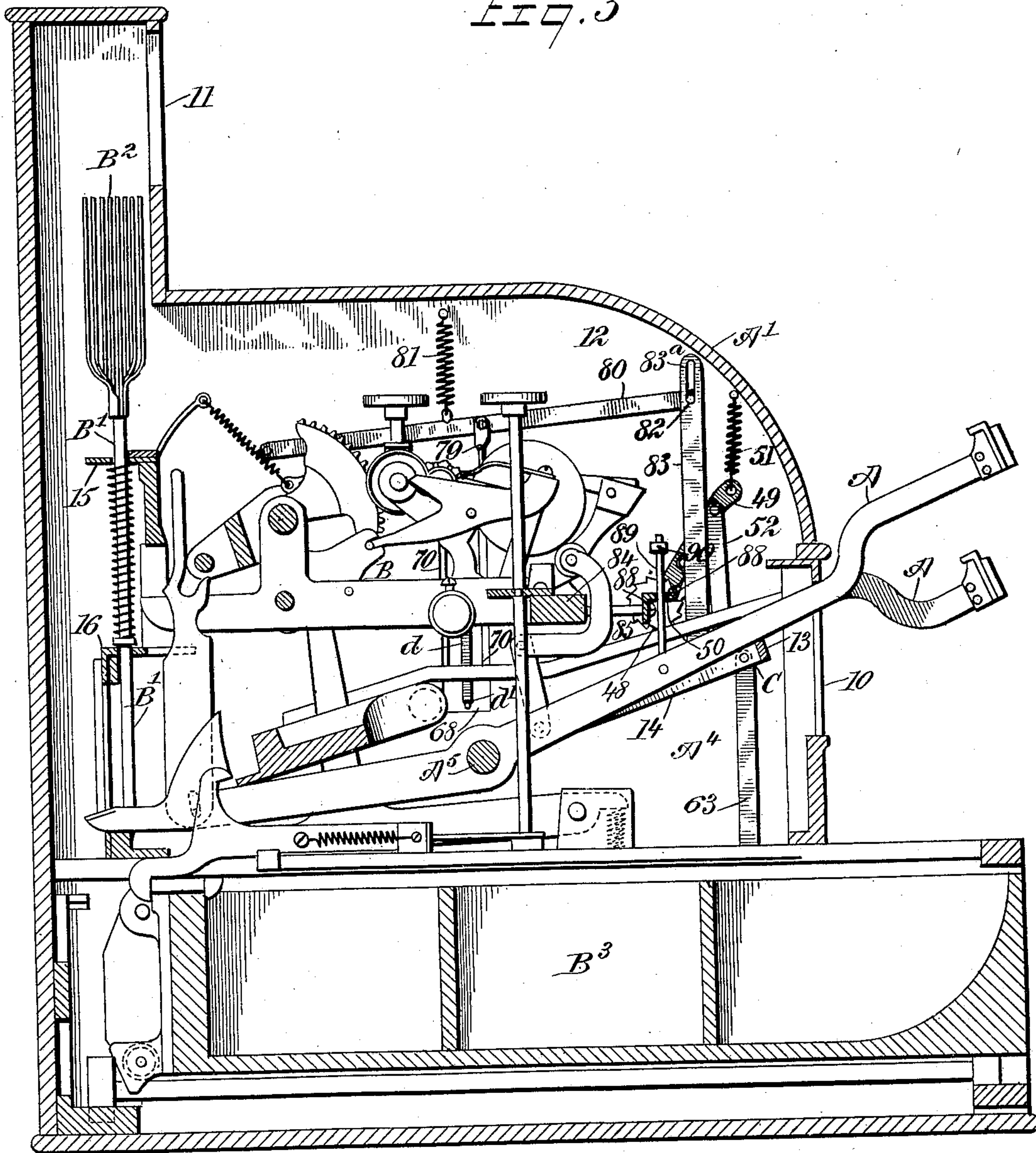
J. C. VAHJEN.
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NO MODEL.

5 SHEETS—SHEET 3.

Fig. 3



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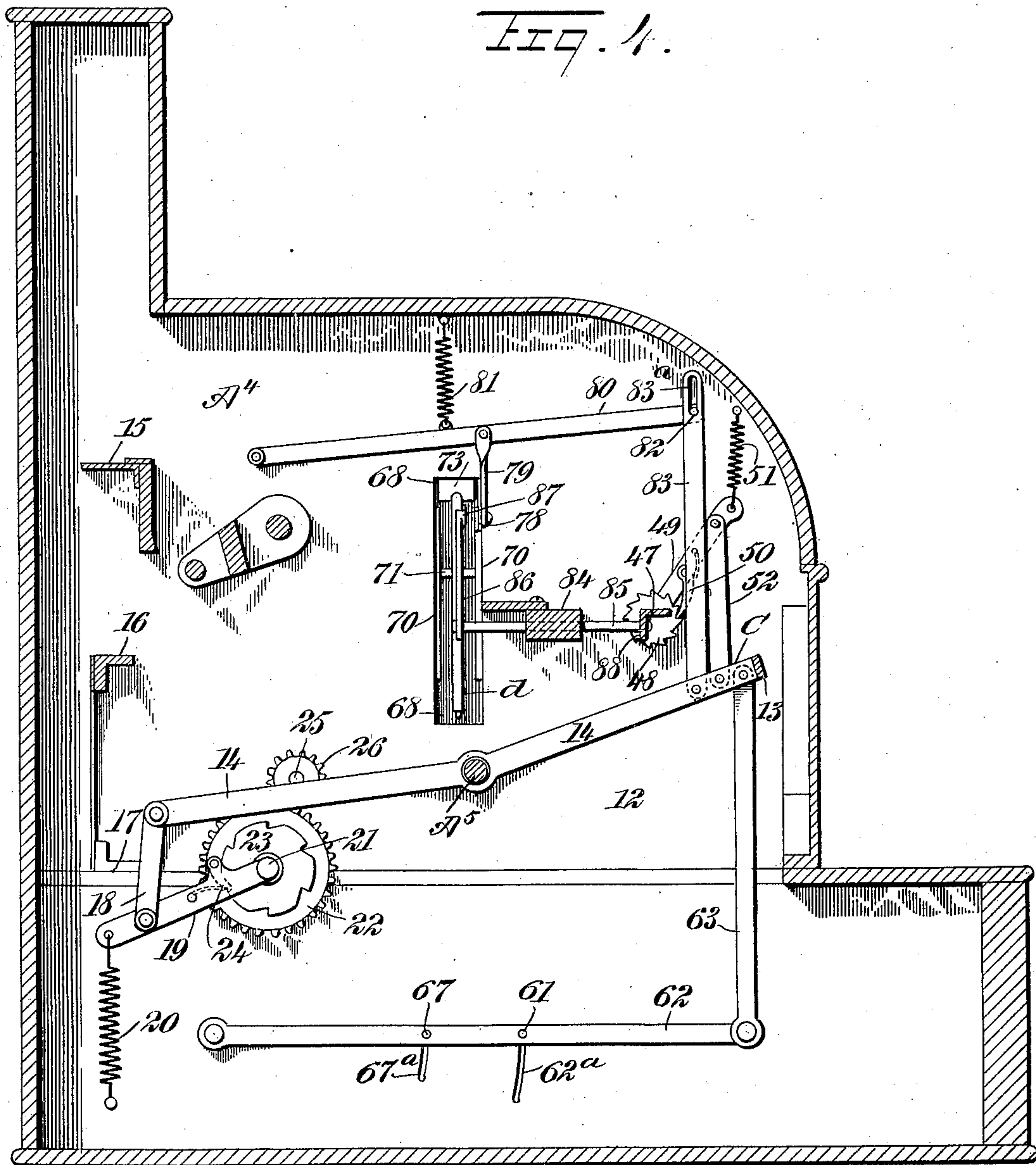
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NO MODEL.

5 SHEETS—SHEET 4.



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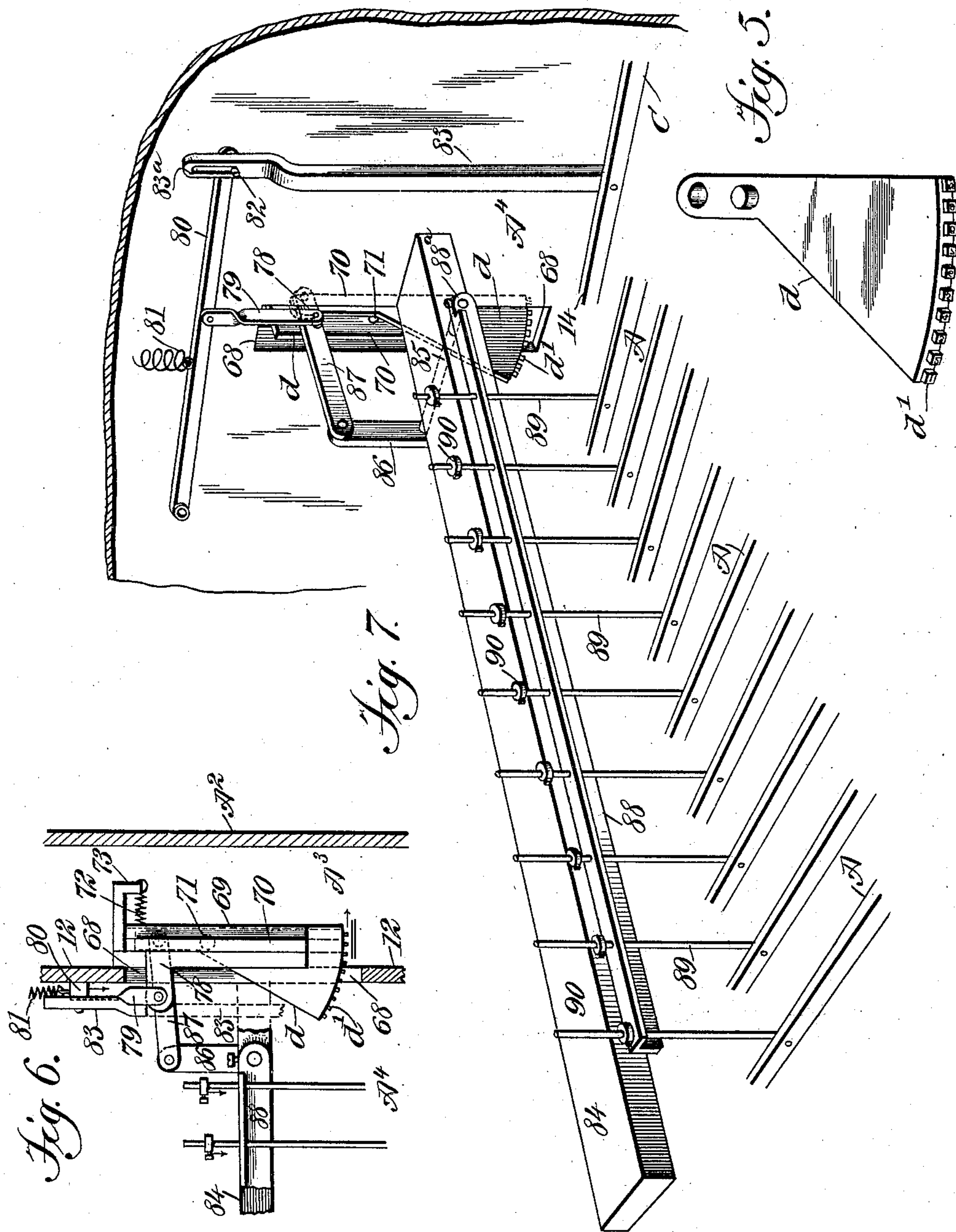
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J. C. VAHJEN.
CASH REGISTER.

APPLICATION FILED APR. 28, 1903.

NO MODEL.

5 SHEETS—SHEET 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHANN C. VAHJEN, OF NEW YORK, N. Y., ASSIGNOR TO JOHN H. VAHJEN,
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CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 756,083, dated March 29, 1904.

Application filed April 28, 1903. Serial No. 154,641. (No model.)

To all whom it may concern:

Be it known that I, JOHANN C. VAHJEN, a subject of the German Emperor, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Cash-Register, of which the following is a full, clear, and exact description.

My invention relates to a printing mechanism for cash-registers operated by key-levers, which mechanism is particularly designed to print in duplicate and when desired to operate in conjunction with a knife adapted to cut one of the printing tapes or ribbons into checks for delivery from the machine, while the other printed tape or ribbon remains concealed in the machine.

The purpose of the invention is to provide a simple construction of printing attachment applicable to any key-lever-operated machine, but it has been shown and described in connection with a special construction of cash-register, the subject-matter of an application filed by me February 5, 1903, Serial No. 141,994, the subject-matter of the present application for patent relating particularly to the application of my improved printing attachment to that class of cash-registers known as the "National" cash-registers, and especially to the key-lever machine included in such class for which Letters Patent were granted to Thomas Carney January 22, 1895, No. 532,762. The especial purpose of this application is to demonstrate the practical application of the improved printing attachment to the National type of cash-register operated by key-levers.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a front sectional elevation of a cash-register to which the improvement is applied. Fig. 2 is a vertical section through an extension of the casing of the cash-register, showing the knife and the tapes or ribbons

upon which the impressions are made, the sections being taken practically on the line 2 2 of Fig. 1. Fig. 3 is a vertical section taken substantially on the line 3 3 of Fig. 1. Fig. 4 is a vertical section taken practically on the line 4 4 of Fig. 1. Fig. 5 is a perspective view of the printing or impression sector. Fig. 6 is a fragmentary sectional view of the printing mechanism and immediate connections; and Fig. 7 is a detail perspective view of the self-contained printing mechanism, illustrating its adaptation to the key-levers of a cash-registering machine.

While I have selected for demonstration the construction of cash-register illustrative of the National type as set forth to the patent to Carney, above mentioned, I desire it to be understood that my invention is not confined to such particular construction of machine operated by key-levers, as application can be made with equally good results to any machine of such type.

As the operation and construction of the machine adopted as an example has been illustrated and described in the Letters Patent granted therefor, I will specifically refer only to such parts as are necessary to the operation of the improved printing attachment, which attachment will be described in detail in due order.

Relative to the exemplar form of cash-register selected, A represents the key-levers, which extend out through suitable openings 10 at the front of the casing A', which key-levers are fulcrumed upon a fixed rod A⁵, extending from side to side of the casing, which levers, through suitable cooperating mechanism B, operate vertical rods B', carrying tablet-indicators B² to expose one at a suitable front opening 11 at the upper portion of the casing and to simultaneously drop a tablet which had been previously exposed and at each operating stroke to effect the release of a cash-drawer B³.

The casing A', as is customary with the majority of machines of the type under consideration, is provided at one end with an extension or annex A², forming thereby an auxiliary chamber A³, separated from the main cham-

ber A⁴ by a wall 12, and access may be gained to this auxiliary chamber A³ by a door or removable plate in the customary manner, which door or plate is, as usual, normally locked.

Below all of the key-levers A an actuating-frame C is located within the main or body chamber A⁴ of the machine. This actuating-frame C, as is shown in Figs. 1, 3, and 4, consists of a front bar 13, extending from side to side of the body-chamber, and side bars 14, which extend rearwardly from the ends of the front bar, being pivoted upon the fixed rod A⁵ at a point about centrally between their ends, as is best shown in Fig. 4, and the releasing device for the money-drawer may be connected with the side bars 14 of the actuating-frame C, or the mechanism for releasing the money-drawer may be that provided for in the machine to which the attachment is applied.

It may be here remarked that the tablet-carrying bars B' are shown guided in brackets 15 and 16 at the rear of the main chamber A⁴, as is shown in Figs. 3 and 4, and that the bottoms of the said bars in their normal position rest upon a support 17 at the bottom portion of the said main chamber; but this portion of the construction does not constitute a portion of the attachment sought to be protected.

A link 18 is attached to the rear end of the right-hand side member 14 of the actuating-frame C, as is shown in Fig. 4, and this link 18 is pivotally attached to an arm 19 near the rear extremity of said arm. A spring 20 is attached to the rear end of the arm 19 and to the right-hand side of the main or body chamber A⁴ of the casing.

The forward end of the arm 19 is pivoted upon a shaft 21, located within the body of the casing, as is also shown in Fig. 4. A gear-wheel 22 is mounted to turn loosely upon this shaft, and a ratchet-wheel 23 is secured to the inner face of the gear-wheel, operated upon by a downwardly-extending spring-controlled dog 24, which is pivoted to the aforesaid arm 19. This mechanism, through the downward movement of a key-lever A, which in turn operates the actuating-frame C, is adapted to operate a check-feed device, and to that end a shaft 25 is journaled in the right-hand wall of the main or body chamber A⁴ of the machine, extending into the annex or auxiliary chamber A³, as is shown in Figs. 2 and 4. A pinion 26 is secured to the shaft 25 within the body-chamber A⁴, meshing with the teeth of the gear-wheel 22, and within the annexed or auxiliary chamber A³ a feed-wheel 27 is secured to the said shaft 25, as is shown in Fig. 2, the driver of which wheel 27 is preferably roughened or serrated. A tape 28 passes over the feed-wheel 27, which tape is preferably of thick paper or pasteboard and is normally wound upon a reel 29, mounted to turn upon a short axle 30, located within the annexed or auxiliary chamber A³ near its

lower corner, if convenient, as is shown in Fig. 2. The tape 28 is held in engagement with the feed-wheel 27 by means of a pressure-roller 31 or its equivalent, and this roller 31 is carried by an arm 32, pivoted at one end to the partition 12, separating the two chambers A³ and A⁴, the roller being held in proper engagement with the said tape 28 by a spring 33, attached to the free end of the arm 32 and to any convenient stationary support. The tape 28 after passing over the feed roller or wheel 27 extends over and lies upon a horizontal table 34, extending in direction of the front and rear of the annexed or auxiliary chamber A³ from a point below the front outlet-slot 35 in said annexed chamber, as is shown in Fig. 2, and adapted for the discharge of the printed check 36. The tape is directed on this table by a guide-plate 37, located adjacent to the feed-roller 27, as is also shown in Fig. 2.

Two guide-pins 38 and 39 are located over the table 34 somewhat adjacent thereto, and these pins are in the same horizontal alignment and are a predetermined distance apart. The inking-ribbon 40 passes beneath these pins, and between said pins 38 and 39 the inking-ribbon is flat or horizontally straight. The inking-ribbon 40 is connected at one end with a suitably-supported spool 41 and at its opposite end with a corresponding spool 42, as is shown in Fig. 2, and any means may be employed for moving the ribbon from one spool to the other. A tape 43, preferably of lighter material than the other—tissue-paper, for example—is likewise made to pass under the said guide-pins 38 and 39 and above and in contact with the straight intermediate section of the inking-ribbon 40. The upper tape 43 is adapted for recording purposes and is to remain in the machine until purposely removed and receives an impression the duplicate of that provided upon the main or check tape 28 by means of a printing mechanism to be hereinafter described. One end of the record-tape 43 is attached to a spool 44, mounted to turn upon a suitable support 45 at the upper rear portion of the annexed chamber A³, and the opposite end of the said record-tape 43 is attached to a corresponding spool 46, mounted to turn with the shaft 47 at the front upper portion of the annexed chamber A³. The shaft 47 is the winding-shaft and extends through the partition 12 into the body-chamber A⁴ of the machine, as is shown in Fig. 4, and within this chamber a ratchet-wheel 48 is secured to the shaft 47.

An upwardly and forwardly extending arm 49 is loosely mounted on the shaft 47 adjacent to a ratchet-wheel 48, provided with a dog 50, engaging with and adapted to turn the ratchet-wheel 47, and consequently effect the winding of the spool 46. The upper forward end of the arm 49 is supported by a spring 51, attached thereto and to the fixed support at the right-hand side of the body of the casing, and

the said arm 49 is connected with the right-hand side member 14 of the actuating-frame C by a link 52. Thus when a key-lever A is forced downward the dog 50 acts upon the ratchet-wheel 48 to turn the winding-spool 46 in a direction to wind up the record-tape 43 thereon a sufficient distance to bring a fresh surface between the guide-pins 38 and 39 to receive the next impression. The record-tape 43 is operated at the downward movement of a key-lever, while the check-tape 28 is fed at the upward or return movement of the key-lever.

In connection with the check-tape 28 I employ a cutting mechanism D. As is best shown in Figs. 1 and 2, this cutting mechanism consists of a vertical cylinder 53 open at the top and closed at the bottom and supported by transverse bars 54 at the forward portion of the annexed or auxiliary chamber A³, and in the bottom portion of the said cylinder a spring 55 is located, as is particularly shown in Fig. 1.

A plunger-rod 56 is mounted to slide loosely in the cylinder 53, the lower end of which rod has bearing against the upper end of the spring 55, and at the upper end of the said rod 56 a cross-head 57 is secured. A knife 58 is attached either to the said cross-head or to a portion of the plunger-rod 56, to which the cross-head is attached. In the upper position of the said knife 58 it passes through a slot in the table 34 in order to separate a sufficient length of printed tape 28 from the mass of such tape to form a check 36, heretofore referred to; but this cutting operation of the knife does not take place until the section of the tape from which the check 36 is to be cut extends sufficiently beyond the front of the annexed section A² through the opening 35 therein, so that the said check may be readily grasped. A cross-bar 59 is located above an opening in the table 34, through which the knife passes, so that the knife will have a firm surface upon which to bear in its cutting operation.

A rod 60 is loosely mounted in the cross-head 57 of the cutting mechanism, as is shown in Fig. 1, and this rod is provided with a head at its upper end and extends downward parallel with the cylinder 53. Said rod is adapted to draw the knife downward away from the table at the downward stroke of the key-lever. This is accomplished by pivotally connecting the lower end of the said rod 60 by means of a screw 61 or otherwise to a lever 62, fulcrumed near the back of the machine to the partition-wall 12 between the two chambers, the lever 62 being located in the body-chamber of the machine, as is shown in Fig. 4. The said screw or pin 61, connecting the setting-rod and the lever 62, has sliding movement in a slot 62^a, made in the division-wall 12 of the two compartments of the machine.

The forward end of the lever 62 is connected

by a link 63 with the right-hand side member 14 of the actuating-frame C, preferably at a point near the front of the said frame. When the knife and carrying-rod 56 are brought downward by the said lever 62, the setting-rod 60 and connections between the lever and actuating-frame, which downward movement of the knife, as stated, is accomplished when the key-lever is depressed, the said knife is held temporarily in its downward position until the depressed key-lever is released and returns to its normal position. This temporary locking of the knife 58 and its carriage in a lower position is accomplished through the medium of an angle or elbow lever 64, pivoted at the junction of its members to the inner face of the right-hand wall of the body-chamber of the machine, as is shown in Fig. 2. The lower member of this lever is weighted, overbalancing its upper or vertical member, which latter member is provided with a head 65, extending rearwardly beyond the rear edge of the vertical member, and the upper rear face of the said head is more or less inclined. Thus when the knife-carriage is drawn downward the cross-head 57 by engagement with the head 65 of the locking-lever 64 will pass the said head until it reaches a position below it, whereupon the lower member of the said locking-lever will bring the upper member in such position that its head will extend over the top of the cross-head 57 of the knife-carriage.

In order to effect a release of the knife and bring about a severance of the check-tape 28 to produce a check, a trip-bar 66 is connected by a screw 67 or its equivalent with the aforesaid lever 62 and at a point preferably between the pivotal connection of the said lever with the safety-rod 60 and the pivot end of the lever, as is shown in Fig. 4. This pivotal screw or pin 67 has sliding movement in a slot 67^a, made in the partition-wall of the machine. Thus when the key-lever is raised and the actuating-frame C ascends the trip-bar 66 will engage with the free or rear end of the lower weighted member of the locking-lever 64 and will force said member upward, thus carrying the head 65 of the vertical member out of engagement with the cross-head 57 of the knife-carriage, at which time the spring 55 will act to force the knife 58 upward to cutting position. In review of this portion of the operation it may be here stated that when the key-lever is pressed down a tablet is exposed, as is customary, and as the key-lever is descending the winding-spool 46 for the recording-tape is turned to wind up said tape sufficiently to present another surface to receive an impression. In the continued downward movement of the key the knife is drawn down and locked. Upon the return or upward movement of the key-lever operated upon the gear 22 is revolved and the feed-roller 27 for the check-tape is set in motion to feed a printed check from the

machine and to bring a fresh surface of the said tape 28 in position to be printed upon. At or about the same time and on the upward movement of the key-lever the knife is released from its locking device and a check 36 is cut from the tape 28 and may be readily drawn out from the machine, as is indicated in Fig. 2.

With reference to the mechanism for producing an impression upon a single tape or simultaneously upon two independent tapes in order to apply the same a vertical opening 68 is made above the table 34 about centrally between the guides 38 and 39, and upon the partition-wall 12 between the two compartments of the machine in the auxiliary or annexed chamber A³ slideways 69 are located at the side edges of the said opening 68. Sliding plates 70 have vertical movement in each of the slideways 69, and a printing segment or sector *d* is pivoted upon the said slides or sliding plates 70 on a pin 71, connecting said slides, the wider portion of the sector being its bottom portion.

At the bottom edge of the printing-sector *d*, as is shown in Figs. 5 and 7, type *d'* are produced or secured, the said type reading, for example, from "1" to "0," the type designating "1" being at the lower end of the sector, which is within the body-chamber A⁴, as is shown in Fig. 6. The type designating "0" will then be at the opposite edge of the sector, or at that edge which is within the annexed or auxiliary chamber A³. The type correspond in number to the number of levers, the type designating "0" being that which corresponds to the key-lever operated to indicate "No sale." This printing-sector *d* is held about centrally of its lower portion in the aforesaid opening 68 in the partition-wall of the machine, as is also shown in Fig. 6, by a spring 72, attached to the outer upper edge of the sector and to the downwardly-extending bracket 73, projected from the upper central portion of the guideways 69, and such position of the sector is its normal position.

An opening is made in the table 34, over which the inking-ribbon extends at a point centrally between the guide-pins 38 and 39, and just below said opening two slideways 74 are attached to the partition-wall between the chambers of the machine within the annexed or auxiliary chamber, as is shown in Fig. 2. A plate 75 has vertical movement in the slideways 74, and the bottom of the plate is extended horizontally to project beyond the bottom portions of the slideways, and so limit the upward movement of the said plate 75, which is normally held in an upper position by springs 76, attached to its lower extension members and to the partition-wall of the machine somewhat adjacent to the table 34. At the upper end of the sliding plate 75 an anvil-head 77 is formed, adapted to slide freely in the aforesaid opening in the table 34. This anvil-head has limited downward movement.

As each key is pressed the printing-sector is rocked upon its pivot sufficiently to bring the proper type-number over the tapes 28 and 43, and on the further downward movement of the key the printing-sector is carried downward, so as to produce an impression, the platen being the anvil head or block 77, which will yield to a slight extent in a downward direction. After the tape has received the impression and the printing-sector has returned to its upper normal position through the movement of the slides 70 the anvil head or block 77 will assume its normal position, due to the action of the springs 76. (Shown in Fig. 2.)

An ear 78 (shown in Figs. 4 and 6) extends within the body-chamber of the machine from one of the slides 70 at a point at or near its upper end, and a link 79 is pivotally attached to this gear 78, which link in its turn is pivotally connected to a lever-arm 80, pivoted at one end near the rear of the body-chamber of the machine to the partition-wall 12, which divides the chambers of the casing. A link 79 is pivoted about centrally to the lever-arm 80, and a spring 81, attached to the upper portion of the machine and to the said lever-arm 80, serves to hold the lever-arm in the normal position. At the forward end of the lever-arm 80 a pin 82 is secured, and this pin enters a slot 83^a in the upper end of a link 83, which link in its turn is pivotally attached to the right-hand side member 14 of the operating-frame C.

A cross-bar 84 extends from the partition-wall of the machine to the opposite wall of the body-chamber and at a point above the actuating or operating frame C, and at the right-hand end of this cross-bar 84 a short shaft 85 is pivoted. This shaft at its rear end is secured to an upwardly-extending link 86, and this link is pivotally attached to a second upper horizontal link 87, which in its turn is also pivotally connected with the upper end of the printing-sector *d*.

A key-bar 88 extends normally parallel with the front portion of the cross-bar 84 and practically flush with the upper surface of the said cross-bar, and a rod 89 is connected with each key-lever A. These rods 89 pass through suitable openings in the key-bar 88, which key-bar at its right-hand end is pivotally attached to the cross-bar 84, as is shown at 88^a in Fig. 7. It will be observed that this key-bar 88 is held in its upper or normal position by reason of its connection with the printing-sector *d* and by reason of the tension of the spring 72 at the upper portion of said sector. Each rod 89 extending over a key-lever is provided above the key-bar with a collar 90, adjustably attached thereto, and the collar on the rod connected with the key-lever marked "1" is close to the upper surface of the said key-bar, while the collars on the rods of the other key-levers are graduated in distance from the said key-bar, so that the key-lever 1,

for example, imparts the greatest throw to the key-bar, while the right-hand lever, designated as "0" and "No sale," has the shortest throw. In this manner the movement of the sector d is controlled, and the proper type is brought into position to make an impression on the tapes.

In operation when a key-lever is pressed down for a portion of its downward travel the collar 90 on the rod connected with that lever will have engaged with the key-bar 88 and will have carried that key-bar down a sufficient distance to have rocked the printing-sector d sufficiently to bring the desired type near the position for impression. On the further downward movement of the key-lever the sector will have moved so that the desired type will be in exact position for impression, and about such time the pin 82 on the lever 80 will have reached the upper end of the slide 83^a in the link 83, and the link 83, drawn down by the actuating-frame pressed upon by the key-lever, will draw the lever-arm 80 downward, and thus through the link connection 79 with the slides 70 will force the said slides downward and they will carry with them the sector d and produce the desired impression. When the key-lever is released, the parts above described automatically return to their normal position.

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

1. A self-contained printing attachment to cash-registers, consisting of a key-operated bar adapted to be pivoted to a support, a slide adjacent to the pivoted end of the bar, independent of the support for the bar and arranged to operate with transverse relation thereto; an oscillating printing-sector mounted in the slide, a rocking connection between the key-operated bar and sector, and key-operated means for raising and lowering the slide.

2. A self-contained printing attachment to cash-registers, consisting of a key-operated bar adapted to be pivoted to a support, a slide operating at an angle to the pivotal end of the bar and independent of the bar and its support, an oscillating printing-sector mounted in the slide, a rocking connection between the upper portion of the sector and pivot portion of the bar, and key-operated means for raising and lowering the slide, having timed action with relation to the means employed for rocking the sector, as described.

3. A self-contained printing attachment to cash-registers, consisting of a key-operated bar adapted to be pivoted to a support at one end and provided with rods loosely passed therethrough and adapted for connection with the key-levers of the machine, stops limiting the downward movement of the rods and acting upon the said key-operated bar, a slide, an oscillating printing-sector pivoted in the slide, a rocking connection between the key-oper-

ated bar and the printing-sector, and an attachment to the slide for raising and lowering the same and carrying the printing-sector to and from an impression position, the rocking action of the sector being timed with reference to the end movement of the sector to print, as described.

4. A self-contained printing attachment to cash-registers, consisting of a key-operated bar adapted to be pivoted to a support at one end and provided with rods loosely passed therethrough and adapted for connection with the key-levers of the machine, stops limiting the downward movement of the rods and adapted to engage with the said key-operated bar, a slide, an oscillating printing-sector pivoted in the slide, a rocking connection between the key-operated bar and the printing-sector, an attachment to the slide for raising and lowering the same and carrying the printing-sector to and from the impression position, which attachment includes a spring-controlled lever having link connection with the slide, and an operating-bar adapted to be operated upon by the key-lever of the machine, having sliding pivotal connection with the spring-controlled lever, as specified.

5. In a cash-register, a series of key-levers, a pivoted frame operated by the manipulation of each key-lever, which frame extends beneath the key-levers, a slide mounted upon the casing of the machine, a key-operated bar in graduated connection with the key-levers, which connection consists of rods pivoted to the key-levers, passing loosely through the bar and adjustable stops on the rods above the bar, a sector, having type at its wider end, mounted to rock in the said slide, and means controlled by the key-levers, for raising and lowering the said slide and for rocking the sector, as described.

6. In a cash-register, a series of key-levers, a pivoted frame operated by the manipulation of each key-lever, a slide mounted upon the casing of the machine, a key-operated bar in graduated connection with the key-levers, a sector having type at its wider end mounted to rock in the said slide, a spring-controlled lever, a link connection between the said lever and the said slide, and a bar connected with the said pivoted frame, and slotted to receive a pin extending from the said spring-controlled lever, all arranged for operation as described.

7. A self-contained printing attachment to cash-registers, consisting of a pivoted frame adapted to be located beneath the key-levers of the machine and to be operated by the manipulation of each key-lever, a slide mounted upon the casing of the machine, a key-operated bar pivoted at one end, which key-operated bar is in graduated connection with each of the key-levers, said connection consisting of rods pivotally attached to the key-levers and passed loosely through the key-operated

bar, and graduated stops adjustably located at the upper ends of the rods above the said key-operated bar, a sector having type at its wider end, mounted to rock in the said slide, a rock-
5 ing connection between the said sector at its upper portion and the key-operated bar, link and lever connections between the said pivoted frame and the said slide, a table located below the sector, an inking-ribbon extending
10 above the said table, guides for the inking-ribbon located one at each side of the sector, supports for the ribbon, tapes passed above

and below the said inking-ribbon, roller-supports for both ends of one of the said tapes, a reel-support for one end of the other tape, and 15 a cutting mechanism for the tape supported at one end only, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHANN C. VAHJEN.

Witnesses:

J. FRED. ACKER,

EVERARD BOLTON MARSHALL.