

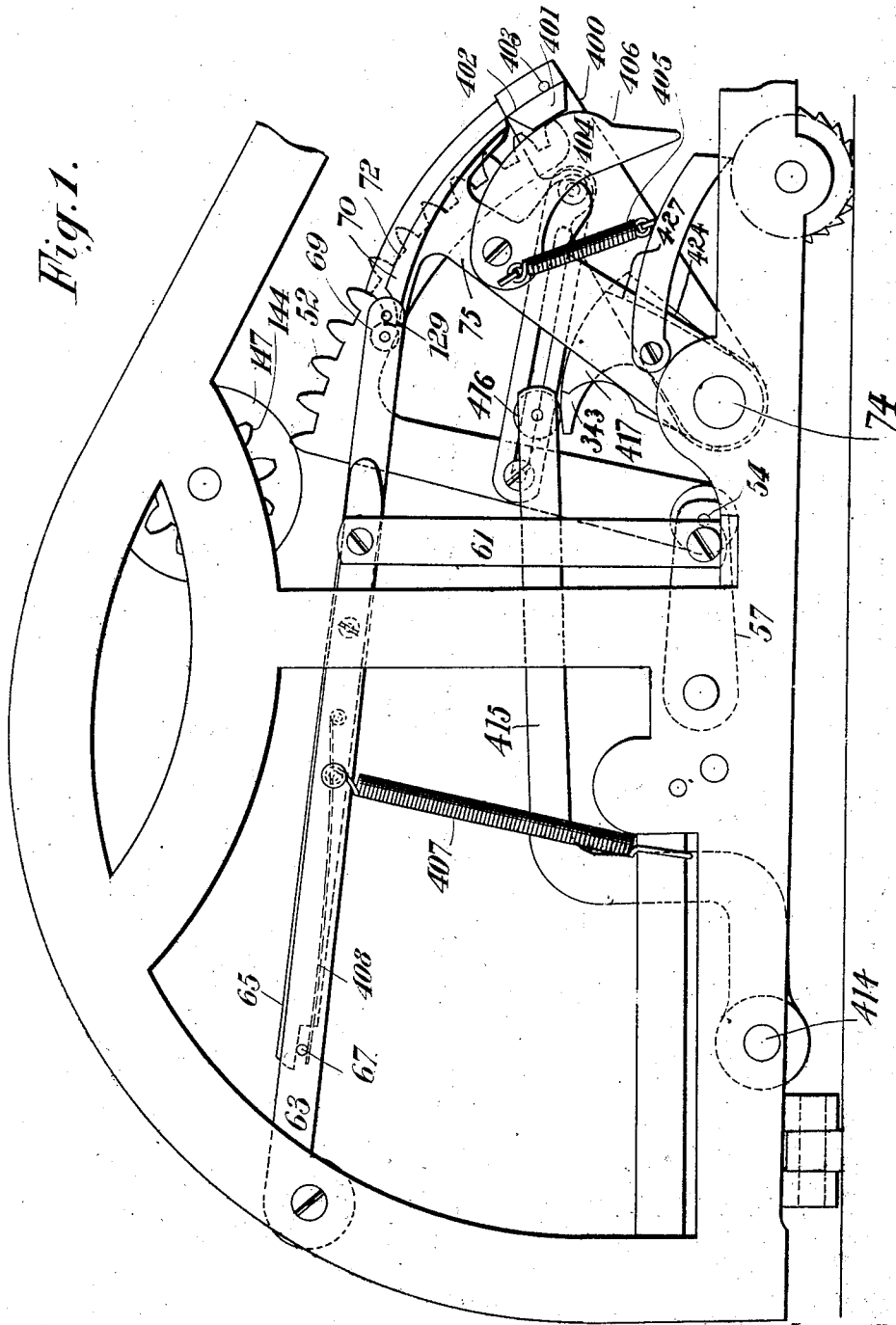
1,059,522.

A. BORDT.
ADDING MACHINE.
APPLICATION FILED SEPT. 12, 1910.

Patented Apr. 22, 1913.

8 SHEETS—SHEET 1.

Fig. 1.



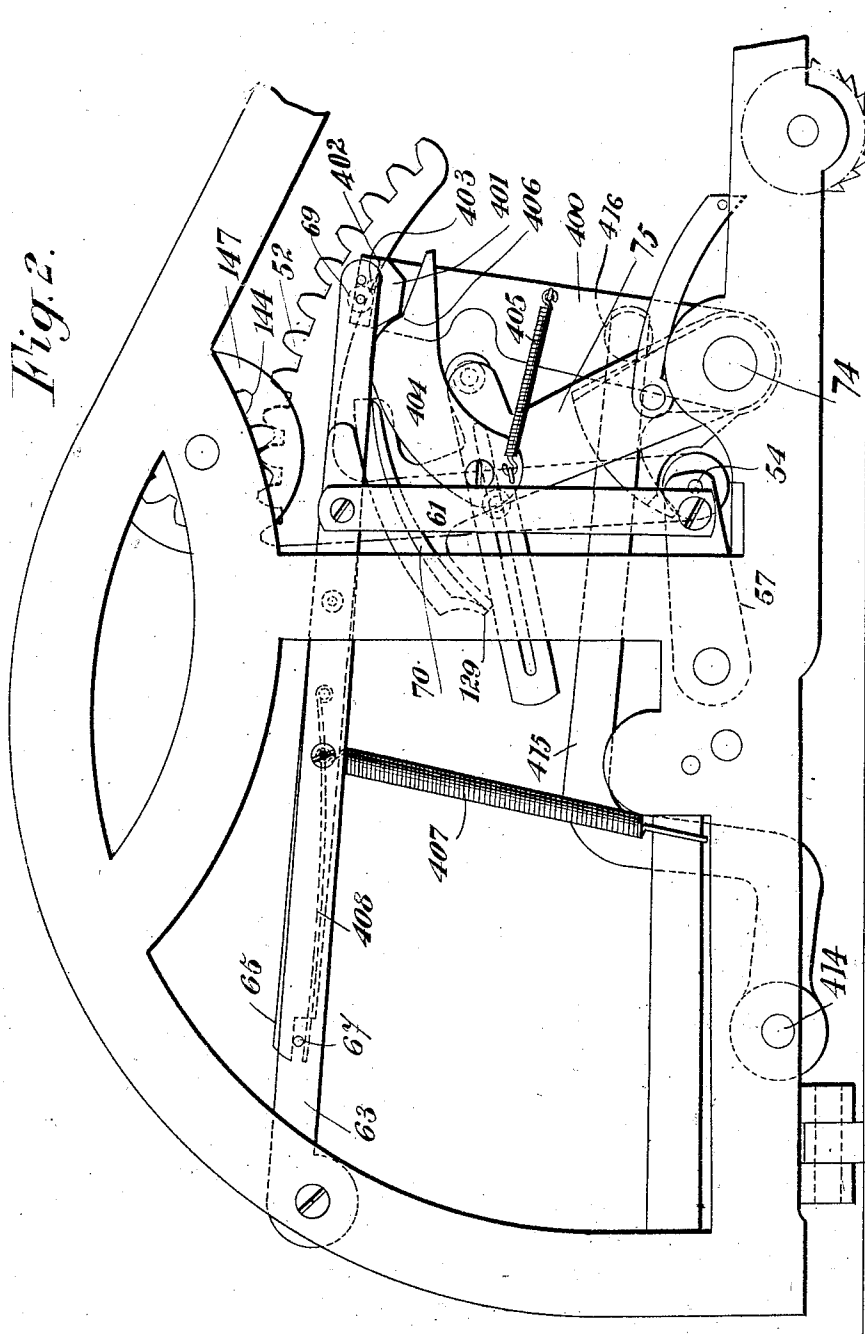
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APPLICATION FILED SEPT. 12, 1910.

Patented Apr. 22, 1913.

8 SHEETS—SHEET 2.



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APPLICATION FILED SEPT. 12, 1910.

Patented Apr. 22, 1913.

8 SHEETS—SHEET 3.

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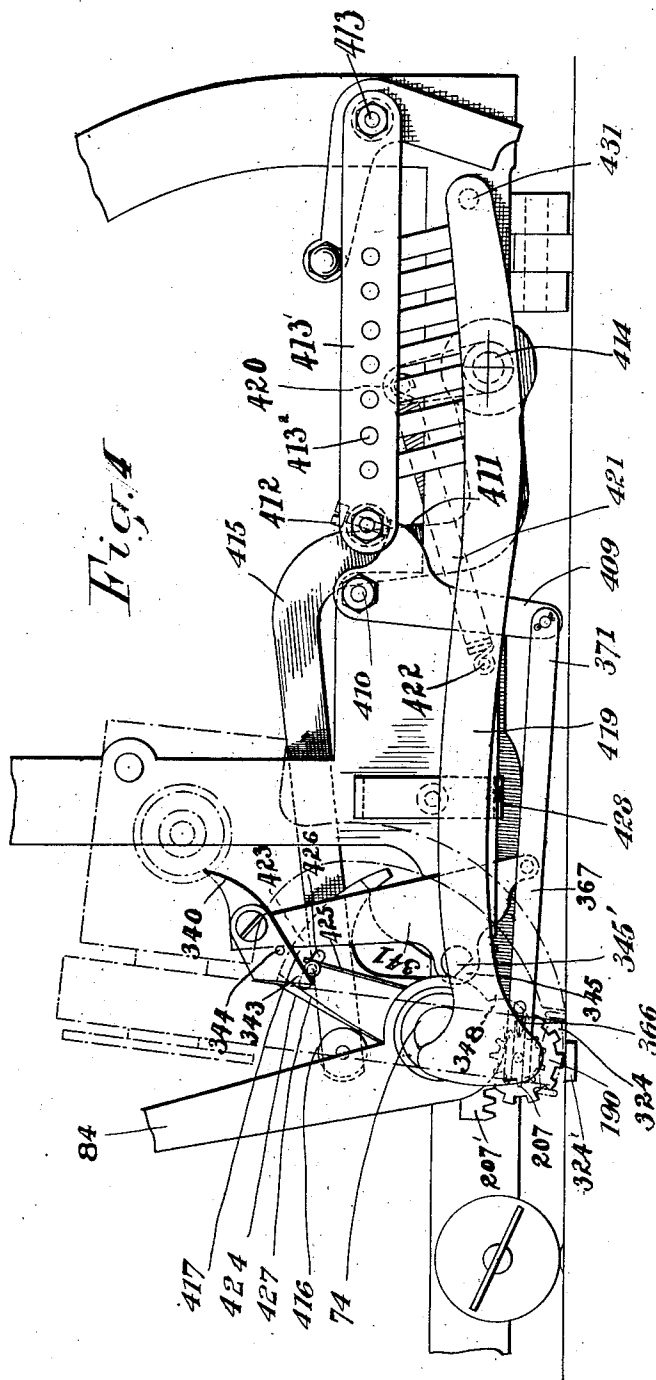
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8 SHEETS—SHEET 4.



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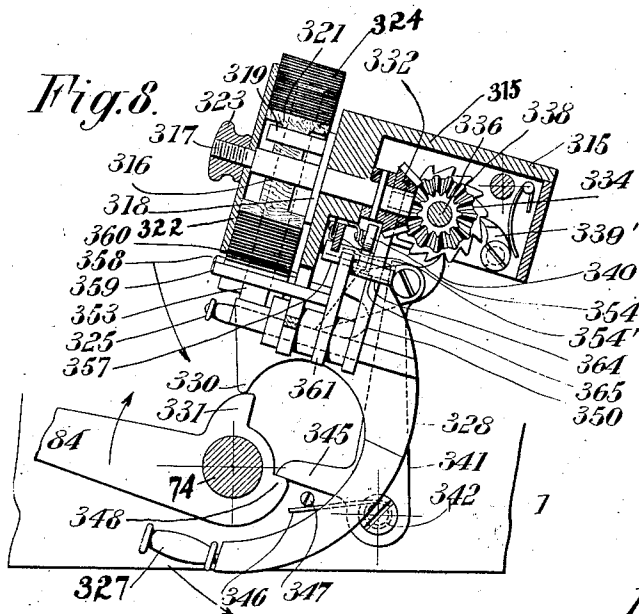
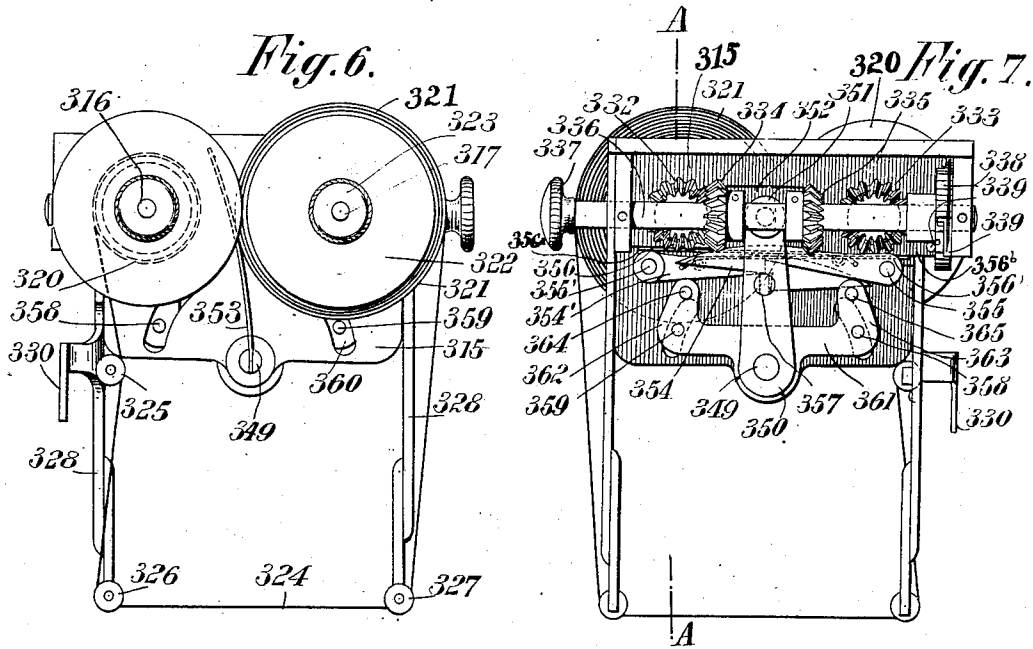
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Patented Apr. 22, 1913.

8 SHEETS—SHEET 6.



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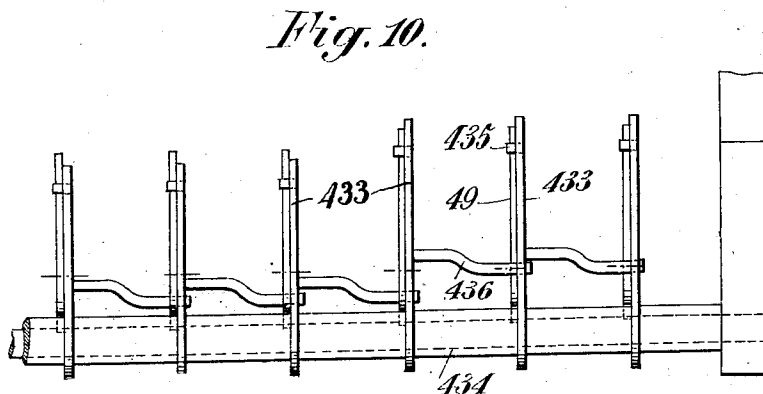
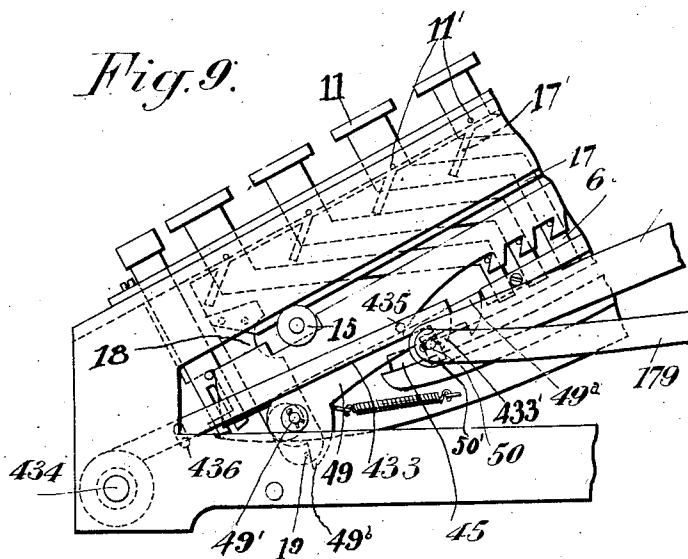
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 8 SHEETS—SHEET 7.



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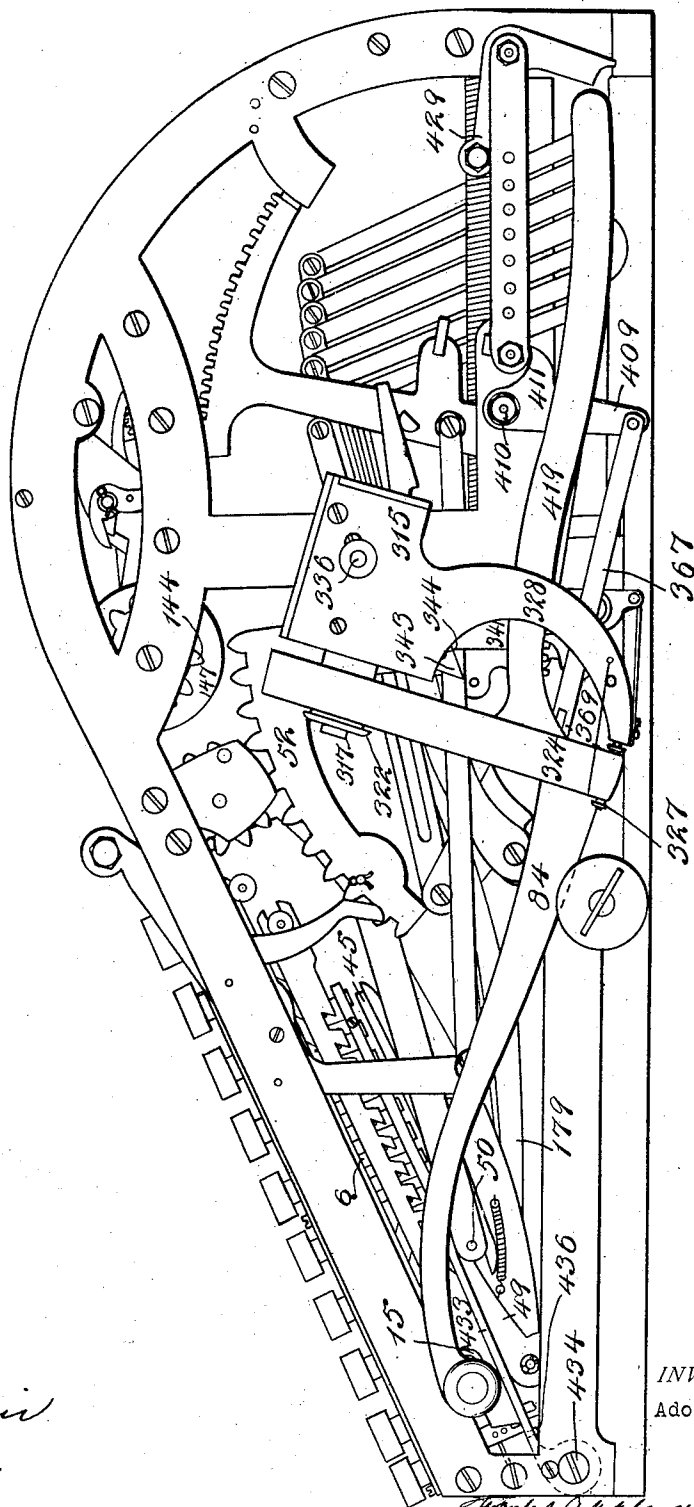
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APPLICATION FILED SEPT. 12, 1910.

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8 SHEETS—SHEET 8.



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UNITED STATES PATENT OFFICE.

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ADDING-MACHINE.

1,059,522.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed September 12, 1910. Serial No. 581,588.

To all whom it may concern:

Be it known that I, ADOLF BORDT, a subject of the German Emperor, and resident of Mannheim, Germany, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification.

This invention relates to improvements made in adding machines and has for its several objects, first, to increase the reliability of operation of the adding machine by moving the show disks in a positive manner, second, to produce in an absolutely certain manner, the disengagement of the show disks; third, to improve the printing of the characters by replacing the usual inking pad with an inking ribbon, fourth, to obtain a regular and uniform printing of the characters by the application of an invariable force, whereby the printing types are applied against the material being printed upon; fifth, to provide means whereby the operator may easily throw the printing mechanism out of operative relation with the adding mechanism; and sixth, to replace the usual zero hiding mechanism with a mechanism for preventing the printing of the zeros.

One of the improvements, which forms the subject matter of this invention comprises a lever mechanism which assures the engagement of the toothed wheels, of the show disks, with the corresponding actuating sector, up to the end of the rearward stroke of the actuating lever, and only allows the disengagement, of the aforesaid teeth, when the actuating lever has already begun its forward stroke; that is to say, after the complete stop of the mechanism and the complete abolition of any motion which might have been imparted to the moving members. In known machines of this character, the force imparted by the operator, to the actuating lever, being essentially variable, the printed member was either too dark or too light. One of the devices, described hereinafter, remedies the foregoing defect, by causing the printing operation to be accomplished by a constant force which is imparted, after being stored up, by a simple motion of the actuating lever.

The accompanying drawings given, by way of example, show one form of embodiment of the improved construction of the adding machine herein described.

In these drawings:—Figure 1 shows a fragmental, left side, elevation view, embodying the engaging mechanism at rest, Fig. 2 is a similar view of the members shown in Fig. 1, but here shown in the position which they occupy when the actuating lever is at the end of its backward stroke, Fig. 3 is a side elevation view of the printing mechanism and of the ribbon inking device, at rest, Fig. 4 is a similar view of the mechanism shown in Fig. 3, the members of which are shown in their printing position, Fig. 5 is a top plan view of the mechanism shown in Fig. 3, Fig. 6 is a front elevation view of the ribbon inking device, Fig. 7 is a rear view of the ribbon inking device, the guard plate being removed, Fig. 8 is a vertical sectional view on the line A—A of Fig. 7, Fig. 9 is a fragmental side elevation view embodying the device for preventing the printing of the zeros; Fig. 10 is a front elevation view of the mechanism shown in Fig. 9, and Fig. 11 is a right side elevation view of the complete adding machine.

As described in my patent application #485,592, dated March 25, 1909, the engagement of the toothed wheel 144 with the toothed sectors 52, at the beginning of the rearward stroke of the actuating lever, is obtained by raising the mechanism comprising the elements 63, 61, 57, etc., which carries the shaft 54, which constitutes the oscillatory axis of the toothed sectors 52. This raising motion is accomplished by means of the segment 70, the rear end (129) of which is inclined, and constitutes a cam, which raises the roller 69, which is journaled to the lever 65; the latter being carried by the arm 63. The rotation of the show disks is obtained by means of the segmental rack 52, which in its rearward movement, engages the toothed wheel 144; the latter being in fixed relation to the show disks and rotatable therewith. In its rearward stroke, the cam 129 is forced under the roller 69, and thereby raises the forward ends of the levers 63 and 65 and the members 61, 54 and 52. The said engagement, between the toothed wheels 144 and the sectors 52, is maintained, in the machine described in the said patent application, so long as the roller 69 is supported by the upper surface 72 of the segment 70; the said engagement ceases as soon as the said roller has arrived at the front end of

the surface 72, at which moment the weight of the mechanism 63, 61, 57, 56, 54 and 52, together with the action of the spring 407, causes the said mechanism to descend, thereby producing the separation of the said toothed parts. For maintaining the said forward stroke of the actuating lever 84 has begun, a second arm 400 is mounted freely on the shaft 74. This arm 400 has been provided with a lateral projection or lug 401 and with the upper, forward surface 402, which constitutes a continuation of the track 72 for the roller 69. A pin 403, which extends laterally from the lever 400, serves as an abutment for the roller 69. A pawl 404 is mounted for oscillation on the arm 75 and is subjected to the action of a spring 405, which is connected therewith and with the arm 400. The said spring 405 has a constant tendency to apply the pawl 404 against the lower surface of the projection 401 in such a manner that, when during the operation, the arm 75 moves back from the arm 400, a shoulder 406 engages one of the lower edges of the said projection 401.

In the adding machine described in my prior application No. 485,592, the disengagement of the teeth of the toothed sectors 52, from those of the toothed wheels 144, is dependent entirely upon the weight of the movable members thereof, for lowering the said members. In the present form of embodiment, I provide means for effecting the downward movement of the said members, by subjecting them to the action of a spring 407, connected to the main frame of the machine and to the arm 63.

The members which have just been described are normally in the position shown by Fig. 1, that is, in the position of rest. When it is desired to make an addition, and to this end, the predetermined key has been depressed, and the operator begins to move the actuating lever backward, the roller 69 is raised by means of the incline or cam surface 129, thus bringing the sectors 52 into engagement with the toothed wheel 144, and said roller rolls along the surfaces 70 and 402 until the said roller contacts the pin 403. Since, at this moment, the actuating lever 84 has not yet reached the end of its rearward stroke, and the arm 75 continues moving rearward while the arm 400 is held stationary by the roller 69. While continuing its rearward motion, the arm 75 puts the spring under tension and causes the shoulder 406 to engage the projection 401. When this engagement has been effected, the lever 84 is at the end of its rearward stroke, and the sectors 52 and wheels 144 are still meshing together.

During the short moment of rest, existing between the backward and forward motions of the lever 84, the wheels 144 lose their

momentum, which had been imparted thereto, thereby avoiding liability of making an error in exposing the number on the show disks. The parts of the mechanism described, having been brought into position shown by Fig. 2, if the actuating lever 84 is now brought forward, the arm 75 pushes the arm 400 backward by means of the pawl 402; thereby causing the surface 404 to move away under the roller 69. At the moment when the latter leaves its bearing point on the said surface 402, it is pulled downward by the weight of the engaging mechanism and by the force of the spring 407. The said roller 69, in its descending motion, passes down through the space, existing at this moment, between the projection 401 and the segment 70, and contacts the top of the pawl 404, carrying the latter downward and thus disengaging it from the said projection 401. Thus, the segment 70 is forced against the said projection 401, by means of the spring 405, which brings the arm 400 back into its position to rest. During the foregoing movement, the pawl 404 has moved under the projection 401, and the roller 69 has rolled along against the lower surface of the segment 70, which constitutes an arc of a circle eccentric to the upper arcuate surface of the segment 70, and thereby forces the said roller downward, and when it has passed beyond the said segment 70, at its forward end, the roller automatically assumes a position opposite the incline 129. This result is accomplished by means of a spring 408, secured to the lever 65, and bearing on the pin 67, which is integral with the arm 63.

The ribbon indicating mechanism, of the printing device, shown in Figs. 6 to 8 of the drawings, is formed of a box-shaped housing 315, in the front wall of which two shafts 316 and 317 are journaled and project outwardly and inwardly from the said front wall. Each shaft carries a disk 318 on its outwardly projecting part, and each said disk carries a pin 319. On the outer parts of these shafts are seated the ribbon bobbins or spools 320 and 321, the wooden hubs of which are provided with eccentric apertures which receive the pins 319, whereby the bobbins are held against rotation of the shafts. The ribbon bobbins are secured on the shafts 316 and 317 by means of disks 322 which are held on the screw threaded outer ends of the shafts by means of milled nuts 323. The inking ribbon 324 unwinds from one bobbin, for instance from the left hand bobbin, passes over a roller 325, descends thence over a roller 326, passes horizontally to the roller 327 and thence upward to the other bobbin. The rollers 326 and 327 are carried by arms 328 depending from the housing of the inking device. This inking device is pivotally supported above the printing

disks 190 by a pin 329, secured in the main frame 1 of the adding machine. This pin, which forms the axis of oscillation of the inking device, is positioned at the rear of the center of gravity of the latter, and therefore has a constant tendency to apply the depending beak 330 against a cam 331, provided on the hub of the actuating lever 84. The cam 331 is arranged in such relation to the beak 330 that it allows the entire framework to oscillate downwardly, as the lever 6 nears the end of the rearward stroke, so as to lower the horizontal portion of the inking ribbon, under the printing disks 190, a moment before the latter are lowered into printing contact. During the following forward stroke of the lever 6, the beak 330 moves upon the cam 331, raises the framework of the printing mechanism and causes the inking ribbon 324 to advance, so that its lower horizontal part separates from the character which has just been printed.

The inking mechanism comprises an automatic actuating device for the ribbon, (which may also be actuated by hand), and an automatic reversing disk for same, (which may also be actuated by hand). These devices are constructed in the following manner: The inner projecting parts, of the shafts 316, 317 of the ribbon bobbins, each carry a bevel gear wheel 332 and 333 respectively, which are adapted to mesh with the corresponding gear wheels 334 and 335 respectively, keyed on a shaft 336, which is rotatably seated in bearings; the latter being provided in the lateral walls of the housing 315. This shaft may be shifted in its longitudinal direction so as to alternately cause engagement of the bevel wheels 333 and 335, and of the bevel wheels 332 and 334. The rotation of the shaft 336 may be obtained either by hand (by means of the milled nut 337, which it carries at its outer end), or by a ratchet wheel 338, mounted on the shaft 336, so as to provide for the longitudinal shifting of the shaft through the hub of the ratchet wheel, which is secured against rotation on the shaft by any proper means. Lateral motion of said ratchet wheel 338, relative to the housing, is prevented by its contact with a wall of the housing 315 and by contact with a pin 339, in the front wall of the housing 315. The ratchet wheel 338, the backward rotation of which is prevented by a pawl 339', is actuated by a pawl 340, carried by the upper end of an arm 341, which is adapted to oscillate on a pivot 342 of the main frame. The pawl 340 is provided with a counter-weight 343, carrying a pin 344 which is normally applied against the arm 341. The latter carries, near its pivot a lateral arm 345, provided with a head 345', which has a tendency to constantly press said head against the periphery of the hub of the actuating

lever 84, because of the cooperative relation of the flat spring 346 with the stud 347 which is secured in the frame 1. This stud constitutes an abutment for the spring which is secured to the pivot 342. The head 345' is engaged, toward the completion of the forward stroke of the actuating lever 84, by a shoulder 348, provided on the head of the lever 84, so as to raise the frame 345 and to thereby cause the arm 341 to oscillate. The pawl 340 causes the ratchet wheel 338 to advance one tooth each time the lever 84 makes a full stroke. During the following backward stroke of the lever 84, the arm 341 oscillates forward, under the action of the spring 346, and causes the pawl 340 to slide over the succeeding tooth of the ratchet wheel 338.

The reversing gear of the ribbon is constructed in the following manner:—Mounted in the lower part of the front wheel of the housing 315, is a shaft 349, which is parallel to the shafts 316 and 317, and carries an arm 350, the latter being provided at its upper end with a roller 351, having its periphery in contact with the hubs of the two bevel wheels 334 and 335. The front end of the shaft 349 carries a flat spring 353 which extends upward between the two ribbon winding bobbins. This spring bears on the ribbon, which is being wound on the bobbin, and exerts a tension thereon in proportion to the quantity of ribbon on the bobbin. As this quantity of ribbon increases, the spring finally acquires sufficient force to accomplish the shifting of the shaft 336, through the medium of the shaft 349 and the arm 350, thereby throwing the gearing of the wound bobbin out of mesh and causing the gearing of the unwound bobbin to mesh and thereby changing the direction of the rotation of the bobbins. The flat spring 353, at the same time, assumes a position in contact with the ribbon on the opposite bobbin. In order to produce the said shifting, at a predetermined and proper moment and in a positive and sudden manner, a special disengaging device is provided which comprises, for each of the ribbon winding bobbins, a latch 354 and 354' respectively, which oscillate on shafts 355 and 355', secured in the front wall of the housing 315. The flat springs 356 and 356', secured to the latches and bearing against abutments 356 and 356' respectively, have a constant tendency to push the latches into engagement with a pin 357, secured in the front surface of the lever 350, so as to project under the two latches 354 and 354'. Mounted on the shaft 349, and adapted to oscillate freely thereon, between the arm 350 and the front wall of the housing, is a balance beam 361, carrying two pins 358 and 359, each passing through a slot 360, provided in the front wall of the hous-

ing 315. The pins 358 and 359 project beyond the front surface of the housing, under the ribbon bobbins, so as to be engaged by the ribbon bobbin which is being wound up, and to be pushed downward by the ribbon when the bobbin has become nearly filled. The beam 361 also carries, on each of its arms, an upward extension 362 and 363 respectively, each being provided with a pin 364, and 363 respectively, adapted to engage corresponding latches 354 and 354'.

In the position shown by Fig. 7, the arm 350 is held in the left position by the latch 354', while the spring 353 having been pushed toward the right side by its contact with the ribbon being wound upon the bobbin 321, is exerting a tension which resists the engagement of said latch 354'. The increasing quantity of ribbon on the bobbin 321 produces the progressive descent of the pin 359, and simultaneously causes the pin 365 to be raised. At a determined moment, that is when the bobbin 321 is filled, the pin 365, having risen sufficiently, causes the disengagement of the latch 354' from the pin 357; thus freeing the lever which is thrown toward the right by means of the spring 353. This lever 350 carries with it the shaft 336 and the bevel wheels 334 and 335, the first of which is disengaged from the gear wheel 332, while the second is coupled with the gear wheel 333. The ribbon therefore begins, from this moment, to be wound upon the bobbin 320, and the operation is reversed and repeated longitudinally, and each bobbin is alternately filled. It is obvious that, by suitably operating, by hand, the pins 358 and 359 and the shaft 336, by means of the button 337, the operator may reverse the winding of the ribbon at any desired moment.

In order to assure a correct, even and uniform printing of the column to be added, it is very important that the printed characters be placed in perfect alinement; and in order to obtain this result the printing mechanism described in the said patent application, has been improved by the provision of a rake-like detent 366, carried by a bifurcated frame 367, the outer extension of which comprises furcations 368 and 369 which are each provided at one end with a slot 370, adapted to receive and slide upon the shaft 177, which latter carries the printing disks 190. The said rake-like detent is intended to push its teeth between certain teeth of the wheels 207, a moment before the printing takes place, and to thus arrange and secure the printing types in positive and perfect alinement. The rear extension 371, of the frame 367, is pivotally connected with a depending arm 409, which latter is pivotally connected with a shaft 410, secured to the frame 1. The arm 409 is provided with a rearward extension 411, which, owing to the weight of the members 409 and 367, is constantly applied

against an adjusting screw 412, screwed through one of the supporters 413 which are secured to the frame, and support the bar 413', in which the shafts 418 are journaled. The screw is operative to adjust the normal position of the arm 409, and thereby to control the depth of engagement, of the detent, into the toothed wheels 207.

In stating the objects of the present invention, a device has been mentioned which provides for obtaining a regular and uniform printing of the characters, by application of an invariable force, for producing the printing impact. This device, shown by Figs. 3, 4 and 5, comprises a shaft 414, journaled in the lower longitudinal members of the main frame, and carrying, near the left side of the machine, an arm 415, the forward end of which is free and carries a roller 416 which bears and rolls on a cam 417, fixed on the main shaft 74. The right hand end of the shaft 414 projects from the framework and has secured to it, in any proper manner, the hub 418, of one of the two side bars 419, which carry the shaft of the type carrying disks 190. The shaft 414 carries an arm 420 with which a spring 421 is connected, the latter being secured, at 422, to the main frame. The purpose of said spring is to suddenly lower the type carrying disks 190, when the arc-shaped surface 423 of the cam 417, leaves the roller 416, during the oscillation of the shaft 74.

If the cam 417, was constructed in the usual or known manner, the incline which is necessary for lifting the roller on its arc-shaped surface, would reduce the impact of the types on the ribbon and on the member being printed upon, and consequently would detrimentally affect the quality of the printing. It has therefore been necessary to provide a cam of special construction, which, while providing a sufficiently steep incline for raising the roller on its arc-shaped surface 423 it also allows the spring 421 to act suddenly and to cause the types to perform a sharp blow and a quick and positive pressure on the ribbon. This special cam is constructed and arranged as follows: Freely mounted on the shaft 74, and adjacent to the cam 417, is a secondary cam 424 having an arc-shaped surface which registers with the arc-shaped surface 423, of the cam 417, and projects forwardly beyond the latter when the machine is at rest and during the rearward stroke of the actuating lever 84. This forward projection is obtained by the action of a spring 425 secured to the hub of the cam 417 and extending through a slot 426, in the cam 417. When, during the operation of the machine, the actuating lever 84 is moved backward, the roller 416 rolls on the two cams 417 and 424 until the front end of the latter cam is reached by the said roller, whereupon the roller falls

suddenly from the front end of the cam 424 and pushes the cam 417 backward against the action of the spring 425 until the entire printing mechanism is arrested by the contact of the type carrying disks against the ribbon 324 which may be suitably arranged above a supporting pad or plate, as indicated at 324' (see Fig. 4). In this position the roller 416 rests on the lower part of the incline 427, of the cam 417, and when the actuating lever 84 is oscillated forward, the incline 427 forces the said roller to rise until it reaches the arcuate surface 423, and thus brings the entire printing mechanism back into the position shown in Figs. 3 and 5. Owing to the repeated shocks to which the printing mechanism is subjected, it might transpire that the types will fail to strike the same place for each character printed, and therefore a slotted guide 428 is provided on the main frame; and, in the slot of this guide, the left hand type carrying bar 419 has vertical movement.

In certain cases it may be desirable to prevent the printing mechanism from acting. To this end I have provided, on the rear supporter 413, a small oscillatory lever 429, one of the arms of which carries a handle 430, the lower arm 429' being so constructed that when it assumes the position shown in dot and dash lines (in Fig. 3), it bears on the cross bar 431 which connects the rear ends of the carrier 419, and consequently prevents movement of the printing mechanism.

The mechanism shown in the said patent application, for hiding the zeros has been replaced in the present form of embodiment, by the following described device, for preventing printing of the said zeros, as shown by Figs. 9 and 10 of the drawings. To this end, the type carrying disks 190 have been divided into eleven equal divisions: That is, each said disk contains ten types from "0" to "9" inclusive. The space 432, which is equal to one eleventh of the circumference, intervenes the types "9" and "0". The toothed wheels 207, as well as the toothed racks 207', are also provided with eleven teeth. It is obvious, however, that for these members 207 and 207' any other appropriate number of teeth may be substituted.

In order to prevent the zeros or 0's from striking the ribbon, and thereby printing before the type carrying disks have been rotated, it is desirable that the spaces 432 are normally in the printing position. Therefore, a supplemental stop lever 433 has been provided, having a hook 433' which engages a cross head 50', which is slidable in the slot 45. The cross head 50' is pivotally secured at 50, to a link 179; the latter being operatively connected with operating mechanism of the machine, by proper means which forms no part of the present inven-

tion and is therefore not described. All the stop levers 433 oscillate freely around a common axis 434, and each lever carries a leftwardly extending pin 435, which rests upon the detent levers 49. These detent levers 49 are free to oscillate on the pivot 49', and each has a hooked end 49^a, adapted to engage the cross head 50'. At the lower extremity of the member 49' is a shoulder 49^b which is in contact with a pin 19, which is carried by an extension 18 of the diagonally slotted plate 17. Each key 11 carries a pin 11' adapted to enter the diagonal slots 17' in the plate 17, and to move said plate rearwardly, by means of the cam action of the slots 17' and the pins 11'. When the bar 17 is moved rearwardly, the extension 18 and pin 19 are carried therewith, and the latter acts upon the shoulder 49^b, thereby raising the hooked end of the lever 49. Each of the levers 433 also carries a finger 436, extending under the adjacent right hand lever 433. Only the lever 433, which is positioned at the extreme right, has no finger 436.

This device operates in the following manner: If the operator lowers an elected one of the keys 11, for instance, the key in the third row rearward and the third row leftward, the stop lever 49 is raised, as described, and the said lever 433 is raised by means of its pin 435 contacting the lever 49 of its corresponding row. The raising of these levers frees the cross-head 50' from engagement with the hook 433', and the said cross-head is free to move rearwardly in the slot 45, until it contacts the end 6 of the key which has been lowered. During the raising motion, the lever 433 has raised, by means of its finger 436, the corresponding adjacent rightward lever; and simultaneously, the extreme right hand lever 433 is also raised. Because of these lifting motions, the cross heads, of these three right hand rows, are allowed to advance in their respective slots 45, until they strike against the hook of the lever 49, which has stopped them in a position corresponding to the printing of the zeros. It will be easily understood that the type carrying disks 190, which correspond to the two rows of keys leftward of the row in which the elected key has been lowered, have their non-printing spaces in alinement with the numerals or zeros which are in the printing position, while the disks which correspond to the rows rightward of the elected key, have either a zero or a numeral in the printing position.

Having now fully described my said invention, what I claim and desire to secure by Letters Patent is:—

1. In an adding machine the combination with the framework and the actuating lever, of show disks, toothed wheels (144) con-

5 nected with said show disks, toothed sectors (52), means for positively connecting said sectors with the said actuating lever, an oscillating carrier for said sectors, means for
 10 raising the said carrier so as to cause the said sectors to mesh with said toothed wheels, an oscillating arm (400), a projection on said arm adapted to cooperate with said oscillating carrier in such a manner
 15 that the latter is held in its raised position until the forward stroke of the said actuating lever has begun, substantially as described.

2. In an adding machine the combination
 15 with the framework, the actuating lever and the shaft carrying it, of show disks, toothed wheels (144) connected with said show disks, toothed sectors (52), means for positively connecting said sectors with said actuating lever, an oscillating carrier for said
 20 sectors, a roller (69) on said carrier, a segment (70) keyed on the shaft of said actuating lever, and adapted to cooperate with said roller (69) so as to raise the latter and
 25 the said oscillating carrier, an arm freely mounted on the shaft of said actuating lever, a projection on said arm and adapted to form the continuation of the engaging surface of the said segment and to receive the
 30 said roller (69), a pin (403) provided on said lever and adapted to stop the said roller (69) a little before the end of the backward stroke of said actuating lever so as to provide an empty space between the aforesaid
 35 segment (70) and the projection of said lever, substantially as set forth.

3. In an adding machine the combination
 with the framework, the actuating lever and the shaft thereof, of a plurality of show
 40 disks, toothed wheels (144) made integral with said show disks, toothed sectors (52), means for positively connecting said sectors with the said actuating lever, an oscillating carrier for said sectors, a roller (69) provided on said carrier, a segment (70) keyed
 45 on the shaft of said actuating lever and adapted to cooperate with said roller (69) so as to raise the latter and the said oscillating carrier, an arm freely mounted on the said shaft of said actuating lever, a projection on said arm and adapted to form the continuation of the engaging surface of said segment and to receive the said roller
 50 (69), a pin (403) provided on said lever and adapted to stop the said roller (69) a little before the end of the backward stroke of said actuating lever so as to provide a gap between the aforesaid segment (70) and the projection on said lever a spring controlled pawl (404) pivotally mounted on
 55 said segment and adapted to engage the said projection and to thus maintain the said gap during the first part of the forward motion of said actuating lever, until the said
 60 roller (69) be disengaged from the said ex-

tension and falls thereby disengaging the said pawl from the said projection, substantially as set forth.

4. In an adding machine the combination
 with the framework, the actuating lever and the shaft thereof, of a plurality of show
 70 disks, toothed wheels (144) made integral with said disks, toothed sectors (52), means for positively connecting same with said actuating lever, an oscillating carrier for said
 75 sectors, a roller (69) on said carrier, a segment (70) having an upper rolling surface beginning with an incline and adapted to cooperate with said roller (69) so as to raise the said carrier, and a lower eccentric
 80 surface also cooperating with said roller so as to bring the latter always opposite the said incline after each stroke of the actuating lever, substantially as set forth.

5. In an adding machine, the combination
 85 with the frame work of the machine, of an operating lever, printing disks, and an inking device comprising a frame work carrying ribbon bobbins, said frame work being pivotally connected with the first said frame
 90 work at a point behind the center of gravity of said inking mechanism, the frame work of said inking mechanism having a beak depending therefrom and adapted to oscillate therewith on said pivot, a cam operatively
 95 connected with said operating lever and adapted to contact the under surface of said beak for raising and lowering the latter and thereby allowing the inking mechanism to be alternately lowered into operative relation
 100 with the printing disks and raised out of operative relation therewith.

6. In an adding machine, a frame, a shaft in the frame having type carrying disks
 105 thereon, means for rotating the type carrying disks, a reciprocable detent suspended in the frame operatively connected with the disks, means for reciprocating the detent, said detent having guiding means in contact with the shaft whereby certain elements of
 110 said disks are engaged by the detent for bringing certain of the type into perfect alinement.

7. In an adding machine the combination
 with the framework, the actuating lever and the shaft of the latter, of printing disks, a
 115 carrier for said disks, a shaft adapted to receive said carrier, a spring (421) adapted to cause the said carrier to oscillate, a double cam on the shaft of said actuating lever, and
 120 a lever 415 and a roller 416 adapted to operatively connect the said cam with said carrier, substantially as and for the purpose set forth.

8. In an adding machine the combination
 125 with the actuating lever and the shaft thereof, of a printing mechanism, and an actuating device for said printing mechanism, the said actuating device being composed of a lever carrying a roller (416), a main cam
 130

(417) keyed on the shaft of said actuating lever of the machine and having an arc shaped rolling path and an incline for raising the said roller (416) when the printing device is brought back into its position of rest, and a second cam (424) which is freely mounted on the shaft of said actuating lever and yieldingly connected with the first one so as to prolongate the arc shaped rolling paths of the latter during the rearward stroke of the said actuating lever and to leave suddenly the said roller 416 when the latter has arrived at the front end of the aforesaid rolling path so as to allow first its sudden fall under the action of the spring 421 and thereafter its easy rising on an incline 427 of the main cam 417, substantially as set forth.

9. In an adding machine, the combination with a main frame, of printing disks rotatable in the frame, each printing disk having ten approximately equally spaced types ranging from nought to nine inclusive and having a relatively wide space between said nought and nine, means for rotating the disks, means including an actuating lever whereby the disks are rotated, an inking ribbon intervening the said disks and the member to be printed upon, stop levers operative for retaining the nought of certain disks in operative relation to the ribbon, supplemental stop levers for retaining the relatively wide spaces of certain disks in operative relation, and actuating keys having means connected thereto for stopping and retaining certain numerals of certain of the disks in operative relation to the ribbon.

10. In an adding machine, a main frame, a multiplicity of printing disks rotatably secured to the frame, each said disk having types thereon ranging from nought to nine inclusive and having a relatively wide space between the nought and the nine, disks retaining means comprising a multiplicity of stop levers and a multiplicity of supplemental stop levers, the said stop levers and sup-

plemental levers being arranged longitudinally and adjacently, means on each stop lever for raising each adjacent supplemental stop lever, means connected with each of the leftward supplemental stop levers for raising all of the stop levers to the right thereof, whereby each said disk is adjusted and retained in a predetermined printing position.

11. In an adding machine, the combination of rotatable type carrying disks, means for rotating the disks, means for retaining each of the disks in a determined rotated position, said means comprising oscillatory stop members pivoted concentrically and supplemental oscillatory stop members pivoted concentrically, the supplemental stop members alternately intervening the stop members and each carrying a pin contacting the said stop members and adapted to be raised thereby, a finger extending rightward from certain of the supplemental stop members and contacting the under side of the nearest rightward supplemental stop member whereby the latter is adapted to be raised, keys, and means coöperatively connected with said keys for oscillating the stop levers, whereby said disks are released from retention of the stop members.

12. In an adding machine the combination with the main frame of the machine, of a printing mechanism comprising an oscillating printing frame, means for causing the said printing frame to oscillate, and a lever adapted to be actuated by hand and mounted in an oscillatory manner on the said framework of the machine so as to be able to prevent with one of its ends the oscillation of the aforesaid printing device, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

ADOLF BORDT.

Witnesses:

JOSEF PFEIFFER,
ERNEST L. IVES.