

W. P. QUENTELL.
COMPUTING MACHINE.
APPLICATION FILED OCT. 1, 1909.

950,114

Patented Feb. 22, 1910.

5 SHEETS—SHEET 1.

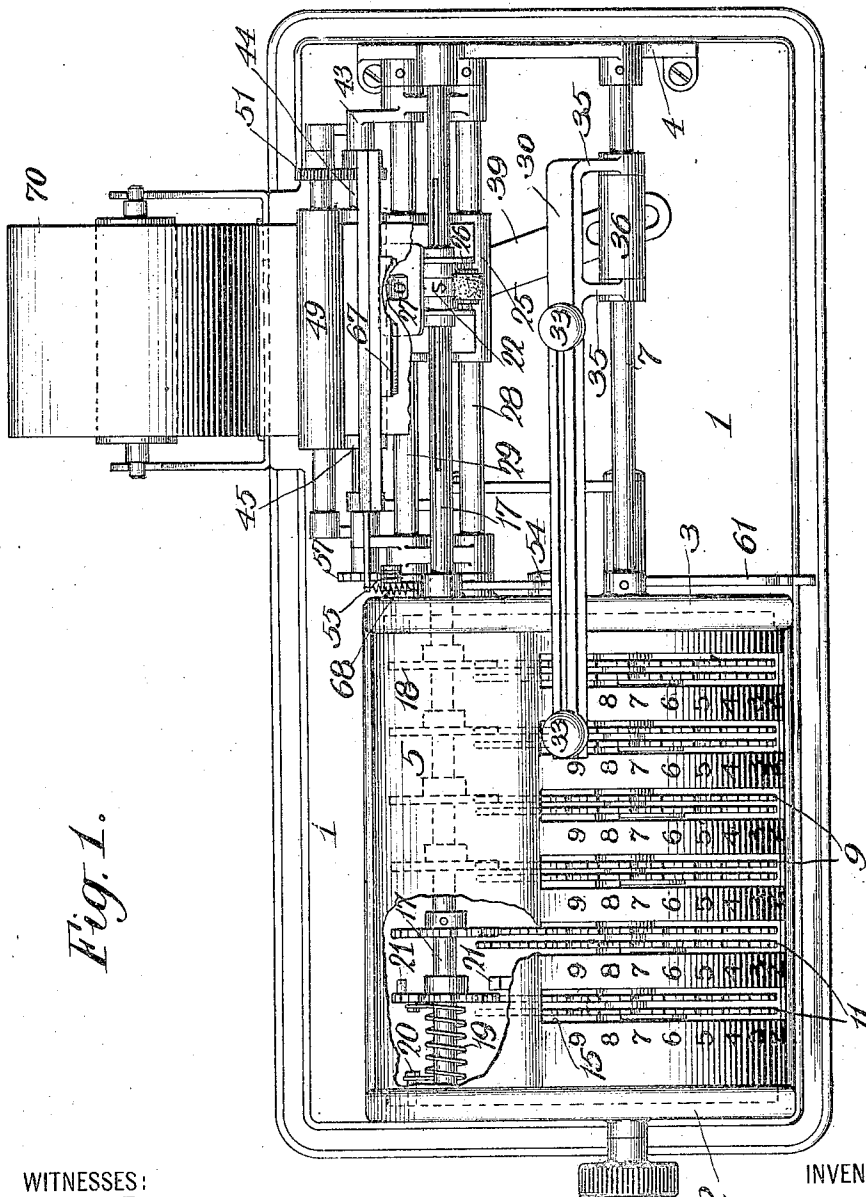


Fig. 1.

WITNESSES:

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Henry Weyer

INVENTOR

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BY

J. C. Edwards

ATTORNEY

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6 SHEETS—SHEET 2.

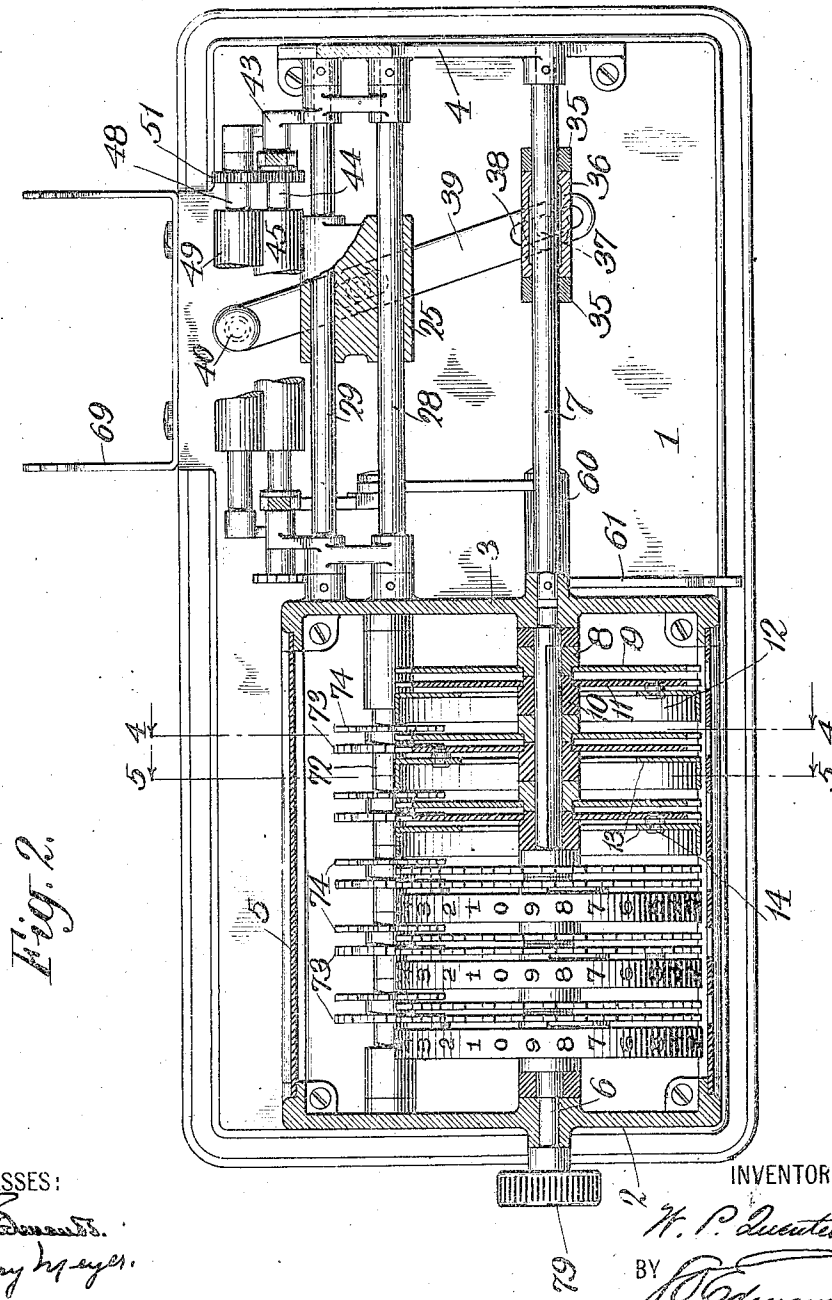


Fig. 2.

WITNESSES:

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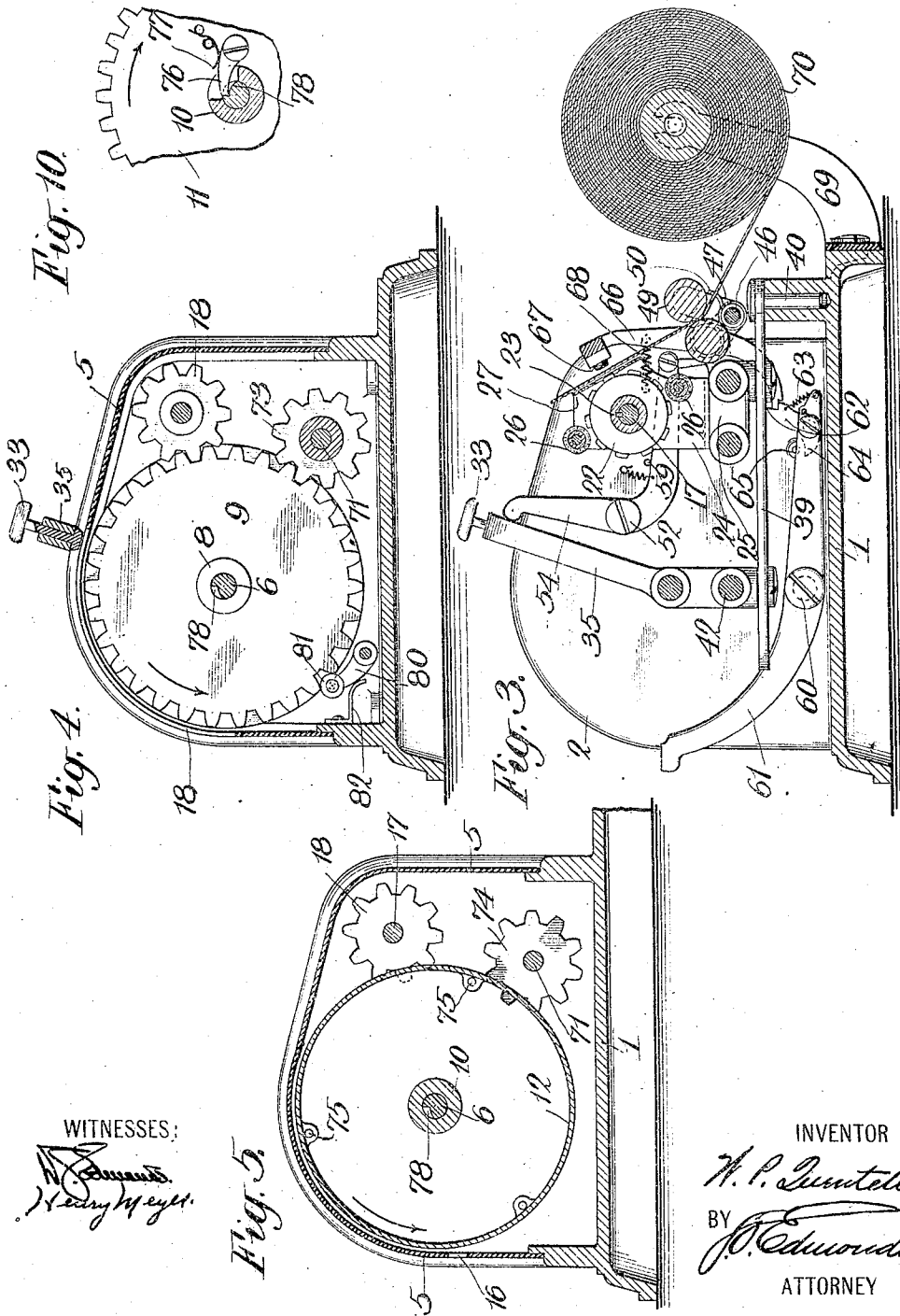
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5 SHEETS—SHEET 3.



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Fig. 5.

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5 SHEETS—SHEET 4.

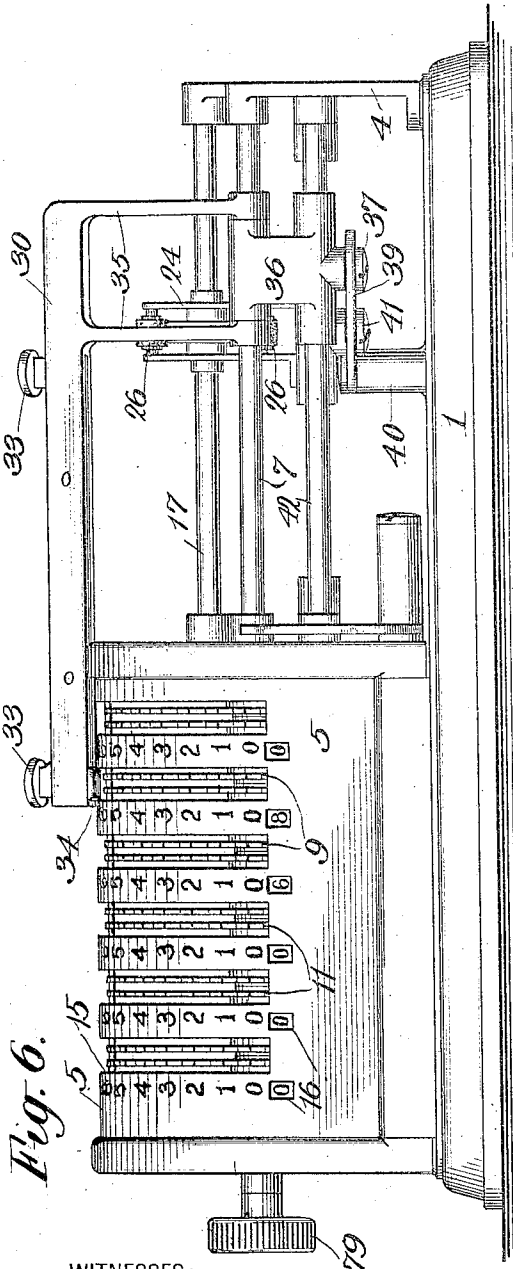


Fig. 6.

WITNESSES:

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Henry Meyer.

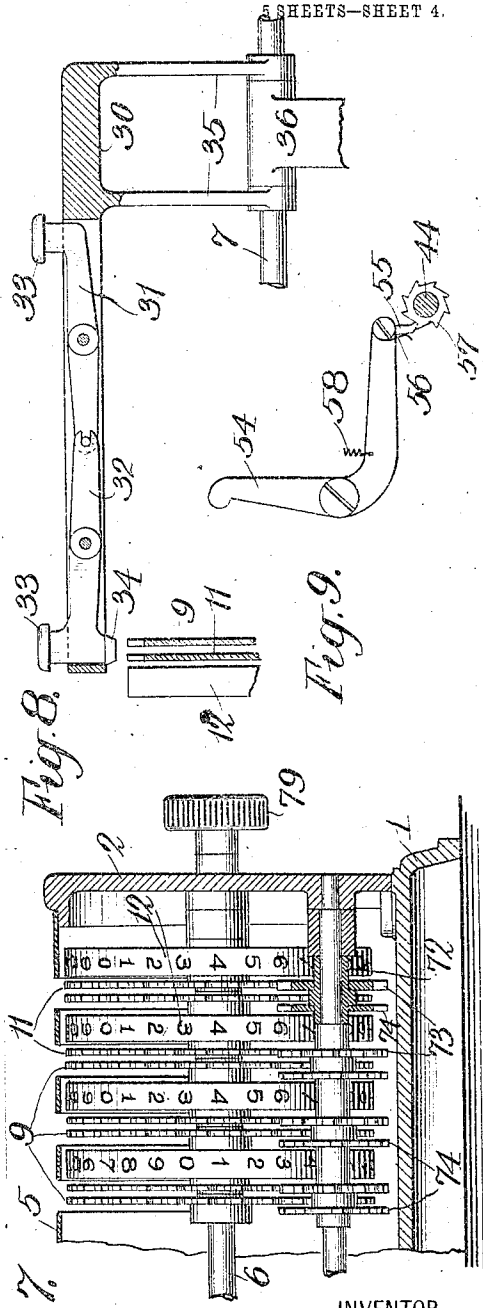


Fig. 7.

Fig. 8.

Fig. 9.

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5 SHEETS—SHEET 5.

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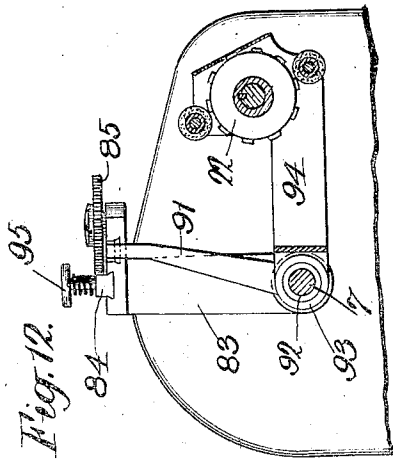
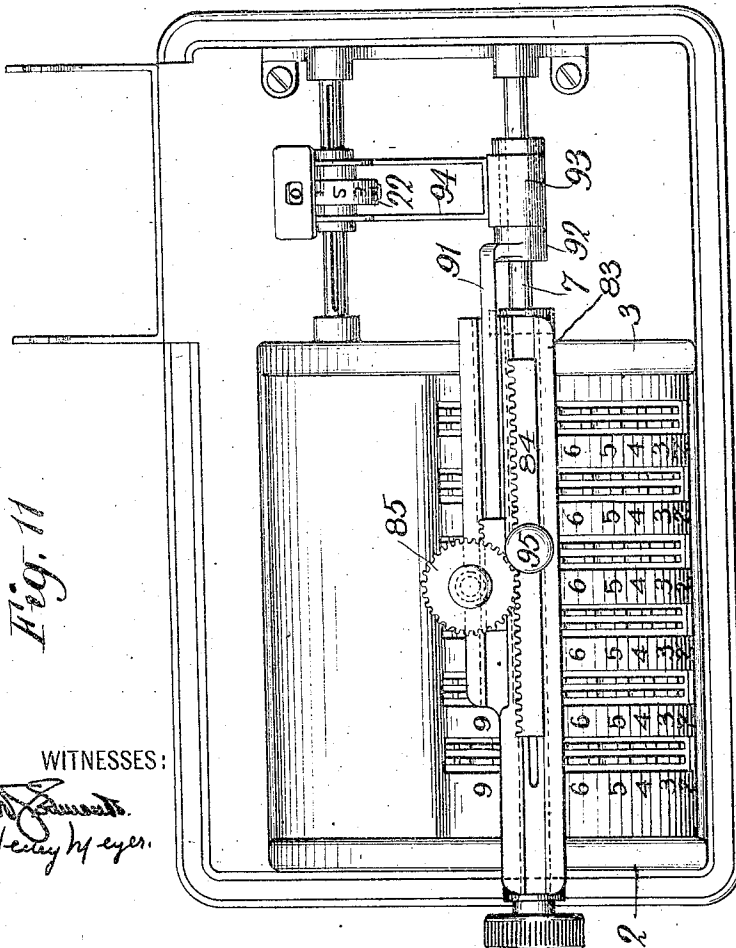
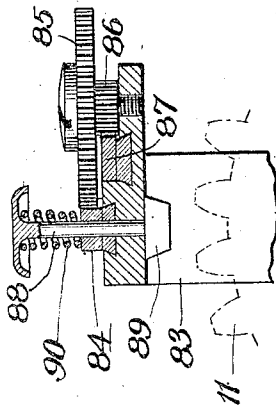


Fig. 13.



WITNESSES:

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Witness by eyes.

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UNITED STATES PATENT OFFICE.

WILLIAM P. QUENTELL, OF NORWALK, CONNECTICUT.

COMPUTING-MACHINE.

950,114.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed October 1, 1909. Serial No. 520,527.

To all whom it may concern:

Be it known that I, WILLIAM P. QUENTELL, a citizen of the United States, residing at Norwalk, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Computing-Machines, of which the following is a specification.

This invention relates to computing machines and is directed particularly to the provision of a machine for listing figures on a sheet or tape of paper and indicating at all times the total of the figures which have been listed.

The object of the invention is to provide a machine for listing and totaling figures of such simplicity of construction and comparatively small number of parts that it may be manufactured at a cost materially less than the machines of this character heretofore commonly employed.

In accordance with my invention, I employ an operating arm which is movable in one direction into coaction with one or another of a series of number-wheels and in another direction to operate the wheel; and also I employ one or more printing members, as for instance a type-wheel, platen or the like, which are positioned automatically during the movements of the operating arm so as to print the desired number in the appropriate column. Preferably, a single type-wheel is provided and this is arranged for both lateral and rotational movement; it is moved laterally when the operating arm is moved to select a particular one of the number-wheels and it is rotated when the arm is moved to operate the number-wheel selected. The type-wheel is thus positioned for printing in the appropriate column and is then rotated so as to bring the proper type-face to the printing position. In connection with the number-wheels, means are provided for indicating at all times the total of the figures printed including means for permitting each wheel to actuate the wheel of the next higher order in the manner necessary in adding machines. These and other features of the machine embodying my invention will be set forth in detail in the following description taken in connection with the accompanying drawings.

Referring to these drawings, Figure 1 is

a top view of the machine broken away in part; Fig. 2 is a horizontal section of the same; Figs. 3, 4 and 5 are vertical sections, Fig. 4 being a section on line 4—4 of Fig. 2, and Fig. 5 a section on line 5—5 of Fig. 2; Fig. 6 is an elevation of the machine; Fig. 7 is a vertical section of a portion of the machine on a plane at right angles to the sections of Figs. 3, 4 and 5; Figs. 8, 9 and 10 are detail views hereinafter referred to; Fig. 11 is a top view of a modified form of machine; and Figs. 12 and 13 are detail views of portions of the mechanism shown in Fig. 11.

Referring to Figs. 1 to 10 inclusive, the machine consists of a base 1 on which are mounted standards 2, 3 and 4, the standards 2 and 3 forming with a sheet-metal member 5 a casing inclosing the number-wheels. In standards 2 and 3 are formed bearings for a rotatable shaft 6. The standards 3 and 4 are formed to support a rod 7 mounted in axial alinement with the shaft 6. Loosely mounted upon the shaft 6 are a plurality of collars 8 each of which carries a gear 9, the teeth of the latter numbering ten or a multiple of ten; in the present instance gears 9 are provided with thirty teeth for convenience and compactness in construction. Adjacent to each collar 8 and also loosely mounted upon shaft 6, is a collar 10 on each of which is mounted a gear 11; each gear 11 lies parallel and adjacent to a gear 9, is of the same size as the corresponding gear 9 and has the same number of teeth. Adjacent to each gear 11 and on the side thereof opposite that on which the gear 9 lies, is a number-wheel 12, this consisting of a sheet-metal wheel having ears 13 extending inwardly and rivets 14 coacting with these ears and the adjacent gear 11 so as to secure the number-wheel to the gear 11. On the outer face of each number-wheel are printed three successive series of numbers from zero to 9, so that a number is applied to the number-wheel 12 for each space between two adjacent gear teeth upon the adjacent gear 11. In the casing 5 are a plurality of slots 15 one overlying each pair of gears 9 and 11, these slots being of a length equal to about one-third the circumference of the gears 9 and 11. Adjacent to each slot 15 the casing 5 has a series of figures applied thereto beginning with zero near the lower

end of the slot and ending with 9 at the upper end of the slot, these figures corresponding to the spaces between the gear teeth showing through the adjacent slot 15. In the forward side of the casing 5 are a plurality of openings 16 each overlying one of the number-wheels 12 so that one figure on each of the number-wheels 12 shows through each of the openings 16.

In the standards 2, 3 and 4 are formed bearings for a shaft 17 to which is secured a plurality of pinions 18 each meshing with one of the gears 9 so that shaft 17 may be turned in one direction by any one of the gears 9. The shaft 17 is turned in the opposite direction by a spring 19 (Fig. 1) connected at one end to one of the gears 18 and at the other end to a pin 20 projecting inwardly from the standard 2, and coacting stops 21 are arranged to arrest the movement of shaft 17 when the latter is in a predetermined position. During this movement of shaft 17 when actuated by spring 19 the pinions 18 operate gears 9 but as these gears are loose on shaft 6 the gears 11 and number-wheels 12 are not then operated.

A type-wheel 22 is mounted upon shaft 17 so as to rotate therewith but it may be moved laterally upon shaft 17 by means of a spline 23. The type-wheel is mounted between two frame-pieces 24 which project upwardly from a base 25 and these frame-pieces 24 carry two ink rollers 26 which when the type-wheel 22 is rotated coact with the printing faces formed upon the wheel so as to apply ink thereto for printing. Extending between the frame-pieces 24 is a guard 27 having an opening therein as shown in Fig. 3 through which the printing of a number is effected. The base 25 is adapted to move laterally upon two rods 28 and 29 which extend between the standards 3 and 4 and pass through openings formed in the base 25.

The rod 7 is above described as extending between the standards 3 and 4 in axial alignment with the shaft 6. Mounted on this rod so as to rotate and to move axially thereon, is an operating arm 30. The upper part of this arm is provided with a lengthwise slot, as shown in Fig. 8, and in this slot are pivotally mounted two interlocked levers 31 and 32 each provided with an operating handle 33. On the end of the lever 32 and below the operating handle thereof is a projection 34 adapted to enter the space between adjacent teeth on any pair of gears 9 and 11. It will be seen that arm 30 may be moved laterally as desired upon the rod 7 so as to bring the projection 34 over the desired pair of gears 9 and 11; either one of the handles 33 may then be depressed to carry the projection 34 into action with the teeth of the underlying gears 9 and 11; and the operating arm 30 may then be turned about rod 7 as an axis,

thus turning the gears 9 and 11 and the number-wheel 12 affixed to the latter.

The means for mounting the operating arm 30 upon the rod 7 comprises two arms 35 lying one on either side of a member 36 which is movable freely upon the rod 7 and a rod 42 directly below the rod 7 and extending between the standards 3 and 4. Member 36 carries a pin 37 which passes through a slot 38 in a lever 39 pivotally mounted at 40 upon the base of the machine. In the lever 39 is a second slot (Fig. 2) which receives a pin 41 projecting downwardly from the base 25 of the frame of the type-wheel 22. Thus, when the operating arm 30 is moved laterally to position it with reference to the appropriate pair of gears 9 and 11, the member 36 will be correspondingly moved laterally and through lever 39 will effect a corresponding lateral movement of the type-wheel so that when the operating arm is brought to rest the type-wheel will be in position to print in the appropriate column.

Extending rearwardly from the supports for the rods 28 and 29 are brackets 43 in which is mounted for rotation a shaft 44 carrying a paper-feeding roller 45. The brackets 43 are further extended rearwardly and carry the pivot pins 46 upon which links 47 are pivotally mounted. These links rotatably support a shaft 48 carrying a paper-feeding roller 49. A spring 50 is coiled about one of the pivot pins 46 and acts upon the adjacent link 47 in a direction to press the roller 49 against the roller 45. On the shafts 44 and 48 are intermeshing gears 51 whereby the two paper-feeding rollers are caused to rotate simultaneously.

Pivotally mounted upon a post 52 projecting from the standard 3 is a bell-crank lever 54 one end of which is adapted to be engaged and operated by the operating arm 30. The other end of this bell-crank lever carries a pawl 55 which is held by a spring 56 in engagement with the periphery of a ratchet wheel 57, mounted upon the shaft 44 of the paper-feeding roll 45. A spring 58 acts upon the bell-crank lever 54 in a direction to hold it normally against a stop 59.

Pivotally mounted upon a post 60 projecting from the standard 3 is a lever 61 which is also adapted to be engaged and operated by the operating arm 30. Pivotally mounted upon lever 61 near the rear end thereof is a pawl 62 one end of which is connected by a spring 63 to the end of the lever 61. Pawl 62 has a toe 64 which is adapted to engage a stop pin 65 projecting outwardly from the standard 3. The operating end of the pawl 62 is adapted to engage and operate a platen-carrying lever 66 loosely mounted upon the shaft 44 so as to rock thereon. At its upper end lever 66 carries a platen 67 adapted to coact with the paper strip and

one of the printing faces of the type-wheel 22 through the opening in the guard 27. A spring 68 acts upon the lever 66 to normally hold the platen 67 in the position in which it is shown in Fig. 3.

Secured to the base 1 are supports 69 for a reel of paper tape 70 and the tape passes from this reel between the paper-feeding rollers 45 and 49 and upward between the guard 27 and the platen 67.

Extending between the standards 2 and 3 and mounted for rotation in bearings formed therein below and parallel to the shaft 17, is a shaft 71 having a plurality of collars 72 (Fig. 2) loosely mounted thereon. On each roller 72 is a pinion 73 meshing with a gear 11 and having ten teeth. On each number-wheel 12 are three pins 75 so positioned that as the number-wheel rotates the pin 75 will engage the teeth of the corresponding pinion 74 and each pin 75 will turn pinion 74 a distance equal to one tooth of the pinion. When pinion 74 is moved thus it causes a movement of a corresponding extent of the pinion 73 adjacent thereto and as this pinion is in mesh with the gear 11 which is affixed to the number-wheel 12 next to the one which operated the pinion 74, this movement of the pinion 74 a distance equal to one tooth will cause the number-wheel of the next higher order to be moved a distance equal to one number.

In order to set all the number-wheels at zero each gear 11 has a pawl 76 pivotally mounted thereon and actuated by a spring 77 to press the end of the pawl through an opening in its collar 10 and into a notch 78 formed in the shaft 6, this notch 78 extending under all of the collars 10. Shaft 6 extends through its bearing in the standard 2 and carries an operating handle 79. In the normal operation of the machine, gears 11 move in such direction that the pawl 76 rides freely over the notch 78, but if it is desired to set all the number-wheels at zero, it is only necessary to turn the handle 79 and with it shaft 6 until the wall of notch 78 engages each of the pawls 76 and by means of these pawls turns the gears 11 and number-wheels 12 until the zeros on the number-wheels show through the openings 16 in casing 5.

In order to assist in properly positioning the number-wheels and to guard against accidental movement thereof I provide upon the base 1 a plurality of pivotally mounted levers 80, one for each pair of gears 9 and 11, each lever carrying a roller 81 and being acted upon by a spring 82 to hold the roller 81 against the periphery of the gears 9 and 11.

The operation of the machine, as thus constructed, will now be described.

If it be desired to print on the tape a number consisting of two digits the operat-

ing arm 30 is moved to the left until the projection 34 thereof lies over the second pair of gears 9 and 11 from the right. As the arm is moved thus, the type-wheel will be correspondingly moved so that the printing faces thereon are in position to print upon the paper tape in what will be the second column of figures upon the tape. Then, when the arm 30 is in this position it is rotated about the rod 7 until the projection 34 lies over the appropriate notch in the gears 9 and 11, as shown by the figures upon the casing 5 adjacent to the slot through which the gears 9 and 11 may be seen. This having been done one of the handles 33 is depressed so that projection 34 will be carried into coaction with the gears 9 and 11 of the second pair from the right and arm 30 is then moved downwardly as far as it will go, thus carrying the second pair of gears 9 and 11 and the number-wheel 12 corresponding thereto, with it. Thus the second number-wheel, that is the number-wheel for the tens, will have been moved around a distance corresponding to the number of tens in the number to be printed and the number showing through the opening 16 for the tens will have been increased by the number of tens in the number to be printed. When the gears 9 and 11 were turned thus the shaft 17 was also turned a corresponding extent against the tension of the spring 19 by reason of the coaction of the gear 9 with the pinion 18 on shaft 17. Before this movement took place shaft 17 had been held in such position by spring 19 and stops 21 that the zero on the type-wheel 22 was in position for printing, so that the movement of shaft 17 effected by gear 9 would carry the type around to the position for printing from the type on wheel 22 corresponding to the number of teeth which the gears 9 and 11 were moved. At the end of the downward rotational movement of the operating arm 30, the latter engages the lever 61 depressing the forward end thereof and raising the pawl 62; the pawl when thus operated, rocks lever 66 so as to retract the platen 67 but when the toe 64 of pawl 62 engages pin 65, the pawl is caused to release the lever 66 and the spring 68 actuates lever 66 to cause the platen to strike a blow upon the rear side of the paper strip 70, thus printing the figure upon the forward side of the strip. When this has been done the handle 33 is moved to withdraw the projection 34 from coaction with the gears 9 and 11 and immediately spring 19 turns shaft 17 so as to turn the type-wheel to the zero position. In doing this the pinion 18 causes the gear 9 to rotate but as gear 9 is movable independently of the gear 11, the number-wheel 12 is not actuated. The operating arm 30 is then moved laterally into position with the projection 34 over the first set of gears 9 and

11 for the units and the type-wheel is correspondingly moved laterally. The gears 9 and 11 are then operated by means of the projection 34 and the operating handle in the manner above described and the units number will then be printed upon the tape at the right of the tens number previously printed. This having been done the operator rotates the arm 30 in the upward direction until it engages the paper-feeding lever 54 so as to feed the tape along a distance corresponding to one tooth of the ratchet wheel 57. In any case where the extent of the movement of a number-wheel when actuated by the actuating arm 30 is such that a "9" is carried past the corresponding opening 16 in the casing 5, a pin 75 on that number-wheel will engage a tooth of the corresponding pinion 74 and turn that pinion a distance equal to one tooth; in moving thus, the pinion 74 will correspondingly move the adjacent pinion 73 and since this pinion is in mesh with the gear 11 of the next adjacent number-wheel 12, the "1" which is to be carried from one column to the next will be transferred to the next adjacent number-wheel 12 by a movement of that number-wheel equivalent to one number.

In Figs. 11, 12 and 13, I have shown a modification of my invention whereby the parts are more compactly arranged. In this embodiment of the invention the operating arm consists of a bail 83 the arms of which are provided with openings through which the shaft 6 extends, one of these arms lying adjacent to the standard 3 and the other arm lying adjacent to the standard 2. In the upper face of the operating arm 83 is formed a way adapted to receive a strip 84 having rack-teeth formed thereon. This rack meshes with a gear 85 mounted on a stub shaft projecting upwardly from the arm 83 and to the gear 85 is secured a pinion 86 meshing with a rack 87 adapted to slide parallel to the rack 84 in a way formed in the arm 83. A pin 88 passes through an opening in the rack 84 and a lengthwise slot in the arm 83, and to the lower end of this pin is secured a projection 89 which is adapted to enter the spaces between adjacent teeth of the gears 9 and 11. A spring 90 coiled about pin 88 between the rack 84 and the operating handle of the pin, serves to normally hold the projection out of engagement with the gears 9 and 11. To the rack 87 is secured a laterally extending arm 91 which at its end distant from the rack 87 is secured to a sleeve 92 adapted to slide upon the rod 7. The sleeve 92 is provided with a circumferential groove adapted to receive a sleeve 93 and to this sleeve is secured the frame 94 of the type-wheel 22. It will thus be seen that when the handle 95 on the pin 88 is moved laterally to position the projection 89 over the desired pair

of gears 9 and 11, the printing-wheel 22 will be correspondingly moved so as to print in the appropriate column, but the lateral movement of the type-wheel is considerably less than that of the handle 95 because of the reduction effected by the gearing between the two racks 84 and 87.

Having now described my invention, what I claim as new therein and desire to secure by Letters Patent is as follows:—

1. The combination of a plurality of number-wheels, a single manually-actuated operating member for operating all of said wheels, said member being movable manually in one direction to carry it into coaction with a number-wheel and in another direction to operate the wheel, printing mechanism comprising cooperating printing members, means for moving one of said printing members actuated in moving said operating member into coöperation with one of said wheels, and means for moving one of said printing members actuated in moving said operating member to move one of said wheels, substantially as set forth.

2. The combination of a plurality of number-wheels, a single operating member therefor which is freely movable manually with respect to said wheels, said member being movable manually in one direction to carry it into coaction with a number-wheel and in another direction to operate the wheel, printing mechanism comprising cooperating printing members, means for moving one of said printing members actuated in moving said operating member into coöperation with one of said wheels, means for moving one of said printing members actuated in moving said operating member to move one of said wheels, and means for actuating said printing mechanism to cause it to print, substantially as set forth.

3. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels and movable to operate the wheel, printing mechanism comprising cooperating printing members, means for moving one of said printing members actuated in moving said operating member into coöperation with one of said wheels, means for moving one of said printing members actuated in moving said operating member to move one of said wheels, and means actuated by said operating member for actuating said printing mechanism to cause it to print, substantially as set forth.

4. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels and movable to operate the wheel, printing mechanism comprising cooperating printing members, means for moving one of said printing members actuated in moving said operating member into coöperation with one

of said wheels, means for moving one of said printing members actuated in moving said operating member to move one of said wheels, a support for a paper-strip, means for actuating the printing mechanism to cause it to print on the paper-strip, and means for feeding the paper-strip, substantially as set forth.

5. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels and movable to operate the wheel, printing mechanism comprising coöperating printing members, means for moving one of said printing members actuated in moving said operating member into coöperation with one of said wheels, means for moving one of said printing members actuated in moving said operating member to move one of said wheels, a support for a paper-strip, means actuated by said operating member for actuating the printing mechanism to cause it to print on the paper-strip, and means actuated by said operating member for feeding the paper-strip, substantially as set forth.

6. The combination of a plurality of number-wheels, means for causing each number-wheel in making ten steps to operate the next adjacent number-wheel one step, a single manually-actuated operating member for operating all of said wheels, said member being movable manually in one direction to carry it into coaction with a number-wheel and in another direction to operate the wheel, printing mechanism comprising coöperating printing members, means for moving one of said printing members actuated in moving said operating member into coöperation with one of said wheels, and means for moving one of said printing members actuated in moving said operating member to move one of said wheels, substantially as set forth.

7. The combination of a plurality of number-wheels, a single manually-actuated operating member for operating all of said wheels, said member being movable manually in one direction to carry it into coaction with a number-wheel and in another direction to operate the wheel, a pair of printing members including a type-wheel and a platen, means for moving one of said printing members actuated in moving said operating member into coöperation with one of said wheels, means for rotating said type-wheel by actuating said operating member to turn a number-wheel, a spring for returning the type-wheel, and a stop for arresting the type-wheel when in a predetermined position, substantially as set forth.

8. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels, a shaft geared to said wheels, a type-wheel splined on said shaft, and a connection be-

tween said operating member and said type-wheel for moving the latter upon said shaft, substantially as set forth.

9. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels, a shaft geared to said wheels, a type-wheel splined on said shaft, a spring for turning said shaft, a stop for arresting movement of said shaft in a predetermined position, and a connection between said operating member and said type-wheel for moving the latter upon said shaft, substantially as set forth.

10. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels, a pair of printing members including a type-wheel and coöperating platen, gearing between said number-wheels and said type-wheel for rotating the latter, and a connection between said operating member and one of said printing members for moving the latter, substantially as set forth.

11. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels, a pair of printing members including a type-wheel and coöperating platen, gearing between said number-wheels and said type-wheel for rotating the latter, a connection between said operating member and one of said printing members for moving the latter, and means for operating said printing members, substantially as set forth.

12. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels, a pair of printing members including a type-wheel and coöperating platen, gearing between said number-wheels and said type-wheel for rotating the latter, a connection between said operating member and one of said printing members for moving the latter, and means actuated by said operating member for actuating said printing members to cause them to print, substantially as set forth.

13. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels, a pair of printing members including a type-wheel and coöperating platen, gearing between said number-wheels and said type-wheel for rotating the latter, a connection between said operating member and one of said printing members for moving the latter, a support for a paper-strip, means for actuating the printing members to cause them to print on the strip, and means for feeding the paper-strip, substantially as set forth.

14. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said

wheels, a pair of printing members including a type-wheel and cooperating platen, gearing between said number-wheels and said type-wheel for rotating the latter, a connection between said operating member and one of said printing members for moving the latter, a support for a paper-strip, means for actuating the printing members to cause them to print on the strip, and means actuated by said operating member for feeding the paper-strip, substantially as set forth.

15. The combination of a plurality of number-wheels, an operating member movable into cooperation with any one of said wheels, a shaft geared to said wheels, a type-wheel splined on said shaft, a platen cooperating therewith, a connection between said operating member and said type-wheel for moving the latter upon said shaft, and means for actuating the type-wheel and platen relatively to cause them to print, substantially as set forth.

16. The combination of a plurality of number-wheels, an operating member movable into cooperation with any one of said wheels, a shaft geared to said wheels, a type-wheel splined on said shaft, a platen cooperating therewith, a connection between said operating member and said type-wheel for moving the latter upon said shaft, and means actuated by said operating member for moving the type-wheel and platen relatively to cause them to print, substantially as set forth.

17. The combination of a plurality of number-wheels rotatable about an axis, a manually-actuated operating member rotatable about the same axis and movable laterally relatively to said wheels into cooperative relation to any one of the wheels, a printing mechanism comprising cooperating printing members, means for moving one of said printing members in correspondence with the lateral movement of said operating member, and means for moving one of said printing members in correspondence with the rotational movement of said operating member, substantially as set forth.

18. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into cooperative relation to any one of the wheels, a pair of printing members including a type-wheel and cooperating platen, gearing between said number-wheels and said type-wheel for rotating the latter, and a connection between said operating member and one of said printing members whereby the latter will be positioned by the lateral movement of the operating member, substantially as set forth.

19. The combination of a plurality of number-wheels rotatable about an axis, an

operating member rotatable about said axis and movable laterally relatively to said wheels into cooperative relation to any one of said wheels, means on said member for engaging a number-wheel, a gear adjacent to each number-wheel and moved therewith by said member, a shaft, gears thereon meshing with said gears, a printing member positioned by said shaft, a printing member cooperating therewith, and a connection between one of said printing members and said operating member, substantially as set forth.

20. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into cooperative relation to any one of said wheels, means on said member for engaging a number-wheel, a gear adjacent to each number-wheel and moved therewith by said member, a shaft, gears thereon meshing with said gears, a type-wheel splined on said shaft, a platen cooperating therewith, and a connection from said operating member to said type-wheel for moving the latter upon said shaft, substantially as set forth.

21. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into cooperative relation to any one of said wheels, means on said member for engaging a number-wheel, a gear adjacent to each number-wheel and moved therewith by said member, a shaft, gears thereon meshing with said gears, a printing member positioned by said shaft, a printing member cooperating therewith, a connection between one of said printing members and said operating member, a spring for turning said shaft in one direction, and a stop for arresting movement of said shaft under the influence of said spring, substantially as set forth.

22. The combination of a plurality of number-wheels rotatable about an axis, a gear adjacent to each number-wheel and rotatable relatively to the number-wheel about said axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into cooperative relation to any one of said wheels, means on said member for engaging a number-wheel and the gear adjacent thereto, a shaft, gears thereon meshing with said gears, and a printing member positioned by said shaft, substantially as set forth.

23. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into cooperative relation to any one of the wheels, a pair of printing members including a type-wheel and cooperating platen,

gearing between said number-wheels and said type-wheel for rotating the latter, a connection between said operating member and one of said printing members for moving the latter, and means for operating said printing members, substantially as set forth.

24. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into coöperative relation to any one of the wheels, a printing mechanism comprising coöperating printing members, means for moving one of said printing members in correspondence with the lateral movement of said operating member, means for moving one of said printing members in correspondence with the rotational movement of said operating member, and means actuated by said operating member for causing said printing mechanism to print, substantially as set forth.

25. The combination of a plurality of number-wheels rotatable about an axis, a manually-actuated operating member rotatable about the same axis and movable laterally relatively to said wheels into coöperative relation to any one of the wheels, a printing mechanism comprising coöperating printing members, means for moving one of said printing members in correspondence with the lateral movement of said operating member, means for moving one of said printing members in correspondence with the rotational movement of said operating member, means for supporting a sheet, means for feeding said sheet, and means for operating said printing mechanism to cause it to print on said sheet, substantially as set forth.

26. The combination of a plurality of number-wheels rotatable about an axis, a manually-actuated operating member rotatable about the same axis and movable laterally relatively to said wheels into coöperative relation to any one of the wheels, means for causing each wheel in making ten steps to actuate the next adjacent wheel one step, coöperating printing members, means for moving one of said printing members in correspondence with the lateral movement of said operating member, and means for moving one of said printing members in correspondence with the rotational movement of said operating member, substantially as set forth.

27. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into coöperative relation to any one of said wheels, means on said member for engaging a number-wheel, a gear adjacent to each number-wheel and moved therewith by said member, a shaft, gears thereon

meshing with said gears, a printing member positioned by said shaft, a printing member coöperating therewith, a connection between one of said printing members and said operating member, and means actuated by said operating member for causing said printing members to print, substantially as set forth.

28. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into coöperative relation to any one of said wheels, means on said member for engaging a number-wheel, a gear adjacent to each number-wheel and moved therewith by said member, a shaft, gears thereon meshing with said gears, a printing member positioned by said shaft, a printing member coöperating therewith, a connection between one of said printing members and said operating member, a support for a sheet, means for operating said printing members to cause them to print on said sheet, and means actuated by said operating member for feeding said sheet, substantially as set forth.

29. The combination of a plurality of number-wheels rotatable about an axis, a gear adjacent to each number-wheel and rotatable relatively to the number-wheel about said axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into coöperative relation to any one of said wheels, means on said member for engaging a number-wheel and the gear adjacent thereto, a shaft, gears thereon meshing with said gears, a spring for turning said shaft in one direction, a stop for arresting movement of the shaft when moved by the spring, and a printing member positioned by said shaft, substantially as set forth.

30. The combination of a plurality of number-wheels rotatable about an axis, a gear adjacent to each number-wheel and rotatable relatively to the number-wheel about said axis, an operating member rotatable about said axis and movable laterally relatively to said wheels in coöperative relation to any one of said wheels, means on said member for engaging a number-wheel and the gear adjacent thereto, a shaft, gears thereon meshing with said gears, a pair of printing members, a connection between said shaft and one of said printing members whereby the shaft positions the member, a connection between said operating member and one of the printing members whereby the operating member when moved laterally will position the printing member, and means for operating the printing members to cause them to print, substantially as set forth.

31. The combination of a plurality of number-wheels rotatable about an axis, a gear adjacent to each number-wheel and

rotatable relatively to the number-wheel about said axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into coöperative relation to any one of said wheels, means on said member for engaging a number-wheel and the gear adjacent thereto, a shaft, gears thereon meshing with said gears, a pair of printing members one of which is positioned by said shaft, and means actuated by said operating member for causing said printing members to print, substantially as set forth.

32. The combination of a shaft, a plurality of number-wheels loosely mounted thereon, a clutch between the shaft and each number-wheel, means for operating the shaft, a gear loosely mounted on the shaft adjacent to each number-wheel, an operating member rotatable about said axis and movable relatively to said wheels into coöperative relation to any one of said wheels, means on said member for engaging a number-wheel and the gear adjacent thereto, a shaft, gears thereon meshing with said gears, a pair of printing members one of which is positioned by said last-named shaft, and means for operating said printing members, substantially as set forth.

33. The combination of a plurality of number-wheels rotatable about an axis, a gear adjacent to each number-wheel and rotatable relatively to the number-wheel about said axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into coöperative relation to any one of said wheels, means on said member for engaging a number-wheel and the gear adjacent thereto, a shaft, gears thereon meshing with said gears, a pair of printing members one of which is positioned by said shaft, means for operating said printing members, and means for causing each number-wheel in making ten steps to actuate the next adjacent number-wheel one step, substantially as set forth.

34. The combination of a plurality of number-wheels, a single manually-actuated operating member for operating all of said wheels, said member being movable manually in one direction to carry it into coaction with a number-wheel and in another direction to operate the wheel, printing mechanism comprising coöperating printing members, means for moving one of said printing members actuated in moving said operating member into coöperation with one of said wheels, means for moving one of said printing members actuated in moving said operating member to move one of said wheels, and means for indicating the total actuation of said number-wheels, substantially as set forth.

35. The combination of a plurality of number-wheels, an operating member movable into coöperative relation to any one

of said wheels, a pair of printing members including a type-wheel and coöperating platen, gearing between said number-wheels and said type-wheel for rotating the latter, a connection between said operating member and one of said printing members for moving the latter, and a casing for said number-wheels having openings therein through which one number on each wheel may be seen, substantially as set forth.

36. The combination of a plurality of number-wheels rotatable about an axis, a manually-actuated operating member rotatable about the same axis and movable laterally relatively to said wheels into coöperative relation to any one of the wheels, a printing mechanism comprising coöperating printing members, means for moving one of said printing members in correspondence with the lateral movement of said operating member, means for moving one of said printing members in correspondence with the rotational movement of said operating member, and means for indicating the total actuation of said number-wheels, substantially as set forth.

37. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into coöperative relation to any one of said wheels, means on said member for engaging a number-wheel, a gear adjacent to each number-wheel and moved therewith by said member, a shaft, gears thereon meshing with said gears, a printing member positioned by said shaft, a printing member coöperating therewith, a connection between one of said printing members and said operating member, means for actuating the printing members to cause them to print, and means for indicating the total actuation of said number-wheels, substantially as set forth.

38. The combination of a plurality of number-wheels, a single manually-actuated operating member for operating all of said wheels, said member being movable manually in one direction to carry it into coaction with a number-wheel and in another direction to operate the wheel, printing mechanism comprising coöperating printing members, means actuated in moving said operating member into coöperation with one of said wheels for moving one of said printing members a distance less than but bearing a predetermined relation to the movement of said member, and means for moving one of said printing members actuated in moving said operating member to move one of said wheels, substantially as set forth.

39. The combination of a plurality of number-wheels, an operating member movable into coöperation with any one of said wheels and movable to operate the wheel,

printing mechanism comprising cooperating printing members, means actuated in moving said operating member into cooperation with one of said wheels for moving one of said printing members a distance less than but bearing a predetermined relation to the movement of said member, means for moving one of said printing members actuated in moving said operating member to move one of said wheels, and means actuated by said operating member for actuating said printing mechanism to cause it to print, substantially as set forth.

40. The combination of a plurality of number-wheels, an operating member movable into cooperation with any one of said wheels, a shaft geared to said wheels, a type-wheel splined on said shaft, and a connection between said operating member and said type-wheel for moving the latter upon said shaft when said member is moved a distance less than but bearing a predetermined relation to the movement of said member, substantially as set forth.

41. The combination of a plurality of number-wheels, an operating member movable into cooperation with any one of said wheels, a pair of printing members including a type-wheel and cooperating platen, gearing between said number-wheels and said type-wheel for rotating the latter, a connection between said operating member and one of said printing members for moving the latter when said member is moved a distance less than but bearing a predetermined relation to the movement of said member, and means actuated by said operating member for actuating said printing members to cause them to print, substantially as set forth.

42. The combination of a plurality of number-wheels rotatable about an axis, an operating member rotatable about said axis and movable laterally relatively to said wheels into cooperative relation to any one of said wheels, means on said member for engaging a number-wheel, a gear adjacent to each

number-wheel and moved therewith by said member, a shaft, gears thereon meshing with said gears, a type-wheel splined on said shaft, a platen cooperating therewith, and a connection from said operating member to said type-wheel for moving the latter upon said shaft when said member is moved a distance less than but directly proportioned to the movement of the member, substantially as set forth.

43. The combination of a plurality of number-wheels, a single manually-actuated operating member movable freely with respect to said wheels to cause it to directly engage any one of the wheels at any point thereon between predetermined limits and to cause it to rotate the wheel engaged thereby, printing mechanism comprising printing members, means for moving one of said printing members actuated in moving said operating member into engagement with one of said wheels, and means for moving one of said printing members actuated in moving said operating member to rotate one of said wheels, substantially as set forth.

44. The combination of a plurality of number-wheels, a single manually-actuated operating member movable about the axis of said wheels and movable freely with respect to the wheels to cause it to directly engage any one of the wheels at any point thereon between predetermined limits, printing mechanism comprising cooperating printing members, means for moving one of said printing members actuated in moving said operating member to cause it to engage one of said wheels, and means for moving one of said printing members actuated in rotating said operating member about the axis of said wheels, substantially as set forth.

This specification signed and witnessed this 28th day of September, 1909.

WILLIAM P. QUENTELL.

Witnesses:

E. S. YOUNGS,
FRANKLIN JUDGE.