

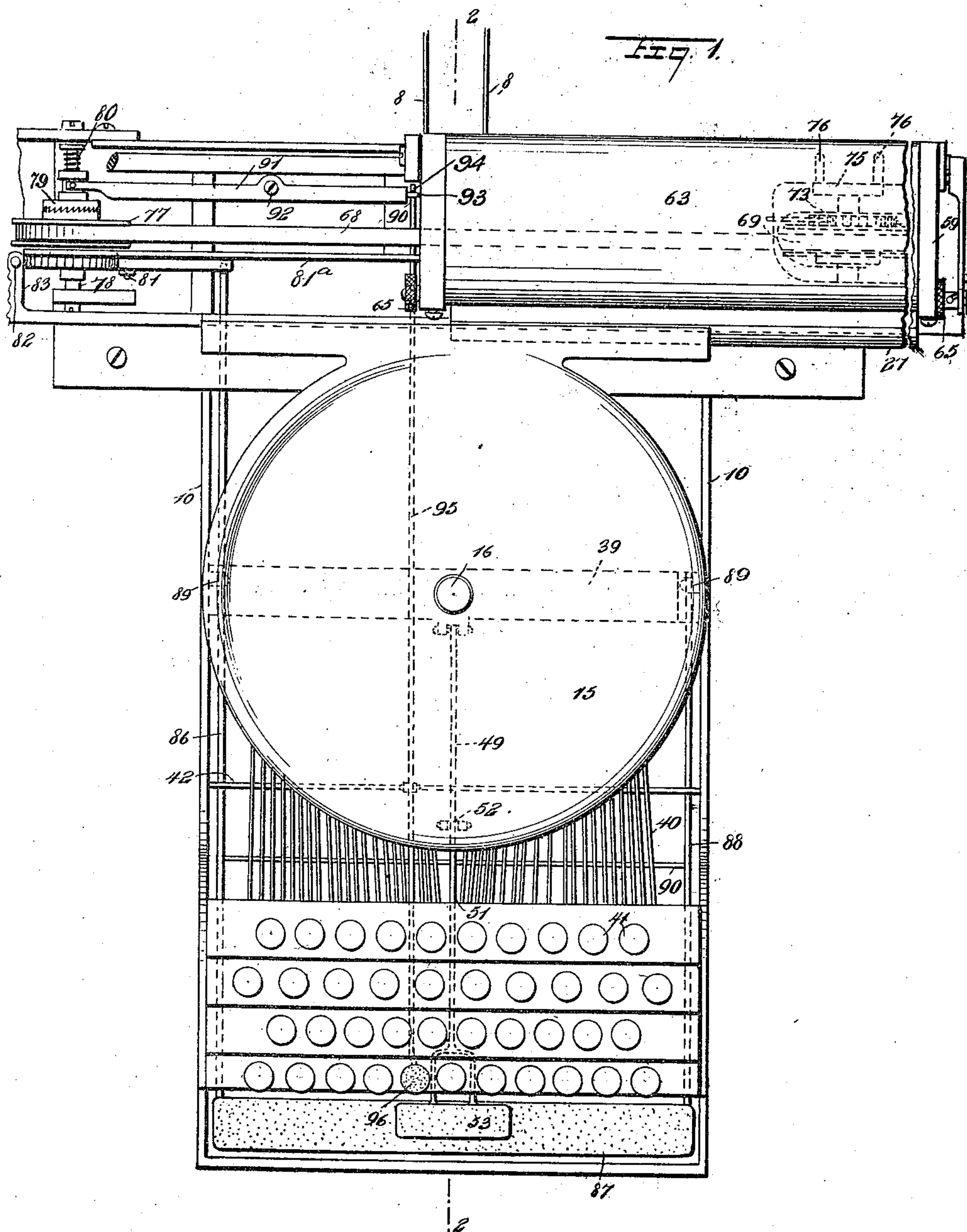
(No Model.)

5 Sheets—Sheet 1.

L. F. URBANUS.
TYPE WRITING MACHINE.

No. 574,230.

Patented Dec. 29, 1896.



WITNESSES:

H. Walker
H. P. Hutchinson

INVENTOR

L. F. Urbanus

BY

Munn & Co
ATTORNEYS.

(No Model.)

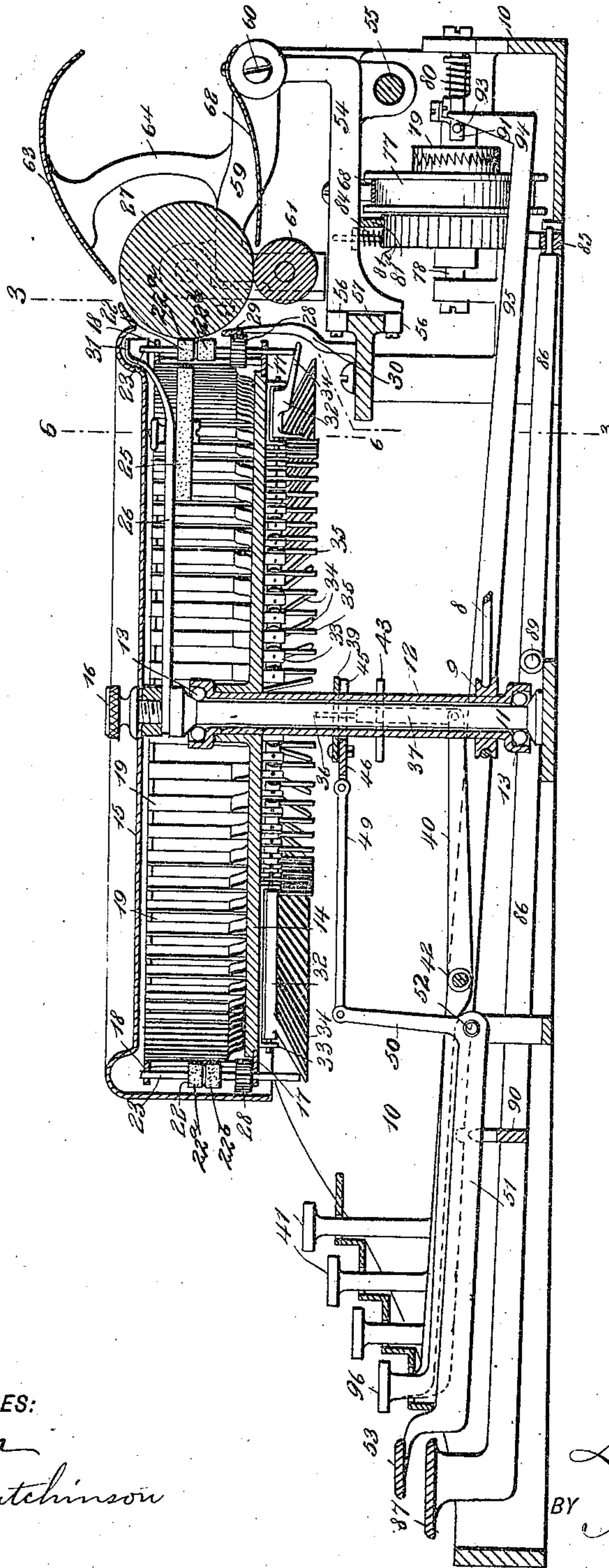
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FIG 2



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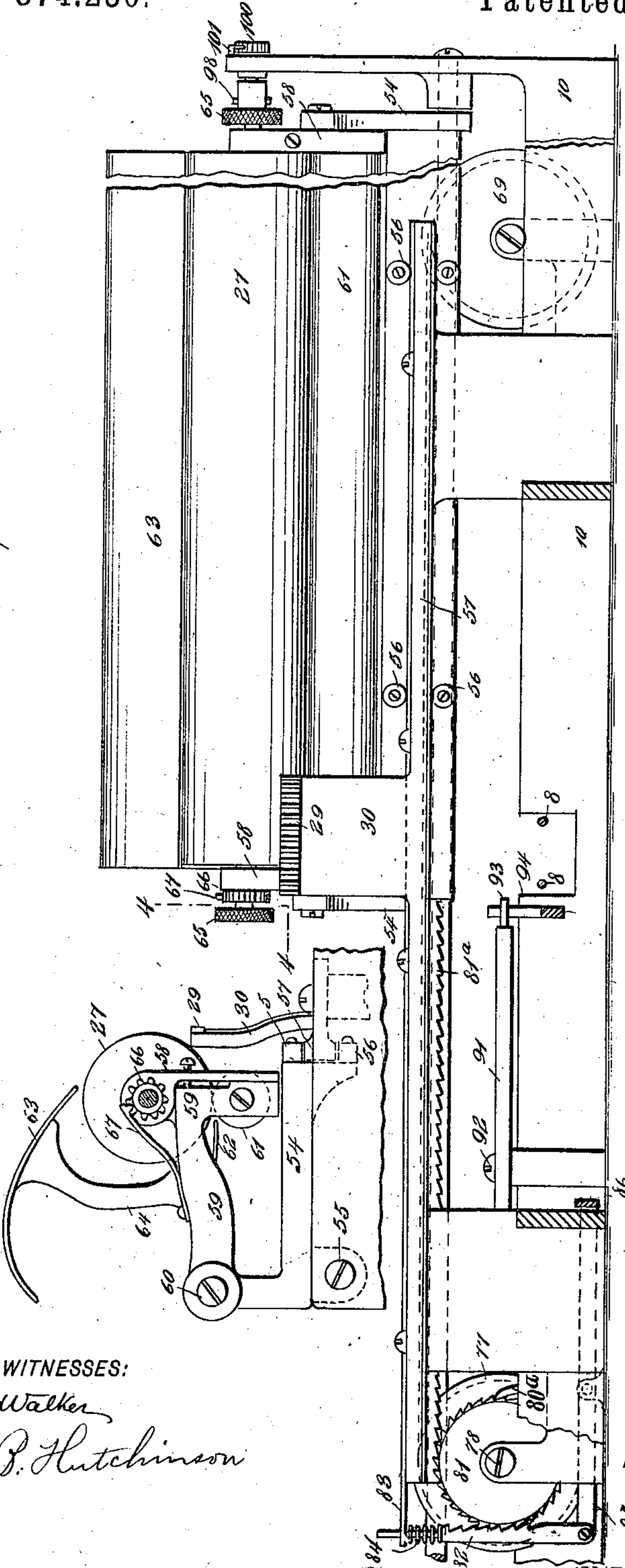
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Fig 3.

Fig 4.



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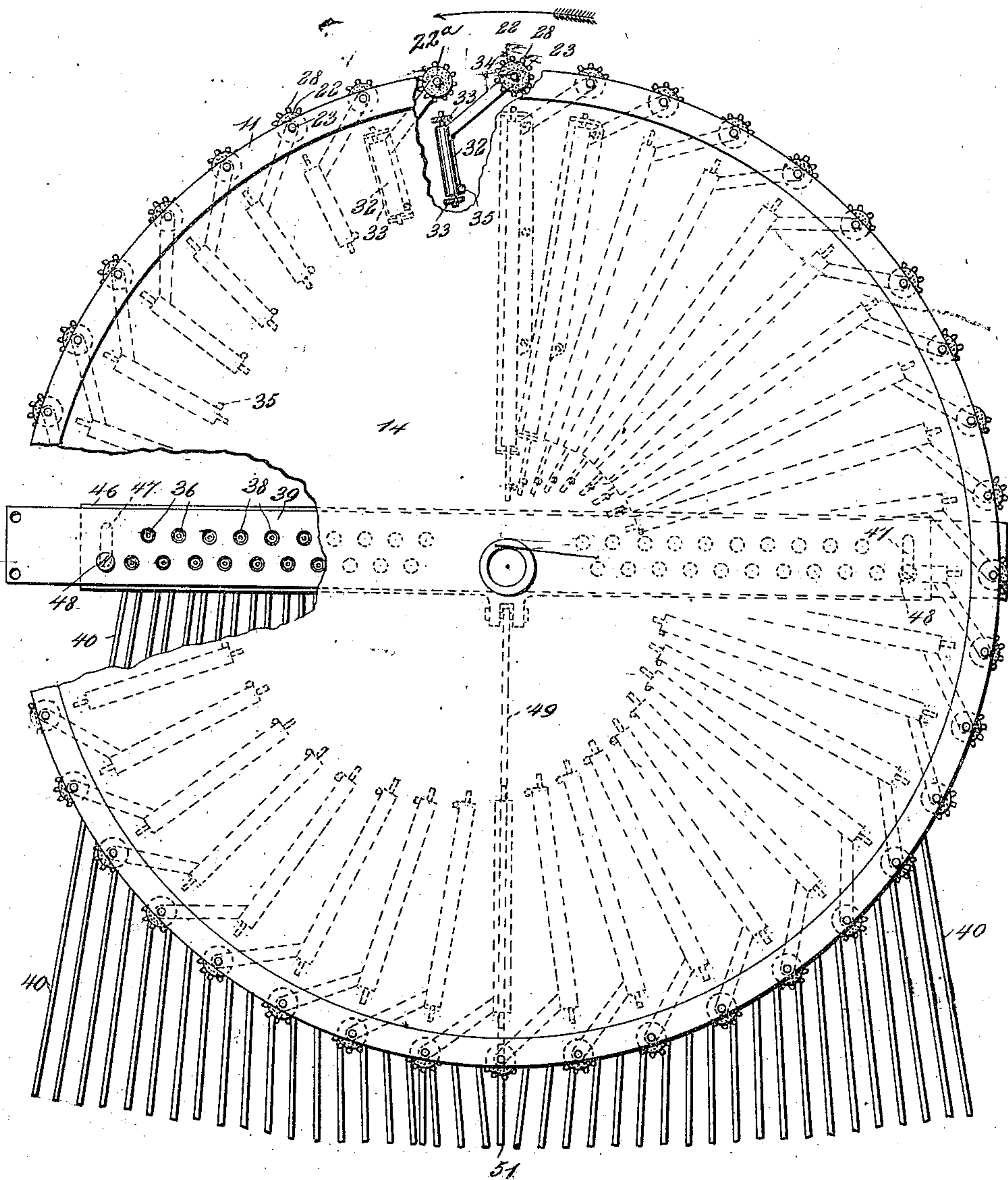
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Fig. 5.



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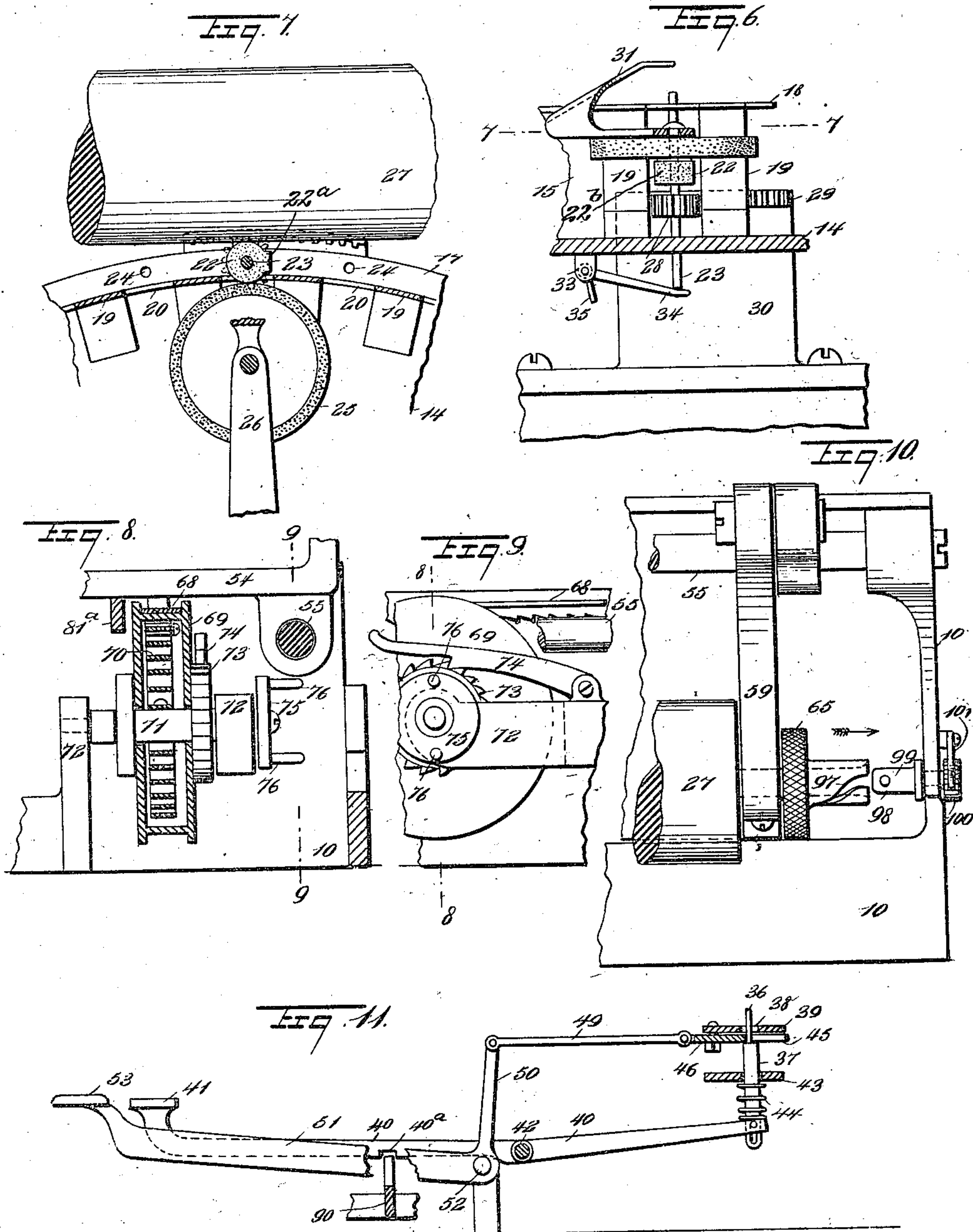
No Model.)

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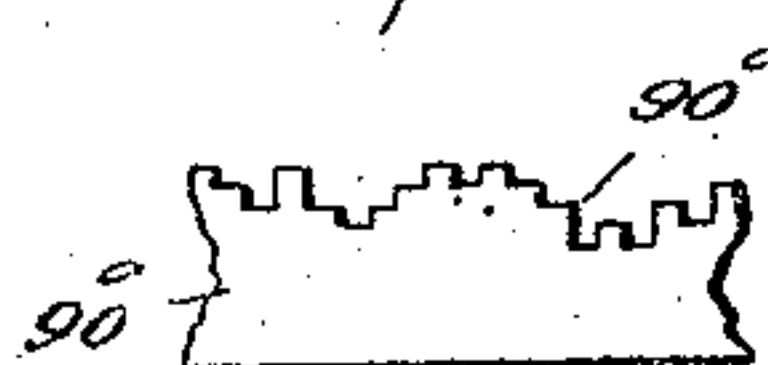
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Fig 12



INVENTOR

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UNITED STATES PATENT OFFICE.

LAWRENCE F. URBANUS, OF CHICAGO, ILLINOIS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 574,230, dated December 29, 1896.

Application filed October 11, 1894. Serial No. 525,648. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE F. URBANUS, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Type-Writing Machine, of which the following is a full, clear, and exact description.

The object of this invention is to provide a superior type-writer having the revoluble type-wheel, on which type-heads are mounted, and means by which the type-heads may be moved to effect an impression.

Another object of my invention is to produce a machine having a simple and efficient feed mechanism to move the carriage backward and forward, also to arrange the key mechanism so that the machine may be operated to shift from upper to lower case and made to make the line and letter spaces with great facility and nicety, and, in general, to produce a machine which is adapted to operate with the utmost speed and do the best work.

Still another object of my invention is to produce a variable-spacing mechanism for the machine, so that absolutely exact printing may be done, the mechanism being arranged so that a small space may be made for a period or other punctuation-mark, a larger one for a letter, and a still larger one for a combination of letters.

To these ends my invention consists of certain features of construction and combinations of parts which will be hereinafter described and claimed.

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

Figure 1 is a plan view of the machine embodying my invention. Fig. 2 is a longitudinal section on the line 2 2 of Fig. 1. Fig. 3 is a cross-section on the line 3 3 of Fig. 2, looking toward the carriage. Fig. 4 is a detail section on the line 4 4 of Fig. 3 and illustrates an end elevation of the carriage. Fig. 5 is a broken detail plan of the revoluble disk or plate, the type mechanism thereon, and the keys which operate the type. Fig. 6 is a cross-section on the line 6 6 of Fig. 2. Fig. 7 is a broken sectional plan on the line 7 7 of Fig. 6. Fig. 8 is a cross-section on the line 8 8 of Fig. 9 and shows the spring mechanism for

returning the carriage. Fig. 9 is a broken vertical section on the line 9 9 of Fig. 8 and shows an end elevation of the aforesaid carriage-return mechanism. Fig. 10 is a broken detail plan of a portion of the carriage and the mechanism for automatically turning the platen or roller so as to make a line-space. Fig. 11 is a detail of the key mechanism, and Fig. 12 is a broken side elevation of a modified form of the cross-bar struck by the keys to actuate the spacing mechanism.

The machine is provided with a suitable frame 10, which supports a vertical post 11, and on this is a revoluble hollow shaft 12, journaled in ball-bearings 13 at the top and bottom, and the shaft carries a revoluble disk or plate 14, which, together with the printing mechanism thereon, is inclosed by a dish-shaped cover 15, which is fastened by a thumb-screw 16, or equivalent device, to the top of the post 11. On the periphery of the type-disk 14 are rings 17 and 18, arranged one beneath the other and connected by a circumferential band 19, (see Figs. 6 and 7,) which is cut away at regular intervals to provide openings 20 for the type-heads 22, which are carried on vertical spindles 23, held loosely in holes 24 in the rings 17 and 18. The type-heads 22 have central grooves, as shown in Fig. 2, thus dividing the heads into two parts, the upper of which preferably carries the lower-case type 22^a and the lower part carries the upper-case type 22^b; but of course this arrangement may be reversed. It will be observed that the wheel may be very conveniently made of sufficient width to permit the combination of type letters or logotypes to be produced on them. It will be understood that in either case each of the wheel parts carries a character.

As the disk 14 revolves it brings the type-head 22 opposite an inking-roller 25, which is journaled on an arm 26, extending from the post 11, and immediately after leaving the roller the type on the wheel is turned so as to press against the roller-platen 27, which is of the usual kind and is carried by a movable carriage, as hereinafter described, the roller being held horizontally opposite the face of the printing mechanism, as shown clearly in Fig. 2. The spindles 23 of the type-wheels are each provided with pinions 28, which,

when the spindles are raised, engage a rack 29 on a suitable support 30, (see Figs. 6 and 7,) the rack being preferably concentric with the shaft 12, and thus the movement of the disk 14 causes the pinion to roll on the stationary rack and so turn the type-head and bring the type thereon first against the inking-roller 25 and then in position to print on the platen 27. This obviates the use of an ink-ribbon and enables the type to be perfectly inked just before it prints. Under normal conditions, however, the type-heads turn below the inking-roller and platen and only the type-head which is to print is inked, and consequently a great saving of ink is effected.

The upper end of the arm 26 extends outward above the spindles and is bent to form a cam 31, as shown in Figs. 2 and 6, which cam is placed just beyond the printing-point, so that after a type-head has printed the spindle 23 strikes against the cam 31, and is thus forced downward to normal position, thus making it impossible for any type-wheel to stick up and cause a bad impression. The disk 14 and the type-heads are kept in constant and rapid rotation, this being effected by means of a pulley 9 on the shaft 12, and a belt 8, which is adapted to connect with a spring, electric, or other motor.

The several type-heads are thrown up to place by the mechanism described below. For each type-spindle 23 there is a type-lever 32, (see Fig. 2,) which is journaled in a hanger 33, placed radially on the under side of the disk 14, and the lever has at its outer end an arm 34, adapted to swing upward and lift the spindle 23, and at its inner end a depending arm 35, which is adapted to strike the reduced upper end 36 of a type-bar 37, which is vertically movable, and there is a type-bar for each lever and a key for each type-bar, as described presently. The reduced ends of the type-bars move vertically through apertures 38 in a guide-plate 39, which is shown best in Figs. 2 and 5, and in order that each type-bar may strike its appropriate type-lever the several type-bars are arranged so that no two of them are in line, that is, they are arranged at different distances from the center of the type-disk 14, and the type-levers 32 are of dissimilar lengths, so that their arms 35 are arranged in a spiral line, as shown clearly in Fig. 5, and thus it is possible for each arm 35 to strike its appropriate type-bar when the latter is raised, without coming in contact with any other type-bar.

The type-bars 37 are each pivoted to a key 40, which is arranged horizontally in the machine-frame in the usual way, being fulcrumed as shown at 42, and provided with a finger-piece 41, and the finger-pieces of the several keys are arranged in banks after the usual manner. The type-bars 37 move through a plate 43, as shown clearly in Fig. 11, and beneath this plate on each type-bar is a spring 44, which carries back the key 40 and type-bar after the latter has been raised.

On the under side of the guide-plate 39 is a slide-plate 46, which is held to the guide-plate by means of screws 48, projecting through slots 47 in the slide-plate, (see Fig. 5,) and the slide-plate is also provided with slots 45 wide enough to permit the passage of the body portion of the type-bars through them. The slide-plate is to adjust the type-bars for lower and upper case printing, that is to say, if the slide-plate is pulled forward a type-bar may project bodily through a slot 45, and the upper end 36 of the type-bar, striking an arm 35 of a type-lever 32, will move the lever sufficiently to cause its arm 34 to raise the type-head 22 so that the lower portion of the head will come opposite the platen 27 and thus print an upper-case character, but in normal position the slide-plate 46 is pushed back to the position shown in Fig. 11, and this brings the slide-plate into position to strike the shoulder of the type-bar 37 and prevent the latter from moving upward through the slot 45 of the slide-plate, and hence when the end 36 of the type-bar strikes the arm 35 of the type-lever 32 it will only move the arm 34 sufficiently to bring the upper half of the type-wheel opposite the platen, as shown in Fig. 2, and a lower-case character is printed. The slide-plate 46 is moved by means of a connecting-rod 49, which is pivoted to a crank-arm 50 on a letter-shift key 51, which is pivoted at its elbow, as shown at 52, and terminates in a finger-piece 53, which may be struck to tilt the lever and shift the slide-plate.

The platen 27 is carried by a carriage 54, which is movable back and forth opposite one edge of the printing-disk and its mechanism, and the carriage at one side slides on a supporting-rod 55 and at the other has rollers 56, which clasp a guideway 57. (See Fig. 2.) The platen is journaled in brackets 58, which are secured to the arms 59 of the carriage, these arms being fulcrumed, as shown at 60, so that when desired the platen, the feed-roller beneath it, and the paper-guides above and below it may be thrown back so as to permit the work and the printing mechanism to be examined. The arms 59 carry a feed-roller 61, which is held just beneath the platen 27, and a paper-guide 62 extends inward from the carriage back to a point opposite the meeting rollers, and above the platen is another paper-guide 63, which is held on arms 64, extending upward from the arms 59.

The platen 27 is provided with the usual end-milled wheels 65 to enable it to be turned by hand, and it has the customary ratchet-wheel 66 and pawl 67 to prevent its accidental turning.

The carriage 54 is moved backward and forward by means of a tape or belt 68, which extends longitudinally beneath it and to which the carriage is attached, this belt being at one end secured to a spring-barrel 69, the spring 70 of which is coiled within it and is secured at one end to the barrel and at the other to the shaft 71, which carries the barrel, this

shaft being journaled in suitable supports 72 and provided with a ratchet-wheel 73 and pawl 74 to prevent it from turning in the wrong direction. The shaft is provided at one end with a disk 75, having pins 76 thereon, the disk and pins thus serving as the key by which the shaft may be turned so as to tighten the spring and regulate its tension. The opposite end of the belt 68 is secured to a pulley 77 on a shaft 78, which is parallel with the shaft 71 but at the opposite side of the machine, as shown clearly in Fig. 3, and the pulley 77 is loosely mounted on its shaft 78 and is normally held to rotate therewith by means of a clutch 79, keyed to slide on the shaft in the usual manner. A spring 80 backs the clutch and normally keeps it in engagement with the pulley. In order to prevent the shaft 78 and the pulley 77 (as long as it is coupled thereto by the clutch 79) from rotating in the direction in which the spring 70 tends to turn them, I provide a pawl 80^a, which engages a ratchet-wheel 81, mounted to turn with the shaft 78. The ratchet-wheel 81 is also engaged by a rack 82, (see Fig. 3,) which is movable vertically opposite the ratchet-wheel, and the said rack slides in a guide 83 and is pulled upward by a spring 84.

The lower end of the rack-bar 82 is pivoted to a lever 85, which swings vertically, as shown in Fig. 3, and this lever is engaged by one end of the spacing-key 86, which extends forward to the keyboard and is provided with a finger-piece 87, extending the full width of the keyboard, the opposite end of the said finger-piece being pivoted to a lever 88, the pivot 89 of which is opposite the corresponding pivot of the spacing-key 86. The lever 88 and spacing-key 86 are connected by a cross-piece 90, (see Fig. 2,) which is arranged in the usual manner beneath the keys 40, and thus whenever a key 40 is depressed to print a letter, as already described, the lever 85 is raised, thereby depressing the rack-bar 82, so that the ratchet-wheel 81 and with it the shaft 78, the clutch 79, and the pulley 77 will be turned against the tension of the spring 70, causing the said pulley 77 to pull on the belt 68 and move the carriage 54 and the platen a distance of one letter-space and at the same time partly winding up the spring 70. When the letter is printed and the key returns to its normal position, the spring 84 will restore the rack 82 to its upper or normal position, the pawl 80^a preventing the return movement of the pulley 77 and the carriage 54. It will be seen that the effect is the same whether one of the letter-keys or the spacing-key 86 is depressed.

To provide for variable spacing, that is, to make a space corresponding to the character printed, the several keys 40 are provided with notches 40^a on the under side, these being relatively shallow or deep, according as the space to be made is large or small. Consequently when a key with a small notch or perhaps with no notch is depressed it will

move the cross-piece a comparatively long distance and thus make a large space, while one of the keys which is more deeply notched will move the cross-piece a less distance and therefore make a smaller space. It will be obvious that the notches may be provided in the cross-piece 90, as shown at 90^a in Fig. 12, the keys in that case having no notches.

When the carriage has been moved from left to right to print a line, all that is necessary to return it is to release the clutch 79, and the tension of the spring 70 turns the spring-barrel 69 and pulls on the belt 68, so as to pull back the carriage and unwind the belt from the pulley 77. This releasing of the clutch is effected by the following mechanism: The clutch is connected by means of the usual groove and pin, as shown in Fig. 1, or in any equivalent manner, with a lever 91, which is fulcrumed near its center, as indicated at 92, and the free end of the lever has a pin 93, which engages a cam-tooth 94 on the return-key 95, terminating at its front end in a finger-piece 96, arranged on the keyboard with the other finger-pieces, and the return-key is fulcrumed on the same pivot 42 as the other keys. It will be seen then that by simply depressing the finger-piece 96 the rear end of the carriage-return key 95 is raised, moving the cam-tooth 94 against the pin 93 and swinging the lever 91 so as to move the clutch 79 out of engagement with the pulley 77 against the tension of the spring 80, thus releasing the pulley 77 and permitting the return of the carriage.

Each time the carriage is moved to the left by the depression of one of the keys 40 the rack 82, by turning the pulley 77, partly rewinds the spring 70, so that when the carriage reaches its extreme position to the left the spring is fully rewound. The winding of the spring therefore is entirely automatic.

In order that the spring may be wound up when the carriage is moved to the left by hand, the carriage is provided with a rack-bar 81^a, which is secured to its under side and engages the ratchet-wheel 81, so that when the machine is being used in the ordinary way the rack has no function; but if the carriage is pushed to the left the rack-bar engages the ratchet-wheel and turns the shaft 78 and pulls on the belt 68, so as to wind up the spring 70 of the spring-barrel, and the carriage may therefore be returned, as described.

The arrangement above described provides for making the letter-spaces, and to make the necessary line-spaces the mechanism shown best in Fig. 10 is employed, which does the line-spacing automatically on the return of the carriage.

The shaft of the platen 27 is provided with a spiral slot 97, which is adapted to engage the pins 98 of the short shaft 99, which is journaled on the frame 10 opposite the end of the platen-shaft, and the shaft 99 is provided with a ratchet-wheel 100, which is en-

gaged by a pawl 101, this locking the shaft so that it can turn in but one direction. As a result, when the carriage returns to begin a new line the pins 98 enter the slot 97 and, acting on the walls of the slot, turn up the platen, so as to bring the paper into position for a new line; but when the platen begins to move away in the opposite direction, while a new line is being printed, it is not turned, because the ratchet-wheel 100 and pawl 101 permit the slotted shaft of the platen to turn the shaft 99.

From the foregoing description it will be seen that the machine can be easily and perfectly controlled and that the keys merely serve to throw the type into position for printing, while the actual work is done by a rotating disk or cylinder, and hence the letters are all similarly and nicely printed.

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

1. In a type-writing machine, a revoluble disk, types secured near the periphery of the disk and slidable individually toward and from the same, in a direction approximately perpendicular to the plane of the disk and means for moving any one of the types relatively to the disk and independently of the other types, substantially as described.

2. In a type-writing machine, a revoluble disk, types secured near the periphery thereof and each independently slidable relatively to the disk in a direction substantially parallel to the axis of the same, each type having a plurality of characters thereon, and means for independently moving the individual types relatively to the disk, substantially as described.

3. In a type-writing machine, the combination with the revoluble disk and the vertically-movable type-carrying spindles thereon, of the inking-roller and platen above the disk, and means, as the pinion on the spindles and the stationary rack, for turning the spindles, substantially as described.

4. In a type-writing machine, the combination, with the revoluble disk, of the vertically-movable type-spindles on its periphery, the key-operated mechanism for raising the spindles, type-heads on the spindles, an arm extending above the disk and terminating in a cam to engage the tops of the spindles, and an inking-roller carried by the arm and extending into the path of the raised type-heads, substantially as described.

5. The combination, with the revoluble disk and the vertically-movable type-carrying spindles thereon, of the type-levers journaled on the under side of the disk and provided with arms to engage the spindles, and a key mechanism for moving any desired type-lever, substantially as described.

6. The combination, with the revoluble disk and the vertically-movable type-carrying spindles thereon, of the type-heads journaled on the disk, there being a lever for each spin-

dle, arms at the outer ends of the levers to engage the spindles, a second series of arms, each secured to the type-levers and arranged in different radii on the disk, and key-operated type-bars to engage the second series of arms and tilt the type-levers, substantially as described.

7. The combination, with the revoluble disk, the vertically-movable type-carrying spindles thereon, the tilting levers on the disk to engage the spindles, and the arms on the levers, of a guide-plate beneath the levers, vertically-movable type-bars to engage the arms, and a key-operated device to regulate the movement of the type-bars and the throw of the levers, substantially as described.

8. The combination, with the revoluble disk, the vertically-movable type-carrying spindles, the tilting levers to operate the spindles, and the operating-arms on the levers, of the perforated guide-bar beneath the lever-arms, a key-operated slotted slide-bar beneath the guide-bar, and the key-operated type-bars adapted to move through the slots of the slide-bar and having reduced ends to enter the perforations of the guide-bar and engage the lever-arms, substantially as described.

9. The combination of a revoluble type-disk, means for continuously revolving the same, type-heads carried by the disk and movable independently thereon in a line parallel with the axis of the disk, a pinion on the trunnion of each type-head, a stationary rack-bar raised above the normal positions of the pinions, and means for elevating the pinions into engagement with the rack-bar, substantially as described.

10. In a type-writer, a paper-roller, a hollow shaft rigid therewith and having a spiral groove therein, a second shaft having a pin projecting therefrom and capable of being received within the hollow shaft, and pawl-and-ratchet mechanism for the solid shaft, substantially as described.

11. In a type-writer, a paper-roller having a cammed surface, a revoluble shaft having a pin thereon capable of engaging with the cam-surface of the paper-roller, and pawl-and-ratchet mechanism operating with the shaft, substantially as described.

12. The combination with the type-actuating and carriage-moving mechanism, of a transverse rod, a parallel track extending with the rod, a carriage having an eye receiving the rod, two oppositely-located rollers on the carriage and embracing the track, two arms pivotally mounted on the carriage and provided with downwardly-extending portions engaging the same, and paper-rollers carried by the arms, substantially as described.

13. In a type-writer, the combination of a disk, means for continuously revolving the same, a series of type revolving with the disk and movable vertically, means for moving them vertically, an inking-roller, a platen, and a rack, substantially as described.

14. In a type-writer, the combination of a post, a disk revolving thereon, an arm projected from the post, an inking-roller carried by the arm, type vertically movable on the disk, a platen, a stationary rack, and pinions on the type, substantially as described.

15. In a type-writer, the combination of a mounted disk, type movable vertically on the disk, bent levers of varying lengths respectively connected to the type, bars movable into engagement with the levers, keys actuating the bars, and a platen, substantially as described.

16. In a type-writer, the combination of a disk, type movable vertically thereon, bent levers of varying lengths respectively connected with the type, bars movable into engagement with the levers, keys controlling

the bars, a stationary rack, pinions on the type and movable with the type to engage the rack, and a platen, substantially as described.

17. In a type-writer, the combination with a frame, of type-operating bars each having a shoulder thereon, type, and a slide-plate adapted to reciprocate and formed with a series of slots respectively receiving the type-operating bars, the plate being capable of engaging with the shoulders of the type-operating bars or permitting said shoulders to pass through the slots, substantially as described.

LAWRENCE F. URBANUS.

Witnesses:

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CHAS. A. LUSBY.