

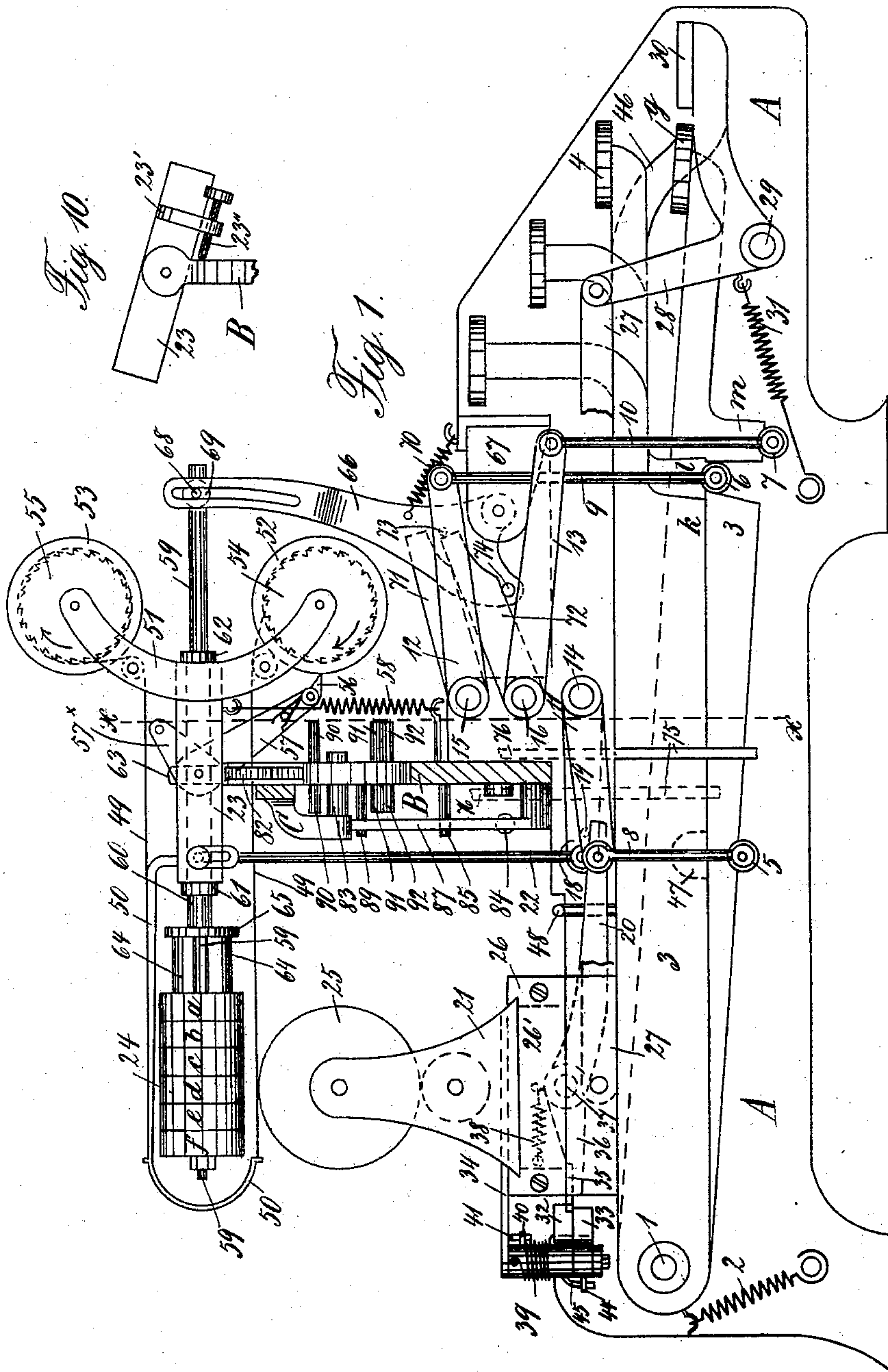
(No Model.)

4 Sheets—Sheet 1.

E. WENTSCHER.
TYPE WRITING MACHINE.

No. 605,619.

Patented June 14, 1898.



Witnesses.
C. Weist.
W. Heyke.

Inventor.
Ernst Wentscher

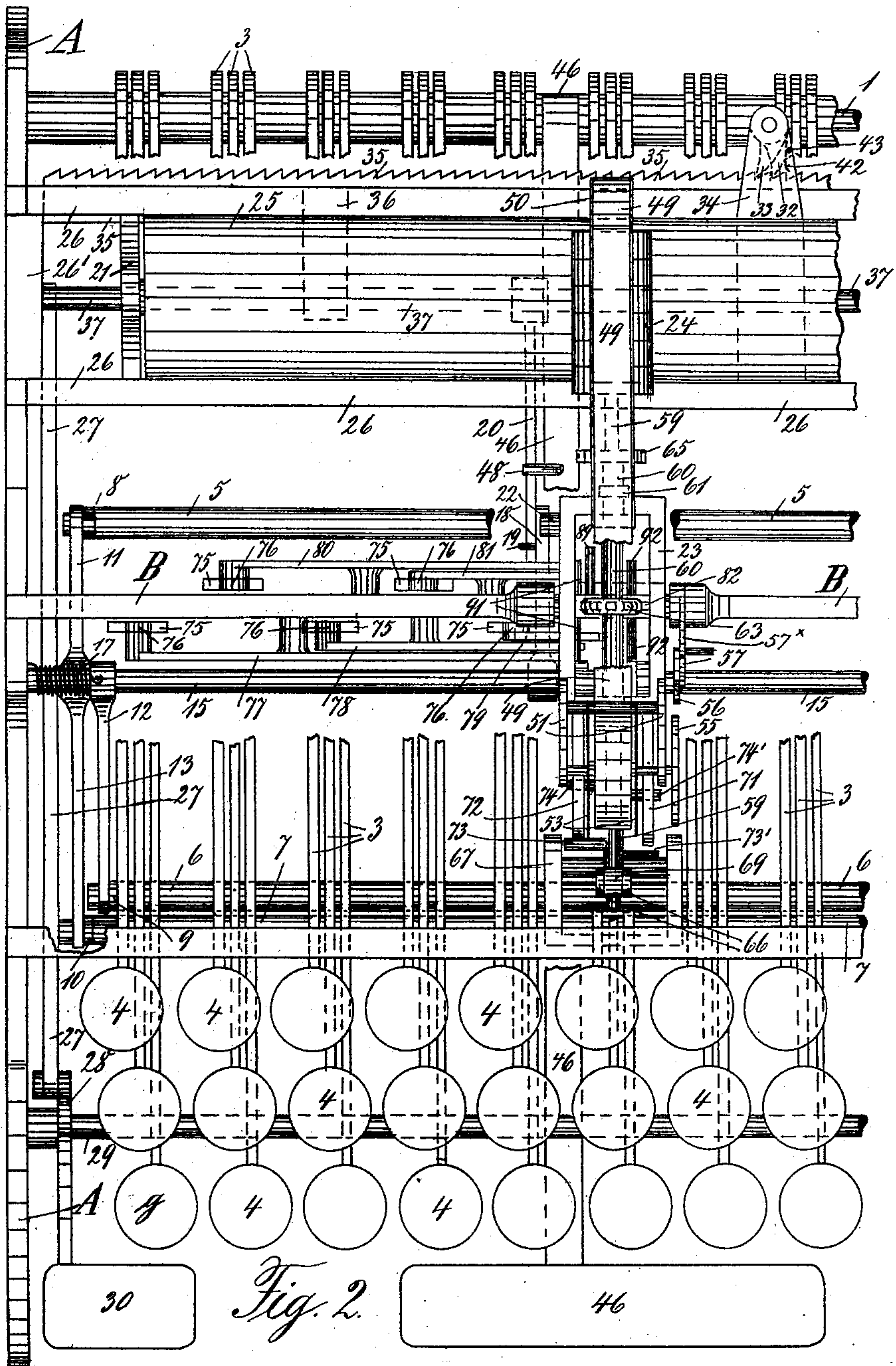
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C. Weir
W. Beyke.

Inventor:

Ernst Wentzker

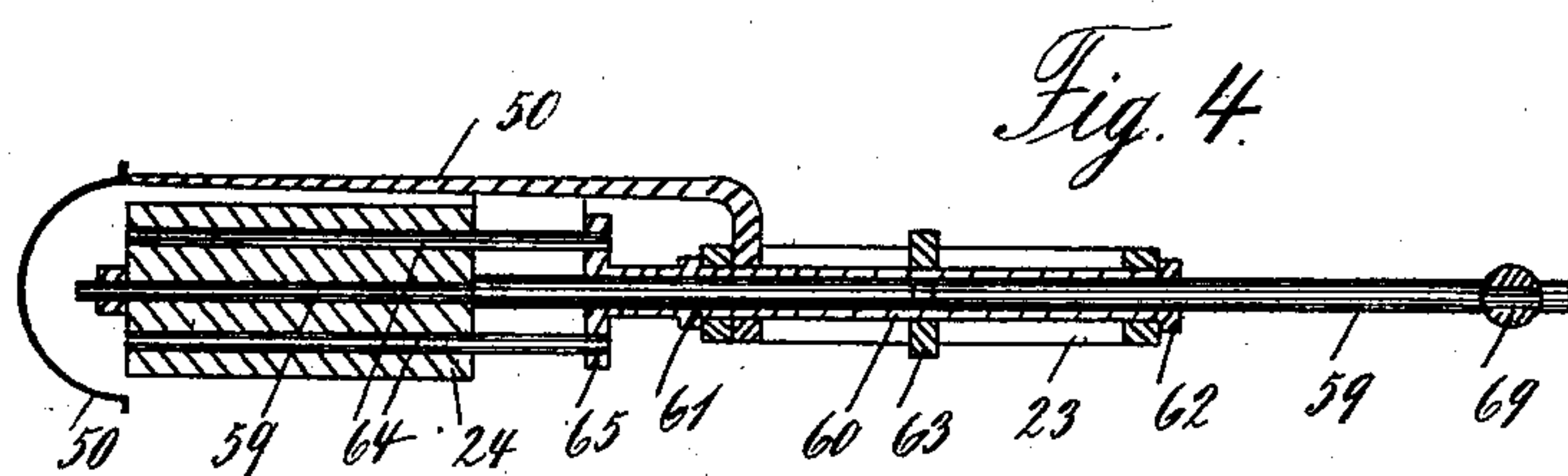
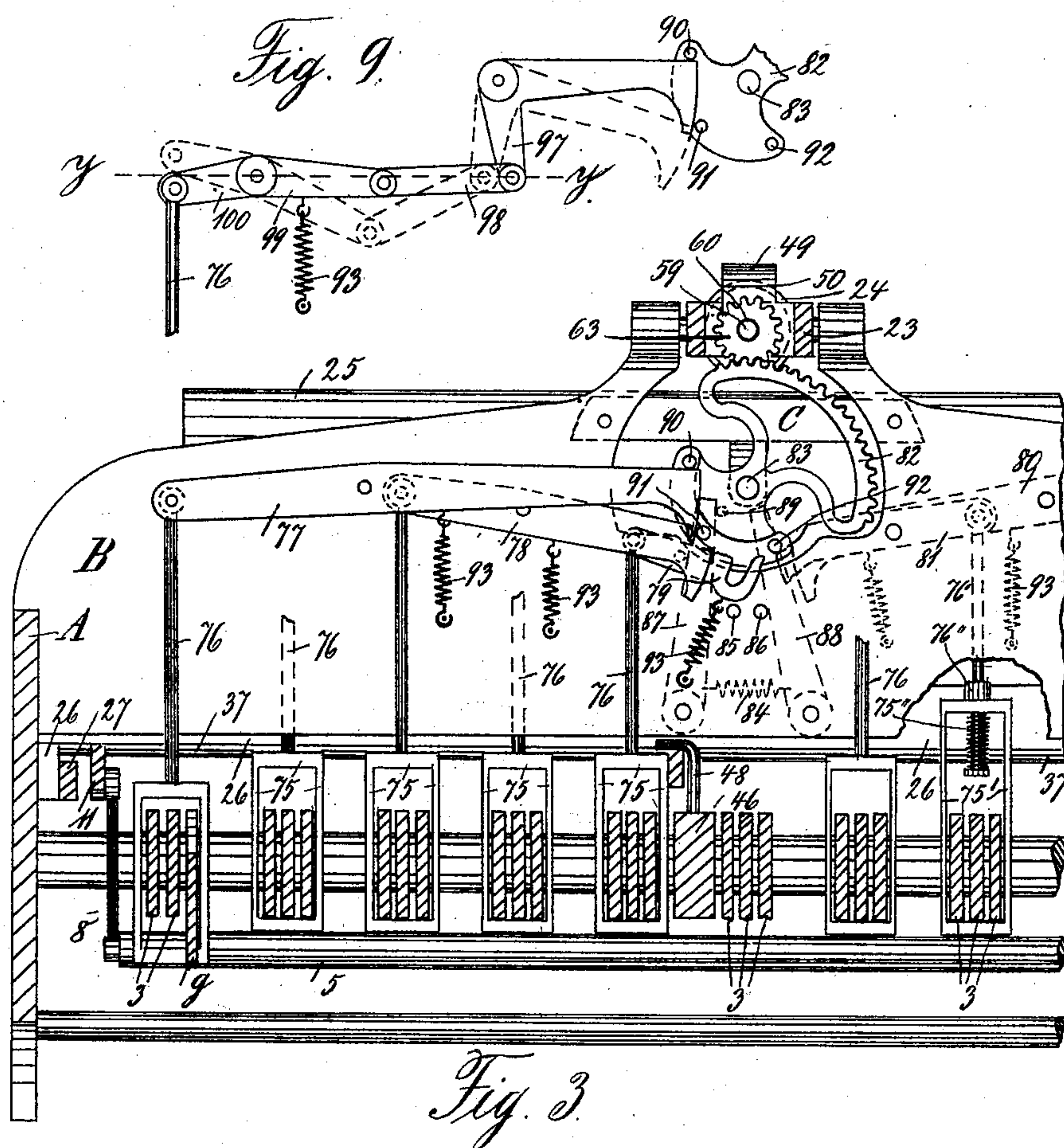
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4 Sheets—Sheet 3.

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W. Heyke.

Inventor.

Ernst Wentscher

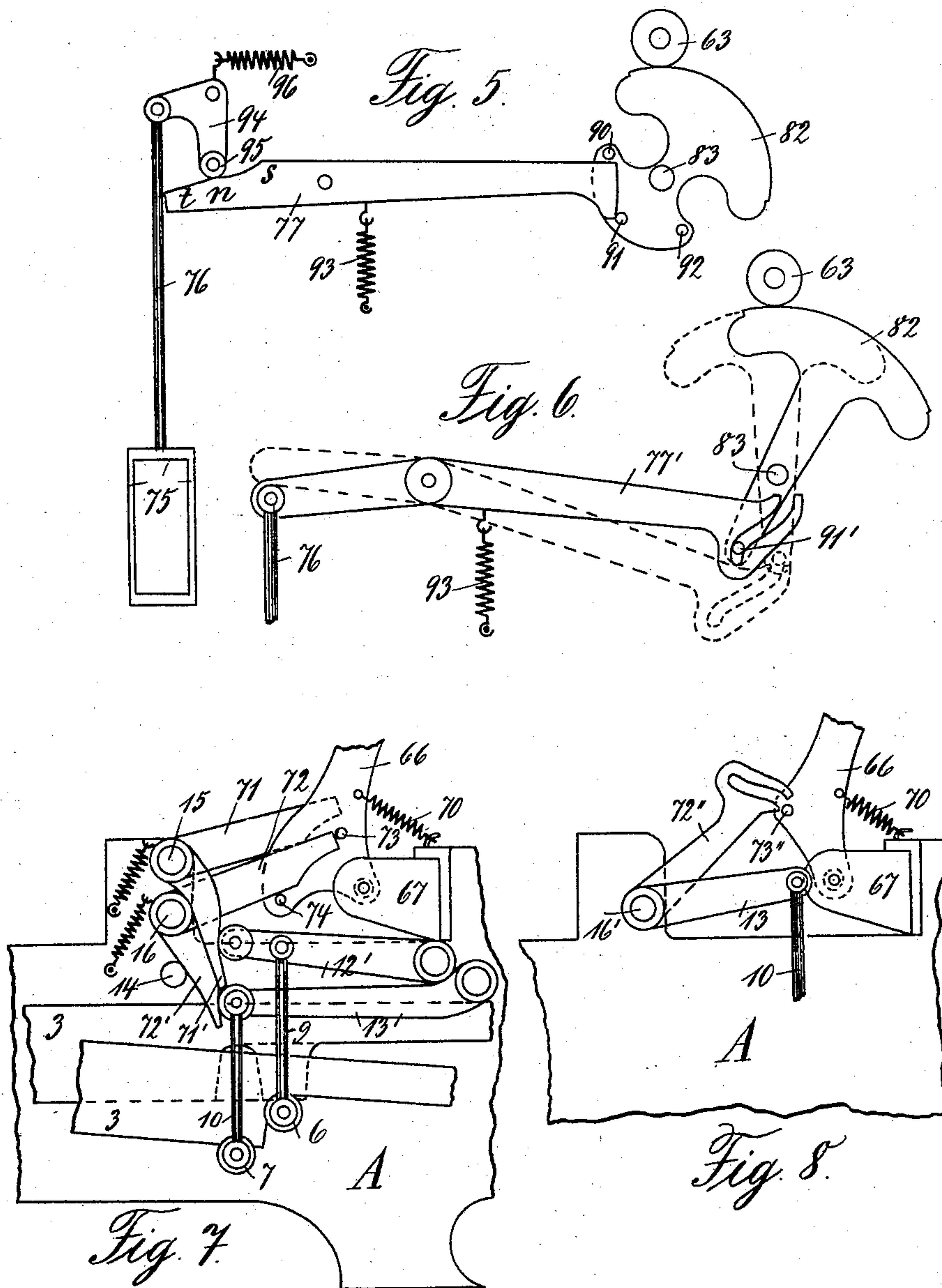
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4 Sheets—Sheet 4.

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Witnesses.
C. W. W.
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Inventor.
Ernst Wentscher

UNITED STATES PATENT OFFICE.

ERNST WENTSCHER, OF BERLIN, GERMANY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 605,619, dated June 14, 1898.

Application filed April 6, 1896. Serial No. 586,407. (No model.) Patented in England August 30, 1895, No. 16,269.

To all whom it may concern:

Be it known that I, ERNST WENTSCHER, a subject of the German Emperor, residing at Berlin, Germany, have invented certain new and useful Improvements in Type-Writing Machines, (for which I have obtained a patent in Great Britain, No. 16,269, bearing date August 30, 1895,) of which the following is a specification.

My invention relates to type-writers in which the types are provided on a cylinder to be rotated and shifted on its axis and swung against the paper-carrier; and the object of my invention is to provide means for rotating, shifting, and instantaneously and exactly stopping the type-cylinder by the common key-stroke. I attain these objects by the mechanisms illustrated in the accompanying drawings, in which—

Figure 1 is a side view, the left-hand side frame being removed; Fig. 2, a top view broken away at the right; Fig. 3, a front and sectional view through line *xx* of Fig. 1 and corresponding to Fig. 2. Figs. 4 to 10 are details and modifications of my invention hereinafter fully described.

Similar letters and figures refer to similar parts throughout the several views.

The key-levers 3, provided with finger-plates 4, are loosely mounted on a shaft 1, fixed to the side frames A and held in position by springs 2. Rods 5 6 7 extend underneath the key-levers and are connected, respectively, by rods 8 9 10 to levers 11 12 13, fixed to the ends of rocking shafts 14 15 16, which are journaled in the side frames A and kept in position by springs 17, Fig. 2, surrounding the said shafts. A lever 18, fixed to shaft 14, bears with a pin 19 against a lever 20, controlling the shifting movement of the paper-carriage 21, and is connected by a rod 22 to the swinging frame 23 of the type-cylinder 24, which latter is thus swung against the paper-carrier 25 at each key-stroke.

The paper-carriage 21 is guided in rails 26 of a movable frame, the end pieces 26' of which slide along the inside of the side frames A and are connected by rods 27 to levers 28, mounted on a shaft 29. The middle portions of the said rods are broken away in the drawings, Fig. 1, in order to avoid confusion arising from dotted lines. A spring 31, actuat-

ing lever 28, thus holds the frame 26 26' and the paper-carriage in the rear position, as illustrated in the drawings, and returns it thereto whenever removed therefrom by depressing the upper-case-shifting key 30, attached to lever 28.

The paper-carriage 21 is drawn from the right to the left by a spring, as commonly, and therefore not represented in the drawings, and is controlled in its step-by-step movement by pawls 32 33, pivoted to a plate 34 of the carriage, and by a toothed rack 35, fixed to levers 36 of a rocking shaft 37, extending between the end pieces 26' of the frame 26 26'.

Shaft 37 carries the above-mentioned lever 20, and a spring 38, Fig. 1, tends to keep rack 35 in engagement with pawl 33 and out of engagement with pawl 32 and lever 20 in a raised position. Pawl 32 is actuated by a spiral spring 39, wound on the shaft of the pawl, so as to hold a pin 40, fixed to this shaft, in contact with a stop 41 of plate 34. Pawl 33 is turned outward beyond pawl 32 by a flat spring 42, Fig. 2, fixed to pawl 33 and bearing against a pin 43, projecting downward from pawl 32, as illustrated in Fig. 2, and a pin 44 of pawl 33, Fig. 1, bearing against a curved pin 45 of pawl 32, stops the movement of pawl 33. By these means the step-by-step movement of the paper-carriage is performed in the well-known manner—that is to say, the latter remains stationary—when by depressing a key rack 35 passes from engagement with pawl 33 into engagement with pawl 32, as represented in Fig. 1, and is shifted the distance of one tooth, when by releasing the key rack 35 is returned to its normal position by spring 38. These movements of rack 35 are performed at each key-stroke by means of the above-mentioned connections 5 8 11 14 18 19 20, and Fig. 1 shows the said parts in their working position, one of the keys *g* being supposed to be depressed.

The space-key 46, Figs. 1 and 2, is provided with a recess 47 opposite to rod 5 and with a hook 48 at its upper side, extending over the lever 20. Thus by depressing the space-key the type-cylinder is not swung downward against the paper-carrier 25; the latter only being shifted as required. Lever 20 is reached as well by the pin 19 as by the hook 48 in each position of the frame 26 26'.

The line-by-line turning movement of the paper-carrier 25 is effected in any well-known manner.

The ink-ribbon 49 passes over a guide-piece 50, fixed to the swinging frame 23, and is wound on reels 52 53, journaled in arms 51 of the frame. It is shifted by ratchet-wheels 54 55 on the shafts of the reels and a spring-actuated pawl 56, pivoted to a lever 57, turning on the swinging axis of the frame 23. Lever 57 is to be adjusted by a handle 57^x and fixed in the adjusted position or held therein by friction, so as to bring pawl 56 into engagement with the teeth either of wheel 54 or 55 when the type-cylinder 24 swings upward in order to shift the reels 52 53 and the ribbon in either or in the other sense, as indicated by arrows in Fig. 1. The upward-swinging movement of the type-cylinder is effected by a spring 58, fixed to the frame 23.

Fig. 4 is a longitudinal vertical section of the type-cylinder 24 and its swinging frame 23. The cylinder is fixed to a shaft 59, which passes freely through a sleeve 60, turning in the frame 23 and held in position by collars 61 62. The turning movement of the cylinder is effected by means of a pinion 63, fixed to the sleeve 60, and by fingers 64, projecting from a disk 65, forming the end of sleeve 60, and passing freely through longitudinal openings of the cylinder. Thus the latter is enabled to be turned and simultaneously longitudinally shifted with its shaft.

The types are arranged in sections *a b c d e f*, Fig. 1, on the outer surface of the cylinder, forming longitudinal rows. The upper-case letters and figures are placed in the sections *a b c*. When printing an upper-case letter or figure, the paper-carriage is shifted by depressing the shifting-key 30, while in the position illustrated in the drawings a lower-case letter of section *d* is to be printed, the type-cylinder, which in this position of the paper-carriage should normally print a letter of section *f*, having been longitudinally shifted the distance of two sections, as will be presently described.

The shifting movement of the type-cylinder is effected by a forked lever 66, pivoted in supports 67 of the framework and engaging by its slotted ends with pins 68 of a swivel-joint 69 of shaft 59, Fig. 4. Lever 66 is actuated by a spring 70, Fig. 1, so as to normally hold the cylinder in contact with disk 65 of sleeve 60 and in a position to print a letter of section *f* or of section *c*, the shifting-key 30 simultaneously having been depressed.

In order to print a letter of sections *b e* or *a d*, the cylinder is to be shifted the distance of one or two sections, respectively. This shifting movement is effected by levers 71 and 72, fixed to the above-mentioned rocking shafts 15 and 16, respectively, and by means of the connections 6 9 12 and 7 10 13, referred to heretofore.

Levers 71 72 are placed to both sides of lever 66, Figs. 1 and 2, the lower part of which is

provided at each side with two pins projecting from the lever, as shown in Fig. 1 with reference to the pins 73 74, which engage with lever 72. Key *g* being depressed takes along with the rod 7 and lever 72, which by actuating pin 74 swings the lever 66 to the left of Fig. 1 and correspondingly shifts the type-cylinder, as represented, Fig. 1. This swinging movement is stopped by the pin 73 when the latter reaches the end of lever 72, and the type-cylinder is thus shifted exactly the distance of two sections, so as to bring section *d* into printing position. Likewise by depressing a key which takes along with the rod 6 lever 71, by means of pins 73' 74', Fig. 2, performs the shifting movement of the type-cylinder a distance of one section, while it remains in its normal position and in contact with disk 65 by depressing a key which actuates neither of the rods 6 and 7. Accordingly thereto the keys are divided into three groups *k l m*, Fig. 1, and provided with suitable recesses at their under edges in such manner that the keys forming the group *k* actuate neither of the rods 6 and 7, while the keys of the group *l* take along with rod 6, and those of the group *m* rod 7 only. Lever 66 is returned to its normal position by the spring 70 whenever removed therefrom.

The turning movement of the type-cylinder is performed by analogous means, as best shown in Fig. 3. The key-levers 3, except the three middlemost ones, pass by three through frames 75, vertically suspended by rods 76 on levers 77 to 81, Figs. 2 and 3, pivoting to both sides of a vertical cross-plate B, which extends between the side frames A of the machine. There are two systems of levers 77 to 81 symmetrically arranged to the middle of the machine, the levers 77 78 79 of each system being placed at the front side of plate B and the levers 80 81 at the rear side thereof.

In Fig. 3 of the drawings the front levers 77 78 79 of the right-hand system are omitted and the rear levers 80 81 indicated by dotted lines, while in Fig. 2 but the left-hand lever system is shown, and the corresponding right-hand system is omitted by reason of being a mere repeating of the former ones. In Fig. 1 the levers 77 to 81 are altogether omitted for sake of clearly showing the other parts of the machine, the frames 75 and connecting-rods 76 being only partially indicated.

The left-hand levers 79 81 78 80 77 bring about the turning movement of the cylinder a distance of one, two, three, four, and five longitudinal rows, respectively, in either sense, and the right-hand levers correspondingly in the other sense. There is one row which normally prints when the cylinder remains in its middle position. Every three levers passing through the same frame 75 will therefore impart the same turning movements to the type-cylinder; but one of every three levers appertaining to the group *k*, the other to that *l*, and the third to group *m*, each of them brings about another shifting movement—that is to

say, when taking notice of the shifting-key 30 every three levers passing through the same frame 75 will control all the six types of the corresponding longitudinal row of the type-cylinder.

The turning movement of the type-cylinder is brought about by a swinging toothed segment 82, Figs. 3 and 2, loosely mounted on a pin 83 of a support fixed to a plate C, which extends across a recess formed in the frame-plate B. Segment 82 swings in the said recess and engages with the above-mentioned pinion 63 on sleeve 60. It is held in its normal position by levers 87 88, pivoted to the rear side of the frame-plate B and pressed against stop-pins 85 86 by a common spring 84, the upper ends of the said levers bearing against a pin 89, projecting from the rear side of segment 82, and thus returning the latter to its normal position whenever removed therefrom. Pins 90 91 92, projecting from both sides of the segment 82 and engaging with the levers 77 to 81, serve for turning and exactly stopping the segment and the type-cylinder, as indicated in Fig. 3 of the drawings with respect to lever 77, which is brought into working position by depressing the key *g*. Lever 77 takes along with the segment 82 by means of pin 90 until it is stopped by the pin 91 when the latter reaches the front end of lever 77. The depressed key being released, a spring 93 returns lever 77 to its normal position, and the segment is driven back by means of the spring-actuated lever 87 bearing against pin 89, as heretofore described. Lever 78 when actuated by depressing its corresponding key should turn the segment in a similar sense, but stop it sooner by reason of its stopping edge projecting beyond that of lever 77, and thus being sooner reached by the stop-pin 91. Levers 80 81 work in an analogous manner, as will be understood without further explanation. Lever 79, which imparts the slightest turning movement to the segment 82, is preferably hook-shaped, so as to turn and stop the segment by means of the pin 91 only, as clearly shown in Fig. 3.

The working ends of levers 77 to 81 are so shaped and arranged with respect to the path of pins 90 91 92 that each lever when working may bring about the corresponding turning movement of the segment without any interference on the part of the levers not in action. It is obvious that the turning and shifting movement of the type-cylinder must be finished before it reaches the paper-carrier 25 in order to make a clean impression. Fig. 1 shows the cylinder in the corresponding position, the remainder of its swinging movement being then to be performed without further turning and shifting the same. When the cylinder reaches this position, the depressed key *g* cannot be further depressed, by reason of its movement being stopped as well by the pin 91 of segment 82 bearing against the edge of lever 77 as by the pin 73 of lever 66 bear-

ing against the edge of lever 72; but the cylinder, in virtue of its inertia received by its swinging movement up to that position, will continue this movement allowed by the slotted upper end of connecting-rod 22 until it reaches the paper-carrier 25, a further depression of the key not being needed. As soon as the impression has been performed the cylinder recoils by assistance of the spring 58 and returns to the position shown in Fig. 1, likewise without being turned nor shifted for the above-mentioned purpose, and then by releasing the key it will be turned, shifted and swung back to its normal position, pinion 63 abiding in constant engagement with the segment 82 when the cylinder performs its swinging movement.

There are modifications of my invention consisting in means for allowing of depressing the keys until the type-cylinder positively reaches the paper-carrier and yet stopping its turning and shifting movement a little before. One of these modifications is represented in Fig. 3 by the right-hand frame 75', which is loosely mounted on its rod 76', so as to slide thereon, and pressed against a collar 76'' by a spiral spring 75'', the latter being of a greater resistance than spring 84, so as to overcome spring 84 when turning segment 82 without being compressed. As soon as the segment is stopped, while the type-cylinder has reached the position shown in Fig. 1, the depressed key *g* can be further depressed by compressing spring 75'' until the cylinder positively reaches the paper-carrier. For the same purpose, with respect to the shifting movement of the cylinder, levers 71 72, Fig. 1, may be elastically mounted on shafts 15 16, or there may be inserted a spring into the rods 9 10, as described with respect to the rod 76' of Fig. 3.

Figs. 5 and 7 show another modification of the turning and shifting mechanisms, respectively, answering the same purpose.

In Fig. 5 the supporting-rod 76 of frame 75 is connected to a lever 94, pivoted to the frame B and engaging by a pin or roller 95 with the suitably-shaped edge *t n s* of lever 77. When by depressing the corresponding key roller 95 reaches the point *n*, as represented in Fig. 5, the turning movement of lever 77 and of segment 82 is finished, the edge *n s* then forming a circle with respect to the swinging center of lever 94. The key therefore can be further depressed until the cylinder positively reaches the paper-carrier without being further turned. A spring 96 returns the lever 94 to its normal position when the depressed key is released, the turning movement of the cylinder likewise being prevented until roller 95 passes beyond the point *n*.

From the foregoing the modification represented in Fig. 7 will be easily understood. Levers 71' 72' are mounted on the shafts 15 16 and so shaped at the end of their working edges that levers 12' 13', actuating by pins or

rollers the levers 71' 72', will not further turn these levers when engaging with the ends of the said edges. If therefore, as represented Fig. 7, lever 72 has turned and stopped lever 66, lever 13' and rod 7, connected thereto, can be further depressed by the key without further turning lever 72.

It will be obvious that in the modification shown in Figs. 5 and 7 the controlling edges may be provided to levers 94 and 12' 13', and the pins or rollers engaging with the said edges to levers 77 and 71' 72', respectively.

Another modification is represented in Figs. 6 and 8, the supporting-rods 76 and 10 of the frame 75 and rod 7 being directly connected to levers 77' and 13, respectively, as described with reference to Figs. 1 and 3. The turning movement of the parts 82 and 66 is performed by slotted levers 77' and 72'', the slotted ends thereof engaging with pins 91' and 73'', respectively. This modification dispenses with separate stopping-pins, the pins 91' and 73'' serving the double purpose of turning and stopping the parts 82 and 66. In order to allow of depressing the key until the cylinder positively reaches the paper-carrier, the inner ends of the slots of levers 77' and 72'' are made of circular form with respect to their swinging centers, so as to stop the movement of the parts 82 66 for the last period of their stroke. In this modification the use of the levers 87 88 and spring 84, as described with reference to Fig. 3, and likewise of spring 70, as described with reference to Fig. 1, may be dispensed with, parts 82 and 66 being positively returned to their normal position, as indicated in Fig. 6 by dotted lines, and the overswinging of segment 82 beyond its middle position being prevented by giving likewise a suitable circular form to the open end of the slot of lever 77', by passing of which pin 91' and the segment are deprived of their inertia.

Another modification is shown in Fig. 9. Rod 76 is connected to a two-armed lever 99 100, the arm 99 of which, being pivoted to a rod 98, thus forming a toggle-lever. Rod 98 is movably connected to lever 97, which engages with the pins 90 91 of the segment 82. By these means the swinging movement of lever 97 will be gradually retarded when the swinging system passes from its normal position (indicated by dotted lines) to its working position. (Shown in full lines.) The latter having been nearly reached, lever 97 will be practically stopped for the short time the levers 98 99 pass through the dotted central line $y\ y$. This stoppage suffices for allowing of the type-cylinder performing the last period of its swinging movement without turning.

Fig. 10 shows an arrangement for stopping at different points the upward-swinging movement of the type-cylinder in order to regulate the force of its stroke against the paper-carrier. To this purpose a set-screw 23'' is provided in a support 23', laterally projecting from the swinging frame 23. Screw 23'' bears

against the frame-plate B, and the upward stroke of the cylinder can be varied at will by correspondingly adjusting screw 23'', the slot provided in the upper end of rod 22 being of sufficient length.

I do not confine my invention to any of the modifications described nor to the combination of mechanisms for simultaneously turning, shifting, and swinging the type-cylinder by the common key-stroke, the shifting movement not being absolutely needed—as, for instance, when arranging the types only in two sections of the type-cylinder, which are controlled by the shifting-key 30 only, or if arranging, as commonly, three sections of types controlled by two separate shifting-keys. My invention is independent of such combinations and simply consists in means for turning and simultaneously stopping a swinging part pivoted to the stationary frame of the machine no matter whether the swinging movement of this part is intended for turning or shifting the type-cylinder.

Having now fully described the nature of my invention, what I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging toothed segment, pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the stationary frame of the machine and engaging with the said pin or pins for swinging and stopping the swinging toothed segment, of frames suspended from the said levers, each of the said frames being actuated by the keys corresponding to one and the same longitudinal row of types of the type-cylinder, and of means for controlling the turning movement of the type-cylinder by the said swinging segment.

2. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging lever, pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the stationary frame of the machine and engaging with the said pin or pins for swinging and stopping the swinging lever, of frames suspended from the said levers, each of the said frames being actuated by the keys corresponding to one and the same circular section of types of the type-cylinder, and of means for controlling the longitudinal shifting movement of the type-cylinder.

3. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging part, pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the sta-

tionary frame of the machine and engaging with the said pin or pins for swinging and stopping the said swinging part, of frames suspended from the said levers and depressed by the key stroke, of springs inserted between the said frames and the said levers, and of means for controlling the type-cylinder by the said swinging part.

4. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging part pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the stationary frame of the machine and engaging with the said pin or pins for swinging and stopping the said swinging part, of levers controlling by pin-and-cam or by roller-and-cam action the movement of the said swinging and stopping levers, of frames suspended from the said controlling-levers and depressed by the key stroke, and of means for controlling the type-cylinder by the said swinging part.

5. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging toothed segment pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the stationary frame of the machine and engaging with the said pin or pins for swinging and stopping the swinging toothed segment, of levers controlling by pin-and-cam or by roller-and-cam action the movement of the said swinging and stopping levers, of frames suspended from the said controlling-levers, each of the said frames being actuated by the keys corresponding to one and the same longitudinal row of types of the type-cylinder, and of means for controlling the turning movement of the type-cylinder by the said swinging segment.

6. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging lever pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the stationary frame of the machine and engaging with the said pin or pins for swinging and stopping the swinging lever, of levers controlling by pin-and-cam or by roller-and-cam action the movement of the said swinging and stopping levers, of frames suspended from the said controlling-levers, each of the said frames being actuated by the keys corresponding to one and the same circular section of types of the type-cylinder, and of means for controlling the longitudinal shifting movement of the type-cylinder.

7. In a type-writing machine, in which the types are arranged in a plurality of circular

sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging part pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the stationary frame of the machine and engaging with the said pin or pins for swinging and stopping the swinging part, of toggle-levers controlling the movement of the said swinging and stopping levers, of frames suspended from the toggle-levers and depressed by the key stroke, and of means for controlling the type-cylinder by the said swinging part.

8. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging toothed segment, pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the stationary frame of the machine and engaging with the said pin or pins for swinging and stopping the swinging toothed segment, of toggle-levers controlling the movement of the said swinging and stopping levers, of frames suspended from the toggle-levers, each of the said frames being actuated by the keys corresponding to one and the same longitudinal row of types of the type-cylinder, and of means for controlling the turning movement of the type-cylinder by the said swinging segment.

9. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging lever, pivoted to the stationary frame of the machine and provided with a pin or pins, of levers likewise pivoted to the stationary frame of the machine and engaging with the said pin or pins for swinging and stopping the swinging lever, of toggle-levers controlling the movement of the said swinging and stopping levers, of frames suspended from the toggle-levers, each of the said frames being actuated by the keys corresponding to one and the same circular section of the types of the type-cylinder, and of means for controlling the longitudinal shifting movement of the type-cylinder.

10. In a type-writing machine, in which the types are arranged in a plurality of circular sections and of longitudinal rows on the surface of a type-cylinder, the combination of a swinging frame carrying the type-cylinder and an adjustable stop for stopping the upward-swinging movement of the type-cylinder at different points.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ERNST WENTSCHER.

Witnesses:

W. HAUPT,
CHARLES H. DAY.