

No. 737,457.

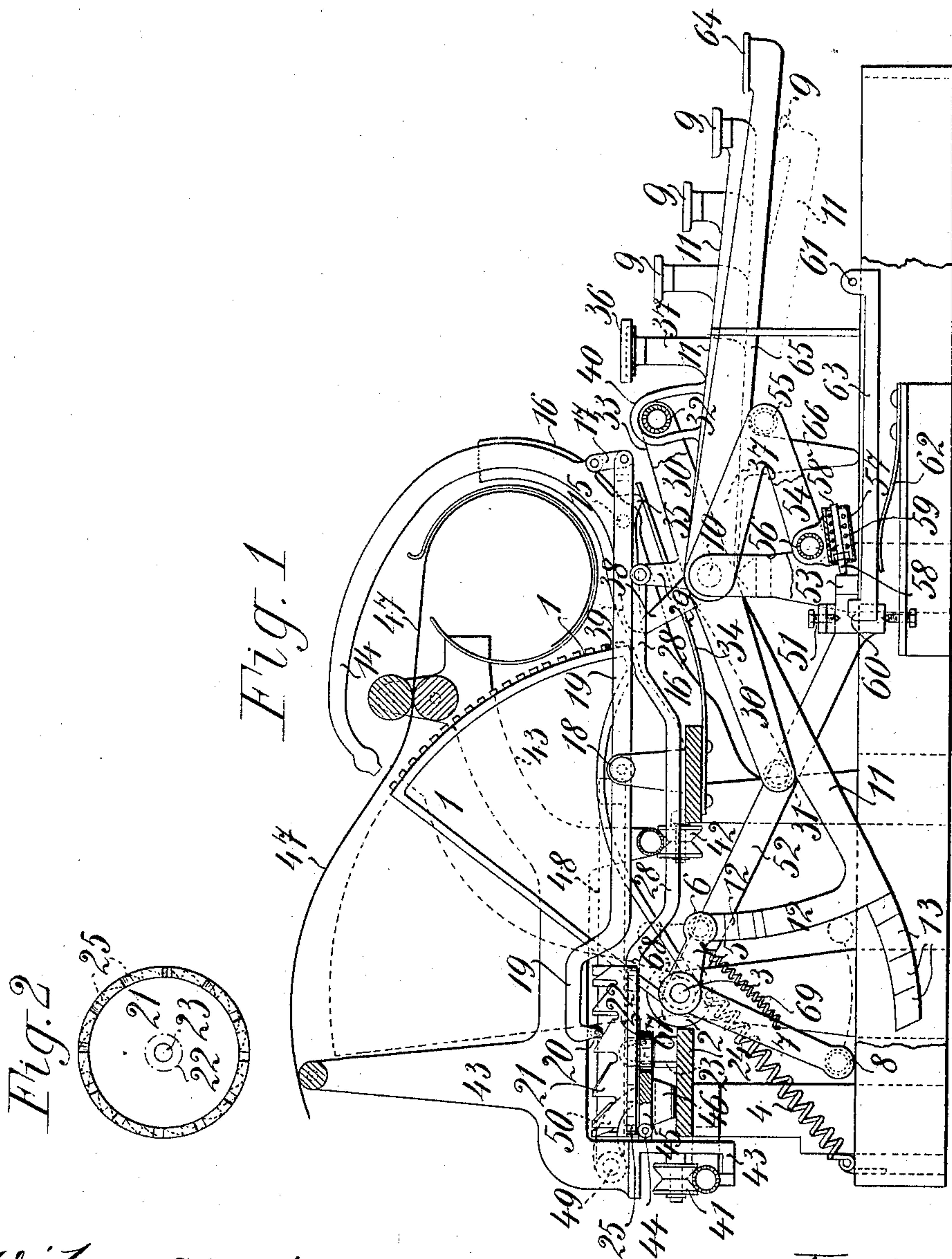
PATENTED AUG. 25, 1903.

E. NOWAK.
TYPE WRITER.

APPLICATION FILED MAR. 31, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
James L. Norris, Jr.
C. W. Kessler

Inventor
Emil Nowak
BY
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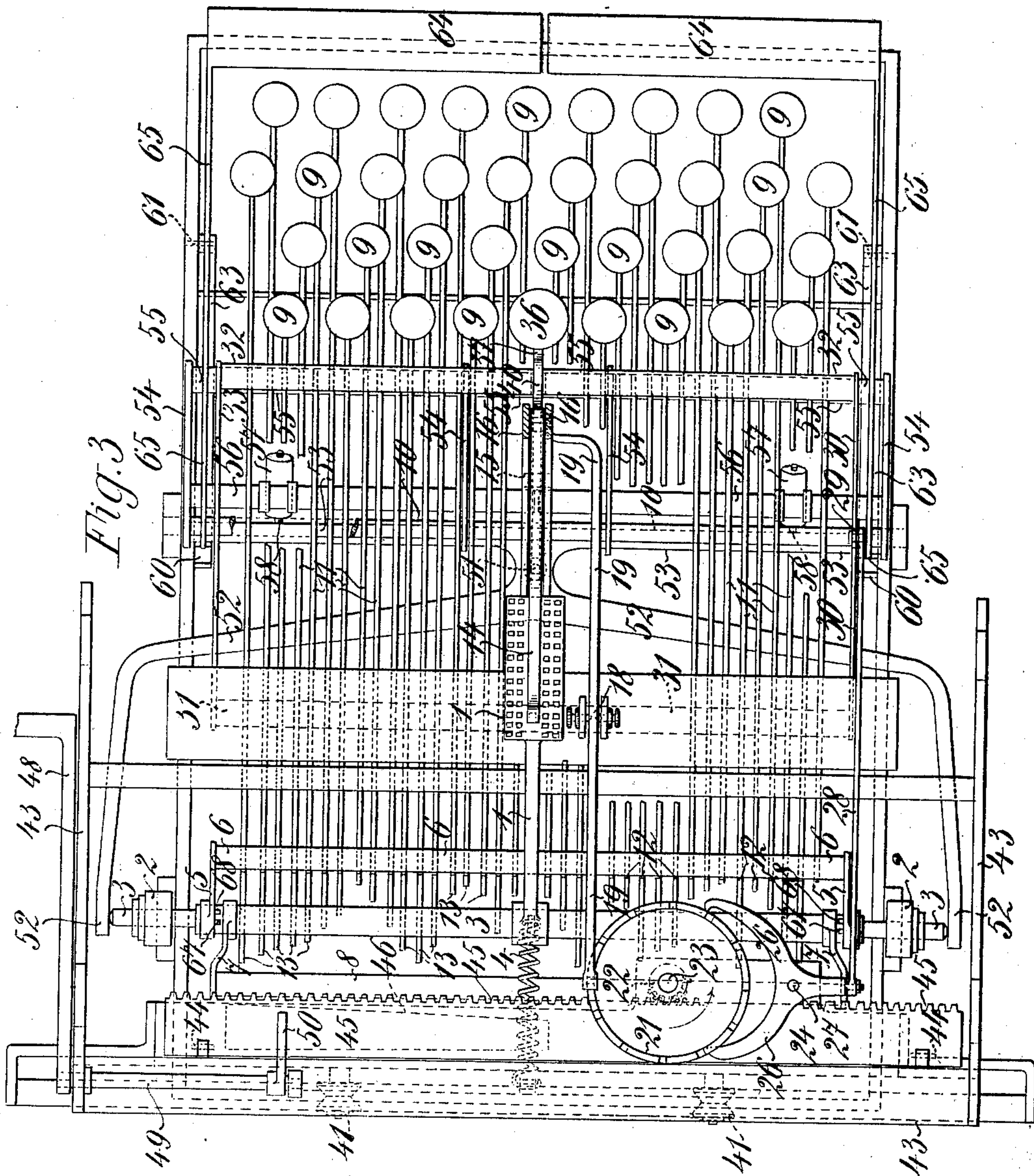
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UNITED STATES PATENT OFFICE.

EMIL NOWÁK, OF VIENNA, AUSTRIA-HUNGARY, ASSIGNOR TO JEAN JULIUS JUNGFERMANN AND AUGUST HOFFMANN, OF VIENNA, AUSTRIA-HUNGARY, AND HORST TICHSEN, OF SCHLOSS BUCHENGRUND, NEAR LÜBEN, PRUSSIAN SILESIA, GERMANY.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 737,457, dated August 25, 1903.

Application filed March 31, 1903. Serial No. 150,463. (No model.)

To all whom it may concern:

Be it known that I, EMIL NOWÁK, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Type-Writers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that kind of type-writer in which a sector of a cylinder carrying type is turned by the striking of a key to the position in which the type corresponding with the key is in the path of the hammer. The improvements are in the mechanism for bringing the type-sector into position and locking it therein by the key-lever. For this purpose the arrangement is such that the type-sector carries no type at its middle part, which is normally in the same plane as the hammer, and the rows of type are arranged symmetrically with respect to this part. By striking a type-key the sector is not only partly rotated, but also shifted in the direction of its axis in order to bring that row which contains the type corresponding with the key struck into position for printing. By thus arranging the rows of type on the sector the construction of the machine is rendered simple, symmetrical, and easily controlled.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a type-writer having the improvements according to this invention. Fig. 2 is a detail view, and Fig. 3 is a plan.

The type-sector 1 is keyed to the shaft 3, which is horizontally journaled in ball-bearings 2. Spring 4 tends to bring the sector back into the position shown in Fig. 1. The type is arranged on this sector in four rows parallel in vertical planes. Near each end of the shaft 3 is an arm 5, the two arms being united by a rod 6, parallel with the axis

of the shaft. The shaft also carries rearwardly-projecting arms 7, similarly united by a rod 8. The finger-keys 9 are fixed on the ends of levers 11, which turn on a common shaft 10. The other end of each lever has an upward projection 12 and an approximately horizontal projection 13. When a key is depressed first, the projection 12 comes in contact with the rod 6 and turns the type-sector 1 until the type corresponding with the key is brought into line with the head of the hammer 14. As soon as this is the case the projection 13 comes in contact with the rod 8 and prevents the type-sector from moving farther. The sector now remains in this position so long as the key is depressed; but as soon as the latter is liberated the sector returns to its position of rest under tension of the spring 4. The projections 12 and 13 of the key-levers must be of different lengths. Those levers which correspond with the lowest types on the sector must have the longest projections 12 and the shortest projections 13, while for the highest types the reverse is the case. The hammer 14 is journaled at 15 in the standards 16 and is connected by a short link 17 with one end of a lever 19, pivoted at 18. The other end of this lever carries a roller 20, which engages with the teeth of a crown-wheel 21. The latter is carried by a short vertical axle 23, which is journaled in the bracket 24 and has keyed to it a pinion 22. The lower edge of the crown-wheel 21 has escapement-teeth 25, engaging with an anchor 26. This anchor turns on a vertical axis 27 and is connected by a link 28 with the arm 29 of a three-armed lever 30, which turns free on the shaft 10. The ends of the lever 30 are connected by two bars 31 32, extending across all the key-levers 11, the former above the rear parts thereof and the latter above the front parts, with the ends of a similar lever 33. A spring 34, bearing against a projection 35 on the hammer 14, urges the latter toward the type-sector, and therefore keeps the lever 19 in the position in which its roller 20 bears against the teeth of the crown-wheel 21. The space-key 36 is carried by lever 37, the tail 38 of which engages under the tail 39 of the hammer 14,

thus keeping the hammer raised. Lever 37 has a loop 40, through which the rod 42 passes. The paper-carriage 43, sliding on rollers 41 42, carries a rack 45, which can be turned downward on hinges 44 and is pressed upward by a spring 46. This rack engages with the pinion 22. A spring-drum of known kind acts on the paper-carriage and is not shown in the drawings. When a key 9 is depressed, the type-sector is moved in the manner described. The rod 31 is moved upward, and the arm 29 of the lever 30 through link 28 rocks anchor 26 forward, so that the crown-wheel 21 under tension of the paper-carriage spring, through rack 45 and pinion 22, moves through an angle measured by the distance between two of the escapement-teeth. The paper-carriage is thus moved through a certain distance (half a space) at the same time the roller 20 of the lever 19 rides over a tooth of the crown-wheel, rocking the lever against the pressure of spring 34, raising the hammer 14 into its extreme position and letting it fall again to strike the paper 47, together with the color-ribbon above it, (not shown in the drawings,) against the type. When the key 9 is released, the type-sector returns to its normal position, together with the frame 30 31 32 33, which is urged by a spring. (Not shown in the drawings.) The anchor is thus rocked back into its first position, Fig. 3, letting the escapement move another tooth, so that the paper-carriage is shifted through another half-space and the hammer brought back into the position shown in Fig. 1. By actuating the space-key 36 exactly the same movements are produced, except that the type-sector is not moved and the hammer is raised and prevented from falling by the tail 38.

In order that the paper-carriage may be freely shifted, a short shaft is journaled thereon, carrying an arm 48 and a finger 50, which extends over the toothed rack 45. When the arm 48 is pressed downward, the finger 50 presses down the rack 45 on its hinges 44, so that it is out of engagement with pinion 22.

As already stated, the type-sector carries four rows of type symmetrically with regard to the middle plane of the machine. The inner rows come into use when keys 9 are depressed; but for bringing the outer rows into use a shifting-key must be depressed, as well as a key 9. The keys are arranged in two groups, one on each side of the middle line of the machine. The left-hand group corresponds with the two left-hand type rows on the sector, the right-hand group with the two right-hand rows. When one of the keys of the left-hand group is depressed, therefore, the type-sector must be shifted so far to the right that the corresponding row of type comes in the plane of the hammer, while depression of a key of the right-hand group must shift it equally to the left. This is accomplished by a four-armed lever turning on a vertical axis 51 and embracing with two of

its arms 52 the axle 3 of the sector, as shown in Fig. 3, while the two arms 53 extend right and left under the key-levers.

Turning free upon the shaft 10 there is on each side of the machine a bent lever-arm 54, each being connected with two rods 55 56, extending half-way across the machine. Each rod 56 has attached to it a casing 57, in which a pin 58 slides against the pressure of spring 59. This pin bears upon the arm 53. The distance through which the four-armed lever can move to the right and left is normally limited by the stop 60 on each side of the machine. This stop is carried by an arm 63, pivoted at 61 and urged upward by spring 62. At each side of the machine there is a shifting-key 64, fixed to an arm 65, which turns on the shaft 10 and has a downwardly-extending projection 66. When the shifting-key is depressed, this projection bearing on the arm 63, as shown in Fig. 1, depresses the latter, thus removing stop 60 from the path of the arm 53 of the four-armed lever, so that the latter can move until its arm 52 strikes the ball-bearing 2.

It will be seen that so far as the foregoing description is concerned the hammer 14 might fall while the type-sector 1 is still moving—that is, before it is fixed in its correct position. Such a premature action would imprint the wrong type or damage the paper. To avoid this, the arms 5, which are united by the rod 6, are mounted free on the shaft 3 and carry projections 68, which can engage with projections 67 on the shaft. Arms 5 are connected by springs 69 with the corresponding arms 7 on the shaft 3, these springs being strong enough to overcome spring 4 without suffering extension. When a key 9 is depressed, the type-sector is turned and at the same time shifted to bring the inside row of type into use, or if shifting-key has been previously depressed the outside row of type for the arms 5 carry with them the arms 7 by means of springs 69, and the frame 54 55 56 shifts, by means of spring-pin 58, the four-armed lever. The type-sector is now in its correct position before the arm 29 has rocked the anchor 26 far enough to free the escapement 25, a further pressure on the key 9, which puts springs 59 and 69 under pressure and tension, respectively, being essential before the anchor is sufficiently rocked. By reason that during this further pressure the rod 8 is already arrested by the projection 13 the type-sector 1 remains in position of rest, while the arms 5, loosely mounted on the shaft 3, put the spring 69 under tension and are rotated further until the projections 68 engage the projections 67 of the arrested arms 7. During this last part of movement imparted to the key independently of the type-sector the hammer 14 is released and may fall against the paper 47. The hammer therefore can only fall after the type-sector has attained its proper position. As the roller 20 occupies a certain time in riding

over a tooth of the crown-wheel 21, the paper-carriage will have been properly shifted at the moment when the hammer falls. To limit the distance through which the type-sector must be turned, the hammer may be arranged to be normally opposite the middle line of the sector, and the latter may be brought into position by being turned up or down. In this case separate rods 6 and 8 are arranged for each half of the machine, and the key-levers of the one half have their projections 12 and 13 so formed that the depression of a key moves the type-sector downward.

15 I claim—

1. In a type-writer, a shiftable type-sector-supporting mechanism, a four-armed lever mounted on a vertical axis and having two of its arms engaging said mechanism and adapted when operated to shift the same, means engaging the other two arms of said lever for operating it, and a series of key-levers, said means adapted to be operated when one of the said key-levers is depressed.

25 2. In a type-writer, a crown-wheel provided with escapement-teeth, a hammer operated by said wheel, a series of key-levers, means for operating said wheel, said means adapted to be operated when one of said key-levers is depressed, and a type-carrying sector coöperating with said hammer.

30 3. In a type-writer, a type-carrying sector, a horizontally and axially shiftable supporting mechanism for said sector, means for imparting a horizontal movement to said mechanism, causing thereby the shifting of said sector in a horizontal direction, and a series of key-levers for operating said means and for imparting an axial movement to said mechanism, said key-levers provided with projections engaging the said mechanism for imparting the axial movement thereto and for limiting the extent of said movement.

45 4. In a type-writer, a type-carrying sector, a shiftable supporting mechanism for said sector, a four-armed lever having two of its arms engaging with said mechanism, said lever when operated adapted to have the said two arms shift the said mechanism, a lever-frame adapted to engage the other two arms of the said lever and when operated to oper-

ate the said four-armed lever, two banks of key-levers, stops for the lever-frame, said lever-frame adapted to be operated when a key-lever of one of the banks is depressed, and means for moving the said stops to permit of an extended movement of said four-armed lever, substantially as herein shown and described. 55

5. In a type-writer, a type-carrying sector mounted on a horizontal axis, a transversely and axially movable shiftable supporting means therefor, key-levers for operating said mechanism, said key-levers provided with projections for limiting the axial movement of said mechanism, and means carried by the said mechanism and adapted on a partial depression of one of the key-levers to shift the said mechanism, thereby moving the type-sector into position and upon a further depression of the key-lever to effect the printing. 65

6. In a type-writing machine, a type-carrying sector, a shiftable supporting mechanism therefor, a four-armed lever mounted on a vertical axis and adapted to have two of its arms engage said mechanism for shifting it when said lever is operated, means for operating said lever, and a series of key-levers each having its inner end provided with a pair of projections, said projections when their respective key-lever is depressed adapted to suitably move and limit the movement of the said shiftable supporting mechanism, said levers adapted to operate said means. 75

7. In a type-writing machine, a type-carrying sector, a shiftable supporting mechanism therefor provided with a pair of rods, means for shifting said mechanism, key-levers, projections on the key-levers adapted to engage with said rods and suitably move and limit the movement of said sector, a hammer mechanism coöperating with said sector, and mechanism operated by the key-levers for suitably operating the said hammer mechanism. 85

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

EMIL NOWÁK.

Witnesses:

JOSEF RUBASCH,
ALVESTO S. HOGUE.