

A. SIEPMANN AND A. RADEMACHER.

TYPEWRITER MECHANISM.

APPLICATION FILED FEB. 14, 1921.

1,405,722.

Patented Feb. 7, 1922.

3 SHEETS—SHEET 1.

Fig. 1.

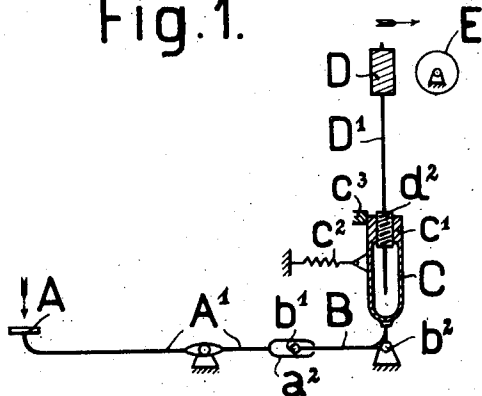


Fig. 2.

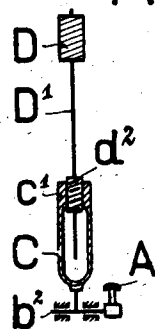


Fig. 3.

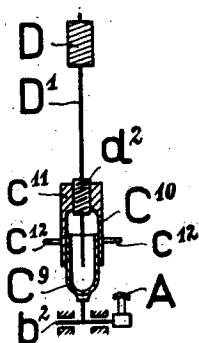


Fig. 4.

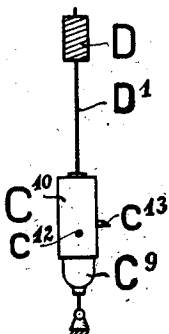


Fig. 5.

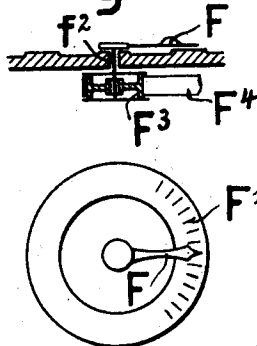


Fig. 7.

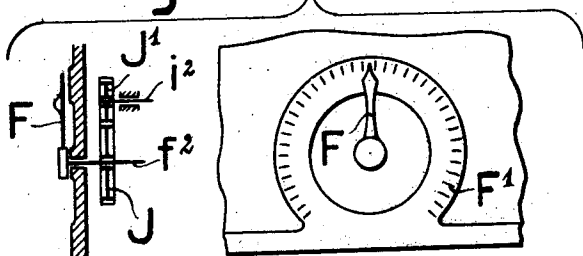
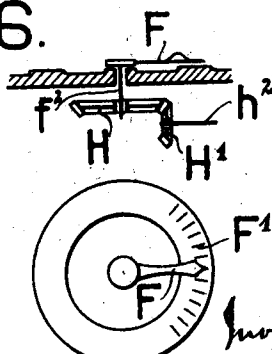


Fig. 6.



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 3 SHEETS—SHEET 2.

Fig. 8.

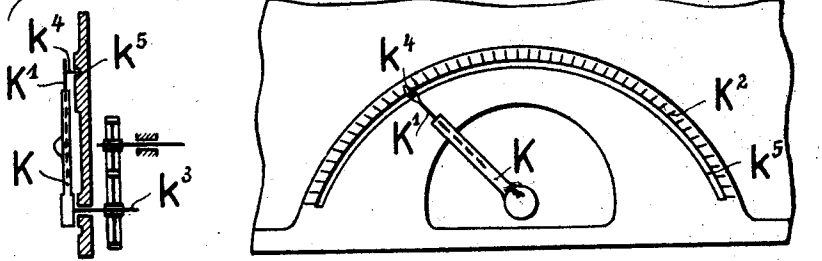


Fig. 9.

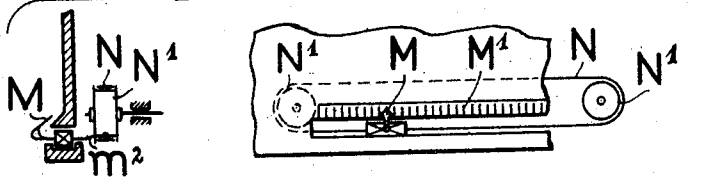
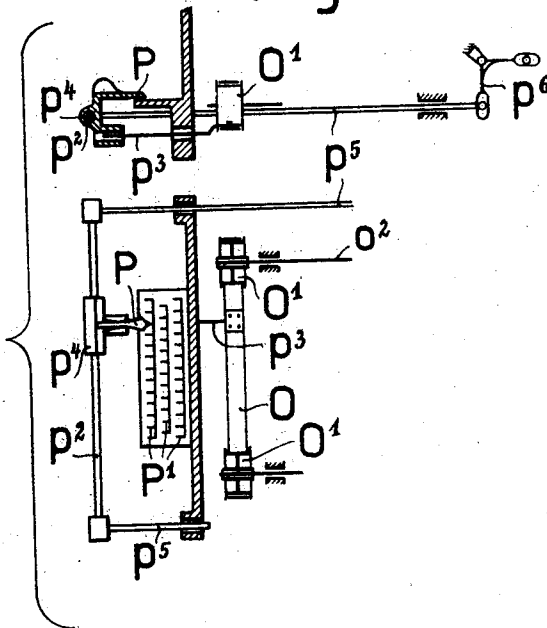


Fig. 10.



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3 SHEETS—SHEET 3.

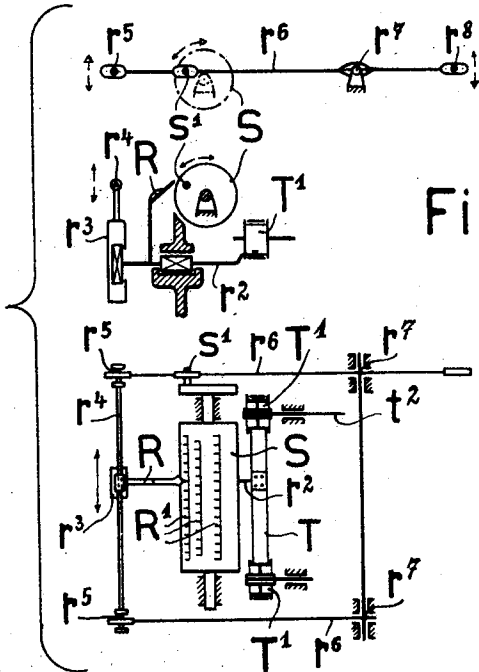


Fig. 11.

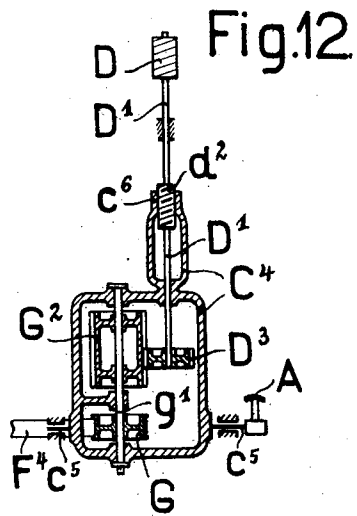


Fig. 12.

Fig. 13.

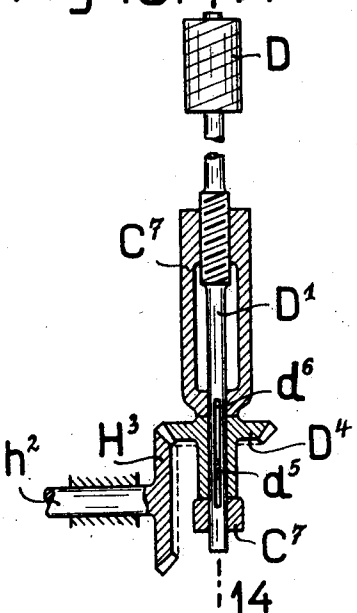
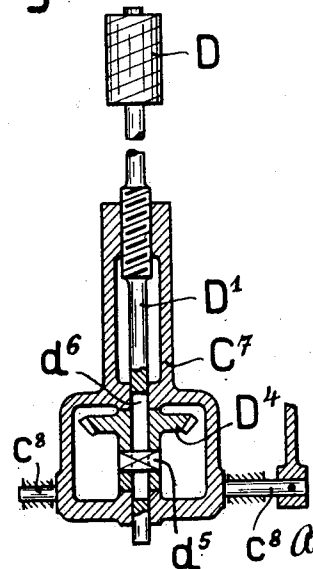


Fig. 14.



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UNITED STATES PATENT OFFICE.

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TYPEWRITER MECHANISM.

1,405,722.

Specification of Letters Patent.

Patented Feb. 7, 1922.

Application filed February 14, 1921. Serial No. 444,866.

To all whom it may concern:

Be it known that we, ADOLF SIEPMANN, residing at Essen, Germany, and AUGUST RADEMACHER, residing at Essen, Germany, both citizens of the Republic of Germany, have invented a certain new and useful Improvement in Typewriter Mechanism, (for which we have filed an application in Germany, December 5, 1919.) of which the following is a specification.

This invention relates to typewriting mechanisms having a unique type key and a device for adjusting the type to be printed. The object of the present invention is to provide a very simple typewriting mechanism of this kind which requires but little space. To this end the types are arranged along a screw line on the shell surface of a cylinder which may be adjusted by means of an index movable with respect to a row of letters, this adjustment being effected through the intermediary of a screw-threaded guide.

The invention will be described with reference to the accompanying drawings which illustrate several forms of execution of the subject matter of the invention and in which:

Fig. 1 is a diagrammatic view, partly in section and partly in side elevation of the typewriting mechanism,

Fig. 2 is a front view, partly in section, of parts of the typewriting mechanism,

Fig. 3 is a similar view of a modified form of the mechanism,

Fig. 4 is a side view pertinent to Fig. 3,

Figs. 5 to 11 are diagrammatic views, partly in section and partly in elevation, of seven forms of execution of the index device belonging to the typewriting mechanism,

Fig. 12 is a diagrammatical view in vertical section of an adjusting device for the typewriting mechanism suitable for the index device in accordance with the construction disclosed in Fig. 5,

Fig. 13 is a similar view of an adjusting device for the typewriting mechanism suitable for the remaining index devices, and

Fig. 14 is a section on line 14—14 in Fig. 13 looking from the left.

The mechanism illustrated in Figs. 1 and 2 will be described first.

The typewriting mechanism is provided

with a unique type key A mounted on a two-armed lever A¹. This key-lever is connected by intervention of a guide a² b¹ to a lever B pivoted at b² and the other arm of which forms a casing C. This latter is provided with a female thread c¹ for a male thread d² arranged on the shaft D¹ of a cylinder D. On the shell surface of this cylinder the types are disposed, and that along the several turns of a continuous screw line. The pitch of these turns corresponds to the pitch of the thread c¹, d². Opposite to the type cylinder D there is arranged a paper roller E (Fig. 1). A spring c² (Fig. 1), engaging both the casing C and the frame of the machine tends to maintain the parts A, B, C, D in the inoperative position disclosed in the drawing in which the casing C comes to abut against a stop c³ (Fig. 1) of said frame.

As a result of the aforesaid arrangement of the parts, the type cylinder D is caused to strike against the roller E when the key A is depressed, so that the type which happens to be nearest to said roller will now make a print on the paper. The particular type desired is set up in the printing position by a rotation of the shaft D¹ of the type cylinder by means of a mechanism which will be more fully described hereinafter. The roller E may be fed forward from letter to letter and from line to line by any one of the methods known in the art. The spaces between the words may likewise be made in the customary manner by means of a spacing key.

In the device illustrated in Fig. 5, an index F adjustable relatively to a horizontally disposed row of letters F¹ is mounted on a vertical shaft f² supporting a roller F³ serving to guide a steel band F⁴. This band, as Fig. 12 shows, is run across a second roller G, the shaft g¹ of which is lodged in a frame C⁴. The frame C⁴ is lodged to oscillate on the frame of the machine by means of pivots c⁵ and is connected with the key lever A, A¹, in the same manner as the casing C disclosed in Figs. 1 and 2, by intervention of an intermediate lever B. The shaft D¹ of the type cylinder D is adapted to engage by means of a thread d² a female thread c⁶ formed in the frame C⁴. Upon the shaft g¹ of the band roller G there is mounted a broad spur wheel G² meshing

with a narrow spur wheel D^3 mounted upon the shaft D^1 .

In consequence of this arrangement, the action of setting the index F upon a letter 5 belonging to the row F^1 , which is directly effected by hand, is transmitted by aid of the gearing $f^2 F^3 F^4 G g^1 G^2 G^2$ to the shaft D^1 . During this operation the spur wheel D^3 moves along the spur wheel G^2 . The 10 type cylinder D follows the rotation of the shaft D^1 ; said cylinder being moved up or down by reason of the guide action carried out by the threads $c^6 d^2$, and, moreover, being so adjusted that the type of the particular letter upon which the index F has been 15 set within the row F^1 will come to face the roller E. In order to allow of an absolutely accurate adjustment of the type cylinder D to be effected, the band rollers F^3 and G may be provided with teeth adapted to engage 20 perforations formed in the steel band F^4 . It may further be noted that the section of the band F^4 lying intermediate the rollers F^3 and G is located in parallel to the axis of the pivots c^5 . When the frame is rocked 25 about the axis of the pivots c^5 , the band will therefore not be stretched to any notable degree, but will merely obtain a slight twist.

In the form of execution shown in Fig. 6, 30 the vertical shaft f^2 of the index F is positively connected by means of two bevel wheels H, H^1 to a shaft k^2 , whence the shaft D^1 of the type cylinder D may obtain its drive by intervention of a pair of bevel 35 wheels H^3 , D^4 (Fig. 13). In this case again, the shaft D^1 is lodged within a frame C^7 arranged to rock on the frame of the machine by means of pivots c^8 (Fig. 14) and connected to the key lever of the mechanism. 40 The bevel wheel D^4 is disposed between two bearings for the shaft D^1 and connected to this said shaft so as to allow of shift but not of rotation relatively to the latter by means of a transversely disposed wedge d^5 passing 45 through a slot d^6 formed in the shaft D^1 . The height of the teeth of the pair of bevel wheels H^3 D^4 is so dimensioned that they will not come to disengage when the frame C^7 is rocked.

In the form of execution shown in Fig. 7, 50 the shaft f^2 of the index F is disposed horizontally and is connected by intervention of a pair of spur wheels J J^1 with a shaft i^2 the rotation of which may be transmitted upon the shaft of the type cylinder by aid 55 of the gear illustrated in Figs. 13 and 14.

The same applies to the arrangement according to Fig. 8. However, in this case the row of letters, K^2 , is not disposed, as the row 60 of letters F^1 of the forms of execution shown in Figs. 5, 6 and 7, along the arc of a circle, the centre of which lies within the axis of the shaft of the index, but rather along a flat arc of a circle, the centre of which is dis- 65 posed considerably below the shaft k^3 of the

index K K^1 . By these means there is secured a row of letters which, while possessing a large radius, will not take up much space in the altitudinal direction and which may be read off much more conveniently. 70 In this case, the index comprises two parts K K^1 adapted to telescope of which the part K^1 having the point, is adapted to move by aid of a pin k^4 within a groove k^5 formed concentrically to the row of letters K^2 with- 75 in the wall of the machine, so that the index when rocked will alter its position while the point thereof will however always be disposed above the row of letters.

According to the form of execution shown 80 in Fig. 9, the row of letters M^1 of the index mechanism is arranged along a straight line. In this case, the index M moves along a straight path on the wall surface of the machine and is fixed to a steel band N run- 85 ning across two band rollers N^1 , by means of an arm m^2 projecting into the interior of the machine. The shaft of one of the two band rollers may be positively connected to the shaft of the type cylinder by means of 90 the gearing disclosed in Figs. 13 and 14.

In the arrangement shown in Fig. 10, the letters of the index mechanism are disposed in a plane in three rows P^1 to facilitate to an increased degree the reading off thereof. 95 A certain number of the full turns of the thread along which the types are arranged on the cylinder D corresponds to the length of each of the rows of letters P^1 . Whenever therefore it be desired to shift the index P 100 (Fig. 10) from one row of letters P^1 to another, then obviously the type cylinder must be either raised or lowered for the corresponding number of turns. To this end, the oscillating element (casing or frame) sup- 105 porting the type cylinder D, comprises two telescoping parts C^9 C^{10} (Figs. 3 and 4). The one of these parts C^9 is mounted on the fulcrum b^2 of the bell crank lever B connected to the key-lever A A^1 (Fig. 1); while 110 the other part, C^{10} , is adapted to move on the part C^9 and is provided with the female thread c^{11} for the tapped portion d^3 of the shaft D^1 of the type cylinder. On the part C^{10} there are in addition arranged two pins 115 c^{12} with which coacts the adjusting mechanism which will be hereinafter explained. The index P (Fig. 10) is secured to a casing p^4 adapted to slide along a rod p^2 disposed in parallel to the row of letters and connect- 120 ed by means of an arm p^3 extending into the interior of the machine with a steel band O running across two rollers O^1 . The shaft of the type cylinder is driven by the shaft o^2 of one of the said band rollers. To the 125 rod p^2 there are fixed and this at right angles thereto, two rods p^5 lodged in horizontally disposed guiding means on the frame of the machine. The one of these two rods engages a bell crank lever p^6 which is connected to 130

the pins c^{12} (Figs. 3 and 4). Besides this last-mentioned pin, there is fixed to the part C^{10} of the casing or frame a cog c^{13} for which there is provided a row of notches in the frame of the machine. Each time the type cylinder carries out a printing operation, the said cog c^{13} engages one of the said notches and thereby adjusts, say in the event the index P should happen not to have been accurately set upon a row of letters P^1 , the height of the parts C^{10} , D in such a manner that there will be secured an absolute alignment on the paper.

In the case of the index mechanism illustrated in Fig. 11, the letters are arranged in three rows R^1 on a cylinder S arranged to rotate on the frame of the machine.

The index R is caused to move along a straight line on the frame of the machine in parallel to the axis of the cylinder S and is connected to an arm r^2 adapted to engage a steel band T running across two rollers T^1 . The shaft of the type cylinder is again driven by the shaft t^2 of the one roller T^1 . A handle r^3 is connected to the body of the index R in such wise as to permit of the said handle being displaced in a vertical sense relatively to the index while at the same time adapted to take the index along in the case of a movement effected in parallel to the axis of the cylinder S. In the course of this movement, the handle r^3 slides along a rod r^4 , for its part arranged to engage by means of pins r^5 longitudinal slots formed in two levers r^6 mounted to oscillate at r^7 on the frame of the machine. The one of these two levers r^6 engages by means of two longitudinal slots, respectively, a pin s^1 of the cylinder S and, at r^8 , a system of levers connected to the pin c^{12} (Figs. 3 and 4). As a result of this arrangement the type cylinder is rotated by intervention of the parts r^2 , T, T^1 , t^2 whenever the handle r^3 is displaced along the rod r^4 . Moreover, when the handle r^3 is caused to effect a movement in the vertical direction, then by intervention of the parts r^4 , r^5 , r^6 , s^1 and r^8 on the one hand, another row of letters R^1 is moved in front of the point of the index, while, on the other hand, the type cylinder is either raised or lowered.

Claims.

1. A typewriting mechanism comprising a type carrier having a plurality of circumferentially extending types and mounted for rotation to effect type selection, an index and pointer, and means connecting said pointer to said type carrier and including a screw-threaded guide for selecting the type.

2. A typewriting mechanism comprising a cylindrical type carrier having a plurality of circumferentially extending types and mounted for rotation to effect type selection, a type key operatively connected to said type carrier for effecting printing and means for effecting type selection compris-

ing an index, a movable pointer and means connecting said movable pointer to said type carrier including a screw-threaded guide.

3. A typewriting mechanism comprising a cylindrical type carrier having a plurality of spirally arranged types and mounted for rotation to effect type selection, an oscillatable support and means for mounting said type carrier upon said support whereby it can be adjusted relatively thereto during type selection, a type key, and means connecting said type key to said support whereby upon the depression of said type key said type carrier will effect the type printing.

4. A typewriting mechanism comprising a cylindrical type carrier having a plurality of spirally arranged types projecting therefrom and mounted for rotation to effect type selection, a shaft upon which said type carrier is mounted, a support for said shaft, connection between said support and said shaft comprising a screw-threaded guide, an index, a movable pointer cooperating therewith and a gearing operatively connecting said movable pointer to said shaft for rotating the same, whereby said type carrier will move axially to effect type selection, said gearing permitting said axial movement.

5. A typewriting mechanism comprising a type carrier having a plurality of extending types arranged along a screw line and mounted for rotation to effect type selection, a shaft for said type carrier, an oscillatable support, cooperating screw-threads upon said shaft and said oscillatable support for mounting said type carrier upon said support so that it is adjustable axially, an index and movable pointer, a spur wheel gearing mounted on said oscillating support, one spur wheel of said spur wheel gearing being carried by said shaft, a driving belt connecting said movable pointer to the other gear of said spur wheel gearing for rotating the same, whereby during type selection which is initiated by said movable pointer said shaft will be rotated and adjusted axially, said spur wheel gearing permitting axial displacement of said first mentioned spur wheel with respect to said second mentioned spur wheel.

6. A typewriting mechanism comprising a type carrier having a plurality of circumferentially extending types and mounted for rotation to effect type selection, an oscillatable support, a shaft upon which said type carrier is mounted, said shaft being mounted on said support by means of a screw-threaded guide, an index and movable pointer, toothed gearing connecting said movable pointer to said shaft for rotating the same, one gear wheel of said toothed gearing being mounted upon said oscillating support and connected to said shaft so as to permit axial displacement of said

shaft during type selection but preventing independent rotation of said shaft.

7. A type writing mechanism comprising a type carrier having a plurality of circumferential types and mounted for rotation to effect type selection, a shaft for said type carrier, an oscillating support, means for mounting said shaft upon said support to permit rotation of said shaft and an axial adjustment thereof during type selection and an index operatively connected to said shaft for initiating said type selection, said index comprising a telescoping pointer, a member provided with a row of letters cooperating with said pointer and arranged along the arc of a circle, the radius of which is greater than the shortest length of said pointer, said member being formed with a groove arranged concentrically with said row of letters and a pin carried by one section of said pointer and cooperating with said groove for keeping said pointer adjacent said letters.

8. In a typewriting mechanism a cylindrical type carrier having a plurality of spirally arranged types and mounted for rotation to effect type selection, an index provided with letters arranged in rows, a cooperating pointer and means connecting said pointer to said type carrier for effecting type selection whereby movement of said pointer along a row of letters rotates said type carrier, the adjustment of said pointer to the rows of letters displacing said type carrier in the direction of its axis of rotation.

9. In a typewriting machine a type carrier having a plurality of circumferential types and mounted for rotation to effect type selection, a shaft for said type carrier, a two-part telescoping support, said shaft being screw-threadedly mounted upon one part of said support, an index having rows of letters, a cooperating pointer, means connecting said pointer to the last mentioned part of said support whereby said type carrier is displaced axially when said pointer is adjusted from one row of letters to another.

10. In a typewriting mechanism a type carrier having a plurality of spirally arranged types and mounted for rotation to effect type selection, a shaft for said type carrier, a telescoping support, screw-threaded means for mounting said shaft on one section of said support whereby rotation of said shaft will adjust said type carrier axially, an index provided with parallel rows of letters arranged in a plane, a pointer cooperating therewith, a guide element for said pointer, said pointer being displaceable along said guide element, said guide element being displaceable transversely to the rows of letters to permit said pointer to be adjusted to said rows of letters and means con-

necting said guide element to said section of said support whereby said type carrier may be adjusted axially.

11. In a typewriting mechanism a cylindrical type carrier having a plurality of types arranged along a screw line and mounted for rotation to effect type selection, a shaft for said type carrier, a telescoping support, said shaft being screw-threadedly united with one section of said support whereby rotation of said shaft will axially displace said type carrier, an index comprising a cylinder provided with parallel rows of letters, a pointer adjustable along the rows of letters, a handle for said pointer, a lever operatively connected to said handle, means connecting said lever to said cylinder whereby upon movement of said handle said cylinder will be rotated to adjust said rows of letters with respect to said pointer, said lever being further connected to said part of said telescoping support, whereby said type carrier will be simultaneously axially displaced.

12. In a typewriting machine a type carrier having a plurality of circumferential types and mounted for rotation to effect type selection, a shaft for said type carrier, a two-part telescoping support, said shaft being screw-threadedly mounted upon one part of said support, an index having rows of letters, a cooperating pointer, means connecting said pointer to the last mentioned part of said support whereby said type carrier is displaced axially when said pointer is adjusted from one row of letters to another, and means for rotating said type carrier shaft during adjustment of said pointer along a row of letters which comprises a pair of rollers, an endless steel band carried by said pair of rollers, means connecting said pointer to said steel band and a shaft and gear connection between one of said rollers and said type carrier shaft.

13. In a typewriting mechanism a type carrier having a plurality of spirally arranged types and mounted for rotation to effect type selection, a shaft for said type carrier, a support comprising two telescoping parts, a screw-threaded union between said shaft and one part of said support, an index having rows of letters and a pointer, means connecting said pointer to the last mentioned part of said support whereby when said pointer is adjusted from one row of letters to another said part of the support and said type carrier are displaced axially, an aligning tooth carried by said last mentioned part of the support and adapted to cooperate with a rack provided on the frame of the machine in order to secure alignment of the types to be printed.

14. A typewriting mechanism comprising a type carrier having a plurality of spirally arranged types and mounted for rotation to

effect type selection, a shaft for said type carrier, an oscillatable support, said shaft and oscillatable support being provided with cooperating screw-threads for mounting said shaft upon said support whereby rotation of said shaft effects an axial displacement thereof and type selection, an index, a movable pointer cooperating therewith, gearing mounted upon said oscillatable support and connected to said type carrier shaft and an endless belt operatively connecting said pointer to said gearing, said endless belt being disposed parallel to the axis of oscillation of said oscillatable support.

15. In a typewriting mechanism, a type carrier having a plurality of spirally ar-

ranged types and mounted for rotation to effect type selection, an oscillatable support, means for mounting said type carrier upon said support whereby axial displacement thereof is permitted during type selection, a type key and means connecting said type key to said support for oscillating said support to effect type printing.

The foregoing specification signed at Essen, Germany, this 25th day of October, 1920.

ADOLF SIEPMANN.
AUGUST RADEMACHER.

In presence of—
HANS GOTTMANN,
JOHANN DECKER.