F. WISSNER.

BOOK TYPE WRITER.

APPLICATION FILED DEC. 5, 1910.

1,026,619.

Patented May 14, 1912.

5 SHEETS—SHEET 1.

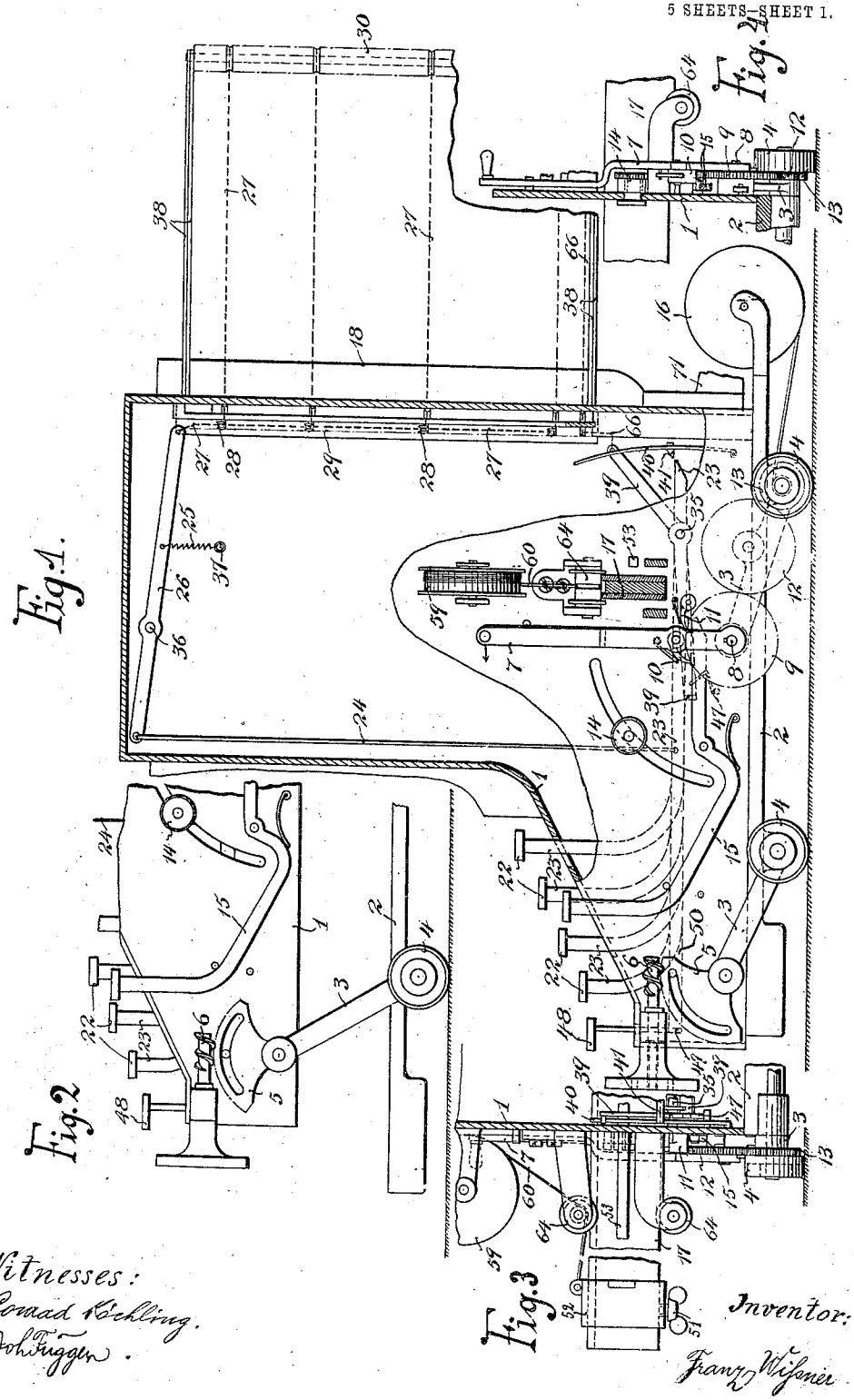


Fig. 1.

Fig. 2

Fig. 4

Fig. 3

Witnesses:
Conrad Röchling.
John Trigger.

Inventor:
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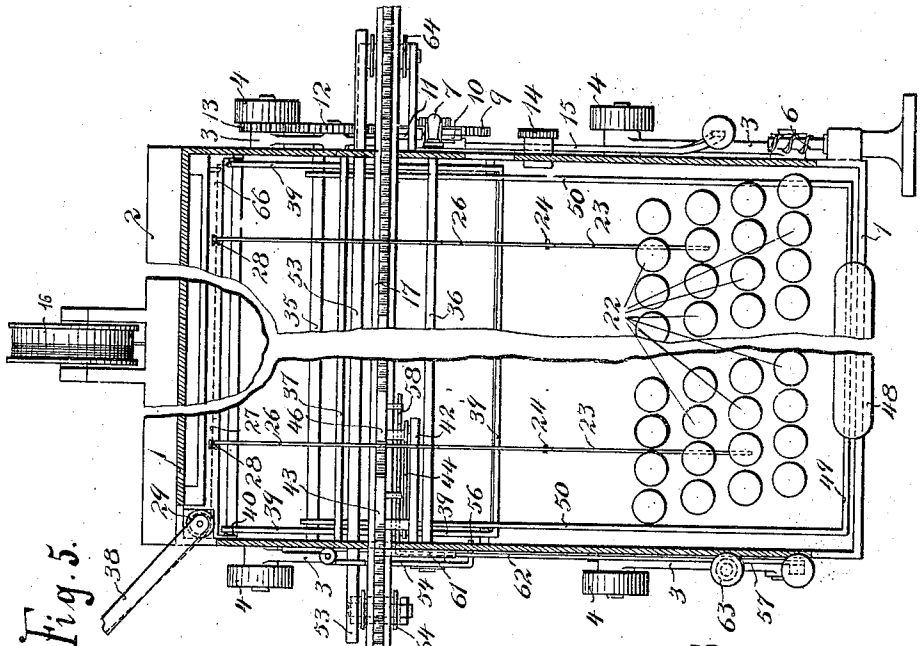


Fig. 5.

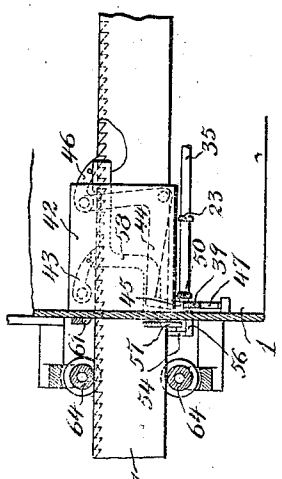
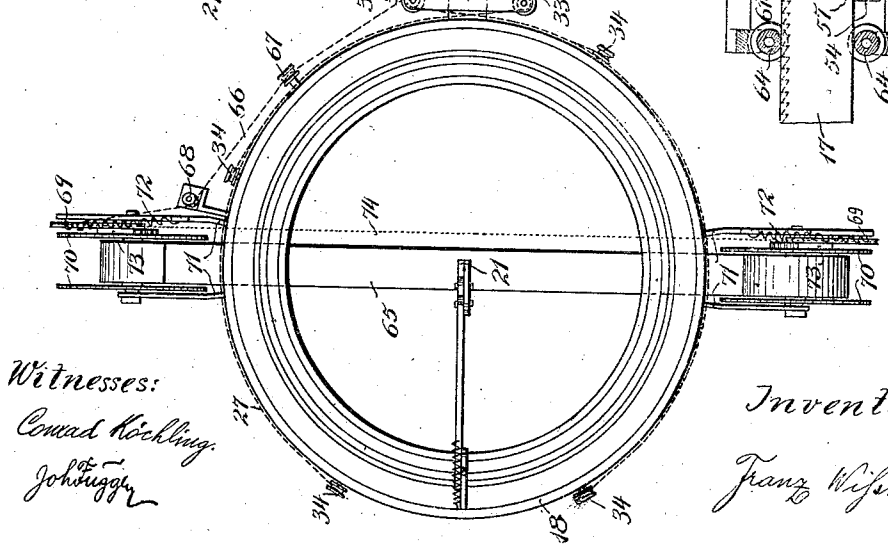


Fig. 6.



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5 SHEETS—SHEET 3.

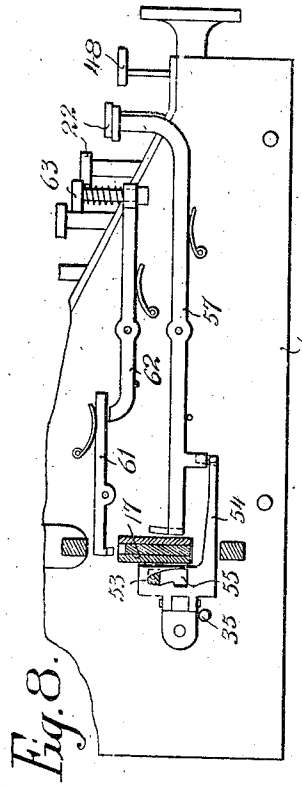


Fig. 8.

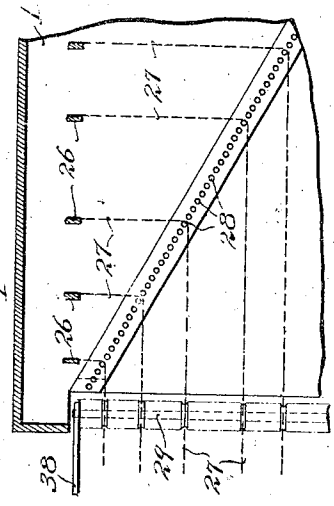


Fig. 9.

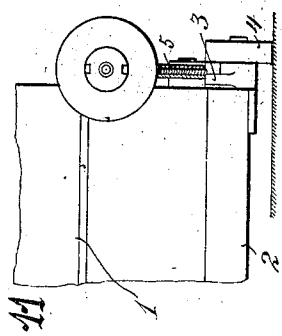


Fig. 11.

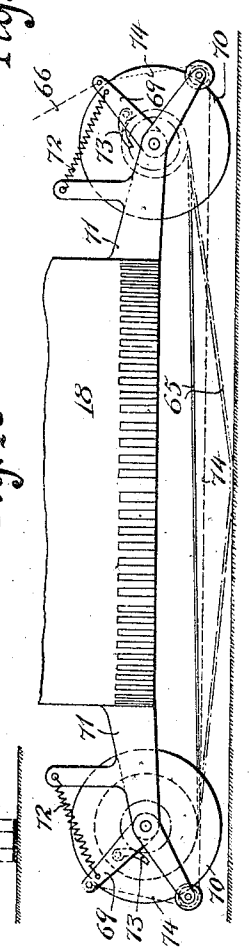


Fig. 10.

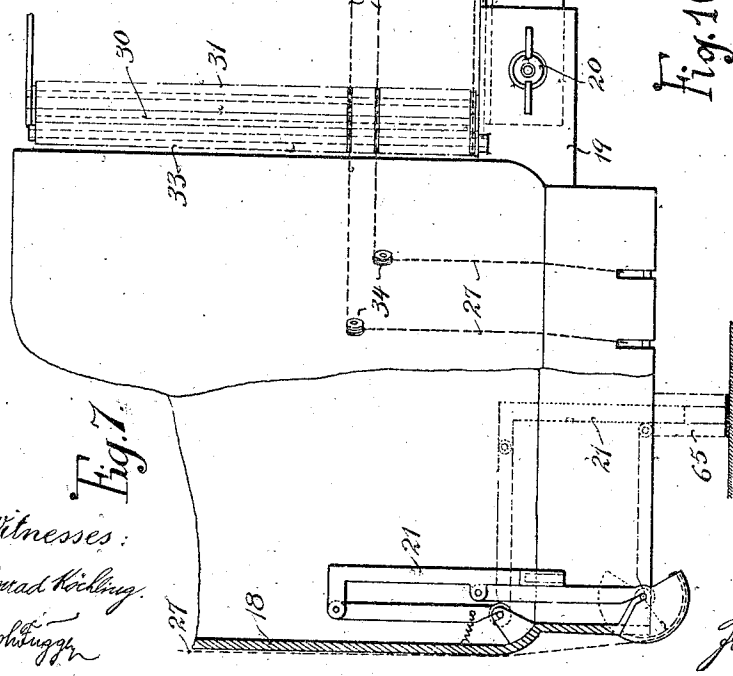


Fig. 7.

Witnesses:

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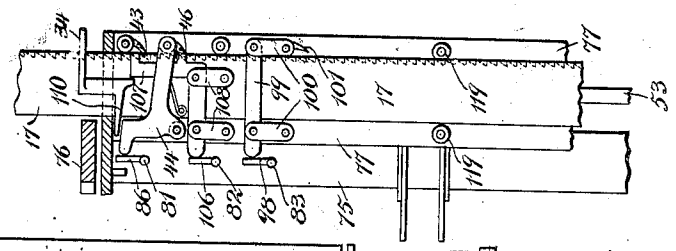
APPLICATION FILED DEC. 5, 1910.

1,026,619.

Patented May 14, 1912.

5 SHEETS—SHEET 4.

Fig. 16.



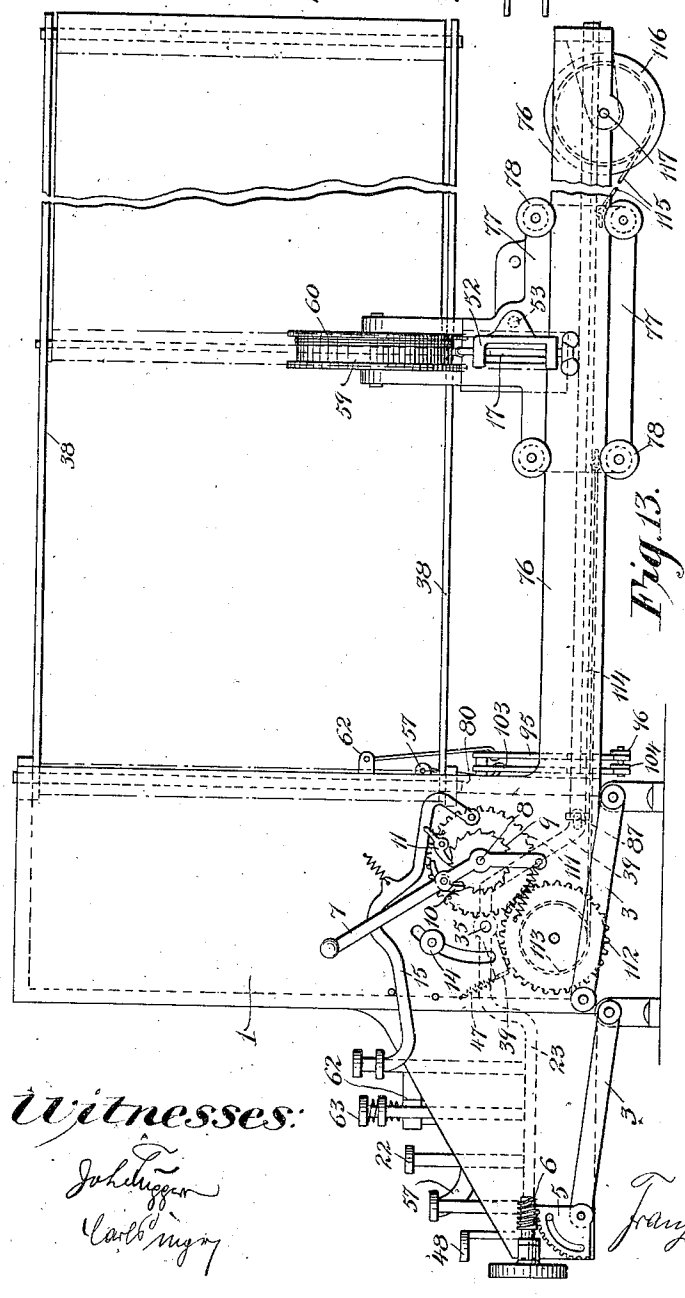


Fig. 13.

Fig. 12.

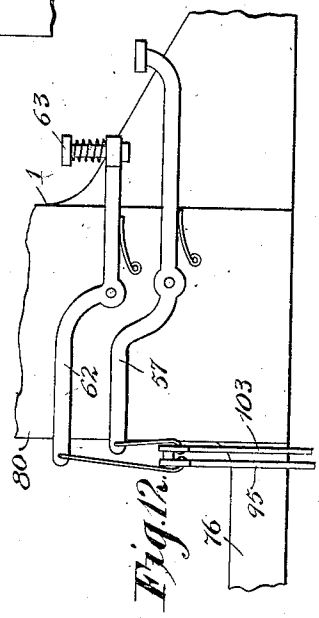
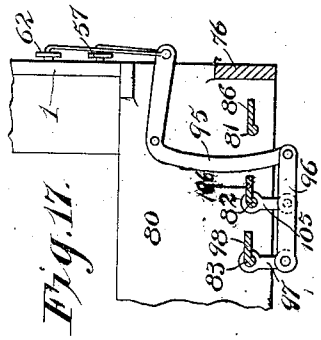


Fig. 17.



Witnesses:

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APPLICATION FILED DEC. 5, 1910.

1,026,619. **Patented May 14, 1912.**

5 SHEETS—SHEET 5.

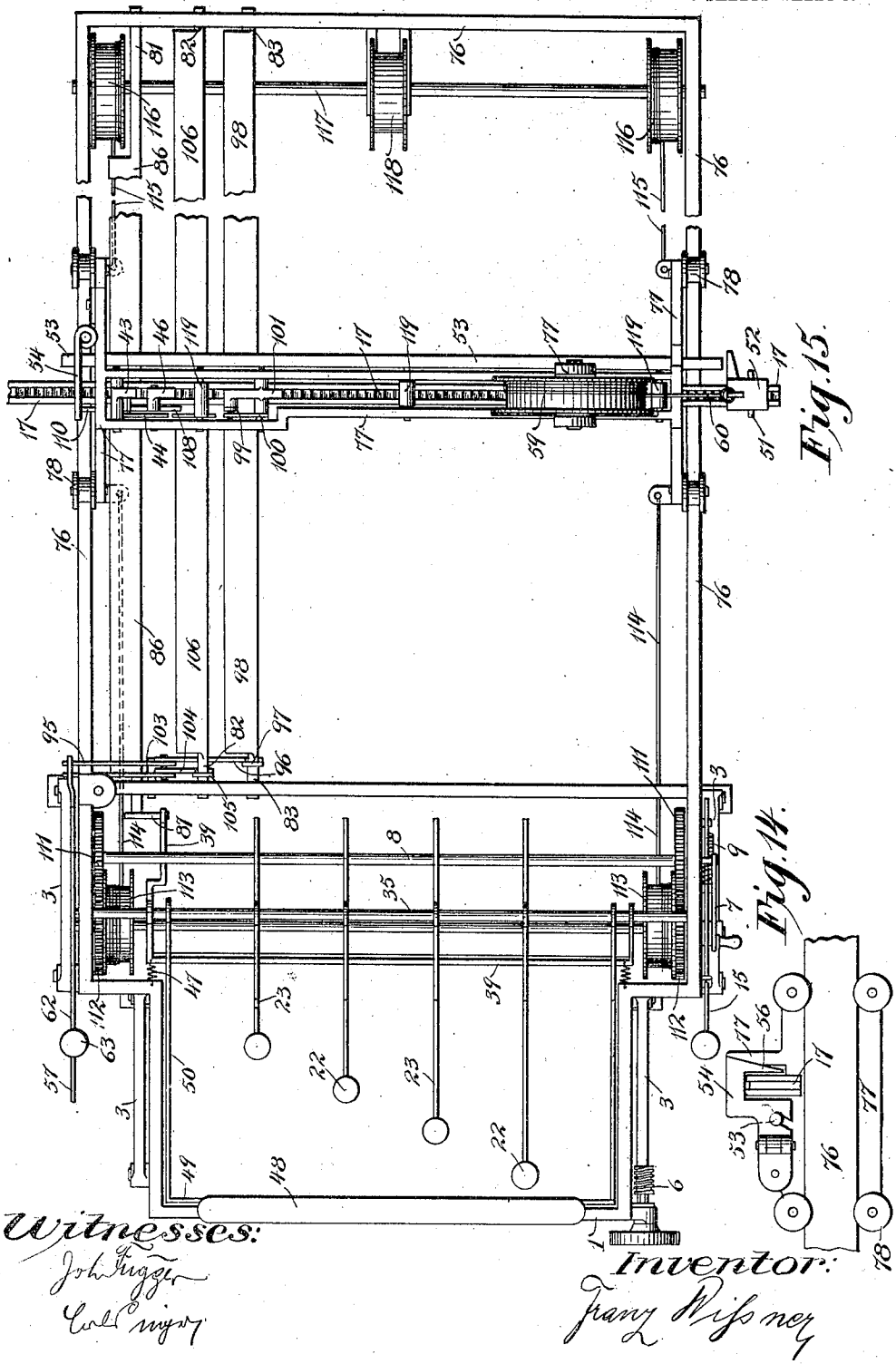


Fig. 15.

Fig. 14.

Witnesses:
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Carl Meyer

Inventor:
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UNITED STATES PATENT OFFICE.

FRANZ WISSNER, OF MAINZ, GERMANY.

BOOK TYPE-WRITER.

1,026,619. Specification of Letters Patent. Patented May 14, 1912.

Application filed December 5, 1910. Serial No. 595,739.

To all whom it may concern:

Be it known that I, FRANZ WISSNER, a subject of the Emperor of Germany, residing at Mainz, Germany, have invented a certain Improved Book Type-Writer, of which the following is a specification.

The present invention relates to a type-writing machine of the kind adapted for writing in books or on paper sheets arranged on a stationary surface, and its object is to provide a machine which is easily operated and which may be worked in any convenient place whether the supporting surface be level or inclined. For this purpose a casing containing the type levers and the ink-ribbon mechanism is arranged laterally of a casing containing the key-mechanism, the former casing being adjustably carried by the latter and fed along the lines by the depression of the keys. The keys are connected to the type-levers by means of cords which are guided over sheaves threaded on fast and movable shafts, said shafts being connected by movable links adapted to maintain the tension on the cords. The machine is connected to its support by links on which it can be adjusted to the level of the writing surface. This adjustment is effected by means of an easily operated worm working in a worm-wheel quadrant connected to one of the links. Means are provided for back spacing and also for an automatic return of the type carrier to starting position as soon as a line is finished.

Since it is the type carrier alone that moves over the writing surface during the operation, only little exertion is required in the working of the machine.

The invention is illustrated by way of example in the accompanying drawings, Figure 1 representing a right side view of the machine, partly in section, Fig. 2, a view of the device for adjusting the machine to the level of the writing surface, Fig. 3, a rear view of the right side of the machine, Fig. 4, a front view of the same side, Fig. 5, a plan of the whole machine, the cover-plate being removed, Fig. 6, a view of the letter spacing mechanism, Fig. 7, a front view, partly in section, of the type carrier, Fig. 8, a left side view, partly in section, of the lower part of the machine, Fig. 9, an interior view of part of the rear wall of the main casing, Fig. 10, a view of the ink-ribbon mechanism, and Fig. 11, a front view of the right, lower corner of the machine. The remaining figures illustrate a modified construction of the machine, Fig. 12 showing part of the left side, Fig. 13, a right side view, Fig. 14, a side view of the carriage for the type carrier, Fig. 15, a plan of the machine, the cover being removed, Fig. 16, a view of the letter-spacing mechanism, and Fig. 17, a view of the left, lower rear corner of the machine.

In the first construction the main casing 1 of the machine is mounted on a carriage 2 running on wheels 4. Links 3 connect the wheel axles at both sides of the carriage with the casing 1, said links being rotatable about the axles as well as about the pivots connecting them to the casing. The wheels 4 are either provided with tires of non-skidding material or fitted with teeth. In the latter case they must be supported on rack-bars. By raising the casing 1 on the links 3, which have normally an oblique position, the machine can be adjusted to the level of the writing surface. For the convenience of such adjustment, one of the links 3 is rigidly connected to a worm-wheel quadrant 5 in which meshes a worm 6 operated by a hand wheel. The casing 1 and all the parts connected thereto can thus be raised, as shown in Fig. 2, by turning the worm 6 which also retains the machine in adjusted position. For the purpose of equalizing the load on the carriage, when the casing is raised, the front part of the carriage is weighted.

Line-spacing is effected by moving the carriage on the wheels 4. For this purpose a lever 7 is provided which sits loose on the pivot 8 by means of which the right-hand rear link 3 is connected to the casing 1. A toothed wheel 9 is also loose on the same pivot and is engaged by a spring-actuated pawl 10 connected to the lever 7. A detent pawl 11, pivoted to the casing 1, also works in the teeth of the wheel 9 which meshes with a wheel 12 rotatably mounted on the link 3. The latter wheel meshes with a wheel 13 connected to the wheel 4 which can thus be rotated, for advancing the machine, by a turning of the lever 7 in the direction of the arrow. A clamp screw 14, adjustable in a curved slot in the casing 1, serves as an abutment for the lever 7 and determines the space between the lines.

When the carriage is to be returned to its initial position, the pawls 10 and 11 must be released from the wheel 9. This is effected

by means of a double-armed spring-pressed lever 15 pivoted to the outside of the casing 1 and fitted with a key-button to facilitate its depression. To prevent a spontaneous advance of the carriage, should the machine be placed on an inclined surface, a spring-actuated spool 16 is provided which is mounted in a fork at the rear of the carriage. By means of a cord, rolled on said spool and on the rear axle of the carriage, a balance is obtained. The spring in the spool 16 may be made strong enough to return the carriage automatically as soon as the lever 15 is depressed.

The types with their levers are carried by a cylindrical casing 18 which is secured to one end of a ratchet rack 17 and held by means of the latter in the casing 1 so as to allow of adjustment in the direction of the lines of writing. The rack is composed of three connected plates, the ratchets being formed on the edge of the center plate. A sleeve 19 on the casing 18 serves to connect the latter to the end of the rack where it is secured by means of a wing nut 20. The type levers 21 are fitted on the inner wall of the casing 18, as shown in Fig. 7, the levers being adapted, when actuated, to deposit the types at a point intersected by the central axis of the cylinder. The types are exchangeably fitted in sleeves on the levers and secured thereto by means of clamp springs. Each type is operated by the depression of a key-button 22 exchangeably mounted on a lever 23. A rod 24 connects the latter lever to one end of a double-armed lever 26 which is arranged in the upper part of the casing 1 and tensioned by a spring 25. To the other end of the lever 26 a cord 27 is fastened which is guided over a sheave 28 mounted on a bar carried obliquely across the inner rear wall of the casing 1 (Fig. 9). From the sheave 28 the cord is passed in succession over the sheaves 29, 30, 31, 33 and 34 to its type lever which is operated when the cord is pulled owing to the depression of the key. All the sheaves 34 are suitably arranged on the outside of the casing 18. The sheaves 29, 30, 31 and 33 are threaded on vertical shafts of which the one for the sheaves 29 is connected to the casing 1, and those for the sheaves 31 and 33 to the casing 18. The shaft for the sheaves 30 is connected to the shafts 29 and 31 by means of links 38 which, by altering the position of the sheaves 30, maintain a uniform tension on the cords 27 during the movements of the type-lever carrier.

All the key-levers 23 are rotatable about a shaft 35; the levers 26 are rotatable about a shaft 36. The springs 25 are also held in common by a spindle 37. The key-levers are guided in slots in the front wall of the casing 1.

Rotatably arranged about the shaft 35 is a frame 39 the front member of which bears against the lower edges of the levers 23. The side members, which hold the levers 23 between them, are prolonged beyond the fulcrum, the prolongations having an oblique position and being provided with pins by means of which they engage upright blade springs 40 tending to raise the front member of the frame against the levers 23. A bar 41, having a beveled front edge, is carried by the springs 40 just above the ends of the levers 23 which are also beveled and prolonged beyond their fulcrums. When a key is depressed, the frame 39 is actuated against the opposition of the springs 40 which are inclined forward by the operation. The forward inclination of the springs causes the bar 41 to engage the ends of the remaining levers 23 so as to keep these levers locked until the depressed lever is released. This arrangement prevents the striking of one key on top of another and a consequent damage of the machine.

The left side member of the frame 39 operates the letter-spacing mechanism. To that end a bell-crank lever 44, pivoted to a plate 42, is fitted with a finger by means of which it abuts against the said member of the frame. A pawl 46, pivoted to a pin on the lever 44, is in constant engagement with the rack 17. When the frame is depressed, the lever 44 follows its movement thereby causing the pawl 46 to be retracted by one tooth. At the release of the frame the latter is restored by a spring 47, aided by the springs 40, to its normal position, an advance of the rack and the type carrier by one tooth being thereby effected. A detent pawl 43, also pivoted to the plate 42, retains the rack when the pawl 46 is retracted.

For spacing the words a space bar 48 is provided which is connected to a frame 49. This frame oscillates about the shaft 35 and engages the frame 39 by its arms 50 in the same manner as the key-levers 23.

At both sides of the casing 1, the rack 17 is provided with stops 52 which are adjustable by means of wing-screws 51 for determining the extent of the typewritten lines in both directions. In conjunction with said stops, means are provided for an automatic return of the type carrier to starting position as soon as a line is completed. For this purpose a bar 53 is slidably arranged across the casing 1, parallelly to the rack 17, so as to serve as abutment for the stops 52. Referring to Fig. 8, which shows the left side of the casing 1, it will be seen that the bar 53 is in loose engagement with a lever 54, the latter being hinged to a plate which itself is rotatable about a pin on the casing 1. This lever has a slot 55 through which the bar is passed and which allows the lever to move vertically, independently of the bar. Horizontal movements of the bar are, how-

ever, transmitted to the lever which engages a notch in the former. At the free end of the lever an inwardly projecting finger 56 is formed (Fig. 6) which works in a slot in the wall of the casing 1. When the stop 52 strikes against the bar 53, at the finish of a line, said bar is slid to the right taking with it the lever 54. The finger 56, which normally rests in the thickness of the casing wall, is thereby pressed against the frame 39 over which it snaps as soon as the frame is lowered owing to the depression of a key or of the space bar 48. At the subsequent upward movement of the frame, after the release of the key, the lever 54 is taken along with it and so also is a lever 57 (Fig. 8) which is pivoted to the casing 1 and adapted to be engaged by the finger 56. The end of the lever 57 is passed through a slot in the wall into the interior of the casing where it terminates in a shackle 58 disposed between the lever 44 and the rack 17. When this shackle is raised by the finger 56, it strikes against pins on the pawls 43 and 46 and puts the latter out of engagement with the rack. A spring-tensioned spool 59, connected to the rack by means of a cord 60 (Figs. 1 and 3), thereupon returns the type carrier to its initial position. In this position of the carrier the bar 53 is actuated by the stop 52 at the right side of the machine, the lever 54 being thereby restored to its normal position, the lever 57 released, and the pawls set free to reëngage the rack. A direct depression of the lever 57, which is extended to the keyboard and fitted with a key-button for the purpose, effects a return of the type carrier from any of its intermediate positions.

The tension of the spool 59 must be adapted to be overcome by the pressure of the spring 47 on the frame 39.

Since it is convenient to be able to retract the type carrier step-wise by one tooth only, an arrangement for such back-spacing is provided as follows: A double-armed detent lever 61, pivoted to the outside of the casing 1, has one end adapted to be put into engagement with the ratchets of the rack 17; it is, however, normally prevented from such engagement by a spring. The other end of the lever is disposed so as to be actuated by the end of a double-armed lever 62 when the latter is depressed by means of a key-button 63. The shank of the key-button is slidably fitted in the lever 62 and encircled by a helical spring. When the key 63 is depressed, the rear end of the detent lever 6 descends onto the back of one of the teeth of the rack 17. While the detent is retained there by the helical spring, the shank of the key-button descends onto the lever 57 and depresses the latter with the effect that the pawls 43 and 46 are disengaged from the rack by the shackle 58. The rack thereupon moves, under the influence of the spool 59, but is checked by the detent 61 which engages the first oncoming tooth. When the key is released, the pawls are first restored to engaging position and then the detent 61 is disengaged from the rack which now assumes a position one tooth to the left of the one it occupied before the depression of the key. This process may, of course, be repeated any number of times.

In order to facilitate the movements of the rack 17, it is mounted between rollers 64 which are adjustably fitted on brackets at both sides of the casing 1.

For the purpose of keeping the ink-ribbon 65 in motion, the rearward prolongation of the right side member of the frame 39 is connected to a cord 66 which is guided, in the same manner as the cords 27, over sheaves 28, 29, 30, and 31 to the type carrier where sheaves 67 and 68 conduct it to the ribbon mechanism. The latter is composed of two ribbon spools 70 mounted in brackets 71 connected to the casing 18. On the shaft of each spool a lever 69 is loosely arranged which is controlled by a spring 72. The levers are fitted with pivoted pawls 73 which are adapted to work in the teeth of ratchet wheels connected to the spools for rotating the latter in opposite directions. A cord 74 connects the two levers 69 so as to make them work in unison. One of the levers is also intended to take one end of the cord 66 which thus actuates the mechanism by the movements of the frame 39. The spring 72 at the side of the cord 66 is adapted to be overcome by the tension of the spring at the opposite side. The pawls 73 are alternately put in engagement with the spools so as to roll the ribbon from one spool to the other.

It is evident that, while retaining the main features of the above-described typewriting machine, the particular construction and combination of parts may be considerably modified. For instance, the rack 17 may be firmly secured to the casing 1, and the type carrier movably mounted thereon by means of a carriage. Moreover, the linkages 38 may be directed to the other side of the rack, and the type carrier may be adapted to travel in a vertical direction, should it be desired to write on a vertical surface. A modification of particular advantage would be to make the casing 1 vertically adjustable on a stationary support and to make the rack with the type carrier adjustable in a carriage which itself is adjustable, for line-spacing, on a frame connected to the stationary casing. In this case the right side of a book may be pushed under said frame while the left side of the same is being written upon. Such an arrangement is illustrated in Figs. 15 to 17 in which the same reference numerals have been retained for parts which are identical with those of the former construction. A

rearwardly projecting frame 76 is connected to the casing 1 which may be raised on links 3, the latter being in this case mounted on a stationary support. The frame 76 is adapted to receive a carriage 77 which travels thereon by means of rollers 78. The ratchet rack 17 is slidably held in the carriage which carries the type casing 18 in the previously described manner. Arranged longitudinally at the left side of the frame 76 are three strips 86, 106, and 98 which are rotatable about eccentrically disposed journals 81, 82 and 83. A crank 87 on the front journal 81 is connected to the frame 39 in such a manner that the strip 86 is lowered whenever a key or the space-bar is depressed. The bell-crank lever 44 (Fig. 16), which abuts against the strip, is turned at the lowering of the latter, so as to retract the pawl 46 on the rack 17. When the key is released the spring 47 restores the elements to their initial position, the rack 17 being thereby advanced by one tooth. Back-spacing is effected, as previously described by the depression of the levers 62 and 57 by means of the key-button 63. In this case, however, the inner end of the lever 62 is linked to one arm of a bell-crank-lever 95 pivoted to the rear wall 80 of the casing 1 (Fig. 17). A link 96 is connected to the other arm of the lever 95, and to a crank 97 mounted on the journal 83 so that, when the key 63 is depressed, the strip 98 is raised. An upright bar 99, guided by links 100, abuts against this strip at the raising of which a detent 101, operated by the upper link 100, is pressed down on the back of one of the teeth of the rack 17. The lever 57 operates in the same manner a bell-crank lever 103, mounted on the same pivot as the lever 95, a link 104 and a crank 105, the latter being connected to the journal 82 so that a depression of the lever 57 effects a raising of the strip 106. A shackle 107, guided by links 108, is raised by the strip 106 thereby lifting the pawls 43 and 46 out of engagement with the rack 17. The backward movement of the type carrier is then effected in the previously described manner by the spool 59 and its cord 60. For effecting an automatic return of the type carrier at the finish of the lines, a similar arrangement is used as in the former construction, the lever 54 (Fig. 14) being connected to a finger 110 so as to turn the latter into engagement with the lever 44 when the rod 53 is actuated by the stop on the rack 17. The finger 110 is disposed under the shackle 107 so that, at the subsequent upward movement of the same, the shackle is raised for disengaging the pawls 43 and 46. As soon as the rod 53 is engaged by the stop 52 at the opposite side, the pawls are restored to engaging position. Line-spacing is effected as before by means of the lever 7 which is rotatable about the shaft 8. The ratchet wheel 9, which is operated by the pawl of the lever, rotates the shaft which carries a toothed wheel 111 at each side of the casing 1. The wheels 111 mesh with wheels 112 secured to spools 113 which actuate the carriage 77 by means of cords 114 connecting the elements. By depressing the lever 15, which acts on rearward prolongations of the pawls 10 and 11, the latter are disengaged from the ratchet wheel 9 whereupon the carriage 77 is automatically returned to its initial position by means of spring-tensioned spools 116. The latter are mounted at the rear of the frame 76 and connected to the carriage by cords 115. The spools 116 are connected to a shaft 117 and the tensioning is effected by means of a spiral spring 118 acting on said shaft. The rack 17 is guided in the carriage 77 by means of rollers 119. All the other mechanisms are identical with these described in connection with the first construction.

I claim:—

1. In a book typewriter, the combination with a movable type carrier of means for holding said carrier suspended at one side of and away from the casing containing the key mechanism, cord connections between the keys of the machine and the type levers for operating the latter, and means for maintaining the tension of the cords during the movements of the type carrier.

2. In a book typewriter, the combination with a movable type carrier and a ribbon mechanism connected thereto, of means for holding said carrier suspended at one side of and away from the casing containing the key mechanism, cord connections between the keys of the machine and the type carrier for operating the types and the ribbon mechanism, sheaves threaded on upright shafts, some being fast and some movable, for guiding the cords, and movable links connecting the shafts to maintain the tension of the cords during the movements of the type carrier.

3. In a book typewriter, the combination with a movable type carrier of a rack bar loosely guided in a carriage and holding said type carrier at one end away from said carriage, key operated cords for operating the types, means for feeding the rack bar in the carriage for letter spacing, means for moving the rack bar with the carriage for line spacing, and means for effecting a return of the bar to its initial position by the depression of keys.

4. In a book typewriter, the combination with a movable type carrier of a rack bar loosely fitted in a carriage and holding said type carrier at one end away from said carriage, a spring tensioned spool acting on the rack bar by means of a cord in longitudinal direction and tending to hold it in its starting position, a detent pawl engaging the

rack, connections between the keys of the machine and the rack bar for advancing the latter in opposition to the spool after each depression of a key, a key operated lever for releasing the rack bar and allowing it to be returned by the spool to its initial position, means for releasing the rack bar automatically at the end of the lines, and means for moving the rack bar with the carriage from line to line.

5. In a book typewriter, the combination with a key board of a rearwardly extending frame connected thereto, a carriage adapted to travel along said frame, a rack bar mounted in said carriage so as to allow of longitudinal adjustment, a type carrier held by said rack bar at one side of and away from the frame, a spring tensioned spool on the carriage acting on the rack bar by means of a cord and tending to hold it in its initial position, a detent pawl engaging the rack, a bell-crank lever adapted to advance the rack bar by means of a pawl, a strip mounted in the frame so as to be continually in engagement with the bell-crank lever, the strip being rotatable about eccentrically disposed journals, connections between the keys of the machine and the strip for actuating the latter and advancing the rack bar in opposition to the spool after each depression of a key, a key operated lever for releasing the rack bar and allowing it to be returned by the spool to its initial position, means for releasing the rack bar automatically at the end of the lines, and means for moving the rack with the carriage from line to line.

6. In a book typewriter, the combination with a key board of a rearwardly extending frame connected thereto, a carriage adapted to travel along said frame, a rack bar mounted in the carriage so as to allow of longitudinal adjustment, a type carrier held by said rack bar at one side of and away from the frame, a spring tensioned spool acting on the rack bar by means of a cord and tending to hold it in its starting position, a detent pawl engaging the rack, a pawl for advancing the bar in opposition to the spool, means for operating the advancing pawl, a shackle arranged underneath said pawls, a key operated lever connected to said shackle so that its depression effects a disengagement of the pawls from the rack, adjustable stops on the rack determining the length of the type-written lines, means operated by the stops for putting the releasing shackle into temporary engagement with the advancing mechanism so as to release the rack bar and allow it to return to its starting position, and means for moving the carriage for line spacing.

7. In a book typewriter, the combination with a rack bar holding the type carrier and being mounted in a carriage so as to allow of longitudinal adjustment, of a spring-tensioned spool acting on the rack by means of a cord and tending to hold it in its starting position, a detent pawl engaging the rack bar, a pawl for advancing the same, connections between the key levers and the advancing pawl for operating the latter, a shackle arranged underneath said pawls, a key operated release lever connected to said shackle so that its depression effects a disengagement of the pawls from the rack, a detent pawl normally out of engagement with the rack, a back spacing lever arranged above the release lever, connections between the back spacing lever and the last-mentioned detent pawl causing the latter to descend onto the back of a tooth when the lever is depressed, a key button sliding with its stem in the back spacing lever, and a helical spring encircling the stem allowing the latter, when depressed, to descend onto and depress the releasing lever for releasing the rack, the pawls being arranged so that the operation of the same by the back spacing key effects a return of the rack bar by one tooth.

8. In a book typewriter, the combination with a key board of a rearwardly extending frame connected thereto, a carriage adapted to travel along said frame, a rack bar slidably arranged in said carriage, a type carrier held by said rack bar at one side of and away from the frame, means for feeding the rack bar for letter spacing, spring tensioned spools arranged at the rear of the frame, cord connections between the spools and the carriage tending to hold the latter in its rearmost position, spools arranged on the key board casing, cords connecting the latter spools with the carriage, a gearing operating the latter spools, a ratchet wheel connected to said gearing, a detent pawl retaining the carriage by means of the ratchet wheel, a pawl operated by a hand lever for rotating the ratchet wheel and advancing the carriage, and a key operated lever for releasing the pawls and allowing the carriage to return to its initial position.

FRANZ WISSNER.

Witnesses:
JEAN GRUND,
CARL GRUND.