P. DE CLAMECY.

COLLAPSIBLE TYPEWRITING MACHINE.

APPLICATION FILED MAY 12, 1919.

1,355,819. Patented Oct. 19, 1920.

5 SHEETS—SHEET 1.

Fig. 1.

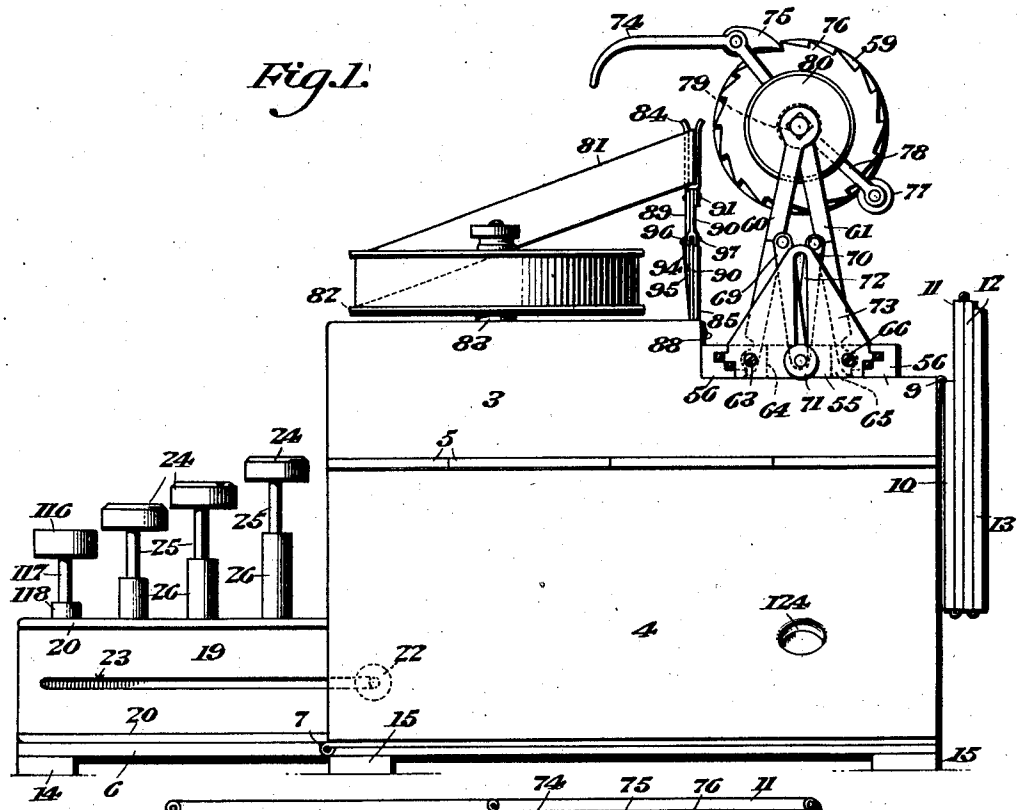
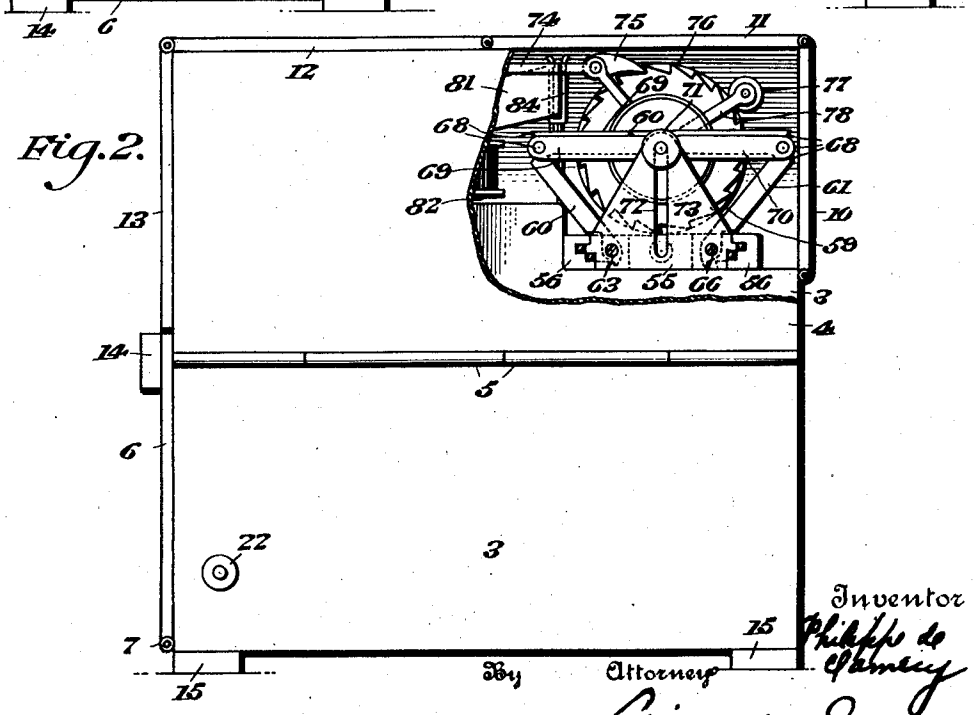


Fig. 2.



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5 SHEETS—SHEET 2.

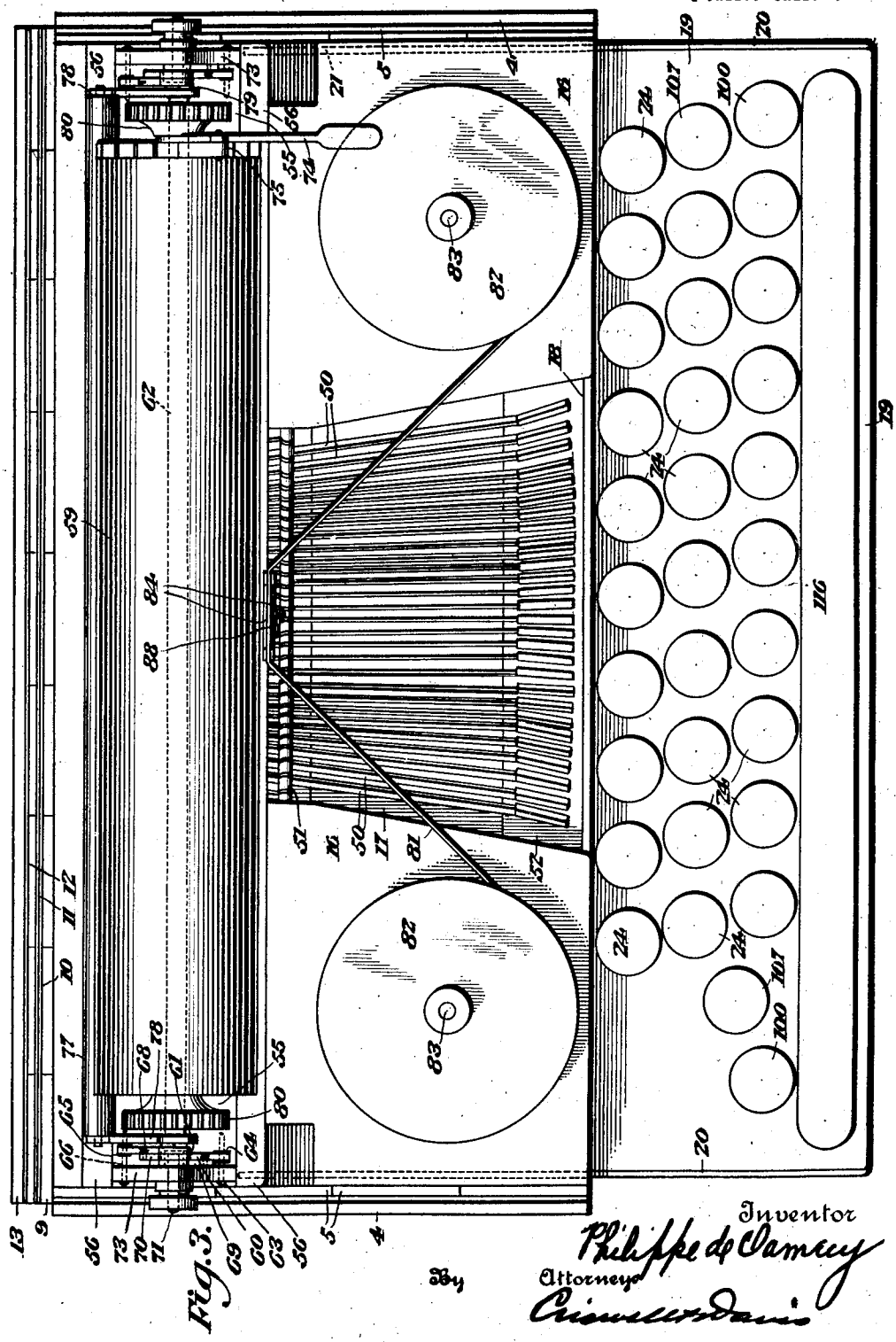


Fig. 3.

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5 SHEETS—SHEET 3.

Fig. 4.

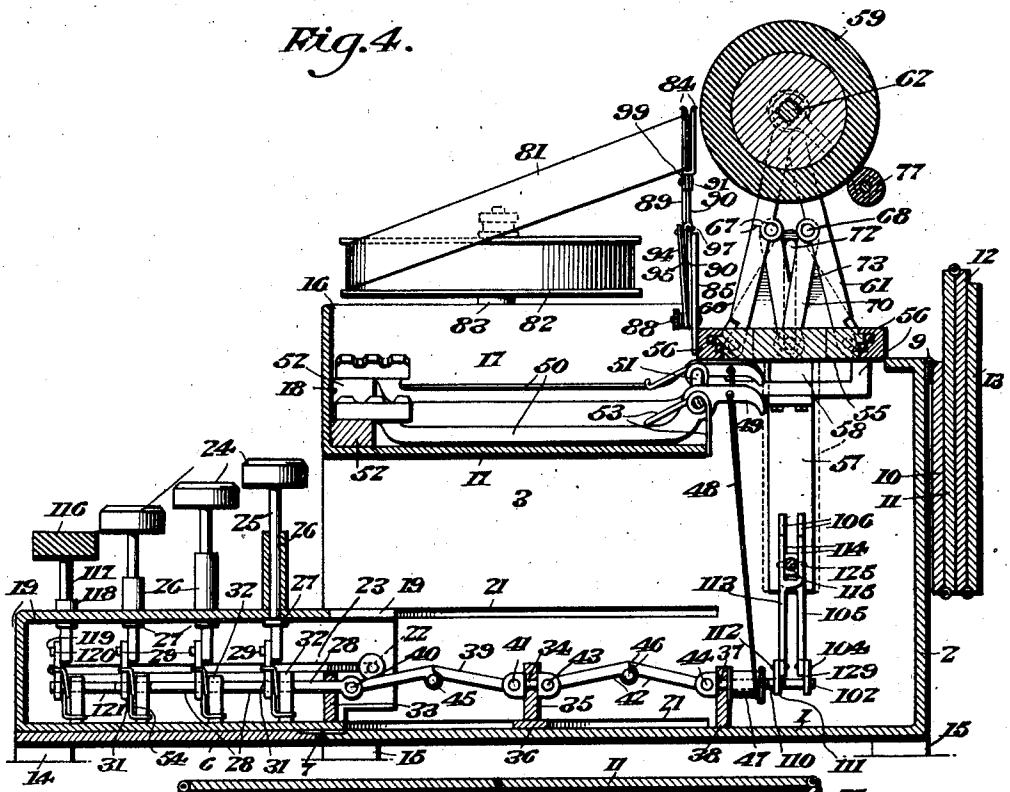
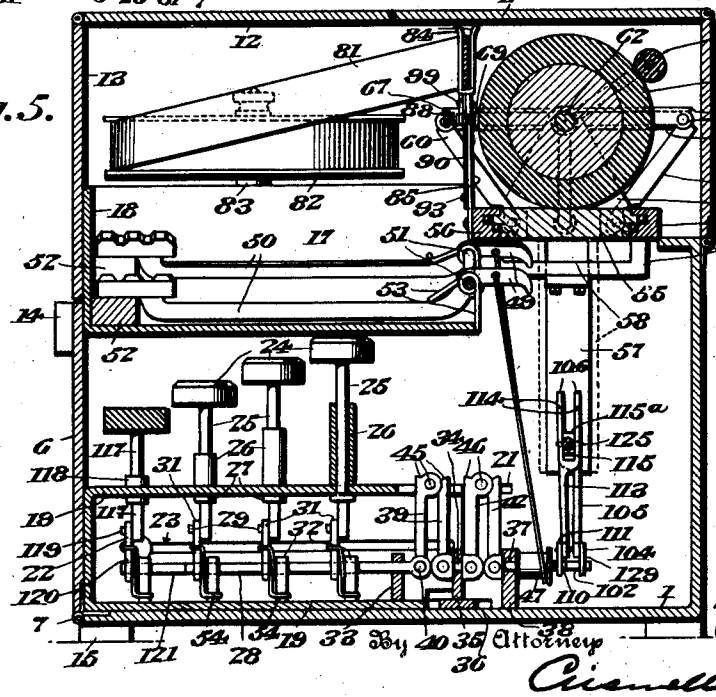


Fig. 5.



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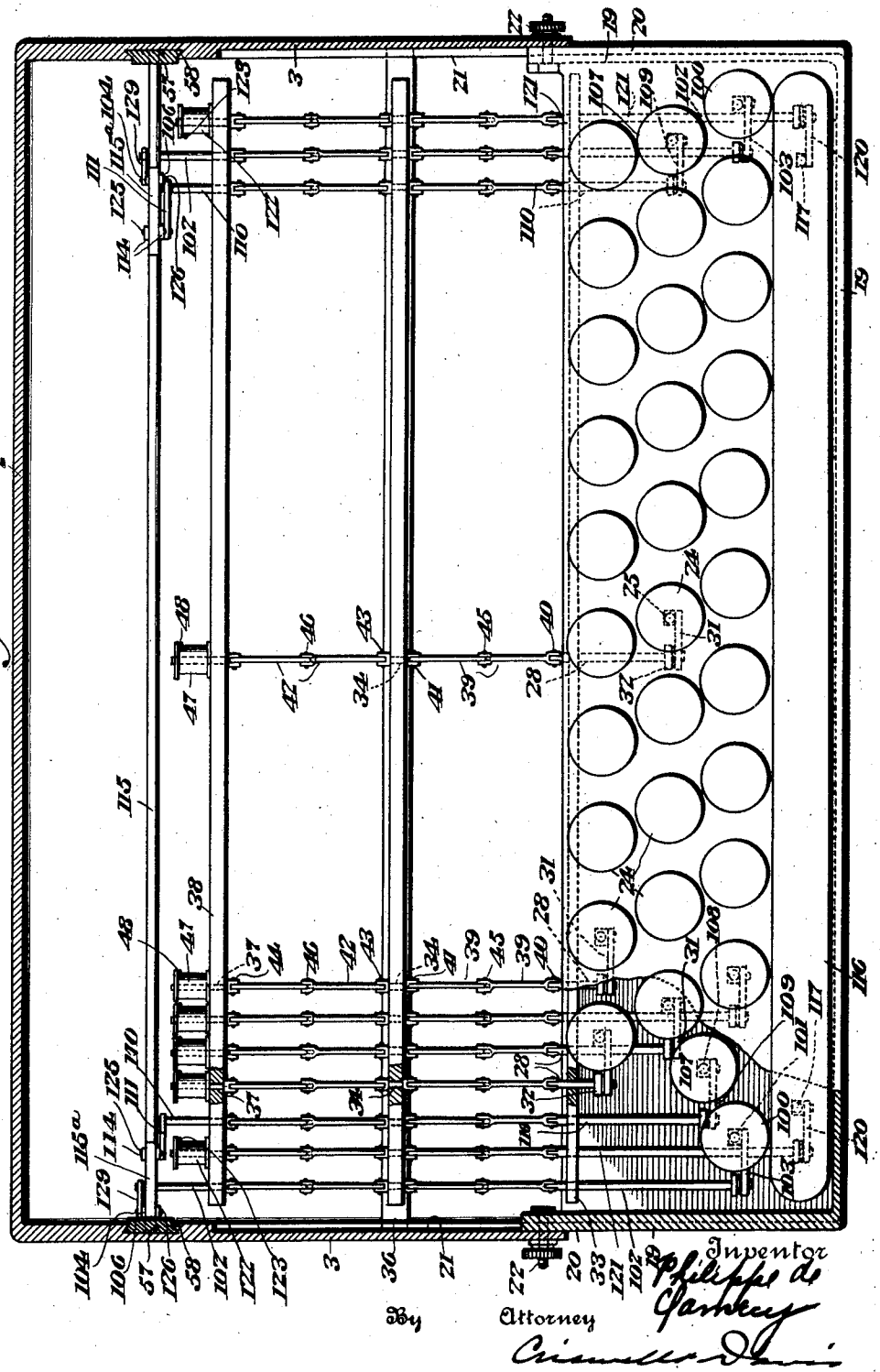
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5 SHEETS—SHEET 4.

Fig. 6.



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5 SHEETS—SHEET 5.

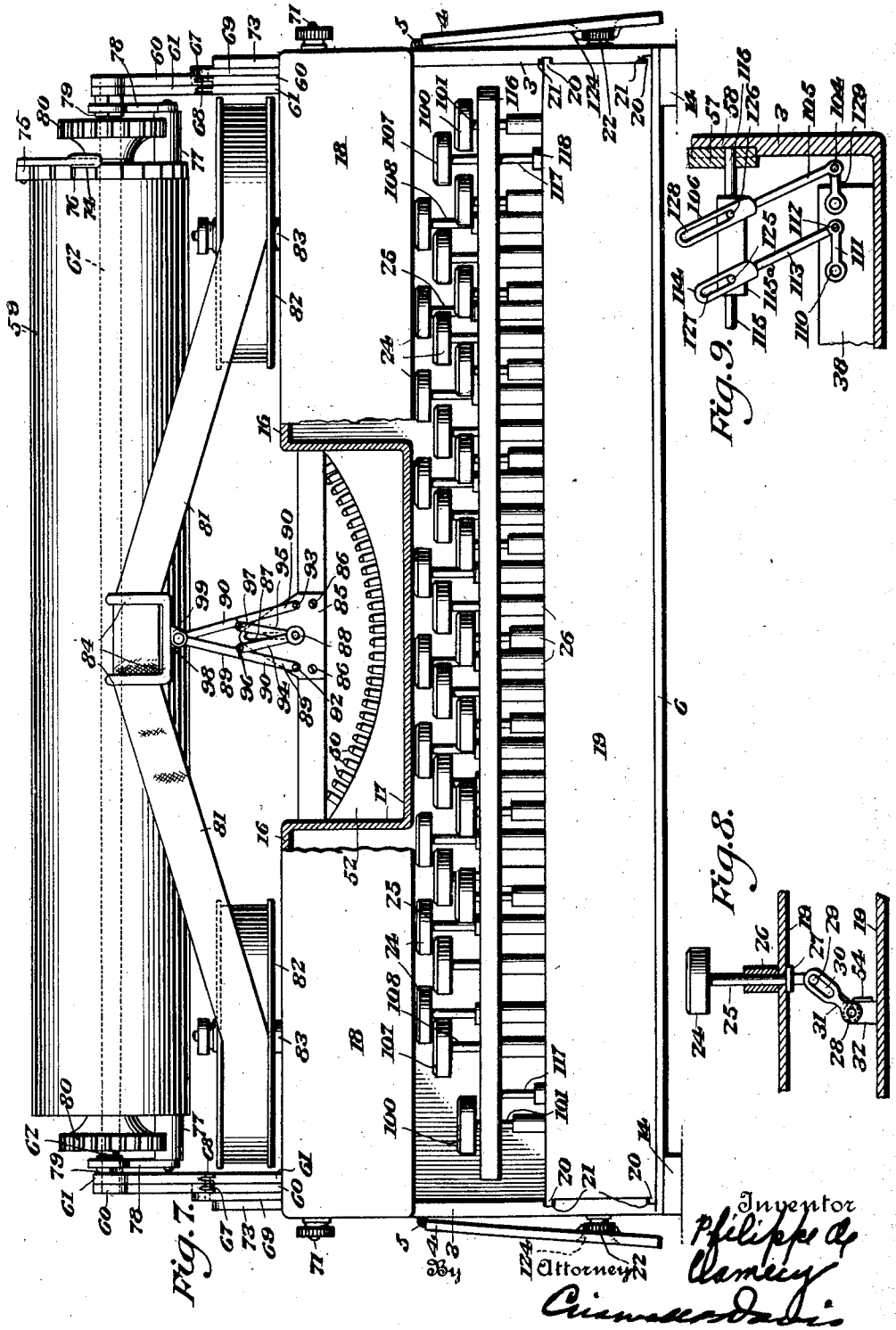


Fig. 7.

Fig. 9.

Fig. 8.

Witnesses

Inventor

Philippe de Clamecy

By

Attorney

UNITED STATES PATENT OFFICE.

PHILIPPE DE CLAMECY, OF CHARLESTOWN, MASSACHUSETTS, ASSIGNOR TO CORONA TYPEWRITER COMPANY, INC., OF GROTON, NEW YORK, A CORPORATION OF NEW YORK.

COLLAPSIBLE TYPEWRITING-MACHINE.

1,355,819. Specification of Letters Patent. Patented Oct. 19, 1920.

Original application filed January 26, 1918, Serial No. 214,017. Divided and this application filed May 12, 1919. Serial No. 296,480.

To all whom it may concern:

Be it known that I, PHILIPPE DE CLAMECY, a citizen of the United States, and resident of Charlestown, county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Collapsible Typewriting-Machines, of which the following is a specification.

This invention relates to improvements in collapsible typewriting machines, and more particularly to compactible type-bar actions for such machines.

This application is a division of my copending application Serial No. 214,017, filed Jan. 26, 1918.

The invention has for its principal objects to provide an improved construction of rectilinearly compactible type-bar action; to provide a front-strike type-bar action having upwardly and rearwardly swinging type-bars, a keyboard shiftable beneath the type-bars, and collapsible connections between the keys and type-bars, said connections being so constructed, arranged and supported as to fold and unfold easily when the keyboard is shifted; and to provide a type-bar action having collapsible rotary operating connections extending fore and aft of the machine each having a plurality of sections pivotally connected end to end.

In the drawings, Figure 1 is a side elevation of the machine with the parts in their extended or normal operative positions;

Fig. 2 a side elevation showing the machine collapsed;

Fig. 3 a plan view of the machine in extended condition;

Fig. 4 a vertical sectional view taken centrally of the machine with the parts in the positions shown in Figs. 1 and 3;

Fig. 5 a view similar to Fig. 4 with the parts in the positions occupied thereby when the machine is collapsed;

Fig. 6 a fragmentary horizontal sectional plan showing the collapsible operating connections between the keys and the parts controlled by the keys;

Fig. 7 a front elevation of the machine in extended condition;

Fig. 8 a detail view showing a part of the key action; and

Fig. 9 a detail view showing part of the platen shift mechanism.

Referring to the drawings by numerals, the frame of the machine comprises a box-like inclosing casing having a rigid main portion formed with a bottom 1, a rear wall 2, and side walls 3. A plate or casing section 4 is hinged at 5 to each of the side walls 3, and a front wall section 6 is hinged at 7 to the forward edge of the bottom 1 of the main portion of the combined casing and frame. A cover or upper portion of the casing is hinged at 9 to the upper edge of the rear wall 2 and is preferably formed of a plurality of hinged sections 10, 11, 12 and 13. The hinged front wall section 6 is provided with a pair of rubber feet 14 adjacent its forward edge and the bottom 1 of the rigid main section of the frame is provided with a rubber foot 15 adjacent each corner thereof. The upper edges of the side walls 3 of the main section of the frame are connected by a transversely extending plate 16 which is depressed intermediate its ends at 17 to receive the type basket, and said walls 3 are also connected by a finishing plate 18 which extends between said walls at the front edges thereof.

A keyboard frame part 19, preferably formed with integral top, bottom, side, and front walls, and having an open rear end, is slidably held to the main frame part to move forwardly and rearwardly out of and into said main frame part. The keyboard frame part 19 is supported on the hinged front section 6 of the inclosing case or main frame when in its normal extended position, and is held to the main frame part by ribs 20 formed on the sides of the keyboard frame part and slidably engaging in grooves 21 formed on the inner surfaces of the side walls 3 of the main frame part. The extent of the sliding movement of the keyboard frame 19 is limited by thumb-screws 22 extending through apertures in the side walls 3 of the main frame and through elongated slots 23 in the side walls of the keyboard frame. By loosening the screws 22 the keyboard frame may be moved into or out of the main frame, and may be locked in its adjusted position by tightening said screws.

A plurality of rows or banks of keys, forming a universal or standard keyboard, are mounted on the keyboard frame part 19 to move therewith, and the banks of keys are

held spaced a fixed distance apart at all times. Each type-bar operating key 24 is rigidly held on the upper end of a vertically reciprocable key stem or rod 25 extending through the top wall of the keyboard frame 19 and slidably guided in a tube or sleeve 26 rigidly held at its lower end to said top wall of the keyboard frame. Each of the stems 25 and sleeves 26 supporting a bank of keys are of the same length, but the stems and sleeves of the several banks are of different lengths to support the rows or banks of keys in different horizontal planes. The extent of depression of the keys is limited by the engagement of the keys with the upper ends of the sleeves 26, and the upward movement of the keys is limited by collars 27 formed on the stems 25 and normally engaging the under side of the top wall of the keyboard frame 19.

Each of the stems 25 is operatively connected to rotate a jointed and collapsible rock shaft 28, there being a shaft 28 for each key stem 25. Any suitable operating connections between the stems 25 and shafts 28 may be provided. As shown, each stem 25 is provided with a horizontally extending arm or projection 29 working in an elongated slot 30 in the outer end of a rock arm 31 fixed on the forward end of the rock shaft 28. Each shaft 28 is formed with a forward section journaled in a bearing formed in a post 32 held to the bottom of the keyboard frame 19, and is also journaled in one of a series of apertures in an upstanding rib or flange 33 formed on the bottom of the keyboard frame. Each shaft 28 is formed with an intermediate section 34 extending through one of a series of apertures or bearings formed in an upstanding rib 35 carried by a slide 36, and a rear section 37 extending through and journaled in one of a series of apertures or bearings in an upstanding rib 38 rigidly held to the bottom 1 of the main frame part. The slide 36 extends transversely of the machine and the ends thereof slidably engage in the lower grooves 21 formed in the side walls 3 of the main frame. The intermediate section 34 of each shaft 28 is shiftable forwardly and rearwardly with the slide 36 and is connected with the front section of the shaft by a knuckle jointed shaft section 39. The knuckle jointed shaft section 39 is pivotally connected at its forward end with the rear end of the forward shaft section by a horizontal pivot pin 40 and is similarly connected at its rear end by a horizontal pivot pin 41 with the forward end of the intermediate longitudinally shiftable shaft section 34. The rear end of shaft section 34 is connected with the forward end of shaft section 37 by a knuckle jointed shaft section 42 similar to the jointed section 39. The section 42 is held to the sections 34 and 37 by horizontal pivot pins 43 and 44, and the knuckle joints 45 and 46 of the shaft sections 39 and 42 are preferably constructed as shown so that the pivotal points thereof are held out of alinement with the shaft bearings. As a further means for preventing the knuckle joints from being shifted into alinement with the shaft bearings when the shaft is extended, the parts of the shaft are formed of such length that the screws 22 will engage the rear end of slots 23 in the keyboard frame 19 and stop the outward movement of said frame before the shaft 28 has been extended sufficiently to bring the pivotal points of the knuckle joints in alinement with the shaft.

A drum 47 is fixed on each of the rear sections 37 of shafts 28 to rotate therewith when its associated printing key 24 is depressed. Flexible wires or cords 48 are secured at their lower ends to the drums 47 to wind thereon, and the upper ends of said cords are secured to rearwardly extending arms or projections 49 formed on the type bars 50. Each type bar 50 is pivotally mounted adjacent its rear end on a curved rod or type-bar-hanger 51, rigidly held at its ends to the transversely extending frame plate 16 at opposite sides of the depressed portion 17 of said plate. The segmental basket of type bars is normally supported in a horizontal position within the depression 17 formed in the plate 16, the heads of the type bars 50 being normally supported on a curved type bar rest 52. Suitable springs 53 may be provided for normally forcing the type bars rearwardly and downwardly, and suitable springs 54 are provided for normally holding the rock arms 31 and key stems 25 in raised position. It will be obvious that, upon the depression of one of the printing keys 24, its coöperating jointed shaft 28 and drum 47 will be rotated, winding cord 48 on said drum, and causing the associated type bar to swing upwardly and rearwardly to the printing point.

A platen carriage 55 is supported adjacent the rear end of the main frame part above and at the rear of the type bars 50, and is adapted to travel transversely of said frame part on a carriage bed 56. The carriage bed 56 is fixed adjacent its ends to the upper ends of a pair of vertical slides 57 of dovetail form, slidably held in vertically extending undercut grooves or ways 58 formed in the side walls 3 of the main frame part. The lower ends of the slides 57 normally rest at the lower ends of the ways 58, as shown in Figs. 4 and 5, to support the carriage bed in its normal position.

The carriage 55 is provided at each end thereof with means for rotatably supporting a platen 59. As shown, the carriage and bed are normally supported in close proximity to the type bar hanger 51, and means is provided for normally supporting the

platen in an elevated position above the carriage in coöperative relation with the type, said platen-supporting means being collapsible to permit the platen to be lowered into close proximity with the carriage and out of coöperative relation with the type to reduce the height of the machine when not in use. I prefer to employ for this purpose the vertically collapsible supporting mechanism shown in the drawings.

The collapsible supports at each end of the carriage are constructed in the same manner and each comprises a pair of knuckle jointed arms 60 and 61 in the upper ends of which one end of the platen shaft 62 is journaled. The arms 60 and 61 are spaced apart at their lower ends, the lower end of arm 60 being pivotally held on a horizontal pivot pin 63 in a recess 64 in the carriage 55 adjacent the forward edge of the carriage, and arm 61 being held in a recess 65 adjacent the rear edge of the carriage on a horizontal pivot pin 66. The arm 60 is provided with a forwardly breaking knuckle joint 67, and arm 61 is provided with a rearwardly breaking knuckle joint 68. The sections of the arms 60 and 61 are normally held in alinement by a pair of links 69 and 70, pivotally held at their lower ends on the shank of a locking screw 71 working in a vertical slot 72 in an upstanding plate or bracket 73 which is rigidly held to the end of the carriage 55. The upper end of link 69 is pivotally held to the pivot pin of the knuckle joint 67 of arm 60, and the upper end of link 70 is pivotally held to the pivot pin of the knuckle joint 68 of arm 61.

Any suitable means may be provided for rotating the platen for line spacing, such as a line-space lever 74, pivotally held to the platen shaft 62, and carrying a dog 75 adapted to engage a ratchet wheel 76 fixed to the platen 59 at one end thereof in the usual manner. Any suitable carriage escapement mechanism, and other usual mechanisms or devices commonly applied to typewriting machines may be provided, such devices not being shown as they form no part of the present invention. Any suitable form of paper guiding and feeding means may be provided. I have shown a feed roll 77 rotatably supported at its ends in the lower ends of a pair of arms 78 fixed at their upper ends on square bosses 79 formed on the upper ends of arms 61. The usual thumb wheels 80 may be provided for rotating the platen.

The ribbon 81 is wound in the usual manner on two spools 82 mounted on shafts 83 supported on the transversely extending frame plate 16. Any suitable mechanism may be employed for rotating the spools 82 to feed the ribbon lengthwise, and any desired means may be provided for vibrating the ribbon to cover and uncover the printing point. The ribbon is supported adjacent the printing point by a vertically collapsible ribbon holder having a ribbon guide 84 of substantially U-shape, the upwardly extending arms of which are forked to receive the ribbon and permit lengthwise and vertical movement of the ribbon relatively to the holder. The U-shaped portion 84 of the ribbon holder is mounted on a collapsible support constructed in substantially the same manner as the collapsible platen supporting means heretofore described. This collapsible support comprises a plate or bracket 85, held to the front edge of the carriage bed 56 by suitable screws 86, and provided with a vertical slot 87 through which the shank of a locking screw 88 extends. A pair of knuckle-jointed arms 89 and 90 are pivotally held by a pin 91 to a lug depending from the bottom or transversely extending member of the U-shaped ribbon guide 84, and are held to the plate 85 at their lower ends by pivot pins 92 and 93, respectively. A pair of links 94 and 95 are pivotally held at their lower ends on the shank of the locking screw 88. The upper end of link 94 is pivotally held to the pivot pin of the outwardly breaking knuckle joint 96 of arm 89, and the upper end of link 95 is pivotally held to the pivot pin of the outwardly breaking knuckle joint 97 of arm 90. Arm 90 is provided at its upper end with a stop or lug 98 and arm 89 is provided with a similar stop 99, said stops being adapted to engage under the ribbon guide 84 at opposite sides of the pivot pin 91 when the ribbon holder is extended to prevent rocking of the guide portion 84 of the ribbon holder.

The head of each of the type bars 50 is preferably provided with three type, as shown, and means is provided for imparting a double case shift movement to the platen. The middle case shift keys 100, one of which is provided at each side of the keyboard, are supported on vertically reciprocable key stems 101, similar to the key stems 25, and operatively connected to rotate the jointed and collapsible rock shafts 102 through rock arms 103. The rock arms 103 and rock shafts 102 are constructed and mounted in the same manner as the type-bar-operating shafts 28. Rock arms 129 are held to the rear ends of the shafts 102 and the outer ends of said rock arms are pivotally connected at 104 with the lower ends of links 105, the upper ends of which are forked as shown at 106. The upper case shift keys 107 located at each side of the keyboard are mounted on reciprocable key stems 108 connected with rock arms 109 to rotate the jointed and collapsible rock shafts 110. Rock arms 111 are held to the rear ends of the shafts 110 and are pivotally connected at 112 with the lower ends of links 113 the upper ends of which are forked as shown at

114. The slides 57 upon which the carriage bed 56 is supported, are connected at their lower ends by a transversely extending rod 115 which extends through the forked upper ends 106 and 114 of the links 105 and 113. The rod 115 is formed with angular enlarged portions 115ª extending through the forked ends 106 and 114 of the links 105 and 113, and pins 125 and 126 extend through said angular portions and engage in slots 127 and 128 formed in the forked ends of said links and serve to normally hold the links in the position shown in Figs. 4, 5 and 9. The rock arm 111 is longer than the rock arm 129 to adapt a greater vertical movement to be imparted to the platen by the shift keys 107 than that imparted to the platen by the shift keys 100.

The space bar 116 is supported on vertically reciprocable stems 117 passing through tubular sleeves or guides 118 held to the keyboard frame part 19. Each stem 117 is provided with an offset portion 119 working in the slotted upper end of a rock arm 120 held to the forward end of a jointed and collapsible rock shaft 121. The rock shafts 121 are constructed and mounted in the same manner as the rock shafts 28 and have drums 122 fixed to the rear ends thereof. Cords 123 are secured to the drums 122 to wind thereon and may be operatively connected in any suitable manner to actuate a carriage escapement mechanism when the space bar is depressed.

When it is desired to collapse the machine the platen 59 may be lowered into close relation with the carriage 55 by loosening the clamping screws 71 and moving said screws upwardly in the slots 72 in brackets 73, thus forcing the upper ends of the links 69 and 70 away from each other, breaking the knuckle joints 67 and 68 of the arms 60 and 61 and lowering the platen 59, together with the feed roller 77 and the line spacing lever 74, from the positions shown in Figs. 1, 3, 4 and 7 to the positions shown in Figs. 2 and 5, and materially reducing the height of the machine. The ribbon holder 84 may be lowered by loosening the clamping screw 88 and moving the same upwardly in the slot 87 in the plate 85, thus forcing the upper ends of the links 94 and 95 away from each other, breaking the knuckle joints 96 and 97 of the arms 89 and 90, and lowering the holder 84 into closer relation with the carriage bed 56 at a point in front of the platen 59, as shown in Figs. 2 and 5.

The length of the machine from front to rear may be materially reduced by loosening the locking screws 22 and sliding the keyboard frame part 19 rearwardly within the main frame part beneath the type basket, thus moving the keyboard into closer relation with the type bars and the platen. It will be obvious that when the keyboard frame part 19 is slid rearwardly in the guide-ways 21 in the side walls 3 of the main frame part the knuckle joints of the collapsible rock shafts will break upwardly permitting the front sections of said shafts to move rearwardly until the pivot points 40 are in close relation with the pivot points 41 of the intermediate sections 34, and that the slide 36 will then be moved rearwardly, carrying with it the intermediate sections 34 of the collapsible shafts, until the pivot points 43 are in close relation with the pivot points 44 of the rear sections 37, as shown in Fig. 5. It will thus be seen that the entire keyboard may be moved within the main frame part beneath the type basket without breaking the mechanical connections between the keys and the type bars, or the connections between the shift keys or the space bar and the mechanisms operated thereby. When the several mechanisms have been moved into compact relation with each other, as above described, the hinged section 6 of the box-like frame or casing may be swung upwardly in front of the keyboard, the side plates 4 may be swung upwardly about their hinges 5, and the jointed cover portion comprising the hinged sections 10, 11, 12 and 13 may be folded, as shown in Figs. 2 and 5, to inclose the upper portion of the machine. As shown in Fig. 2, the sections of the jointed cover portion rest upon the edges of the hinged side plates 4 and are supported thereby. Any suitable means may be provided for fastening the hinged sections in closed position, and any suitable means may be provided for supporting the sections of of the jointed cover portion when the machine is extended. The hinged side plates 4 are provided with suitable recesses 124, into which the heads of the locking screws 71 may pass when the side plates 4 are swung upwardly to closed position.

What I claim is:

1. In a typewriting machine, the combination of type bars, keys, and independent actuating connections between the keys and type bars, each of said connections including a sectional shaft rotatable by its associated key to operate a type bar and having its sections pivotally connected together to permit the key to be moved from its normal position to a position closer to the rear of the machine.

2. In a typewriting machine, the combination of type bars, keys, and operating connections between the keys and type bars whereby the keys and the type bars may be brought into more compact relationship when the machine is not in use, each of said connections including a shaft rotatable by its associated key to operate a type bar, said

shafts having end sections and intermediate jointed sections shiftable laterally relatively to the end sections.

3. In a collapsible typewriting machine, the combination of a support, type bars mounted on said support, keys movable relatively to the type bars from their normal extended operative positions to more compact inoperative positions, rock shafts having knuckle-jointed sections adapted to fold when the keys are moved to compact position, connections between the keys and rock shafts for rotating the shafts when the keys are operated, and connections between the shafts and type bars for actuating the type bars when the shafts are rotated.

4. In a collapsible typewriting machine, the combination of type bars, keys shiftable horizontally fore and aft of the machine relatively to the type bars from normal positions to more compact positions closer to the rear of the machine, and collapsible constantly maintained mechanical operating connections between the keys and type bars each including a rock shaft extending fore and aft of the machine and having pivotally connected folding sections.

5. In a collapsible typewriting machine, the combination of type-bars, means for supporting the type bars above the base of the machine, keys, and operating connections between the keys and type bars whereby the keys and type bars may be placed in superposed relation by relative horizontal movement, each of said connections including a shaft extending fore and aft of the machine rotatable by its associated key to operate a type bar and having jointed sections shiftable laterally to permit relative horizontal movement between the keys and type bars.

6. In a collapsible typewriting machine, the combination of a support, type bars pivotally mounted on the support, keys movable relatively to the type bars from their normal operative positions to more compact inoperative positions, collapsible key-operated rock-shafts, and flexible connections between the type bars and rock-shafts adapted to be wound upon the shafts when the keys are operated.

7. In a collapsible typewriting machine, the combination of a support, type bars pivotally mounted on the support, keys movable relatively to the type bars from their normal operative positions to more compact inoperative positions, cords held at one end to the type bars, and collapsible rotary means operable by the keys for winding the other ends of said cords to actuate the type bars.

8. In a collapsible typewriting machine, the combination of a support, type bars pivotally mounted on the support, keys movable relatively to the type bars from their normal operative positions to more compact inoperative positions, drums mounted on said support in fixed relation with the type bars, flexible connections between the drums and type bars adapted to be wound upon said drums, and constantly maintained connections between the keys and drums for rotating the drums when the keys are operated.

9. In a collapsible typewriting machine, the combination of a support, type bars pivotally mounted on the support, keys movable relatively to the type bars from their normal operative positions to more compact inoperative positions, drums mounted on said support in fixed relation with the type bars, flexible connections between the drums and type bars adapted to be wound upon said drums, and collapsible rotary means operable by the keys for rotating the drums.

10. In a collapsible typewriting machine, the combination of a support, type bars pivotally mounted on the support, keys movable relatively to the type bars from their normal operative positions to more compact inoperative positions, drums mounted on said support in fixed relation with the type bars, flexible connections between the drums and type bars adapted to be wound upon said drums, foldable shafts for rotating said drums, and connections between the shafts and the keys for rotating the shafts when keys are depressed.

11. In a collapsible typewriting machine, the combination of a support, normally substantially horizontal type bars pivotally mounted on the support, keys movable from extended operative positions to more compact positions beneath the type bars, and collapsible rock shafts extending parallel with each other fore and aft of the machine and operatively connected with the keys and type bars to actuate the type bars when the keys are depressed.

12. In a collapsible typewriting machine, the combination of a support, type bars mounted on the support, keys movable from extended operative positions to more compact positions beneath the type bars, rock shafts having knuckle jointed sections adapted to fold when the keys are moved to compact position, and constantly maintained connections between said shafts and the keys and type bars whereby said shafts be rocked by the keys to actuate the type bars.

13. A type bar action comprising a type bar support, type bars mounted on the type bar support, a key board support, keys mounted on the keyboard support, and collapsible operating connections between the keys and the type bars whereby said supports may be given a relative horizontal

movement to place the keys and type bars in superposed relation, each of said connections including a shaft having end sections journaled in bearings on said supports and intermediate pivotally connected laterally shiftable sections, means connecting the forward end section of the shaft with its associated key to adapt the shaft to be rotated by depressing the key, and means connecting the rear end section of the shaft with its associated type bar adapted to actuate the type bar upon rotation of the shaft.

14. In a collapsible visible typewriting machine, the combination of a support, type bars pivotally mounted on the support to move upwardly and rearwardly to the printing point, keys movable from extended operative positions to more compact positions beneath the type bars, a plurality of rock shafts having relatively foldable portions, there being a rock shaft for each key, a connection between each key and the forward end of its associated rock shaft for rotating the shaft when the key is depressed, and a flexible connection between the rear end of each shaft and its associated type bar adapted to be wound about the shaft to swing the type bar upwardly and rearwardly when the shaft is rotated.

15. In a collapsible typewriting machine, the combination of a main frame part, type bars mounted on the main frame part, a keyboard frame part slidably held to the main frame part to move from an extended operative position to a compact inoperative position beneath the type bars, collapsible shafts rotatably supported in parallel relation in fixed bearings on the main frame part and keyboard frame part, keys mounted on the keyboard frame part to move therewith in transverse rows having a constant spaced relation fore and aft of the keyboard frame part, connections between the keys and shafts for rotating the shafts, and connections between the shafts and type bars for actuating the type bars when the shafts are rotated by the keys.

16. In a collapsible typewriting machine, the combination of a main frame part, type bars mounted on the main frame part, a keyboard frame part slidably held to the main frame part to move from an extended operative position to a compact inoperative position beneath the type bars, rock shafts rotatably supported at their forward ends in bearings on the keyboard frame part and rotatably supported at their rear ends in bearings on the main frame part, each of said shafts having intermediate jointed portions shiftable laterally when the keyboard frame part is moved to compact position, keys mounted on the keyboard frame part to move therewith, connections between the keys and shafts for rotating the shafts, and connections between the shafts and type bars for actuating the type bars when the shafts are rotated by the keys.

17. In a collapsible typewriting machine, the combination of a main frame part, type bars mounted on the main frame part, a keyboard frame part slidably held to the main frame part to move from an extended operative position to a compact inoperative position beneath the type bars, rock shafts rotatably supported at their forward ends in fixed bearings on the keyboard frame part and rotatably supported at their rear ends in fixed bearings on the main frame part, each of said shafts having intermediate pivotally connected portions adapted to fold when the keyboard frame part is moved to compact position, keys mounted on the keyboard frame part to move therewith, connections between the keys and shafts for rotating the shafts, drums fixed on the rear ends of said shafts, and flexible connections secured at one end to the drums to wind thereon and secured at their other ends to the type bars.

18. In a collapsible typewriting machine, the combination of a main frame part, type bars pivotally mounted on the main frame part to move upwardly and rearwardly to the printing point, a keyboard frame part slidably held to the main frame part to move within the same beneath the type bars, collapsible shafts each having a front section journaled on the keyboard frame part and a rear section journaled on the main frame part and an intermediate section journaled in a bearing slidably held to the main frame part to move forwardly and rearwardly, knuckle jointed shaft sections connecting the front and rear sections of each shaft with the intermediate section thereof, connections between the keys and the front sections of the shafts for rotating the shafts, and connections between the type bars and the rear sections of the shafts for actuating the type bars.

19. In a collapsible typewriting machine, the combination of a main frame part, type bars pivotally mounted on the main frame part to move upwardly and rearwardly to the printing point, a keyboard frame part slidably held to the main frame part to move within the same beneath the type bars, collapsible shafts each having a front section journaled on the keyboard frame part and a rear section journaled on the main frame part and an intermediate section journaled in a bearing slidably held to the main frame part to move forwardly and rearwardly, knuckle jointed shaft sections connecting the front and rear sections of each shaft with the intermediate section thereof, connections between the keys and the front sections of the shafts for rotating the shafts, drums fixed on the rear sections of the shafts, and cords secured at their upper ends

to the type bars at the rear of the type bar pivots and secured at their lower ends to the drums to wind thereon.

20. In a collapsible typewriting machine, the combination of a main frame part, type bars mounted on the main frame part, a keyboard frame part slidably held to the main frame part to move from an extended operative position to a compact inoperative position beneath the type bars, collapsible shafts having end portions rotatably supported in fixed bearings on the main frame part and keyboard frame part and intermediate laterally shiftable portions, key-supporting rods reciprocably mounted on the keyboard frame part in rows having a fixed relation with each other at all times and supporting rows of keys in banks, connections between the key stems and the forward end portions of the shafts for rotating the shafts when the keys are depressed, and connections between the rear end portions of the shafts and the type bars for actuating the type bars.

21. In a typewriting machine, the combination of a key, a stem supporting the key, a movable part of the machine operable by the key, and a collapsible connection between said key stem and said movable part including a shaft journaled adjacent its ends in bearings shiftable toward and from each other, said shaft having a plurality of pivotally connected sections intermediate its bearings adapted to fold and unfold.

22. In a typewriting machine, the combination of a key, a stem supporting the key, a movable part of the machine operable by said key, a sectional rock shaft having end sections journaled in bearings shiftable toward and from each other and an intermediate laterally shiftable knuckle-jointed portion pivotally connected at its ends to adjacent sections of the shaft, means connecting the key stem with one end section of said shaft for rotating the shaft, and means connecting the other end section of the shaft with said movable part of the machine for actuating said part when the shaft is rotated.

23. The combination of a key, a type bar, and a collapsible operating connection between the key and the type bar including a sectional shaft rotatable by the key having a plurality of rigid sections, relatively shiftable bearings supporting said rigid shaft sections, and knuckle jointed folding shaft sections interposed between said rigid shaft sections and each pivotally connected at its ends to two of said rigid shaft sections.

24. In a collapsible typewriting machine, the combination of a main frame part, a keyboard frame part shiftable fore and aft of the machine, a universal keyboard including printing and shift keys and a space bar all mounted in fixed relation on the keyboard frame part to move bodily therewith as a unit into and out of the main frame part, and longitudinally collapsible rock shafts interposed between the keys and space bar and the devices controlled thereby, each of said shafts having pivotally connected sections foldable relatively to each other.

25. In a collapsible typewriting machine, the combination of a main frame part, printing instrumentalities mounted on said frame part, case shift means mounted on said frame part, a keyboard frame part movable horizontally into and out of the main frame part, printing and shift keys mounted on the keyboard frame part, and longitudinally collapsible rock shafts operatively connecting the printing keys and shift keys with the printing instrumentalities and case shift means respectively, each of said shafts having pivotally connected sections foldable relatively to each other.

This specification signed this 12th day of April, A. D. 1919.

PHILIPPE DE CLAMECY.