No. 880,391. PATENTED FEB. 25, 1908.

C. C. McPHEE.

TYPE WRITING MACHINE.

APPLICATION FILED AUG. 3, 1906.

6 SHEETS—SHEET 1.

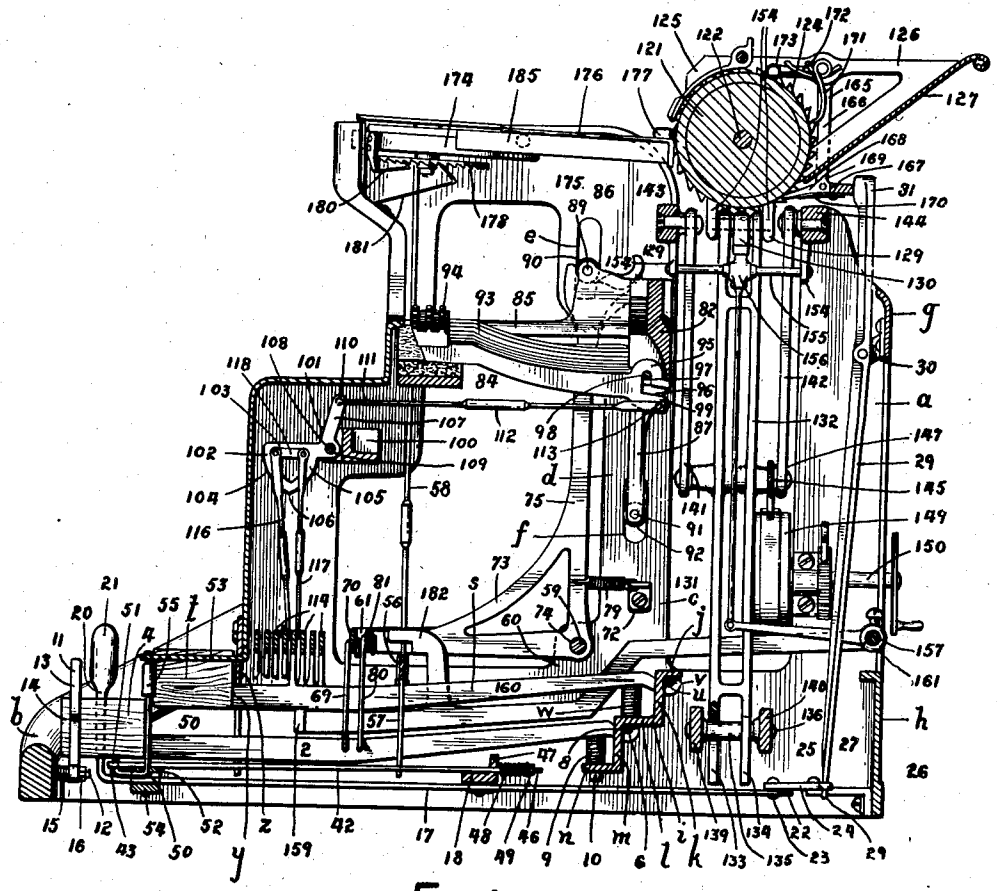


Fig. 1.

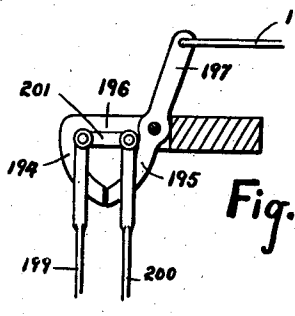


Fig. 13.

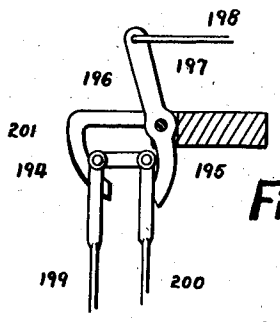


Fig. 14.

Witnesses.

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6 SHEETS—SHEET 2.

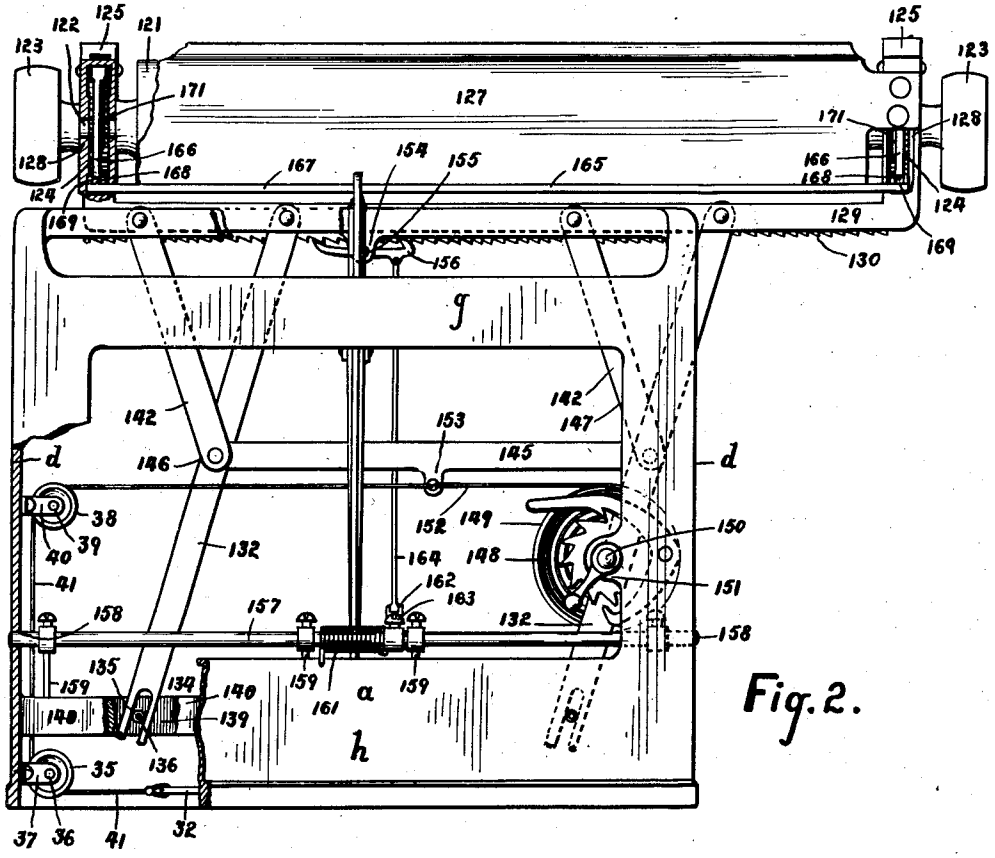


Fig. 2.

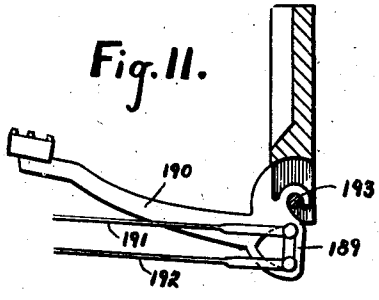


Fig. 11.

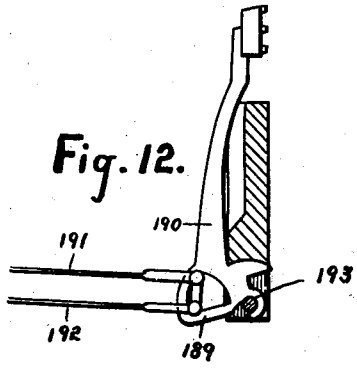


Fig. 12.

Witnesses.

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No. 880,391. PATENTED FEB. 25, 1908.

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TYPE WRITING MACHINE.

APPLICATION FILED AUG. 3, 1906.

6 SHEETS—SHEET 3.

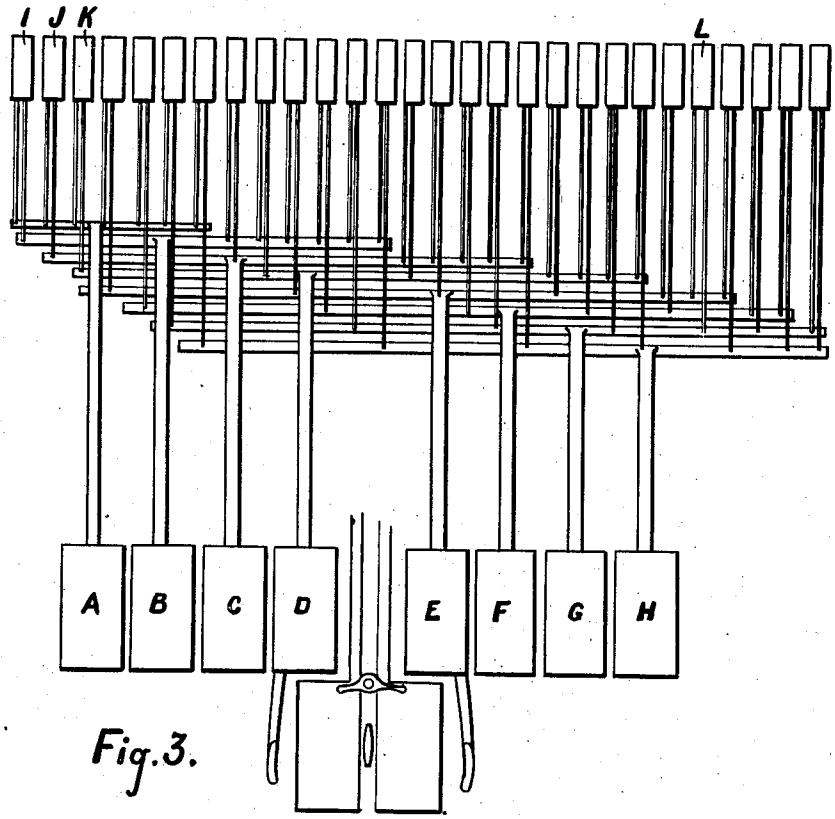


Fig. 3.

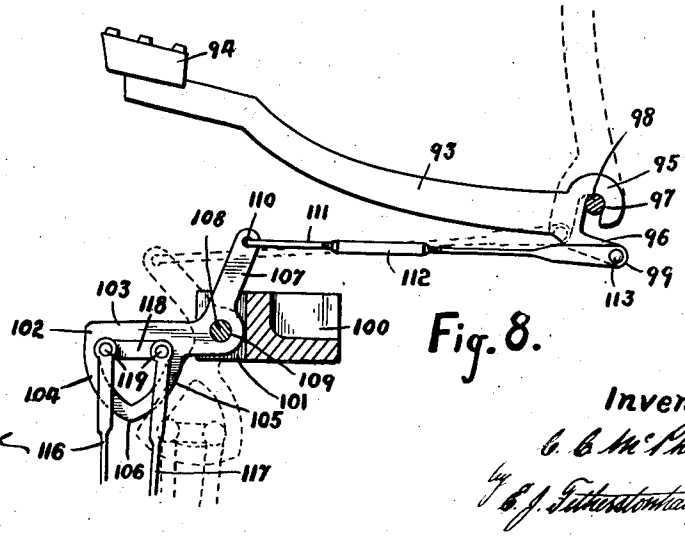


Fig. 8.

Witnesses.

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No. 880,391. PATENTED FEB. 25, 1908.

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TYPE WRITING MACHINE.

APPLICATION FILED AUG. 3, 1906.

6 SHEETS—SHEET 4.

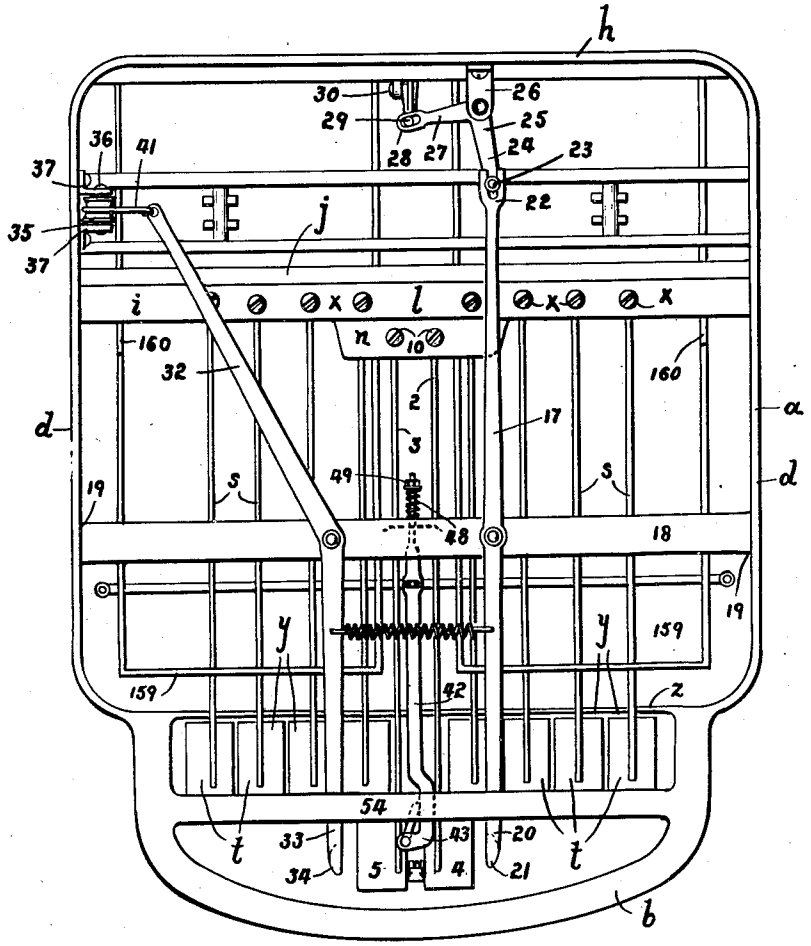


Fig. 4.

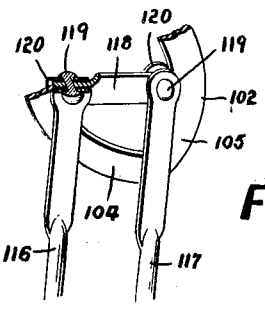


Fig. 9.

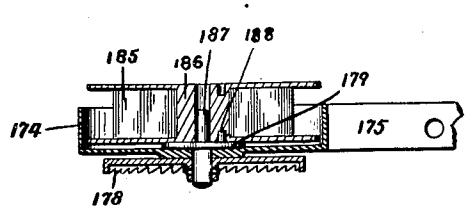


Fig. 10.

Witnesses.

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by E. J. Gethen Strawbridge Atty.

No. 880,391. PATENTED FEB. 25, 1908.

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TYPE WRITING MACHINE.

APPLICATION FILED AUG. 3, 1906.

6 SHEETS—SHEET 5.

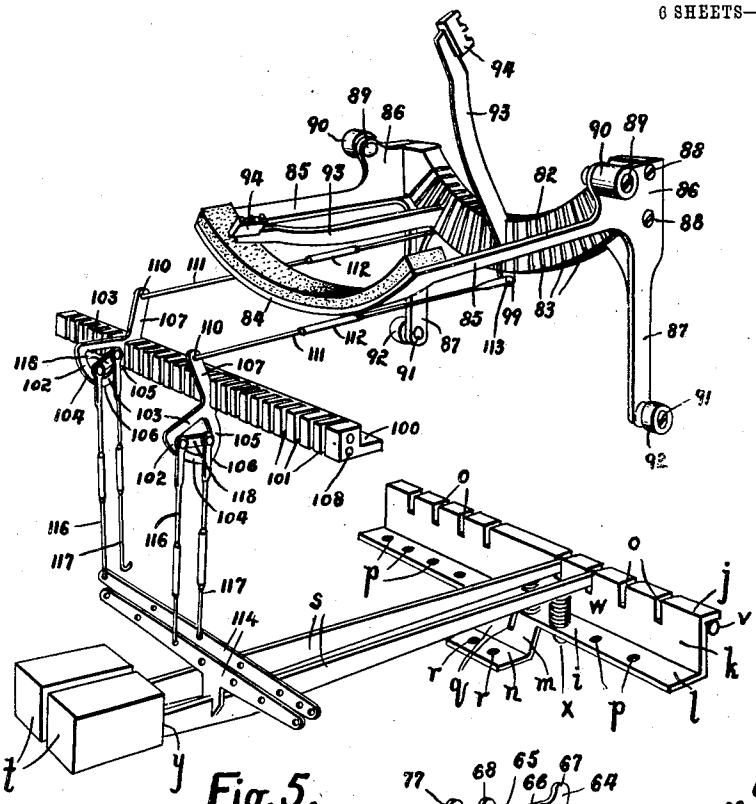


Fig. 5.

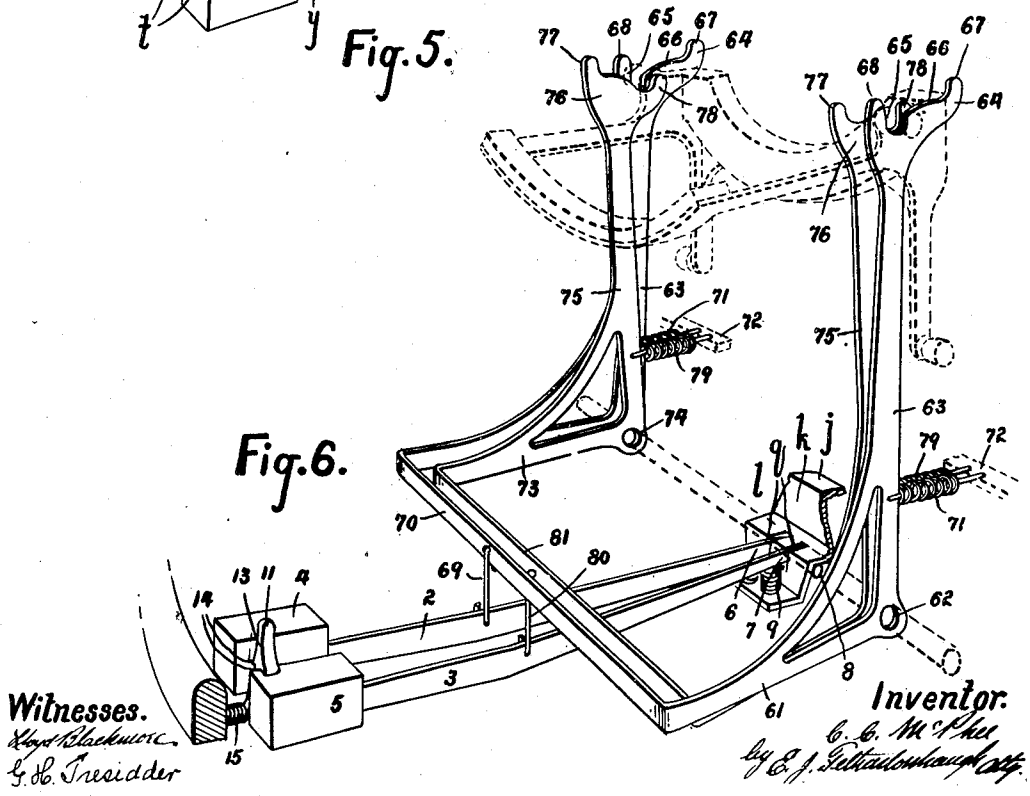


Fig. 6.

Witnesses.
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by E. J. Gallaudet Atty.

No. 880,391 PATENTED FEB. 25, 1908.

C. C. McPHEE.

TYPE WRITING MACHINE.

APPLICATION FILED AUG. 3, 1906.

6 SHEETS—SHEET 6.

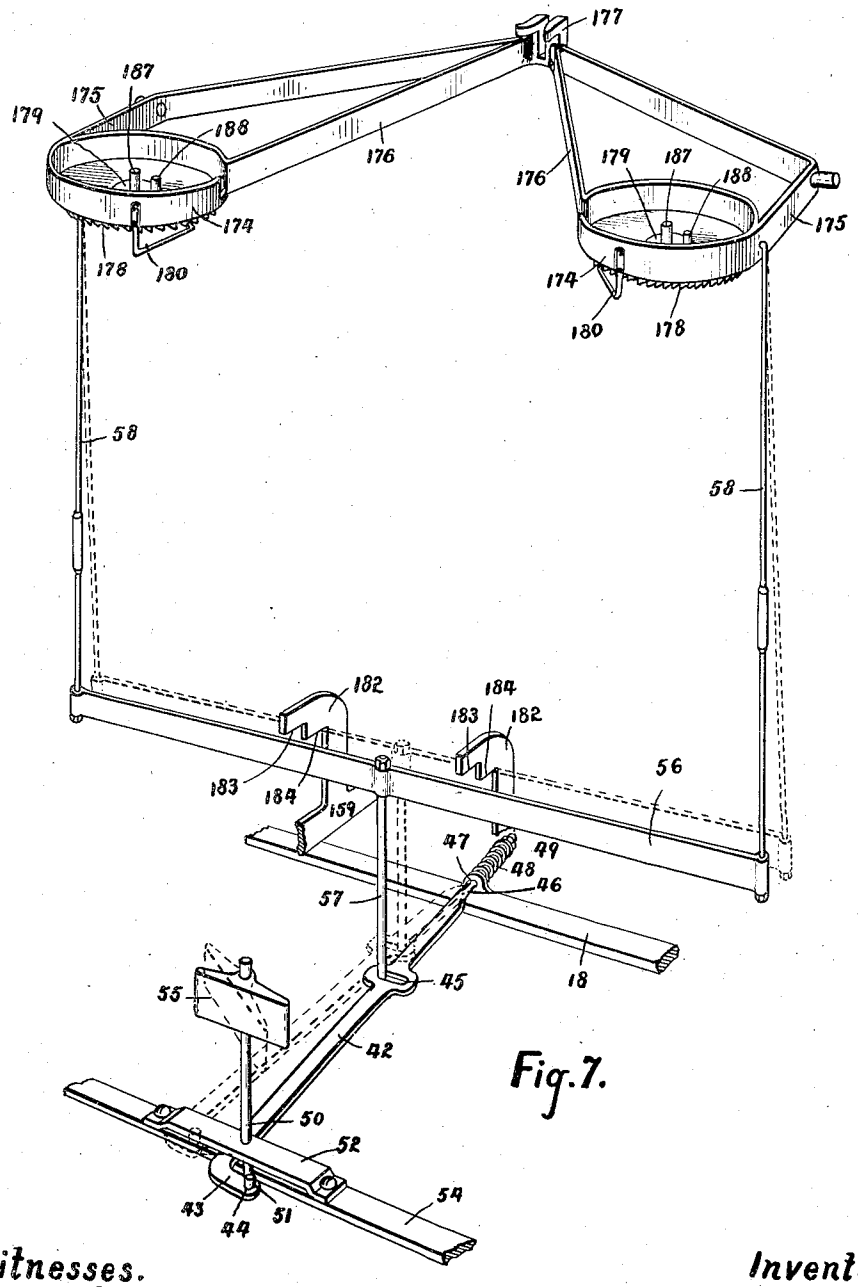


Fig. 7.

Witnesses.

Lloyd Blackmore

G. H. Dresidder

Inventor.

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by E. J. Schroeder Atty

UNITED STATES PATENT OFFICE.

COLIN CAMPBELL McPHEE, OF MONTREAL, QUEBEC, CANADA.

TYPE-WRITING MACHINE.

No. 880,391. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed August 3, 1906. Serial No. 329,110.

To all whom it may concern:

Be it known that I, COLIN CAMPBELL MCPHEE, a subject of the King of Great Britain, residing at 31 Chomedy street, in the city of Montreal, in the district of Montreal, in the Province of Quebec, in the Dominion of Canada, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to improvements in typewriting machines, as described in the present specification and illustrated by the accompanying drawings that form part of the same.

The invention consists essentially of a frame, a traveling platen supported thereby, a plurality of pivoted type bars registering on said platen, a plurality of pivoted key levers and means connecting said key levers in pairs and a type bar for operating the latter.

The objects of the invention are to reduce the number of keys thereby simplifying the fingering and increasing the speed of the operator, and to effect a compact and durable construction.

In the drawings, Figure 1 is a mid-cross sectional view of the machine. Fig. 2 is a rear elevation of the machine. Fig. 3 is a diagrammatic view showing the arrangement of the keys, levers and type bars. Fig. 4 is a plan view of the machine from below. Fig. 5 is a perspective detail showing the stirrup mechanism and operating levers and type bars. Fig. 6 is a perspective detail showing the shifting mechanism. Fig. 7 is a perspective detail showing the ribbon frame and guides and operating mechanism. Fig. 8 is an enlarged detail view showing a type bar and its connection to the stirrup. Fig. 9 is an enlarged sectional perspective detail of a stirrup showing the link and the rods broken away. Fig. 10 is an enlarged cross sectional view through the ribbon spool holding cup. Fig. 11 is a detail view showing a modification of the stirrup mechanism for operating the type bar. Fig. 12 is a detail view showing the type bar in its upright position in the form of stirrup mechanism, illustrated in Fig. 11. Fig. 13 is a detail view showing another modification of the stirrup mechanism. Fig. 14 is a detail view of the stirrup mechanism, illustrated in Fig. 13, in operation.

Like letters and numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, *a* is the frame preferably rectangular in shape and having the key board frame *b* extending outwardly from the front thereof and the vertical openings *c* in the sides *d* towards the rear of the machine and the vertical slots *e* and *f* in the sides to the front of the said openings *c*. The slots *e* being towards the top of the frame and the slots *f* slightly below mid-way in the height of the sides, other wise the frame is in skeleton having upper and lower back pieces *g* and *h* respectively extending across the machine and joining the sides *d*.

i is an angle bar formed of the sections *j*, *k*, and *l*, extending across the machine and securely fixed to the sides *d*, and the sections *m* and *n* centrally arranged in the machine and terminating a short distance from each side of the said center.

o are slots through the angle of the sections *j* and *k* and arranged in sets of four.

p are holes through the section *l* opposite to each of the slots *o*.

q are slots through the angle of the sections *l* and *m* and *r* are holes opposite said slots in the section *n*.

s are key levers having the keys *t* at their outer ends and grooved at their inner ends forming the recess *u*. The key levers *s* are inserted through the front of the slots *o* and a pivot rod *v* extends along under the sections *j* and in the recess *u* formed at the grooved ends of the key levers *s*.

w are cushion springs.

x are screws inserted through the bottom of the section *l* and regulating the tension of the cushion springs *w*.

The keys *t* at the outer end of the key levers *s* project thereabove, having their inner surfaces *y* in proximity to a face plate *z* secured to the front of the frame of the machine and extending downwardly to said key levers.

2 and 3 are key levers having at their outer ends the keys 4 and 5 projecting thereabove in the same manner as the keys *t* on the levers *s*, but to the outside of the said key levers *s* within the key board frame *b*, the key levers 2 and 3 extending inwardly

between the sets of four of the key levers *t* in the center of the machine and having the inner crooked ends 6 and 7 inserted in the slots *q*.

8 is a pivot rod inserted under the section *l* and over the crooked ends 6 and 7.

9 are cushion springs interposed under key levers 2 and 3 and resting on the section *n*. 10 are screws through the section *n* from the bottom and engaging said springs and regulating the tension thereof.

11 is a thumb lock pivoted on the pin 12 projecting inwardly from the key board frame *b* and having the enlarged tapering upper portion 13 forming the shoulders 14 which engage either one of the keys 4 or 5 on the top surface thereof as described.

15 is a spiral spring encircling the pin 12 between the key board frame *b* and the thumb lock 11, and 16 is a nut jamming the thumb lock 11 against the spring 15, so that while the said thumb lock will move readily one way or the other it will always remain in the position to which it may be placed until manually removed.

17 is a rod pivoted in the cross bar 18 secured to the sides *d* of the frame at 19 and having an upturned outer end 20 with the thumb piece 21 at the top thereof to one side of the key 4 and within the key board frame *b*. The rod 17 extends inwardly to the rear of the frame and has the forked inner end 22, the said forked end 22 engages the pin 23 extending downwardly from the section 24 of the crank lever 25, and the said crank lever 25 is pivoted at its angle on the bracket 26 extending from and securely attached to the back piece *h*. It will be thus seen that on pulling the thumb piece 21 sidewise, the crank lever will be turned on its pivot point on the bracket 26. The section 27 of the crank lever at the end thereof has the slot 28, through which extends the vertical rod 29. The rod 29 is pivoted in the bracket 30 projecting from the back piece *g* and securely attached thereto so that the movement of the crank lever caused by the turning of the rod 17 on its pivot will also turn the rod 29 on its pivot in the bracket 30. The top 31 of the rod 29 normally abuts a member of the line spacing mechanism, which is described fully hereinafter.

32 is a rod pivoted on the bottom of the cross bar 18 in a similar manner to the rod 17 and having an outer upturned end 33 with the thumb piece 34 projecting upwardly within the key board frame *b* to one side of the key 5, the rod 32 extends inwardly from its pivoted point to the rear of the machine.

35 is a pulley journaled on a pin 36 fixedly secured in the bracket 37 attached to one of the sides *d* near the bottom thereof.

38 is a pulley turning on the pin 39 secured in a bracket 40 from the same side *d* and in vertical alinement with the pulley 35 and approximately mid-way in the height of the frame.

41 is a flexible tape attached to the inner end of the rod 32 and extending around the pulleys 35 and 38 and at its other end attached to the platen traveling mechanism, as explained hereinafter.

42 is a bar having the off-set 43 at its outer end and the pivot hole 44 therethrough and the slot 45 therethrough intermediate of its length and towards the inner end. The bar 42 has the reduced inner end 46, which extends through the lug 47 projecting upwardly from the center of the cross bar 18. 48 is a spiral spring encircling said reduced inner end 46 and secured thereon by the nut 49 and exerting a continuous pull inwardly on the bar 42.

50 is an angle rod having the upturned pivot pin 51 at the extreme outer end of its lower section extending through the pivot hole 44 in the off-set 43. The angle rod 50 extends upwardly between the key levers 2 and 3 through a central hole in the shoe 52 and at its upper end pivoted in a tongue 53 extending outwardly from the face plate *z*. The shoe 52 is fixedly secured to a cross bar 54 and it may be mentioned that the latter also steadies and supports the outer ends of the rods 17 and 32.

55 is a key fixedly secured towards the upper end of the angle rod 50, and it is used in rotating said rod in its pivotal bearings. It may be here explained that on turning the key 55 from the position shown in the drawing, the pull exerted by the spring 48 will draw the upwardly projecting portion of the pivot pin over against the edge of the shoe 52 and so change the position of the bar 42, and when the key is turned to its position, as shown in the drawing, the rod 50 will again abut the side of the bar 42, and as it is to the other side of the center, the pull of the spring will hold it securely in position.

56 is a bar extending across the machine from side to side above the key levers and having the pintle 57 rigid therewith and extending downwardly therefrom into the slot 45 and having at each end thereof the upwardly extending rods 58 rigid therewith and connected with the ribbon mechanism, as hereinafter more fully explained.

59 is a rod extending across the machine and fixedly secured in the lugs 60 from the sides *d* towards the lower part of the machine.

61 is a frame made in the shape of an inverted bracket and having the journal orifices 62 mounted on the rod 59 and the uprights 63 terminating in the cams 64. The cams 64 are formed with the recesses 65 in the inclined surfaces 66 leading therefrom to the stops 67, and the stops 68 to the other side of the recess.

69 is a connecting rod hooked through the

bar 70 forming part of the frame 61 and to the key lever 2 intermediate of its length so that any pressure on the said key lever will swing said frame 61 on the rod 59 on which it is journaled.

71 are spiral springs caught on to the uprights 63 intermediate of their length at one end and to the brackets 72 secured to the sides *d*, and exerting a continual pull rearwardly on said uprights.

73 is a frame similarly formed to the frame 61, but of smaller dimensions and made to fit just inside the said frame 61 and mounted in a similar manner through the journal orifice 74 on the rod 69, and having the uprights 75 terminating in the cams 76. The cams 76 are formed with the stops 77 and 78 at each end thereof and gradually sloping from an even surface in a decline to the stops 78. The cams 76 operate in conjunction with the cams 64.

79 are spiral springs caught on to the uprights 75 intermediate of their length at one end and to the brackets 72, and exerting a continual rearward pull on said uprights.

80 is a connecting rod hooked on to the bar 81 forming the front part of the frame 73 and keyed to the lever 3 intermediate of its length, so that any pressure on the key lever will at once throw the cams forward.

82 is a crescent shaped bar having a plurality of radial slots 83 made therein from the upper outer corner thereof.

84 is a cresent shaped rest supported in front of the crescent bar 82 by the arms 85, fixedly secured to said rest or forming part therewith, at their outer end, and at their inner end fixedly secured to the plates 86 having the downwardly extending legs 87, said plates being secured to the ends of the crescent bar which are squared to bring the said plates in vertical alinement one to the other. The said plates are secured in any suitable manner but are here shown as fastened thereto by the screws 88.

89 are pins projecting outwardly and securely fixed to the forward corners of the plates 86 and having journaled thereon the rollers 90.

91 are pins projecting outwardly from the lower end of the legs 87 and fixedly secured thereto and having journaled thereon the rollers 92. The pins 91 are slightly to the rear of the pins 89, while the said legs extend directly down from the rear portion of the plate. The crescent 82 is supported in the machine by introducing the said pins with the rollers journaled thereon in the vertical slots *e* and *f*. The rollers 90 are supported on the cams at the top of the uprights 63 and 75 and extend beyond said cams to the said slots *e*. It will be thus seen that any pressure brought to bear on either of the keys 4 or 5 will immediately affect the position of the rollers in the slots [illegible] rearward movement of either of the uprights brings the rollers to a different part of the cams, consequently raising or lowering the crescent bar. 93 are type bars carrying at their outer ends the type blocks 94, on which are arranged in vertical alinement three different characters. The said type bars have the enlarged inner ends 95, in which the slots 96 are made from the end thereof registering with the angular slots 97, which form a pivot journal.

98 is a crescent-shaped rod introduced in the crescent bar 82 passing through the slots 83 and forming a bearing for the type bars 93, which are inserted in said slots and hooked over said rod, the lugs 99 formed by the slots 96 at the inner ends 95 dropping below said crescent bar. 100 is a bar extending across the front portion thereof and securely fixed to the sides *d* and having a plurality of slots 101 made therein from the outer side thereof.

102 are equilateral stirrups having the straight side 103 at the top and equal curved sides 104 and 105 extending therefrom and converging to the point 106. 107 is an elbowed arm extending from one end of the straight side 103 in alinement therewith and preferably forming part thereof. The arm 107 is here shown as elbowed at an obtuse angle to the sides 103, but it must be understood that such construction is not essential. One of said stirrups 102 is inserted in each of the slots 101 and pivoted therein by the rod 108 passing longitudinally through said bar and through the journal orifices 109 at the elbow of the arms 107, the arms 107 have at their top end the orifices 110 in which are hooked the connecting rods 111, said connecting rods having the length adjusting sleeves and couplings 112. The said rods 111 are pivotally secured at their inner ends to the lugs 99 by the pivot pins 113.

114 are T shaped bars one of which is rigidly secured on each of the key levers *s* and are arranged partially across the machine and in close proximity one to the other and have a plurality of holes 115 therethrough.

116 and 117 are rods each having a suitable length adjusting sleeve coupling and hooked lower ends engaging holes in two of the T shaped bars 114 respectively, and at their upper ends pivotally secured to the ends of a link 118 by the pivot pins 119. The links 118 are dimensioned to fit within the stirrup 102 and swing radially from either of its upper angles and are held therein by the washers 120 on the pivot pins 119. It will be seen that in the connection between the keys and the type bars that it is necessary to press on two keys simultaneously before the stirrup and consequently the type bar will be affected, and in describing the operation of the machine, this feature will be more fully explained. 121 is a platen having the shaft

ends thereof and the thumb wheels 123 at the extremities of said shaft.

124 are ratchet wheels mounted on the platen 121 at each end thereof, as customary in typewriter construction.

125 are end frames of the platen carriage having the rearwardly extending portions 126 to support the paper guide 127 and the bearings 128, in which the projecting ends of the shaft 122 are journaled.

129 are keels parallelly arranged and secured to the lower end of the frames 125, and 130 is a rack parallel with and fixedly arranged between said keels 129 and completing the body to the carriage supporting said platen.

131 and 132 are levers formed of parallel bars joined together intermediate of their lengths and pivotally secured to the keels 129 at their upper ends, intermediate of the length of said keels, and having the forked or slotted lower ends 133 and 134 engaging the rollers 135, journaled on the pins 136 fixedly secured to and preferably extending between the cross bars 139 and 140 secured to the sides of the machine, the said pins and rollers are located towards each side of the machine and near the bottom thereof.

141 and 142 are links pivotally connected at one end to the levers 131 and 132 intermediate of the length of said levers and at their other ends pivotally secured to the cross bars 143 and 144, extending from side to side of the machine on the same level as the keels 129 to the front and to the rear of the openings *c*.

145 is a bar pivotally connecting the corresponding toggle-joints 146 and 147 formed by the pivotal connections of the links 141 and 142 with the levers 131 and 132, thus forming substantially a toggle support and movement for the platen carriage.

148 is a coil spring inclosed in the casing 149 and wound around the pin 150 journaled in the lug 151 projecting from one of the sides *d*, as usual in type writer construction.

152 is a tape secured to the said drum and wound there around and at its outer end connected to a lug 153 projecting downwardly from the center of the bar 145 and exerting a continuous pull in one direction on said bar 145 and consequently on the arrangement of toggles supporting the platen carriage.

The end of the tape 41, the pull on which is controlled by the thumb piece 34, and which passes over the pulleys 35 and 38, is also attached to the lug 153 and exerts a pull in the other direction on the bar 35 on the manual operation of the thumb piece 54 against the constant spring pressure in the other direction.

The travel of the platen in its carriage will now be understood, that is to say, the constant spring pull on the carriage in one direction and the manually controlled pull on the said carriage in the other direction. It is now necessary to introduce a means of controlling the said carriage as against the spring pull, and in order to do this a suitable escapement mechanism is applied. Almost any form of escapement mechanism will answer the purpose, but in the present invention, I am applying a well known device, which is considered simple and effective.

154 are lugs projecting downwardly from the cross bars 143 and 144 at the center thereof. 155 is a pin extending between said lugs and fixedly secured thereto.

156 is a double pawl journaled securely on the pin 155 and having its front and rear points engage a tooth on the rack 130 alternately according as the said pawl is rocked on its bearing.

157 is a shaft journaled in suitable bearings 158 in the sides of the machine towards the lower end thereof and at the rear of the machine.

159 are universal bars extending along under each set of key levers and rearwardly to the shaft 157, to which they are fixedly secured, and having the jogs 160 intermediate of their length in order to rise over and pass the angle bar *i*.

161 is a spiral spring encircling the shaft 157 to retain the universal bars 159 in an upper position, consequently any pressure on any of the keys *t* against the pressure of the spiral spring 161 will turn the shaft 157 in its bearings.

162 is a finger projecting from the shaft 157 secured thereto by a suitable set screw 163. The finger 162 at its outer end is pivotally connected to an upright rod 164, which is pivotally connected to the forward end of the pawl 156, so that any downward pressure on the universal bar will rotate the shaft 157 in its bearings, move the finger 162, and consequently draw the rod 164 downwardly releasing the forward point of the pawl and allowing the rear point of the pawl to engage a tooth of the rack and on the release of the pawl on the universal bar resuming its upper position, the carriage will travel to the extent of one tooth, being pulled by the coil spring, as usual in this class of machine.

165 is the frame of the line spacing mechanism having the uprights 166 pivoted at their upper ends to the end frames 125 of the carriage to the rear of the platen 121, and the longitudinal rod 167 joining the said uprights at their lower ends and swinging in towards the lower end of said platen.

168 are pawls pivoted on the longitudinal rod 167 in the slots 169 at the bottom of the uprights 166 and having their points engag-

ing the ratchet wheels 124 mounted on the shaft 122 at each end thereof and spring held to said engagement by the spring 170.

The rear face of the longitudinal rod 67 continuously abuts the top 31 of the rod 29, therefore every operation of the thumb piece 21, which turns the said rod 29 on its pivot will also move said longitudinal rod inwardly and consequently the pawls 168, which are each engaging a tooth in their respective ratchet wheels, this turns the shaft 122 and consequently the platen 121.

171 is a wire spring encircling the pivot of the uprights and caught on to said uprights exerting a back pressure thereon to return the pawl, after being removed inwardly, to its outer position to engage a tooth in the ratchet wheel preparatory to turning the platen around.

172 is a spring held retaining pawl having the roller 173 journaled at the point thereof and holding said roller on being turned to the proper spacing.

174 are spool holding cups having the rearwardly extending arms 175 pivotally secured to the sides *d* at the top thereof and on a level with the platen 121.

176 are ribbon guides rigid with the cups 174 and extending inwardly from each cup to the center of the machine in immediate proximity to the platen, there joining the slotted type bar guide 177, usual in this class of machine, and secured thereto.

178 is a ratchet wheel turning under the spool cups 174 and secured to the shaft of the rotating base 179 in the interior of the cup which carries the spool.

180 are spring retaining pawls secured to and extending from the wall of the cup and engaging the teeth of the ratchet wheels 178.

181 are spring pawls operating the ratchet wheels 178 and secured to the frame of the machine.

182 are curved fingers extending upwardly from the inwardly extending portions of the universal bars 159 and formed in the steps 183 and 184 at its reduced upper end, immediately over the bar 56, from which the upright rigid rods 58 extend. The rods 58 at their upper end have curved ends hooked into the extending arms 175 from the spool holding cups thus forming the connection from the key 55 through to the spool holding cups for raising and lowering the same and for feeding the ribbon. In this connection it may be explained that where two colors of ribbon are used the key 55 controls the particular ribbon to be used for the work to be done, that is to say, that it depends entirely as to which of the steps of the curved fingers 182 are above the movable cross bar 54, and the movement of the said cross bar through its connection with the bar 42 is the means of regulation in this part of the mechanism. The downward pull on the rods 58 brings the spool holding cups down and consequently throws the ribbon guides 176 and the type bar guide 177 up and in position in front of the platen, and it is entirely dependent on the distance of the pull on said rod, as to the height the ribbon will be opposite the platen when the type strikes the same, that is to say, supposing the ribbon or ribbons are red and black and the black is above and the red below, if the pull is greater by the rods 158 on the spool, the red portion of the ribbon or the red ribbon will be thrown opposite the platen and if it is less the black ribbon. In this action of the pulling the rods, which will occur on every movement of the universal bars 159, the spring pawls 181 are operated, the pressure on the spring pawls 181 causes them to move on the ratchet wheel the space of one tooth and when springing back will rotate the said ratchet wheel, the retaining spring pawls 180 holding the wheels to the position to which they are turned by the said spring pawls 181.

185 is a ribbon wound on suitable spools 186 and placed in the cups 174 over the upwardly projecting pins 187 from the rotating base 179, the said spools are prevented from rotating on said base by the upwardly projecting pins 188 to one side of the center and entering a suitable orifice in said spool.

In Figs. 11 and 12 a modification of the stirrup mechanism is shown in which the mechanism operated by the pressure of the key has exactly the same result as in the stirrup mechanism hereinbefore described. In this modification, the stirrup 189 forms part with or is securely attached to the type bar 190 and in place of the pull being vertical the said pull is horizontal, consequently the straight side of the stirrup when the type bars are at rest is in a vertical position, while when the type bar is operated by the pulling of the two rods 191 and 192, the straight side of the stirrup is brought to the horizontal.

The action in order to raise the type bars is precisely the same as the stirrup mechanism and rods described, that is to say, the pull of either the rod 191 or 192 will not affect the operation of the type bar, though the pull of the two rods together will always throw the type block against the platen. The journaling of the type bar at 193 is substantially the same as described.

In Figs. 13 and 14 a further modifiaction of the stirrup mechanism is shown and in this form the stirrup is split at the apex of the curved sides 194 and 195, the side 195 is pivoted in the straight side 196 which is rigid with the side 194. The arm 197 extends upwardly from the side 195 and preferably forms part therewith and at its extremity is connected by the rod 198 with its key. The rods 199 and 200, joined by the link 201 are the operating rods from the key levers, and are operated in a similar manner to the stir-

rup mechanism and rod described. In this construction, the straight side 196 is rigid with the bar extending across the machine and consequently the curved side 194 is also rigid. The movement of said stirrup is entirely confined to the side 195, which, as the link is pulled downwardly, is thrown over to one side and pulls the rod 198 and consequently the type bar up to the platen, and in this action both the rods 199 and 200 must be pulled otherwise the side 195 cannot be forced outwardly as the link in the event of a pull on only one rod will form a pivot bearing in one angle of the stirrup, the other end of the link moving downwardly without affecting the side 195.

Having described the various parts in detail, I shall now more particularly describe the operation thereof. The sheet of paper is inserted in the usual manner in typewriters over the paper guide and under the roller, the paper is set as customary by the operator, and the machine is in readiness to work. It must be noted that in the typewriting machine described, the type blocks have three characters in vertical alinement, consequently there is provided in this machine three levels for the basket formed by the type bars, that is the lower, middle and upper. In this connection it will, of course, be understood that the lower elevation of the basket will print the upper character on the type block on the paper, the middle elevation the middle character and the upper elevation the lower character on the type block. In order to raise a type bar to its position for imprinting the character on the paper surrounding the platen, pressure is exerted simultaneously on two keys having connecting rods to one stirrup. This action will turn the said stirrup on its pivot bearing and consequently pull the type bar to its upper position against the platen.

The T shaped bars 114 each have seven holes with one or the other of the rods 116 or 117 hooked thereto at their lower ends, though in no instance must a rod 116 and the rod 117 be hooked to the same T shaped bar, that is to say, a rod 116 is hooked to one T shaped bar and a rod 117 is hooked to another T shaped bar, necessitating the pressure on both keys simultaneously, belonging to the said T shaped bars, in order to pull the said rods 116 and 117 coincidentally and consequently operate the type bar, which is affected by the particular rods 116 and 117 pulled. The keys in this typewriter are arranged in two sets of four each, and this represents the use of eighty four characters having three in a vertical row on the type block. The sets of four are arranged for four fingers of the right and left hand of the operator and the two middle keys, for other purposes hereinafter explained, controlled by the thumbs. The combination of keys to strike the letters or other characters is learned in a similar manner to that of any fingering in special machines, such as the Morse alphabet for telegraphing and the fingering on instruments in order to produce certain chords. For instance, referring to the diagrammatic view in Fig. 3, I shall indicate the keys as A. B. C. D. E. F. G. H., these keys are connected through the stirrups to the type blocks I. J. K.L. and the others. On pressing the keys A and B the type block I will be thrown up as the T shaped bars affected by said keys have each a rod leading to the stirrup affecting said type bar, further, on a simultaneous pressure on keys A and C the type bar J will be raised as the T shaped bars each have rods leading only to that type bar carrying the type block *j*. On pressing A and D the type block K will be raised. On pressing simultaneously the keys E and G the type block L will be thrown up and so on, until the possible combinations of the right keys are exhausted.

It has been carefully calculated that there are twenty eight combinations in the eight keys and this on account of the three characters in alinement on the type blocks will permit of eighty four characters. On the pressure on one key the type bar will not be affected, but the escapement mechanism will be released in the same manner as if two keys were pressed, for the reason that no matter whether one or more keys are pressed, the universal bars must be operated, as explained in the foregoing detailed description of the parts.

Regarding the thumb keys 4 and 5, the thumb key 4 is used for the purpose of elevating the basket formed of the type bars, while the key 5 is used for lowering it and when the keys are at rest, the basket is in the middle position.

In the description of the parts in detail, it is pointed out that the inverted bracket frames are swung on a pivot by said keys and are of such dimensions as to fit one within the other so that the uprights which terminate in the cams form the support for the rollers from the basket projecting into the vertical slots in the frame of the machine. When the basket is in its lower position, the rollers are in the recess 65 in the cams 64, this is brought about by the pressure on the key 5 which throws the cams 76 forwardly and permits the rollers to reach said recesses. In this position the top-most letter in the vertical row on the type block may be imprinted on the paper in the machine. On the release of the pressure from the key 5, the springs attached to the uprights pull the said uprights 75 parallel with the uprights 63 and this forces the rollers out of the recess and raises the said rollers to a position on the surface of the cams, which is the middle position for the basket, consequently the middle

letter in the vertical row of letters on the type blocks may be imprinted on the paper around the platen and on pressure being brought to bear on the key 4, the uprights 63 and consequently the cams 64 are thrown forward, which forces the roller up to the highest surface on the cams against the end stops 67 bringing the basket up to its upper position, which enables the imprinting of the lowermost letter of the type blocks on the paper around the platen. The release of the pressure on the key 5 allows the uprights to be pulled by the spring back to their normal position, which also brings the basket back to the middle position. The thumb lock 11 is for holding either one of the keys 4 or 5 in its lower position in order to continue printing the characters from either the topmost or the lowermost of the type blocks as the case may be.

The operation of the ribbon mechanism is very similar to that in all visible typewriting machines, with the exception of the key and mechanism, which it operates, for the changing of the color of the ribbon. In this mechanism the key 55 may be turned one way or the other to bring the pivot pin 51 to one side of the bar 42 or to the other side and against the shoe 52, as there is a continuous rear spring pressure on the bar 42. The change in the position of the said bar 42 will alter the position of the pintle 57 and consequently of the bar 56 and of the rods 58 rigid with said bar and extending upwardly to the arm from the spool holding cups 174. This operation will determine the position at which the ribbon frame will be set in relation to the platen and in operation the universal bars through the curved fingers 182 will bring the ribbon frame and consequently the ribbon up to the printing position at each operation of the keys. The key 55 will determine as to which ribbon is brought to position, as stated.

It will be noticed in the description of the detailed parts of this machine that a new device for supporting the platen has been adopted, viz:—the toggle arrangement of bars with one of said bars slotted and extending down over a roller, the said bar extending downwardly being attached to the frame of the carriage, while the link forming with said bar the toggle-joint is secured to the frame of the machine. This construction besides supporting the carriage provides a very free and easy movement backwards and forwards, it relieves great wear on the parts and also minimizes the friction. In the description hereinbefore of this mechanism, the operation will be readily understood without further explanation, it may also be said that in the line spacing mechanism, the detail description of parts sets forth the operation, as there is not sufficient change from the present methods in this particular part of the machine to warrant more elaborate description of the operating and retaining pawls controlled by the thumb piece in the key board.

The type writing machine herein described is, as far as I am aware, a radical departure from any known construction and its simplicity consists essentially in the operation though the arrangement of parts, is quite as simple and perhaps more so than any type-writing machine now in use, however, in operating this machine, the fingers need never and should not be removed from the keys at all and in a very short time, the alphabet, numerals and other characters can be learned from the combinations of keys, so that great speed may be attained with the minimum of exertion, and besides materially limiting the wear and tear on the machine through pounding, so common to operators of typewriting machines.

The simplicity of this machine is emphasized in the entire elimination of the customary search for keys indicating the different characters, particularly those not commonly used, then again, the keys controlling the shifting mechanism are immediately under the thumbs, and also the keys controlling the line spacing mechanism and the pull against the spring pull of the platen carriage, respectively, are in the immediate vicinity of the natural position of the thumbs, when the fingers are on the eight keys, in other words, all the characters and all the movements of the machine may be controlled without lifting the hands from the keys.

There is practically no limit to the speed of a machine of this construction, beyond the mechanical arrangement of the parts, as the knowledge of the combinations producing the letters, numerals and other characters enables the operator to make the type bars register on the platen as rapidly as the said mechanical arrangement will permit them to do so.

A number of parts shown in the drawings and described in this specification are extremely valuable to this particular construction of machine, but some of them are applicable in the construction to other typewriting machines, as for instance, the manner of supporting the platen carriage and the shifting mechanism. Further it may be said that many of these parts just mentioned may be changed in the construction of a machine following the present invention, for while they are described and claimed in this specification and are very salient features, yet the operation of two key levers to cause one type bar to register on the platen and the means taken to secure such result is the basic part to the invention, and all the other parts are subsidiary thereto.

What I claim as my invention is:

1. In a typewriting machine, the combi-

nation with a frame, a platen supported thereby, a plurality of pivoted type bars registering on said platen, a shifting mechanism, and a plurality of pivoted key levers, of a plurality of pivoted members associated with said type bars respectively each of said pivoted members operating a type bar on the simultaneous pressure on two of said key levers, a pair of connecting rods from each of said pivoted members to its co-related pair of key levers, as and for the purpose specified.

2. In a typewriting machine, the combination with a frame, a platen supported thereby, a plurality of pivoted type bars registering on said platen, a shifting mechanism, and a plurality of pivoted key levers, of a plurality of equilateral stirrups pivotally supported and connected with said type bars respectively, and a pair of connecting rods from each of said stirrups to its co-related pair of key levers, as and for the purpose specified.

3. In a typewriting machine, the combination with a frame, a platen supported thereby, a plurality of pivoted type bars registering on said platen, a shifting mechanism, and a plurality of pivoted key levers, of a plurality of equilateral stirrups pivotally supported and connected with said type bars respectively, a link introduced within each of said stirrups, and a pair of rods pivotally joined by said links and connecting a pair of key levers co-related with a stirrup, as and for the purpose specified.

4. In a typewriting machine, the combination with a frame, a platen supported thereby, a plurality of pivoted type bars registering on said platen, a shifting mechanism, and a plurality of pivoted key levers, of a plurality of equilateral stirrups each having a straight side and two curved sides converging to an apex and an extending arm, a pair of rods connecting each of said stirrups with its co-related pair of keys, a link introduced within said stirrup pivotally connecting said rods, and a plurality of rods joining said extending arms to said type bars, as and for the purpose specified.

5. In a typewriting machine, the combination with a frame, a platen supported thereby, a plurality of pivoted type bars registering on said platen, a shifting mechanism, and a plurality of pivoted key levers, of a plurality of equilateral stirrups formed with one straight side and two curved sides converging to an apex, said stirrups being associated with said type bars, a link introduced within each of said stirrups, and a pair of rods pivotally connected to each of said links and to the co-related pair of keys to a stirrup, as and for the purpose specified.

6. In a typewriting machine, the combination with a frame, a platen supported thereby, a plurality of pivoted type bars registering on said platen, a shifting mechanism, and a plurality of pivoted key levers, of a plurality of equilateral stirrups having one straight side and two curved sides converging to an apex, said stirrups being associated with said keys, a link introduced within each of said stirrups, a pair of rods to each of said stirrups pivotally connected by said link, and means connecting said rods to the co-related pair of keys to each stirrup, as and for the purpose specified.

7. In a typewriting machine, in combination, a frame, a platen supported thereby, a plurality of pivoted type bars registering on said platen, a shifting mechanism a plurality of pivoted key levers, a bar extending across the machine and secured to the sides of the frame and having a plurality of cross slots therein, a plurality of equilateral inverted stirrups having an arm extending therefrom and pivotally secured in said slots, a connecting rod from each of said arms to each of said type bars, a link introduced in said stirrup, and a pair of rods pivotally joined by said link and connecting said stirrup with its co-related key levers, as and for the purpose specified.

8. In a typewriting machine, in combination, a frame, a platen supported thereby, a plurality of pivoted type bars registering on said platen, a shifting mechanism, a plurality of key levers, a plurality of T shaped bars mounted on said key levers and extending longitudinally with the machine and having a plurality of holes therein, a cross bar secured to the sides of said machine and having a plurality of slots therein, a plurality of equilateral inverted stirrups pivotally secured in said slots and having an upwardly extending arm rigid therewith, a rod connecting each of said arms and said type bars, a link introduced within said stirrups, and connecting rods pivotally joined by said link and each engaging at their lower ends an individual T shaped bar, as and for the purpose specified.

9. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of key levers, a corresponding number of type bars to the number of combinations possible to be made by the pairing of the said levers and suitably connected thereto to form said combinations, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

10. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of key levers, a corresponding number of type bars to the number of combinations possible to be made by the pairing of the said levers and suitably connected thereto to form said combinations, a shifting mechanism, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

11. A typewriting machine, comprising a

frame, a platen supported thereby and suitably controlled, a set of key levers, a corresponding number of type bars to the number of combinations possible to be made by the pairing of the said levers and suitably connected thereto to form said combinations, said type bars carrying a vertical row of three characters thereon, means for causing a shift from the mid-position to effect an imprint of the upper or lower character on the type block, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

12. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of key levers, a corresponding number of type bars to the number of combinations possible to be made by the pairing of the said levers and suitably connected thereto to form said combinations, each of said type bars having a row of three characters at the end thereof in vertical alinement, an adjustable frame having pivot bearings therein for said type bars, means for retaining said adjustable frame in its mid-position and for elevating and lowering it from its mid-position, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

13. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of key levers, a corresponding number of type bars to the number of combinations possible to be made by the pairing of the said levers and suitably connected thereto to form said combinations, each of said type bars having a row of characters thereon in vertical alinement, pivot bearings for said type bars adjustably supported, means for supporting said pivot bearings in a mid-position, means for shifting said pivot bearings to an upper or lower positon, a set of key levers controlling said shifting means, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

14. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of key levers, a corresponding number of type bars to the number of combinations possible to be made by the pairing of the said levers and suitably connected thereto to form said combinations, a shifting mechanism, a set of key levers centrally arranged in relation to the aforesaid key levers and controlling said shifting mechanism, an escapement mechanism, a universal bar extending under the first named set of key levers and controlling the operation of said escapement mechanism on the downward pressure of any one of said key levers, and means for coloring the imprint, as and for the purpose specified.

15. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of eight key levers, a set of twenty eight type bars, each of said type bars suitably connected to two of said key levers, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

16. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of eight key levers, a set of twenty eight bars, each of said type bars suitably connected to two of said key levers and having a row of characters at the end thereof in vertical alinement, a shifting mechanism normally insuring the imprint of the mid-letter in said rows, a pair of key levers centrally situated in the machine and having the keys thereon extend beyond the keys of the aforesaid key levers and connected to said shifting mechanism for causing the imprint of the upper or lower character of the row, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

17. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of eight key levers, a set of twenty eight type bars, a set of twenty eight equilateral stirrups associated with said type bars, a pair of connecting rods connecting said stirrup with individual key levers, a link introduced in each of said stirrups and pivotally joining said connecting rods, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

18. A typewriting machine, comprising a frame, a platen supported thereby and suitably controlled, a set of eight key levers, a set of twenty eight type bars, a set of twenty eight equilateral stirrups pivoted and connected with said type bars, a pair of rods leading from various twos of said key levers to each of said stirrups, a link introduced within each of said stirrups pivotally joining said connecting rod, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

19. A typewriting machine, comprising a frame, a spring-pulled carriage supported in said frame, a platen journaled therein, a set of eight pivoted key levers having keys for the fingers, a set of pivoted type bars, each of said bars operated by the pressure of two of said keys, a line spacing mechanism, two key levers operatively connected to said platen carriage and said line spacing mechanism respectively and having thumb keys for causing the movement of said carriage against said spring pull and the rotation of the platen for line spacing, an escapement mechanism, and means for coloring the imprint, as and for the purpose specified.

20. A typewriting mechanism, comprising a frame, a set of eight key levers pivoted in bearings supported from the said frame and

having keys at their outer ends in a row immediately adjacent to the front of the frame and arranged in fours, a set of twenty eight type bars pivoted in bearings supported from said frame and having type blocks at their outer end carrying vertical rows of characters, means connecting each one of said type bars with two of said keys, a shifting mechanism, a pair of key levers journaled in pivoted bearings supported from the frame of the machine and below and between the fours of the aforesaid key levers and extending therebeyond at the outer end and having keys adapted to be pressed downwardly by the thumbs, a platen carriage supported on said frame to the rear thereof and having a constant spring pull thereon in one direction, a pivoted key lever having at its outer end a vertically arranged thumb piece adjacent to one of the aforesaid thumb keys and at its inner end a flexible connection with said platen carriage arranged for a manual pull against said spring pull, a platen journaled in said carriage, a line spacing mechanism attached to said carriage and engaging said platen, a pivoted lever having at its outer end a vertically arranged thumb piece adjacent to the other of the aforesaid thumb keys and at its inner end operatively connected by a series of levers to said line spacing mechanism, a universal bar extending under the upper key levers, an escapement mechanism operated thereby, and means for coloring the imprint, as and for the purpose specified.

21. A typewriting machine, comprising a frame, a suitably controlled traveling carriage supported in said frame, a platen journaled therein, a set of eight pivot key levers having keys for the fingers of the hands, a set of pivoted type bars, each of said bars operated by the pressure on two of said keys and having at their outer ends a row of three characters in vertical alinement, a universal bar extending under said key levers and fixedly secured to a rod journaled to the rear of the machine in the sides thereof, a tilting ribbon frame and guide, a shifting mechanism, means connecting said ribbon frame and said universal bar, means for regulating the distance of travel of said frame in the tilting thereof, a central key between the aforesaid keys for controlling said means, an escapement mechanism operated by the movement of said universal bar, and a pair of key levers centrally arranged and having keys at their outer ends extending beyond the aforesaid eight keys and controlling said shifting mechanism, as and for the purpose specified.

22. In a typewriting machine, the combination with a frame, a platen supported thereby and a plurality of pivoted key levers, of a shifting mechanism having a plurality of members formed in the shape of inverted brackets and journaled on suitable bearings supported by said frame, said members having spring-held uprights terminating in cams and suitably connected to a like number of key levers, an adjustable frame traveling in suitable guides in the aforesaid frame and supported on said cams, and a plurality of type bars pivoted in said adjustable frame and registering on said platen, as and for the purpose specified.

23. In a typewriting machine, the combination with a frame, a platen supported thereby and a plurality of pivoted key levers, of a shifting mechanism having a plurality of members formed in the shape of inverted brackets and suitably connected to a like number of key levers, said members being journaled on a suitable bearing supported by said frame and having spring-held uprights terminating in cams, said cams in pairs having corresponding recesses and inclined surfaces, an adjustable frame supported on said cams and traveling in suitable guide ways in the aforesaid frame and lifted and lowered by the varying positions of said cams, and a plurality of type bars pivoted in said adjustable frame and registering on said platen, as and for the purpose specified.

24. In a typewriting machine, in combination, a main frame having vertical slots in its sides, and supporting a plurality of bearings, a platen carriage, a platen, a type bar supporting frame having pins projecting therefrom and rollers journaled on said pins and traveling in said slots, type bars pivoted in said frame and registering on said platen, a pair of frames formed in the shape of inverted brackets and journaled on a suitable bearing in said main frame and having spring-held uprights terminating in pairs of cams respectively, said frames being arranged one within the other and said cams having inclined surfaces and recesses adapted to shift said type bar frame to three levels, a plurality of key levers suitably connected to said type bars, and a pair of key levers connected to said shifting frames respectively, as and for the purpose specified.

25. In a typewriting machine, in combination, a main frame having vertical slots in its sides and supporting a plurality of bearings, a platen carriage, a platen, a type bar supporting frame having pins projecting therefrom and rollers journaled on said pins and traveling in said slots, type bars pivoted in said frame and registering on said platen, a pair of frames formed in the shape of inverted brackets and journaled on a suitable bearing in said main frame and having spring-held uprights terminating in pairs of cams respectively, said frames being arranged one within the other and said cams having inclined surfaces and recesses adapted to shift said type bar frame to three levels, a plurality of key levers suitably connected to said type bars, a pair of levers connected to said shifting frames respectively and a lock

mechanism for retaining either one of said shift keys in its lower position, as and for the purpose specified.

26. In a typewriting machine, in combination, a main frame having vertical slots in its sides, and supporting a plurality of bearings, a platen carriage, a platen, a type bar supporting frame having pins projecting therefrom and rollers journaled on said pins and traveling in said slots, type bars pivoted in said frame and registering on said platen, a pair of frames formed in the shape of inverted brackets and journaled on a suitable bearing in said main frame and having spring-held uprights terminating in pairs of cams respectively, said frames being arranged one within the other and said cams having inclined surfaces and recesses adapted to shift said type bar frame to three levels, a plurality of key levers suitably connected to said type bars, a pair of levers connected to said shifting frame respectively, and a spring cushioned finger pivoted between said shift keys and having laterally projecting flanges adapted to engage either of said shift keys, as and for the purpose specified.

27. In a typewriting machine, in combination, a main frame having vertical slots in the sides thereof and a plurality of bearings and cross bars therein arranged, a platen carriage, a platen, a type bar frame having a slotted crescent shaped bar, depending legs, a cushion rest and pins projecting from the upper sides and extremities of said legs and rollers journaled in said pins and extending through said vertical slots, type bars pivoted in said crescent bar and each having a vertical row of three characters on its type block, a plurality of key levers pivoted in one of said cross bars, means for causing one of said type bars at a time to register on said platen on the pressure of two of said key levers, and means for elevating and lowering said type bar frame to the correct level for one of said characters, as and for the purpose specified.

28. In a typewriting machine, in combination, a main frame having vertical slots in the sides thereof and a plurality of bearings and cross bars therein arranged, a platen carriage, a platen, a type bar frame having a slotted crescent shaped bar, depending legs, a cushion rest and pins projecting from the upper sides and extremities of said legs, and rollers journaled on said pins and extending through said vertical slots, type bars pivoted in said crescent bar and each having a vertical row of three characters on its type block, a plurality of key levers pivoted in one of said cross bars, a pair of tilting frames journaled on a cross bar and connected to two of said key levers and having uprights spring-held from the rear of the main frame and terminating in cams operating in sets one within the other, one of each set having a deep recess permitting said type bar frame to assume its lower position, and a surface supporting said frame in its upper position and the other of each set having surfaces supporting said frame in its mid-position, the movement of either cam changing the position of said carriage, and means for causing one of said type bars to register on said platen on the pressure of two key levers, as and for the purpose specified.

29. In a typewriting machine, in combination, a main frame having slots in the sides thereof and a plurality of bearings and cross bars arranged therein, a platen, a plurality of type bars having a vertical row of three on each of their type blocks, a frame carrying said type bars, a shifting mechanism, a plurality of key levers pivoted in a cross bar in said main frame, a universal bar, a ribbon mechanism, and means for bringing the ribbon to the proper level for said characters, as and for the purpose specified.

Signed at the city of Montreal, in the District of Montreal, in the Province of Quebec, in the Dominion of Canada, this 1st day of August, 1906.

COLIN CAMPBELL McPHEE.

Witnesses:
OTTO HORNUNG,
LLOYD BLACKMORE.