Nov. 18, 1930. G. O. DEGENER 1,781,720

TYPEWRITING MACHINE

Filed Dec. 28, 1927 6 Sheets-Sheet 1

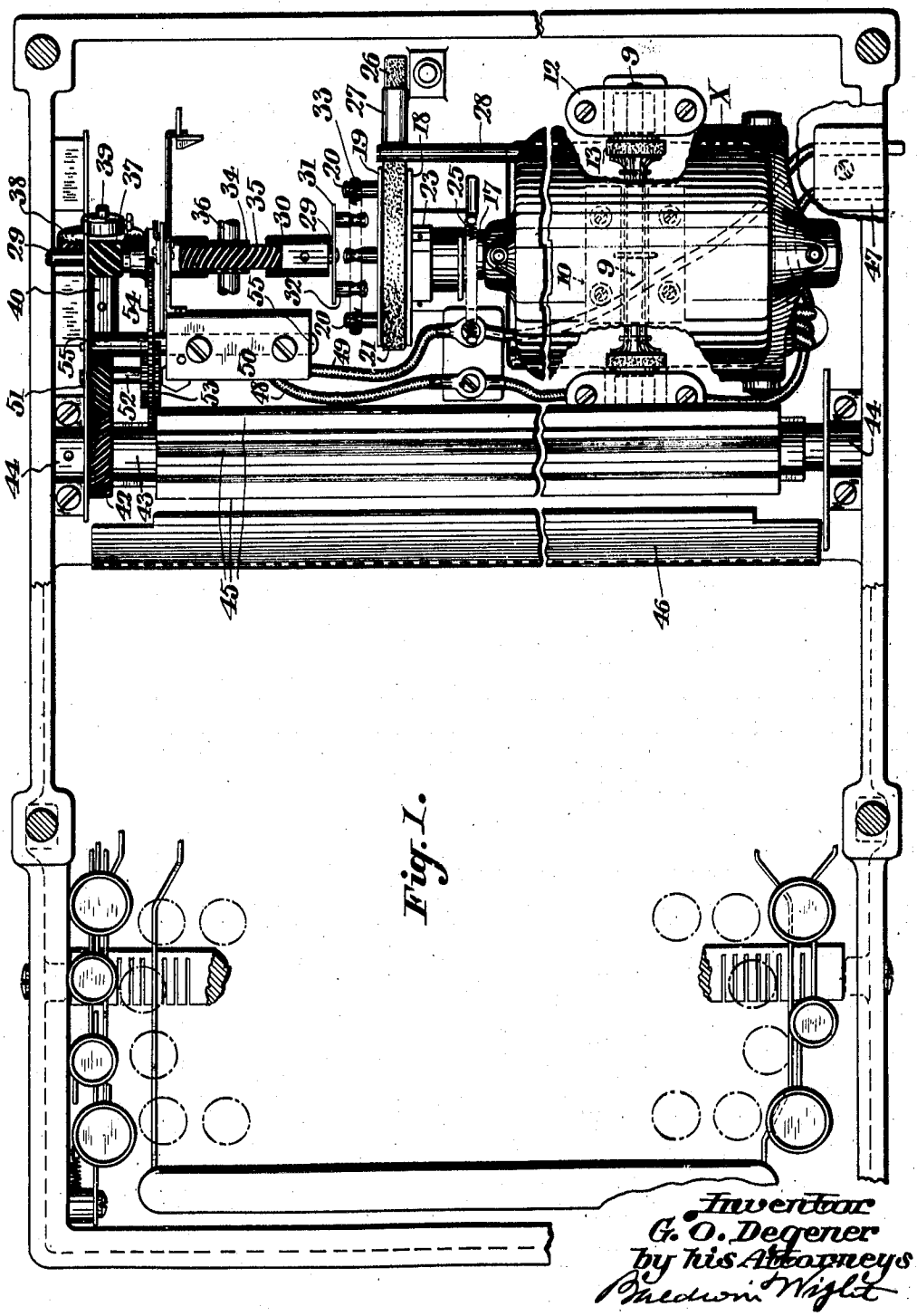


Fig. 1.

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TYPEWRITING MACHINE

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Fig. 3.

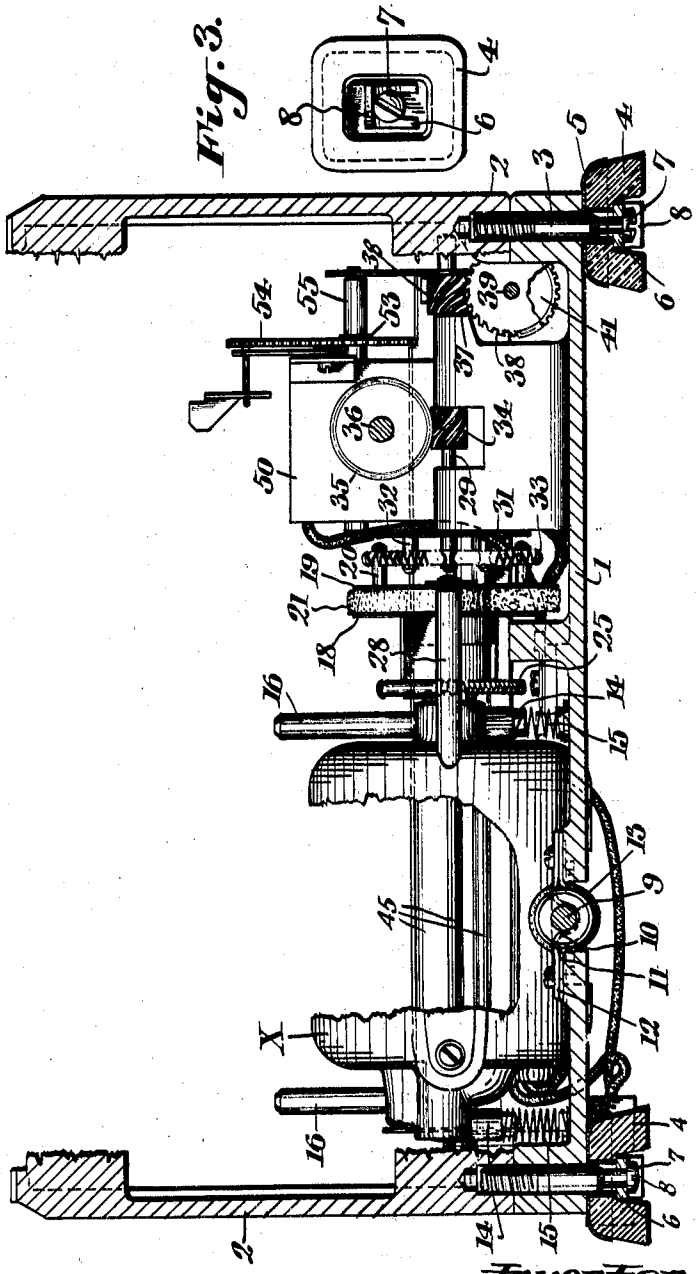


Fig. 2.

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TYPEWRITING MACHINE

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Fig. 4.

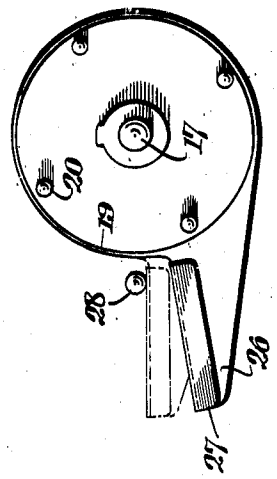


Fig. 5.

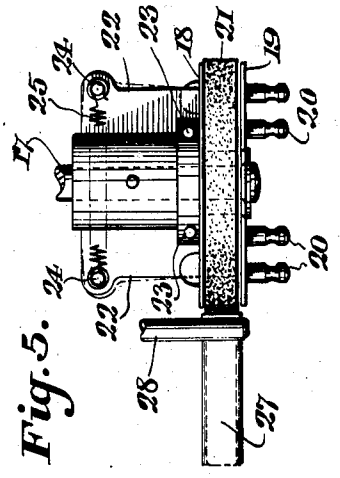


Fig. 12.

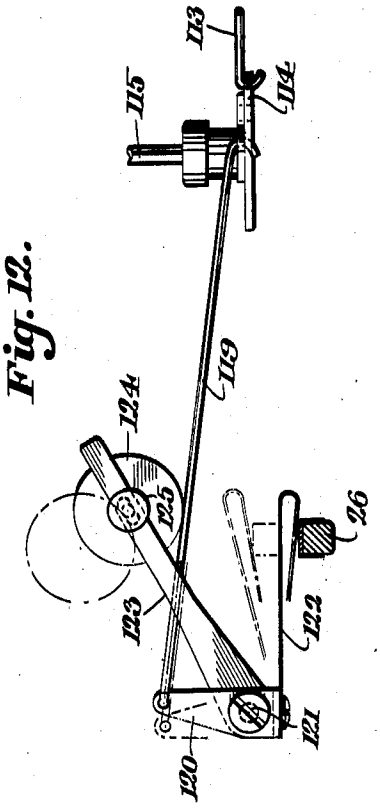
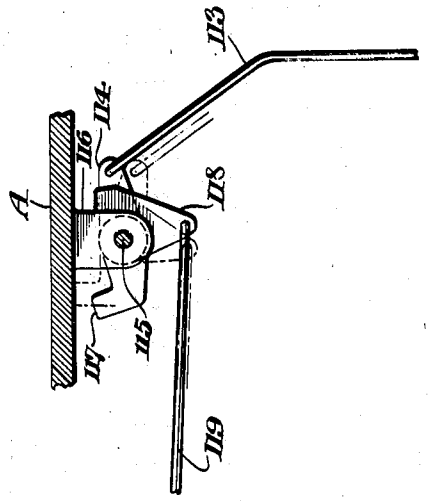


Fig. 13.

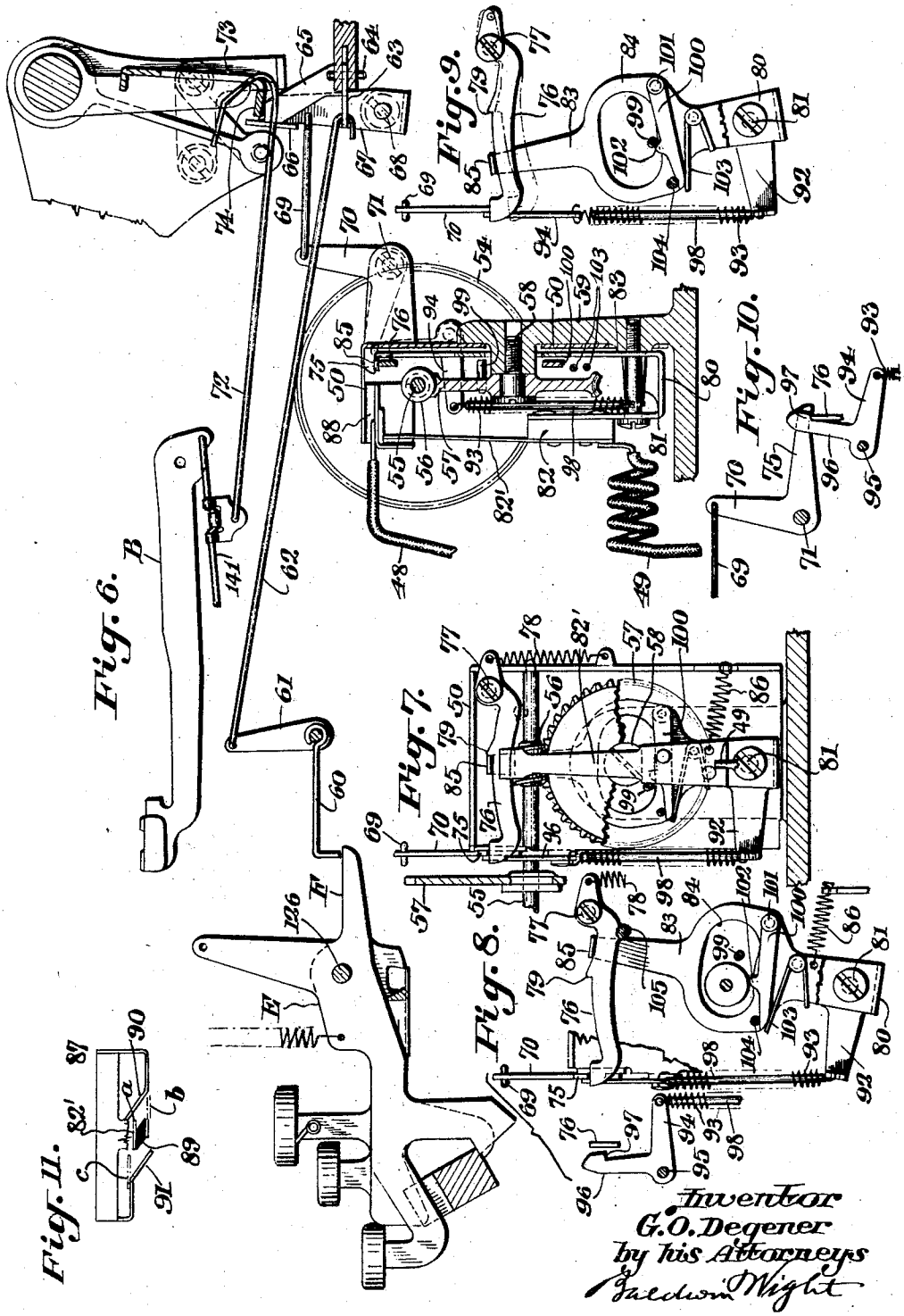


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TYPEWRITING MACHINE

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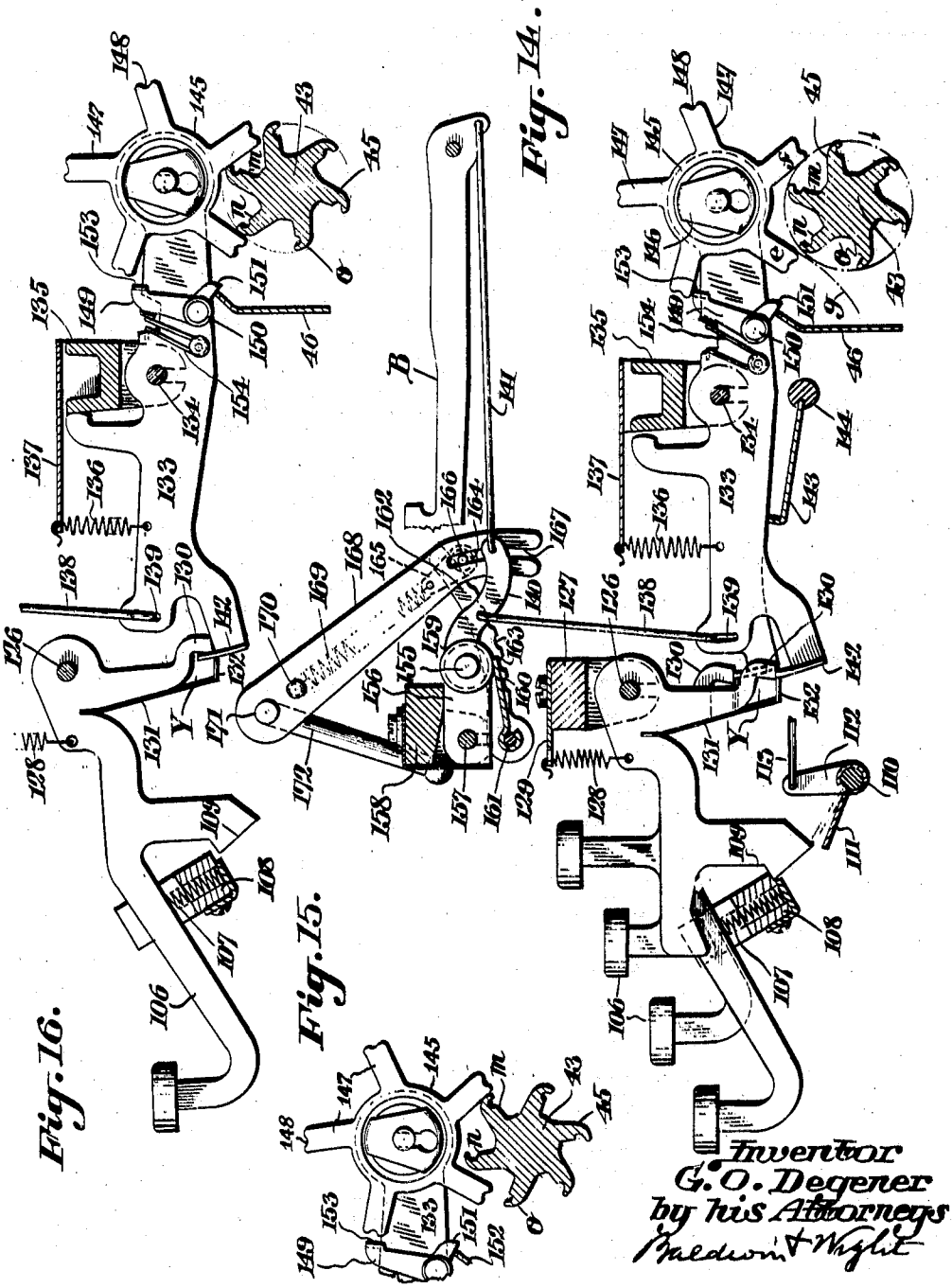


Fig. 14.

Fig. 16.

Fig. 15.

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TYPEWRITING MACHINE

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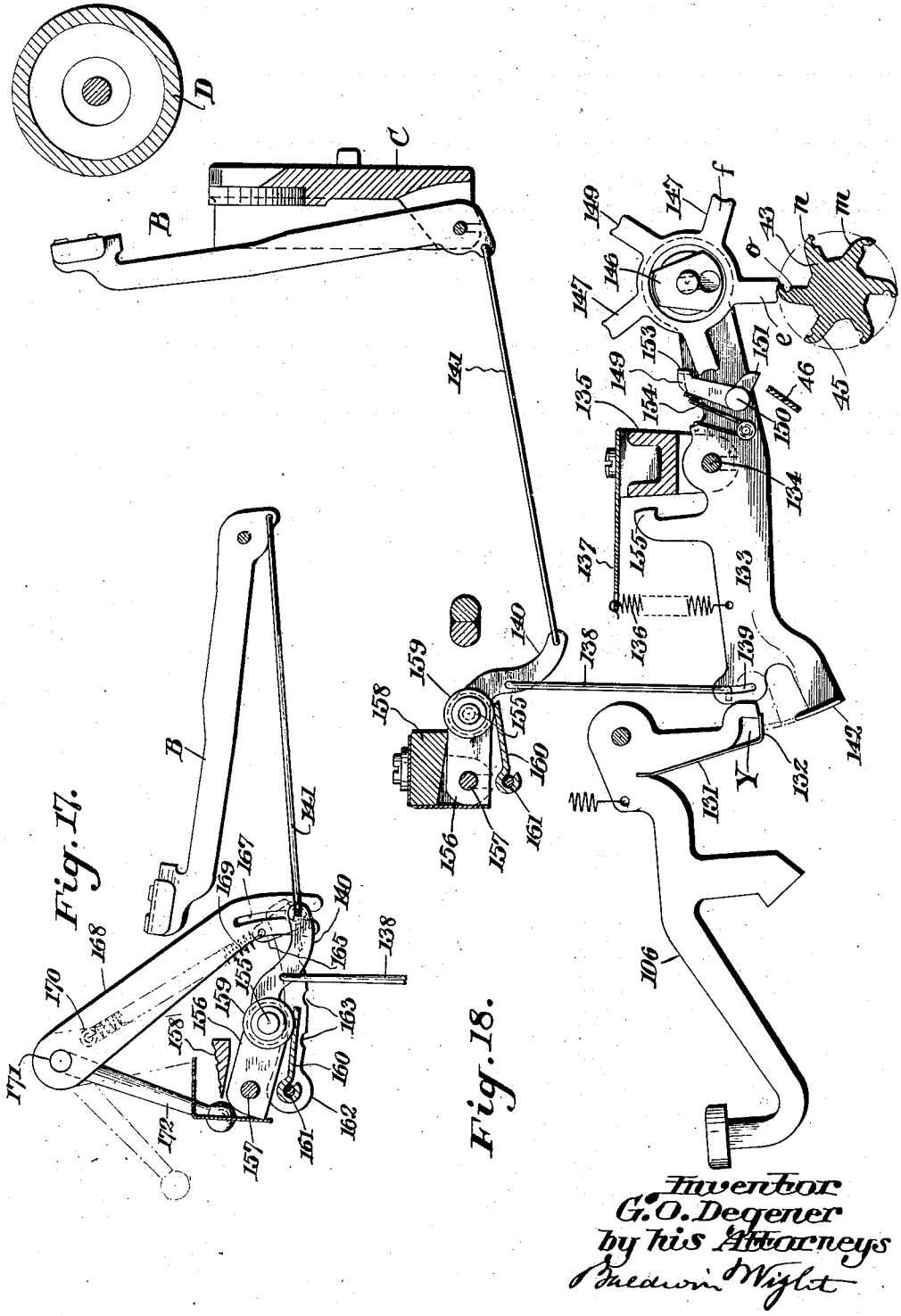


Fig. 18.

Fig. 17.

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Patented Nov. 18, 1930 1,781,720

UNITED STATES PATENT OFFICE

GUSTAVE O. DEGENER, OF NEW YORK, N. Y., ASSIGNOR TO ROYAL TYPEWRITER COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

TYPEWRITING MACHINE

Application filed December 28, 1927. Serial No. 243,063.

The invention herein disclosed relates to a power driven typewriting machine in which the motor and various connections are mounted as a unit on a base plate so that they can be attached to or removed from the typewriting machine as desired. The invention comprises mechanism whereby the printing mechanism, platen shift, carriage return, back spacing mechanism, ribbon mechanism, and escapement mechanism are all operated by power, the operation of these instrumentalities being initiated by the depression of proper keys.

Certain of these features form the subjects matter of separate applications and the present application is directed primarily to the power mechanism and the means by which the same is utilized to operate the type actions and perform the printing.

One feature of the invention is the provision of an operating member driven from a source of power which is set in motion by the depression of a special key and which will remain in motion so long as subsequent type keys are operated within a predetermined interval of time. If this interval is exceeded the power stops and the machine must be started by an operation of the special key.

Another object of the invention is the provision of means which locks all of the type controlling keys in their normal position and which locking means is unlocked as soon as the power operated mechanism or motor begins to operate.

A further object of the invention is the provision of means whereby a type bar may be actuated and returned to normal position irrespective of whether the depressed key has been allowed to return to normal position or not. The invention also provides means whereby a subsequent key may be depressed without releasing a previously operated key or keys.

The invention further comprises the provision of means in the type action which is held in normal position by a spring which however yields in the operation of the action for the purpose of cushioning the same when the power is applied suddenly thereto. The movement of the spring to its normal position also assists in the printing movement of the type bar and means is provided for varying the tension of the spring and thereby the force of the impact.

The invention further comprises a peculiarly formed power shaft and a star wheel so shaped and pivoted that it will always properly and positively contact the power shaft projections so as to avoid any uncertain operation of the power mechanism.

Means is provided for supporting the electric motor upon the base in such manner that practically all weight is removed from the bearings and the noise of operation is thereby greatly reduced. Further objects will be apparent from the following detailed description and the appended claims.

In the drawings:

Figure 1 is a top plan view of the motor and associated mechanism showing a part of the keyboard of the machine.

Figure 2 is a rear view of the motor and associated parts showing the supporting base therefor and its means of attachment to the frame of the machine.

Figure 3 is a bottom plan view of means for attaching a rubber foot to the base plate of the motor support and the latter to the frame of the machine.

Figure 4 is a side elevation of a portion of a friction governor.

Figure 5 is a top plan view of the same.

Figure 6 is a side view of the parts in section of mechanism for initiating the operation of the motor and controlling the same.

Figure 7 is a view of the controlling means taken at right angles to Figure 6.

Figure 8 is a side view of a portion of the controlling mechanism at one stage of the operation.

Figure 9 is a similar view showing the position at a different stage of the operation.

Figure 10 is a fragmentary view of a portion of the controlling means.

Figure 11 is a diagrammatic view of the means for closing and opening the circuit.

Figure 12 is a side view of a portion of

the means for unlocking the keys when the motor is started.

Figure 13 is a top plan view of a portion of the connection shown in Figure 12.

Figure 14 is a side elevation with parts in section of a type action and the operating means therefor with the parts in normal position.

Figure 15 is a view of a portion of the mechanism shown in Figure 14 with the parts in a different position.

Figure 16 is a side elevation similar to Figure 14 but showing the parts as they appear after a depression of the key lever.

Figure 17 is a side elevation of a part of the type action and the operating means therefor at a time when the type bar has moved a short distance toward the printing point.

Figure 18 is a side elevation of a type action and operating means therefor and the type bar when the type bar has moved nearly to the platen.

The motor X is supported as hereinafter described on a base plate 1 which is adapted to be positioned beneath the usual frame 2 of a typewriting machine and is held thereto by means of screws 3 at each corner of the frame 1 which pass through the base plate and are screw threaded into the frame of the machine. These screws also hold in position the usual rubber feet 4 which fit into metallic cups 5. Within a depression in the bottom of each foot is a member 6 having an open ended slot which fits around a reduced portion of the screw 3 and is adapted to be moved between the head 7 of the screw and the body of the foot. The slot in said member is smaller than the head 7 of the screw so that when the member 6 is moved into the Figure 3 position and the screw 3 is tightened the foot will be held firmly to the base plate 1 and this base plate together with the parts carried thereby will be attached to the frame of the machine. However, the opening in the foot and also the opening in the base 1 through which the screw 3 passes is larger than the head 7 of the screw. If it is desired to remove the motor unit from the typewriting machine, the screw 3 is loosened slightly and the member 6 is moved to one side and if desired may be slightly tilted. The feet 4 and the base plate 1 may thereupon be removed since these parts will pass over the head 7 of the screw. This provides a simple and efficient means for removing the motor support whenever it is desired to do so without the necessity of removing the screw 3. It also provides simple means for replacing the feet whenever desired.

The motor X is supported on the base 1 by means of a shaft 9 which is held to the lower side of the motor by means of a keeper plate 10. The ends of this shaft are supported in bearings between semicircular portions of plates 11 and 12 which may be attached to the base 1 by means of screws or similar fastening means. The ends of the shaft 9 are reduced in size and surrounded by felt and felt washers 13 are positioned adjacent the bearings of the shaft. Each end of the motor casing is provided with a downwardly extending boss 14 which fits into one end of a coil spring 15 the other end of which surrounds a projection on the base plate. These springs are of sufficient strength to practically support the entire weight of the motor so that practically no weight comes upon the bearing shaft 9. This not only provides a very satisfactory support for the motor but eliminates a large amount of the usual noise. Oil cups 16 may be provided as desired.

The shaft 17 of the motor has mounted thereon a disk 18 and a second disk 19 is carried thereby. This disk 19 is provided with a plurality of pins 20 projecting from the outer face thereof. A fabric disk 21 is interposed between the disks 18 and 19 and the disk 18 is mounted to slide on the shaft 17. Adjacent the disk 18 the shaft 17 passes through a bearing member which is provided with side extensions and plates 22 (see Figure 5) are pivoted in this bearing at 23 and normally held in a definite position by means of springs 25 which are connected at their ends to pins 24 passing through the plates. It is to be understood that there are two identical plates 22 and that the pins 24 and pivots 23 are the same for both plates respectively.

When the motor is started and the shaft 17 begins to revolve the plates 22 will also revolve and also move outward at one end toward the dotted line position in Figure 5 under the influence of centrifugal force. This movement is against the tension of the springs 25 and the other ends of the plates 22 will bear against the disk 18 and force it into contact with the fabric disk 21 thus pressing the latter against the disk 19 and forming a friction brake. This will act to control the speed of the motor. At one side the fabric disk 21 is provided with a lateral extension 26 which carries a weight 27 and this extension is adapted to contact with a pin 28 which is fixed to the motor X to limit the movement of the disk 21 in one direction and prevent its further rotation with the shaft.

A shaft 29 which is mounted on suitable bearings 30 and in substantial alignment with the shaft 17 of the motor carries a plate 31 which has pins 32 on its outer face projecting toward the pins 20. A spring or other resilient member 33 passes around the outside of the pins 20 and around the inside of the intermediate pins 32 forming a continuous resilient and flexible connection between the two plates and consequently between the shaft 17 and the shaft 29. It is therefore ob-

vious that when the motor is started the shaft 29 will also be rotated and the speed of this rotation will be controlled by the friction brake mechanism already described.

A worm 34 on the shaft 29 meshes with a spiral gear 35 on a shaft 36 which is connected to the carriage return mechanism such as shown in my companion application, Ser. No. 239,493, filed Dec. 12, 1927. A second worm or spiral gear 37 meshes with a gear 38 on a shaft 39 which is mounted in bearings 40 and carries at its other end a gear 41 which meshes with a spiral gear 42 on a transverse shaft 43. This shaft 43 extends across the machine and is mounted in bearings 44 carried by the base plate 1. The shaft 43 is provided in the form illustrated with a plurality of longitudinally extending ribs 45 which are continuous. It is obvious, however, that these ribs may be divided into a plurality of fingers or similar projections. A guard plate 46 is placed in front of the shaft 43. The desired electric connections to the motor may be made by means of plugs 47 and wires 48 and 49 which are connected to switch mechanism within a casing 50.

The spiral gear 42 through which the shaft 43 is driven meshes with a similar gear 51 on a short shaft 52 which carries a pinion 53 meshing with a larger pinion 54 on a shaft 55. This shaft 55 carries a worm 56 (see Figs. 7 and 10) which meshes with a worm gear 57 mounted on a shouldered screw 58 which is mounted in the frame member 59 which supports the casing 50. Referring to Figure 6, a key lever E is employed for starting the motor and is provided with an extension F which underlies a member 60 carried by a rock shaft which is provided with an arm 61 connected by a link 62 to a lever 63. This lever 63 is mounted on a pivot 64 and has an angular upwardly extending arm 65 which lies in front of a bent ear 66 on a lever 67 which is pivoted at 68. The lever 67 is connected by a link 69 to one arm 70 of a bell crank lever pivoted at 71. It is obvious that when the starting key is depressed this bell crank lever will be rocked and through mechanism hereinafter described will act to close the circuit and start the motor. The same bell crank lever is also rocked from the lever 67 whenever a type key is depressed. A link 72 is connected at its front end to the type bar B and at its rear end is connected to a universal frame 73 which has a flange 74 which lies just behind the bent ear 66 on the lever 67. Every time a type bar B is moved to the printing point the universal frame 73, lever 67, and the bell crank lever pivoted at 71, will be operated.

The other end 75 of this bell crank lever overlies the free end of a lever 76 which is pivoted at 77 and is normally held in position by means of a spring 78 which is connected at one end to said lever and at its other end to an ear on the casing 50. This lever 76 has a projection or tooth 79 intermediate its ends.

A U-shaped member 80 is mounted on a shouldered screw 81 which screws into the frame member 59. One leg of this U-shaped member carries a fibre block 82 to which is connected a contact arm 82′ in electric connection with the wire 49. The other leg 83 of the U-shaped member has an enlarged portion 84 which fits through the boss on the frame 50 into which the screw 58 is threaded and the upper end of this leg is provided with a finger 85 which lies just above the lever 76. The normal position of the parts when the machine is not running is shown in Figure 7 and at this time the finger 85 is in contact with the projection or tooth 79 on the lever 76. A spring 86 connected to the U-shaped member and to the casing 50 tends to swing this member from the Figure 7 to the Figure 8 position but when the finger 85 is in contact with the tooth 79 such movement cannot take place.

The contact arm 82′ cooperates with contact mechanism 87 carried by a fibre block 88 in the upper part of the casing 50 in the following manner:

Assuming that the parts are in the Figure 7 position and the starting key E is operated, the lever 76 will be pushed down by the arm 75 of the bell crank lever, and the U-shaped member 80 will rock to the Figure 8 position, this movement being limited by a stop 105. This will cause the upper end of the arm 82′ (see Figure 11) to move from the position designated *a* in which it rests against an insulating fibre block 89 until it contacts with an inclined member 90 which is in circuit with the wire 48. This will close the circuit and the motor will begin operation thereby rotating the shaft 55 in the manner set forth above. This will produce a rotation of the worm wheel 57 and this movement will move the contact arm 82′ from the position *a* to the position *b* in which the circuit is still closed and thence into contact with an inclined member 91 also in the circuit and to the position *c*. This movement is brought about in the following manner:

The U-shaped member 80 has a projecting arm 92 which is connected by a spring 93 with one arm 94 of a bell crank lever pivoted at 95. The other arm 96 of this bell crank lever has a hooked member 97 which is adapted to overlie the lever 76 when the latter is in depressed position. As shown at the left hand side of Figure 8 this hook cannot move over the lever 76 until the latter is depressed. A plunger 98 is positioned within the coil spring 93 and at certain times affords a positive one way connection between the arm 92 and the arm 94 of the bell crank lever. The worm gear 57 carries a pin 99. A lever 100 is pivoted at 101 to the leg 83 of the U-shaped

member. This lever 100 has a projection or tooth 102 intermediate its ends and a spring 103 normally holds the same against a stop 104 fixed to the leg 83 of the U-shaped member. As the worm gear 57 rotates the pin 99 will come in contact with the projection 102 and will move the whole U-shaped member 80 against the tension of the spring 86 from the Figure 8 position toward the Figure 9 position. Just after the parts pass the Figure 9 position in this movement the pin 99 will cam the lever 100 downwardly thus releasing the U-shaped member which will move to the Figure 7 position. In the present embodiment this action takes approximately thirty seconds and if no key has been struck in the meantime the lever 76 will have returned to normal position and the pivoted finger 85 will be caught by the tooth 79 in its return movement under influence of the spring 86 and the parts will stop in the Figure 7 position. However, during the movement of the U-shaped member from the Figure 8 toward the Figure 9 position, the spring 93 has been tensioned and the plunger 98 moved away from the arm 94 as shown in Figure 9 so that the spring will move the bell crank lever which is pivoted at 95 to the Figure 10 position providing the lever 76 has been again depressed by a key. It therefore results that if a type key has been depressed during the latter part of this interval of approximately thirty seconds the lever 76 has been moved downward and is now held in its lowermost position shown in Figure 10, by the tooth 79 of the bell crank lever. Therefore, although the upper end of the contact member 82′ will successively occupy positions *a*, *b* and *c*, it will move directly from this last position to the *b* position, thus keeping the circuit closed. The finger 85 will at this time move from the Figure 9 to the Figure 8 position and the whole operation will be repeated. This construction provides a simple and efficient mechanism for stopping the motor if the operation of the machine is interrupted for more than thirty seconds but maintaining the motor in constant operation providing no such interruption occurs.

The type key levers 106 will be arranged to constitute the usual keyboard and are cushioned in their operative movement by springs 107 which fit in cavities in a block 108. The key levers also have downwardly extending portions 109 which contact with this block to limit their return movement.

A rock shaft 110 has a universal bar 111 which is adapted normally to occupy the dotted line position of Figure 14 in which it lies in the rear of the projections 109 of the key levers and prevents any operation of the key levers. It is necessary to unlock the key levers before they can be depressed and this is effected by the starting of the motor in the following manner:

The shaft 110 has an arm 112 which is connected by a link 113 to an arm 114 of a lever which is pivoted at 115 on an ear 116 extending from the back plate of the machine frame. This lever has a stop portion 117 adapted to contact the back plate to limit the movement of the lever in one direction. The lever also has an arm 118 which is connected by a link 119 to an arm 120 carried by a shaft 121. A bent spring 122 (see Figure 12) is carried by this arm and another arm 123 is also mounted on said shaft 121 to move therewith. This arm has a weight 124 adjustably fastened thereto by a set screw 125. The extension 26 of the fabric disk 21 underlies the bent spring 122. Therefore when the motor is started and the disk 21 moves to the dotted line position of Figure 4, it will move the spring and connected parts to the dotted line position of Figure 12 and this will move the locking plate or universal bar 111 to the full line position of Figure 14, thus unlocking the type keys for operation. In other words, when the motor is started the pivoted plates 22, 22 of the governor will swing outwardly against the tension of the spring 25 and cause the disk 21 to be frictionally gripped between the disks 18 and 19, thus causing the disk 21 to be rotated with the shaft 17. As the disk is thus rotated the weighted arm 27 will be moved upwardly into engagement with the stop 28 which is fixed to the motor casing. This upward movement of the weighted arm 27 will move the spring 122 upwardly and through the train of connections above described, will oscillate the lever 112 and thereby move the universal bar or locking plate 111 away from the keys 106, thus unlocking the keys for operation. When the motor is stopped, the disks 18 and 19 will be released from the disk 21 and the weighted arm 27 will thereupon move downwardly to the full line position shown in Fig. 4. This downward movement of the weighted arm 27 permits the spring 122 to move downwardly to its normal position and this spring assisted by the weight 124 will return the locking plate 111 to its normal or locking position as shown in dotted lines in Figure 14.

The type key levers are all pivoted at 126 in a transverse frame member 127 and are returned to normal position by springs 128 connected to a plate 129 carried by said frame member. Each key lever has a downwardly extending portion 130 and a flat spring 131 carried by the key lever has a horizontal portion 132 so arranged as to form a recess Y between the spring, and the portion 130 of the key lever.

For each type action there is provided a power lever 133 fulcrumed on a rod 134 carried by a transverse member 135 and normally moved in one direction by a spring 136 connected at one end to the power lever and at

its other end to a plate 137 carried by the frame member 135. Each power lever 133 has connected thereto a link 138 which engages a slot 139 in said lever and is connected at its upper end to a front link 140 which in turn is connected by a link 141 to a type bar B. The front end of each power lever has a bent extension 142, the front face of which is adapted to contact with the rear edge of the horizontal portion 132 of the spring 131 while the upper edge of this extension is adapted to contact with the lower edge of the downwardly extending portion 130 of the key lever. The normal position of the parts is as shown in Figure 14. A universal bar 143 carried by a shaft 144 underlies the power levers and is connected to operate the ribbon mechanism as shown in my companion application, Ser. No. 239,491, filed Dec. 12, 1927.

The rear end of each power lever has a star wheel 145 loosely pivoted thereto and a flat spring 146 holds the star wheel against accidental displacement but permits its rotation relative to the power lever. The star wheel is provided with arms 147 having in their outer ends cavities 148. These cavities are so formed that they will exactly receive the ends of the fingers or ribs 45 on the power shaft 43. These ends are curved in arcs of the circle in which they rotate.

A bell crank lever 149 is pivoted at 150 on the power lever and has a projecting arm 151 normally in engagement with the guard plate 46. An upper bent over ear 153 on the lever 149 normally lies in the path of the fingers 147 of the star wheel, as shown in Figure 14, and is forced to this position and against the plate 46 by a spring 154 which bears against the lever 149.

Assuming that the parts are in the normal position shown in Figure 14 a slight depression of a key lever 106 will move the spring 131 and allow the extension 142 on the power lever to move into the recess Y and to the position shown in Figure 16. This allows an upward movement of the front end of the power lever under influence of the spring 136 until it is stopped by a projection thereon engaging the transverse member 135. This upward movement of the power lever will cause a similar downward movement of the rear end and since the projection 151 of the lever 149 can move downward this lever 149 will be swung about its pivot 150 to the position shown in Figures 15 and 16 wherein it lies outside the path of movement of the fingers 147 of the star wheel. At the same time the star wheel will move down from the Figure 14 position to that shown in Figure 15.

As soon as the shaft 43 is rotating the finger *f* of the star wheel will be engaged first by the rib or finger *m* which will rotate the star wheel slightly and thereafter the same finger on the star wheel will be engaged by the rib *n*, while the succeeding rotation will cause the end of the finger *o* to engage in the depression 148 of the succeeding finger *e* of the star wheel. The power lever will therefore be moved to the Figure 18 position and the type bar through the links 138, 140 and 141 will be moved to the printing point. Immediately thereafter the parts will return toward normal position and if the key lever has not been released the extension 142 will contact with the horizontal portion 132 of the spring 131 and thereby retain the star wheel 145 out of engagement with the power shaft 45. When the key lever is released this extension will move to the normal position shown in Figure 14 and the lever 149 will be moved by the spring 154 into the path of the next arm 147 on the star wheel to prevent overthrow thereof. This overthrow preventing mechanism may, however, be omitted in some forms of the invention.

The front link 140 may be pivoted to the frame as in the Standard Royal machine, but in the present form of the invention it is pivoted at 155 to a short lever 156 pivoted on a shaft 157 carried by a transverse frame member 158. The pivot which connects the members 140 and 156 carries a roller 159 which engages against a plate 160 carried by a rod 161 suitably mounted in the frame of the machine. At one end this rod is provided with an arm 162 which has notches 163 in its lower face. A roller 164 is carried by a member 165 and the ends 166 of the pin on which the roller is mounted extend into curved slots 167 of a pair of arms 168 between which the member 165 is positioned. A spring 169 is connected at one end to the member 165 and at its other end to a pin 170 carried by the arms 168. The roller 164 is adapted to engage in the notches 163. The arms 168 are carried on a short shaft 171 which is suitably mounted and provided with a handle 172. By means of this handle the roller 164 may be moved to engage different notches 163 and thereby vary the tension of the spring 169 which tends to hold the plate 160 and all of the levers 156 in the position shown in Figure 14.

In power driven type actions of this character, it is obvious that a very sudden and sharp pull is exerted upon the type action and the spring 169 in the present construction serves to cushion this sharp pull. During the first part of the movement of the type action the parts will move from the Figure 14 to the Figure 17 position and the link 140 and lever 156 during this time move substantially as a unit.

This of course tensions the spring 169 and cushions the movement of the type action. Thereafter as the type bar moves toward the printing point the spring 169 will move the lever 156 back toward normal position so

that when the parts are in the Figure 13 position the lever 156 will have returned substantially to normal position. It will be obvious that during this part of the movement of the type bar the spring 169 assists in moving the same. By varying the tension of the spring 169 as indicated in Figure 17, the force of imprint may be correspondingly varied. This spring connection therefore serves to cushion the operation of the type action and also assists in the actuation of the type bar mechanism by transforming a sudden mechanical force into spring tension.

In order to insure that the projections *o*, *n* and *m* on the power shaft 43 always contacting in the arc 148, a positive method of timing between the star wheel and the power shaft has been devised. The arm *e* of the star wheel will travel on the arc *g* shown in Figure 14, when the power lever is released by the key lever, through the action of the spring 136. It will be seen that arm *e* will never come in contact with the fingers 45 of the power shaft by itself, but must be thrown into proper contact by its adjacent arm *f* entering the path of the teeth *m* and *n* which will successively contact the arm *f*. When arm *f* is contacted by a finger 45 on the power shaft, there always is a space for the arm *e* to enter freely, thereby insuring against uncertain power actions.

It will be apparent that the invention provides a very efficient power operated mechanism and it is also apparent that many details may be widely varied without in any way departing from the spirit of the invention and it is therefore to be remembered that the invention is not to be regarded as limited by the specific embodiment herein described and illustrated but by the scope of the appended claims.

I claim as my invention:

1. In a power operated typewriting machine, a type action comprising a type bar, a power shaft, a power lever normally disengaged from the shaft, a key for releasing said power lever to engage the shaft, and connections between the power lever and the type bar for moving the latter to printing position, said connections including a spring tensioned element which moves away from and back to normal position during the movement of the type bar to the printing point, thereby cushioning the action of the power lever engaging the power shaft and subsequently assisting the printing movement of the type bar.

2. In a power operated typewriting machine, a type action comprising a type bar, a power shaft, a power lever normally disengaged from the shaft, a key for releasing said power lever to engage the shaft, connections between the power lever and the type bar for moving the latter to printing position, said connections including a spring and an element tensioned thereby which moves away from and back to normal position during the movement of the type bar to the printing point, thereby cushioning the action of the power lever engaging the power shaft and subsequently assisting the printing movement of the type bar, and means for varying the tension of said spring.

3. In a power operated typewriting machine, a type action comprising a type bar, a power lever, and connections between the power lever and the type bar, said connections including a front link connected directly to the type bar and power lever, a movable support for the front link, and a spring holding said support in normal position.

4. In a power operated typewriting machine, a type action comprising a type bar, a power lever, and connections between the power lever and the type bar, said connections including a front link connected directly to the type bar and power lever, a movable support for the front link, a spring holding said support in normal position, and means for varying the tension of said spring.

5. In a power operated typewriting machine, a type action, a power lever connected to the same, a power driven rotating element having projections thereon, a star wheel pivoted to the power lever and frictionally held against accidental rotation, said star wheel having fingers normally held out of the path of said projections, and means for moving the fingers of the star wheel into the path of said projections to actuate the lever and thereby the type action.

6. In a power operated typewriting machine a type action, a power lever connected to the same, a power driven rotating element having projections thereon, a star wheel pivoted to the power lever and frictionally held against accidental rotation, said star wheel having fingers normally held out of the path of said projections, means for moving the fingers of the star wheel into the path of said projections to actuate the lever and thereby the type action, and a key for controlling the operation of said means.

7. In a power operated typewriting machine, a type action, a power lever connected to the same, a power driven rotating element having projections thereon, a star wheel pivoted to the power lever and frictionally held against accidental rotation, said star wheel having fingers normally held out of the path of said projections, means for moving the fingers of the star wheel into the path of said projections to actuate the lever and thereby the type action, and means for preventing overthrow of the star wheel.

8. In a power operated typewriting machine, a type action, a power lever connected to the same, a power driven rotating element having projections thereon, a star wheel pivoted to the power lever and fric-

tionally held against accidental rotation, said star wheel having fingers normally held out of the path of said projections, means for moving the fingers of the star wheel into the path of said projections to actuate the lever and thereby the type action, and means for preventing a double action of the power lever.

9. In a motor driven typewriting machine, the combination with a machine frame, a motor supporting frame and a foot arranged one above the other, and movable fastening means connecting the foot to both frames whereby the foot and the motor frame may be removed from the machine frame without disconnecting the fastening means from the machine frame.

10. In a motor driven typewriting machine, the combination with a machine frame, a motor supporting frame and a foot arranged one above the other, and movable fastening means connecting the foot to both frames whereby the foot and the motor frame may be removed from the machine frame without disconnecting the fastening means from the machine frame, said fastening means comprising a screw having its shank extending upwardly through openings in the foot and motor supporting frame and threaded into the machine frame, the openings in the foot and motor supporting frame being larger in diameter than the head of the screw, and a plate having an open ended slot positioned between the foot and the screw head and movable to a position whereby the foot and the motor supporting frame may be disconnected from the machine frame.

11. In a power operated typewriting machine, a type action comprising a type bar, a power shaft, a power lever normally disengaged from the shaft, a key for releasing said power lever to engage the shaft, and connections between the power lever and the type bar for moving the latter to printing position, said connections including an intermediate link disposed above the power lever, a movable support for said link, a pivoted element disposed below and engageable with said support, and a spring for yieldably retaining said pivoted element in engagement with said support.

12. In a power operated typewriting machine, a type action comprising a type bar, a power shaft, a power lever normally disengaged from the shaft, a key for releasing said power lever to engage the shaft, and connections between the power lever and the type bar for moving the latter to printing position, said connections including an intermediate link disposed above the power lever, a movable support for said link, a pivoted element disposed below and engageable with said support, a manually operable lever, a roller journaled on the lever for cooperation with the under side of the pivoted element and movable with the lever toward and from the pivot of said element, and a spring connecting the roller and lever.

13. In a power operated typewriting machine, a type action comprising a type bar, a power shaft, a power lever normally disengaged from the shaft, a key for releasing said power lever to engage the shaft, and connections between the power lever and the type bar for moving the latter to printing position, said connections including an intermediate link disposed above the power lever, a movable support for said link, a pivoted element disposed below and engageable with said support, a manually operable lever, a roller journaled on the lever for cooperation with the underside of the pivoted element and movable with the lever toward and from the pivot of said element, and a spring connecting the roller and lever, the under side face of said pivoted element being provided with a series of recesses for receiving the roller upon movement of the lever.

14. In a power operated typewriting machine, a type action comprising a type bar, a power shaft, a power lever normally disengaged from the shaft, a key for releasing said power lever to engage the shaft, and connections between the power lever and the type bar for moving the latter to printing position, said connections including an intermediate link disposed above the power lever, a lever for supporting said link, and means including a spring for yieldably retaining said lever against downward movement.

15. In a power operated typewriting machine, a type action comprising a type bar, a power shaft, a power lever normally disengaged from the shaft, a key for releasing said power lever to engage the shaft, and connections between the power lever and the type bar for moving the latter to printing position, said connections including an intermediate link disposed above the power lever, a lever for supporting said link, a roller on said lever, a plate pivoted below said lever and engageable with said roller, and a spring cooperating with said pivoted plate for yieldably retaining said plate in engagement with said roller.

16. In a power operated typewriting machine, a type action comprising a type bar, a power shaft, a power lever normally disengaged from the shaft, a key for releasing said power lever to engage the shaft, and connections between the power lever and the type bar for moving the latter to printing position, said connections including an intermediate link disposed above the power lever, a lever for supporting said link, a roller on said lever, a plate pivoted below said lever and engageable with said roller, an arm movable with said plate, a manually operable lever, a roller journaled on the lever for cooperation

with the under side of the pivoted arm and movable with the lever toward and from the pivot of said arm, and a spring connecting the roller and lever, the under face of said pivoted arm being provided with a series of recesses for receiving the last mentioned roller in different positions of the lever.

17. In a power operated typewriting machine, a type action comprising a type bar, mechanism for actuating said type bar from a source of power comprising a power lever operatively connected to the type bar and adapted to be brought into operative relation to the source of power, a key lever having a recess in its under surface, and an extension on the front end of the power lever normally engaging the key lever adjacent the recess and held by said engagement out of operative relation to the source of power, the extension passing into the recess when the key is depressed, thereby permitting the power lever to assume operative relation to the source of power.

18. In a power operated typewriting machine, a type action comprising a type bar, mechanism for actuating said type bar from a source of power comprising a power lever operatively connected to the type bar and adapted to be brought into operative relation to the source of power, a key lever having a recess in its under surface, a spring on the key lever normally closing the entrance to the recess, and an extension on the power lever engaging the under surface of the key lever and adapted to displace the spring and pass into the recess when the key lever is depressed, such movement permitting the power lever to assume operative relation to the source of power.

19. In a power operated typewriting machine, a type action comprising a type bar, mechanism for actuating the type bar from a source of power which comprises a power lever operatively connected to the type bar, a shaft having fingers with ends formed in arcs of a circle concentric with the axis of the shaft, a star wheel pivoted to said power lever and having extensions provided in their ends with depressions adapted to fit the ends of said fingers, and key controlled means normally holding said power lever so that the extensions of the star wheel are normally out of the path of the fingers on said shaft.

20. In a power operated typewriting machine, a type action comprising a type bar, mechanism for actuating the type bar from a source of power which comprises a power lever operatively connected to the type bar, a shaft having fingers with ends formed in arcs of a circle concentric with the axis of the shaft, a star wheel pivoted to said power lever and having extensions provided in their ends with depressions adapted to fit the ends of said fingers, and key controlled means normally holding said power lever so that the extensions of the star wheel are normally out of the path of the fingers on said shaft, the movement of the power lever when released bringing the extension on the star wheel in the rear of the shaft into position to be engaged by a finger, the consequent movement of the star wheel on the lever bringing the next extension into position to be engaged by the next finger whereby the lever is given its operative movement.

21. In a power operated typewriting machine, a type action comprising a type bar, mechanism for actuating the type bar from a source of power which comprises a power lever operatively connected to the type bar, a shaft having fingers with ends formed in arcs of a circle concentric with the axis of the shaft, a star wheel pivoted to said power lever and having extensions provided in their ends with depressions adapted to fit the ends of said fingers, key controlled means normally holding said power lever so that the extensions of the star wheel are normally out of the path of the fingers on said shaft, and means for preventing overthrow of the star wheel.

22. In a power operated typewriting machine, a type action comprising a type bar, mechanism for actuating the type bar from a source of power which comprises a power lever operatively connected to the type bar, a shaft having fingers with ends formed in arcs of a circle, concentric with the axis of the shaft, a star wheel pivoted to said power lever and having extensions provided in their ends with depressions adapted to fit the ends of said fingers, key controlled means normally holding said power lever so that the extensions of the star wheel are normally out of the path of the fingers on said shaft, and means for preventing overthrow of the star wheel, said overthrow preventing means comprising a stop lever fulcrumed on the power lever, a spring for normally urging the stop lever to engage one of the star wheel extensions, and a fixed element cooperating with the stop element to move the latter out of engagement with the star wheel upon operative movement of the power lever.

23. In a power driven typewriting machine, a rotary shaft, a disk loosely mounted on said shaft and having an arm extending therefrom, a governor control means mounted on the shaft for clamping the disk to said shaft when the shaft is rotated and for releasing said disk when the shaft ceases to rotate, a plurality of type actions adapted to be operated by said shaft, keys for selecting the desired type action to be operated, and means controlled by said disk for locking the keys against operation when the shaft ceases to rotate and for releasing said locking means when the shaft is rotated.

24. In a power driven typewriting machine, a rotary shaft, a disk loosely mounted on said

shaft and having an arm extending therefrom, a governor control means mounted on the shaft for clamping the disk to said shaft when the shaft is rotated and for releasing said disk when the shaft ceases to rotate, a plurality of type actions adapted to be operated by said shaft, keys for selecting the desired type action to be operated, and means controlled by said disk for locking the keys against operation when the shaft ceases to rotate comprising a pivotal locking plate cooperating with all of said keys and normally disposed in inoperative position relative thereto, and a pivoted arm operatively connected to said locking plate and disposed in cooperative relation to the disk arm whereby the latter upon rotation of the disk will move the locking plate to operative position relative to the keys.

In testimony whereof, I have hereunto subscribed my name.

GUSTAVE O. DEGENER.