Oct. 12, 1954

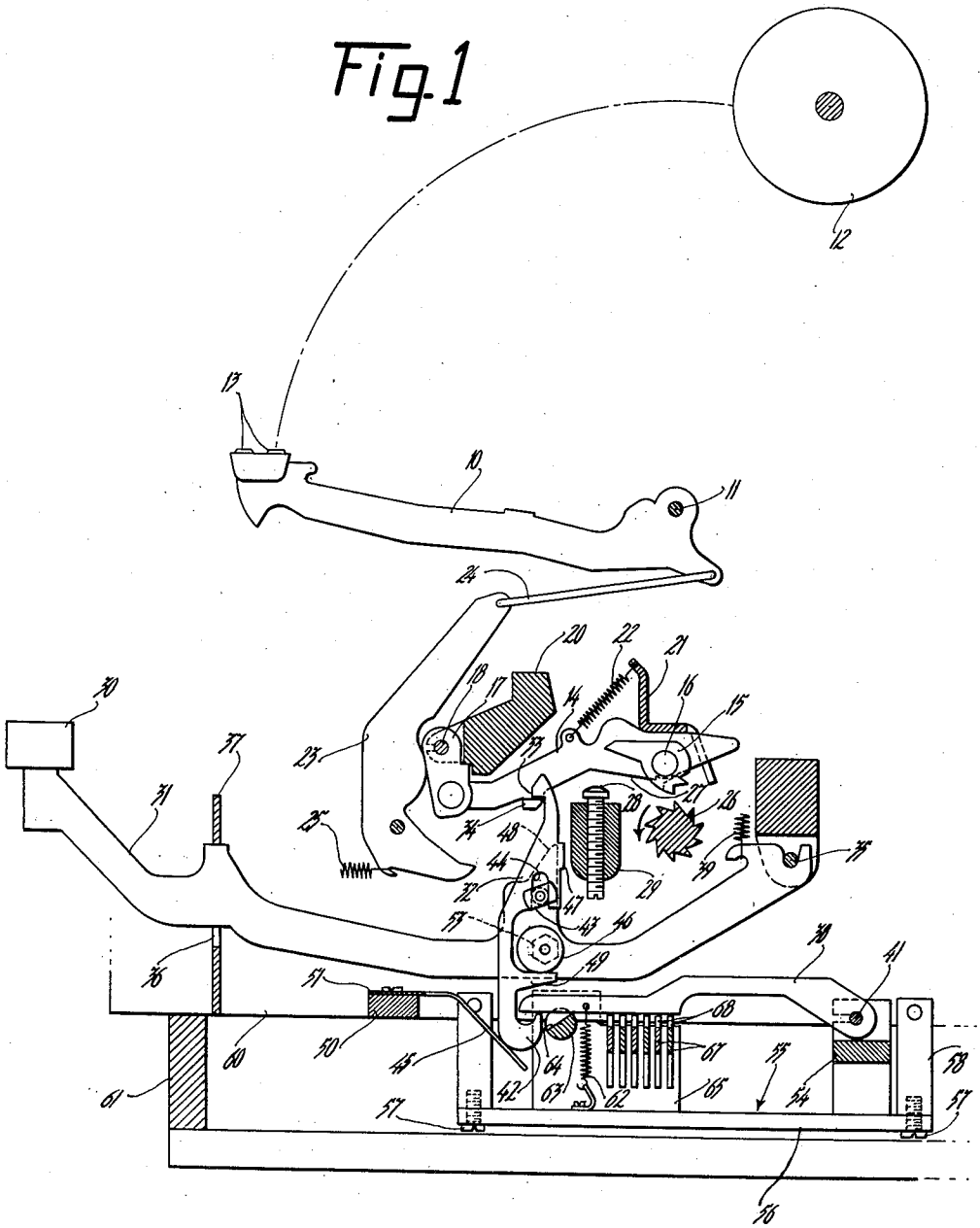
P. R. DULONG
AUTOMATICALLY AND KEY CONTROLLED
POWER ACTUATING MECHANISM

2,691,438

Filed Feb. 4, 1953

2 Sheets-Sheet 1

Fig. 1



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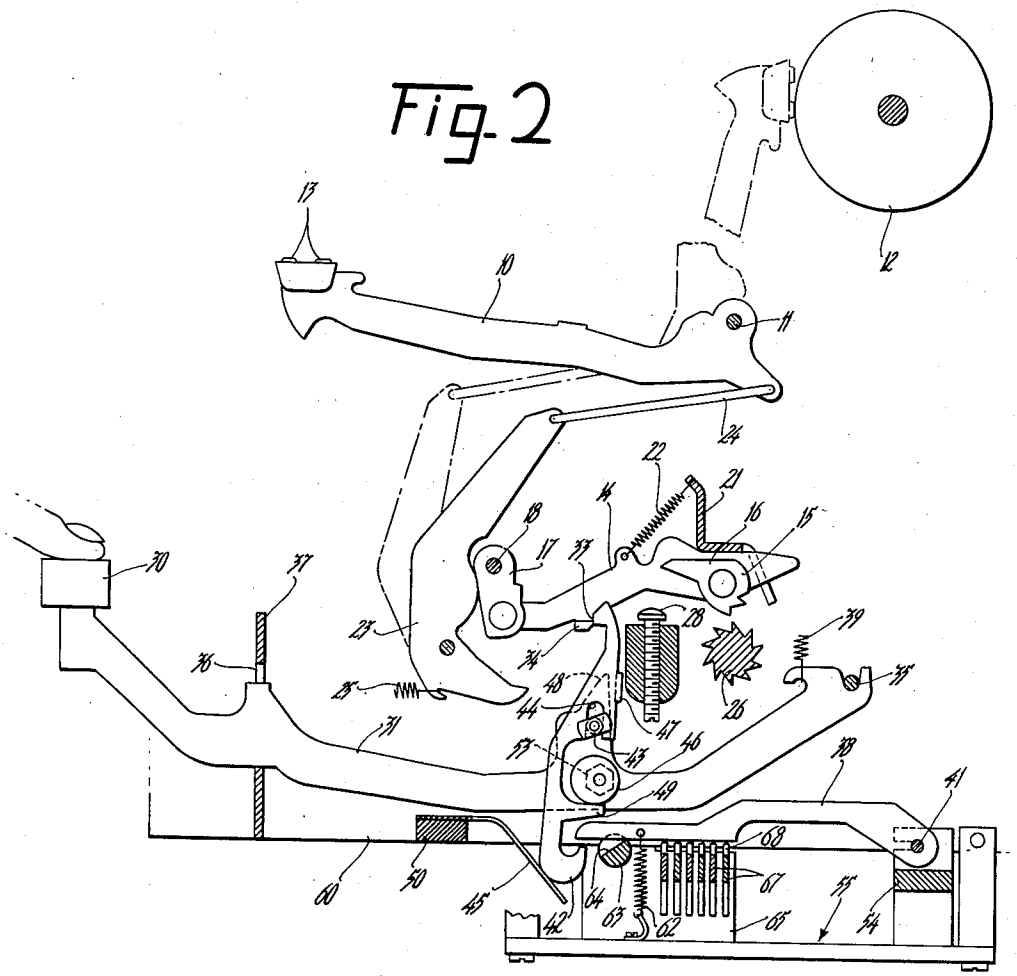
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Fig. 2



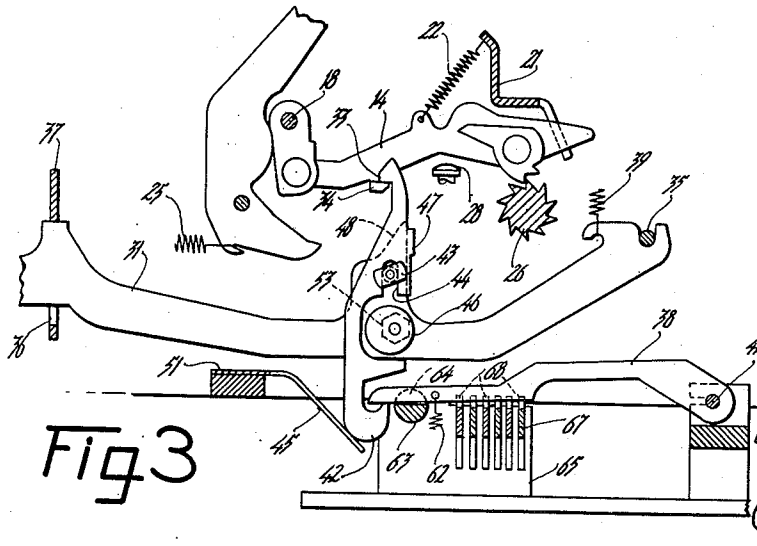


Fig. 3

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AUTOMATICALLY AND KEY CONTROLLED POWER ACTUATING MECHANISM

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5 Claims. (Cl. 197—17)

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This invention in general relates to power operated typewriters of the kind which have actuators that are transitorily engageable with a continuously operating common power member in order to execute a type action operating stroke.

The invention more particularly relates in connection with the stated machines to provision whereby the type action actuators are selectively engageable with a common power member under control of type keys and additionally under automatically controlled elements.

It is a general object of the invention to provide for key control and also for automatic control of type action actuators by an efficient, simple and reliably operative mechanism.

A further object of the invention is to provide for engagement or activation of power actuators through a series of efficient actuator engagers or activators, each of which is efficiently controlled by a key, as well as by an automatically operable control element, and preferably the actuator engagers operate so that the type keys remain unaffected when said actuators are activated automatically.

It is moreover an object to provide an actuator engager or activator which is efficiently responsive to a type key as well as to an automatically operated element, and which has capacity for yield to allow the actuator upon key controlled activation to return to its normal position even though the engager may be held sustainedly operated by the type key.

Still a further object is to provide efficient, simple actuator engagers as hereinabove stated, constructed and supported for convenient and efficient adjustment for the actuator to become activated upon a desired extent of downward operation of the key.

It is a still further and important object of the invention to provide in a power operated typewriter an organization of simple and efficient actuator engagers, satisfying any or all the objects hereinabove stated, and having the automatic operating elements therefor provided on a unit, the engagers being constructed and arranged to facilitate ready attachment of said unit to the machine in a manner so that said operating elements readily assume proper cooperative relation with the actuator engagers.

Other objects and features will in part be obvious and in part be pointed out, particularly as the following description of a preferred embodiment of the invention proceeds.

The invention has been worked out in connection with a power typing mechanism generally disclosed in the U. S. Patent to Yaeger, No. 2,254,764, dated September 2, 1931 but its usefulness and application is not restricted to that mechanism.

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Now particularly referring to the drawings, Figure 1 is a right hand sectional side view of a power operated typewriter embodying the invention, the mechanism being in normal idle condition,

Figure 2 is a sectional side view similar to Figure 1 but a type key is shown in operated position and a type action actuator is shown as having returned to normal position following a power movement resultant from the operation of the key,

Figure 3 is also a view similar to Figure 1 but an actuator engager is shown moved to effective position by an automatic operator element without effect to its related type key.

Now more particularly referring to Figure 1, the machine embodies type bars 10, of which there are a usual curved array, individually mounted pivotally, as at 11, to swing and type against a platen 12. Each type bar may have two types 13, one an upper case type, the other a lower case type. The various type bars 10 are each operable by a power actuator 14 comprising a snatch pawl 15 pivotally carried on the actuator, as at 16. For every type bar 10 the machine has an actuator 14 and the latter are arranged in the machine, transversely spaced, in a straight row and extending parallel. At the front each actuator 14 has pivotal support on a pendant arm 17, and such arms are supported on a common pivot rod 18 carried by a cross bar 20, the latter having slots for accommodating the arms in spaced relations. The actuators 14 at the rear are normally drawn upwardly against a bar 21 by springs 22. The direction of action of said springs 22 provides also that said actuators 14 are biased rearwardly to limits established by the arms 17 swinging limitedly rearwardly on the bar 20. Each arm 17 has a rolling lever association with a sub-lever 23 and each of the latter is connected to one of the type bars 10 by a link 24. The various sub-levers 23 are upreaching to various extents, to accord with the curved array of type bars, as fully brought out in said patent to Yaeger, No. 2,254,764, and are each biased toward their normal positions by springs 25. Underlying the said actuators 14 below their snatch pawls 15, transversely of the machine, there is provided a toothed power member or shaft 26 which when the machine is in operation is power rotated continuously in the direction of the arrow shown

in the drawings. Normally all the snatch pawls 15 are clear above the toothed power shaft 26, as shown in Figure 1. To bring about an operation of any type action comprising the parts 17, 23, 24 and 10, the actuator 14 related thereto is drawn down about its pivotal support on the arm 17 to engage its snatch pawl 15 with the toothed shaft 26. Due to the rotation of the toothed shaft 26 there ensues then initially a limited pivotal motion of the snatch pawl 15 on the actuator, in which the teeth of the snatch pawl 15 bite firmly into said shaft. In continuation of this the snatch pawl 15 along with the actuator 14 receives then a power stroke which is transmitted to the parts 17, 23, 24 leading to the type bar 10. At a select point in the progress of any type bar 10 toward the platen, a cam face 27 on the underside of the actuator 14 meets an abutment 28 and there results an upward deflecting action of the actuator 14 which disengages its snatch pawl 15 from the toothed shaft 26, the type bar 10 continuing its motion toward the platen by momentum and the actuator under the influence of the spring 22 reversing its motion to restore to the normal position shown in Figure 1. The said abutments 28 are in the form of screws which are adjustably carried on a transverse bar 29.

For selectively bringing about power operations of the actuators 14 the machine embodies for every one of the actuators 14, substantially in the vertical plane thereof, a key lever 31 comprising a type key 30. Each key lever 31 carries an actuator engager 32 or activator which has at its upper end a nose 33 normally overlying a heel 34 on the actuator in the form of a lateral projection. The said levers 31 are individually pivoted on a common axis 35 and springs 39 urge them upwardly to limits in guide slots 36 of a comb plate 37, the lower ends of the slots serving to limit operation of the key levers.

The stated engagers 32 have each additionally to the key lever 31 an automatically controlled operator element 38 or arm in control thereof. The said operator elements 38 lie each in the general plane of the related key lever 31, preferably wholly therebelow, as shown. They are carried on a common pivot rod 41 for downward pivotal displacement from the position seen in Figure 1 to the position seen in Figure 3. The forward ends of the operator elements 38 overlie underslung tails 42 on the lower ends of the actuator engagers 32, slightly spaced thereabove, and in the line of action thereof. Downward operation of said operator elements may be effected in various ways, such as under control of perforated sheet or tape control, or by remote control. By way of example, one manner of effecting control of said operator elements 38 will be described later herein.

Now specifically referring to the engagers 32, each is supported on its related key lever 31 for downward operation therewith, thereby to draw the related actuator 14 down for the snatch pawl 15 to mesh the toothed power shaft 26. The operator element 38, due to a bight on the engager 32 above the tail 42, is unaffected by the key operation of the engager 32. On the other hand the operator element 38 is capable to operate the engager 32 without affecting the position of the key 31. To the stated ends, each key lever 31 has a headed pin 43, and each engager 32 is provided with an open slot 44, said engagers 32 by their slots in association with the pins 43 being vertically slidable on the key levers 31. Moreover, such pin and slot association 43, 44 allows pivotal movement of the engager in the general plane of the key lever. The normal position of each engager 32 is established under the influence of resilient means in the form of a spring finger 45, the latter urging the engager 32 upwardly on the key lever to a limit of an eccentrically adjustable stop 46, as well as anticlockwise with reference to the drawings to a limit established by the abutment of a lateral ear 47 on the engager 32 with an upreaching portion 48 of the key lever 31. The eccentric 46 is on the key lever in line with the pin and slot association 43, 44, the engager 32 having a finger 49 underlying it, and the arrangement being such as to allow some clockwise pivotal displacement of the engager about the said association. The spring fingers 45 are part of a single, comb-like member 51 extending transversely of the machine and supported on a transverse bar 50 carried on the machine framework.

Any key lever 31 when operated will carry its related engager 32 downwardly. This lowers the pawl end of the actuator 14 into mesh with the toothed power member 26, and there results a power stroke of the actuator 14. If the machine is operated by control of the operator elements 38, then any operated engager 32 will slide on the key lever downwardly without effect thereon, but will draw the actuator 14 down to cause it to execute a single cyclic operation to operate its related type action.

As any actuator 14 through the toothed roll 26 is driven forwardly, the heel 34 thereon leaves the nose 33 of the engager 32 and when upon divorcement from the toothed power member the actuator 14 returns under the influence of the spring 22 to Figure 1 position, the heel 34 will encounter the front side of the engager nose 33 and will swing the engager 32 clockwise against the tension of the spring 45 about the pin and slot association 43, 44. This is illustrated in Figure 2, wherein the key lever 31 is illustrated as having been prolongedly operated, and wherein the actuator 14 has concluded its cyclic motion instituted by the operation of the key lever. During the pivotal displacement of the engager 32 the finger 49 slides idly along the underface of the adjustable stop 46. It will thus be seen that any operated actuator 14 is permitted to conclude fully its cyclic motion, wherefore the type bar 10 is permitted to restore fully even though the type key may be lingered upon by the operator. Moreover, although the key 31 may be held operated, there will ensue no second typing stroke unless the key is first released and then reoperated. At release of the key the nose 33 of the engager, under the tension of the spring 45 exerted on the engager, springs over the heel 34 of the actuator, all parts having then reassumed their normal positions.

The actuators 14 and the associated arms 17 are respectively all alike, and thus the actuator heels 34 are normally all disposed in a straight transverse row. The eccentrics 46 on the key levers serve to adjust the engagers 32 vertically so that the actuators 14 are engaged with the toothed power member 26 at uniform depth of depression of the key levers. Each eccentric 46 is turnable by a hexagon element 53 at the side of the lever 31 which is opposite to the eccentric and the element 53 has a pin which reaches through a hole in the key lever and is rivetedly joined with the eccentric. Friction resultant from riveting the eccentric to the pin of the

hexagon 53 binds the eccentric adjustably in position.

As has been stated hereinbefore, the operator elements 38 are carried on a common pivot rod 41. The latter is provided in a transversely extending bar 54 that has slots at laterally spaced intervals to guide and locate said elements 38. The said bar 54 in turn is part of a unit 55 comprising a base plate 56 which by screws 57 is attachable to studs 58 projecting rigidly downward from a mechanism supporting frame indicated at 60. The machine also includes a base frame 61 whereon the inner frame 60 is sustained.

The said operator elements 38 may be controlled in various ways to tap one at a time on the tail 42 of the related actuator engager 32. In the structure shown, the operator elements 38 which may also be termed tapping elements, are each urged downwardly by a spring 62, but a shaft 63 having transverse slots 64 in which the elements 38 lie spaced, present each normally a rear edge to prop the element 38 up, clear of the engager tail 42. Below the operator elements 38, extending transversely of the machine and guided in slots of blocks 65 are permutation bars 67. The said permutation bars have various control notches therealong and indicated at 68, so that at different combinational operations of the permutation bars 67 a particular one of said operator elements 38 becomes unobstructed by all the permutation bars. Substantially concomitantly with the effected combinational operations of the permutation bars 67, the stated shaft 63 is transitorily rocked for its slots 64 to lie horizontally as seen in Figure 3, whereby the operator element 38 which at that time is no longer obstructed by the permutation bars will be drawn down by the spring 62 to operate the engager 32. Substantially immediately thereafter the shaft 63 rocks to normal position and restores the operated element 38 to normal position, and holds then again all elements clear of the tails 42. Immediately following the permutation bars 67 restore, and are ready again to accomplish a new selection of an operator element.

The manner of control of the permutation bars 67 and the shaft 63 is not illustrated but may be by electrical impulses controlling operating magnets for the permutation bars and the shaft 63, such impulses emanating in another typewriter or being caused under control of a perforated record medium.

The blocks 65 on which the permutation bars are guided give pivotal support to the shaft 63 and are part of the unit 55. Furthermore, it will be seen that the unit 55 is readily placeable and attachable to the machine so that the operator elements 38 come to overlie the engager tails 42. The typewriter may be tested and operated without said automatic control unit 55.

Having explained the nature and objects of the invention, and having specifically described a machine embodying the invention in its preferred form,

What is claimed is:

1. In a power operated typewriting machine, the combination with a type action and a continuously rotating power member, of an actuator normally clear of said power member and engageable therewith to execute a cyclic type action operating movement ending clear of said power member, an actuator engager, the said actuator having a heel normally positioned in

a line of operation of said engager and said heel escaping said engager in the course of the cyclic actuator movement, a key, a key-operable lever, means to support said engager on said lever for actuator engaging operation of said heel, said engager, when held operated under control of said key, standing in the way of the end of the cyclic movement of the actuator, the said supporting means comprising means to lend said engager capacity for actuator engaging operation on and independently of said lever and comprising also means to lend the operated engager capacity to yield to the actuator ending its cyclic movement, said engager at release of said key reassuming its normal position, and an element to operate said engager independently of said lever.

2. In a power operated typewriting machine the combination with a continuously rotating power member, of an actuator normally clear of said power member and movable in a vertical plane into engagement therewith to execute a mechanism-operating cyclic movement ending clear of said power member, an actuator engager, the actuator having a heel normally in a line of operation of said engager and escaping it in said cyclic movement, a key, a member operable by said key to operate said engager, devices to guide said engager movably on said member key-operable for action on said heel in a direction to engage said actuator, an automatically operable element to move said engager on the said key-operable member to effect the engagement of said actuator, abutment means on said key-operable member from which said engager moves when operated by the automatically operable element, said devices comprising, means on said member to guide the engager at one general location in the said direction with capacity for pivotal movement in the plane of movement of the actuator, spring means to urge said engager to stand normally engaged with said stop means and at said heel biased in the direction of an initial cyclic movement of the actuator, and a stop face on said member whereagainst said engager is biased by said spring means, said engager if still held operated under control of said key when a cyclic movement of the actuator nears conclusion being struck by said heel and yielding pivotally from said stop face pending the release of said key.

3. In a power operated typewriting machine, the combination with a continuously operating power member and a series of normally idle power actuators that are engageable with said power member by downward movement to receive an actuating stroke, of generally upright engagers for said actuators, a depressible key lever for each engager, means to mount each engager on its key lever for downward operation thereon, abutment means on said key levers against which said engagers normally abut and from which they are operable downwardly, spring means to bias said engagers upwardly to the limit of said abutment means, said abutment means providing for operation of said engagers by said key levers, and a tapping element located below each key lever and downwardly operable, said engagers comprising each a part underlying its related tapping element for actuator engaging operation thereby, and said engagers being key lever operable without effect on the tapping elements.

4. The invention set forth in claim 3, comprising a unit structure to carry and guide said tapping elements and applicable readily to the

machine so that each tapping element overlies the related part of the engager.

5. In a power operated typewriting machine, the combination with a series of normally idle power actuators that are activatable to execute power strokes, of individual activators for said actuators arranged adjacently of each other in a row, a key operable lever for each of said activators, means to mount each activator on its related lever for actuator activating operation thereon, abutment means on said levers against which said activators are normally positioned and from which they are adapted to be operated, spring means to bias said activators normally against said abutment means, said abutments rendering said activators operable by said keys, a row of tapping elements to operate said activators independently of said keys and arranged to allow operation of said activators by said keys, and a unit structure carrying and guiding said tapping elements and readily applicable to the machine so that said tapping elements are in cooperative relation with said activators.

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