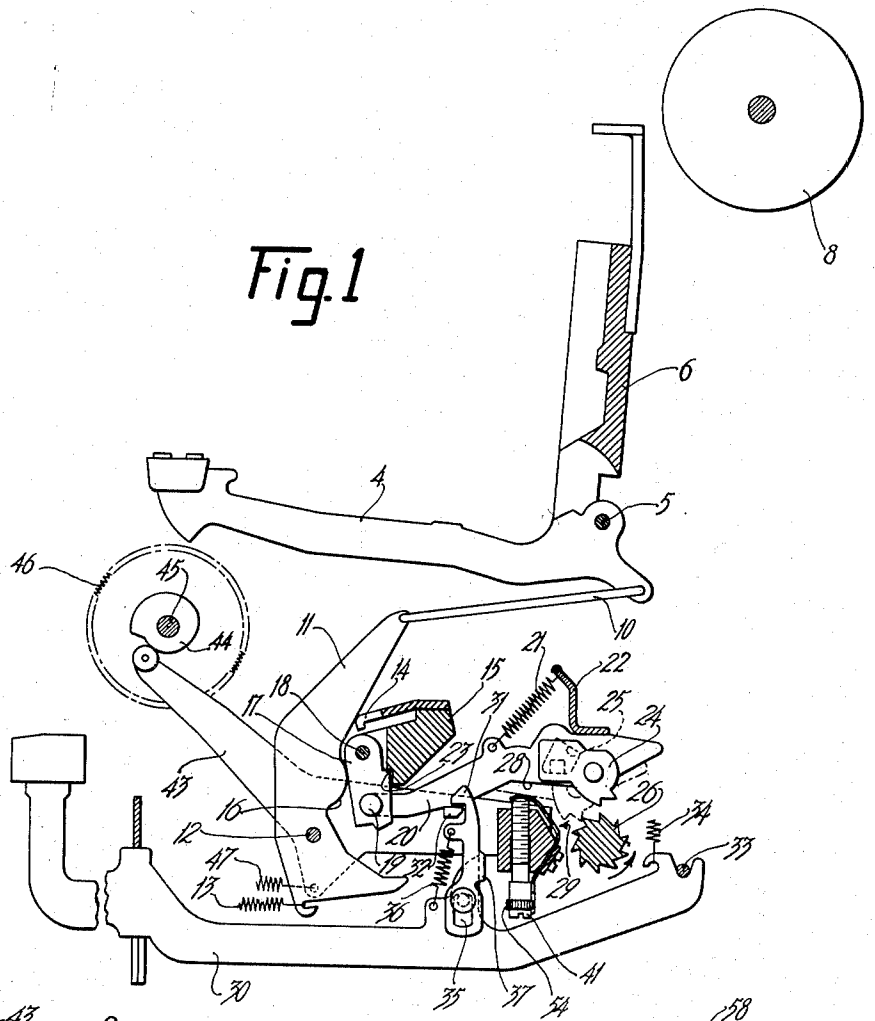
April 13, 1954 H. C. YAEGER 2,675,109

POWER-OPERATED TYPEWRITING AND LIKE MACHINES

Filed Nov. 15, 1951

Fig. 1



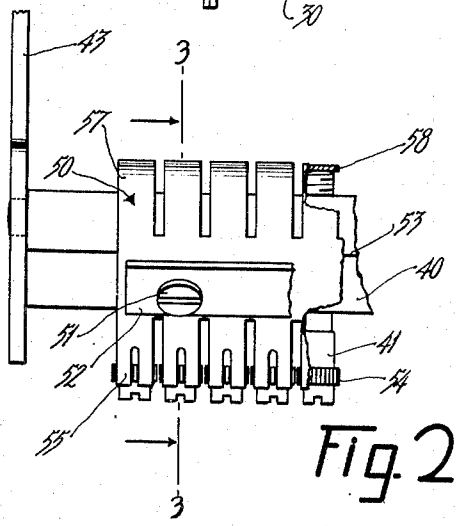


Fig. 2

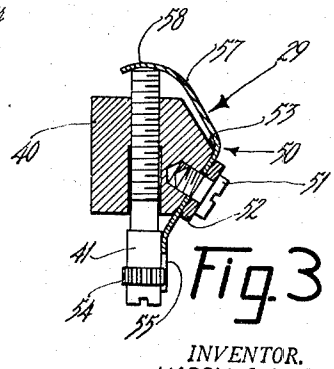


Fig. 3

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POWER-OPERATED TYPEWRITING AND LIKE MACHINES

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Application November 15, 1951, Serial No. 256,556

3 Claims. (Cl. 197—17)

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This invention relates to typewriting and like machines having power-operated means for actuating the typing and other instrumentalities.

An object of the invention is to provide an improved power-actuated mechanism of the kind wherein a driven member or actuator receives a power stroke by coaction with a rotary driving member, and the extent of said stroke is determined by the engagement of the actuator with a throw-off device which terminates the power stroke, the improvement being directed to providing a smooth, more durable and reliably operative coaction between the actuator and the throw-off device.

Another object resides in providing an improved throw-off device for power-actuated type actions and the like, which device presents a relatively broad cylindrical surface area for wiping engagement of the type action actuator therewith with a minimum of friction, during which the actuator is thrown off from its drive connection with the rotating driving roll.

In its more specific aspect the invention concerns throw-off devices of the adjustable kind presenting a row of screws each threadedly mounted to afford endwise adjustment thereof to vary the extent or duration of the actuator's power stroke. In such throw-off devices the heads or ends of the screws present a rounded or spherically convex area for engagement by the actuator and therefore afford only a point contact therewith, a further object being to provide a throw-off device of this kind having elements serving in conjunction with said screws and which present a broad line contact for the actuators, without in any way hampering the adjustability of the knock-off screws.

With the above and other objects in view, the invention will now be described with reference to the accompanying drawing wherein one embodiment which the invention may assume in practice is shown for the purposes of illustration.

In the drawing:

Figure 1 is a sectional view taken on a plane fore and aft of the typewriter embodying the invention, showing a typical power-actuated type action in its quiescent condition and showing a portion of the power-actuating means in operated condition in dot-and-dash outline,

Figure 2 is an enlarged rear elevation of an end portion of the improved throw-off device of the power-actuating means, certain of the parts being broken away to facilitate illustration, and

Figure 3 is a sectional view of the throw-off device taken on line 3—3 of Figure 2.

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The power-actuated type action system herein shown, except as to certain improvements in the throw-off device, conforms substantially to that described and claimed in the Yaeger patent, No. 2,254,764. It is to be understood that the present invention is not confined, in its application, to this particular kind of type action system, it being intended that the latter is to typify the various power type actions wherein the power stroke of the driven member or actuator link by a rotating driving member is terminated by engagement and coaction of the driven member or link with a throw-off device.

The usual type-bar 4, pivoted at 5 in a segment 6, is operated from its inactive position to strike a platen 8. For clarity only a single type-bar 4 and its actuating mechanism is shown, it being understood that the type action shown is typical of all of the type actions in the typewriter, as will be clear by reference to the Yaeger patent. A link 10 operatively connects the type-bar 4 to a sub-lever 11 pivoted at 12 on the typewriter mainframe. A spring 13 urges sub-lever 11 toward its inactive position at which it rests against a stop 14 on a transverse bar 15. The sub-lever 11 has a rounded portion 16 at which a power-actuated lever 17 makes a rolling contact with the sub-lever. Lever 17 is pivoted at 18 on the bar 15 and is flexibly connected at 19 to a driving link or power actuator 20. The actuator link 20 is urged upwardly and rearwardly by a spring 21 into its normal or inactive position. The upward position of link 20 is determined by engagement of same with an angle bar 22 and its rearward position is gaged by a shoulder 23 on lever 17 engaging the transverse bar 15. The actuator link 20 pivotally carries a snatch pawl 24 capable of limited pivotal movement thereon as determined by a pin on the pawl engaging edges of a slot 25 in the actuator link. By means later described the actuator 20 is swung downwardly about pivot 19 until the teeth of pawl 24 become engaged by the teeth on a constantly rotating toothed power driver or snatch roll 26, driven by suitable means such as an electric motor to revolve in the direction of the arrow.

Under the driving influence of the snatch roll 26, the pawl 24 swings the limited extent, during which swing the pawl edge 27 engages and coacts with the angle bar 22 to ensure full engagement of the pawl teeth with the teeth of the snatch roll and, by a leverage action, gives the actuator link 20 its initial drive. After pawl 24 has rotated its full extent, the continued driving influence of snatch roll 26 thereon moves the

actuator link 20 leftwardly, thus swinging lever 17 leftward to actuate the sub-lever 11 from its inactive position. The power-actuation of link 20, as described, continues to a point where a cam face 28 thereon comes into engagement with a throw-off device generally indicated at 29. The cam face 28, sliding along the contact point or area of the throw-off device, causes the actuator link 20 to move in a path tangential to the periphery of snatch roll 26, and the link and its pawl 24 thus arrive at the position shown in dot-and-dash outline in Figure 1. At said position the camming action of link face 28 is causing the pawl teeth to ride out of the orbit of the snatch roll teeth and thus terminate the power-drive of actuator 20. After disengagement of pawl 24 from the snatch roll, spring 21 becomes effective to raise the actuator 20 and restore same rearwardly to its inactive position, the pawl 24 meanwhile also resuming its inactive position on the actuator.

For initiating the operation of the power type action, a key lever 30 carrying a hook 31 is provided, the hook being adapted to engage over a lug 32 on the actuator link 20. Key lever 30 is pivoted at 33 and is urged by a spring 34 to its upper, inactive position. The hook 31 is mounted on key lever 30 by a pin-and-slot connection 35 and is urged by a spring 36 downwardly against the pin of said connection and forwardly about said pin. An ear 37 on hook 31 engages the rear edge of an upstanding member on key lever 30 to hold the hook upright and yet allow it to swing rearwardly.

On depressing the key lever 30 the actuator link 20 will be drawn downwardly, the spring 36 being of adequate strength to overcome the force of spring 21, and the operation of the power-actuating means will occur as above described. Although key lever 30 may be held down, only a single power stroke of the actuator link 20 will occur because the lug 32, moving rearwardly as its actuator link 20 is restored, will merely engage the upper, front face of hook 31 and cause same to yield rearwardly, thus permitting the actuator 20 to become fully restored free of the snatch roll. On release of the depressed key lever 30, hook 31 rising with the lever will latch itself over lug 32 and thus become re-engaged with the now restored actuator 20, in readiness for the next operation of the type action.

The throw-off device 29 comprises a bar 40 extending transversely of the typewriter below all of the actuators 20 and has a screw 41 for each actuator threaded therein. In power-operated typewriters of the general kind shown herein, the type bar is preferably driven only part way by power, the momentum of the type bar and connected parts completing the stroke. Adjustment of the screw 41 toward or away from the actuator will vary the extent or duration of the power stroke to thus adjust the force of impact of each type individually, as is well known in the art. For instance, by lowering the screw 41 from its position in Figure 1, the point at which the rear tooth of pawl 24 becomes disengaged from the snatch roll 26 is also lowered and moved leftward, with the result that the duration of the power stroke of the actuator 20 is increased, and the impact of the associated type will therefore be greater.

Collective position-adjustment of all of the screws 41 to afford a universal type-impression control is provided in a manner shown and described in said Yaeger patent, No. 2,254,764. At each of its ends the bar 40 is supported on an arm of a lever 43 fulcrumed at the pivot 12.

A second arm of lever 43 projects forwardly and carries a roller with which a cam or eccentric 44 coacts, there being a cam for the lever 43 at each side of the typewriter. The two cams 44 are connected for rotation in unison by a shaft 45 on which a dial wheel 46 is secured.

The weight of the bar 40, augmented by a spring 47 biasing each lever 43, urges the bar downward and presses the rollers on the two levers 43 against the cams. Rotation of the dial wheel 46 in appropriate direction will raise or lower the bar 40, as will be readily apparent, to effect a universal adjustment of all the power actions collectively.

The improvements in the throw-off device 29 of the invention will now be described. An elongate sheet metal strip 50, preferably having the cross-sectional shape shown in Figure 3, is attached to a rearward face of bar 40. The strip 50 is preferably made of leaf-spring stock such as Phosphor bronze or hardened steel, the bronze being more suitable because of its lesser frictional character in coaction with steel or iron material of which the actuator 20 is usually made. Spaced screws 51 threaded into the bar 40, secure the strip 50 thereto along a medial longitudinal area of the strip, the strip 50 being reinforced for stiffness at this medial area by a narrow bar 52. The rearward face of the bar 40 presents a longitudinal ridge 53 formed of upper and lower faces inclined from each other, to the lower one of which the strip 50 is fastened.

As above described, the screw 41 is threadedly adjusted to vary the power stroke of the actuator 20. To secure this adjustment the head of screw 41 has an integral collar 54, the periphery of which is straight-knurled or otherwise serrated to form a toothed band. The portion of the strip 50 below the medial area is slotted at alternately shallow and greater depths, as shown clearly in Figure 2, to form a row of forklike lugs 55, one for each screw 41. The shorter slot which divides the lug into two tines is of a width to snugly receive one of the teeth of collar 54 therein in such manner as to hold the screw 41 against accidental turning and yet permit intended adjustment of the screw, during which the tines of lug 55 ratchet on the collar teeth 54.

The ridged formation of the rear wall of bar 40, with the strip 50 secured only to the lower inclined face, affords an arrangement in which a substantial upper portion of the strip 50 extends from the top of the ridge clear of the upper face and is therefore free to flex independently of the bar 40. As shown in Figure 2 this upper portion of strip 50 is slotted at such intervals as to form a prong 57 or spring finger for each screw 41. As shown in Figure 3 each prong 57 extends upwardly and forwardly and includes a curved end portion 58 presenting an outer cylindrical contour. Each prong 57 has an inherent tension which causes it to constantly bear against the upper rounded end of screw 41, regardless of the adjusted position of the screw.

In throw-off devices of known power-actuated type actions heretofore in use, the actuator link, such as that at 20, directly engaged the upper end of a throw-off element such as screw 41 which, to assure a smooth surface for engagement by the actuator, was rounded or convex. Such surfaces, however, afforded only a point

contact by the actuator and were therefore susceptible to abnormal wear. Further, when the actuator was disposed even slightly to either side of its normal location central with the screw, only an edge corner of the cam face 28 would engage the throw-off screw, thus causing undue friction and abnormal wear, and requiring frequent servicing. The provision of the strip 50, with the series of prongs 57 which overlie the contact ends of the throw-off screws 41, obviates these difficulties by providing a substantially broad cylindrical contact face 58 with which the cam face 28 of the actuator engages. Considering the rapid and sharp impact by which the actuator coacts with the throw-off device 29, it will be apparent that the provision of the smooth, broad curvilinear area for engagement by the actuator will assure uninterrupted performance of the mechanism over a substantial period. In this regard it may also be noted that the strip 50, being fabricated of formed sheet metal, lends itself readily to fabrication of an anti-frictional yet durable metal such as spring bronze, particularly in coaction with steel or iron parts. Further, the described association of the leaf-spring prong 57 with an endwise-adjustable member such as the screw 41 has the advantage of changing the line of contact, at which the actuator 20 engages the cylindrical face 58, incidental to a change in the adjusted position of said member or screw 41. That is, as screw 41 is adjusted upward, for instance, a contact line nearer the end of prong 57 will become effective.

Having thus described the invention, what is claimed is:

1. In a power-operated typewriter having a series of actuators, a power roller for imparting a power stroke to the actuators, and a throw-off device including an elongate bar, a series of throw-off members supported transversely of said bar and having their corresponding ends projecting therefrom for cooperation with the respective actuators to terminate the power stroke, said throw-off members being endwise adjustable on the supporting bar to vary the extent of the power stroke, a series of spring prongs each secured at one end to said bar and extending therefrom to project beyond and overlie the actuator-cooperative end of the corresponding said throw-off member and tensioned to press against said end, the member-overlying end portion of each prong being curved so as to present an outer cylindrical contour for engagement by the actuator, the length of the curved

portion being such as to afford a cylindrical contact area for the actuator for any adjusted position of the throw-off member over the full range of its endwise adjustment.

2. In a power-operated typewriter having a series of actuators, a power roller for imparting a power stroke to the actuators, and a throw-off device engageable by the actuators to terminate the power stroke, said throw-off device comprising an elongate bar extending along the series of actuators, a row of throw-off screws each threadedly mounted in said bar to afford endwise adjustment of said screws for varying the extent of the power stroke, said screws each extending from edge to edge of said bar, a side of said bar providing a lengthwise face inclined transversely to diverge from the axes of said screws, and an elongate sheet-metal strip coextensive with said bar and secured against the inclined side face thereof, said strip having transverse slots at intervals to form prongs, one for each of said screws, said prongs overhanging substantially from the edge of said inclined face and being directed to extend over and press against the corresponding ends of said screws to each present a broad area for engagement by the respective actuators.

3. In a power-operated typewriter having a series of actuators, a power roller for imparting a power stroke to the actuators, and a throw-off device engageable by the actuators to terminate the power stroke, said throw-off device comprising an elongate bar, a series of throw-off screws threadedly mounted in said bar to afford endwise adjustment of said screws for varying the extent of the power stroke, and an elongate sheet-metal strip secured to and coextensive with said bar and including a series of prongs projecting transversely of said strip to lie across one end of said screws and thus present a broad generally flat area for engagement by the respective actuators, said screws each having a toothed band adjacent the other end of each screw, said sheet-metal strip also including a series of spring lugs, one for each of said screws, and each bearing against the toothed band of the respective screws for detenting each screw in adjusted position.

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