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2,818,151

POWER OPERATED TYPEWRITING AND LIKE MACHINES

Filed Nov. 17, 1954

2 Sheets-Sheet 1

Fig. 1

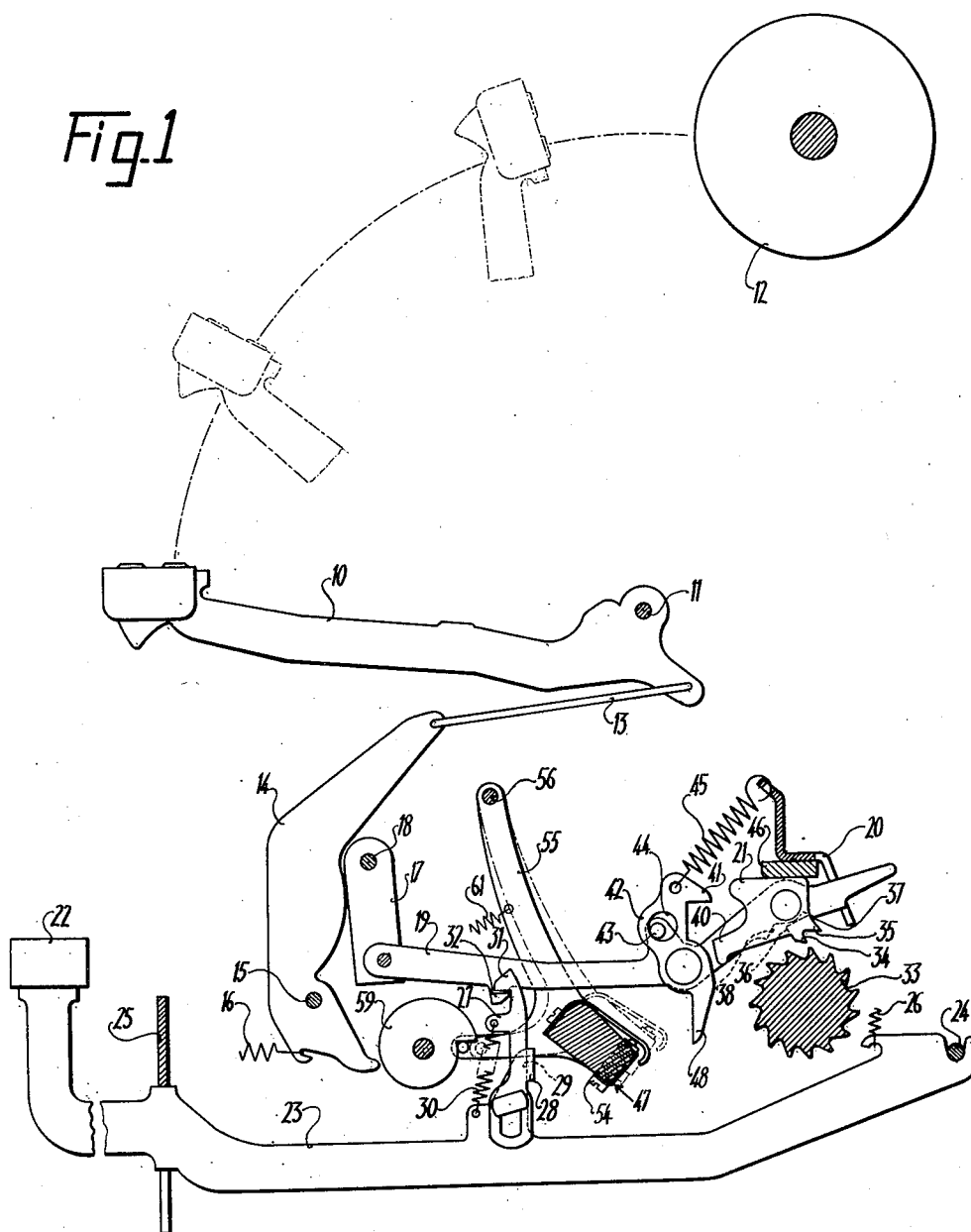
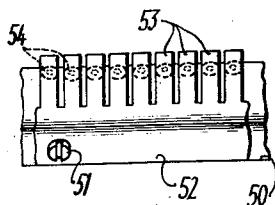


Fig. 2



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Fig. 4

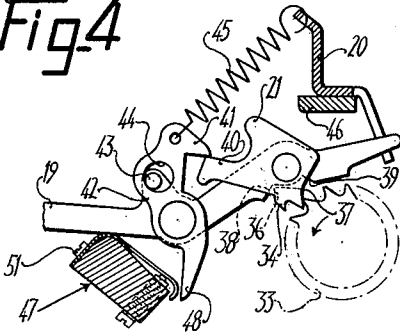


Fig. 3

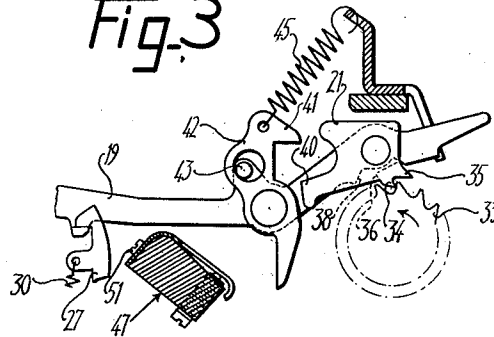


Fig. 6

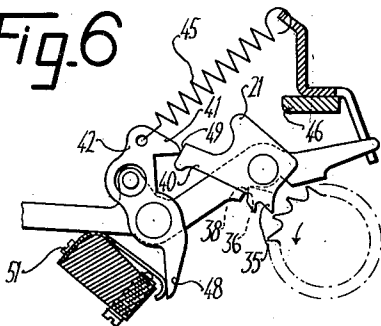


Fig. 5

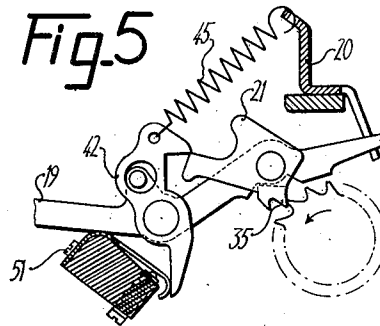
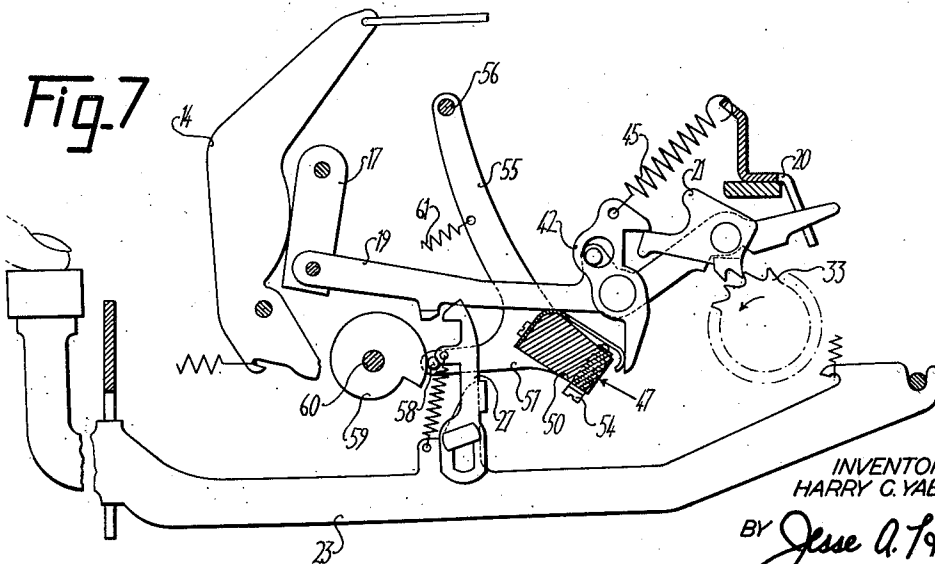


Fig. 7



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POWER OPERATED TYPEWRITING AND LIKE MACHINES

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8 Claims. (Cl. 197—17)

The present invention relates to power driven business machines, especially typewriting machines and in its more particular aspects relates to means for accurately controlling the printing impressions of the type of a power driven typewriter.

In typewriting machines it is well known to manually move an actuator into engagement with a rotating power shaft so that the shaft may drive the actuator a preselected distance to power operate a type bar or other instrumentality and to provide some means for disconnecting said actuator from said shaft after the type bar or other instrumentality has been actuated.

It is an object of this invention to provide an improved means for disconnecting an actuator from a rotating power shaft, whereby the disconnection may be accurately timed, will be quiet and will be brought about without the usual forcing apart of the members and the consequent shock and strain imposed thereby.

Other objects, features and advantages of the invention will become more readily apparent as the description of a preferred embodiment thereof proceeds.

Referring now to the drawings:

Figure 1 is a view partly in side elevation and partly in cross section of a type action of a power driven typewriter and showing the improved disconnect means of the present invention.

Figure 2 is a plan view of an improved kick-off bar showing the means for individually timing the kicking off of the individual type bar actuators.

Figure 3 is a view partly in side elevation and partly in cross section of a portion of the type bar actuator and associated mechanism, showing the parts at the moment when the actuator has been moved into engagement with the rotating power shaft.

Figure 4 is a view similar to Figure 3, showing the position of the parts after the actuator has been driven nearly to its full extent.

Figure 5 is a view similar to Figures 3 and 4 and showing the position of the parts at the moment of disengagement of the actuator from the power shaft.

Figure 6 is a view similar to Figures 3, 4 and 5 and showing the parts immediately after the actuator has become fully disengaged from the power shaft and before the actuator has been restored to its normal position, and

Figure 7 is a partial side elevational view of the mechanism showing an adjustment for obtaining light typing impressions and showing the actuator in engagement with the rotating power shaft.

The power actuated type action system shown in the drawing is more fully shown and described in the Yaeger Patent No. 2,254,764 and comprises a type bar 10 pivotally mounted upon a segmental shaft 11 and adapted to be swung from the full line position shown in Figure 1 into engagement with the usual roller platen 12. The type bar is connected by a link 13 to one end of a sub-lever 14 which sub-lever is pivotally mounted upon a shaft 15 and urged to its normal position shown in Figure 1 by a spring 16, where it is arrested by a suitable stop, not

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shown. A lever 17 is pivotally mounted upon a cross shaft 18 and has pivotally connected thereto one end of an actuator 19 the opposite end of which is slidably guided in a comb guide 20. The lever 17 is in abutment with an edge of the sub-lever 14 so that when the actuator 19 is moved to the left as viewed in Figure 1 the lever 17 will rock the sub-lever 14 and swing the type bar into engagement with the platen. A clutching element which may be in the form of a toothed pawl 21 is mounted upon the actuator 19 for limited pivotal movement, as will presently be more fully explained.

A type key 22 is carried by a key lever 23, the rear end of which is pivotally mounted upon a cross shaft 24 and the front end of which is guided in a suitable comb guide 25. The key lever is normally held in the position shown in Figure 1 by means of a spring 26. A member 27 is pivotally mounted upon the key lever 23 and is provided with a tab 28 which engages a stop 29 provided on the key lever; said member being normally maintained in the position shown in the drawing by means of a spring 30. The upper end of the member 27 is provided with a hook portion 31 normally overlying a lug 32 provided upon the actuator 19. Depression of the key 22 causes the member 27 to rock the actuator 19 downwardly about its pivotal connection with the lever 17 to bring the clutching element or toothed pawl 21 into engagement with a rotating power shaft or toothed roller 33, as is well known.

One of the novel features of this invention is the construction and mounting of the pawl 21 upon the actuator 19. The clutching element or pawl is provided with a pair of teeth 34 and 35 and that portion of said pawl wherein the teeth are cut is considerably thicker than the rest of the pawl. The thickened portion of the pawl is cut to provide a pair of shoulders 36 and 37 which lie within a cutaway portion of the actuator and limit the pivotal movement of said pawl by engagement with stop surfaces 38 and 39 respectively of said actuator.

To further limit the pivotal movement of the pawl 21 at certain times, said pawl is provided with a tail portion 40 for engagement with a nose 41 of a latch member 42 pivotally mounted upon the actuator. Pivotal movement of the latch member 42 is limited by means of a pin 43 secured to the actuator and extending through an enlarged opening 44 provided in said latch member. A spring 45 extends between the latch member and comb member 20 and normally holds the actuator in the position shown in Figure 1 with the top surface of the pawl resting against a stop bar 46 and the teeth thereof out of engagement with the teeth of the shaft 33.

Referring now particularly to Figures 3 and 4, it will be observed that when the key is depressed to swing the actuator down about its pivotal connection with the lever 17, the tooth 34 of the pawl 21 comes first into engagement with the teeth of the shaft 33 whereupon continued rotation of said shaft rotates said pawl in a clockwise direction to bring the tooth 35 thereof into engagement with the teeth of said shaft. After the pawl has rotated sufficiently to engage its tooth 35 with the shaft 33, the tail portion 40 thereof engages beneath the nose 41 of the latch member 42, as shown in Figure 4, to limit the rotary movement of said pawl and thereby cause the rotating shaft to drive the pawl and the actuator as a unit toward the left to operate the type bar as aforesaid. In Figure 4, it will be observed that at this time rotation of the pawl 21 in a clockwise direction is limited entirely by the engagement of the tail portion 40 thereof beneath the nose 41 of the latch member; the pawl not having rotated sufficiently to bring the shoulder 36 into engagement with the stop surface 38. The pawl 21 and latch member 42 could of course be so constructed and arranged that no initial rotation of the

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pawl would be permitted but the construction illustrated provides a more positive engagement of the pawl with the power shaft and permits the actuator to be started on its power stroke more gently and without shock.

Extending crosswise of the machine beneath the actuators is a kick-off bar generally designated 47, the particular construction and arrangement of which will presently be more particularly described. The latch member 42 is provided with a downwardly extending tail portion 48 and as the actuator moves toward the left far enough to drive the type bar part way to the platen the tail portion 48 contacts the kick-off bar to thereby rock the latch member in a counter-clockwise direction and remove the nose 41 thereof from latching engagement with the pawl 21. Removal of the nose 41 from the tail portion 40 of the pawl 21 permits said pawl to rotate sufficiently further in a clockwise direction to disengage the tooth 35 thereof from the teeth of the rotating power shaft 33, said disengagement being accomplished smoothly and without shock or noise.

In Figure 4, it may be seen that before the tail portion 48 of the latch member engages the kick-off bar 47, the lower edge of the actuator 19 has come into contact with an edge of said kick-off bar, so that at the time the tail portion 48 strikes said kick-off bar the actuator is travelling horizontally. Under these circumstances, the clutching element or pawl 21 would eventually disengage itself from the toothed roller 33 but by varying the position of the kick-off bar, in a manner presently to be explained, the length of time that said clutching element stays in engagement with the roller may be accurately controlled. As will readily be appreciated, the length of time that the clutching element is in engagement with the roller determines the distance that the actuator will be driven and consequently determines the force with which the type will strike the platen; it being understood that the speed of rotation of the roller is constant.

Figure 5 shows the position of the parts just as the tooth 35 is becoming freed from the latch member 42 and Figure 6 shows the pawl rotated to its fullest clockwise extent with the shoulder 36 thereof in engagement with the stop portion 38 of the actuator and the teeth thereof completely disengaged from the teeth of the shaft 33. It will be observed that with the parts in Figure 6 position the end of the nose 41 rests upon a flattened end 49 of the tail portion 40. After disengagement of the pawl from the shaft 33, the spring 45 moves the parts back to the position shown in Figure 1 and during this movement the upper edge of the pawl 21 strikes the stop bar 46 to rotate said pawl in a counterclockwise direction and free the latch member for restoration to its normal position.

The kick-off bar 47 comprises an elongated rectangular member 50 secured to which as by means of screws 51 is a thin metal plate 52 preferably of bronze or a similar wear-resistant material. As best seen in Figure 2, the plate 52 is slotted to provide a plurality of resilient fingers 53, there being a separate finger for each actuator 19. An adjustment screw 54 is provided for each of the fingers 53 and by turning said screws the individual fingers may be moved slightly toward or away from the rectangular member 50 to thereby vary the point at which the tails 48 of the various individual latch members 42 will come in contact with the kick-off bar. By thus varying the points at which the different latch members contact the kick-off bar, the force of the impressions of the individual types may be regulated so that an "M," for example, will print with the same degree of typing impression as, for example, a period. During typing operations the lower edges of the actuators slide on a smoothly curved portion of the plate 52, as may be observed in the drawings.

Secured to the opposite ends of the members 50 are arms 55, only one of which is shown. Each arm 55 is pivotally mounted on a side frame plate of the machine

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as at 56 and is provided with a generally horizontally extending portion 57 carrying a pin 58, which pin rests against the periphery of a spiral cam 59 secured to a rotatably mounted cross shaft 60. The pins 58 are held in engagement with the cams 59 by means of springs 61 extending between the arms 55 and the side plates of the machine. Any suitable means may be provided for manually adjusting the rotative position of the cross shaft 60; for example, one end of said shaft may be extended through the side plate of the machine and be provided with a knob located outside of the machine casing. While a particular means for adjusting the position of the kick-off bar has been shown, such means is not of the essence of the present invention. Any suitable arrangement for permitting adjustment of the kick-off bar toward and away from the toothed roller 33 may be employed without departing from the present invention.

Figure 1 shows the position of the cams 59 and kick-off bar 47 which permits of the greatest travel of the actuators 19 and consequently of the heaviest type impressions. Figure 7 shows the adjustment for obtaining the lightest typing impressions.

Having thus described a preferred embodiment of the invention, what is claimed is:

1. In a machine of the class described, an instrumentality to be power operated, an actuator for said instrumentality, a power shaft, a clutching element pivoted on said actuator, means for moving said actuator to engage said clutching element with said shaft, a latch member mounted on said actuator for cooperation with said clutching element, said latch member normally preventing full pivotal movement of said clutching element and consequently causing said clutching element and said actuator to be moved as a unit by said power shaft, and means operable upon said latch member for causing said latch member to release said clutching element and permit pivotal movement thereof to disengage said clutching element from said power shaft.

2. In a machine of the class described, an instrumentality to be power operated, an actuator for said instrumentality, a toothed power shaft, a toothed pawl pivoted on said actuator, means for moving said actuator to engage said toothed pawl with said power shaft, a latch member mounted on said actuator, said latch member normally preventing full pivotal movement of said pawl and consequently causing said pawl and said actuator to be moved as a unit by said shaft, and means operable upon said latch member to cause said latch member to release said pawl and permit rotation of said pawl to disengage the teeth thereof from the teeth of said power shaft.

3. In a machine of the class described, an instrumentality to be power operated, an actuator for said instrumentality, a toothed power shaft, a toothed pawl pivoted on said actuator, means for moving said actuator to engage said toothed pawl with said power shaft, a latch member pivotally mounted on said actuator, said latch member permitting a limited rotation of said pawl when the teeth thereof first engage said shaft, said latch member subsequently preventing further rotation of said pawl and consequently causing said pawl and said actuator to be moved as a unit by said shaft, and means for rotating said latch member to a position to release said pawl and permit further rotation of said pawl to disengage the teeth thereof from the teeth of said shaft.

4. In a machine of the class described, an instrumentality to be power operated, an actuator for said instrumentality, a power shaft, a clutching element pivoted on said actuator, means for moving said actuator to engage said clutching element with said power shaft, a latch member mounted on said actuator, said latch member permitting a limited rotation of said clutching element when said clutching element first engages said power shaft, said latch member subsequently preventing further rotation

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of said clutching element and consequently causing said clutching element and said actuator to be driven as a unit by said power shaft, kick-off means, and means on said latch member engageable with said kick-off means during the driven movement of said actuator to release said latch member from latching engagement with said clutching element and thereby permit further rotation of said clutching element to disengage said clutching element from said power shaft.

5. In a machine of the class described, an instrumentality to be power operated, an actuator for said instrumentality, a power shaft, a clutching element pivoted on said actuator, means for moving said actuator to engage said clutching element with said power shaft, a latch member pivoted on said actuator, said latch member normally preventing full pivotal movement of said clutching element and consequently causing said clutching element and said actuator to be power operated as a unit by said power shaft, kick-off means, means on said latch member engageable with said kick-off means during the power operation of said actuator to release said latch member from latching engagement with said clutching element and permit rotation of said clutching element to disengage said clutching element from said power shaft, and means for relatively adjusting said kick-off means and said latch member to change the point of engagement of said latch member and said kick-off means.

6. In a machine of the class described, an instrumentality to be power operated, an actuator for said instrumentality, a power shaft, a clutching element pivoted on said actuator, means for moving said actuator to engage said clutching element with said power shaft, a latch member pivoted on said actuator, said latch member permitting a limited rotation of said clutching element when said clutching element first engages said power shaft, said latch member subsequently preventing further rotation of said clutching element and consequently causing said clutching element and said actuator to be moved as a unit by said power shaft, kick-off means, means on said latch member engageable with said kick-off means during movement of said actuator to release said latch member from latching engagement with said clutching element and permit further rotation of said clutching element to disengage said clutching element from said power shaft, and means for relatively adjusting said kick-off means and

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said latch member to change the point of engagement of said latch member and said kick-off means.

7. In a machine of the class described, an instrumentality to be power operated, an actuator for said instrumentality, a power shaft, a clutching element pivoted on said actuator, means for moving said actuator to engage said clutching element with said power shaft, a latch member pivoted on said actuator, said latch member normally preventing full pivotal movement of said clutching element and consequently causing said clutching element and said actuator to be moved as a unit by said power shaft, kick-off means, means on said latch member engageable with said kick-off means during movement of said actuator to release said latch member from latching engagement with said clutching element and permit rotation of said clutching element to disengage said clutching element from said power shaft, and means for adjusting said kick-off means toward and away from said power shaft to vary the point of engagement of said latch member with said kick-off means.

8. In a machine of the class described, an instrumentality to be power operated, an actuator for said instrumentality, a power shaft, a clutching element pivoted on said actuator, means for moving said actuator to engage said clutching element with said power shaft, a latch member pivoted on said actuator, said latch member permitting a limited rotation of said clutching element when said clutching element first engages said power shaft, said latch member subsequently preventing further rotation of said clutching element and consequently causing said clutching element and said actuator to be moved as a unit by said power shaft, kick-off means, means on said latch member engageable with said kick-off means during movement of said actuator to release said latch member from latching engagement with said clutching element and permit further rotation of said clutching element to disengage said clutching element from said power shaft, and means for adjusting said kick-off means toward and away from said power shaft to vary the point of engagement of said latch member with said kick-off means.

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