March 16, 1937. C. J. FITCH 2,074,051

KEYBOARD CONTROL MECHANISM

Filed March 23, 1935

FIG.1.

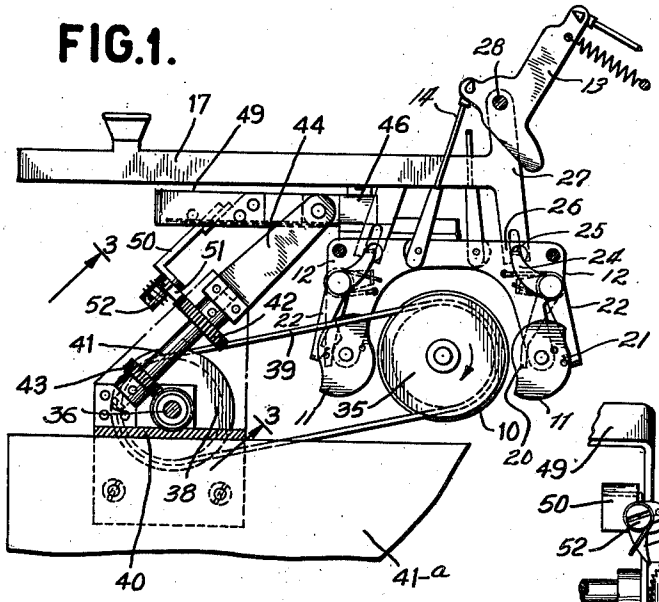


FIG.3.

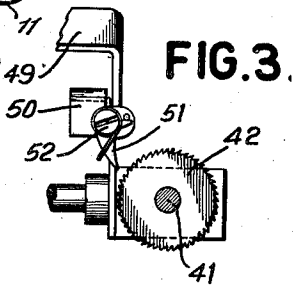
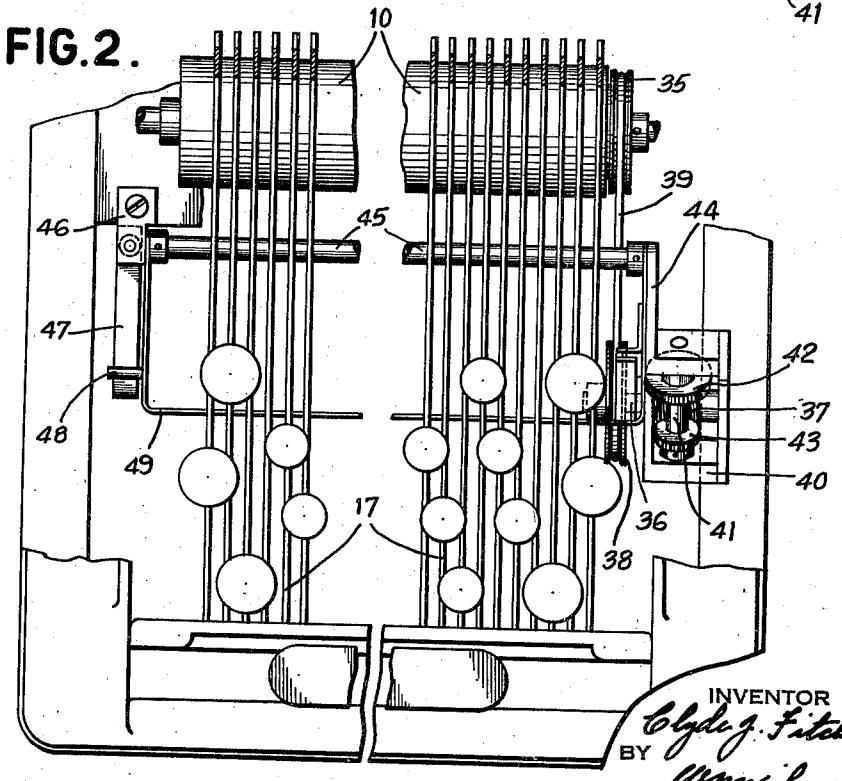


FIG.2.



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KEYBOARD CONTROL MECHANISM

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8 Claims. (Cl. 197—17)

This invention relates to improvements in keyboard control mechanisms and particularly to mechanisms adapted to control the rate of operation of the keyboard and is especially adaptable to power driven mechanisms such as typewriters of the type comprising a power driven roller for actuating the printing instrumentalities.

One of the objects of the present invention is to provide means governing the keyboard operation at various predetermined rates.

Another object of the present invention is the provision for limiting the rate of speed of depressing the key bars so as to conform with the selected predetermined rate.

Still another object of the present invention is to provide for locking of the keyboard when the device is in an inoperative condition.

Still another object of the present invention is to provide means to prevent the action of the keyboard to increase the selected predetermined rate of speed of the keyboard regulating means.

The stated objectives of the invention are accomplished by providing a transverse bail adapted to be engaged by each key bar upon its depression and in addition thereto to be depressed by further depression of the key bars. A pawl arrangement is associated with the bail, so that upon the depression of the bail, the pawl engages a continuously rotating ratchet wheel. The ratchet wheel may be rotated at various speeds in accordance with the desired rate of operation of the keyboard.

Therefore, upon depressing the different keys at a rate exceeding the fixed speed of the ratchet wheel, the pawl engages the face of the teeth, retarding the complete depression of the keys until the teeth of the ratchet wheel have been advanced to permit the pawl to travel its full stroke. In this manner the device tends to regulate the operation of the keyboard to conform to the rate of speed for which it is adjusted. In addition thereto, it also tends to promote rhythmic operation of the keyboard in contra-distinction to irregular and spasmodic operation thereof.

A worm drive is provided for the said ratchet wheel so that when the mechanism is set for a predetermined rate of speed, it is impossible to force the ratchet wheel to rotate faster than its predetermined speed by exerting extremely hard pressure on the keys.

A further feature of the invention is that the transverse bail acts as a keyboard lock when the drive mechanism and ratchet wheel are at rest, in this manner preventing the depression of the individual key bars when the mechanism is in an inoperative condition.

Various other objects and advantages of the invention will be obvious from the following particular description of one form of mechanism embodying the invention or from an inspection of the accompanying drawing; and the invention also constitutes certain new and useful features of construction and combination of parts hereinafter set forth and claimed.

In the drawing:

Fig. 1 shows a sectional elevation of one form of mechanism embodying the present invention.

Fig. 2 shows a plan view of the control mechanism.

Fig. 3 shows a detail of the pawl and ratchet arrangement, and is a sectional view along line 3—3 of Fig. 1.

This invention can be embodied in a considerable variety of constructions, and of these one has been selected for specific description and illustration herein, the one which at the present time is believed to exhibit the invention in its most convenient and effective form. The construction referred to is one form of a well-known recording unit and described in a copending application, Serial No. 677,018, filed June 22, 1933.

Referring now to the drawing in which similar parts are designated by the same numerals in the several views, it is believed that a clear understanding of the invention will be had therefrom when considered in conjunction with the following description.

As mentioned before for illustrative purposes, this invention is shown embodied in a power driven typewriter of the type disclosed in the aforesaid application, the construction of which is well known to those in the art, and hence requires only the following brief description.

Transmitting unit

Referring to the drawing, and in particular to Fig. 1, in the embodiment illustrated in the drawing, well known means are provided for actuating the type bars (not shown) by power operated devices comprising a power driven roller 10.

A cam 11 is pivoted on one arm of a bell crank lever 12 pivoted in the frame, the other arm of which is operatively connected with one arm of a bell crank lever 13 by means of link 14. The other arm of lever 13 is connected to the type bars (not shown) in a well known manner and fully disclosed in the aforesaid application.

The lever 12 is actuated by the cam 11 when the latter engages the driven roller 10 to be oper-

ated thereby. The engagement of the cam 11 with the power roller is controlled by means of the key lever 17 in a manner which will now be described.

The cam 11 is resiliently engaged by a spring-pressed arm 20 which tends to turn it into engagement with the power driven roller or stop 21 on a lever 22 pivoted on the bell crank 12 and normally arranged in the path of a lug on the cam. When the lever 22 swings to move its stop out of the path of the lug, the arm 20 swings the cam into engagement with the power roller to be actuated thereby to swing the bell crank 12 to actuate its connected mechanism.

The lever 22 has an arm 24 which is provided with an offset projection 25 at its end which projects laterally through an opening in the bell crank 12 and engages the bifurcated lower end 26 of an arm 27 of a key lever 17 pivoted on the common rod 28.

It is obvious then that depression of a key lever 17 releases the revolubly mounted cam 11 to engage and be actuated by power roller 10 in turn operating bell crank 12 and its attached links to cause the associated mechanism, such as the key bars and other operating mechanisms, to be operated.

It will be understood that the usual number of key bars and power devices with their associated mechanisms are provided, but only one of them is shown for the sake of clearness.

A driving pulley 35 attached to power driven roller 10 rotates the shaft 36 and attached worm gear 37 at a constant speed by means of the driven pulley 38 fixed on shaft 36 and a suitable connecting belt 39. A suitable member 40 fastened to the frame 41*a* of the typewriter, in addition to supporting the shaft 36 supports shaft 41 with its attached ratchet wheel 42 and worm gear 43. An extension arm 44 of the frame 40 supports one end of shaft 45, the other end of which is suitably supported by a member 46 fastened to the frame of the typewriter. Fixed to the said member 46 is a spring blade 47 adapted to engage a pin 48 protruding from a bail member 49. The bail member fixed to shaft 45 is disposed beneath the key bars 17 of the typewriter in such a manner that any depressed key bar 17 engages the bail 49 to depress the said bail against the action of spring blade 47, which restores the bail to its normal position upon release of the key bar. A pawl supporting member 50, suitably fixed to the bail 49 and extending therefrom, retains a spring-pressed pawl 51 pivoted on stud 52. It is evident from this description that upon depression of the bail member 49 caused by the depression of a key bar 17, the pawl 51 is adapted to engage the teeth of ratchet wheel 42. The speed of rotation of the said ratchet wheel is controlled by the driven power roller 10 the speed of which may be adjusted to any desired rate.

Therefore, it is seen, that the ratchet wheel 42 is rotated at a predetermined rate of speed and let it be assumed that this rate permits the different key bars 17 to be depressed at an even rate equivalent to 60 five-character words per minute; i. e., the teeth of ratchet wheel 42 are advanced beyond the established point or axis of contact by pawl 51, so as to permit the bail 49 and member 50 to be lowered or depressed 300 times per minute so that the retained spring-pressed pawl 51 travels its full stroke upon the depression of each key bar. In the event that the key bars are depressed at a faster rate or at an uneven rate, the depressed pawl tends to engage the faces of the teeth of the ratchet wheel and in this manner opposes further depression of the key bars at that exact moment. As the teeth of the ratchet wheel are advanced the pawl can freely be depressed the full depth of its stroke in turn permitting the key bars to be fully depressed with ease.

In this manner the keyboard action can be controlled to regulate the speed of operation thereof. When operated at the predetermined rate, or less than the predetermined rate, corresponding to the selected speed of the ratchet wheel and at an even and rhythmic rate, the keyboard is free acting and any opposition to the depression of the key bars is not present, however, any operation of the key bars faster than the predetermined rate selected will cause the action of the keyboard not to be free acting in the sense that the action of the key bars will be quite firm in resisting the depression thereof.

It was mentioned hereinbefore that this device is not limited in its application to power driven key operated mechanisms, and it is obvious that it may be applied to any form of key operated device. In the event that the device is applied to non-power operated mechanisms the shaft 36 can be rotated by an individual motor or suitable power source.

It was also mentioned hereinbefore that a worm drive 37, 43 is provided to rotate the ratchet wheel 42. The provision of this type of drive prevents the ratchet wheel from being driven by the pawl mechanism 51 at a speed faster than the predetermined rate of speed selected for the ratchet wheel, by means of exerting extremely hard pressure on the individual key bars.

Furthermore, the device just described acts as a keyboard lock, that is, preventing the depression of the individual key bars, when the ratchet wheel 42 is in an inoperative or non-rotating condition. With the mechanism at rest, the pawl mechanism 51 cannot travel the full length of its stroke, since it is necessary for the ratchet teeth to be advanced to permit this action, and therefore the bail member 49 is prevented from being depressed, in turn rendering the keyboard inoperative or in a locked condition when the ratchet wheel is at rest.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is as follows:

1. A keyboard controlling mechanism comprising a cyclically operated member adapted to be operated at a selected predetermined rate of speed, a plurality of operable key bars, and a common means associated with the said key bars and controlled by the said member to regulate the rate of operation of the said key bars in accordance with the selected rate of operation of the said member.

2. A keyboard controlling mechanism comprising a constantly rotating device adapted to be rotated at selective rates of speed, a plurality of operable key bars, and a common means jointly controlled by the key bars and the rotary device to regulate the rate of operation of the said key

bars in accordance with the selected rate of operation of the said device.

3. A keyboard controlling mechanism comprising a rotating ratchet wheel adapted to be operated at a selected predetermined speed, a plurality of operable key bars, and a common pawl mechanism operated by the operation of any one of the said key bars so as to engage the said ratchet wheel to regulate the rate of operation of the said key bars in accordance with the selected speed of the ratchet wheel.

4. A keyboard controlling mechanism comprising a rotary member adapted to be operated at a selected predetermined speed, a plurality of operable key bars, a common means associated with the said key bars adapted to be operated upon the depression of any one of the key bars, and a mechanism adapted to cooperate with the said rotary member controlled by the said means upon operation of the selected key bars, to regulate the rate of operation of the selected key bars in accordance with the selected speed of the rotary member.

5. In a typewriting machine, the combination of printing instrumentalities, power driven means for actuating said instrumentalities, keys for controlling the operation of said printing instrumentalities, a cyclically operated member responsive to said power driven means and adapted to be operated at a selected predetermined rate of speed, means associated with the said keys and controlled by said member to regulate the rate of operation of the said keys in accordance with the selected rate of operation of the said member.

6. A keyboard controlling mechanism comprising a member adapted to be operated at a predetermined speed, means to operate said member, a plurality of operable key bars, common means controlled by the operation of any one of the said key bars and controlled by the said member to regulate the rate of operation of the said key bars in accordance with the speed of operation of the said member, said common means associated with the said member so as to prevent the operation of any one of the said key bars when the said member is not operated.

7. A keyboard controlling mechanism comprising a cyclically operated member adapted to be operated at a predetermined rate of speed, a plurality of operable key bars, a transverse bail associated with the said key bars and arranged to be operated upon the operation of a key bar, and means controlled by the said bail and member to regulate the rate of operation of the said key bars in accordance with the rate of operation of the said member.

8. A keyboard controlling mechanism comprising a cyclically operated member adapted to be operated at a predetermined rate of speed, a plurality of operable key bars, a transverse bail associated with the said key bars and arranged to be responsive to the operation of the said key bars, and a pawl mechanism controlled by said bail and member to regulate the rate of operation of the said key bars in accordance with the rate of operation of the said member.

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