

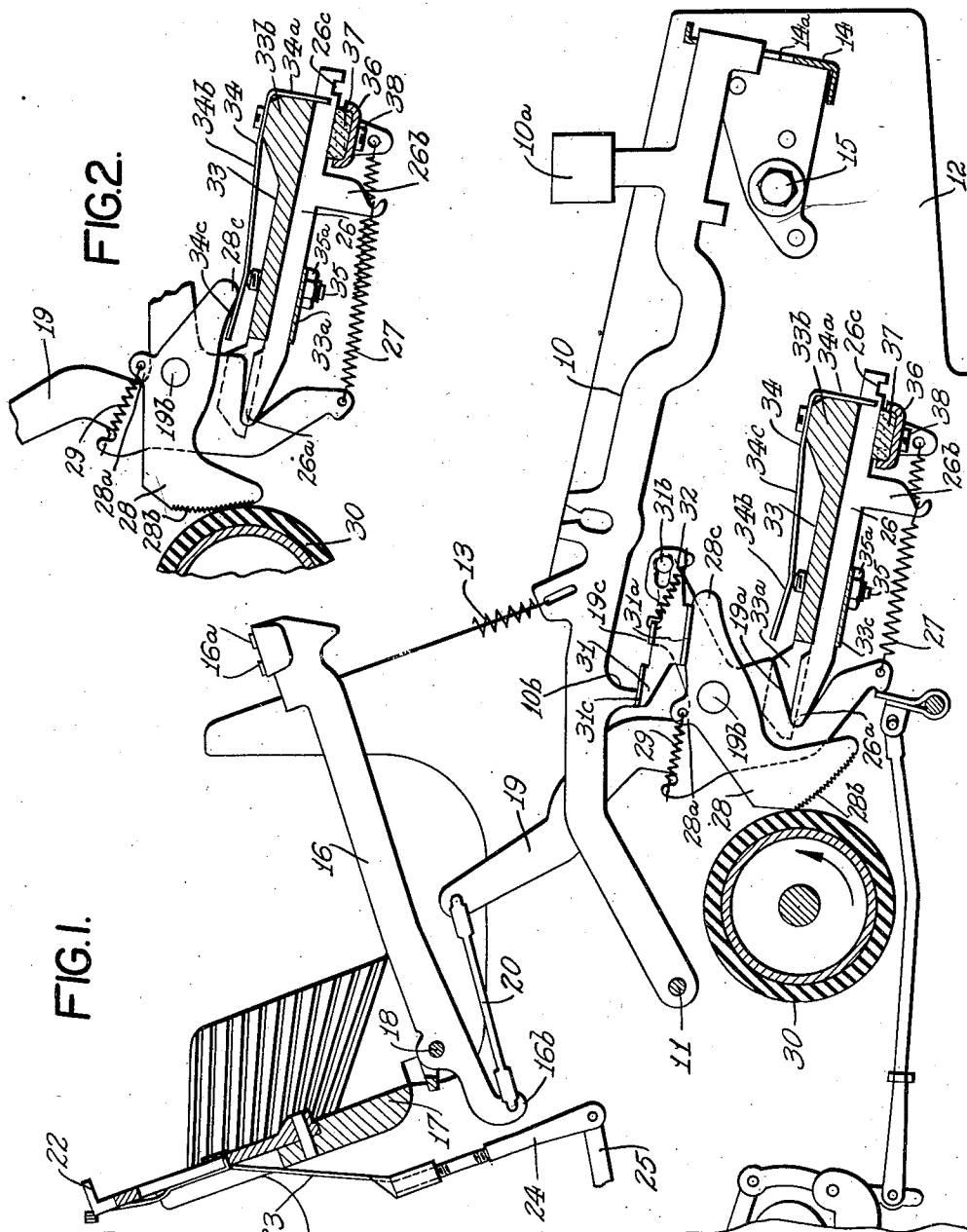
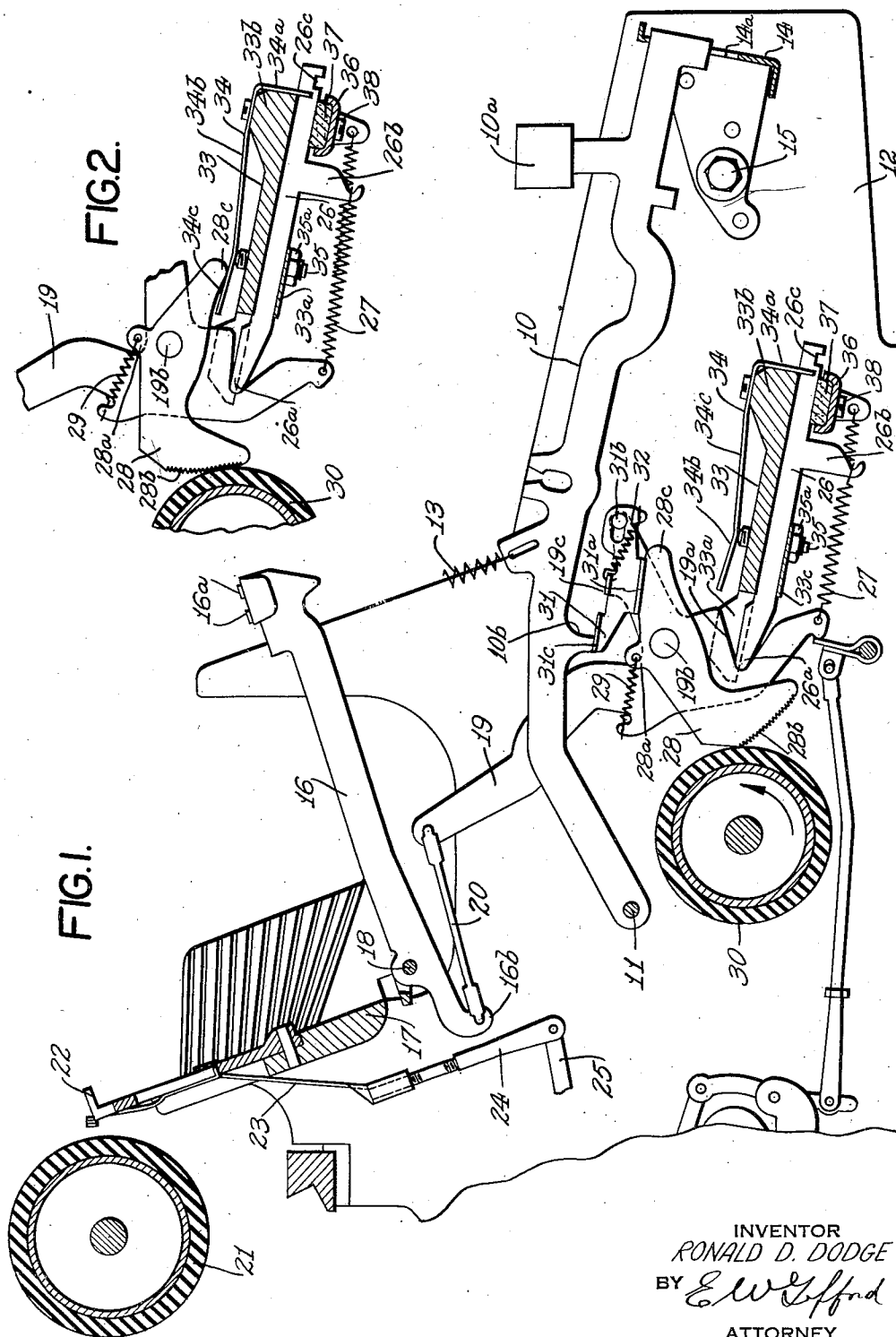
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R. D. DODGE

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POWER MECHANISM FOR TYPEWRITING MACHINES

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INVENTOR
RONALD D. DODGE
BY *E. W. Gifford*
ATTORNEY

UNITED STATES PATENT OFFICE

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POWER MECHANISM FOR TYPEWRITING MACHINES

Ronald D. Dodge, Poughkeepsie, N. Y., assignor to
International Business Machines Corporation,
New York, N. Y., a corporation of New York

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This invention relates to typewriting machines. The primary object of the present invention is to provide an improved means of adjusting the blow of the type bars imparted by the type bar operating mechanism of a power operated typewriter.

An object is to provide a blow adjusting means which is individual to each type bar and which is readily accessible to the servicemen.

Another object is to provide a blow adjusting means which is simple in construction and requires a minimum of parts.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a vertical section through the power mechanism of a typewriting machine embodying the present invention.

Fig. 2 is a detail view in section showing one of the power units in operated position.

The numeral 10 designates one of the key levers of which there is one for each character printing type bar and which is pivoted on a cross rod 11 suitably supported in the base 12 of the machine. Each key lever 10 is provided with a finger button 10a and a restoring spring 13 which urges the key lever 10 in a counterclockwise direction (Fig. 1). The forward or right hand ends of the key levers 10 are guided in slots 14a in a key guide ball 14 which is adjustably pivotally mounted in the base 12 by means of studs 15, only one of which is shown in Fig. 1.

Associated with each key lever 10 is a character printing type bar 16 which, as usual in the art, may be provided with two types 16a comprising upper and lower case characters. The type bars 16 are supported in a type basket which includes the usual segment 17 and the type bars 16 are pivoted in the segment 17 by the usual curved pivot wire 18. The segment 17 is slotted to accommodate the type bars 16 and, since the segment is curved, the type bars 16 recline at the angle shown in Fig. 1 but at different levels in the machine.

Each type bar 16 is operated by a power unit which includes a sub-lever 19 connected by a link 20 to an extension 16b formed in the associated type bar 16, whereby the rocking of the sub-lever 19 clockwise, through the link 20, actuates the type bar 16 in a counterclockwise direction to engage one or the other of the type characters 16a with the work sheet on the usual platen 21,

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the type striking through the usual ribbon. At the printing point the types are guided by a type guide 22 which is secured to the front face of the segment 17. The type guide 22 also slidably supports a ribbon vibrator 23 which is mounted on the upper end of a link 24 pivoted at its lower end to a lever 25 for actuating the ribbon vibrator. Any suitable means may be used for actuating the ribbon lever 25.

The lower end of each sub-lever 19 is formed with a deep notch 19a which cooperates with a fulcrum strip 26 having a rounded nose 26a and the notch 19a is kept seated on the nose 26a by means of a spring 27 which is anchored to the lower end of the sub-lever 19 below the notch 19a and to a lug 26b in the fulcrum strip 26. The spring 27 not only serves to hold the sub-lever 19 on the pivot or nose 26a but also tends to restore the sub-lever 19 when it has been actuated as hereafter described and incidentally assists in restoring the type bar 16 after it has made its impression.

Each power unit includes a somewhat L-shaped cam element 28 pivoted at 19b on the sub-lever 19. This cam 28 is provided with a restoring spring 29 which is anchored to an ear 28a formed in the cam 28 and to a lug struck from the lever 19. The cam 28 is provided with a serrated tread 28b designed to cooperate with the power roller 30 which rotates continually in the direction of the arrow (Fig. 1) while the machine is in use. Normally, however, the upper end of the tread 28b clears the power roller 30 with the parts shown in the position of Fig. 1 which is the normal position.

Each cam 28 has an elongated tail piece 28c which ordinarily is held in engagement with a lug 31a in the release member 31, the spring 29 in the position of Fig. 1 holding the tail piece 28c against the lug 31a. The release member 31 is provided with a slot through which passes a stud 31b carried by an arm forming part of the sub-lever 19. A spring 32, connected to an ear formed in the release member 31 just below and to the right of the stud 31b and to a lug 19c formed in the arm of lever 19 carrying stud 31b holds the member 31 with the stud 31b at the right hand end of the slot in member 31 and also normally holds member 31 up against the lug 19c. The member 31 has a lug 31c which just clears a short extension or lug 16b in the character key 10.

When the character key 10 is depressed, the member 31 will be rocked slightly counterclockwise by the engagement of the lug 16b with the

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lug 31c. This rocks the cam 28 slightly clockwise sufficiently to bring the upper end of the tread 28b into engagement with the surface of the power roller 30. Thereafter, the power roller 30 drives the cam 28 in a clockwise direction and, due to the eccentric shape of the tread 28b on member 28, pushes the stud 19b to the right in a short arcuate path, thereby actuating the sub-lever 19 in a clockwise direction on pivot 26a and, through the link 20, operating the type bar 16 to effect an imprint from one of the types 16a.

If no means is provided to control the blow of the type bars 16, the power roller 30 will actuate the cam 28 until the end of the tread 28b is reached which will occur before the type bar 16 actually strikes, and due to momentum the sub-lever 19 will be carried a little further beyond the point of disengagement of the cam 28 from the power roller 30 by the force of inertia stored in the type bar and the power unit which includes the sub-lever 19. This, however, would result in all type bars receiving approximately the same force of blow which is not desirable, owing to the fact that the area of the type face varies greatly and for other reasons.

The blow adjusting means is arranged to cause the cams 28 to become disengaged from the power roller 30 at various points in the operating strokes of the cams 28 while they are still under the influence of the power roller 30. The fulcrum strips 26 are mounted edgewise on the flat under-face of a transverse frame member 33 which is secured at its ends in the base 12 and the strips 26 are spaced from each other at their left hand ends, adjacent the noses 26a by slots 33a formed in the frame member 33 which also serve to space apart the sub-levers 19, the fulcrum strips 26 being shaped at their left hand ends to the right of the nose 26a so as to project partly into the slots 33a. At their right hand ends the fulcrum strips 26 are spaced by slots formed in a comb spring plate 34 secured to the top of the frame member 33 which is formed with a longitudinal rib 33b for this purpose.

The comb strip 34 has a vertical comb portion 34a spacing the fulcrum strips 26 apart and is also formed with a horizontal comb including the spring prongs or fingers 34b which are slightly bent and extend approximately horizontally directly underneath the nose portion 28c of the cam members 28, each cam member having associated with it a spring prong or finger 34b. Each finger 34b is spring-biased downwardly into engagement with a screw stud 35 which may be turned by means of a screw driver to raise or lower the prongs 34b so as to bring them closer to or further away from the nose portions 28c, as desired. The fulcrum strips 26 are clamped in their adjusted positions by nuts 35a and a clamping strip 33c having holes for the screw studs 35.

In the course of the rotation of the cam 28 by the power roller 30, the nose portion 28c will engage the associated finger 34b and prevent further clockwise rotation of the cam 28 as shown in Fig. 2. Bearing in mind that the stud 19b travels in an arc of a circle toward the right, the cam 28 will be caused to have a motion of translation to the right which will carry it out of engagement with the power roller 30, notwithstanding the fact that an intermediate portion of the tread 28b may, at that moment, contact the power roller 30. It is quite clear from Fig. 2 that by turning the stud 35 so as to raise or lower the prong 34b the point at which the cam 28 leaves the power roller may be regulated very closely.

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It is also possible to adjust the clearance between the cam 28 and the power roller 30 individually for each power unit. It is for this purpose that the fulcrum strips 26 are adjustable longitudinally and to facilitate such adjustment they are frictionally clamped in place by a channel-shaped clamping bar 36 and interposed between the edges of the fulcrum strips 26 and the bar 36 is a resilient strip 37 which may be composed of a fairly dense flexible plastic, the channel-shaped bar 36 being attached to the frame member 33 by means of clamp screws 38.

In order to adjust any one of the fulcrum strips 26, the nuts 35a on both sides of the selected strip 26 are loosened and the strip pushed to the left or pulled to the right the required distance. Notches 26c formed in the ends of the strips 26 enable a suitable hook tool to be engaged with the strip to pull it to the right.

There are a number of reasons why it is desirable that the power units be adjustable to vary the blow. One reason is that the area of type face varies widely, as between a period type bar, representing one extreme, and an upper case M or W, representing the opposite extreme. Another reason is that the type bars are on different levels and, in most commercial machines, the sub-levers must be of different lengths to avoid wide variation in angularity of the connecting links or to reach the cam slots formed in the type bars of some machines.

One of the advantages of the adjusting means described herein is their simplicity. Another advantage of the means comprising the screw studs 35 and fingers 34b is that the point of disengagement may be adjusted to be very precise and the wear on the tread of member 28 at the point of disengagement is spread over a large area and not concentrated at a very small area as is usually the case with power mechanisms of the snatch-roll type. In fact the spring 29, the resiliency of the usual rubber covering of the power roller 30 and the inertia of the train of connections including the type bar assist in producing a snappy disengagement with little slippage and the element 28 is not gradually forced off the power roller.

While there have been shown and described and pointed out the fundamental novel features of the invention, as applied to a preferred embodiment, 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:

1. Power mechanism for typewriters and the like comprising a power roller, a cam supporting member, a cam pivoted thereon and adapted for rolling engagement with the power roller, means for imparting a forward swinging movement to the cam upon its pivot to cause it to engage the power roller for rotation by the latter, means tending constantly to swing the cam in the reverse direction for restoring said cam after disengagement from the power roller, and an element engaged by said cam in its rotation by said power roller for terminating its rolling engagement with said power roller.

2. Power mechanism for typewriters and the like comprising a power roller, a cam lever, a segmental cam pivoted on the cam lever, key-operated means for imparting a forward swing-

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ing movement to the cam to cause it to engage the power roller for rotation by said roller, means to swing the cam in the reverse direction upon disengagement from the power roller, and means engageable with said cam during the course of its rotation by said power roller for disengaging said cam from said roller and enabling the second named swinging means to restore said cam.

3. Power mechanism for typewriters and the like comprising a power roller, a cam lever, a segmental cam pivoted on the cam lever and provided with an abutment, an actuating member adapted to engage said abutment and impart a forward swinging movement to the cam to cause it to engage the roller, means for swinging the cam reversely when disengaged from the roller, and means engageable with said abutment to disengage said cam from said power roller and render the reverse swinging means effective.

4. Power mechanism for typewriters and the like comprising a power roller, a cam lever, a segmental cam pivotally mounted on said lever and provided with an abutment, a key lever, an interponent operable by said key lever and pivoted to the cam lever in a position to push against said abutment when the key lever is actuated, whereby a forward swinging movement is imparted to the cam to engage the cam with the power roller for rotation by the latter, a spring for swinging the cam reversely, and means engageable with said abutment for positively disengaging said cam from said power roller to enable said spring to restore said cam, said means being adjustable to vary the duration of rotation of the cam by said power roller.

5. A power mechanism for typewriters and other office machines comprising a power roller, a rockable member, a cam element pivoted on said member and rotatable for driving engagement with said power roller, means to initially rotate said element until it is gripped by said power roller and rotated thereby, means to restore said element upon disengagement of said element from the power roller, and means engaged by said element during the course of its rotation by the power roller for disengaging said element from said power roller.

6. A power mechanism for typewriters and other office machines comprising a power roller, a pivoted member having a connection to a device to be operated; a coupling element pivotally mounted on said member and having a tread portion engageable with said power roller by an initial pivotal movement of said element on said member, said coupling element having a release portion; means to impart said initial pivotal movement to said element, and means engaged by said release portion during the course of rotation of said element by the power roller for positively releasing said tread portion from said roller.

7. In a power mechanism for typewriters and the like, a power roller; a power unit including a member rotatably engageable with said power roller for driving engagement with the latter and means to restore said member after disengagement from said roller, means for imparting an initial rotational movement to said member to engage it with the power roller, and adjustable means for limiting rotation of said member by the power roller and at the same time rendering the restoring means effective.

8. A power mechanism for typewriters and the like comprising, a power roller; a power unit having an element rotatably engageable with the

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power roller and a rockable support for said element, said element normally having a clearance with respect to the said power roller, said support having a fulcrum notch; a fulcrum element having a fulcrum nose seated in said notch, a spring for restoring said rockable support and holding said notch in cooperation with said nose and means to adjustably movably mount the fulcrum element to enable adjustment of said clearance.

9. A power mechanism for typewriters and the like comprising a power roller; a power unit having an element rotatably engageable with the power roller and a rockable support for said element, said support having a fulcrum portion; a fulcrum bar having pivotal engagement with the fulcrum portion, a spring for holding said fulcrum portion in pivotal engagement with the fulcrum bar, and means to adjustably slidably mount said fulcrum bar.

10. A power mechanism comprising a power roller, a rockable support having an operating connection to a part to be operated, a coupling element pivoted on said support for rotating engagement with the power roller, a key having a projection, and an interponent pivotally and slidably mounted on said support between said key projection and said coupling element and disposed so that when the key is depressed the interponent is rocked on its pivot to rock said coupling element into engagement with the power roller and, when said key is held in operated condition, said interponent will be caught by the key lug during restoration of the rockable support and be prevented from moving between said lug and said coupling element.

11. A power mechanism for typewriters and the like comprising a power roller, a cam unit having a cam rotatable by the power roller and means to initially engage the cam with said roller, means to compel disengagement of the cam from said roller at a predetermined point in the operating cycle of the cam unit, and means to vary the point at which the last named means disengages said cam from said roller.

12. A power mechanism for typewriters and like machines comprising a main power roller; power units operable by the power roller, each power unit including a coupling element initially rotatively engageable with the power roller for rotation by the latter and including a support rocked by said rotation of the coupling element; a support frame having a series of guide slots, one for each support; a series of fulcrum bars, one for each support, for pivoting said supports in said slots; restoring springs individual to said supports for maintaining the pivotal relation between the supports and bars; a spring guide comb having a series of slots in alignment with the first named slots for holding said bars in edgewise spaced relation on said support frame and also having a series of prongs in the plane of said coupling elements and operative to disengage said elements from said power roller at various points in the operating cycles of said power units, clamping means for adjustably securing said bars in said slots including screws for adjusting said prongs, and selectively operable means for initially rotating said coupling elements to engage the latter with the power roller.

13. A power operated typewriter having a power roller; a series of power devices operable by the power roller, each power device including a rockable member; a frame, a series of fulcrum members, each having a fulcrum bearing on one of said rockable members; means for mounting said

fulcrum members on said frame for individual adjustment of the fulcrum point of each rockable member, and springs individual to said rockable members for maintaining bearing contact between said fulcrum members and said rockable members.

14. A power mechanism for the type bar of a typewriting machine, comprising a power roller; a rock lever having an operating connection to the type bar; an L-shaped cam pivoted on said lever intermediate the ends of said lever and intermediate the ends of one bar of the L, the other bar having a tread portion engageable with the power roller for partial rotation by the latter, said tread portion being eccentric to the pivot of said cam on said lever whereby to rock said lever and actuate the type bar when the cam is rotated by the power roller, said cam normally having a clearance with the power roller closed by a small initial rotation of the cam to engage the tread portion with the power roller; a fulcrum member having a loose contact pivotal engagement with a portion of said rock lever, a spring for maintaining said pivotal engagement and restoring said lever, means to adjustably movably mount the fulcrum member for adjustment of said pivot, and means to effect said initial rotation.

15. A power mechanism for the type bar of a typewriting machine, comprising a power roller; a rock lever having an operating connection to the type bar; an L-shaped cam pivoted on said

lever intermediate the ends of said lever and intermediate the ends of one bar of the L, the other bar having a tread portion engageable with the power roller for partial rotation by the latter, said tread portion being eccentric to the pivot of said cam on said lever whereby to rock said lever and actuate the type bar when the cam is rotated by the power roller, said cam normally having a clearance with the power roller closed by a small initial rotation of the cam to engage the tread portion with the power roller; means engageable with the free end of the bar of the L which is pivoted to said lever for disengaging the cam from the power roller, and means for effecting said initial rotation.

RONALD D. DODGE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,602,757	Dorsey	Oct. 12, 1926
1,614,475	Hokanson	Jan. 18, 1927
1,661,710	Thompson	Mar. 6, 1928

FOREIGN PATENTS

Number	Country	Date
102,337	Austria	of 1926
552,797	Great Britain	of 1943