May 31, 1960 R. A. DONNAN ET AL 2,938,615

TYPE BAR DRIVE

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FIG. 2

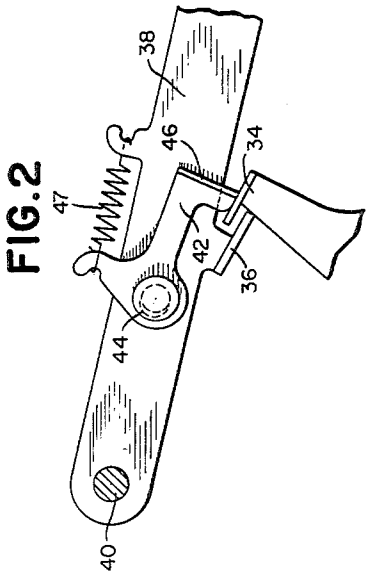


FIG. 1

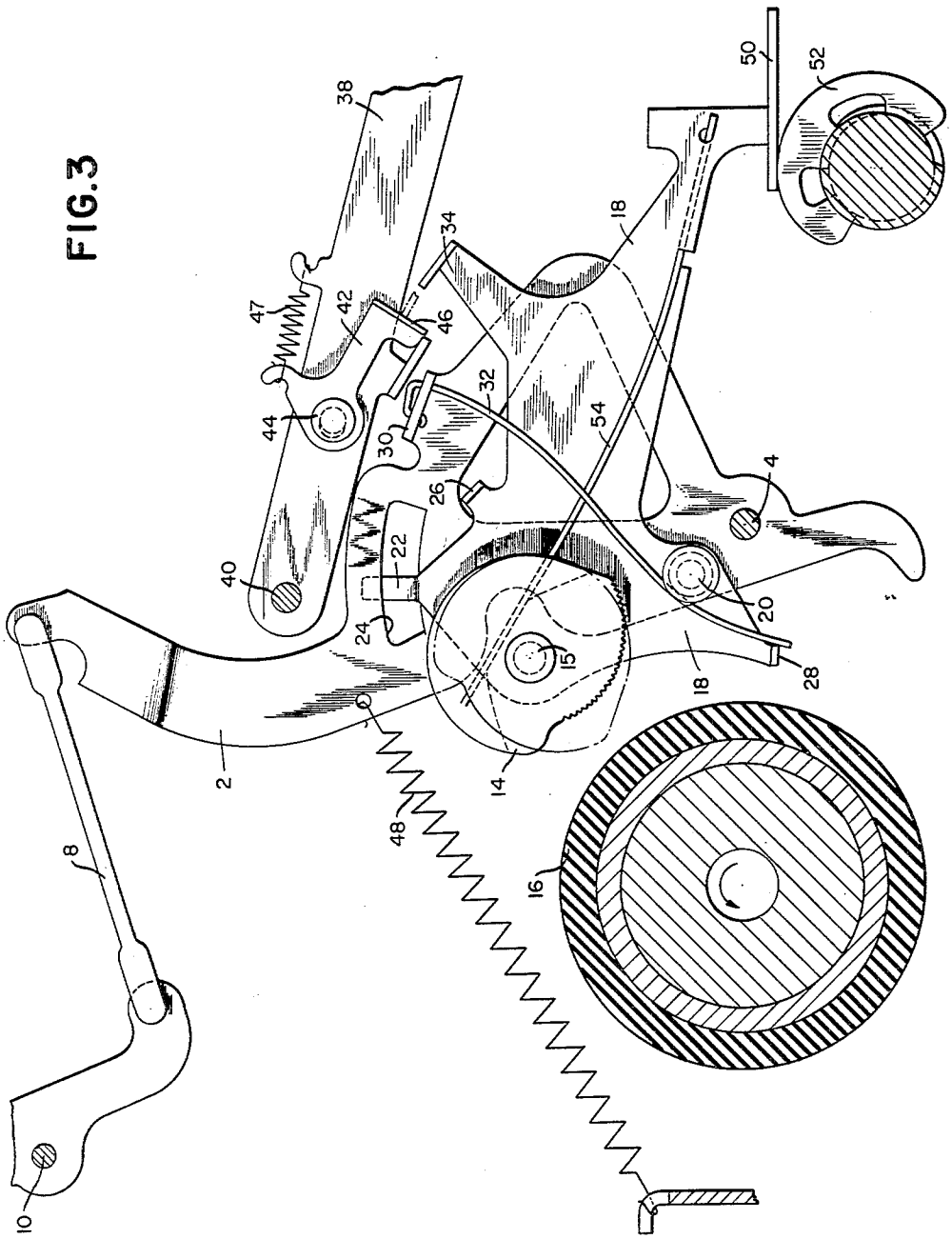
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FIG.3



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TYPE BAR DRIVE

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4 Claims. (Cl. 197—17)

This invention relates to typewriters and more particularly to an improved tripping mechanism and cam control for a power driven type bar drive.

In conventional power driven type bar mechanisms, examples of which are shown in U.S. Patents 2,723,740 and 2,796,966, a cam is held normally out of engagement from a continuously driven power source, such as a power roller, and then pushed into engagement with the power roll to initiate a type bar print stroke.

In order to keep the conventional cam tripping force at a minimum, the clearance between cam and power roller must be as small as possible. Because of these close tolerances, and under certain type bar bounce conditions, unwanted repeat print strokes take place.

It follows that it is a first object of this invention to provide a new tripping mechanism for a power driven type bar drive.

It is a further object of this invention to provide an improved interengagement between a type bar and its driving cam wherein any type bar rebound will not cause an unwanted repeat stroke.

It is a still further object of this invention to reduce the finger shock or jar which a typist senses during a conventional type bar print stroke.

It is a further object of this invention to provide an improved cam control for a power driven type bar.

It is a still further object of this invention to provide an improved combined cam control and tripping mechanism for a power driven type bar drive.

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.

Briefly, this invention relates to an improved power driven type bar drive cam control and tripping mechanism therefor, wherein the cam is mounted on an intermediate lever that is spring urged into engagement with the power roll and accordingly when a key lever is depressed the cam is tripped for biased movement into engagement with, rather than pushed into engagement with, the power roll, and since the cam is spring urged into engagement with the power roll, the key lever is completely disengaged from the intermediate lever at time of cam knock off, hence the typist does not sense any finger shock during a type bar print stroke.

Referring to the drawings, Fig. 1 is a side elevation showing the details of a type bar drive mechanism.

Fig. 2 is an enlarged view of the tripping mechanism for the type bar drive.

Fig. 3 is an enlarged view of the cam control mechanism.

The type bar structure comprises a cam lever 2 which is pivotally supported at 4 on a transverse rod which extends across the typewriter. It is to be understood that normally a plurality of cam levers are supported on the rod 4, one for each type bar of the machine.

Each type bar 6 is pivotal about a support fulcrum 10 and connected via a link 8 to the cam lever 2. When the cam lever 2 is rocked clockwise about its pivot 4, the type bar 6 will be driven counterclockwise about its support 10 into printing engagement with a platen 12.

The driving means for cam lever 2 is a cam 14 which is selectively engageable with a continuously driven power roll 16. The cam 14, which is pivotally supported on a pin 15 carried by an intermediate lever 18, is normally spaced from the power roll a slight distance. The intermediate lever is pivotally supported on a pin or stud 20 carried by the cam lever 2. The intermediate lever 18 has an offset finger 22 which is slidable relative to cam lever 2 within the limits of a slot 24 formed in the cam lever.

The intermediate lever has a pair of bent over ears 26, 28, and the cam lever has bent over ear 30. A spring 32 is hooked into the ear 30 of the cam lever to engage stud 20 as well as the ears 26 and 28 of the intermediate lever 18. With this arrangement of parts, there is a bias on the ear 28 tending to rotate the intermediate lever clockwise about stud 20, and a bias on the ear 26 tending to rotate the intermediate lever counterclockwise about the stud 20. Since the distance between ear 26 and stud 20 is greater than the distance between ear 28 and stud 20, then, with the parts arranged as in Fig. 1, there is an unbalanced torque which tends to rotate the intermediate lever counterclockwise about stud 20.

This unbalanced torque is utilized to rock cam 14 into engagement with the power roll 16, consequently the intermediate lever is equipped with an integral trip latch 34 which engages a trip finger 36 extending from a key lever 38. The latter is pivotally supported about a fulcrum rod 40 which extends transversely of the typewriter so as to support one key lever for each type bar driving mechanism.

With this structure, it is apparent that when the trip finger 36 has been depressed out of blocking engagement with the latch 34, spring 32 acts to rock the intermediate lever 18 counterclockwise (moving trip latch 34 to the Fig. 2 position) to bring cam 14 into engagement with the power roll, thereby initiating a type bar print stroke.

The power roll 16 drives cam 14 towards its high dwell clockwise about its pivot 15 thereby rocking cam lever 2 clockwise about its pivot 4. That is, an extension of pivot 15 drives cam lever 2 until a flange 50 on the intermediate lever 18 engages an impression control cam 52, then a shift takes place wherein the driving relation between the intermediate lever 18 and the cam lever 2 is via the pivot pin 20 rather than via pin 15. This change in drive is explained completely in U.S. Patent 2,796,966.

After the cam 14 has rotated to its high point, then, as a result of the momentum of the parts, the cam lever will continue to rock in free flight until the type bar 6 strikes the platen. During this free flight of the cam lever, cam 14 is restored to its normal position shown in Fig. 1 through the interaction of a spring 54 in engagement with a flat surface on the under side of the cam 14. The type bar 6 and its cam lever 2 are restored to rest position (Fig. 1) by a spring 48.

One of the important elements of this improved type bar cam control is that the cam 14 cannot jam to stall the power roll as could happen with conventional type bar driving mechanisms when type bars clash, and lock near printing position. With this improved cam control, the cam would merely roll over under such conditions and make a complete revolution about its pivot 15 whereupon the spring 54 would again restore the cam to its normal position shown in Fig. 1.

With reference to the interengagement of trip latch 34, and trip finger 36, reference is made to Fig. 3 to show the position of these parts when the cam lever 2 has been rocked to a type bar print position.

It is then apparent that a blocking device is required to prevent repeat strokes, otherwise if key lever 38 were held depressed the trip latch 34 would cyclically move to its Fig. 2 position and a repeat stroke would occur.

A blocking device or latch guard 42 is pivotally and slidably supported on a stud 44 carried by the key lever 38. The latch guard 42 is biased by a spring 47 against the trip finger 36 in such a position that a shoulder 46 on the guard is normally spaced a short distance beyond the right edge of the finger 36, as shown in Figs. 1 and 3. The trip latch 34 normally engages the end of the finger 36 and lies below the shoulder 46. When the key lever 38 is depressed, the latch guard 42 is held against movement with the lever since the shoulder 46 rests upon the latch 34. The end of the finger 36 is moved out of alignment with the end of the trip latch upon depressing the key lever, and the intermediate lever 18 is rocked counterclockwise so that the trip latch assumes a position relative to the finger 36 as shown in Fig. 2. The cam 14 is engaged with the power roll and causes the intermediate lever to rock clockwise. As the trip latch 34 moves beyond the shoulder 46, the latch guard 42 snaps down to the position shown in Fig. 3. With latch guard 42 in its Fig. 3 position—e.g. when the key lever is held depressed, the trip latch 34 will strike latch guard 42 (see dotted position Fig. 3) and thus hold cam 14 away from the power roll 16. When key lever 38 is restored to its Fig. 1 position, the trip latch 34 will slide off latch guard 42 and assume its Fig. 1 rest position.

Specific reference is made again to the mechanism for moving cam 14 into engagement with power roll 16. That is, in the prior art, (U.S. Patents 2,723,740 and 2,796,966) the power cam is pushed into engagement with the power roll under the direct action of the key lever. In the subject mechanism, however, the cam engages the power roll under the force of the spring 32 and the sole function of the key lever is to release the intermediate lever to permit spring 32 to act. With this structure, the only force that restrains the key lever 38 is the spring 58 and the end frictional force between the trip finger 36 and the trip latch 34. If these inter-acting surfaces are made smooth enough it will take only a very slight amount of force to depress the key lever to bring the cam into engagement with the power roll, since the spring 58, which holds the outer end of the key lever in a guide comb 60, can be of a force simply great enough to overcome the gravitational effect of the key lever 38 whereupon a very minimum force will be required to depress the key lever to initiate a type bar print stroke.

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. A type bar drive mechanism for a typewriter comprising, in combination, a cam lever, means operatively connecting said cam lever to said type bar, an intermediate lever pivotally mounted on said cam lever, a cam rotatably supported by said intermediate lever, a power roll, spring means urging said intermediate lever in a direction to engage said cam with said power roll, a manually operable key lever, means on said key lever normally engaging said intermediate lever for holding the latter against the urging of said spring means, said last mentioned means moving out of engagement with said intermediate lever on operation of said key lever to permit engagement of said cam with said power roll and effect a driving of said type bar from a rest position to a print position, and a member pivotally mounted on said key lever and movable, on operation of said type bar, to a position for engagement by said intermediate lever when said key lever is held depressed, thereby holding said intermediate lever in a position with said cam free of said power roll.

2. A type bar drive mechanism for a typewriter comprising, in combination, a cam lever, means operatively connecting said cam lever to said type bar, an intermediate lever pivotally mounted on said cam lever, a cam rotatably supported by said intermediate lever, a power roll, spring means urging said intermediate lever in a direction to engage said cam with said power roll, a manually operable key lever, a finger formed integral with said key lever, a latch arm on said intermediate lever and having a projecting portion normally engaging the end of said finger for holding said intermediate lever against the urging of said spring means, said finger moving out of engagement with said projecting portion on operation of said key lever to permit engagement of said cam with said power roll and effect a driving of said type bar from a rest position to a print position, and a guard member mounted on said key lever and cooperating with said finger to provide a stop for said projecting portion when said key lever is held depressed, said stop operating to hold said intermediate lever in a position with said cam free of said power roll.

3. The mechanism of claim 2 in which said guard member is pivotally mounted on said key lever for engagement with said finger, and a spring normally holding said guard member against said finger in a position slightly overlying its end, said guard member being held by said projecting portion against movement with said finger on depression of said key lever, said intermediate lever operating on the driving of said cam by said power roll to move said projecting portion away from said guard member, thereby permitting said guard member to move against said finger and act as a stop for said projecting portion when said key lever is held depressed.

4. The mechanism of claim 3 in which the pivotal mounting for said guard member permits a slight longitudinal movement of the latter whereby engagement of said projecting portion with said guard member forces the latter against the action of said spring into alignment with the end of said finger.

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