

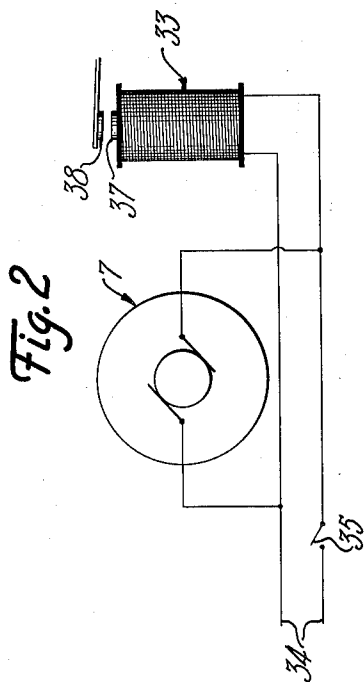
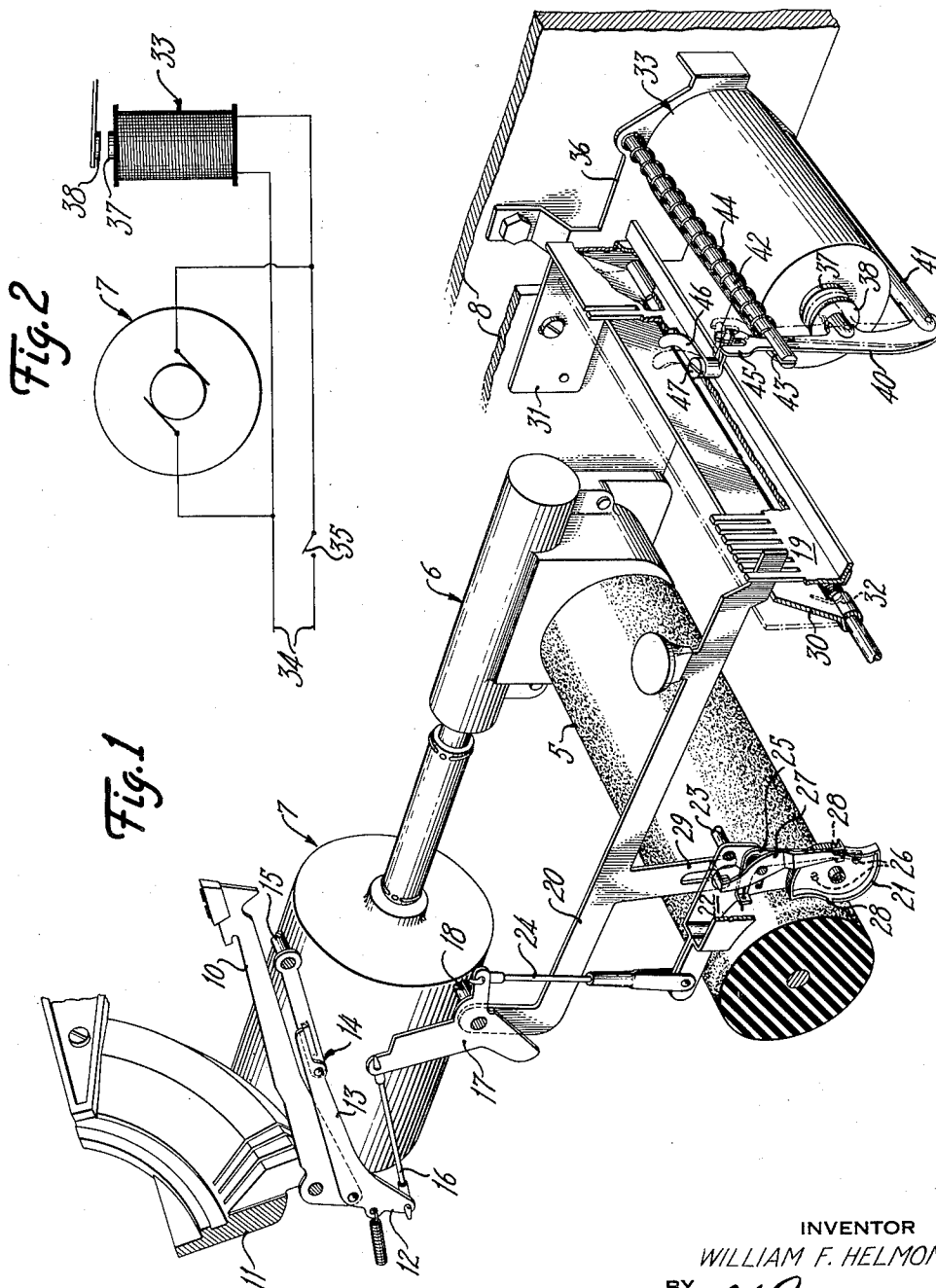
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TYPEWRITING MACHINE

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TYPEWRITING MACHINE

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This invention relates to power-driven typewriting machines, with reference more particularly to machines of this character in which a type action actuating element is released into engagement with a driving roller incident to driving the type action, at the instant the operating key is depressed.

In machines of this character a troublesome condition arises from the unintentional operation of any of the type action keys when the power of the machine is shut off and the actuating friction roller is idle, particularly if a number of the keys are so operated. When one or more of the control keys are operated with the power off, the machine does not function, but each type action so operated is initially set. Consequently, when the machine is put into actual use and the power is turned on, the type actions unintentionally set are immediately actuated, with the result that the machine is caused to jam, thus necessitating time-consuming repair or adjustment. Even if the operator realizes that the machine has been initially set without power, the correction of this condition is an awkward operation usually requiring the services of a repair man to remove the power roller and individually restore each preset type action before the machine may be properly operated.

The present invention has for one of its objects to provide a simple and reliably operative mechanism by which the foregoing difficulties are obviated, to the end that unintentional operation of any of the type action keys is prevented unless the power of the machine is on.

More particularly, the invention has for an object to provide an automatically operable mechanism including a locking device effective to prevent operation of the type actions when the electric power is shut off, the mechanism including electro-responsive means operative when the power is turned on to release the locking device and render the type action system free for operation.

In its more specific aspect, the invention provides an automatically operable locking mechanism effective when the power is shut off to bring a universal lock bar into locking engagement with the key levers of the type actions to prevent their operation, the mechanism including an electromagnetic device in circuit with the electric motor of the machine and having an armature operatively connected to the lock bar to automatically release the key levers incident to energizing the electric motor.

Other objects and advantages will hereinafter appear.

In the drawing,

Figure 1 is a perspective view of a preferred embodiment of the invention illustrated in conjunction with related mechanism of the typewriting machine, and

Figure 2 is a schematic wiring diagram of the preferred circuit of the electric motor and magnetic lock-releasing device.

The invention is illustrated in conjunction with a typewriting machine having a type action system of well-known character, a brief description of which will be given. A single type action of the system is shown, all of which are selectively adapted for power actuation by a roller 5 arranged laterally of the machine and driven through a worm gear drive 6 by a motor 7, both suitably mounted on a member 8 of the machine framework. Each type action includes a type bar 10 pivoted on a mounting segment 11 and actuated by an operating train including a drive arm 12 of a lever 13 forming part of a toggle device 14 pivoted on a fixed rod 15, the drive arm 12 being connected by a link 16 to a sub-lever 17 pivoted on a fixed rod 18.

A key lever 20, also pivoted on the rod 18 and having its forward end guided in a fixed comb plate 19, controls actuation of the type action, the actuating mechanism of which includes a cam 21 rotatably carried on a bell-crank lever 22 pivoted on a fixed rod 23, a link 24 connecting lever 22 with the sub-lever 17. In the inactive condition of the actuating mechanism, the cam 21 is urged to rotate clockwise, as viewed from the left in Figure 1, by a spring-pressed lever 25 coacting with one of a pair of pins 26 on the cam, so that when free to rotate, the eccentric periphery of cam 21 is brought into engagement with the power roller 5. The cam 21 is releasably held against rotation by a latch lever 27 pivoted on the bell crank 22, the lower end of which lever cooperates with one of a pair of projections 28 on the cam to hold same non-rotative, the upper end of the lever 27 being engaged in a forked member 29 of the key lever 20.

As the key lever 20 is depressed, the lever 27 is swung so that its lower end disengages the projection 28 and the cam 21 is thus released to be rotated by the influence of the spring-pressed lever 25 thereon. The periphery of the cam is thus brought into engagement with the power roller 5 which, being rotated, imparts further rotation to the cam 21 with the effect that the bell crank 22 is swung about its pivot 23 and the

type bar 10 is actuated toward the platen, all in the well-known manner. In completing its cycle of operation, the cam 21, having made a half turn, is restored to initial position as shown in Figure 1, at which it is again under the rotative influence of the lever 25 and is latched by lever 27.

In machines having type actions of this character the initial release of the type action, which brings the cam 21 into coaction with the roller 5, is completed in any type action of the system of which a key is depressed, whether the power roller 5 is rotated or stationary. Consequently, with the roller stationary, the actuating mechanism of each type action of which a key has been depressed is initially set only and does not complete its cycle of operation, with the result that when the power of the machine is turned on to rotate the roller, all of the set type actions are simultaneously power-actuated.

The present invention is directed to provide mechanism including locking means to prevent unintentional operation of the type action key levers 20 when the motor 7 is idle and the roller 5 is therefore stationary, by which mechanism the locking means is automatically released as soon as the motor 7 is energized. In the embodiment illustrated, a universal lock bar 30 is arranged transversely of the machine, preferably adjacent and beneath the forward ends of all the key levers 20 so that the free longitudinal edge of the lock bar normally abuts each key lever and locks same in its normal, raised position. The lock bar 30 is pivotally mounted at each end on the framework of the machine, preferably in plates 31, one of which is shown, forming a support for the comb plate 19 on the framework 8. A restoring spring 32 has its one end engaging the lock bar 30 and its other end anchored preferably on the comb plate 19 to urge the lock bar to locking position as shown in full lines in Figure 1.

The means by which the lock bar is swung to ineffective or unlocked position automatically, incident to energizing the motor 7, comprises an electromagnetic device 33, such as a magnet or solenoid, connected in circuit with the motor 7, preferably as shown in Figure 2. Electric current is supplied to the motor 7 from a suitable current supply 34, herein a two-wire circuit, and the motor 7 is connected to the respective wires, to which also the magnetic device 33 is connected, the flow of current being controlled by a suitable switch 35. Although the motor and magnetic device are shown connected in a parallel circuit with the current supply, it will of course be apparent that other circuits such as a series connection or a relay hook-up may be used, it being mainly the requirement that the magnetic device 33 be in the motor circuit in such manner that current is caused to energize the device 33 at the same time the motor 7 is energized.

In the present embodiment of the invention illustrated, the electromagnetic device 33 takes the form of a magnet mounted on a base plate 36 secured to the framework 8, a magnet core 37 of which has its axis preferably parallel with the pivotal axis of the lock bar 30, for compactness. A disk 38 constitutes an armature of the magnet 33 and is carried on a lever 40 pivotally mounted at one end on a post 41 secured to the base plate 36. A guide rod 42, also secured to the base plate 36, has a slot 43 by which the free end of lever 40 is guided in its reciprocatory movement to or from the magnet 33, the guide rod 42 having a

compression spring 44 thereon pressing against lever 40 to urge the armature 38 a limited distance away from the magnet core 37.

The free end of lever 40 is forked as shown at 45 and is thereby operatively connected to a bell crank 46 pivotally mounted by a screw 47 on a flange of the comb plate 19. One arm of the bell crank 46 is engaged by the forked end 45 of lever 40 and the other bell-crank arm passes through a slot in the comb plate and has its free end engageable with the lock bar 30. When the machine is not in use and the motor 7 is therefore idle, spring 44, acting on lever 40, yieldably holds the bell crank 46 in retracted position to allow the lock bar 30 to assume its locking position by influence of its spring 32.

In operating the machine, the motor 7 is energized by closing the switch 35, thus simultaneously energizing the magnet 33. As soon as the motor 7 is energized, the roller 5 is rotated in readiness to power-actuate any of the type actions initially set by depressing their key levers 20. The magnet 33 being energized, draws the armature 38 axially toward the magnet core 37, and the resultant swinging of lever 40 swings the bell crank 46 and thereby actuates the lock bar 30 to unlocked position, the various parts thus assuming the respective positions shown in dot-and-dash outline in Figure 1. The key levers 20 of the type action system are thus made free to be operated as long as the motor 7 is energized. However, as soon as the motor 7 is shut off, the magnet 33 is deenergized and the spring 44, acting through lever 40, causes the bell crank 46 to be retracted and thus allows the lock bar to be swung by its spring 32 to locked position to prevent unintentional operation of the type action system while the motor 7 is idle.

It will be seen from the foregoing that the invention provides an automatically operable mechanism including a locking device effective to prevent operation of the type actions when the electric power is shut off, the mechanism including electro-responsive means operative when the power is turned on to release the locking device and thereby render the type actions free for operation.

Although in this application there is specifically described one embodiment which the invention may assume in practice, it will be understood that same is shown for the purposes of illustration, and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What is claimed is:

1. A typewriter having a main-frame, type-key-levers, a front comb laterally guiding said levers at forward end-portions of the latter, a power roll, an electric motor for driving the power roll, and type operators becoming operatively connected to said roll in response to depression of corresponding key levers; in combination with a key-lever-locking mechanism comprising a transverse locking plate rockably supported adjacent and behind said comb for moving an upper edge of said locking plate into and out of locking relation with said key levers, a spring normally maintaining said plate in locking relation, a lever pivoted at the front of said comb and extending through an opening provided in the latter for moving said locking plate to ineffective position; and an electro-mechanical operating unit for said lever disposed forwardly of said comb, comprising a base attached

to said main frame, an electro-magnet fixed to said base, a lever pivotally mounted on said base and carrying an armature attractable by said magnet, and a spring tending to move said armature-lever away from said magnet, said armature-lever having a detachable fork-and-tongue connection to said lever on the comb; a circuit being provided to supply current jointly to the motor and said magnet so that said magnet is energized to move said locking plate to ineffective position only when said motor is energized.

2. A typewriter having a main-frame, type-key-levers, a front comb laterally guiding said levers at forward end-portions of the latter, a power roll, an electric motor for driving the power roll, and type operators becoming operatively connected to said roll in response to depression of corresponding key levers; in combination with a key-lever-locking mechanism comprising a transverse locking plate rockably supported adjacent and behind said comb for moving an upper edge of said locking plate into and out of locking relation with said key levers, a spring normally maintaining said plate in locking relation, a lever pivoted at the front of said comb and extending through an opening provided in the latter for moving said locking plate to ineffective position; and an electro-mechanical operating unit for said lever disposed forwardly of said comb, comprising a base attached to said main frame, an electro-magnet fixed to said base, a post fixed to said base, a lever of the third order fulcrumed on said post and carrying, between its fulcrum end and an opposite end, an armature attractable by said magnet, said lever having at said opposite end a detachable fork-and-tongue connection to said lever on

the comb, a post fixed to said base and having a slotted end guiding said armature-lever adjacent said connection, said posts being on opposite sides of said magnet, and a compression spring surrounding said slotted post and tending to disengage said armature-lever from said magnet; a circuit being provided to supply current jointly to the motor and said magnet so that the latter is energized to move said locking plate to ineffective position only when the motor is energized.

3. A typewriter having a main-frame, type-key-levers, a power roll, an electric motor for driving the power roll, and type operators becoming operatively connected to said roll in response to depression of corresponding key levers; in combination with a key-lever-locking mechanism comprising a transverse locking plate rockably supported for movement into and out of locking relation with said key levers, a spring normally maintaining said plate in locking relation, a lever pivoted on the main-frame for moving said locking plate to ineffective position; and an electro-mechanical operating unit for said lever disposed forwardly of said locking plate, comprising a base attached to said main-frame, an electro-magnet fixed to said base, a second lever separably articulated to the first said lever and carrying an armature attractable by said magnet, and a spring tending to move said armature-lever away from said magnet; a circuit being provided to supply current jointly to the motor and said magnet so that said magnet is energized to move said locking plate to ineffective position only when said motor is energized.

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