

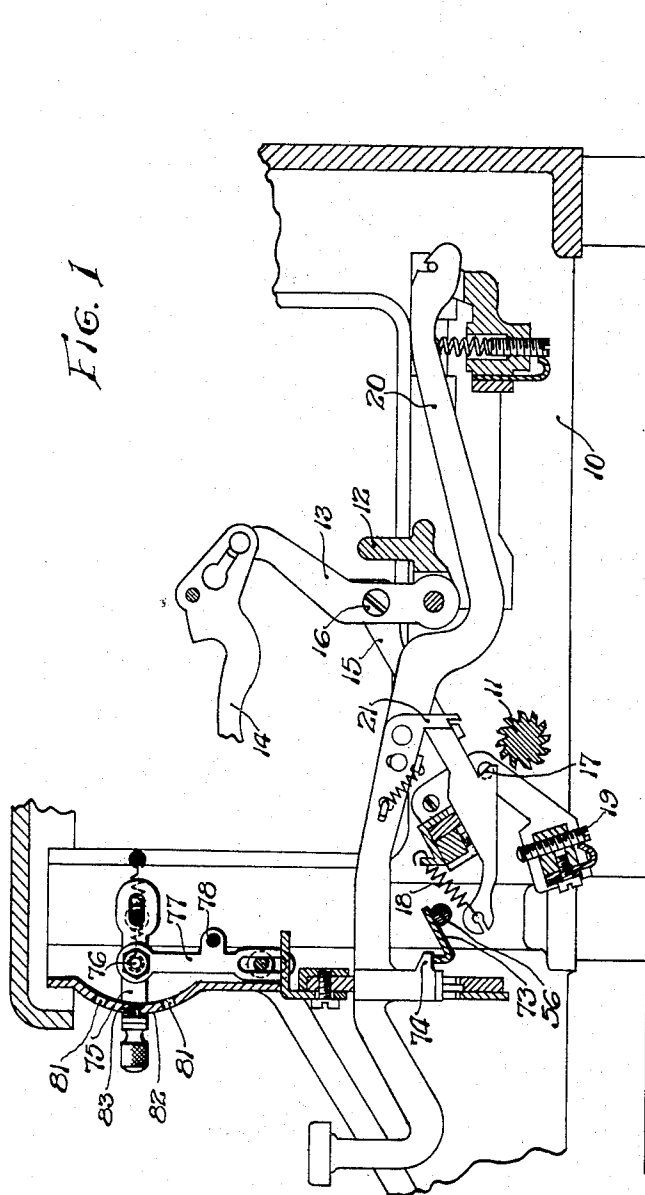
Aug. 8, 1933.

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1,921,159

POWER ACTUATED TYPEWRITER

Original Filed Sept. 2, 1925 3 Sheets-Sheet 1



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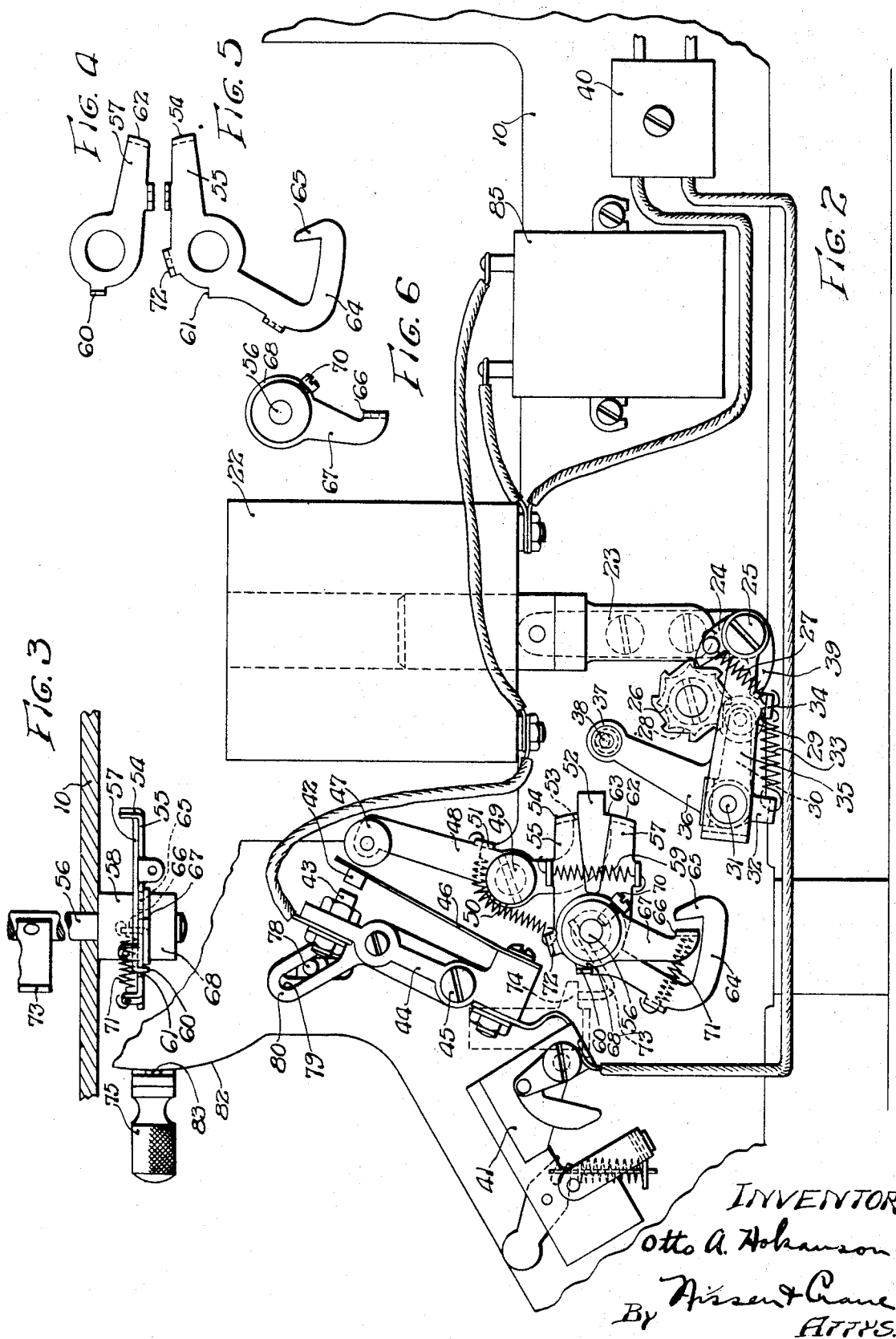
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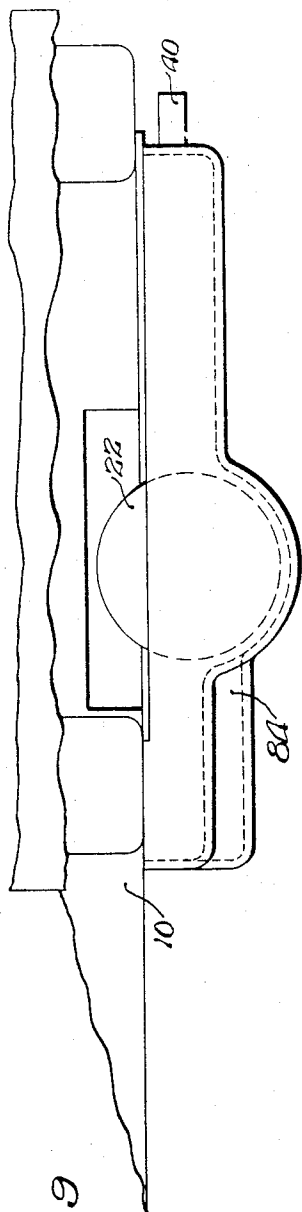


Fig. 9

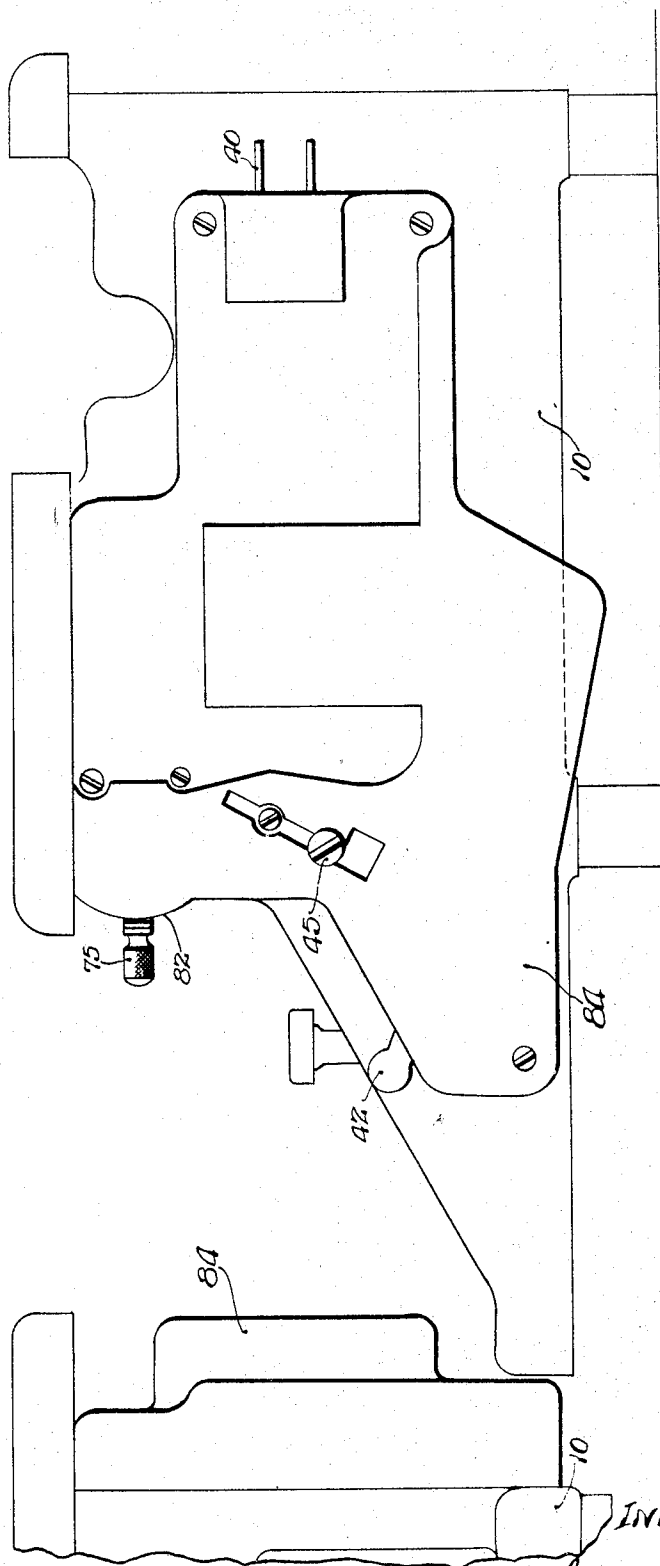


Fig. 8

Fig. 7

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UNITED STATES PATENT OFFICE

1,921,159

POWER ACTUATED TYPEWRITER

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Application September 2, 1925, Serial No. 54,039
Renewed Dec. 26, 1929

9 Claims. (Cl. 197—17)

This invention relates to power mechanism for actuating the type bars and other parts of typewriting machines, and has for its object the provision of such mechanism that will operate only at such time as is necessary to move some part of the mechanism, that will make little noise, that will use a minimum of power, and that will be of improved construction and operation.

The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawings and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawings—

Fig. 1 is a fragmentary vertical section of a typewriter having one embodiment of the present invention applied thereto;

Fig. 2 is a fragmentary side elevation of the typewriter with the side cover removed to show the actuating mechanism;

Fig. 3 is a fragmentary detail in top plan;

Figs. 4, 5 and 6 are details of parts;

Fig. 7 is a side elevation with the side cover in place;

Fig. 8 is a fragmentary front elevation showing the side cover in place; and

Fig. 9 is a fragmentary top elevation showing the side cover in place.

The numeral 10 designates the frame of a typewriting machine having a toothed roller 11 extending transversely of the frame and journaled therein. A bar 12 also extends across the frame and carries a series of pivoted sublevers 13 which engage and operate the type bars 14. Each sublever 13 has an actuator 15 pivoted at 16 thereto and provided with a hook 17 for engaging the roller 11. A spring 18 holds the actuator in an upper retracted position. Adjustable screws 19 register with the actuators and disengage them from the roller at the end of their forward strokes imparted to them by the roller 11 for operating the type bars. The key levers 20 are provided with fingers 21 that move the actuators selectively into engagement with the roller 11. The mechanism thus far referred to is more completely described in my prior application, Serial No. 732,615 filed August 18, 1924, which application issued as Patent No. 1,614,475, granted January 18, 1927, for an Improvement in power actuated typewriters.

In the present invention the roller 11 instead of being continuously rotated is given a step-by-step forward movement, the movement being inaugurated by the depression of the key levers

that cause the actuators to engage the drive roller. The power for rotating the roller 11 is supplied by an electro-magnet 22 provided with a plunger 23 which carries a pawl 24 pivoted to the plunger at 25 and drawn into engagement with a toothed wheel 26 by a spring 27. The wheel 26 is fastened to the roller 11 and is positioned outside of the side walls of the frame. The teeth of the wheel 26 are reversely directed relative to the teeth of the roller 11. A star wheel 28 is secured to the wheel 26 at one side thereof and engaged by a roller 29 carried on an arm 30 pivoted at 31 on the frame. A lug 32 is secured to the arm 30 and a spring 33 connects the lug 32 with a lug 34 on an arm 35. The spring 33 holds the roller 29 against the star wheel 28 to accurately position the wheel 26 and roller 11. The arm 35 is pivoted at 31 and engages the pivot screw 25 to move upwardly therewith when the solenoid is energized. An upright arm 36 is formed integral with the arm 35 and has a fiber or other suitable contact roller 37 adjustably secured to its upper end by an eccentric screw 38. The pawl 24 has a tailpiece 39 integral therewith that strikes the ratchet wheel 26 at the upper limit of the stroke of the solenoid to prevent overthrow.

Current is supplied to the solenoid 22 through a contact plug 40 which is connected through a switch 41 to a pair of contacts 42 and 43. The contact 43 is mounted on an insulation block 44 pivoted to the side of the frame at 45. The contact 42 is carried by a spring 46 mounted on the block 44. A tappet roller 47 is carried on an arm 48 pivoted to the frame at 49. A spring 50 is secured to a lug 51 on the arm 48 and draws the tappet 47 toward the contact 42. The arm 48 has a tailpiece 52 having a shoulder 53 engaged by a detent 54 on an arm 55 pivoted on a rock shaft 56 extending across the frame of the machine. The detent 54 when in engagement with the shoulder 53 holds the tappet 47 in retracted position, as shown in Fig. 2. A second arm 57 shown in Fig. 4 is secured to a collar 58 journaled on the shaft 56. A spring 59 draws the arms 55 and 57 toward each other and their approach is limited by a lug 60 on the arm 57 and a shoulder 61 on the arm 55. The arm 57 carries a detent 62 arranged to engage a shoulder 63 on the tailpiece 52 but positioned adjacent the edge of the shoulder when the detent 54 is in engagement with the shoulder 63. The arm 55 has a tailpiece 64 which carries a tooth 65 in the path of a lug 66 on an arm 67 carried by a collar 68 secured to the shaft 56 by a set screw 70. A spring

71 normally draws the arms 67 and 64 toward each other, but the spring 50 is attached to a lug 72 on the arm 55 and being stronger than the spring 71 holds the detent 54 against the tailpiece 52. The shaft 56 carries a bar 73, Fig. 1, which underlies projections 74 on the key levers 20.

Whenever any key lever is depressed the shaft 56 is given a partial rotation which moves the lug 66 against the tooth 65 and carries said tooth or lug 65 to the right, as shown in Fig. 2. This releases the detent 54 and permits the spring 50 to move the tappet 47 to close the contacts 42 and 43 and permits current to flow through the solenoid 22. The movement of the key lever also positions the corresponding actuator in front of a tooth on the toothed roller 11 and when the solenoid is energized it moves the roller one space to actuate the type bar corresponding to the key lever depressed. The upward movement of the plunger 23 moves the contact roller 37 against the tailpiece 52 and restores it to its initial position at the close of the plunger movement, thus opening the contacts 42 and 43 and deenergizing the solenoid immediately upon the completion of its operation permitting the plunger to return to position for the next operation. Ordinarily the tailpiece 52 will be returned before the key lever can be released so that the detent 54 will still be held up out of the path of the shoulder 53. In this case the detent 62 will engage the shoulder 63 and lock the tailpiece in its restored position until the key is released. The position will be sufficiently retracted because of the offset relation of the shoulders 53 and 63 to permit the detent to move into position behind the shoulder 53 when the key lever is released. The release of the key lever will retract the detent 62 from the shoulder 63 and transfer the holding action to the detent 54 preparatory to the next key depression. Thus each stroke of the key positions the actuator, closes the circuit to energize the magnet to impart a step of rotation to the power cylinder, automatically breaks the circuit at the close of the operation and locks the contact closer in open position.

The contact block 43 is preferably adjustable toward and from the tappet to control the time in the movement of the plunger at which the circuit will be broken and thus regulate the force of the type impression. This adjustment is effected by means of a lever 75 connected at 76 to a link 77 having a pin 78 which projects through the side of the case and engages an inclined slot 79 in a plate 80 connected to the insulator block 44. This provides a simple and efficient arrangement for regulating the force of the impression. The lever 75 may be provided with any desired number of positions determined by openings 81 in the curved portion 82 of the casing for receiving the end of a pin 83 on the adjusting lever.

A cover plate 84 shown in Figs. 8, 9 and 10 encloses the actuating mechanism and is provided with the proper contour to fit the various parts. It will be seen from Figs. 8 and 9 that the mechanism is very compact and does not project from the side of the machine any farther than the top plate of the ordinary hand-operated machine. It is sometimes desirable to provide a condenser 85 in the electric circuit to prevent sparking at the contacts. The condenser may be connected in parallel with the solenoid, as shown.

I claim:—

1. The combination with a typewriter having type bars and key levers, of a rotary power drive, key controlled means for selectively connecting

said type bars with said power drive, a solenoid having a plunger, ratchet mechanism for imparting limited rotary movement to said power drive when said solenoid is energized to move said plunger in one direction, a circuit for energizing said solenoid, a spring actuated tappet for closing said switch, a detent for holding said tappet in retracted position, a key controlled device for releasing said detent, means actuated by said solenoid for retracting said tappet at the close of an operation of said solenoid, and means for automatically retaining said tappet in retracted position.

2. The combination with a typewriter, of a power drive for said typewriter, a solenoid for operating said power drive, a circuit for energizing said solenoid, a spring actuated member for closing said circuit, a pair of detents for holding said circuit-closing means in retracted position, said detents being key controlled to release said circuit-closing means, and means operated by said solenoid for retracting said circuit-closing means, said detents operating to retain said circuit-closing means in retracted position irrespective of the position of the keys of said typewriter.

3. The combination with a typewriter having key levers and type bars, of a solenoid for actuating said type bars, means controlled by said key levers for operatively connecting said type bars with said solenoid, a circuit for energizing said solenoid, a switch for closing said circuit, a device operated by said keys for closing said switch, a movable block on which said switch is mounted, and means for shifting said block to change the position of said switch relative to its actuating device for controlling the closing period of said switch.

4. The combination with a typewriter, of electrically actuated means for operating said typewriter, a switch for controlling said electrically actuated means, a key controlled device for closing said switch, said switch being pivotally mounted on said typewriter for movement toward and away from said key controlled device, and a hand lever for shifting the position of said switch.

5. The combination with a typewriter having key levers and type bars, of a power roller for actuating said type bars, a solenoid for imparting movement to said power roller, actuators controlled by said key levers for connecting said type bars with said power roller, a circuit for energizing said solenoid, a switch movably mounted on said typewriter and interposed in said circuit, a spring actuated member for closing said switch, means for holding said member in retracted position, key controlled means for releasing said holding means, means for adjusting said switch toward and from said spring actuated switch-closing member, and means operated by said solenoid for resetting said spring actuated switch-closing member after the release of said holding means.

6. In a typewriter, the combination with a type bar, of a key lever, electric mechanism for operating said type bar, a switch for controlling said electric mechanism, an automatic switch actuator, latch mechanism for holding said actuator out of operation, means operated by the depression of said key lever to trip said holding means to cause said actuator to operate said switch to effect the operation of the type bar, and means operated by said electric mechanism for restoring said actuator and said switch to their

non-operating positions independently of the position of said key lever.

7. In a type writer, the combination with a type bar, of a key lever, electro-magnetic mechanism for operating said type bar, a switch controlled by the depression of said key lever for effecting the operation of said electro-magnetic mechanism, and means comprising a lever in an accessible position on the typewriter for adjusting the position of said switch to regulate the type bar impression.

8. In a typewriter, the combination with a type bar, of a key lever, a power drive, means for connecting said power drive to said type bar upon depression of said key lever, electric mechanism for operating said power drive, a switch controlled by the depression of said key lever for effecting the operation of said electric mechanism, and a lever in a position accessible to the operator for controlling the timing of the operation of said switch to regulate the impression of the type bar.

9. In a typewriter, the combination with a plurality of type bars, of a plurality of key levers, a power roller, means for connecting said power roller to said type bars upon depression of said key levers, a solenoid, means connected between said solenoid and said power roller to drive the latter, a switch for controlling the energization of said solenoid, an automatic spring-actuated device for closing said switch, means for holding said device in retracted position, means connected to said key levers for releasing said holding means to cause said device to act automatically to close said switch, and means operated by the said solenoid for restoring said device to its retracted position and said holding means to its holding position while said switch moves to open position to effect de-energization of said solenoid.

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