

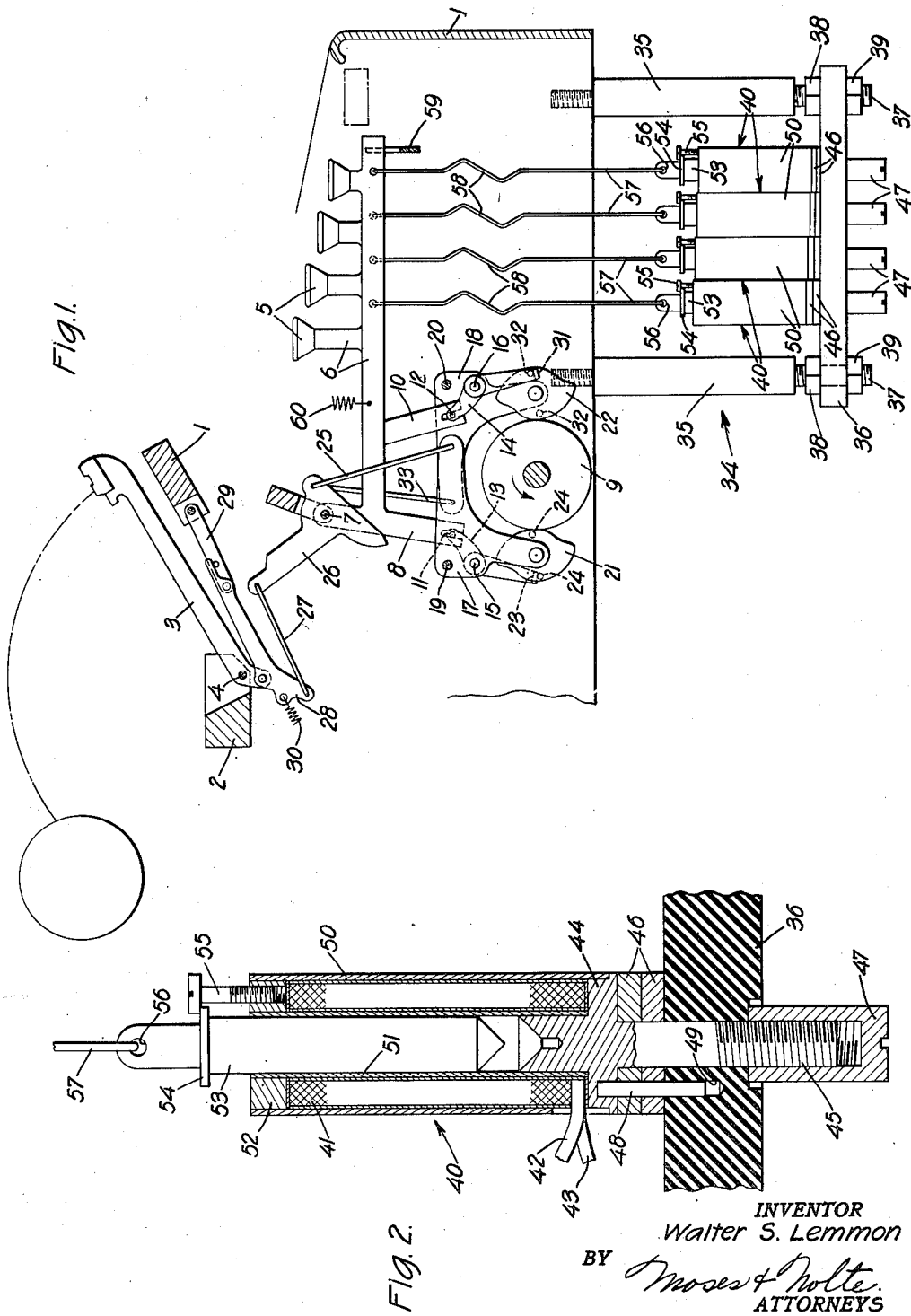
Jan. 5, 1937.

W. S. LEMMON

2,066,786

POWER OPERATED RECEIVER OR RECORDER

Filed June 22, 1933



UNITED STATES PATENT OFFICE

2,066,786

POWER OPERATED RECEIVER OR
RECORDER

Walter S. Lemmon, New York, N. Y., assignor,
by mesne assignments, to International Business
Machines Corporation, New York, N. Y., a
corporation of New York

Application June 22, 1933, Serial No. 677,018

5 Claims. (Cl. 197-5)

This invention relates to a power operated receiver or recorder adapted to be tripped by electrical impulses received from a remote point and operated to type a received message or other matter to be reproduced. The machine embodying the invention may be located at a point far distant from the transmitter or it may be located in the same room with the transmitter. In the former case the receiver is used for telegraphing or radio-graphing; in the latter, merely for duplicating.

It is a feature of the invention that the typing instrumentalities are merely tripped by the received electrical impulses, and that the power required for driving the type bars and the other operating parts is supplied from a suitable source of power. The machine is adapted, therefore, to type the received message in a uniform manner regardless of the varying degrees of damping or fading which may occur in transmission. It is feasible with such an apparatus to apply the received signals directly or with uniform amplification to the operation of the typing means, without the intervention of punching instrumentalities for preparing a control tape or ribbon.

Other features of the invention relate to the provision of suitable electromagnetic means for operating the key levers and to the arrangement and adjustment of such means for assuring proper and dependable operation.

Other objects and advantages will hereinafter appear.

In the drawing forming part of this specification,

Figure 1 is a fragmentary, sectional elevation illustrating a portion of a power operated typewriter having the improvements of the present invention applied thereto, and incorporated therein; and

Figure 2 is a fragmentary, sectional elevation on a larger scale than Figure 1, illustrating details of construction and mounting of a single one of the electromagnetic units.

The invention is illustrated as built into a power operated typewriter of standard construction. The illustrated machine is known as the Electromatic typewriter, and is characterized by the fact that the type bars do not have to be driven by force supplied by the operator, the keys being operated merely as triggers, and the power for driving the parts being supplied from a suitable source of power.

Briefly, the machine comprises a frame 1, in which the type segment 2 is mounted. Type bars 3 are pivotally mounted upon a wire 4 that passes through the segment 2.

The keys 5 are carried by key levers 6 which are pivoted upon a rod 7. Some of the key levers have tails 8 which extend downward to the rear of a continuously running roller 9, and the other key levers have tails 10 which extend downward in front of the continuously running roller 9. The tails 8 and 10 are bifurcated and embrace, respectively, pins 11 and 12 carried by bellcranks 13 and 14. The bellcranks 13 and 14 are pivoted respectively at 15 and 16 upon other bellcranks 17 and 18. The bellcranks 17 and 18 are pivoted at 19 and 20, and carry at the lower ends thereof, rotary cams 21 and 22. The bellcrank 13 is provided at the lower end thereof with a lip 23 which normally stands in the position illustrated in Figure 1, wherein it obstructs one of two pins 24 carried by the cam 21, and thus prevents rotation of the cam. When a key lever 6 is depressed for rocking one of the tails 8 rearward, the associated bellcrank 13 is rocked counter-clockwise to move the lip 23 clear of the pin 24. The cam 21 stands in engagement with the roller 9, which roller is continuously rotated in a counter-clockwise direction. As soon as the lip 23 is moved to a non-obstructing position, the roller 9 becomes effective to rotate the cam 21 through a half revolution. By the time that the cam has turned through a half revolution the lip 23 has been returned to position to intercept the other pin 24 on the cam, and so arrest rotation of the cam. The rotation of the cam, however, serves to rock the bellcranks 17 in a clockwise direction. The bellcrank is thus caused to pull downward upon a link 25. This rocks a further bellcrank 26 in a clockwise direction, causing it to act through a link 27 to pull forward upon another bellcrank 28. The bellcrank 28 is connected to the tail of the type bar 3, and serves to operate the type bar. The motion of the bellcrank 28 is controlled in part by a link 29 which is pivoted to bellcrank 28 and to the frame 1. A contractile spring 30 connected to the bellcrank 28 tends to restore the parts to the positions indicated in Figure 1.

The tails 10 which are carried by other key levers act in a similar manner to withdraw a lip 31 from obstructing relation to pins 32 provided on the cam 22. This results through the bellcrank 18 and link 33 in the operation of the appropriate type bar in the manner already described.

The description up to this point has had to do only with those parts which are standard parts of the Electromatic typewriter.

For the purpose of tripping the key levers from a remote point of control, provision is made of an

attachment unit 34. This unit comprises a plurality of depending rods 35 which are secured to the frame 1 and which support at their lower ends an insulating plate 36. Each of the rods 35 has a reduced threaded portion 37 at the lower end thereof. The plate 36 is impaled upon these reduced threaded portions and is clamped in place by upper and lower nuts 38 and 39. The nuts 38 and 39 may obviously be adjusted to raise and lower the insulating plate 36. The insulating plate 36 carries all of the remaining parts of the attachment device. The adjustment of plate 36 is therefore adapted to effect adjustment of the other parts as a unit.

The insulating plate 36 carries a multiplicity of electromagnets 40, one for each key lever and one for each additional part such as the space bar and the carriage return mechanism that may require operation. Each electromagnet 40 comprises a coil 41 which is connected through conductors 42 and 43 in a suitable circuit. The coil 41 is supported upon a metallic base 44 having a threaded stem 45. The stem 45 passes downward through compressible rubber washers 46 and through the insulating plate 36. A cap 47 is threaded upon the lower end of the stem 45 and may be turned to adjust the normal vertical position of the coil 40. The rubber washers 46 are compressed more or less according to the adjustment of the cap 37 and are made yieldable for the purpose of enabling such adjustment to be made. A pin 48 secured in the base 44 extends downward through the washers 46 and is received in a hole 49 formed in the insulated plate 36. The pin 48 prevents rotation of the coil 41. The coil 41 is enclosed between non-conductive cylinders 50 and 51, and between the upper ends of the cylinders provision is made of a ring 52.

A movable core or armature 53 of magnetic materials is received within the coil 41. The core 53 is provided with a collar 54, which collar is adapted to be engaged with the lower face of the head of a screw 55. The screw 55 is threaded into the ring 52 and may be adjusted to control the upper limit of movement of the core 53. The core 53 has an eye 56 provided at the upper end thereof. This eye receives a rod 57 which extends upward from the core 53, and which forms a connection between the core and one of the key levers 6. The electromagnetic mechanism and the connecting means described is duplicated for each of the key levers.

Each rod 57 has a bent portion 58 formed in it so that it will not be rigid and unyielding. Thus at the moment when the circuit through an electromagnet is first closed, when the minimum current is available and the maximum air gap and the maximum inertia of the key lever all concur to promote sluggish operation, the rod is permitted to stretch slightly. This permits the air gap to be reduced and facilitates the quick application of a substantial force for pulling the key lever downward. The curved portion of the key lever also comes into play when the key lever is arrested by a stop 59 at the lower limit of its movement. If, when the key lever is arrested, the electromagnet is still pulling downward on the core, or the core is still tending to travel downward as a result of the momentum previously gained, the curved portion 58 of the connecting rod 57 yields to ease the strain upon the parts.

Springs 60 connected to the key levers act as usual to return the key levers to their normal positions. The screws 55 are so adjusted on the

various electromagnets that a uniform relation of the core to the coil is secured. The caps 47 are adjusted to effect individual adjustment of the electromagnets. The parts are adjusted in such a manner that the rods 57 hold the collars 54 up against the lower faces of the screws 55. The rods 57 are themselves held barely under tension by the adjustment secured.

It may be desirable from time to time to adjust the electromagnetic mechanism as a unit. For this purpose the nuts 38 and 39 may be adjusted up or down.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims and in which references are made to the type bars as instrumentalities and the bell crank members and associated linkages as power operated devices individual to said instrumentalities.

I claim:

1. In a power operated receiver or recorder, including a frame, a multiplicity of operating instrumentalities, power operating devices individual to such instrumentalities, and a keyboard comprising a multiplicity of keys each adapted to selectively trip one of the power operating devices; a multiplicity of separate electromagnetic units for operating the respective key levers, each having a lost motion connection with the associated key lever, said separate units being all assembled in a single compact, composite unit and a common supporting plate for said separate units attached to the frame, each separate unit including a compressible base member resting on the supporting plate, a stem extending through the supporting plate, and an adjustable clamping member cooperating with the stem to compress the base member more or less and thereby to adjust the vertical position of the unit.

2. In a power operated receiver or recorder, in combination, a multiplicity of instrumentalities, power operated devices individual to such instrumentalities, a keyboard comprising a multiplicity of keys each adapted to trip one of the power operated devices, electromagnetic devices associated with each key, and connecting means comprising a link or rod between each of the electromagnetic devices and the associated keys including lost motion means which form an integral part of the connecting means to permit the electromagnetic device to gain momentum before operating the associated key said lost motion means comprising a bent portion in said link or rod.

3. In a power operated receiver or recorder, in combination, a multiplicity of instrumentalities, power operated devices individual to such instrumentalities, a keyboard comprising a multiplicity of keys each adapted to trip one of the power operated devices, and a multiplicity of separate electromagnetic units associated with the respective key levers, said units being all assembled in a single compact composite unit and secured beneath the keyboard and connecting means comprising a link or rod between each of said units and key levers to operate the respective key levers, said connecting means including lost motion means which form an integral part of said connecting means and comprises a bent portion in said link or rod.

4. A remote controlled unit comprising a plurality of instrumentalities, a plurality of controlling key levers, operated means disposed between

said instrumentalities and key levers whereby the depression of the key levers are effective to operate the associated instrumentalities, electromagnetic devices, and connecting means comprising a link or rod between said electromagnetic devices and the key levers including lost motion means which form an integral part of the connecting means to permit the electromagnetic device to gain momentum before operating the associated key lever said lost motion means comprising a bent portion in said link or rod.

5. A remote controlled unit comprising a plurality of instrumentalities, a plurality of controlling levers therefor, electromagnetic devices, and connecting means comprising a link or rod between said devices and levers including lost motion means which form an integral part of the connecting means to permit the electromagnetic device to gain momentum before operating the said levers said lost motion means comprising a bent portion in said link or rod.

WALTER S. LEMMON.