Nov. 3, 1936. A. SALZBERGER ET AL 2,059,537

POWER DRIVEN TYPEWRITIMG MACHINE

Filed Aug. 19, 1935 2 Sheets-Sheet 1

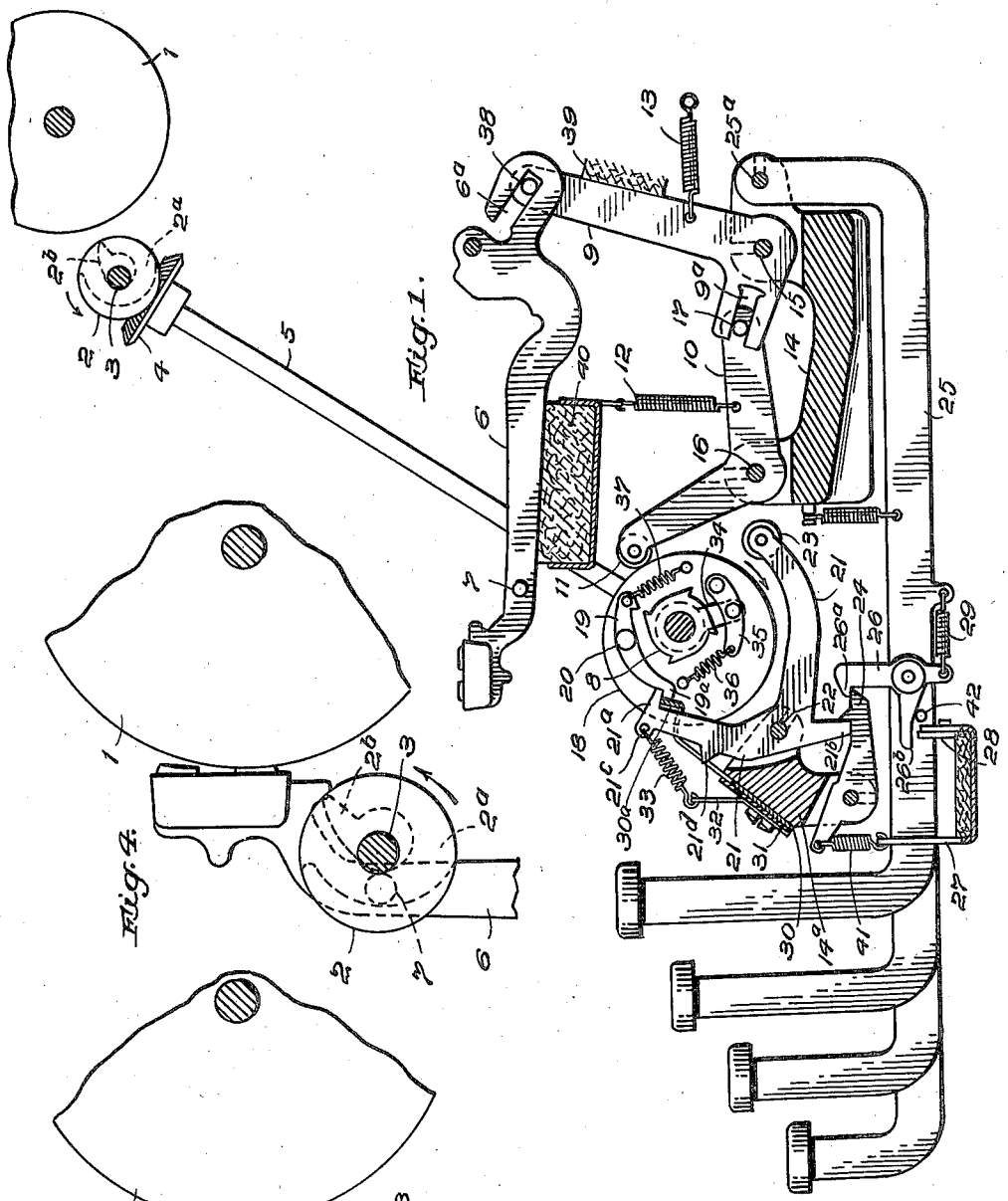


Fig. 1.

Fig. 4.

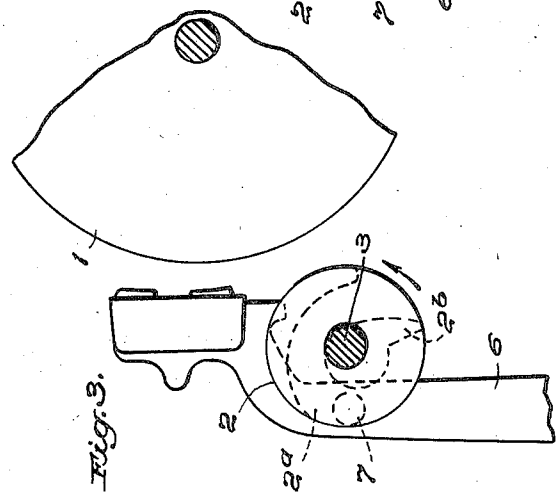


Fig. 3.

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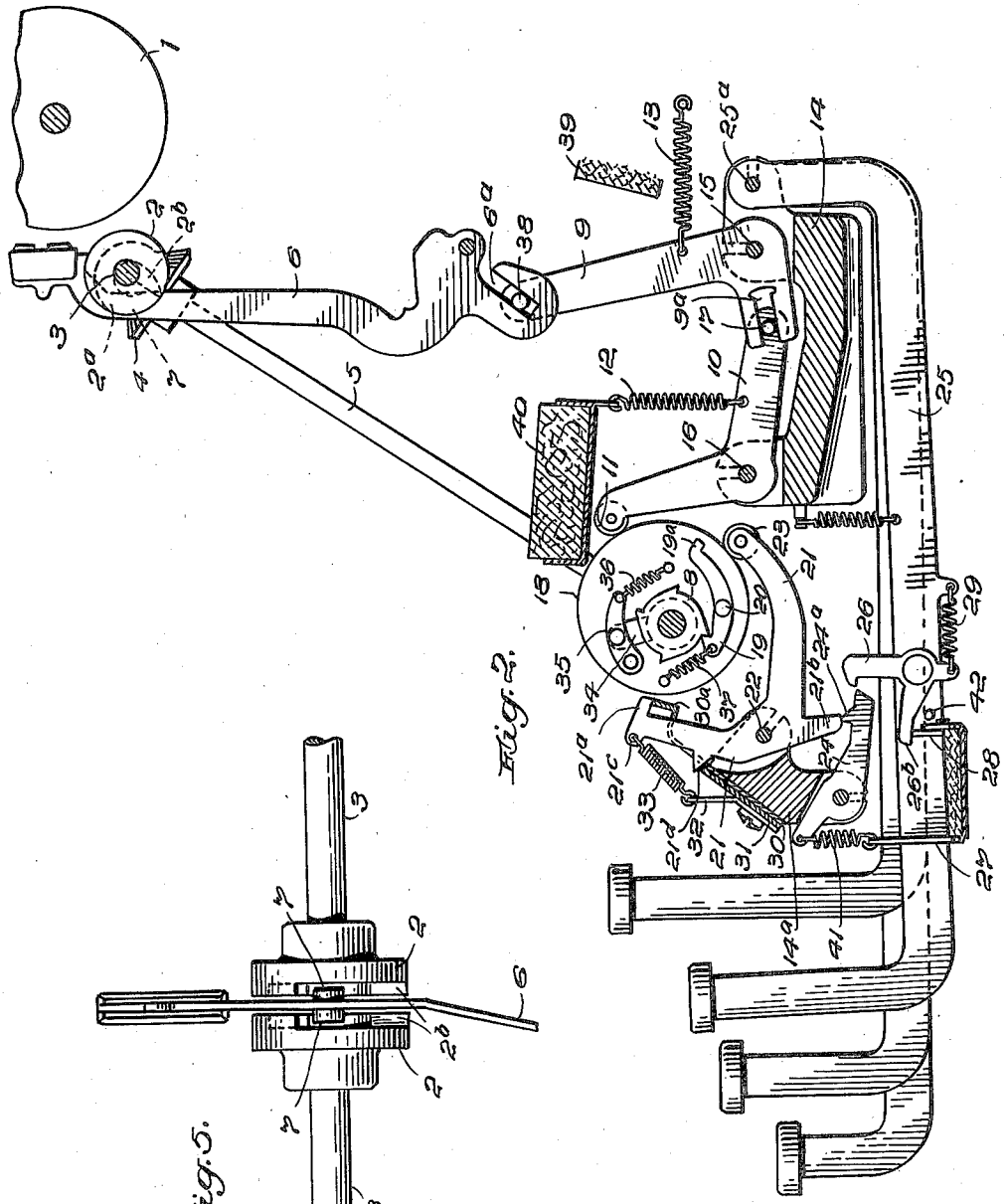


Fig. 2.

Fig. 5.

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POWER-DRIVEN TYPEWRITING MACHINE

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11 Claims. (Cl. 197—17)

The object of the present invention is to present a power-driven, noise-dampened type-lever writing machine, the type-levers of which are lifted by being coupled with a rotating shaft.

There are already known power-driven type-lever writing machines, in which the type-levers are lifted, and pressed against the paper roller, by means of rotating eccentric disks which can be coupled with the type-lever rods, but in these known machines neither a sufficient sling-force of the type-levers is obtained, nor is the pressure produced by the types at the imprint place sufficient to effect the required noise-dampened imprint.

There exist also power-driven writing machines, in which the type-levers lifted manually in the usual manner by a depression of the keys are intercepted by a catching device producing an imprint on the paper by the intermediary of a power-driven eccentric. Also push-rod writing machines have become known, the types of which are intercepted in a similar manner and are thrown against the paper roller at the lower portion of the same. In both cases the power-drive is, however, thrown into gear by the type-carrier only when the type-lever touches or shortly before it touches the catching device. Apart from the longer key stroke required by this manner of operation, and from the greater expenditure of hand-power required for throwing the power drive into gear, much time gets lost by the retarded coupling-in, the masses are not quickly enough accelerated and no increased writing speed can be attained.

The object of the present invention is to overcome the above-mentioned drawbacks and to obtain, simultaneously with full utilization of the source of power for the entire type-lever stroke, a noise-dampened imprint, as well as a continuous speed-movement of the type-levers, these effects being obtained by the provision of a pressing-on device arranged near to the writing place of the paper roll, in front of the same rotating during the entire type-lever movement, and being in a corresponding positive driving connection with the coupling shaft, that pressing-on device taking hold of the type-lever at the end of its stroke and pressing it against the paper roller. As pressing-on device or member especially a rotating cam is employed which presses against the type-lever possibly near to the imprint place, viz. at the head of the type.

In order to warrant the positively corresponding co-operation of said pressing-on cam and the type-lever lifting device, as well as a soft and noiseless introduction into the path of the moving cam, there has here been chosen the known type-lever drive comprising an eccentric disk and a toothed shaft with which this disk can be coupled, the pressing-on cam receiving the type-lever from said driving member in the proximity of the upper dead-centre position of the eccentric, the number of teeth of the shaft corresponding to the number of revolutions of the pressing-on cam.

By means of the eccentric motion it is not necessary to transmit any appreciable power. The entire type driving and feeding rods can be easily made and permits increased speeds owing to the slight masses, whereas the pressing-on gearing with its smaller and merely rotating members can have larger dimensions without any drawback resulting therefrom.

Provision is also made that the engagement of the catch-pawl with the eccentric disk, as well as the disengagement of these members, takes place noise-damped, without a hard impact.

The invention is illustrated diagrammatically and by way of example on the accompanying drawings, on which

Figure 1 is a transverse section through a power-driven type-lever writing machine designed according to this invention, the type-levers being shown in their position of rest.

Figure 2 is a similar representation, the key-lever being, however, depressed and the type-levers being lifted up to the cam.

Figure 3 is a side-view of a type-lever head in lifted position, at the place of entrance into the cam.

Figure 4 is a similar view, the type-lever head being pressed against the paper roller by the cam, and

Figure 5 is a front view of the cam with the type-lever head in operated state.

On the drawings, 1 denotes the paper roller and 2 is the pressing-on cam for the type-levers. This cam consists of two individual disks 2a attached to the inner end of two shafts 3 which extend from both sides to the middle of the machine. The outer ends of the shafts 3 are equipped with screw-wheels meshing with similar screw wheels 4 secured to a connecting axle 5 transmitting the power from the source of power (not shown). On the drawings said wheels have, for the sake of greater distinctness, been drawn as bevel-wheels. The lower connection between the axle 5 and the continuously rotating shaft 8 of the power drive consists likewise of screw-wheels also omitted in the drawings.

The type-levers 6 are below the type head provided on both sides with projections 7 constituted, for instance, by bolts or by small rolls, and each cam-disk 2a has at its inner side a curved groove into which the respective projection 7 can enter and by which the appertaining type is pressed against the paper roller in order to produce an imprint.

The driving power is transmitted by a toothed shaft 8, and the number of revolutions and the adjustment of the cam 2 is so chosen that every tooth of the shaft 8 corresponds to one revolution of the cam 2 so that a type-lever lifted up to the cam meets always the entrance end of the curved grooves. In order to accelerate the reverse motion of the type-levers 6, said grooves terminate at sling cams 2^b whereas the oppositely located side of the groove wall is well rounded off to obtain a quick exit of the roll 7 out of said groove. The strength of the imprint can be varied by appropriate adjustment of the paper roller.

In order to allow of lifting the type-lever possibly sling-free up to the cam 2, safety members constituted by springs 12 and 13 acting counter to the direction of lifting are provided at the members 9 and 10 serving for moving the type-levers. The lifting motion proper is produced gradually by means of an eccentric disk 18 by the intermediary of the two double-armed levers 9 and 10 supported by pivots 15 and 16 in the frame 14 of the machine. The lever 9 engages by means of a bolt 38 in known manner the slot 6^a of the type-lever, and has in its lower leg a slot 9^a which receives the bolt 17 of the lever 10, the other leg of this lever carrying a roll 11 that contacts with the rotating eccentric disk 18.

In Fig. 1 the lever 10 is shown with its roll 11 in contact with the eccentric, the latter being in its position of rest. The bolt 38 does not impact to the end of the slot 6^a, but, in order to obviate noise, the back of the lever 9 contacts with a soft piece 39 similar to the soft supporting piece 40 provided for supporting the type-levers.

The eccentric disk 18 is designed as a coupling disk for connecting with the toothed shaft 8, in that it is provided with a pawl 19 pivoted about the pin 20. The tooth of the pawl is continually drawn into the toothing of the shaft 8 by means of a tensile spring 37. The pawl 19 is prolongated beyond its fulcrum for the purpose of uncoupling, and is provided with a rectangular extension 19^a serving as end-abutment for the revolution of the disk 18. Said prolongation forms on its back or outer side an elevation which when the members concerned are disengaged, as in Fig. 1, corresponds about with a part of a circle having the axis of the toothed shaft as its centre, whereas when the members concerned are in their operative position, as in Fig. 2, a member entering into the path of the back is opposed by a rising curve.

At the part 14^a of the frame of the machine is located on a pivot 22 a double lever 21 which is turnable in the direction of motion of the eccentric disk 18; one of the legs of said lever embraces the eccentric and carries a roll 23 located in the path of the eccentric 18, whereas the other leg extends upwards and has a nose 21^a that can be turned into the path of the pawl 19. When said nose is in this position (Fig. 1) it contacts with the back of this pawl and depresses it whereby the tooth of the pawl is disengaged from the toothing of the shaft 8. The lever 21 is maintained in this position by a ratchet-pawl 24 which is likewise supported at the part 14^a of the frame and is subject to the action of a spring 41 and assumes, under this action, a position in front of the downwardly directed lug 21^b of the double-lever 21.

The position of rest of the parts described is released by the key lever 25 which is supported on a pivot 25^a at the frame 14 of the machine and to which is pivoted a trigger-pawl 26 having a nose 26^a taking over a lug of the ratchet-pawl nose 24^a. When the key-lever 25 is depressed, the nose 26^a pulls the ratchet-pawl 24 downwardly with it until a horizontal leg 26^b of the trigger pawl 26 pushes upon an adjustable abutment member 28 attached to the comb-shaped guide member 27, counter to the action of a spring 29, whereby the vertical leg of the nose 26^a is stripped off from the ratchet-pawl 24. The position of these members with respect to one another is then that shown in Fig. 2. On the return movement of the key-lever 25 the trigger pawl 26 is again moved into its original position, i. e. its position of rest, by said spring 29 in which position it contacts with an abutment pin 42.

In the meantime the ratchet pawl 24 has been drawn off downwardly, together with its nose, from the downwardly directed nose 21^b of the double-lever 21 by the downward movement of the pawl 26. The vertical leg of the double-lever 21 is provided, besides with the nose 21^a for the end abutment, with an eye 21^c and a lug 21^d. In front thereof, at the part 14^a of the frame, is screwed to this part a guide member 30 of sheet-metal, an abutment member 31 likewise of sheet-metal, and a member 32 provided with an ear. To this ear and to the ear 21^c of the double-lever 21 is attached a tensile spring 33 which draws said lever forwardly so as to bring the nose 21^d into contact with the edge of the abutment sheet-metal member 31. The sheet-metal guide member 30 is provided on that side where there is the toothed shaft with a rectangularly bent-off portion 30^a which only loosely contacts with the frontal side of the lug 19^a, in such a manner, that when the end-abutment 21^a is being lifted the pawl 19 is slightly pressed against the face of the lug 19^a by the action of the spring 37. The pawl cannot, therefore, engage the shaft 8 at once and cannot, thus, be torn by an early action of the toothed shaft against the not yet completely removed end abutment member 21^a.

Initiating the rotary movement of the eccentric is effected in a soft and gradual manner by means of a small brake block 34 which continually slides in a groove of the toothed shaft under the action of a pressure-lever 35 and a tensile spring 36 which two members are attached to the eccentric disk. The pressure to which said small block is subjected, or the frictional force respectively, is so chosen that only shortly after the abutment 21^a has left that position in which it could act as abutment, the toothed shaft 8 has taken the disk 18 along with it so far that the pawl 19 fully engages its mate and is now taken round by the toothing with the usual speed of this shaft.

Also if the key lever is held depressed for a longer period of time, the eccentric disk should not perform more than one rotation. It has, for this reason, been provided that the uncoupling of the drive is every time effected by making the eccentric disk 18 contact with the roll 23. The long arm of the lever 21 is then depressed, the rear of the nose 21^b slides over the back of the nose 24^a, the ratchet lever 24 gives way downwardly and finally the nose 24^a jumps so as to arrive in front of the nose 21^b and holds the double-lever 21 and, thus, also the end abutment member 21^a fast in its locking position, as in Fig. 1.

Mention must be made of the feature that also the stopping of the eccentric disk 18 is not effected by a hard impact of the lug 21^a of the double-lever at the bent-off portion 19^a of the

pawl. In fact, prior thereto the lug 21a touches slightly the exterior curved back of the pawl in the proximity of the pivot 20, and this curve is so shaped that the pawl is forced out of the toothing of the shaft 8 already about in the middle portion of the pawl prolongation so that the impact in the end position is effected only by said pawl being taken along by reason of the braking action exerted by the small block 34.

We claim:—

1. A mechanism for obtaining noise-dampened imprints of the type-levers of a power-driven type writing machine comprising in combination with the type-levers a power-driven rotating device adapted to lift the selected type-lever, a paper-roller against which said levers are pressed, and means arranged before said rotating device, adapted to take hold of the type-lever just being actuated at the end of its stroke and to press it against said roller, said means rotating continually during the entire type-lever movement and being in positive operative connection with the power-driven rotating device.

2. A mechanism as specified in claim 1, in which the said means is constituted by a rotary cam pressing upon the type-lever near to the place of writing.

3. A mechanism as specified in claim 1, in which said means is constituted by a rotary cam pressing upon the type-lever near to the writing place and comprising two rotary cam disks rotating parallel to the path of the type-lever and in which lateral projections at both sides of the type-lever at the upper end of the same are provided adapted to engage said cam discs.

4. A mechanism as specified in claim 1, in which said means is constituted by a rotary cam pressing upon the type-lever near to the writing place and comprising two rotary cam disks rotating parallel to the path of the type-lever and in which lateral projections at both sides of the type-lever at the upper end of the same are provided adapted to engage said cam discs, said cam discs having each a curve adapted to draw the type-lever forwardly against the paper roller and another curve adapted to sling it rearwardly.

5. A mechanism as specified in claim 1, in which said means is constituted by a rotary cam pressing upon the type-lever near to the place of writing, and in which the type-lever lifting device is constituted by a toothed shaft and an eccentric disk adapted to be coupled with said shaft, the toothing of said shaft comprising as many teeth as said cam performs revolutions during one revolution of the shaft.

6. A mechanism as specified in claim 1, in which said means is constituted by a rotary cam pressing upon the type-lever near to the place of writing, and in which the type-lever lifting device is constituted by a toothed shaft and an eccentric disc adapted to be coupled with said shaft, the toothing of said shaft comprising as many teeth as said cam performs revolutions during one revolution of the shaft, said rotary cam and disc being so timed that the rotary cam seizes the type-lever when the eccentric disc is in the proximity of its upper dead-centre position.

7. A mechanism as specified in claim 1, in which the type-lever lifting device comprises a toothed shaft, an eccentric disc and means adapted to couple said shaft with said disc and comprising a pawl attached to the lifting disc and adapted to engage the toothing of said shaft and a stationary abutment member acting upon said pawl, said pawl and abutment member being so devised that said pawl is prevented from engaging the toothing of the toothed shaft until the rotary motion of the disc has been initiated.

8. A mechanism as specified in claim 1, in which the type-lever lifting device comprises a toothed shaft, an eccentric disc and means adapted to couple said shaft with said disc and comprising a pawl attached to the lifting disc and adapted to engage the toothing of said shaft and a stationary abutment member acting upon said pawl, said pawl and abutment member being so devised that said pawl is prevented from engaging the toothing of the toothed shaft until the rotary motion of the disc has been initiated and braking means arranged on said disk being in frictional engagement with the shaft and taking the disc along with the shaft to initiate its rotary motion.

9. A mechanism as specified in claim 1, in which the type-lever lifting device comprises a toothed shaft, an eccentric disc and means adapted to couple said shaft with said disc and comprising a pawl attached to the lifting disc and adapted to engage the toothing of said shaft and a stationary abutment member acting upon said pawl, a nose forming a part of said abutment member and a curved back on said pawl adapted to be engaged by said nose when entering into the path of said pawl and to lift, prior to the eccentric disc arriving in its end-position, said pawl out of the toothed shaft and braking means arranged on said disc being in frictional engagement with the shaft and adapted to turn the eccentric disc into its end-position.

10. A mechanism as specified in claim 1 in which said type-lever lifting rotating device is constituted by a toothed shaft and an eccentric disc adapted to be coupled with said shaft and in which a pawl is provided attached to the eccentric disk and adapted to engage the teeth of the shaft and means are provided for controlling said device consisting of a member hinged to the frame of the writing-machine and lying on the one hand in the path of the eccentric disc and on the other hand in the path of the pawl and being adapted to be engaged by said disc and to be brought into locked checking position by it at the end of each revolution.

11. A mechanism as specified in claim 1, in which said type-lever lifting rotating device is constituted by a toothed shaft and an eccentric disc adapted to be coupled with said shaft and in which a pawl is provided attached to the eccentric disk and adapted to engage the teeth of the shaft and means are provided for controlling said device consisting of a member hinged to the frame of the writing-machine and lying on the one hand in the path of the eccentric disc and on the other hand in the path of the pawl and being adapted to be engaged by said disc and to be brought into locked checking position by it at the end of each revolution, a key lever, a second pawl hinged to the key-lever and having a nose; a third pawl adapted to engage said nose and to lock the said member and an adjustable abutment member provided at the frame of the machine and adapted to turn the second pawl into its disengaging position when the key-lever is depressed, whereby also the third pawl is disengaged.

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