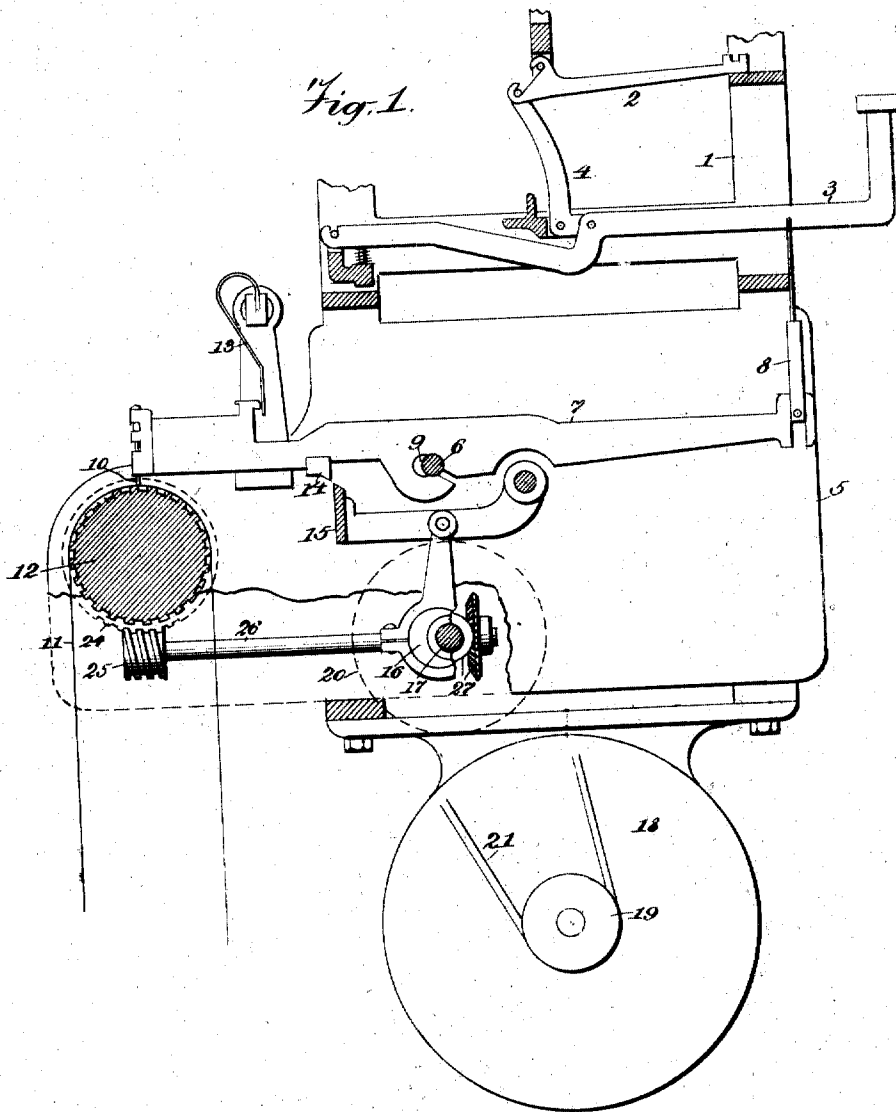


E. S. JOHNSON & J. L. RHEA.
 AUTOMATIC TYPE WRITER ACTUATOR
 APPLICATION FILED AUG. 1, 1917.

Patented Oct. 8, 1918.
 3 SHEETS—SHEET 1.

1,281,252.



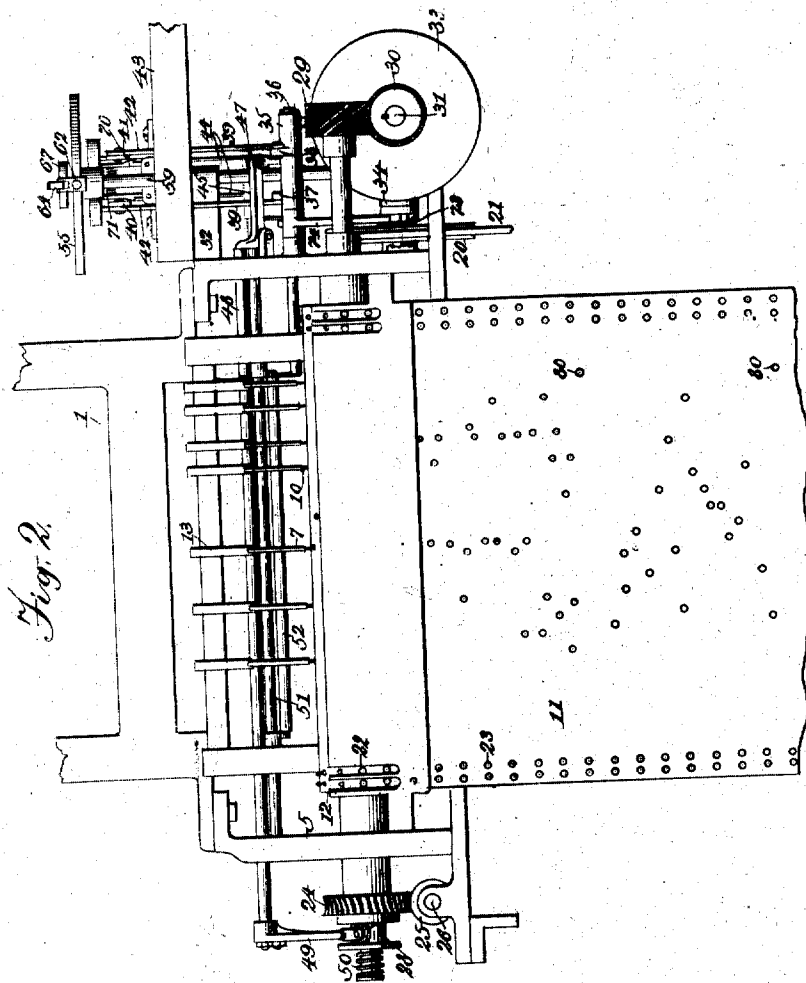
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Fig. 3.

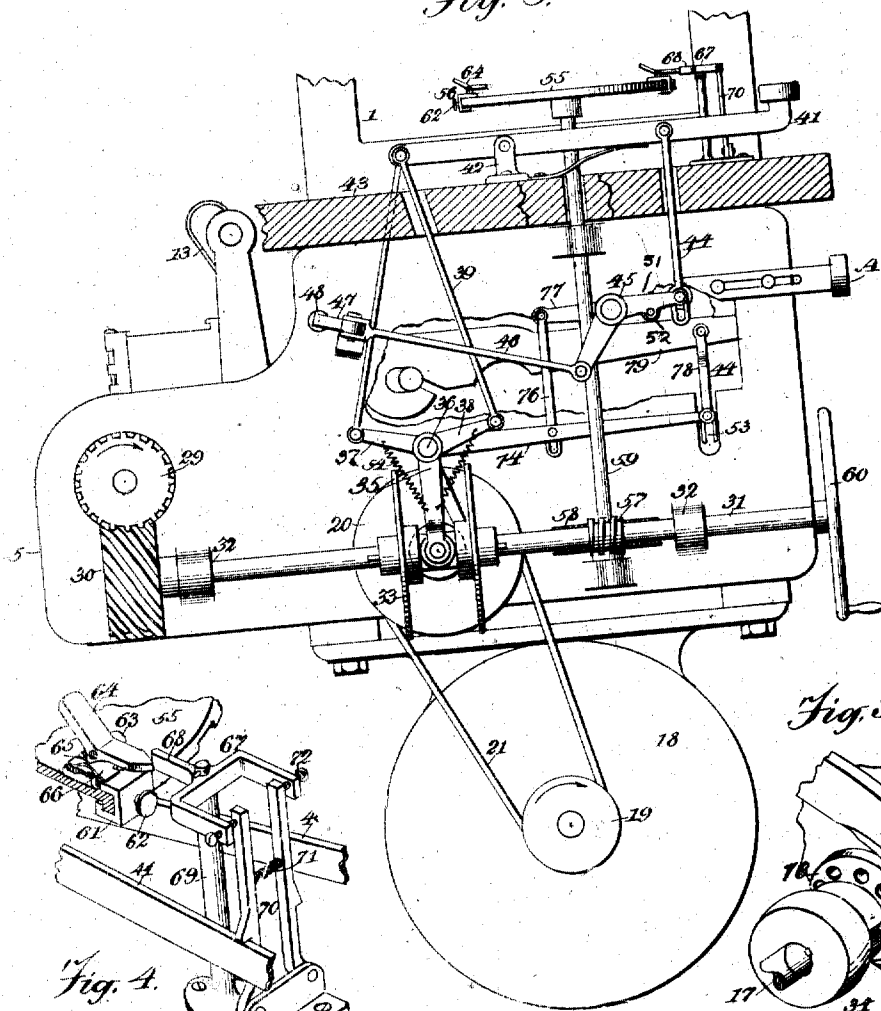


Fig. 4.

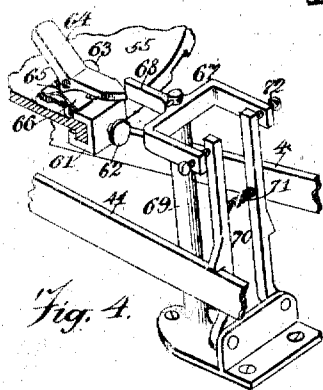
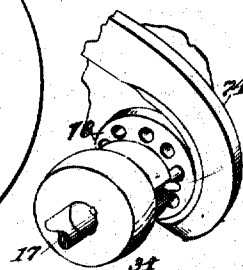


Fig. 5.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC TYPE-WRITER ACTUATOR.

1,281,252.

Specification of Letters Patent.

Patented Oct. 8, 1918.

Substitute for application Serial No. 54,629, filed October 7, 1915. This application filed August 1, 1917.
Serial No. 184,987.

To all whom it may concern:

Be it known that we, ERNEST S. JOHNSON and JOSEPH L. RHEA, citizens of the United States, residing at Webster City, in the county of Hamilton, State of Iowa, and Council Bluffs, in the county of Pottawattamie and State of Iowa, respectively, have invented certain new and useful Improvements in Automatic Type-Writer Actuators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to typewriters adapted for mechanical operation for the production of duplicate matter such as "form letters" and the like, through the medium of a perforated sheet and correlating mechanism cooperating with the keys of a typewriter.

The object of this invention is to provide means whereby the typewriter may thus be operated mechanically and automatically, and may be quickly shifted from one set form to another, as the same may be arranged on a continuous sheet. As at present constituted, the machine is adapted to special and limited correspondence, in which a form letter as a whole is duplicated, the machine being set to the beginning of such form letter for each automatic operation. This invention contemplates the arrangement of the matter to be typewritten in a series of form-words, sentences, paragraphs, or other divisional parts of a letter or document, on a continuous perforated sheet, and mechanism adapted to quickly shift the sheet forward or back to any predetermined subject matter. Inasmuch as the great mass of commercial correspondence is susceptible of being reduced to a rather large, but still a limited number of set expressions, in a varied and changing order, it thus becomes possible to produce such letters for most purposes, without slavish duplication, and at the same time very rapidly, and by purely mechanical means as regards the writing operation, the operator merely selecting the matter, by a momentary operation, for the machine to automatically produce.

This application is a substitute for a prior one, No. 54,629, filed October 7, 1915, and subsequently abandoned.

In the accompanying drawings, forming a

part of this specification, Figure 1 is a skeleton figure, partly in section, showing so much of the automatic typewriter to which this invention relates as to afford a clear idea of its construction and operation. Fig. 2 is a rear view of such automatic mechanism, together with the selecting mechanism forming the subject matter of this invention. Fig. 3 is a side view, mainly external, illustrating said selective mechanism. Fig. 4 is a fragmentary view in perspective illustrating the starting trip mechanism. Fig. 5 illustrates a simple clutch and its releasing lever, whereby an electric motor is clutched into engagement with the writing mechanism, and disengaged therefrom.

Referring to Fig. 1, the numeral 1 denotes the main frame of a typewriter adapted for "visible writing." This has the usual type-bar 2, key-lever 3, and connection 4 for the actuation of the type-bar in writing. The other parts of the typewriter itself are not necessary to a proper understanding of this invention.

The mechanism for operating the typewriter automatically is connected with a sub-frame 5 on which the typewriter is mounted. Directly below the key-levers 3 is mounted, on a cross-rod 6, a series of levers 7, which, for convenience, may be called master-levers. These connect at their front ends with the key-levers by slip-links 8, which permit independent depression of the key-levers. At the cross-rod their pivot-holes 9 are slotted, so as to permit a little longitudinal movement. At the rear end they are provided with depending pins 10, which in the neutral position ride on the surface of the paper-sheet 11 trained over a fluted roller 12. When a hole in the sheet passes under any pin, the pin is forced into a groove of the roller by a spring 13, and is carried forward by the revolution of the roller far enough to bring the lug 14 of that particular lever into the path of a rapidly vibrating bar 15. After a single blow of the vibrator the master-lever flies back to normal position, having actuated a key-lever to make a single type impression. The vibrator is actuated by an eccentric 16 on a cross-shaft 17 connecting operatively with an electric motor 18 by pulleys 19 and 20, and a belt 21. A slow rotation is imparted

to the fluted roller, which carries the perforated paper sheet, held to exact register by sprockets 22 and marginal perforations 23, by a worm-gear 24, worm 25, shaft 26 and bevel gearing 27. The drive of the roller may be connected and disconnected by a clutch 28. Though not important to this invention, it may be added that one of the master-levers is connected operatively with the motor switch, so as to stop the motor automatically by means of a predetermined stop-hole in the perforated sheet. It is to be understood that in the organized machine the master levers are arranged in a closely associated series, only a few of them being shown in Fig. 2, the better to show mechanism which would be hidden by them.

Referring now to the other figures of the drawing, 2, 3, 4 and 5, the selective mechanism will be described.

In order that the perforated sheet may be moved back and forth to any desired position, the fluted roller must be unclutched from the driving mechanism, and the gang of master-levers must be raised out of contact with the paper. It is also essential to the practical use of the machine that in shifting from one subject matter to another the perforated sheet move rapidly, whereas its normal movement in writing is relatively slow. There must also be some means for easily determining the stopping and starting points, as the sheet is shifted, the former preferably automatic, while the latter is the work of the operator. These main features, together with others, are fully set forth in the description following.

A simple high-speed drive for the paper roller consists of spiral gears 29 and 30, the latter attached to a shaft 31 mounted in bearings 32. Splined to this shaft is a pair of connected friction disks 33 straddling a friction-wheel 34 attached to the end of the shaft 17. The disks may be shifted to the neutral position shown, or into alternate position, by a double bell-crank lever 35 pivoted on a stud 36. The oppositely disposed arms 37 and 38 of this lever connect by links 39 with the respective finger or key-levers 40 and 41, fulcrumed at 42 on the table-top 43. It is evident that the depression on one or the other of the levers will cause the roller to move in one direction, and the same movement of the companion key-lever will reverse such movement. It is first necessary, however, to unclutch the slow driver, and this is done by the depression of either lever, through the medium of a connecting-rod 44, bell-crank 45, connecting rod 46 and bell-crank 47 acting on the transverse shift-rod 48 connecting with the fork 49. The clutch engages automatically by means of a spring 50. It is also necessary to release the master levers from contact with the paper roll, so

that the paper may be run freely in either direction. This is accomplished by the depression of either key-lever acting through a bail 51 having a roller 52 resting on all of said master levers, as shown in Figs. 2 and 3. Assuming the motor to be running in the direction indicated by the arrow in Fig. 3, it will be evident that when the left key-lever (the one shown in said figure) is depressed the master levers are all disengaged, the slow motion clutch is released, and the high-speed drive for the roll is engaged, causing the paper to advance, the fluted roll moving in the same direction as the motor. Depressing the right hand key reverses the movement of the paper. As one key-lever is depressed the other rises, as shown in Fig. 4. To allow for this movement the connecting rod 44 is slotted or forked, as shown at 53. The friction drive may be made elastic by allowing motion of the arms 37 and 38 independently of the fork 35, and connecting them by springs 54.

Of many devices that would serve to indicate starting and stopping positions of the paper, that herein illustrated is regarded as one of the simplest and best. It comprises a disk or dial 55 provided with movable indicators 56 adjustable to any desired predetermined point on the dial. In the case of a manually operated machine these indicators would come, in the revolution of the dial, to a certain point, indicated in any suitable way, when the operator would start the automatic writing mechanism. It is desirable, however, that the starting of the machine to write be automatic, as well as the writing, and the mechanism is shown as adapted for that purpose, the desired slow revolution of the dial being effected by a worm 57 on the shaft 31 engaging a worm-gear 58 on the vertical shaft 59 carrying the dial. A crank-wheel 60 is provided for hand operation. In Fig. 4 is best shown a simple type of indicator adapted to actuate trip mechanism. This comprises a clamp 61 attachable to any point along the flanged edge of the dial, as by a thumb-screw 62. Between upstanding lugs 63 is pivoted an angled finger 64 having a central shoulder 65 bearing on a spring 66, which serves to hold it when tilted to either of its positions. In Fig. 4 it is shown in operative position, while the one at the left in Fig. 3 is in the idle position. In the path of this trip-finger when in operative position is mounted a trip-lever 67. This is in the form of a stirrup, with a tail 68 to engage the finger a little while the latter is moving past it. The stirrup is pivoted to a suitable supporting post 69, and its arms engage upstanding pivoted detents 70 which alternately serve as latches to hold one or the other of the key-levers in depressed position. A spring 71 holds them outwardly, so as to readily engage

their respective key-levers. Nice adjustment of the trip mechanism is secured by means of temper-screws 72. Only two of the trip-fingers are shown, but it is to be understood that as many of them will be provided for the dial as there may be differing sentences, paragraphs, or the like, on the perforated paper sheet.

The action of the machine will now be evident. The indicator being first set in a position on the dial coinciding with the commencement of any desired sentence, the operator has only to depress the proper key-lever (to advance or recede the paper), when the high-speed mechanism is brought into action, feeding the paper rapidly forward or back, and coincidentally turning the dial. When this reaches the predetermined position the detent is tripped, and the release of the key-lever disengages the high-speed mechanism and permits the automatic engagement of the clutch for slow speed, and the restoration of the master-lever to normal writing position. The writing then proceeds automatically until stopped, either by hand, or by suitable stop mechanism, the latter being of course preferable.

A simple means of stopping the writing operation is the disengagement of the pulley 20 from its shaft. This may be done by a clutch 73, of a well-known type, which engages automatically, but is released by a lever 74. The latter is shown pivoted on the stud 36. It connects by a slotted link 76 with an arm 77 of the same lever that releases the other clutch and the master levers, but the depressing of a key-lever serves to engage this clutch while it disengages the other. To disengage this clutch the lever 74 connects by a slotted link 78 with one of the master-levers 79. This coöperates with a stop-hole 80 in the perforated sheet, at the end of the subject matter, as indicated in Fig. 2. When, therefore, the sheet advances, in the writing operation, far enough for the master-lever to engage this stop-hole, the clutch 73 is thrown out of engagement, and the machine stops automatically.

The selective mechanism may also be started, operated and stopped by hand, if desired. A cam-faced push-button serves to disengage the master-levers and the slow-speed clutch, but does not engage the friction drive for high speed. The form-sheet may then be advanced or retracted by the hand-wheel 60.

In practice it is probable that a perforated paper sheet represents the simplest and most satisfactory type of writing-form medium, meaning thereby the pattern or scheme which corresponds to the matter as written, and which coöperates with the typewriter, through suitable mechanism, to produce such written matter. We are aware, however, that other means than a perforated

sheet are available, and the invention is not limited to the use of such perforated sheet, except as the same may be specifically claimed. A principal feature of the invention being means to facilitate the shifting from one writing form to another, it will be evident that the specific nature of the writing controlling medium is of minor importance. Two such perforated forms are herein shown, one being the group of perforations arranged above the upper 80 in Fig. 2, and the other the group below it, and above the lower 80.

It will be evident from the foregoing that the element herein designated as the writing form controls the action of the typewriter, through the medium of intermediate mechanism coöperating with the typewriter keys, the main purpose of this invention being to facilitate the shifting of such writing forms into and out of action. For the sake of brevity in the claims, and to avoid the confusion arising from the use of the word operator, the term actuator will be used to designate the element, or set of elements, through which the subject matter of the writing form or scheme is mechanically transmitted to the keys of the typewriter.

Having thus described our invention, we claim:

1. In an automatic typewriter actuator having writing-forms arranged on a single medium, feed mechanism therefor, indicators corresponding to the various forms, and means connecting the indicators operatively with the form feed, whereby the positioning of the indicators denotes the beginning of any desired form.

2. In an automatic typewriter actuator having writing-forms separately disposed on a single medium, feed mechanism for said medium, indicators coinciding with the various forms, a carrier therefor, and mechanism connecting the feed and carrier, whereby any indicator is moved to a predetermined position, and the beginning of a form is denoted.

3. In an automatic typewriter actuator having a single controlling medium with forms separately disposed thereon, feed mechanism therefor coöperating normally with the writing mechanism, an independent form-feed, means for disengaging the normal feed, and a movable indicator coöperating with the independent feed to denote the commencement of any desired form.

4. In an automatic typewriter actuator having a controlling medium with forms disposed thereon, a normal feed therefor, an auxiliary, faster feed, mechanism to shift from one feed to the other, a lock for the faster feed, and trip mechanism to release the lock and permit the restoration of the normal feed.

5. In an automatic typewriter actuator

having a controlling medium with separate forms thereon, a normal feed therefor, an auxiliary and faster feed, mechanism to shift the feed from normal to faster, a lock for the same, trip mechanism to release said lock, and means for automatically tripping the lock at a predetermined point to release the faster and restore the normal feed.

6. In an automatic typewriter actuator having separately disposed writing forms on a single medium, a normal feed therefor, an auxiliary, faster feed operating backward and forward, automatic mechanism adapted to so actuate the feed, a lock to hold the feed in actuating position, and a trip for the lock releasable at a predetermined point by said actuating mechanism.

7. In an automatic typewriter actuator having multiple writing forms on a single medium, a normal feed for said medium, a faster, backward or forward feed, mechanism to actuate the same automatically, a lock therefor, a lock-trip, a movable indicator connecting with the actuating mechanism to release the trip, and means for setting the indicator to release the trip at a predetermined point.

8. In an automatic typewriter actuator having writing forms on a single medium, a normal feed therefor, an auxiliary feed operable backward or forward, mechanism adapted to actuate the same automatically, means for engaging either backward or forward feed at will and disengaging the normal feed, and means for arresting the auxiliary feed at any desired point and restoring the normal feed.

9. In an automatic typewriter actuator having a controlling writing-form medium, a normal feed therefor, a backward or forward auxiliary feed therefor, automatic

mechanism to operate the same, a lock therefor, a trip for the lock, indicators to denote releasing positions, shiftable in or out of the path of the trip mechanism, and a movable carrier for the indicators, actuated by the mechanism which actuates the feed.

10. In an automatic typewriter actuator having a writing-form medium, a normal feed therefor, an auxiliary feed and mechanism to actuate the same backward or forward automatically, a lock and trip mechanism therefor, means for shifting from one feed to the other, a dial revolved by the actuating mechanism and indicators thereon, said indicators being shiftable in and out of the path of the trip mechanism.

11. In an automatic typewriter actuator having a writing-form medium, normal and auxiliary feeds therefor, means for actuating the auxiliary feed backward or forward, means for shifting from one feed to the other, a clutch for the feed actuating mechanism, and a connection between the clutch and the feed shift.

12. In an automatic typewriter actuator having a writing-form medium, a normal feed therefor, an auxiliary feed and mechanism to operate the same backward or forward, a clutch therefor, means for shifting from one feed to the other, a connection of the clutch therewith, and a connection of the clutch with the main actuator mechanism, whereby the clutch is manually engaged and automatically disengaged.

In testimony whereof we affix our signatures in presence of two witnesses.

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