C. J. PAULSON & J. E. SIMPSON.

TYPE WRITING MACHINE.

APPLICATION FILED APR. 15, 1914.

1,150,382.

Patented Aug. 17, 1915.

2 SHEETS—SHEET 1.

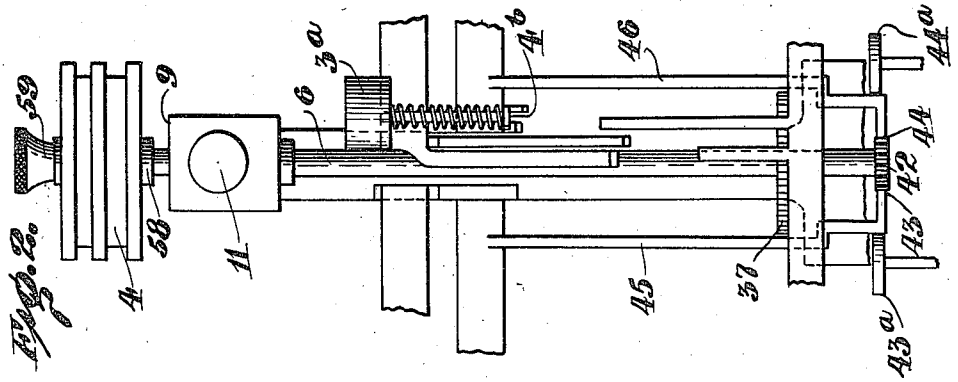


Fig. 2.

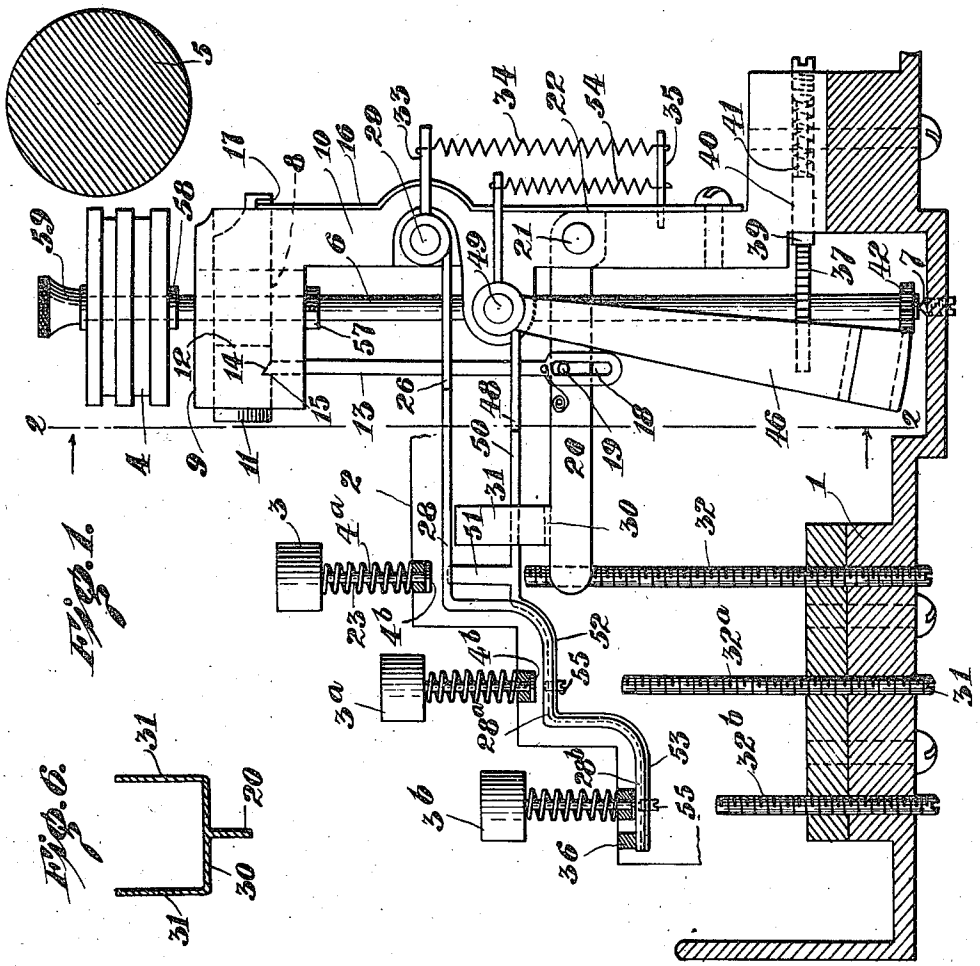


Fig. 1.

Fig. 6.

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2 SHEETS—SHEET 2.

Fig. 4.

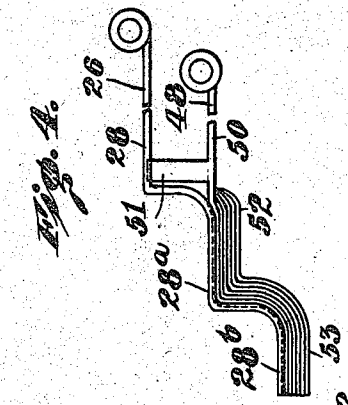


Fig. 5.

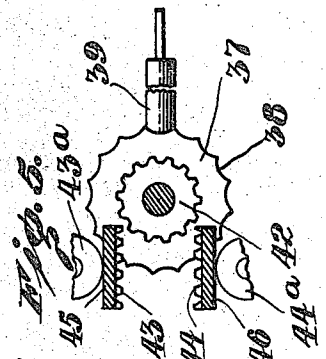
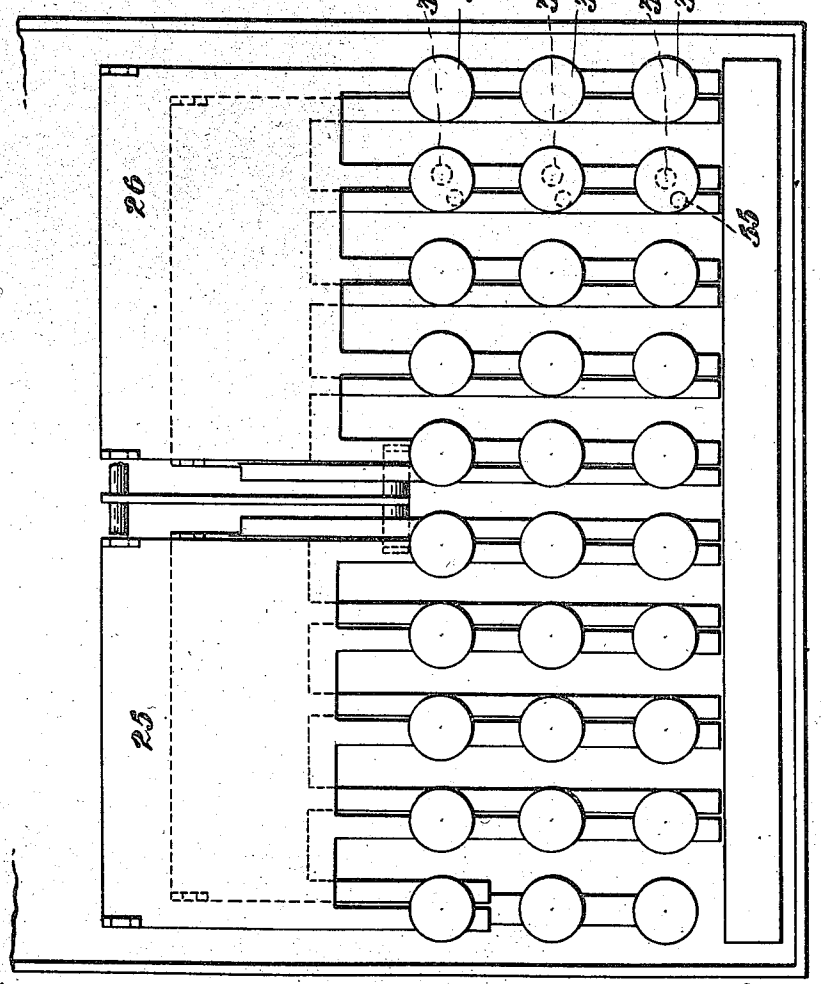


Fig. 3.



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TYPE-WRITING MACHINE.

1,150,382. Specification of Letters Patent. Patented Aug. 17, 1915.

Application filed April 15, 1914. Serial No. 831,947.

To all whom it may concern:

Be it known that we, CHARLES J. PAULSON, a subject of the King of Sweden, of Newark, in the county of Essex and State of New Jersey, and JAMES E. SIMPSON, a citizen of the United States, and resident of the borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to typewriting machines, and our improvements are directed to a machine having a type carrying wheel capable of movement toward the platen for printing, and wherein the keys in their movement to equal depths cause said wheel to be rotated variably to bring different types to the printing position, said keys also in their movement storing spring energy and releasing it for the actuation of an impression striker. Under these principles of operation, we employ a vertically pivoted, horizontal type carrying wheel capable of slight, tensionally returned movement in the direction of an adjacent platen, with an impression striker guided in a path of movement in which it may reciprocate to and from the wheel support, spring energy being stored and released in the actuation of said striker whereby it strikes the wheel support a sharp blow to impel it in the direction of the platen, there being a pinion on the wheel support and a rack movable during the storing of energy in the striker spring to rotate said wheel support and wheel to bring a determined type on the wheel into printing position. The type wheel support carries a wheel having a series of peripheral depressions corresponding with the number of type extending around said type wheel, and a yielding detent is adapted to enter said depressions to aline the type on the wheel at the printing point.

There are two series of operating levers interposed between the keys, and stops therefor, each lever series being blanked or shaped from a single sheet of metal or other suitable material. In the example shown these levers are formed from separate sheets for each half of the key board, arranged respectively at opposite sides of a central dividing line. Other divisions of said lever sheets may be made to suit the convenience of manufacture, but in the interests of economy we have found it desirable to form these levers by stamping a set thereof from a single sheet. The said two series of levers are arranged in different planes, one series being superposed over the other. The upper set of levers extend forwardly from their blank in terraced formation, respectively in the paths of the several banks of keys, and adapted to be depressed by said keys equal depths to stops therefor, their supporting blank or sheet being fulcrumed at the rear of the machine. Said blank or sheet carries a plunger which rocks a pivotal arm that bows a flat spring and also withdraws a latch from engagement with a slidable striker with which said spring is engaged, whereby said spring is enabled to throw said striker when released against the type wheel support.

In the movement of a key the other blank or sheet, which has levers formed therefrom and extending in different horizontal planes between the keys and stops, to be operated vertically variable extends by said keys, in the full movements of the latter actuates a rack which rocks about the same fulcrum as said blank, and causes said rack to rotate the pinion on the type wheel support variably according to the extent of movement imparted to said blank, whereby the type wheel is enabled to bring to the printing position the type thereof corresponding with the key that had been depressed.

Other objects of the invention will appear in the following description. In the drawings:—Figure 1 is a side elevation, partly in section, of a portion of a type writing machine embodying our improvements. Fig. 2 is a front elevation taken on the line 2—2 Fig. 1. Fig. 3 is a top plan view of a part of the machine with the key board removed, but showing the key stem disks. Fig. 4 is a detail side elevation on a reduced scale of the type wheel and striker spring actuating means. Fig. 5 is a detail plan view of the rack and pinion device for rotating the type wheel, and Fig. 6 is a detail vertical section of arm 20.

In said figures the numeral 1 indicates the frame of the machine of which that part is shown carrying the key board 2, finger keys 3, type wheel 4 and associated parts. The rotatable platen 5 is illustrated in its rela-

tive position with respect to the type wheel, but its carriage, the support therefor, the carriage feed and ribbon mechanism are not here shown, forming no part of the present invention.

The type wheel 4 which is horizontally disposed is supported upon a vertical rod 6 that is mounted on a conical or needle pivotal bearing 7 extending upwardly from the bottom of the frame. Said bearing 7 is vertically adjustable, and may be in form of a screw, threaded through the base plate of the machine frame. Said rod 6 extends through a slot 8, formed in a bracket 9 which projects forwardly from a rear portion 10 of the frame, said slot lying transversely of the machine to provide space therein for a swaying movement of rod 6 to carry the type wheel to and from the platen, the sides of said slot forming lateral guides for said rod in that movement.

Mounted in the bracket 9 and lying within said slot 8 to have reciprocable movement therein is a striker 11, which is slotted at 12 for the reception of rod 6 and to provide a clearance at opposite sides of said rod, a pallet 13 having a beveled nose 14 being engaged with a recess 15 in said striker to hold it normally retracted against the tension of a spring 16 which lies against the rear surface of frame portion 10 and engages with a recess 17 in said striker for the purpose of throwing it against rod 6 in the direction of the platen. Said pallet 13 is mounted by slot 18 engaged with pin 19 on a lever 20, said lever being fulcrumed at 21 in frame portion 10 and having a rear cam surface 22 adapted with the depression of lever 20 to press rearwardly and bow the spring 16 thereby applying tensional force to the striker 11, whereby upon the action of pin 19 against the lower end of slot 18 the pallet 13 is released from its engagement with the striker, and said striker is thrown rearwardly by the released force of said spring to strike rod 6 with sufficient force to impel said rod with the type wheel toward the platen for printing.

The slot 18 is of sufficient length to allow the pin 19 on lever 20 to coöperate therewith in releasing the striker at that moment when the type wheel, through instrumentalities to be described hereinafter, has been rotated through the action of a finger key to bring a designated type into printing position.

The finger keys 3, having stems 4^a which may be square in section to prevent turning, also have springs 23 and are carried in terraced rows upon the key board 2. Said stems 4^a may have base disks 4^b.

Pivotally supported beneath said key board is a horizontal plate having a series of fingers separated at its forward portion for co-action with said finger keys whereby said plate may be depressed for the operation of the striker. Preferably said plate is divided into two parts 25, 26, disposed one at each side of a dividing line centrally transverse of the key board. Description of the plate portion at one side of said dividing line will serve for both as they correspond in every respect.

Plate 26 has the forwardly extending fingers 28 in the same horizontal plane therewith, said fingers lying beneath and in the path of the rearmost row of said keys 3, but spaced from the plunger disks of said keys a determined distance. Said fingers are extended forwardly in terraced formation at 28^a where they lie in the path of the second bank of keys 3^a but separated a less distance from the key plunger disks whereby the full stroke of said keys 3^a, equal in extent to the full stroke of keys 3 will, due to the greater distance of said fingers at 28^a from the fulcrum 29 of plate 26 in frame portion 10, cause said plate to rock through the same arc as when operated by keys 3.

A further forwardly terraced extension of said fingers at 28^b in the path of a third or front row of keys 3^b lies close against the plunger disks of said keys to travel therewith during the full stroke of said keys, said extensions 28^b at their points of contact with said key plunger disks being separated from the fulcrum 29 such extent that the plate 26 turns through the same arc as when operated by keys 3. A horizontal bar 30, carried by lever 20, has a yoke comprising fingers 31 extending upwardly therefrom, said fingers lying respectively beneath the plates 25, 26, whereby said lever 20 is depressed in the downward movement of either of said plates as operated by any one of the finger keys in the action aforesaid, whereby said lever 20 is rocked in the striker operating movement previously described. Stops 32, 32^a and 32^b are provided beneath the finger extensions 28, 28^a and 28^b respectively, said stops being of different heights and adjusted to form seats for said extensions 28, 28^a and 28^b at the limit of the depressed movement of plate 26. The purpose in employing the three stops aforesaid is to provide a rigid seating or bearing for said plate in its operation. The stops 32, 32^a, 32^b may be in the form of screw rods threaded upwardly through a base portion of the frame, whereby said stops may be conveniently adjusted to their exact positions as seating stops.

The plate 26 may be rolled about shaft 29 which forms its fulcrum to provide a convenient pivotal connection therewith, and a pin or other projection 33 may extend rearwardly therefrom to serve as a support for a spring 34 which engages at its other end with a pin or other projection 35 on the frame, the function of said spring being to

return the plate 26 to its normal horizontal position against a stop as at 36 after each depressed movement thereof.

The rod 6 carrying the type wheel also carries a wheel 37 having a series of depressions 38 around its periphery corresponding with the type provided around the circumference of the type wheel, said depressions being adapted to receive a detent 39 supported in a slideway 40 in the frame in opposed relation thereto and pressed toward said wheel by a spring 41 to normally hold the rod 6 with typewheel 4 spring pressed away from the platen, and to selectively localize said wheel 37 in manner to present determined type on the type wheel to the printing position on the platen. Said rod 6 further carries a pinion 42 adapted to mesh at opposite sides thereof with the racks 43, 44 on pivotal sectors 45, 46 respectively, said sectors depending, respectively, from horizontal plates 47, 48 which lie below the plates 25, 26 respectively, and are fulcrumed on a shaft 49 supported by the frame. The plates 47, 48 are separated in the same manner as the plates 25, 26, being operative, respectively, under opposite sides of the key board.

The racks 43, 44 which have guide rolls 43^a, 44^a respectively, operate separately to turn the rod 6 and the type wheel in opposite directions from the normal set printing position of said type wheel, to thereby limit the extent of turning movement of said type wheel in bringing the type at opposite sides of the normal printing point thereof into the printing position.

Consequently the keys at the right hand side of the key board will operate one of said sectors and the keys at the left hand side of the key board will operate the other sector, said sectors, which are normally disengaged from the pinion, moving operatively in the same direction, but thereby imparting opposite directional movement to said pinion.

A description of the operating means for one of said sectors will suffice.

The plate 48, carrying sector 46, is mounted to rock on shaft 49, and has forwardly extending fingers 50 with studs 51 lying beneath and in the path of the plungers of the finger keys 3. Said studs 51 are set at variable distances away from said finger key plunger disks so that they may be operated variably in the movements of even stroke of said keys, whereby each finger key will be caused to swing said sector 46 a different distance for the purpose described. Finger extensions 52 are stepped or terraced below the finger portions 51, lying beneath the finger keys 3^a, said extensions 52 being also set in different horizontal planes, the extension nearest a finger key being separated by a space one degree nearer its key than the space separating the finger portion 51 which is nearest to its key. There is a further forward set of finger extensions 53 lying beneath the keys 3^b, one of said extensions being in normal contact with its key and the other extensions 53 being separated from their keys varying distances graduating therefrom each to a point one degree less than the space separating the nearest extension 52 and its key.

Thus it will be apparent that the depression of each finger key will cause a movement of different degree to be imparted to the plate 48, which, correspondingly, will swing the sector 46 a different distance and cause the variable rotation of pinion 42, shaft 6 and type wheel 4, by which means a predetermined type on said type wheel will be brought to position opposite the printing point on the platen.

The plate 48, with its sector 46, is swung back to normal position at the end of each stroke of a finger key by the retractile action of a spring 54, which extends from a pin or projection 55 at the rear of plate 48 to the pin or projection 35 on the frame, this return action also restoring rod 6 and type wheel 4 to normal position.

The finger extensions 52, 53 may each be provided with adjustable bearing points consisting of screws 55 for their correct setting.

The studs 51, and the bearing points 55 of extensions 52, 53 are positioned beneath the respective banks of keys in such manner that the key plunger disks 4^b, in bridging the fingers 28, 50; 28^a, 52; and 28^b, 53, will bear upon said studs 51 and extension bearing points 55 in order that the plate 48, which is not arrested by the stops 32, may be controlled accurately by the finger keys.

The shaft 6 supporting type wheel 4 is retained in its pivotal bearing by a collar 57 on said shaft lying up against the under surface of frame extension 9, and the type wheel is held against movement on said shaft by collar 58 and thumb nut 59.

In the operation of this invention it will be noted that the striker actuating spring is extended and the striker retaining pawl or pallet is released at the limit of the stroke of each finger key, the type wheel having been turned in that same stroke to present to the printing point on the platen the type represented by the particular finger key depressed, and that the printing operation occurs immediately after the completion of said finger key stroke through the action of spring 16 on the then released striker.

Our invention is susceptible of various modifications within its scope, and is not limited to the particular details and construction herein shown and described.

We claim:

1. In a typewriting machine having a

platen, a type wheel, a solid vertical supporting shaft therefor having endwise bearing whereby said shaft is capable of swaying movement to carry said wheel to and from said platen, a guide for said shaft comprising lateral bearing surfaces for opposite sides of said shaft to direct its swaying motion, means for rotating said shaft variably, and means for swaying said shaft upon its endwise bearing to impel said wheel toward said platen.

2. In a typewriting machine having a platen, a type wheel, a solid vertical supporting shaft therefor having endwise bearing whereby said shaft is capable of swaying movement to carry said wheel to and from said platen, a guide for said shaft comprising lateral bearing surfaces for opposite sides of said shaft to direct its swaying action, means for rotating said shaft variably, means for swaying said shaft upon its endwise bearing to impel said wheel toward said platen, and tensional return means for said shaft.

3. In a typewriting machine having a platen, a type wheel, a swaying pivotal support therefor, a slidable striker operable in the direction of said support, means holding said striker normally away from said support, a spring to impel said striker against said support in the direction of said platen, and means to both store energy in said spring and release said striker.

4. In a typewriting machine having a platen, a type wheel having a pivotal support capable of swaying to and from said platen, a slidable striker operable upon said support in the direction of the platen, an actuating spring for said striker, a lock to hold said striker against the tension of said spring, finger keys, and means between said keys and lock to release the latter with the depression of a finger key.

5. In a typewriting machine having a platen and a type wheel movable to and from said platen, a spring pressed striker to actuate said type wheel, a lock to hold said striker against the tension of said spring, finger keys, and means between said keys and lock to release the latter with the depression of a finger key.

6. In a typewriting machine having a platen and a typewheel movable to and from said platen, a striker to actuate said type wheel, a lock for said striker, finger keys, a rock plate in the path of said finger keys, stops for said rock plate, and a lever in the path of said rock plate, said lever having a cam to store energy in said spring when actuated by said rock plate in the depression of a finger key, and a connection between said lever and lock whereby the latter is released from said striker at the completion of a finger key stroke.

7. In a typewriting machine having a series of independently supported plunging finger keys, each movable through an equal stroke, a rock plate having stepped actuating extensions in the path of and lying variable distances apart from said keys, a type wheel, connections between said type wheel and rock plate whereby the former is turned by the latter, and an adjustable stop for each stepped portion of the actuating extension, whereby each extension may terminate its depressed movement upon plural separated seats, to thus find stable lodgment.

8. In a typewriting machine having a platen, a type wheel having a swaying support, an impression striker for said type wheel, a bi-part rock frame, a series of finger keys operating some on each part of said rock frame, and actuating means for said striker operable by either part of said rock frame.

9. In a typewriting machine having a rotatable type wheel and an impression striker therefor, a rock plate to operate said type wheel, and a rock plate to operate said striker, said plates having parallel extensions, and finger keys each including a pair of said extensions in the path of its operative stroke.

Signed at borough of Brooklyn in the county of Kings and State of New York this 13th day of April A. D. 1914.

CHARLES J. PAULSON.
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