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TYPE ACTION AND CASE SELECTING MECHANISM FOR TYPEWRITING MACHINES

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Fig. 1.

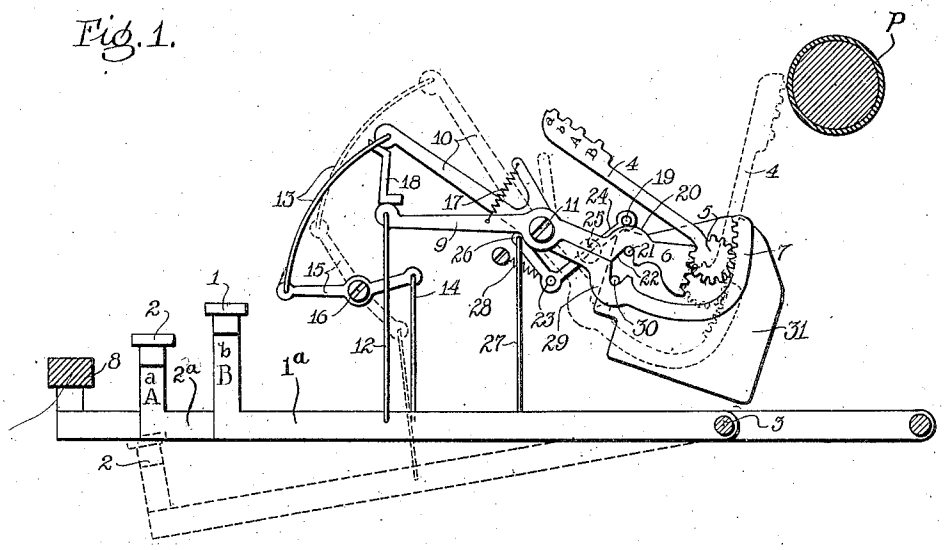
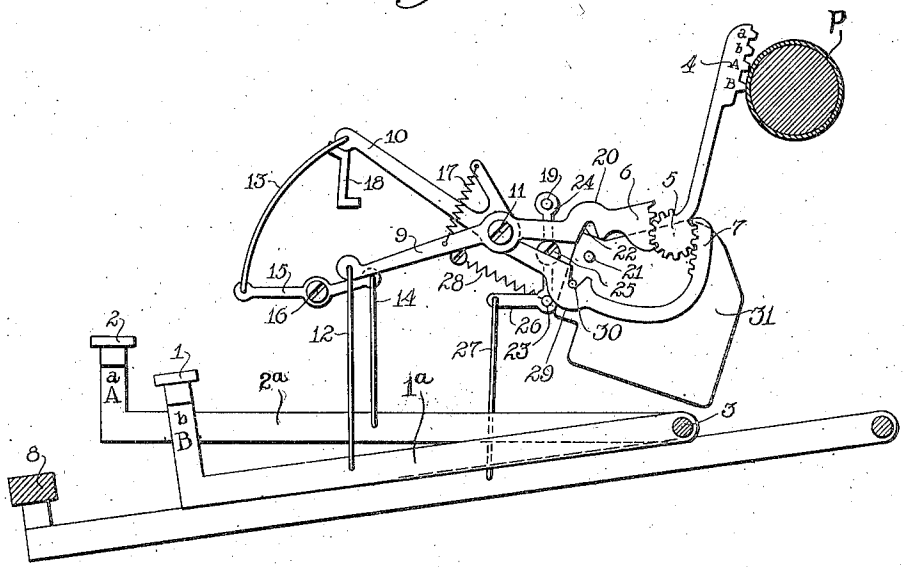


Fig. 2.



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PHOTO-LITHO. by SACKETT & WILHELMS CORP. N.Y.

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TYPE ACTION AND CASE-SELECTING MECHANISM FOR TYPEWRITING MACHINES.

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This invention relates to typewriting or like machines and more particularly to the type actions thereof and to case selecting or controlling means combined therewith.

The purposes of the invention, generally and briefly stated, are to lighten the load on the case controlling key; to reduce the number of type bars commonly employed in such machines; to avoid the necessity for shifting either the platen or type bar basket upon case changing operations; and to provide a type bar operating mechanism, one unit of which, and the type bar operated thereby, will serve for a selective operation by a plurality of keys; and also to provide an arrangement whereby one restoring spring will also serve for a plurality of keys.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices set forth in the following description and particularly pointed out in the accompanying claims.

The objects set forth above are accomplished by the construction shown in the drawing, wherein—

Figure 1 is a detail diagrammatic side elevation of a type action and case controlling mechanism constructed in accordance with my invention; the view showing the parts disposed for printing lower case characters.

Figure 2 is a like view of the same, showing the parts disposed to print upper case characters.

The construction illustrated shows only one pair of printing keys, one type bar common to the two printing keys and the operating mechanism between the said keys and the type bar, together with a case controlling key and means associated therewith for controlling the type bar operating mechanism. Such unit is duplicated the required number of times to form a complete machine, it being understood that the parts of each type action, excepting the key lever, are disposed substantially in a radial plane, radiating from the printing point.

A characteristic of the construction, as it is shown in the present instance, is that each type bar is carried by a pinion or its equivalent which, in order to selectively produce the striking action of the upwardly and rearwardly swinging front strike bar against the platen P, is caused to turn on a differentially shifting center so that any one of a plurality of types carried by the bar may be caused to strike the platen at the printing point. The different associated printing keys have connections for operating the type bar selectively for lower case printing, and the case controlling key controls the shifting of the pivotal center of the type bar during the striking action for selective upper case printing by the same printing keys.

As shown in the drawing, the printing keys 1 and 2 are carried by parallel key levers 1^a and 2^a respectively, pivoted upon the same transverse rod 3. The type bar 4 operated by these keys is carried by a pinion 5 which forms the heel of the type bar. In the printing motion of the type bar, the pinion 5 is rolled to the right (as the parts appear in the drawings) by and on a pair of opposed actuating members, racks or segment gears 6 and 7. During this time the center of the pinion, and the type bar as a whole, move downward or upward more or less, to bring different types on the type bar into printing position. The extent of the downward or upward motion of the pinion and type bar during the type bar printing movement is dependent upon which of the keys, 1 or 2, is depressed, and on the position of the case controlling key 8.

The segment gears 6 and 7 for operating the pinion 5 are carried by levers 9 and 10 respectively, pivoted together at 11 and respectively connected to the key levers 1^a and 2^a by the link 12, and by the links 13 and 14 and the intermediate lever 15. Each lever 15 is pivoted upon a fixed transverse rod 16 curved to conform to the curvilinear arrangement of the radially disposed set of levers 15. Thus, when the key 1 is depressed the link 12 is drawn downward and thereby causes the segment gear 6 to swing upward either around an associated pin 21 or the pivot 11; whereas when key 2 is depressed, the associated link 14 is drawn downward, but through the lever 15, and link 13 swings the companion segment gear 7 downward either around the pivot 11 or an associated pivot pin 30. The return motion of the mechanism, irrespective of which key is depressed, is effected by a contractile spring 17 extending between the levers 9

and 10. The limit of the return motion is determined by a stop, abutment or fulcrum member 18 located between the forward ends of the levers 9 and 10 and common to all of such levers.

With the case control key 8 in its normal undepressed position, a transverse curved rod 19, preferably common to all of the levers 9, bears against the upper edge 20 of each of said levers 9. The effect of this is to compel each lever 9, when the associated key 1 is depressed, to rock around the companion fixed pivot pin or rod 21, the latter bearing against the lower surface of the lever 9 at the recess 22 therein. This results in, say, type "b" on the bar making the impression. If key 2 is depressed with the transverse rod 19 still bearing against the upper surface 20 of each lever 9, the type, say, "a" will make the impression. The bar 19 and a similar bar 23 for engaging the lower edge of each lever 10 are carried by arms 24 having fixed pivots 25. One of the arms 24 has an extension 26 which is connected by a link 27 with the case control key 8. A spring 28 normally holds the arms 24 and case control key 8 in the position shown in Fig. 1. With the key 8 depressed, the rod 19 is rocked out of engagement with the levers 9, while the rod 23 is moved into engagement with the lower edge 29 of each lever 10. Under these conditions, if key 1 is depressed, the "B" type on the bar will make the impression, whereas if key 2 is depressed, the "A" type will make the impression.

Each of the type bars is retained against lateral displacement by a pair of fixed plates 31 arranged on opposite sides thereof and between which the floating type bar is guided in its printing movement.

Some of the parts of the mechanism, such as stop 18, pins or rods 21, 30, 19 and 23 may be common to all of the type bar operating units in the machine.

For convenience in following the drawing, the type bar is marked at one side thereof with the types which it carries, and the keys 1 and 2 bear the corresponding characters.

The operation of the mechanism will now be described more in detail and in the following order:

First, for making an impression of a small "b", then a small "a", then a large "B" and finally a large "A".

In making an impression of a small "b", the mechanism is operated under the normal condition shown in Fig. 1 of the drawing, with shift key 8 in its upper position. The depression of key 1 results in swinging lever 9 around the pivot 21, the segment gear 6 moving upward, and segment gear 7 moving downward around the abutment or fulcrum 18, due to the lowering of the pivot 11 connecting the arms 9 and 10. Under the same conditions, when key 2 is depressed the segment gear 6 remains stationary, while arm 10 swings around pivot 11. The front end of arm 10 is rocked upward due to the connections 13, 14 and 15, with key 2. The segment gear 7 at this time is carried downward far enough to cause the small "a" of the type bar to make the impression at the printing point.

With the case control key 8 depressed, rod 19 disengages the upper edge of each lever 9 and the rod 23 engages the lower edge of each lever 10. Then, when key 1 is depressed, lever 9 rocks around its pivot 11 while lever 10 remains stationary. This results in the large "B" type making the impression, whereas, under the same conditions if key 2 is depressed the large "A" type will make the impression. In the first case the segment gear 7 remains stationary while the pinion 5 rolls upward thereon and in the second case the pinion 5 rolls betweeen the upwardly moving segment gear 6 and the downwardly moving segment gear 7.

It will be observed that in printing the four characters "a", "b", "A" and "B" the following operations take place:

1st for printing "a":

Rack 6 remains quiescent while rack 7 is moved down around 11 as a center.

2nd for printing "b":

Rack 6 moves up around 21 as a center while rack 7 moves down on upper part of 18 as a fulcrum.

3rd for printing "A":

Rack 6 moves up fulcruming on lower part of 18 and rack 7 moves down fulcruming on 30.

4th for printing "B":

Rack 6 moves up fulcruming on 11 while rack 7 remains quiescent.

The operation of the type bar as above described by the different printing keys, and with the case controlling key in the Fig. 1 and Fig. 2 positions, results in a variation in the leverage of the controlling members 9 and 10; a variation of the pivotal centers on which they turn; a variation in the throw of the actuating members 6 and 7 controlled by said members 9 and 10, and also a selective determination of whether both of said members 6 and 7 shall move one up and the other down, or whether one shall remain quiescent while the other moves, and if so which of said members shall remain quiescent and which shall move. While preferably the total extent of relative movement between the two actuating members 6 and 7 is always the same, this movement is selectively apportioned by the key controlled means between the two actuating devices, and such selective apportioning selectively determines which type on the type bar shall

be brought to the printing position. Thus, if it be assumed that the total extent of relative movement between the two actuating members 6 and 7 is 6/10 of an inch, this amount remains practically constant in writing from all types on the bar, but is differently apportioned between the two actuating members as follows in printing from the different types:

In writing small "a" the member 7 moves down, say, about 6/10 of an inch while the member 6 remains at rest.

In printing small "b" the member 7 moves down about 9/20 of an inch and the member 6 moves up about 3/20.

In printing large "A" the member 7 moves down and the member 6 up, say about equal distances, the total distance of the two movements being about 6/10 of an inch.

In printing large "B" the member 6 moves up say 6/10 of an inch while the member 7 remains quiescent.

This variation in the operation of the members 6 and 7 determines the motion of the type bar to bring any one of the four types thereon to the printing point.

From the foregoing description it will be seen that each type bar is in the nature of a floating bar that turns on a varying pivotal center in swinging to printing position under control of its actuating means; that the same key controlled actuating means (6 and 10) coact with the associated type bar under all circumstances to control its movement whether printing from one or another of the four types thereon, although the actuating means may operate differentially on the bar to control the differential center on which it turns depending on the printing key which is actuated and on the position of the case controlling key and the means controlled thereby; that each type action includes in its actuating and center controlling means a pinion and two racks which engage the pinion on opposite sides thereof; that the cooperation of these racks with the pinion not only turns the type bar to printing position but controls the differential centers around which the type bar turns, so as to print selectively from any one of four types thereon, and that in selecting different types on a type bar for printing, the levers 9 and 10 have varying leverages depending on the selection made, the lever 9 at different times fulcruming on the parts 21, 18 or 11, and the lever 10 fulcruming at different times on the parts 11, 18 or 30, depending in both instances on the selection made with the aid of the printing keys 1 and 2 and the case control key 8.

By the present invention a simple, compact, light easily operating typewriting machine may be constructed in which a change in writing from lower to upper case or vice versa may be readily effected without giving a relative shift between the platen and type bars by an actuation of the case controlling key, and each type bar may nevertheless be individually selected to write from any one of four types with the aid of two printing keys and the case control key.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting or like machine, the combination with a platen and a type bar carrying a plurality of types, of means for operating said type bar to effect an impression of any desired type carried thereby, said means comprising a plurality of printing keys and connections between said keys and type bar by which said type bar may be caused to selectively effect an impression by rocking around a differentially movable support, and a case controlling key ineffective to print and to shift the type bar and platen relatively one to the other but effective for differentially controlling said connections to cause other types on each type bar than those normally employed to be brought selectively to the printing point by the same printing keys.

2. In a machine of the class described, a type bar, a pinion rigid with said type bar, a pair of segment gears engaging opposite sides of said pinion, depressible keys and connections between said keys and said segment gears for transmitting motion to said segment gears, a case controlling key, and means under the control of said case controlling key for selectively compelling one or the other of said segment gears to rock around fixed centers.

3. A machine of the class described, comprising a type bar carrying a plurality of type, a pinion rigid with said type bar, a pair of segment gears pivoted together and engaging opposite sides of said pinion, a depressible key for each of said segment gears and linked thereto to cause the same to oscillate around said pivot, and adjustable means for engaging either of said segment gears at a point removed from said pivot in order to modify the motion of said segment gears under the action of said keys.

4. In a typewriting machine, the combination of two key-controlled type-bar-actuating devices having a constant fixed extent of relative movement between them, selective means for variably apportioning between said two actuating devices such fixed extent of relative movement, a type bar having a pivotal swinging motion to printing position and carrying a plurality of types, means

for operating the type bar variably from said actuating devices to selectively print from one or another type thereon in accordance with the variable apportioning between said actuating devices of said relative movement.

5. In a typewriting machine, the combination of a type bar having a plurality of types, two type-bar-actuating devices movable in opposite directions, the type bar being swung to printing position by the relative movement of said actuating devices, a plurality of keys, and means controlled thereby for operating said actuating devices and apportioning their total extent of relative movement between them, thereby selectively determining which type on the bar shall be brought to the printing point.

6. In a type action for typewriting or like machines, the combination of a floating type bar mounted to turn on a variable pivotal center, two printing keys, and actuating connections between said printing keys and the type bar for moving the type bar as stated to selectively print from one type or another on said type bar in accordance with which one of said keys is actuated, said actuating connections including toothed gearing means.

7. In a type action for typewriting or like machines, the combination of a floating type bar operating to swing by a pivotal movement to the printing point, and two differentially operated members on opposite sides of the heel of the type bar and by which the type bar is supported, actuated and guided in its printing movement and along and on which the heel of the type bar has a rolling motion in its printing movement, and keys for controlling the movements of said members.

8. In a type action for typewriting or like machines, the combination of a floating type bar movable on a variable pivotal center to printing position to print from different types on the bar, and actuating means for controlling the printing movement of the bar and also the pivotal center thereof comprising two printing keys, and toothed gearing between said keys and type bar for selectively moving the type bar to print from one or another type thereon depending on which of said keys is actuated.

9. In a type action for typewriting or like machines, the combination of a type bar, two printing keys, actuating connections between said printing keys and the type bar effective to selectively print from one type or another on said type bar in accordance with which one of said keys is actuated, said actuating connections including two toothed members, and key controlled case controlling means for determining whether each of said toothed members when actuated by its respective printing key shall turn on one or another center and thereby enable said printing keys to selectively print from two additional types on the type bar.

10. In a type action for typewriting or like machines, the combination of a floating type bar operating to swing by a pivotal movement to the printing point, and two differentially operated members on opposite sides of the heel of the type bar and by which the type bar is supported, actuated and guided in its printing movement and along and on which the heel of the type bar has a rolling motion in its printing movement, a geared connection between each of said members and the heel of the type bar, and independently operated keys for controlling said members.

11. In a typewriting or like machine, the combination of a platen, a type bar carrying a plurality of types, a plurality of printing keys for selectively printing from one or another of the types on said bar, a case controlling key, and means controlled thereby which are ineffective to shift the type bar and platen relatively one to the other or to actuate the type bar but are effective nevertheless to cause said type bar to selectively print from one or a other additional types on said type bar depending on the printing key actuated.

12. In a typewriting or like machine, the combination of a floating type bar movable on a variable pivotal center to printing position to print from different types on the bar, and actuating means therefor comprising two printing keys, two toothed actuating members controlled by said keys for selectively moving the type bar to print from one or another type thereon depending on which of said keys is actuated, and key controlled means for determining whether each of said toothed members when actuated shall turn on one or another center and thereby enable the said printing keys to selectively print from two additional types on the type bar.

13. In a type action for typewriting or like machines, the combination of two fixed guide plates which are spaced apart, a floating type bar loosely disposed between said guide plates and guided thereby against lateral movement, said type bar swinging with a pivotal movement to the printing position around different centers depending on selection, and means for actuating said type bar to turn around different centers according to selection comprising two printing keys, and intermediate connections between said keys and the type bar for moving it selectively to print from one or another type thereon depending on which of said printing keys is actuated and also for controlling the center around which the floating type bar turns.

14. In a type action for typewriting or

like machines, the combination of a type bar, two printing keys, and actuating connections between said printing keys and the type bar effective to selectively print from one type or another on said type bar in accordance with which one of said keys is actuated, said actuating connections including a toothed portion on the type bar, and two key controlled toothed members cooperative with said toothed portion on opposite sides thereof.

15. In a type action for typewriting or like machines, the combination of two fixed guide plates which are spaced apart, a floating type bar loosely disposed between said guide plates and guided thereby against lateral movement, said type bar swinging with a pivotal movement to the printing position around different centers depending on selection, and means for actuating said type bar to turn around different centers according to selection comprising two printing keys, two driving members each connected to a different printing key and cooperating directly with said type bar to move the latter selectively to the printing point around one center or another depending on the printing key which is actuated.

16. In a typewriting or like machine, the combination of two fixed guide plates which are spaced apart, a floating type bar loosely disposed between said guide plates and guided thereby against lateral movement, said type bar swinging with a pivotal movement to the printing position around different centers depending on selection, and means for actuating said type bar to turn around different centers according to selection comprising two printing keys, two pivoted driving members each connected to a different printing key and cooperating directly with said type bar to move the latter selectively to the printing point around one center or another depending on the printing key which is actuated, a case controlling key, and means controlled thereby for controlling the pivotal center around which each of said driving members turns and thereby enable the said printing keys to selectively print from two additional types on the type bar.

17. In a typewriting or like machine, the combination of a platen, a type bar variably shiftable bodily with a swinging motion to the printing position, two prnting keys for said type bar, and intermediate geared actuating connections between said printing keys and type bar for variably swinging the type bar to print from one or another type thereon depending on which printing key is actuated, one of said geared actuating connections remaining quiescent during the operation of one of said printing keys, and two of said geared connections moving during the operation of the other of said printing keys.

18. In a typewriting or like machine, the combination of a platen, a type bar variably shiftable bodily with a swinging motion to the printing position, two printing keys for said type bar, intermediate geared actuating connections between said printing keys and type bar for variably swinging the type bar to print from one or another type thereon depending on which printing key is actuated, one of said geared actuating connections remaining quiescent during the operation of one of said printing keys and two of said geared connections moving during the operation of the other of said printing keys, and a case controlling key for determining which of said geared actuating connections shall remain quiescent in order to selectively print from two additional types on the type bar depending on the printing key which is actuated.

Signed at Chicago this 24 day of Nov., 1924.

WESLEY WILSON.