

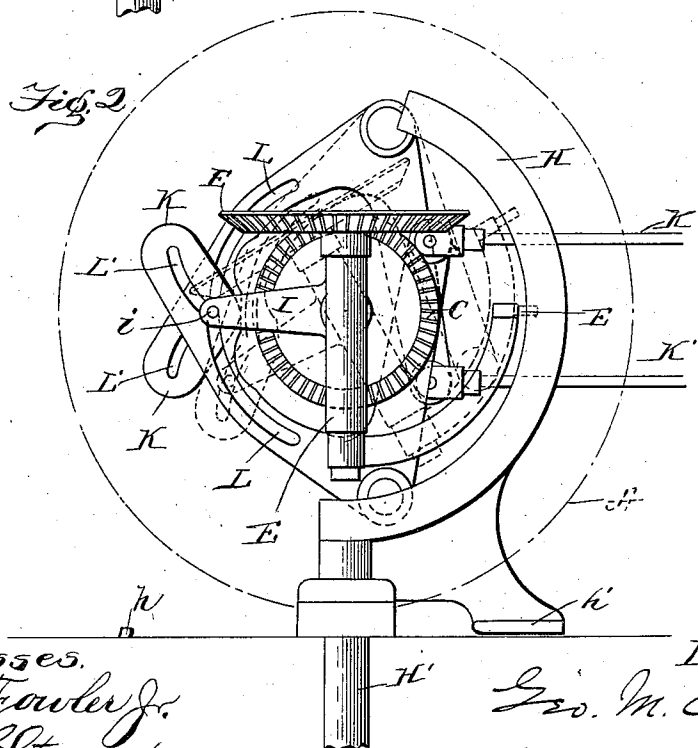
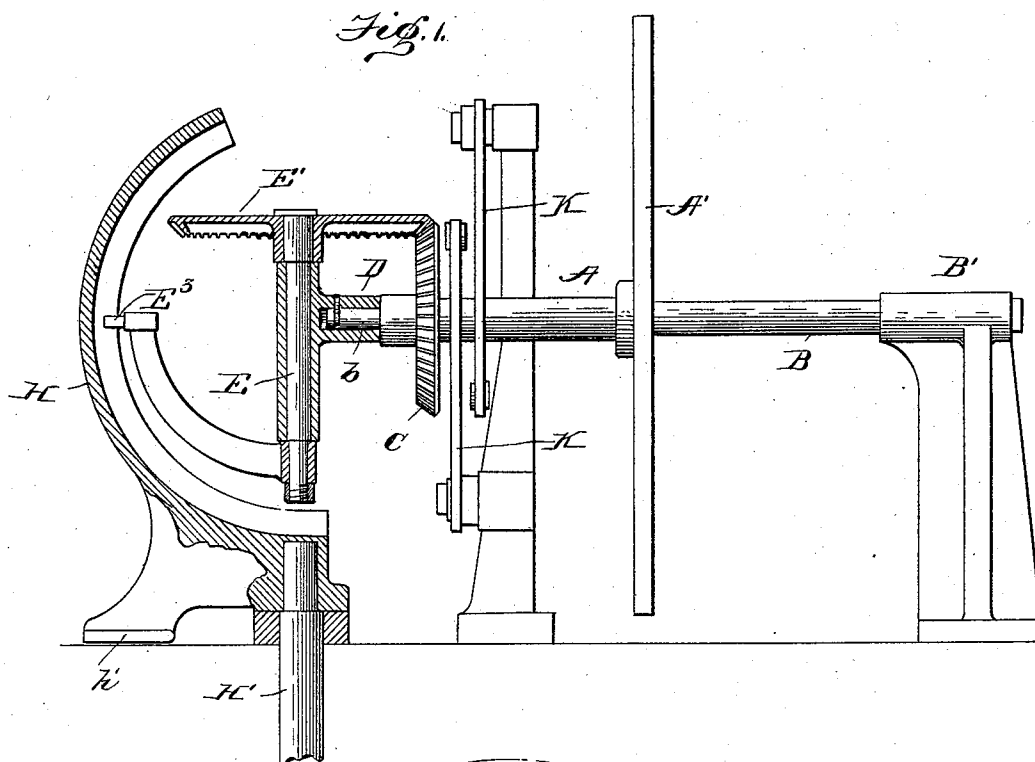
(No Model.)

2 Sheets—Sheet 1.

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MECHANICAL MOVEMENT.

No. 557,116.

Patented Mar. 31, 1896.



Witnesses,  
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Inventor  
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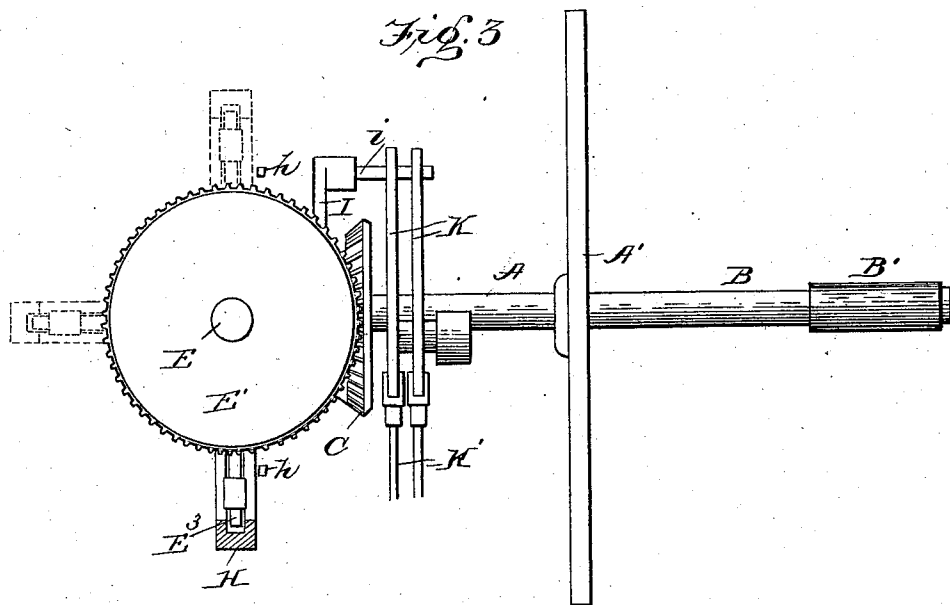
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*Alfred Stewart*

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# UNITED STATES PATENT OFFICE.

GEORGE M. ECKELS, OF CHICAGO, ILLINOIS.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 557,116, dated March 31, 1896.

Application filed May 23, 1895. Renewed February 14, 1896. Serial No. 579,323. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE M. ECKELS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in Mechanical Movements; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specifica-  
10 tion, and to the letters of reference marked thereon.

This invention relates to improvements in mechanical movements, the particular object being to provide a mechanism whereby a shaft  
15 may be turned to present any one of a number of arcs of its circumference at a given point and oscillated on its longitudinal axis to any particular point within the range of said arc, the embodiment of the invention  
20 shown being adapted for use in a type-writer wherein the type wheel or segment is provided on its periphery with two or more series of characters—as, for instance, ordinary characters, caps and figures—each of said series oc-  
25 cupying a definite arc of the circumference of the wheel. This wheel being carried by the shaft, when it is desired to print characters—say figures—the shaft is first turned to advance the segment or portion of the wheel  
30 having figures thereon and then oscillated within the range of said segment to bring the desired characters to the printing-point, whereby the extent of movement and the number of parts necessary for printing the  
35 characters are greatly reduced.

The invention will be described with particular reference to this arrangement; but it will be understood that I do not wish to be limited to the employment of the mechanism  
40 in any specific organization or machine, as it will be found a most perfect mechanism wherever it is desired to move a shaft or part operated thereby in the manner specified.

Referring to the accompanying drawings,  
45 Figure 1 is a side elevation, partly in section, of a mechanism constructed in accordance with my invention. Fig. 2 is an end elevation of the same with the segment-changer turned to one side and one motion of the parts  
50 shown in dotted lines. Fig. 3 is a top plan view with the segment-changer shown in different positions of adjustment in dotted lines.

Like letters of reference denote the same parts in all the figures.

The shaft (or, in the present instance, more  
55 properly, sleeve) upon which the type-wheel A' is mounted is lettered A in the accompanying drawings, being journaled on a shaft B, supported in any approved manner, as by bearing B'. A gear-wheel C is rigidly mount-  
60 ed on the sleeve A, and on a center coincident with the axis of the sleeve, preferably on an extension b of the shaft B, there is journaled a cross-head D having a bearing at right angles to and crossing the line of the axis of  
65 the sleeve. In this bearing there is journaled a shaft E carrying at the upper end a gear-wheel E' meshing with the gear-wheel C.

The rotation of the shaft and wheel E' on their axis is controlled by a controlling-arm  
70 E<sup>2</sup>, which arm in order to balance up the mechanism is preferably attached to the lower end of the shaft and is provided on the outer end with a bearing E<sup>3</sup> adapted when the parts  
75 are in the position shown in Fig. 1 to be in line with the axis of the shaft and sleeve AB. If held in this position while free to rotate it is obvious that the two gear-wheels will be locked together and the whole structure, in-  
80 cluding the cross-head, may be turned with the sleeve A and type-wheel, while, on the other hand, if the cross-head be held against rotation, the controlling-arm and its connected gear-wheel may be rotated on their axis at  
85 right angles to the sleeve A and through the medium of the gear-wheel C will rotate the said sleeve and type-wheel. With this structure, then, we have two connections through  
90 which we may control the movement of the sleeve and type-wheel, each independent of the other—that is to say, the controlling-arm may be swung around or the cross-head may be turned, and either will turn the sleeve and type-wheel.

A curved shifter H, having a radius equal  
95 to the radius of the controlling-arm, is mounted on a shaft or pivotal center H' in the plane of movement of the shaft E, the two centers being under normal conditions in line, and this shifter H is provided with a channel  
100 or way in its inner face, in which the journal E<sup>3</sup> on the controlling-arm plays. When the shifter H is turned, as in Figs. 2 and 3, the shaft E and wheel E' will be rotated, and by

fixing the extent of such movement the type-wheel may be rotated to any desired point. For convenience I have shown the gears so proportioned that a quarter-turn of the gear E' will turn the type-wheel one-third of a rotation, and hence when the shifter is turned from normal position, Fig. 1, a quarter-turn in one direction or the other, Fig. 3, it advances a new segment of the type-wheel, and, if desired, stops *h* may be provided at the proper point against which a foot *h'* on the shifter may strike to insure accuracy.

For the minor shifting of the sleeve and type-wheel the cross-head is provided with a laterally-extending arm or projection I, Figs. 2 and 3, having a pin *i*, with which the oppositely-arranged cam-levers K coöperate. These cam-levers may be in the form of bell-cranks, as shown, with operating-links K' connected with one of the arms and peculiarly-shaped cam-slots in the other arms for coöperating with the pin on the cross-head. The slots referred to are formed with one portion L lying, when in normal position, in the arc of a circle traversed by the pin when shifted by the other lever. The other portion of the slots L' are arranged at a proper angle to move the pin and cross-head when the lever is swung on its pivot, as illustrated by the dotted lines, Fig. 2. When the cross-head is so moved, the journal E<sup>3</sup> on the controlling-arm is held in the slot in the shifter, and if the shifter be in either of the three positions indicated in Fig. 3 the relation of the gear-wheels to each other will not be changed, although the sleeve and type-wheel are moved, and by properly limiting such movement any particular letter or space on the type-wheel may be presented at the printing-point.

From the foregoing it is now clear that I have a construction by means of which I can with one set of connections turn the sleeve and wheel carried thereby practically an entire revolution, and through the other set of connections I can oscillate said sleeve and wheel carried thereby to and from any point within a limited arc of its circumference, the two sets of connections being practically independent of each other. The mechanism is simple and is especially adapted for use in connection with type-writers, as there is little or no lost motion and little or no friction.

While I have used the term "gear-wheel" herein, it is obvious that as the wheels oscillate portions of their peripheries may be inoperative, and then the wheels act as gear-segments. Hence by the use of said term I do not wish to be limited to a construction embodying complete gear-wheels.

Having thus described my invention, what I claim as new is—

1. The combination with the wheel or part to be oscillated and a gear-wheel moving therewith of a cross-head journaled on an axis in line with the axis of said gear-wheel, and a second gear-wheel in mesh with the first, journaled on said cross-head with means for

simultaneously turning the cross-head and wheel or part to be oscillated and means independent of said first-mentioned means for rotating the gear-wheel carried by the cross-head; substantially as described.

2. The combination with the wheel or part to be oscillated and a gear-wheel moving therewith, of a cross-head journaled on an axis in line with the axis of said gear-wheel, a second gear-wheel in mesh with the first and journaled on said cross-head at right angles to the axis on which said head turns, with means for simultaneously turning the cross-head and wheel or part to be oscillated, and means independent of said first-mentioned means for turning the gear-wheel carried by the cross-head; substantially as described.

3. The combination with the wheel or part to be oscillated and a gear-wheel moving therewith, of a cross-head journaled on an axis in line with the axis of said gear-wheel, a second gear-wheel in mesh with the first and journaled on said cross-head at right angles to the axis on which the head turns, a controlling-arm connected and turning with said last-mentioned gear-wheel and a shifter with which said arm coöperates substantially as described.

4. The combination with the wheel or part to be oscillated and a gear-wheel moving therewith, of a cross-head journaled on an axis in line with the axis of said gear-wheel, a second gear-wheel in mesh with the first and journaled on said cross-head at right angles to the axis on which the head turns, a controlling-arm connected with said last-mentioned gear-wheel, a shifter with which said arm coöperates pivoted to turn on a center located in the plane of movement of the axis of the gear-wheel on the cross-head and means for controlling the movement of the cross-head; substantially as described.

5. The combination with the wheel or part to be oscillated and a gear-wheel moving therewith, of a cross-head journaled on an axis in line with the axis of said gear-wheel, a second gear-wheel in mesh with the first and journaled on said cross-head at right angles to the axis on which the head turns, a controlling-arm connected with said last-mentioned gear-wheel, a shifter with which said arm coöperates pivoted to turn on a center located in the plane of movement of the axis of the gear-wheel on the cross-head, said shifter having a way or bearing for said arm curved to form the arc of a circle with its center coincident with the center on which the cross-head turns, and means for controlling the movement of the cross-head; substantially as described.

6. The combination with the wheel or part to be oscillated and a gear-wheel moving therewith, of a cross-head journaled on an axis in line with the axis of said gear-wheel, a second gear-wheel in mesh with the first and journaled on said cross-head at right angles to the axis on which the head turns, a con-

trolling-arm connected with said last-mentioned gear-wheel, a shifter with which said arm coöperates pivoted to turn on a center located in the plane of movement of the axis of the gear-wheel on the cross-head, said shifter having a way or bearing for said arm curved to form the arc of a circle with its center coincident with the center on which the cross-head turns, a projection on the cross-head and cam-levers coöperating therewith to control the movement of the cross-head; substantially as described.

7. The combination with the wheel or part to be oscillated and a gear-wheel moving therewith, of a cross-head journaled on an axis in line with the axis of said gear-wheel, a second gear-wheel in mesh with the first and journaled on said cross-head at right angles to the axis on which the head turns, a controlling-arm connected with said last-mentioned gear-wheel, a shifter with which said arm coöperates pivoted to turn on a center located in the plane of movement of the axis of the gear-wheel on the cross-head, said shifter having a way or bearing for said arm curved to form the arc of a circle with its center coincident with the center on which the cross-head turns, a projection on the cross-head and cam-levers having oppositely-ar-

ranged cam-slots therein coöperating with said projection to control the movement of the cross-head; substantially as described.

8. The combination with the wheel or part to be oscillated and a gear-wheel moving therewith, of a cross-head journaled on an axis in line with the axis of said gear-wheel, a second gear-wheel in mesh with the first and journaled on said cross-head at right angles to the axis on which the head turns, a controlling-arm connected with said last-mentioned gear-wheel, a shifter with which said arm coöperates pivoted to turn on a center located in the plane of movement of the axis of the gear-wheel on the cross-head, said shifter having a way or bearing for said arm curved to form the arc of a circle with its center coincident with the center on which the cross-head turns, stops for limiting the movement of the shifter, a projection on the cross-head and cam-levers having oppositely-arranged cam-slots therein coöperating with said projection to control the movement of the cross-head; substantially as described.

GEORGE M. ECKELS.

Witnesses:

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