H. E. TOWLE.

MECHANICAL MOVEMENT.

No. 181,805. Patented Sept. 5, 1876.

Fig. 5.

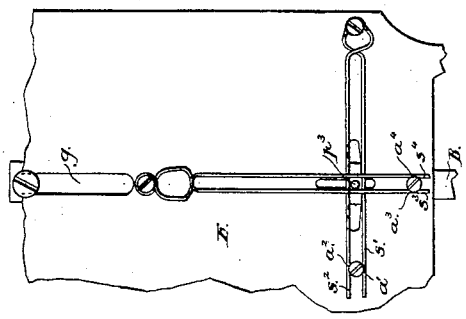


Fig. 2.

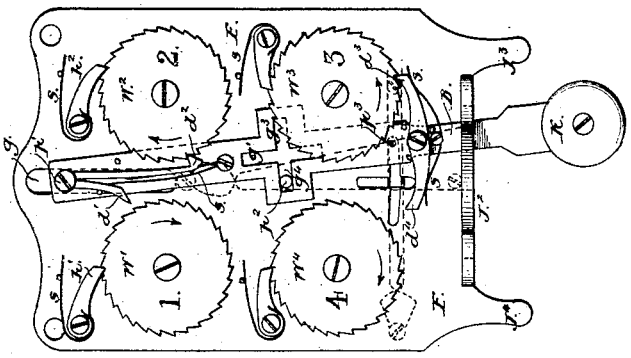


Fig. 4.

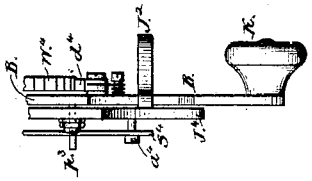
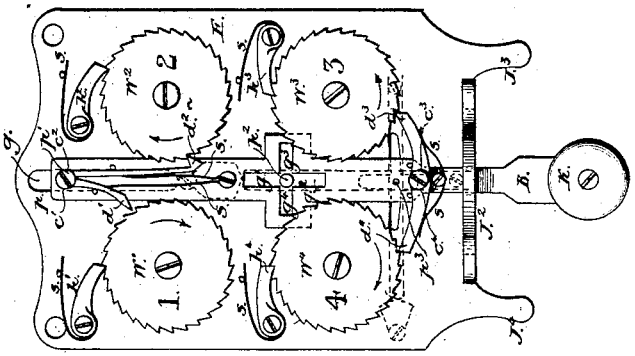


Fig. 1.



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IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. **181,805**, dated September 5, 1876; application filed August 24, 1876.

To all whom it may concern:

Be it known that I, HAMILTON E. TOWLE, civil engineer, of the city, county, and State of New York, have invented a new and useful Improvement in Mechanical Movements, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 is a front elevation of an apparatus containing my invention. Fig. 2 shows the bar B, operating through the carrier d^3 on wheel 3. Fig. 3 is a view of the back of plate F, showing the restoring-springs s^1, s^2, s^3, and s^4, and their stops; also, the intersecting grooves, similar to g^1, g^2, g^3, and g^4. Fig. 4 is a side elevation, showing the relation of bar B, knob K, and projection J^2 and pin p^3.

Similar letters indicate corresponding parts.

This invention relates to converting reciprocating motion into rotary motion or to other reciprocating motion, the resulting motion being produced at either one or another of two or more points more or less distant from the point of application of the actuating force, the points of the resulting motion being chosen at the will of the operator, who applies the actuating force at a single point or handle. For example, two, three, or more wheels may be arranged so that either of them may be moved about its axis a prescribed amount by the actuating force applied at a common knob or handle, and the motion of a wheel may be stopped, and either of the others in the system may be started, and the change from any one to any other may be made at will, and without disturbing those which it may be desired to keep at rest.

Instead of wheels turning, there may be substituted levers to be acted upon, which may perform any specific duty in any machine to which the said lever may be the prime mover.

The object of my invention is to enable the operator, by manipulating but one handle or knob, to actuate any other mechanism of the system at will without changing his hold, or losing time for making any adjustments or movements other than those peculiar to the prescribed paths of the point connection of the actuating force. For example, he may open or close either one of two or more electric circuits, and leave them as he desires, and next operate upon either of the others, and, in general, change about at will.

A most obvious case of useful application would be to a registering-machine, for registering, on counting-wheels of any approved manufacture, a variety of rates of fares on the number of persons paying either of a number of rates of fare, and keeping the various kinds separate, and the numbers of each kind paid quite clear and distinct from the others. It is applicable to work any registering-machine, and several of them may be connected to be worked by one actuating-knob, whereby the conductor of the operations can control his business and make the proper registration with great celerity and convenience.

The attachment or combination of alarm-bells or other devices with my invention is within the power of any one skilled in the art of making registers and similar machinery. I therefore do not describe all applications where my improvements would be desirable, but state in general that it is intended to be used in all places where such motions as it is capable of delivering at various points are now produced in the ordinary ways.

Let the wheels W^1, W^2, W^3, and W^4, Fig. 1, represent the primary wheels (or points of application of moving force) in four different systems of mechanism. For example, they may be of four counting or adding machines of any known kind. Let it be desired to move wheel 1 one tooth only at a time, and wheel 2 two teeth, wheel 3 three teeth, and so on, for any reasonable number of wheels and amount of angular motion required of them. Each of the wheels is centered on a suitable axis. The wheels may be graduated disks, with graduations corresponding to the number of teeth on the respective wheels.

K is the actuating lever, knob, or handle, for the operator to apply the force to.

B is the sliding bar, the upper end of which, at the point p, is made to move in a prescribed path, (shown in this example to be a right line,) corresponding to the groove g^1, in which the pin at p^1 travels. The extent of longitudinal motion of the bar B may be limited by the length of the groove g or g^1.

Knob K is fixed at the lower end of bar B, which also has a limited and prescribed sidewise or lateral motion in each direction.

Two intersecting grooves for the motions of the four wheels are made to guide or be controlled by a second pin, p^2, which groove corresponds to the lateral motions required.

Four springs, s^1, s^2, s^3, and s^4, are made to press against stops a^1 a^2, &c., while the bar B is in its normal or intermediate position, ready to be acted upon. These springs restore the bar B to this normal position whenever it is left subject to their action, communicated through or upon a pin, p^3, or other suitable means of connection with bar B.

To the bar B, at convenient points c^1 c^2 c^3 c^4, are attached pushers, pawls, hooks, or carriers d^1 d^2 d^3 d^4, adapted to engage their respective wheels 1 2 3 4.

Carrier d^1 will act upon wheel 1 when the knob K is pulled down, and, as shown in Fig. 1, it is adapted to move that wheel the space of one tooth only, when the stop-pin p^2 or p^3 and end of groove g or g^1 limits further motion. Any stop will serve as well as one in the groove g^1.

The motion having been made as desired, and the force on the knob K slackened, the parts will be moved by the springs and go directly to their normal positions.

If wheel 2 is to be moved, shove up the knob K by pressing the finger and thumb, one against the bottom of the knob, and the other against the upper side of the shelf or projecting finger-support J^2. The bar B will be moved upward, the hooked pawl or carrier d^2 will engage in the teeth of wheel 2, and that wheel will turn the corresponding amount due to the upward motion.

Should wheel 3 be the one to be moved, press knob K to the right by nipping the knob and finger-support J^3 together, which will make the carrier d^3 act on wheel 3 and move it three teeth, as limited in this instance.

To move wheel 4 a similar movement of K toward J^4 will effect the desired result without disturbing any other of the wheels.

All the parts are mounted on the base or foundation piece F, which may be a tube having the bar B projecting through one end, and working in various grooves cut radially in the head or end piece of the tube, while the other end of the bar B may be guided in a hole in the head of the other end of the tube, so as to admit of reciprocating motion of the bar through the tube, to allow the moving bar to operate carriers working upon two more points than would be possible if the motions of the bar were confined to radial grooves only, allowing the bar to move laterally at the other end near the knob K.

The various sizes of wheels and teeth, and the variable general geometrical proportions of parts, will enable a skilled person to make many applications of this invention to numerous useful purposes.

The grooves or slots for guiding the bar B may be made in the bar itself or in the foundation-piece F, or in a separate plate conveniently secured to the frame or base of the machine.

Springs to keep the carriers in proper position, and stops to limit the motion of the carriers in the various directions, are shown in the drawings so clearly as not to require any elaborate description here.

The letter s is used to indicate springs, and the letter a to indicate stops.

Projections or abutments for giving support to the fingers of the operator are marked with the letter J, with numerals added.

Wheels representing the primary moving parts of several systems in the same organization, acted upon through the initial point on knob K, are marked with the letter W and a numeral, thus: W^1 W^2 W^3, &c.

The wheels 1, 2, 3, and 4 are prevented from turning backward by the holding spring-pawls h^1, h^2, h^3, and h^4.

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

1. A movable bar provided with a suitable means for applying the actuating force by which it is moved at will in two or more prescribed directions, corresponding to predetermined motions of two or more independent elementary parts of independent mechanical devices or systems, each capable of being actuated by force delivered through said movable bar by suitable connections, combined with restoring-springs, by which the movable bar is brought into its normal position, ready for a new actuation in either of its prescribed directions, substantially as described.

2. In combination with a supporting-frame, a movable bar, actuating carriers controlled by stops, capable of motion in two or more directions, and capable of driving separately through said carriers either one of two or more systems of mechanism, substantially as described.

3. The combination of a handle or finger piece, adapted to move in two or more directions, with the finger-supports, corresponding to the movements in said directions, substantially as shown and described.

4. The combination of a movable bar, capable of movement in two or more directions, with restoring-springs and stops to bring the bar into its normal position, substantially as shown and described.

5. The combination of a handle or finger piece with two or more finger-supports, substantially as and for the purpose set forth.

Dated at the city of Washington, District of Columbia, August 24, 1876.

Witnesses: HAMILTON E. TOWLE.
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