

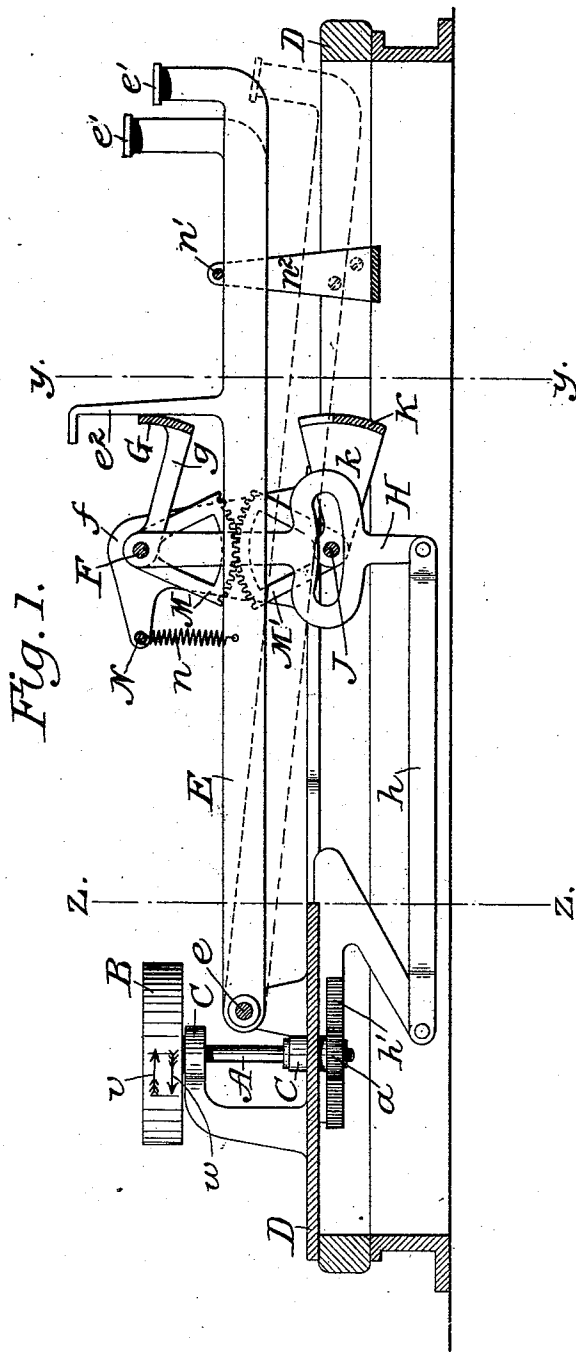
(No Model.)

3 Sheets—Sheet 1.

D. L. TOWER.
MECHANICAL MOVEMENT.

No. 542,179.

Patented July 2, 1895.



Witnesses
S. P. Palmedo.
A. N. Jester.

Inventor
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Atty

3 Sheets—Sheet 2.

No. 542,179.

Fig. 2. Patented July 2, 1895.

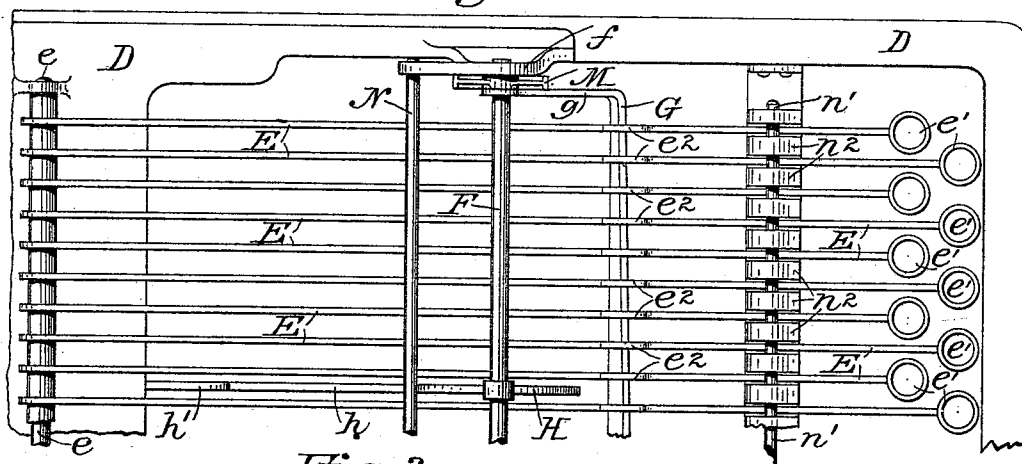


Fig. 3.

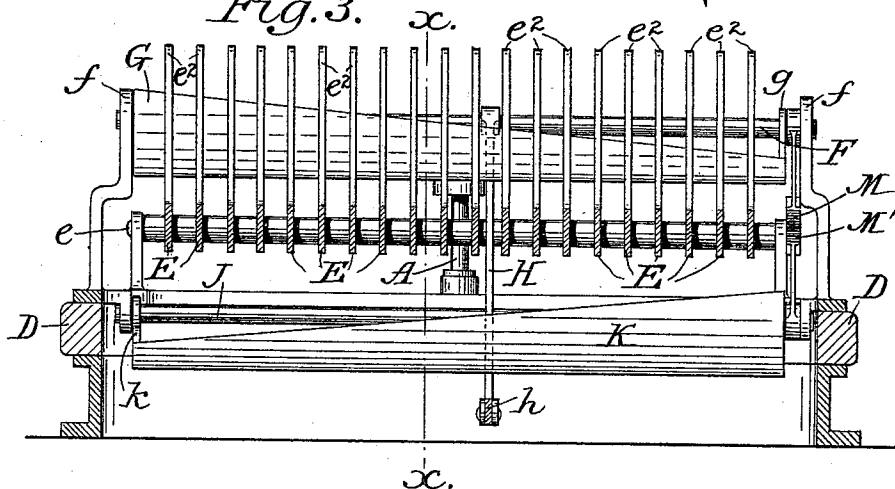
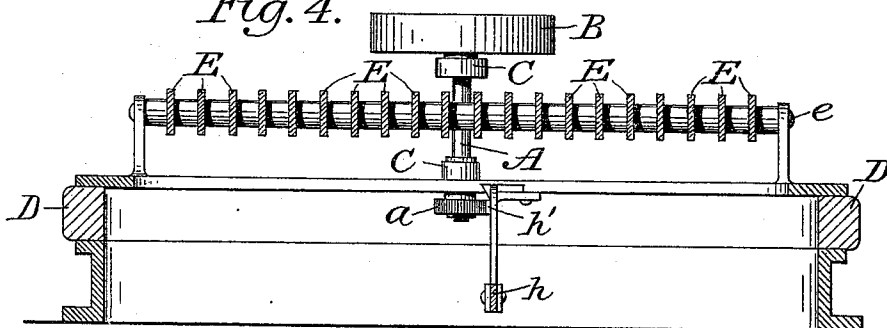


Fig. 4.



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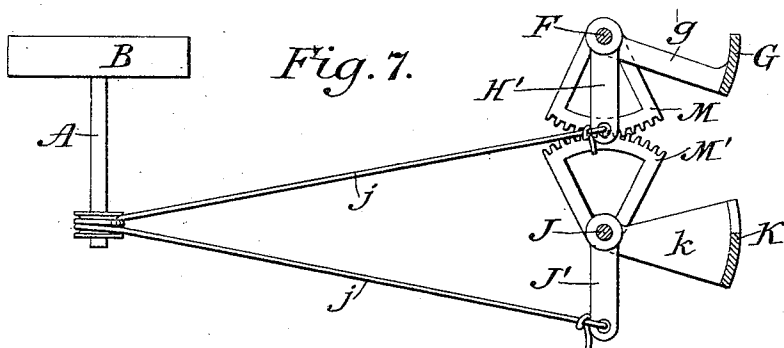
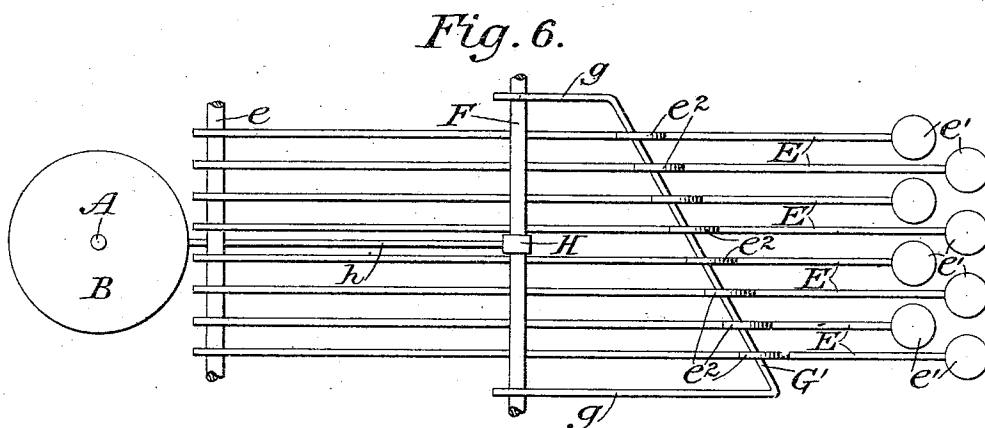
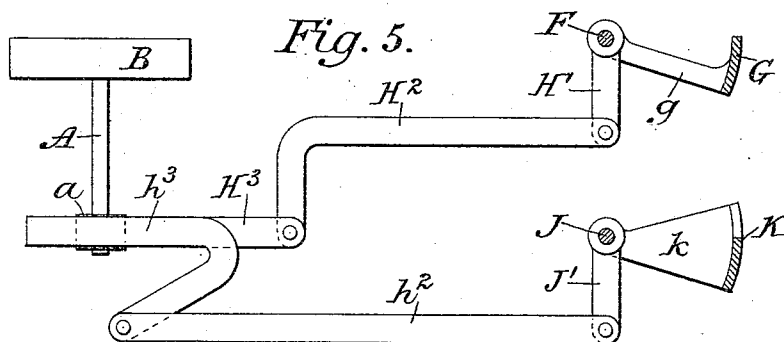
(No Model.)

3 Sheets—Sheet 3.

D. L. TOWER.
MECHANICAL MOVEMENT.

No. 542,179.

Patented July 2, 1895.



Attest:

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A. Hidden

Inventor:

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UNITED STATES PATENT OFFICE.

DANIEL L. TOWER, OF BROOKLYN, NEW YORK.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 542,179, dated July 2, 1895.

Application filed September 21, 1892. Serial No. 446,386. (No model.)

To all whom it may concern:

Be it known that I, DANIEL L. TOWER, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Mechanical Move-
5 ments; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this spec-
10 ification.

The object of my invention is to produce an improved mechanism by which the move-
15 ment of a lever or key may be imparted to a rotatory or oscillatory body, such as a shaft, and the movement of the said body be checked positively and with accuracy at a predeter-
mined point.

The device will be found useful in a great
20 variety of machines, and particularly in that class of registers or indicators in which a rotating or oscillating dial or wheel or pointer is employed and in that class of type-writing
25 machines in which the types are formed or borne on a wheel and must be brought one at a time to the line of print.

In the drawings, wherein I have illustrated one embodiment of my invention, Figure 1 is a longitudinal section on the line xx of Fig.
30 3 of an apparatus constructed in accordance with my invention. Fig. 2 is a partial plan view of the same. Fig. 3 is a section on the line yy of Fig. 1. Fig. 4 is a section on the line zz of Fig. 1. Fig. 5 is a detail view, in
35 sectional elevation, illustrating a different form of apparatus embodying my invention. Fig. 6 is a detail plan view showing another form; and Fig. 7 is a detail view, in sectional
elevation, showing still another form.

In the drawings the rotatory or oscillatory
40 body to which movement is to be imparted is represented as a vertical shaft A, bearing on its upper end a wheel or disk B and mounted in suitable bearings C C on the
45 frame-work D. The keys which are actuated by the operator to effect the desired movement of the "shaft," as I shall hereinafter term the
rotatory or oscillatory body referred to, are
50 represented as levers E E, pivoted upon a rod e and having each a finger-piece e' . Each lever is also provided with a stop-arm e^2 . Above the series of levers E E is journaled in suit-

able bearings $f f$ a shaft F, to which are
secured the arms $g g$ of the bail G, having
an inclined upper edge, as shown clearly in
Fig. 3. The shaft F also has fixed thereto an
55 arm H, which is connected in any convenient
manner to the shaft A to impart its move-
ment thereto. As a suitable intermediate
connection for this purpose, I have shown the
60 arm H as connected by a rod h to a sliding
rack h' , with which meshes a pinion a on the
shaft A.

Beneath the levers E is journaled a second
shaft J, to which are secured the arms $k k$ of
65 a bail K, also having an inclined upper edge,
the direction of inclination being opposite to
that of the bail G. Connections between the
shaft J and the shaft A might be made simi-
lar to the connections between the shaft F
70 and the shaft A; but as the object is to have
the two shafts F and J act upon the shaft A
in a similar manner, but in opposite direc-
tions, the same result may be effected by
gearing the two shafts F and J together by
75 segmental gears M M', as shown in Fig. 1, fixed,
respectively, to the shafts F and J.

Fig. 5 presents the arrangement suggested
above, in which the shafts F and J are inde-
pendently connected to the shaft A. The
80 shaft F has a short arm H' , which is connected
by a link H^2 with a rack H^3 , which engages
the pinion a upon one side of the same, while
the shaft J has a short arm J' , which is con-
nected by a link h^2 with a rack h^3 , engaging
85 the pinion a upon the other side. The two
bails G and K are thus compelled to move to-
gether and to the same extent, but in oppo-
site directions.

In the construction shown in the drawings
90 each lever E is drawn upward by a spring n ,
which is attached to a cross-rod N, suitably
supported above the levers. A stop-rod n' is
supported by brackets n^2 to limit the upward
movement of the levers E under the stress of
95 the springs n .

The operation of my improved mechanism
will now be readily understood. Assuming
that all parts are in their normal position, let
it be supposed that the lever E at the extreme
100 left of Fig. 3 is depressed. In its downward
movement the arm e^2 engages the bail G at
the highest point of its inclined edge, and
therefore moves the bail through its greatest

range of motion. Through the described connections from the bail G to the shaft A the latter is moved in the direction of the arrow *v* on the wheel B to the limit of its movement in that direction. As the bail K is connected to the shaft A either directly or through the shaft F, as described, but in such a manner as to be moved in a direction opposite to that of the bail G, the said bail K will rise as the lever is depressed and the lower end of its inclined edge will meet the lever E just as the shaft A reaches the limit of its predetermined movement, and will therefore lock the lever E positively against any farther movement downward. The lever E, being now released by the operator, will return to its normal position under the influence of the spring *n* without affecting the shaft A. If now any other lever E is depressed, that at the extreme right of Fig. 3 being taken as an example, the under side of said lever will first strike the higher end of the inclined edge of the bail K and will depress the same thereby through the described connections, rotating the shaft A in the direction of the arrow W on the wheel B to the limit of its motion in that direction. The bail G will be lifted as the bail K is depressed and the lower end of the inclined edge of the said bail G will meet the finger *e*² just as the limit of motion of the shaft A is reached and will lock the lever against any farther movement downward. The operation of any of the intermediate levers E will now move the shaft in the direction of the arrow *v* in a manner already explained, the movement of the shaft being checked positively by the action of the two opposing bails on the operated lever at the exact point determined by the relative position of the operated lever.

I have shown in the drawings, and described above, a desirable form and arrangement of mechanism embodying my invention; but I do not intend to limit myself to the particular construction shown. Thus, instead of inclining the upper edge of the bail G, the same effect would be produced either by making the fingers *e*² of the several levers E of graduated lengths or by making one arm of the bail longer than the other, so that the bail itself would lie diagonally across the levers, as shown at G' in Fig. 6, and would be

struck by them at different distances from their pivots, it being necessary, simply, that the levers shall act differentially upon the bail. Likewise the form of the connections between the bails and the shaft A may be varied widely. Thus the shafts F and J might be dispensed with and the arm H be carried directly by one arm of either bail. Again, in place of the sliding rack *h'* and the rod *h*, each shaft F J or bail G K might be provided with an arm H' or J' and cords *j j* passed therefrom to and around the shaft A in opposite directions, as shown in Fig. 7. These and many other variations of the connections are equivalent of the connections shown, so far as concerns the scope of my invention, and need not be described in detail.

I claim as my invention—

1. The combination of a rotatable body, a series of keys or levers, two bails oppositely disposed with respect to said levers, and connections from said bails to said rotatable body whereby the latter is moved in opposite directions by the movement of the bails and whereby each bail is moved in opposition to the other, substantially as shown and described.

2. The combination of a rotatable body, a series of levers, two bails disposed oppositely with respect to said levers, and each operated differentially by said levers, connection between said bails whereby they move together but in opposite directions, and a connection from said bails to said rotatable body, substantially as shown and described.

3. The combination of a rotatable body, a series of keys or levers, two bails oppositely disposed with respect to said levers and having inclined edges whereby they are operated differentially by said levers, connection between said bails whereby they may move together but in opposite directions and a connection from said bails to said rotatable body whereby the latter may be rotated in either direction, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DANIEL L. TOWER.

Witnesses:

A. N. JESBERA,
A. WIDDER.