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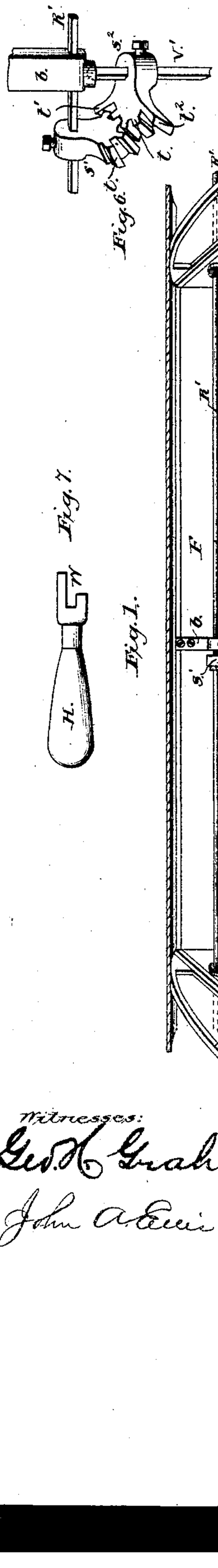
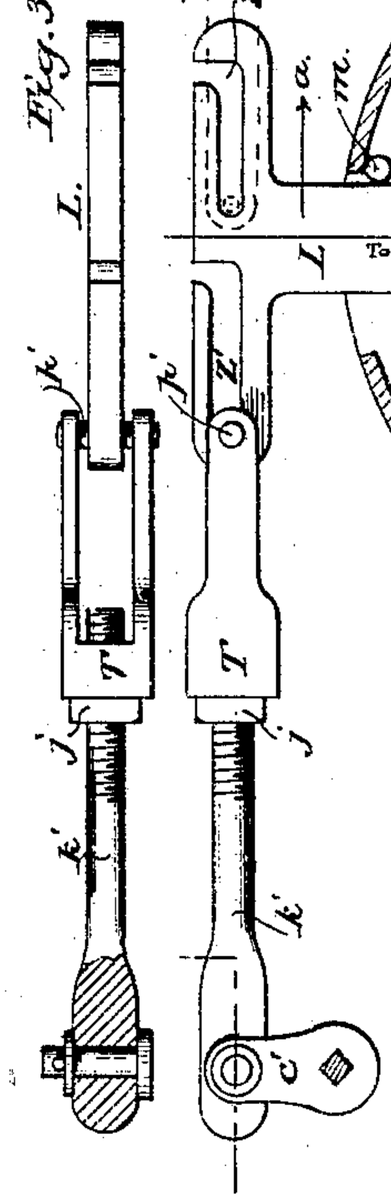
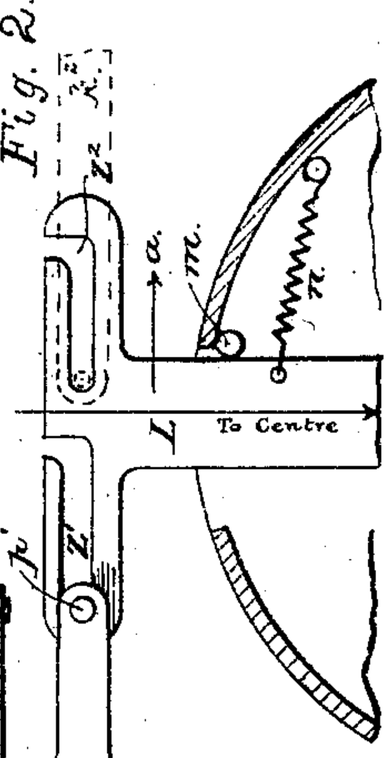
H. E. TOWLE & J. B. BENTON.

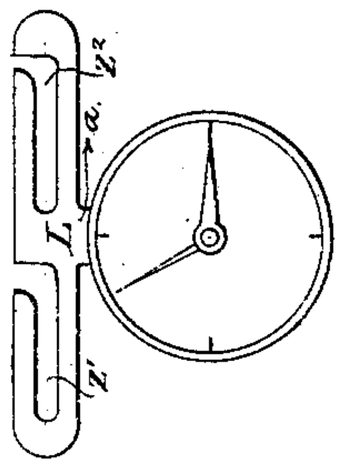
MECHANICAL MOVEMENT.

No. 182,337. Patented Sept. 19, 1876.









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2 Sheets—Sheet 2.

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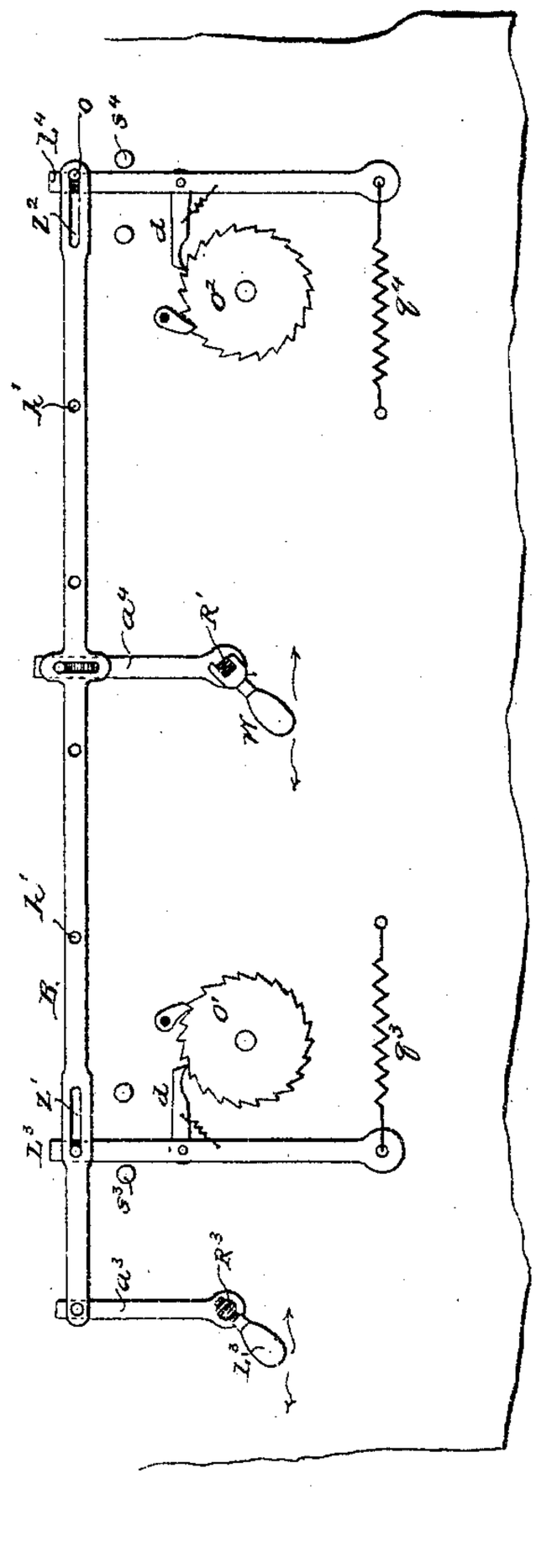
Fig. 8



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UNITED STATES PATENT OFFICE.

HAMILTON E. TOWLE, OF ROSELLE, NEW JERSEY, AND JOHN B. BENTON, OF YONKERS, NEW YORK; SAID BENTON ASSIGNOR TO SAID TOWLE.

IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. **182,337**, dated September 19, 1876; application filed August 28, 1876.

To all whom it may concern:

Be it known that we, HAMILTON E. TOWLE, of Roselle, Union county, in the State of New Jersey, and JOHN B. BENTON, of Yonkers, in the State of New York, have invented certain new and useful Improvements in Mechanical Movement; and we do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making a part of this specification.

Our invention relates to the transmission of motion in different directions by means of connections made by rods, &c., as hereinafter described.

Figure 1 represents two ends, C^1 and C^2, and part of one side, F, of an open street-car, the other side being removed. Fig. 2 shows in detail the adjustable connections near the object to be operated upon. Fig. 3 shows in plan the said connections shown in Fig. 2. Fig. 4 shows the lever L, having the T-shaped head, provided with two slots marked z^1 z^2. Fig. 5 is a view of a modification of the parts shown in Fig. 3, (in plan;) also crank c^1. Fig. 6 is a perspective view of the connections made between the horizontal rod R^1 and the vertical rod V′. (Shown in elevation in Fig. 1.) Fig. 7 shows the portable actuating crank or wrench W, provided with a handle, H. Fig. 8 shows another application or modification of our improvements, to operate the two objects O^1 and O^2, situated at some distance from each other.

The object of our invention is to transmit motion from any intermediate point of the connections to the particular object, at one extremity or the other, that may be desired by the operator. It may, however, be made to act upon and operate at several intermediate points at the same time, the force being applied at any convenient point along the line of the connections. It is desired, for example, to be able to actuate a registering-machine of any kind, placed at the end C^2 of the car, (shown in Fig. 1,) and another at the opposite end C^1. Let M^1 M^2 represent such a machine to be operated. L, Fig. 4, shows the lever to be moved, and Fig. 2 shows the normal position of the lever L resting against the stop *m*, against which it is drawn by the spring *n*, the lever L being centered in an axis within the case of the machine. (Not shown in the drawings.)

In all the figures arrow *a* represents the direction of the force exerted by the spring *n* acting upon the lever L in each machine.

R^1 R^2 are round angular or preferably square rods, running through the car on each side, near the frame-work F. It is supported by a bracket, *b*, between the ends, and the ends of R^1 pass through and project beyond the outer ends of the car, as shown in Fig. 1. M^1 M^2 are two registering-machines, of the kind known as the "monitor," wherein the actuating-lever L is drawn in the direction of arrow *a* against a stop. Let it now be desired to operate either one of the levers L in the machine M^1 or M^2, from a point within reaching distance of either rod R^1 or R^2, say, at a point near the post P. Let M^2 be the selected machine to be worked in this instance, M^1 meanwhile to remain at rest. The wrench W, Fig. 7, is to be applied to the square rod R^1, and the handle H simply drawn down, whereby a rotatory or torsional motion is given to R^1, which rocks or moves through an angular space, carrying with it crank c^2, and drawing the rod and connections between this crank c^2 and the machine M^2 to the left, which also compels the lever L to move to the left, (see Fig. 2,) whereby the machine M^2 is actuated, while at the same time the other cranks c^1 and c^3 and their connections (to the levers of M^1 and M^2) produce no effect, because of the slots z^2 z^2 in the levers, which allow the motion there to become lost motion, not effecting the monitor M^1.

Should it be desired to work M^1 and leave M^2 at rest meanwhile, it is only necessary to push up the handle of wrench, Fig. 7, after it is applied to R^1, instead of pulling it down, as before. In this case the lost motion will take place in the slot z^1 of the lever of M^2. Meanwhile rod R^2 will in no manner be affected.

Should it be inconvenient to reach so high as to be able to apply the wrench W to R^1, the same effect on M^2 will be produced by applying the wrench W to the vertical rod V′, which is bevel-geared to the rod R^1 by the sectors s^1

s^2, Fig. 1, and which are shown more in detail in Fig. 6. The upper sector, s^1, has ordinary teeth *t*, while the lower sector, s^2, at its ends, has two long teeth, t^1 t^2, which serve to prevent the beveled sectors s^1 s^2 from becoming disengaged during extreme motion. The vertical rod V′ is supported at the upper end by a socket in the pendent bracket *b*, and at the lower end by the horizontal bracket *b′*, secured to the post P.

It will be seen that an operator standing between the two rods R^1 R^2, and applying a wrench (or lever fitted to a hole if the rod is round) to either of these rods, and pulling down, will operate the machine M^2, while if he pushes upon the same the work will be done only upon the machine M^1.

As regards the vertical rod V′ on the post P, if the lever or wrench is applied to V′, (handle H projecting toward the inside of the car,) and drawn from M^2 to the left, that machine, M^2, will be operated, but not the other one, M^1. If reversed motion is given, (to the right,) the monitor M^2 will remain at rest, and the other instrument, M^1, will be operated. The same will be true of rod R^2, so that by either R^1 or R^2 the same effects may be produced, and only the one desired machine or instrument will be affected.

Adjustable connections *k′ j′* T are introduced, as shown in Figs. 2 and 3 in detail. A turn-buckle, T, and jam-nut *j*, for making adjustment of length is shown in Figs. 2 and 3. The lost-motion spaces z^1 and z^2 are also shown in these figures. Fig. 5 shows non-adjustable connections *k′*, which are also shown at the end of the car C^1, at k^1 and k^2.

The kind of register or instrument to be operated is immaterial to the working of our invention—whether to work a register, ring bells, make special alarms, start and stop machinery, or give signals, &c.

The apparatus is peculiarly applicable to street-cars, for working registers. It enables the conductor to work his registers from either side of an open car while passing along the side foot-board, and collecting his fares without entering the car to do so. For example, suppose monitor M^1 to represent a register for counting five-cent fares, and monitor M^2 to represent another register for counting ten-cent fares. The conductor, standing near the post P, collects one fare of each kind, five and ten cents. It is only necessary for him to apply his lever or wrench to the vertical rod V′ and move it horizontally from M^1, (to the right,) and also from M^2, (toward the left,) in order to actuate each instrument successively.

The rods being small, and the springs *n* holding the levers L in their normal positions against their stops *m*, being quite strong, there will be no danger of trouble from playful handling of the rods V′ R^1 R^2, &c., by the passengers. When these rods are round, and provided with holes to insert a lever, there is more possibility of such interference, because a nail or wire, and many other common articles can be readily inserted in one of the holes to produce mischief; but when a wrench, W, of prescribed size, is required to grasp the rods, this danger is practically avoided, as has already been experimentally demonstrated.

The use of a round rod, R^3, and a lever, L^3, to work the same, is shown in Fig. 8, in which R^3 is a round rocking rod, carrying the arm a^3 connected at the top to the longitudinally-working rod or bar B, which also is adapted to receive the lever L^3 in the holes *h′ h′* to produce direct end-movement in either direction. z^1 z^2 are the slots providing for the necessary lost motion, to enable the parts to work either of the working levers L^3 or L^4, which ordinarily rest against the stops s^3 s^4 from the force of the springs q^3 q^4.

R^4 is a square rod, with the wrench W applied to it, ready to work either system O^1 or O^2. For example, by moving either L^3 or W to the right, the rod B is moved to the left, which actuates the lever L^4 and the mechanism attached; and by moving either of the same levers to the left the rod B is forced to the right, carrying the lever L^3 with it, while L^4 remains at rest in consequence of its connecting-pin *o* sliding along the slot z^2. So that turning the rods R^3 R^1 in one direction, or sliding bar B in one direction, produces no effect upon either the lever, pawls, or carrier *d* of one system, O^1 or O^2, while those of the other system are made to operate the corresponding system in a positive manner, as will be seen by examination of Fig. 8.

The same crank c^2 can readily be made to serve the same purpose as a pair of cranks c^1 and c^2, being in such case a double-acting crank moving in two directions—one direction corresponding to positive motion of one system, and idle or lost motion in the other system, or vice versa. Such double-acting crank we refer to in our claims as "two cranks," as it is so in substance and effect.

What we claim, and desire to secure by Letters Patent, is—

1. The combination of an actuating rod, two cranks, or one double crank, and a slotted bar or lever, operating substantially as described, to transmit motion at will in either of two directions, for the purposes set forth.

2. The combination of two actuating rods, connected by bevel-geared sectors, one of which sectors is provided with a long end-tooth, or teeth, to serve as a stop or stops, to prevent excessive motion of the gears, substantially as shown and described.

3. The T-formed slotted lever, and the cranked actuating rod, in combination with the intermediate adjustable parts connecting the crank and slotted lever, substantially as described and shown.

4. Two rods, each having two sets of connection to the two separate objects to be acted upon, with suitable means for actuating said rods in such a manner that the operator may actuate or operate either, and but one of

said objects at a time, by exercising force upon either of said rods, in either direction, substantially as set forth.

5. In a car provided with a system of horizontal rods or other connections, working a registering-machine fixed in said car, the combination, with said horizontal connections, of a vertical rod by which the horizontal connections may be worked by means of a suitable wrench or lever, substantially as described.

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