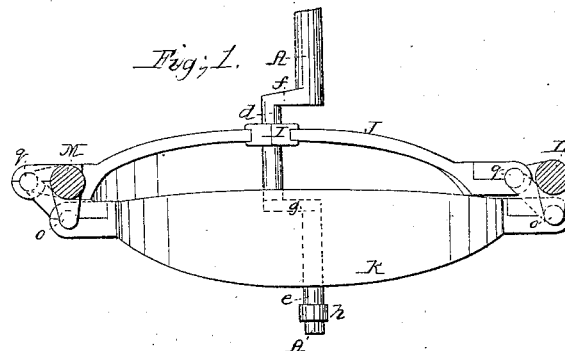
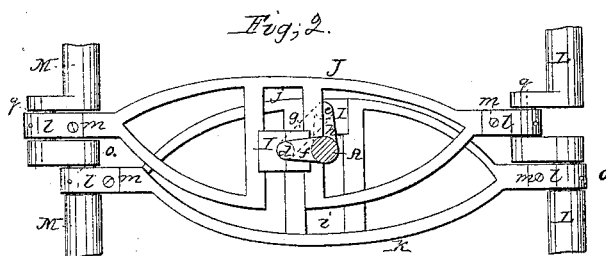
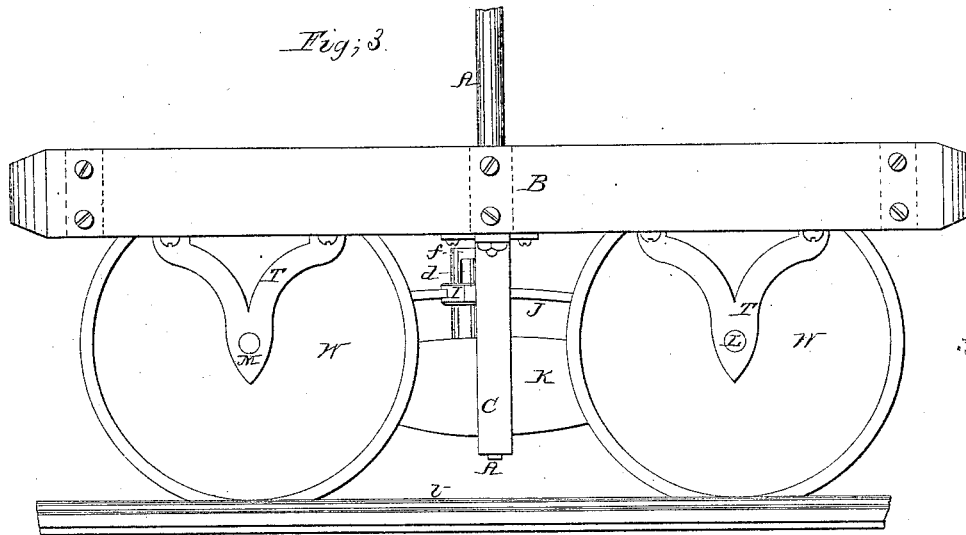


H. F. Shaw,

Mechanical Movement.

N^o 50,283.

Patented Oct. 3, 1865.



Witnesses
N. Ames
L. R. Clarke

Inventor;
Henry F. Shaw

UNITED STATES PATENT OFFICE.

HENRY F. SHAW, OF WEST ROXBURY, MASSACHUSETTS.

IMPROVEMENT IN TRANSMITTING MOTION.

Specification forming part of Letters Patent No. 50,283, dated October 3, 1865.

To all whom it may concern:

Be it known that I, HENRY F. SHAW, of West Roxbury, in the county of Norfolk and State of Massachusetts, have invented a new and useful Method of Transmitting Motion; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a plan, and Fig. 3 is a side elevation, of the same applied to a locomotive or dummy engine.

Like parts are indicated by the same letters in all the drawings.

The nature of my invention consists, first, in transmitting rotary motion from a rotating crank-shaft to a shaft or shafts arranged at an angle to the same by means of two connecting-rods, or their equivalents, provided with slots at right angles to their length for the elongated cranks to slide in, so that while said connecting-rods slide over said cranks parallel with their axis the cranks will slide in the slots at right angles with the rods, by means of which devices the driving-shaft is free to turn in a plane at right angles with the driven shaft or shafts, and also to move vertically toward and from the same, as may be required; and, second, in the combination of the above devices with the wheel-axles and truck-frame of a locomotive or a street steam-railway car or dummy engine, the power being applied to the upper end of the crank-shaft either from a reciprocating engine or engines or a rotary engine whose axis may be the crank-shaft itself, by means of which arrangement the boiler and engine or engines, which are located in the front end of the car, above the truck-frame, are free to move vertically toward and from the axles of the truck-wheels to accommodate the up-and-down motion of the car and truck upon the springs on which they rest, while at the same time the truck-frame is free to turn to the right or left, in the usual manner, independently of the body of the car, and provision is made for the necessary movement or swaying of the truck-frame B to either side of the wheels W W, occasioned by the curvature and irregularities of the track U.

To enable others skilled in the art to make and use my improvement, I will now proceed

to describe the construction and operation of the same.

A is the crank-shaft, which turns in suitable bearings, B and C, as shown in Fig. 3, and is provided with two elongated cranks, *d* and *e*, placed at right angles to each other, being connected with the shaft by means of the arms *f g h*.

L and M represent two parallel shafts, (as the two axles of a truck-frame, B, for a locomotive or dummy engine,) provided with two cranks, *o* and *q*, at right angles to each other, as represented in Figs. 1 and 2. These two shafts L and M are united by means of the two connecting-rods J and K, in the usual manner of connecting the front and hind axles of locomotives. These connecting-rods J and K may be shaped as shown in the drawings, or in any other suitable and obvious manner, being connected with the cranks *o q* by means of the caps *l* and screws *m*.

j and *i* are slots in the rods J and K, at right angles to the same, as clearly shown in Figs. 1 and 2.

I I are boxes, made in two parts, and fitted to slide freely in the slots *i j* in the rods I and K, the center of the said boxes being provided with cylindrical bearings for the reception of the elongated cranks *d* and *e*, which turn in and slide up and down through them as the shaft A is rotated.

From the above description it is obvious that as the shaft A revolves the boxes I I will slide backward and forward in the slots *i* and *j*, at right angles to the rods J and K, while at the same time the said boxes are sliding longitudinally on the elongated cranks *d* and *e*, whereby a vertical and horizontal motion is communicated to the said rods and a continuous rotary motion to the shafts L and M. As the elongated cranks *d* and *e* are somewhat longer than twice the length of the cranks *o q* upon the shafts L M, it is obvious that the shaft A may have a slight vertical motion toward and from the shafts L M, the advantage of which, when applied to a locomotive or street steam-railway car, has been already described. Again, as the slots *i* and *j* are somewhat longer than the throw of the cranks *d* and *e*, it follows that the rods J and K may have a slight motion toward or from the shaft A, at right angles to the same, the

advantage of which, when applied to a locomotive, &c., has also been alluded to above.

Fig. 3 represents my improved method of transmitting motion as applied to a locomotive or street steam-railway car or dummy-engine. It is obvious, however, that my method may be applied to very great advantage in many other cases for transmitting motion from a vertical to a horizontal shaft, and vice versa, where miter or bevel gears are now employed, thereby preventing a great amount of friction, noise, and jarring.

Having thus described the nature of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Transmitting motion from shaft to shaft, when at an angle with each other, by means

of the slotted connecting-rods J K and elongated cranks *d e*, or their equivalents, substantially as described.

2. Giving motion to the driving-wheels of a locomotive, dummy-engine, or street steam-railway car by means of the vertical crank-shaft A, provided with the elongated cranks *d* and *e* and the slotted connecting-rods J and K, or their equivalents, arranged and operating substantially as described.

3. Passing the vertical driving-shaft A through the center on which the truck-frame turns, substantially as described.

HENRY F. SHAW.

Witnesses:

N. AMES,

GEO. R. CLARKE.