

UNITED STATES PATENT OFFICE

JAMES B. HUNTER, OF ASHLEY, ILLINOIS.

IMPROVEMENT IN MOTIVE POWERS.

Specification forming part of Letters Patent No. 119,362, dated September 26, 1871.

To all whom it may concern:

Be it known that I, JAMES B. HUNTER, of Ashley, in the county of Washington and State of Illinois, have invented a new and Improved Motive Power; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to improvements in motive powers, in which the power is obtained by a weighted car running down an inclined way; and it consists in an improved arrangement of means for tilting the way to reverse the incline when the car arrives at either end, to utilize the power of the car while moving in either direction. It also consists in an arrangement of apparatus for automatically taking up the slack chain connecting the car with the gearing for transmitting the motion, while the other chain—two being employed—is imparting the motion. It also comprises a novel arrangement of the final wheel of the transmitting-train.

Figure 1 is a plan view of my improved apparatus. Fig. 2 is a side elevation. Fig. 3 is a section taken on line *x x*, and Fig. 4 is a section on line *y y*.

Similar letters of reference indicate corresponding parts.

A represents the frame or ways on which the weighted car is to run; it rests on the curved rockers C arranged on a suitable bed, D, and is provided with strong points E extending down through the rockers at the center into holes in the base, which admit of the necessary vibration for the ways to be tilted, but hold them against moving out of position on the bed. F is a tilting lever pivoted to a support at G, and connected a short distance above with each end of the frame by rods H pivoted to it, and screwing through the studs I, by which they are connected to the frame for adjustment therewith. K is the first moving shaft of a system of multiplying gears for transmitting the motion, on which there are fitted two chain-winding drums, L M, which connect with the shaft for imparting the power by the chains, by ratchets N and pawls O, which allow them to turn independently of the shaft for winding up the chains. One end of the car is connected to drum L by chain P passing over guide-wheel Q, and the other end is connected

to drum M by chain R. Each drum is also connected by a belt, S, or other suitable means, with a drum, T, attached to shaft U by a coiled spring, V, so arranged that when the chain is unwinding from its drum the drum T will be turned so as to coil up said spring, and when the motion of the car is reversed and said chain slackened by the return movement of the car the coiled spring V will revolve drum T, and the latter, turning the chain-drum by the cord S or other device, will wind up the chain again ready for imparting the motion when the way is reversed again. In this way a continuous motion is produced, except the interruption caused by tilting the way, which is done by the attendant each time the car arrives at the bottom. This tilting of the way elevates the weighted car and depresses the other end so that it will run back again. The inclination of the way is intended to be varied according to the power required by means of the spring-stop W on the lever F and the notched bar X attached to the bed, the said stop dropping into the notches of said bar and holding the way in any position required. The multiplying-train may be of any approved kind, and combine both rotary and reciprocating movements, if preferred. Y is a ratchet applied to one of the shafts of the train, and Z is a holding-pawl for engaging with and arresting the motion or holding the apparatus after it has been arrested. The shaft U has a crank, U', for regulating the tension of the springs, which may also be used for holding the springs against uncoiling. I propose to transmit the motion from the clock-train to a crank-shaft, for which I employ a cam or escapement-wheel, *a*, with a zig-zag groove, *b*, in it to work a lever, *d*, which has a friction-roller, *e*, working in said groove, and is connected by a rod, *f*, with a cross-head, *h*, by which the pitman connected with the driving-shaft *k* is worked; and in order to prevent any shocks from the action of the wheel *e* in the zig-zag groove *b* I connect the wheel *a* to its shaft *n* by a spiral spring, which is confined in the hub *p*, one end of said spring being attached to the shaft and the other to the wheel so that the said spring will relieve the shocks. The hub *p* is provided with a removable plate to admit of applying the spring. The cross-head *h* is mounted on rollers *l* working on the rail in and under the guide *j* for reducing the friction due to a sliding cross-head.

Having thus described my invention, I claim

as new and desire to secure by Letters Patent—

1. The tilting-frame or way mounted on the rockers *C* and points *E* and provided with the tilting-lever, connected as described, and having the shiving-stop working in connection with the notched stop-bar, all substantially as specified.

2. The transmitting wheel *a* having the zig-zag groove *b*, and connected to the shaft by a spring, combined with the lever *d*, roller *e*, rod *f*, and the cross-head *h*.

3. The arrangement of the cross-head *h* on fric-

tion-rollers *e*, and with the rail *m* and guide *k*, all substantially as specified.

4. The driving-shaft *R*, having a separate drum, *M*, for the connecting-chain of each end of the car, said drum being mounted as described, and connected to a spring-winding drum, *T*, for automatically winding up the slack chain, all substantially as specified.

Witnesses:

JAMES B. HUNTER.

JOSHUA HUNTER,
JOHN W. HERRIN.