

D. L. PALMER.
HAND CAR.
APPLICATION FILED OCT. 23, 1911.

1,018,264.

Patented Feb. 20, 1912.

Fig. 1.

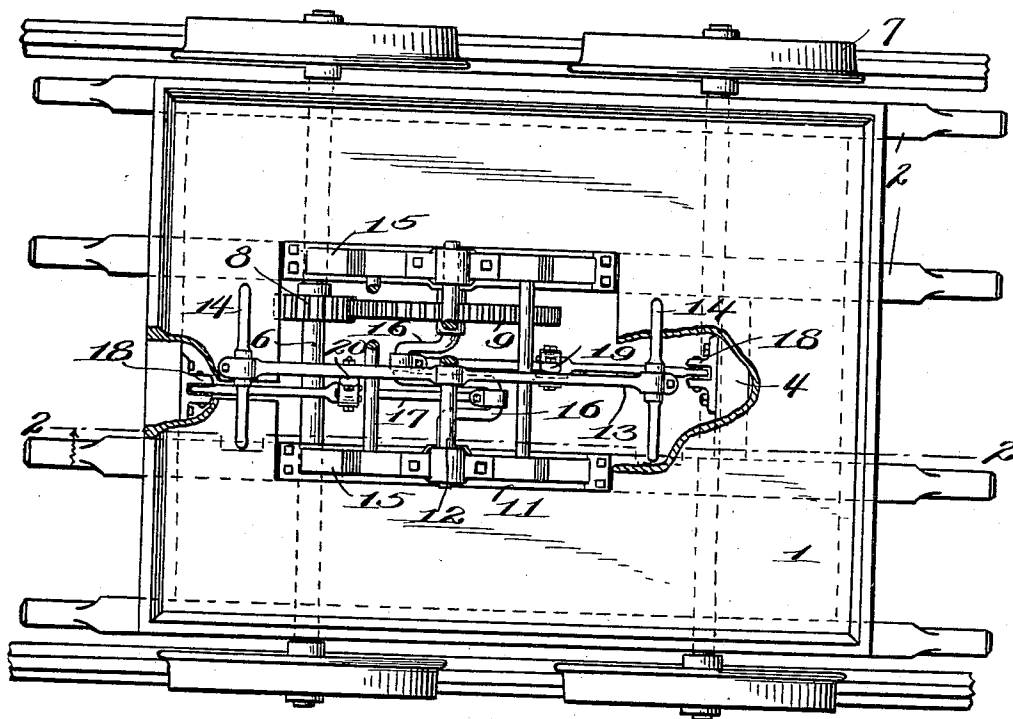
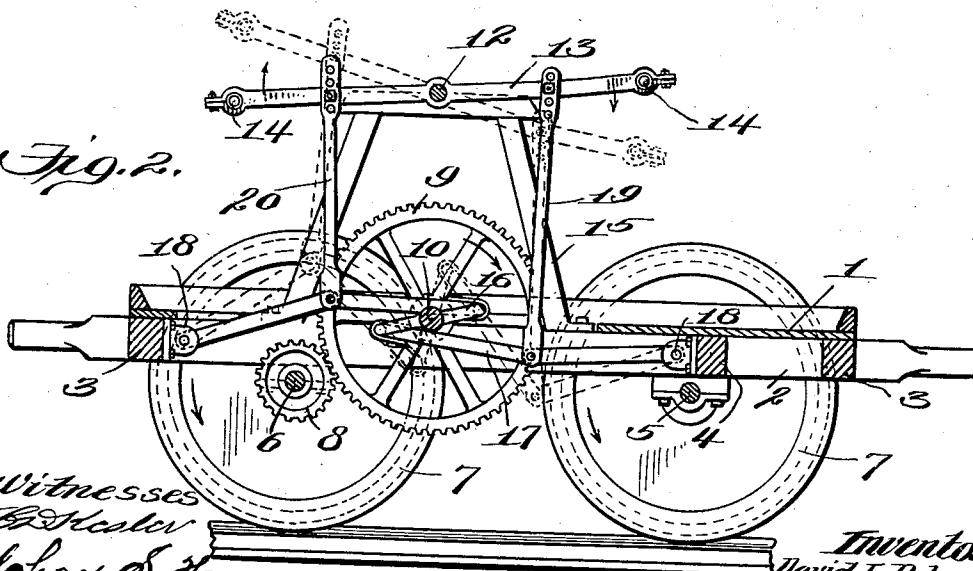


Fig. 2.



Witnesses
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HAND-CAR.

1,018,264.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed October 23, 1911. Serial No. 656,260.

To all whom it may concern:

Be it known that I, DAVID L. PALMER, a citizen of the United States, residing at Worthington, in the county of Bradford and State of Florida, have invented new and useful Improvements in Hand-Cars, of which the following is a specification.

This invention relates to hand cars for use on railroads, and the primary object of the same is to construct and arrange the cranks and levers of hand cars in such manner that the maximum amount of driving power exerted upon the levers by manual operation may be obtained by a materially reduced primarily applied manual force to maintain the propulsion of the car.

In other words, the object is to overcome largely the loss of power due to the indirect action of the levers and analogous devices as well as friction present in the form of hand car as ordinarily constructed and commonly used.

The invention consists in the construction and arrangement of the several parts which will be more fully hereinafter described and claimed.

In the drawing: Figure 1 is a top plan view of a hand car embodying the features of the invention. Fig. 2 is a longitudinal vertical section on the line 2—2, Fig. 1.

The numeral 1 designates the body of the car which comprises the usual frame structure and bed including the side and end sills 2 and 3 and in the present instance an extra cross-sill 4 is introduced in the frame. In suitable bearings attached to the frame axles 5 and 6 are rotatably mounted and have on opposite extremities the usual form of flanged wheels 7, the axle 6 receiving the driving power through the medium of a pinion 8 keyed thereto and in continual mesh with a spur gear 9 fast on a crank shaft 10 which constitutes the drive shaft of the car. In the center of the bed an opening 11 is formed as usual in cars of this type for projection and movement therethrough of the operating mechanism in part, and over this opening the primal operating means is disposed and consists, as usual, of a rock-shaft 12 having a hand lever 13 centrally secured thereon and provided with hand bars 14 at opposite ends, the said rock-shaft being mounted in suitable bearings secured on the top members of opposed uprights or frames 15.

The crank shaft 10 is formed or provided

with oppositely projecting cranks 16, and to each crank the inner end of links or levers 17 is movably attached. The links or levers 17 are composed of two members, the inner end of one member being attached to one of the cranks 16 as just specified, and the outer end of the remaining member is movably attached to a fulcrum support 18, the fulcrum support of one set of links or levers being secured to the inner side of the cross-sill 4 and the similar support of the remaining set of links or levers is secured to the inner side of one of the end sills 3, both fulcrum supports being of a similar structure, and one located about in the longitudinal central plane of the car and the other a little to one side of said plane to dispose the sets of links or levers longitudinally with relation to the car body and in line with the centers of their respective cranks 16. To the hand lever 13 at suitable distances on opposite sides of the rock shaft 12 the upper ends of connecting bars 19 and 20 are adjustably attached and depend through the opening 11 in the car bed and have the links or levers 17 attached thereto, each connecting bar having one pair of levers pivotally attached to the lower end thereof, or in other words, the lower end of each connecting bar is applied over the intermediate joint of each set of links or levers 17.

The connecting bar 20 is shorter than the bar 19 so that the stroke on one side of the crank shaft will be shorter than on the other side to equalize the manually applied power stress and insure a compensating action or operation of the two sets of links or levers 17 and a regular rotation of the crank shaft 10 and spur gear 9 by a constant overthrow of the cranks 16 past the dead center. This operation is enhanced and rendered advantageous by intermediately joining the sets of links or levers 17 and attaching the lower ends of the connecting bars 19 and 20 to the said levers at their intermediate joints for the reason that by applying the power to the fulcrum points of the links or levers 17 the resistance to movement of the links or levers is overcome and less power is required to bring the levers to a straight line, and the nearer they come toward a straight line the more expansive force they will have. In the arrangement of intermediately fulcrumed or hinged links or levers as shown in the drawing and in accordance with the features of this inven-

tion, both sets of levers being simultaneously elbowed and straightened out, and this operation taking place in regular alternation, increased leverage is maintained
5 without loss of power or frictional resistance.

The operation of the car will be readily understood from the foregoing description, and to briefly explain the same the operators grasp the hand bars 14 and rock the
10 lever 13 and shaft 12 to alternately depress and elevate the connecting bars 19 and 20 and correspondingly actuate the sets of links or levers 17 to regularly rotate the
15 shaft 10 through the medium of the cranks 16 and thereby rotate the spur gear 9 and pinion 8 and axle 6.

The improved car will be found exceptionally advantageous in its operation, particularly in starting the same and maintaining a positive rotation of the shaft 10. The operating mechanism as hereinbefore described may be readily applied to hand cars now in use with comparatively little expense and without materially modifying the
25 usual structural features.

What is claimed is:

1. In a hand car, the combination of rotatable wheeled axles one of which carries
30 a pinion, a crank shaft provided with a pair of oppositely projecting cranks and having a spur gear thereon meshing with the said pinion, opposite sets of intermediately joint-

ed levers having their inner members attached to the cranks and their outer members fulcrumed on portions of the car body, a rocking hand lever having hand bars at its opposite ends, and connecting bars depending from the hand lever and attached at their lower ends to the intermediate
40 joints of the sets of levers.

2. In a hand car, the combination of rotatable wheeled axles one of which carries a pinion, a crank shaft provided with a pair of oppositely projecting cranks and
45 having a spur gear thereon meshing with the said pinion, opposite sets of intermediately jointed levers having their inner members attached to the cranks and their outer members fulcrumed on portions of
50 the car body, a rocking hand lever having hand bars at its opposite ends, and connecting bars attached to the hand lever on opposite sides of the center of the latter and depending to and movably connected at the
55 intermediate joints of the sets of levers, the one connecting bar being longer than the other.

In testimony whereof I have hereunto set my hand in presence of two subscribing
60 witnesses.

DAVID LAFAYETT PALMER.

Witnesses:

J. U. STEPHENS,
OPHELIA BUTLER.