

(No Model.)

4 Sheets—Sheet 1.

A. HITT.
HAND CAR.

No. 505,830.

Patented Oct. 3, 1893.

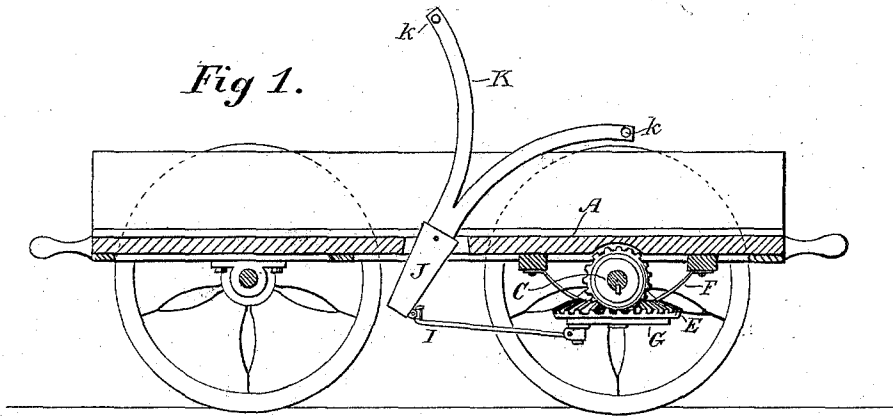
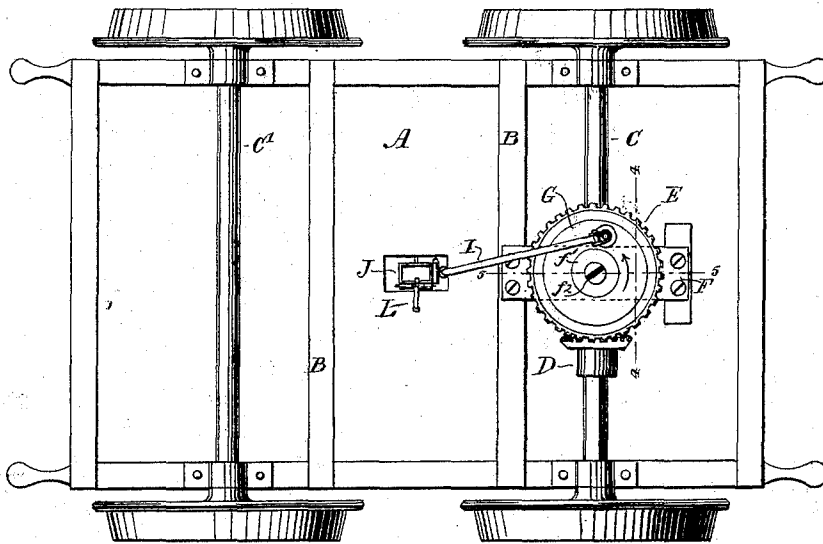


Fig 2.



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Fig 3.

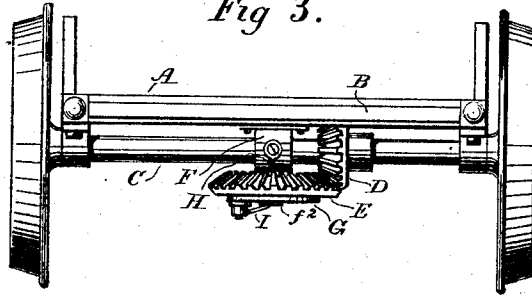


Fig 4.

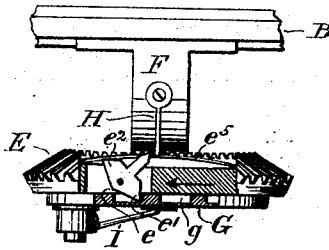


Fig 5.

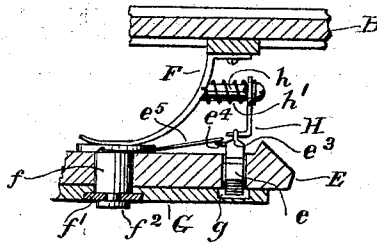


Fig 6.

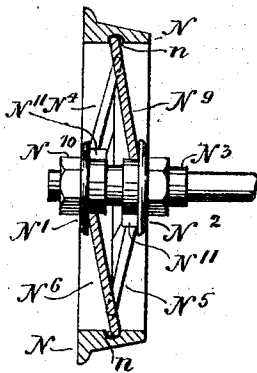
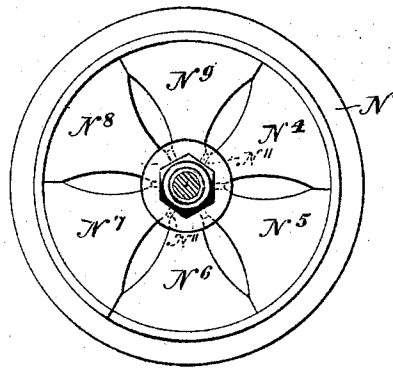


Fig 7.



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Fig 8.

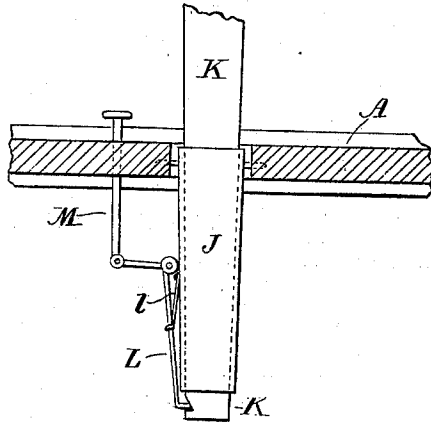


Fig 9.

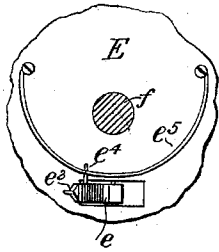
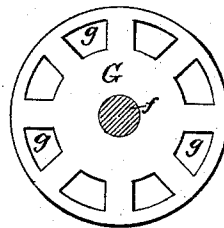


Fig 10.



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(No Model.)

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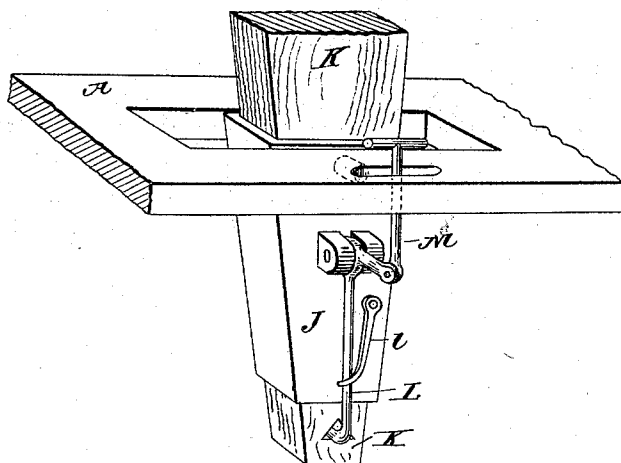


Fig. 11.

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D. A. Carpenter

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UNITED STATES PATENT OFFICE.

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HAND-CAR.

SPECIFICATION forming part of Letters Patent No. 505,830, dated October 3, 1893.

Application filed December 30, 1892. Serial No. 456,774. (No model.)

To all whom it may concern:

Be it known that I, ADRIAN HITT, a citizen of the United States, residing in Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Hand-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The principal object of my invention is to produce a hand car which shall be durable, simple in construction, and which may be propelled at a maximum speed with a minimum expenditure of power. Another object thereof is to attain these results by so arranging the propelling mechanism that the car may be readily transformed into a push car, with a clear platform for the transportation of tools, &c., and as readily reconverted into a motor car as before.

To this end my invention consists in the novel arrangement and combination of parts, and in the details of construction herein shown and described, and more specifically referred to in the claims.

Figure 1 of the accompanying drawings is a longitudinal elevation, partly in section. Fig. 2 is a plan view of the under side of the platform of the car. Fig. 3 is an end elevation of the car viewed from the rear. Fig. 4 is a sectional view on a larger scale of the crown wheel (on the line 4—4 Fig. 2) showing the clutch and reversing mechanism. Fig. 5 is a view thereof on the line 5—5 (Fig. 2). Fig. 6 is a cross section of one of the wheels which I prefer to employ. Fig. 7 is a view thereof in elevation. Fig. 8 is a front elevation of the hand lever socket. Fig. 9 is a broken plan of the upper face of the crown wheel, and Fig. 10 is a plan of the upper face of the ratchet disk. Fig. 11 is a view in perspective of the hand-lever socket showing the lever fastening mechanism.

Similar reference characters are employed to designate corresponding parts in all the views.

In the drawings A represents the platform of the car supported on a suitable frame B, The axles C, C' on which the wheels are mounted are journaled in suitable bearings attached to the frame of the car. The driv-

ing wheels are keyed to the axle C, but the other pair may be arranged to rotate on their axle for convenience in turning the car, and in rounding curves.

A bevel gear D is keyed or otherwise securely fastened to the axle C. This gear may be placed on either side of the crown wheel E with which it meshes. The crown wheel E is journaled on a stud *f* depending from the yoke F which is secured to the framing or platform of the car, and said crown wheel is connected with the operating mechanism of the car in the manner hereinafter described.

Between the connections from the operating mechanism and the driving gear, I preferably arrange a clutch device whereby the driving gear may rotate in one direction independent of the operating mechanism, but will be locked so as to move with it in the other direction. I also preferably make this clutch reversible so that the operating mechanism and driving gear may be locked to move together in either direction as hereinafter explained. I accomplish this result by mounting on the stud *f*, beneath the crown wheel E, a ratchet disk G which with the wheel E is held in place by the countersunk washer *f'* and screw *f*². In a recess in the crown wheel E is pivoted a swinging T-shaped pawl *e*, which is provided with the teeth *e'* *e*² and the arm *e*³. The slot in the wheel E is long enough to permit the pawl to swing on its pivot so as to bring either one of the teeth *e'* *e*² below the under face of the wheel. The upper face of the disk G, which rests against the under surface of wheel E, is provided with a series of recesses *g* which coincide with the pawl *e*, and into one of which projects one or the other teeth of pawl *e* (depending on which side of its pivot it is swung). From the arm *e*³ of pawl *e* projects a pin *e*⁴ which extends out under the loop spring *e*⁵ carried on the upper surface of the crown wheel E. The ends of the loop spring are secured firmly to the face of the crown wheel by screws, or in any suitable manner. This spring *e*⁵, being always under tension, holds the pawl *e* on whichever side of its pivot it may be swung. A yielding finger or trip H is suspended above the wheel E in the path of the arm *e*³ of pawl *e*. This finger H is carried by a pin *h* which

projects from the yoke F, and a torsion spring h' maintains it in an approximately vertical position so that when the arm e^3 of pawl e is on one side of its pivot, the trip will yield slightly and permit the pawl to pass under it as the wheel E revolves, while if the arm is in the reverse position, the trip will engage the arm e^3 , and the movement of the wheel will cause the arm to be lifted by the trip and swung over its center.

A connecting rod I is, at one end, pivotally secured to a stud or post on the disk G, and at the other end is swiveled to the link J, which is pivoted at its upper end in the framing, or to the platform of the car, an opening of sufficient size being made in the platform to receive it. The link J is recessed to form a socket for the lower end of the removable operating lever K, which is provided with suitable handles k . A spring clip L, actuated by a spring l , is secured to the link J, and its lower end is arranged to spring into a notch in the lower end of lever K when it is inserted in the socket J. A rod M secured to the clip projects through and above the platform of the car, by raising which the end of the clip is carried out of the notch in the lever when the latter is to be removed.

I have illustrated herein an improved form of wheel, which I have invented, and which on account of its strength and lightness I prefer to use on my hand car; but it is my intention to file a separate application for this wheel, and I hereby reserve such invention for said application.

The details of the apparatus may be modified in many particulars without departing from the spirit of my invention.

The operation of the simplest form of my improved car, in which the clutch mechanism is not necessarily embodied, will, by referring to Figs. 1 and 2 be understood without a further detailed description. It will be observed that by applying power to the lever K, the link J will be vibrated, and the crown wheel, the gear meshing therewith, the axle and driving wheels will be rotated, the direction of their rotation being determined by the position of the mechanism when it is started; or the proper direction of rotation may be imparted to the parts named by simply starting the car in the right direction before applying power to the hand lever. Where the clutch mechanism is employed, the operation is as follows: With the pawl e in the position shown in Fig. 4, if the lever K be vibrated to turn the disk G in the direction shown by the arrow (Figs. 2 and 4) the tooth e' of the pawl, carried by wheel E, will engage with the side wall of the recess in the disk G into which it projects, and as said disk is rotated, the wheel E will be carried around with it, turning the gear D and driving wheels so as to carry the car forward, the rear of the car being assumed for the purposes of illustration, to be the end at which the axle G is journaled. With each

revolution of the wheel E, the arm e^3 of the pawl e will pass under the trip H and lift it sufficiently to permit the passage of the arm under it, the pawl being held in place by the pressure of the spring e^5 on the pin e^4 , and the trip, under the action of spring h , will spring back to its place. If now, with the parts in the same position, it is desired to start the car in the opposite direction, the car is given a movement in that direction which will cause the crown wheel E to revolve in a contrary direction to that shown by the arrow in Fig. 4, the end of the arm e^4 will be caught by the trip H, and as the wheel turns, will swing the arm over to the other side of the slot, thus reversing the position of the pawl and throwing its tooth e^2 below the under surface of the wheel. If now the disk G be revolved in the opposite direction to that shown by the arrows (Figs. 2 and 4) the tooth e^2 will engage with the left hand side of one of the recesses g and lock the disk G and wheel E so that they will move together as before, but in the opposite direction, and the car will be impelled rearwardly.

The advantages which I attain by my improved construction herein shown and described are principally its ready and instant convertibility from a motor to a push car with a clear platform, which is accomplished by simply removing the handle from its socket; strong and positive acting driving gear which is easily constructed and kept in repair, and by which the power of the operator is applied to the best advantage, and durable and effective reversing gear, which is of the utmost simplicity, and by which lost motion is reduced to a minimum. Furthermore, by the use of a crown wheel rotating in a horizontal plane, the platform may be placed lower than where vertical cogs are employed, thus requiring much less labor to load and unload heavy articles from the car, and also diminishing the tendency to accidents which is involved in the employment of a car with a high platform. Another advantage of this construction is that the diameter of the crown wheel may be much greater than that of a vertical cog, thereby permitting a greatly increased rate of speed. By connecting the crown wheel directly to the link which serves as a socket for the hand lever, the power is applied to the best possible advantage, the number of parts, and thereby the cost of construction is decreased and friction reduced to a minimum. By placing the operating lever near the center of the car, it may be run in either direction with equal facility, and the power may be evenly distributed on both sides of the lever. By making the operating lever removable, the car as before stated may be instantly transformed from a section car into a push car, and in going down grades the lever may be likewise removed so as to be entirely out of the way, thus permitting the operators to rest.

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

1. In a hand car, the combination of a swinging link projecting below the platform, a crown wheel mounted below the platform so as to rotate in a plane parallel therewith, a gear on the driving axle of the car meshing with said crown wheel, a connection between said crown wheel and the swinging link and a removable operating lever engaging with said swinging link and projecting above the platform, substantially as shown and described.

2. In a hand car, the combination of a swinging link pivoted in the framing or platform of the car and projecting below said platform, a crown wheel mounted below the driving axle of the car so as to rotate in a horizontal plane, a gear on the said driving axle meshing with said crown wheel, a connecting rod between said swinging link and said crown wheel and a removable operating lever engaging with said link and projecting above the platform, substantially as shown and described.

3. In a hand car, the combination with the axle and the driving mechanism, of a crown wheel gearing with the axle, a ratchet disk connected with the driving mechanism, and a reversible pawl arranged to be actuated by the movement of the car, and forming an engagement between the said wheel and said disk, substantially as shown and described.

4. In a hand car, the combination with the axle and the driving mechanism, of a crown wheel gearing with the axle, a ratchet disk connected with the driving mechanism, a reversible pawl carried by said crown wheel and arranged to form an engagement with said disk, and mechanism for actuating said pawl, substantially as shown and described.

5. In a hand car, the combination with the axle and the driving mechanism, of a crown wheel gearing with the axle, a recessed disk connected with the driving mechanism, a re-

versible pawl carried by said crown wheel so as to engage with the recesses of said disk, and mechanism substantially as described for reversing said pawl when the movement of the car is reversed, substantially as shown and described.

6. In a hand car, the combination with the axle and the driving mechanism, of a crown wheel gearing with the axle, a recessed disk connected with the driving mechanism, a reversible pawl carried by said crown wheel so as to engage with the recesses of said disk, and a trip for reversing said pawl when the movement of the car is reversed, substantially as shown and described.

7. In a hand car, the combination with the axle and the driving mechanism, of a crown wheel gearing with the axle, a recessed disk connected with the driving mechanism, a pawl carried by said disk and arranged to lock the disk and wheel when the latter is moved in one direction, and a trip for reversing said pawl so as to lock the disk and wheel when the movement of the latter is reversed, substantially as shown and described.

8. In a hand car, the combination of the driving mechanism, axle, gear wheel, crown wheel, disk and reversible pawl, with a yielding trip for reversing the position of the pawl, substantially as shown and described.

9. In a hand car, the combination of the driving mechanism, axle, gear wheel, crown wheel, disk, trip and reversible pawl, with a spring for retaining the pawl in position, substantially as shown and described.

10. In a hand car, the combination of a removable operating handle and a spring clip below the platform, provided with a lever extending through the platform, for holding the operating handle in its socket, substantially as shown and described.

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Witnesses:

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