(No Model.) 2 Sheets—Sheet 1.

E. COURTRIGHT.

HAND CAR.

No. 456,982. Patented Aug. 4, 1891.

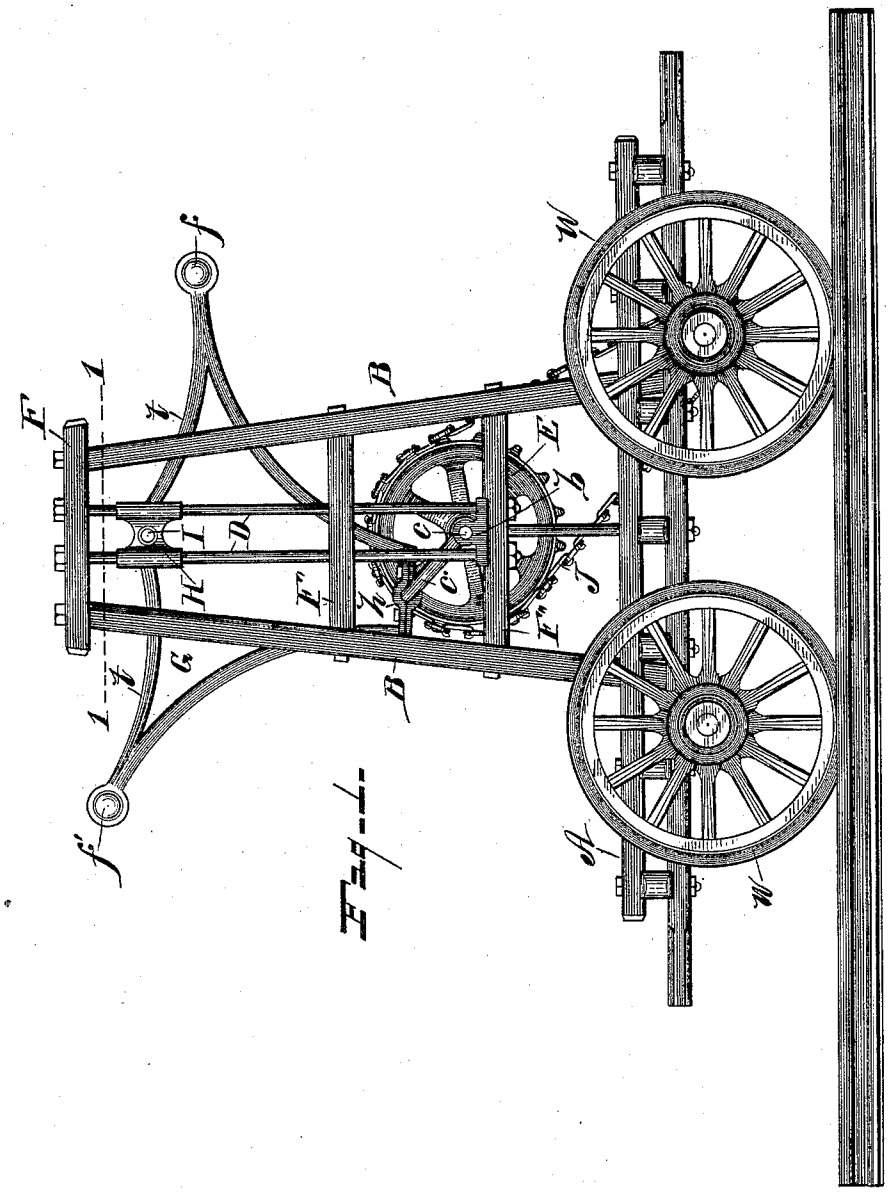


Fig. 1.

WITNESSES

E. M. Wheeler

B. F. Wheeler

INVENTOR

E. Courtright

By

Roscoe B. Wheeler

Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

E. COURTRIGHT.

HAND CAR.

No. 456,982. Patented Aug. 4, 1891.

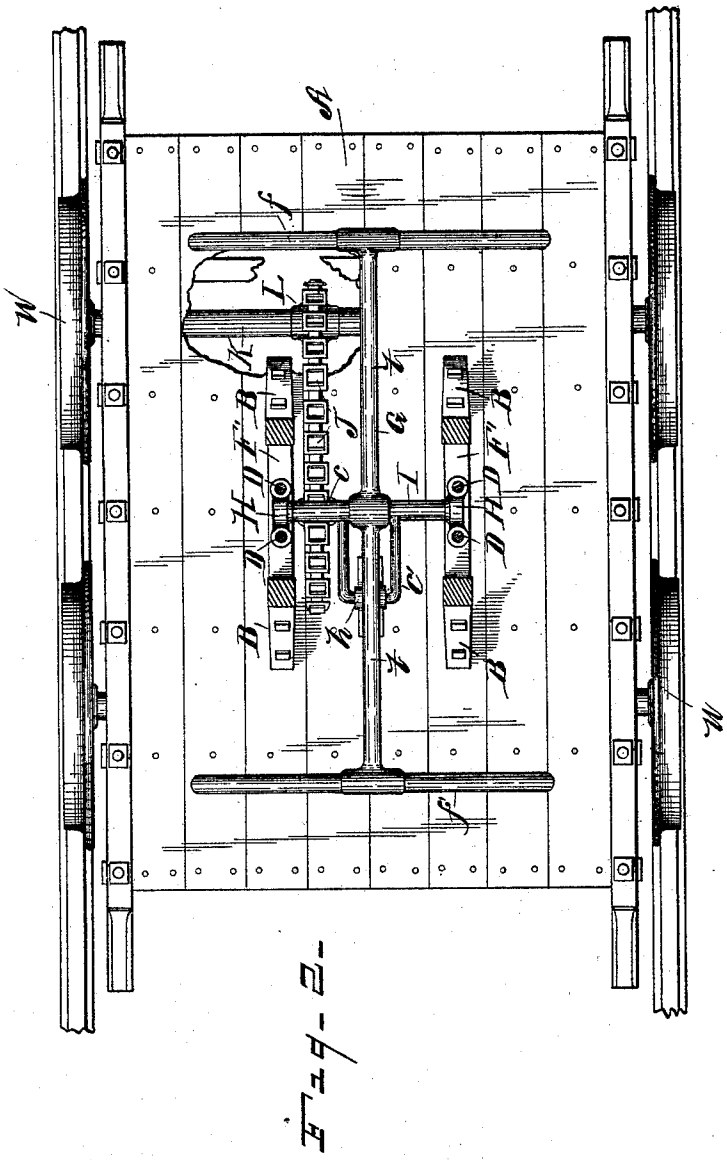


Fig. 2.

WITNESSES

E. Wheeler

R. B. Wheeler

INVENTOR

E. Courtright

By Roscoe B. Wheeler

Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDGAR COURTRIGHT, OF DETROIT, MICHIGAN, ASSIGNOR OF THREE-FOURTHS TO CHARLES G. DAVIES AND FRANK C. LANGLEY, BOTH OF SAME PLACE.

HAND-CAR.

SPECIFICATION forming part of Letters Patent No. 456,982, dated August 4, 1891.

Application filed November 3, 1890. Serial No. 370,103. (No model.)

To all whom it may concern:

Be it known that I, EDGAR COURTRIGHT, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Hand-Cars; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in the propulsion of hand-cars; and it consists in a certain construction and arrangement of parts, as hereinafter more fully set forth, the essential features of which being pointed out particularly in the claims.

The object of the invention is to overcome the dead-centers in the conversion of a reciprocating motion into a continuous rotary motion and without the loss of leverage force in the application of the driving-power to the propulsion of hand-cars. This object is attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a hand-car provided with my improved features. Fig. 2 is a top plan of Fig. 1, a portion of the platform of the car being broken away to show the connection of the chain with a sprocket-wheel on the axle of the car, and the top of the vertical frame that supports the driving mechanism being in horizontal section on line 1 1 of Fig. 1 to more clearly show the arrangement of parts.

Referring to the letters of reference, A indicates the platform of the car, and W the wheels.

B B indicate the uprights of the vertical supporting-frame, consisting of said uprights connected by the cross-bars F F′ F″. Said frame is mounted on the car-platform at the center thereof, as shown in Fig. 2, and supports the operating mechanism of the car.

C indicates a crank-shaft journaled in boxes *b*, mounted on the cross-bars F″ of the frame, said shaft carrying the sprocket-wheel E, that is connected by means of the chain J with the sprocket-wheel L on the axle K of the car. (See Fig. 2.)

G indicates a triangular, reciprocating, and oscillating lever, whose upper arm *t* is mounted at its longitudinal center on the transverse shaft I, that is journaled at its ends in the sliding heads H, said heads being mounted on the vertical guide-rods D, secured at their ends in the cross-bars F F″ of the frame and are adapted to have a reciprocating movement thereon.

The depending end of the triangular lever G is journaled at *h* to the wrist of the U-shaped crank C′ of the shaft C, and the horizontally-opposite ends of said lever are provided with the handles *f f′*, as clearly shown in Fig. 2, at which points the power to drive the car is applied.

From the drawings and above description it will now be apparent that when the power to propel the car is being applied at both the handles of the lever G the crank C′, driven by said lever, is at no time on a dead-center respecting the relative points of the application of power thereto. For instance, when the crank C′ in its revolution is passing the point of dead-center between its axis and the handle *f′* of the lever G, as shown in Fig. 1, the opposite handle *f* of said lever is exerting its full power upon said crank, at which moment the handle *f′* of the lever is stationary and becomes the fulcrum of the handle *f*, thus giving said handle *f* of the lever a greatly-increased leverage force over the crank, the converse being the case when the crank is passing the dead-centers between its axis and the handle *f* of said operating-lever, as will be understood. As the crank C′ revolves, the heads H, having journaled therein the ends of the shaft I, on which is mounted the upper arm *t* of the lever G, slide up and down on the guide-rods D, giving said lever a vertically-reciprocating motion at the point of attachment to the heads H, and as the crank swings out of its vertical centers the lever is rocked, causing its handles to oscillate. When the crank C′ is passing its vertical centers, the arm *t* of the lever G is perfectly horizontal and its handles *f f′* are moving at the same rate of speed and each have the same

leverage force, the shaft I at that time acting as the fulcrum-point for said handles, respectively; but when the crank is passing the line of dead-center, between its axis and one of the handles of the lever, said handle so in line is stationary and becomes the fulcrum of the opposite handle, so that when one of the handles of the lever at which power is applied is rendered ineffective at a certain point through its dead-center the opposite end of the lever, by reason of its shifted point of fulcrum, is given a highly-increased leverage force to carry the crank past said point, thus carrying out the application of power for hand-car propulsion through the conversion of a reciprocating into a rotary motion without the loss of leverage force, producing a hand-car cheap in construction that may be propelled with a great saving of power over those in common use and at a much higher rate of speed.

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

1. In combination with the platform, transporting-wheels, and axle of a hand-car, a sprocket-wheel mounted on the axle, the upright frame mounted on the car, the shaft journaled in said frame, the crank on said shaft, the sprocket-wheel on said shaft, the chain connecting the sprocket-wheels, the triangular lever having its lower plane attached to the crank of the crank-shaft, and the vertically-traveling head, the triangular lever having a pivotal connection with said head, its free ends each carrying a horizontally-projecting handle, substantially as specified.

2. In combination with the platform and running-gear of a hand-car, the upright frame, the parallel guide-rods mounted therein, the sliding heads mounted on said rods, the shaft journaled in said frame and having the U-shaped crank, the triangular lever, its upper arm having a pivotal connection with the sliding heads, its lower arm having a like connection with the U-shaped crank, the handles *f f'* in the free ends of said lever, and means for conveying power from the crank-shaft to the axle of the car, substantially as and for the purposes specified.

3. In conjunction with a hand-car body, an upright frame mounted thereon, sliding heads on said frame, the crank-shaft, the triangle-lever formed of a single piece, said triangle-lever carrying handles in its free ends and having a pivotal connection with the sliding heads and with the crank of the crank-shaft, and means for conveying power from said crank-shaft to the axle of the car.

In testimony whereof I affix my signature in presence of two witnesses.

EDGAR COURTRIGHT.

Witnesses:
J. B. BROOKS,
E. S. WHEELER.