

(No Model.)

4 Sheets—Sheet 1.

F. E. CANDA.

MECHANISM FOR DRIVING HAND CARS.

No. 344,163.

Patented June 22, 1886.

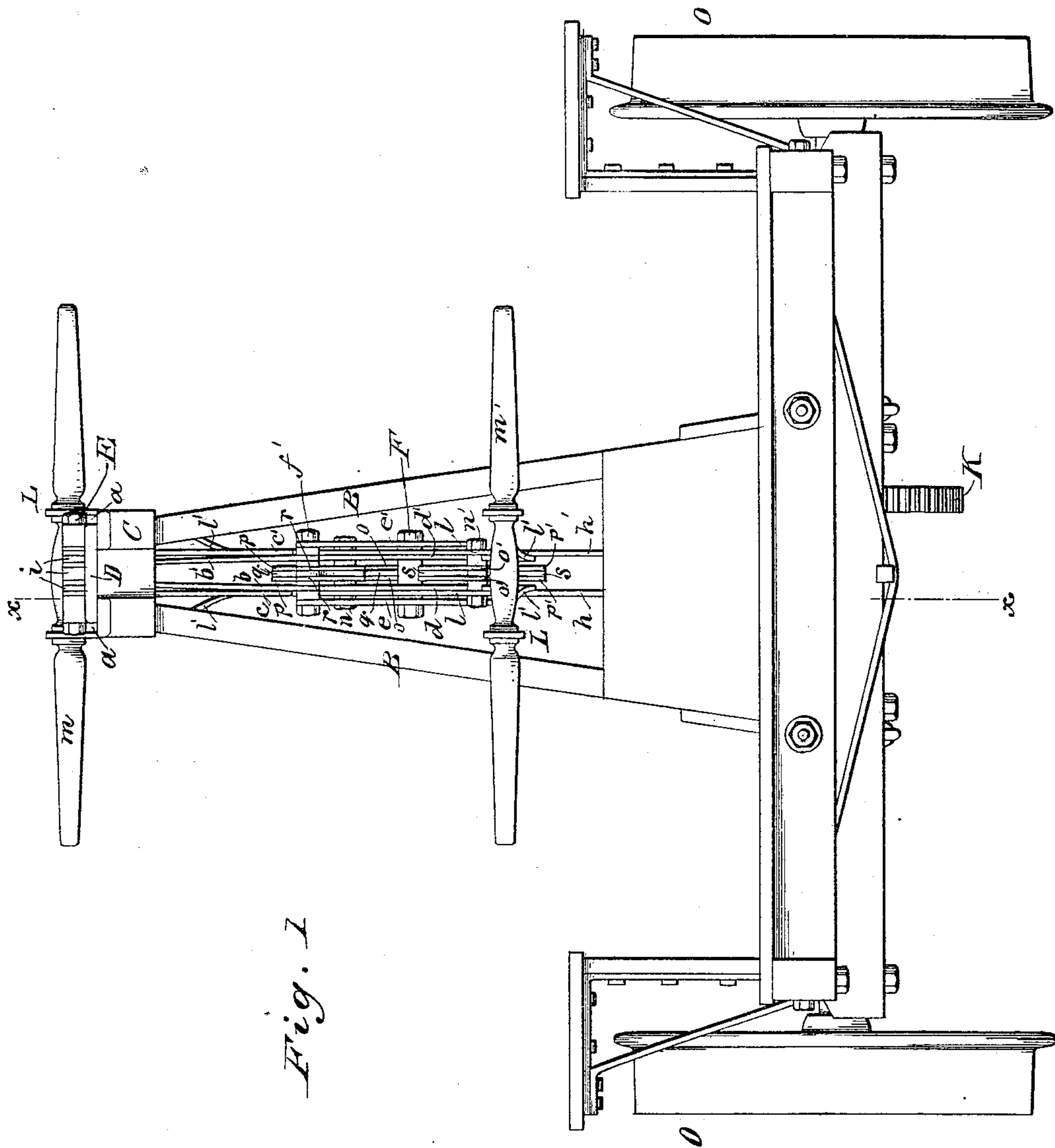


Fig. 1

WITNESSES:

John H. Reemer
E. Sedgwick

INVENTOR:

F. E. Canda
BY *Munn & Co*
ATTORNEYS.

(No Model.)

4 Sheets—Sheet 2.

F. E. CANDA.

MECHANISM FOR DRIVING HAND CARS.

No. 344,163.

Patented June 22, 1886.

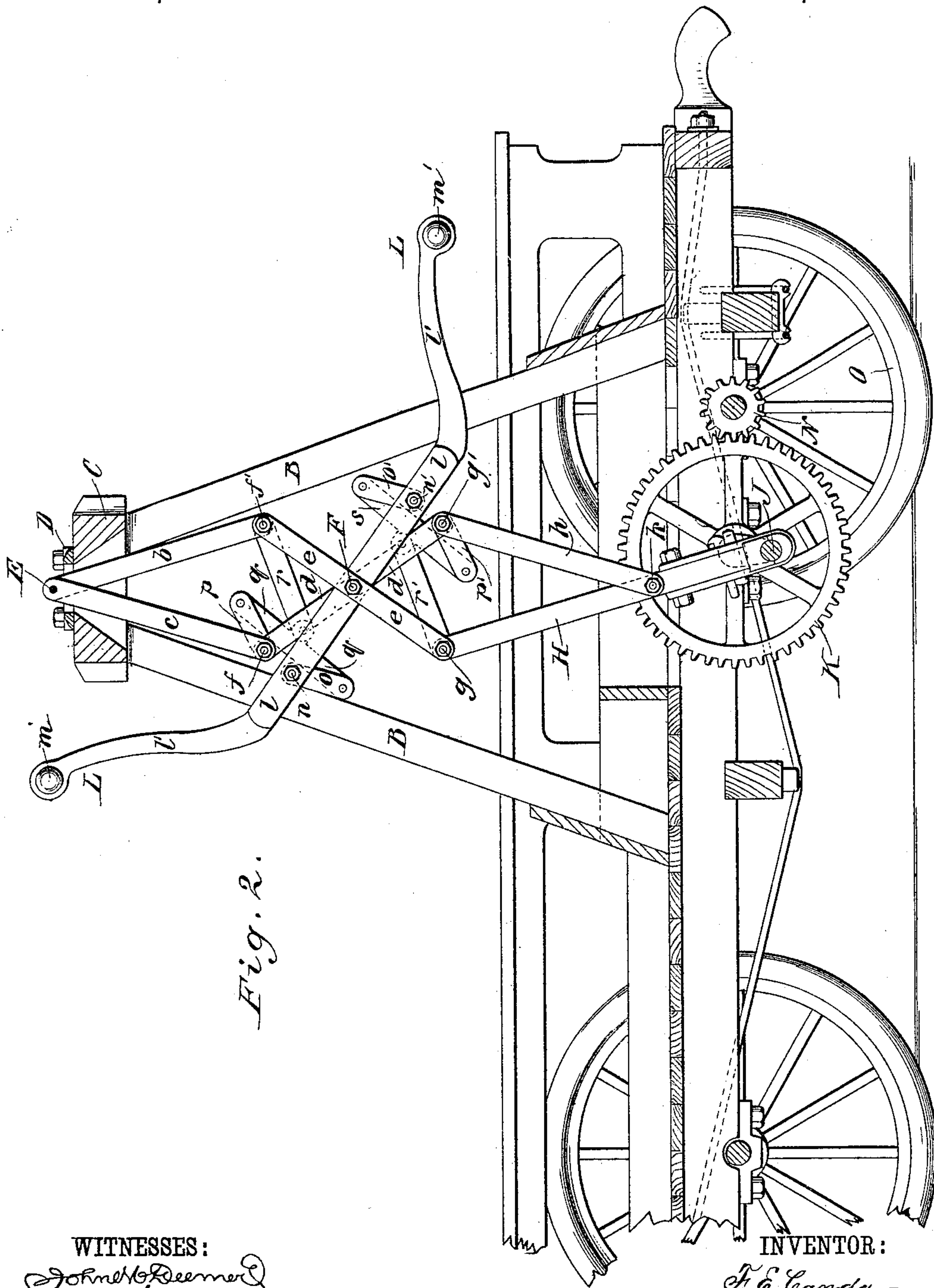


Fig. 2.

WITNESSES:

John McRee
C. Sedgwick

INVENTOR:

F. E. Canda
BY *Munn & Co*
ATTORNEYS.

(No Model.)

4 Sheets—Sheet 3.

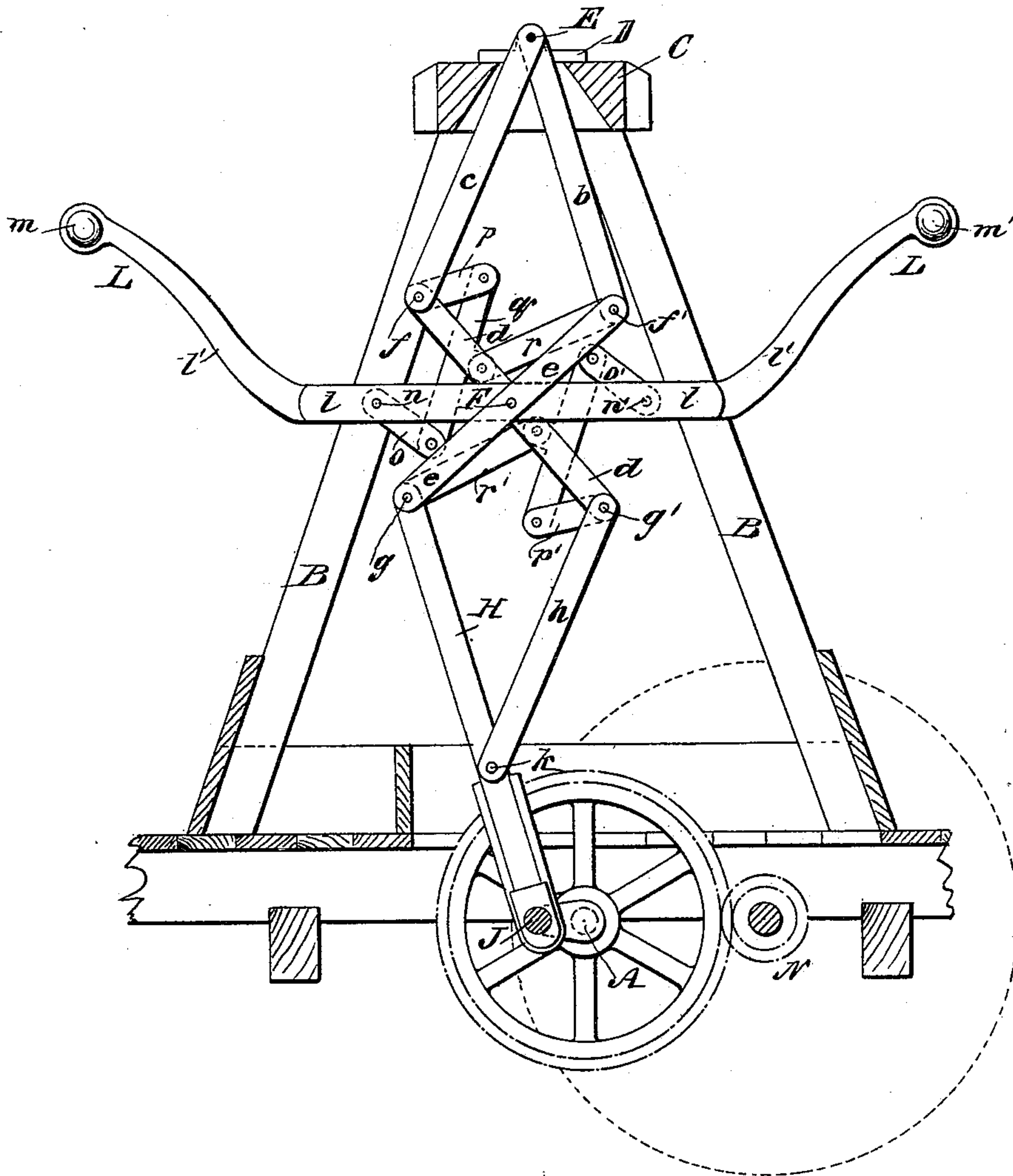
F. E. CANDA.

MECHANISM FOR DRIVING HAND CARS.

No. 344,163.

Patented June 22, 1886.

Fig. 3.



WITNESSES:

John H. Reamer
C. Sedgwick

INVENTOR:

BY *A. E. Canda*
Munn & Co
ATTORNEYS.

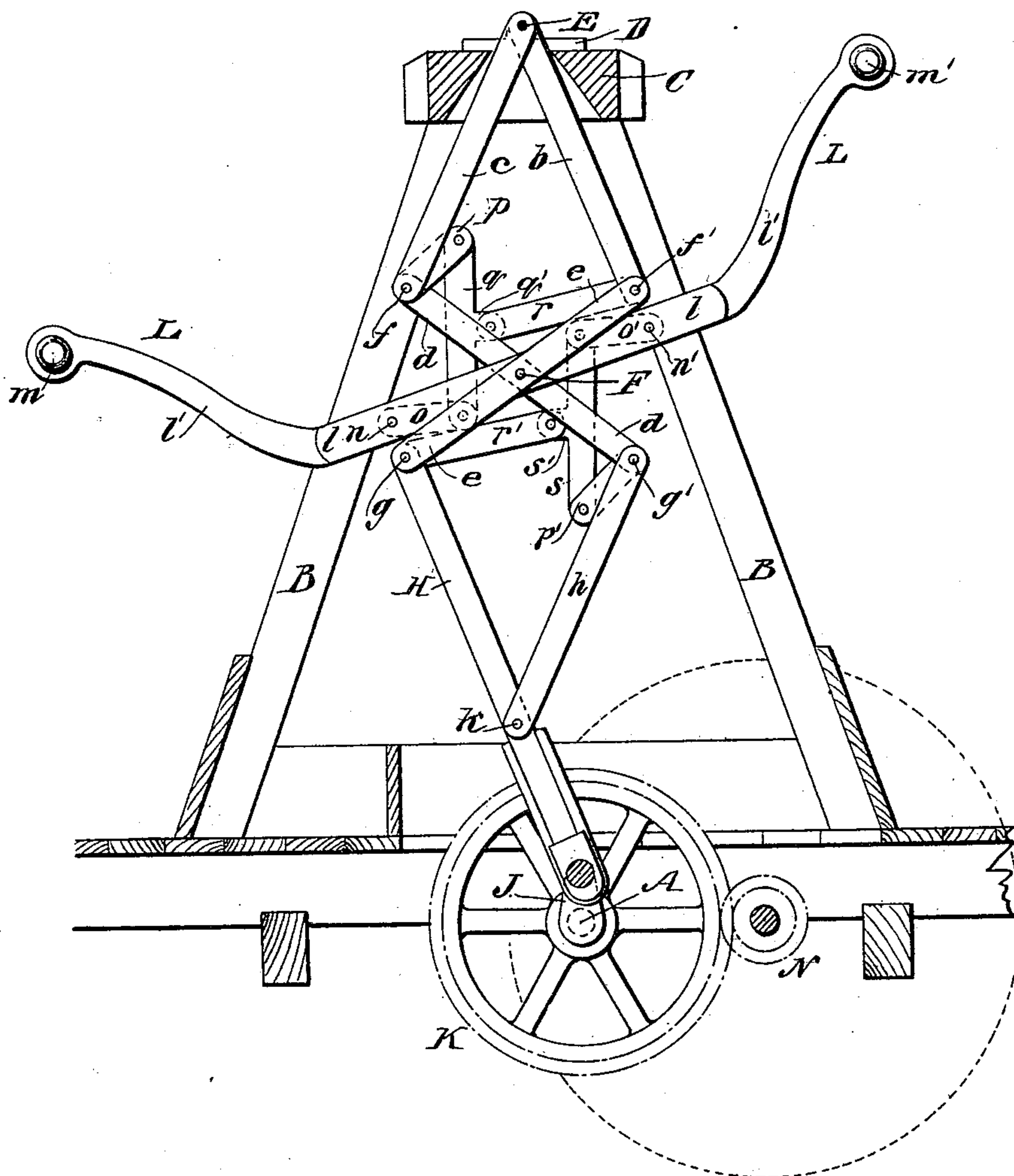
F. E. CANDA.

MECHANISM FOR DRIVING HAND CARS.

No. 344,163.

Patented June 22, 1886.

Fig. 4.



WITNESSES:

John H. Deemer
C. Sedgwick

INVENTOR:

F. E. Canda

BY

Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

FERDINAND E. CANDA, OF NEW YORK, N. Y.

MECHANISM FOR DRIVING HAND-CARS.

SPECIFICATION forming part of Letters Patent No. 344,163, dated June 22, 1886.

Application filed October 26, 1885. Serial No. 180,957. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND E. CANDA, of the city, county, and State of New York, have invented a new and Improved Mechanism for Driving Hand-Cars and for other Purposes, of which the following is a full, clear, and exact description.

My invention relates to the construction of an improved mechanism for driving hand-cars, and its object is to produce a mechanism by which a car may be driven at an exceedingly high rate of speed by means of the ordinary hand-power employed to propel such cars; and to this end my invention consists of a system or series of links or levers united in the form of a lazy-tongs and arranged to be extended and contracted to impart a rotary movement to the crank-shaft, said movement of the lazy-tongs system being brought about by means of a double-armed hand-lever, which is mounted on a central connecting-bolt of the series of levers and connected by a novel arrangement of links with the outer central joints of said levers.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is an end view of a hand-car provided with my improved driving mechanism. Fig. 2 is a side view of the car, with a portion of the supporting-frame removed to show the various parts of the driving mechanism, which in this view are represented in the position they assume on the full downstroke. Fig. 3 shows the position of the parts on the half-stroke, and Fig. 4 on the full upstroke.

The hand-car proper is of the ordinary type, such as is used on the Pennsylvania Railroad, of which the general construction is so well known that it is unnecessary to go into any description thereof. A frame corresponding to the ordinary form of lever-frame, only the frame in this case is slightly higher than usual, and is located directly over the crank-shaft A, is formed by four corner-posts, B B, which are fixed to the floor-beams and united at their upper ends by a cap, C, which is hollowed out in pyramidical form and supports a bearing-block, D. A short rod or bolt, E, is mounted in bearings *aa*, formed in the block D, and this rod carries the four upper links,

b b' and *c c'*, of the driving mechanism, the links being separated and spaced by washers *ii*, and the links *b b'* being between the links *c c'*. Each pair of links, carried by the rod E carries a pair of links, such as those shown at *d d'* and *e e'*, the connections being made by means of bolts *ff'*, which are passed through apertures formed in the ends of the links, the links *c e'* being outside of the links *b b'*, while the links *d d'* are inside of or between the links *c e'*, the bolts *ff'* carrying washers between the links, as in the case of the rod or bolt E, and it may here be said that in all cases I prefer to space the links by washers. The links *d d'* and *e e'* are crossed, the links *d d'* being carried between the links *c e'*, and the two sets of links are, as it were, pivotally connected at their centers by what I will call the "main connecting-bolt" F.

To the extending ends of the links *c e'* and *d d'*, I connect the lower series of links, H H' and *h h'*, by means of bolts *g g'*, and the links *h h'* are loosely fixed to the links H H' by a bolt, *k*, the attachment being made at a point so that the distance from *k* to *g* will be equal to the distance from *k* to *g'*. The links H H' serve the double office of links in the lazy-tongs system and of connecting-rods between such system and the crank J of the shaft A, which shaft is, as usual, mounted in bearings carried by the floor-beams. The shaft A carries a large gear-wheel, K, which engages with a pinion, N, that is fixed to the axle M of the driving-wheels O O.

Upon the bolt F there are mounted the central arms, *l l*, of the double hand-lever L L, the said central arms being rigidly fixed to or made integral with the outer arms, *l' l'*, which carry the handles *m m'*.

The arms *l l* are provided with bolts *n n'* upon each side of the central bolt, F, said bolts *n n'* being placed at like distances from the central bolt, which distance is equal to one-half the length of the links *e* and *d*. These bolts *n n'* carry short links *o o* and *o' o'*, respectively, similar links, *p p* and *p' p'*, being carried by the bolts *f* and *g* of the lazy-tongs system. The free ends of the links *o o* and *p p* are connected by a link, *q*, which is formed with a central lug, *q'*, to which there is pivotally connected a pair of links, *r r'*, which reach to and are loosely held by the bolt *f'*, while the

free ends of the links $o' o'$ and $p' p'$ are connected by a second link, s , which is a duplicate of the link q , being formed with a central lug, s' , and connected to the bolt g by links $r' r'$.

5 From the arrangement of connecting parts, as above described and as illustrated in the drawings, it will be seen that the lever $L L$ is connected by means of links to each of the four outer central joints of the power-transmitting mechanism, and that the central bolt of the said power-transmitting mechanism becomes the fulcrum of the lever through which the power is applied, so that the hand-lever follows the general swing of the lazy-tongs system upon its upper supporting-bolt, E , and is consequently always in position to act upon such system through the medium of its connecting-links.

10 In operating my improved driving mechanism the handles $m m'$ of the lever $L L$ are grasped, and if the crank is in the position shown in Fig. 4 the handle m' is lowered, which movement will cause the projecting ends of the links $o' o'$ and $p p$ to rise and the corresponding ends of the links $o o$ and $p' p'$ to be lowered, thereby driving the links q and s closer to the points $n f$ and $n' q'$, respectively; but to bring about this movement of the links q and s the links $r r'$ must also be moved toward the points named, and consequently the points f and f' will approach, as will also the points $g g'$. In other words, the lazy-tongs system will be extended and the crank-shaft moved to the position shown in Fig. 2. When the motion of the levers $L L$ is reversed, the movement of the links q and s will also be reversed, and at the half-stroke of the lever the parts will be in the position shown in Fig. 3, a continued movement carrying the parts to the position shown in Fig. 4, the movements described and indicated being repeated at each full-stroke of the driving-lever.

With the system described there is no un-

due strain on any one of the pivoted joints, as the power is equally distributed; but in some cases it would not be necessary to have all four of the points $f f'$ and $g g'$ connected with the lever $L L$, as the power could be applied to the points $f f'$ through the links o, p, q , and r ; but I prefer to distribute the power to all four of the connecting-points.

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

1. An improved driving mechanism, consisting of a lazy-tongs system, wherein the power-lever arm is mounted upon and supported by the central pivot or bolt of the system, and connected, by mesne connections, to the outer central joints of the system, substantially as described.

2. An improved driving mechanism, consisting of a lazy-tongs system, wherein the power-lever arm is supported by the central bolt of the system, and connected by links, in a manner substantially as described, with the four outer central joints of said system, substantially as set forth.

3. The combination, with the crank-shaft and lazy-tongs system, substantially as described, of a lever, L , and links o, p, q , and r , substantially as set forth.

4. The combination, with the crank-shaft and lazy-tongs system, substantially as described, of the lever L and links o, p, q , and r , and o', p', s' , and r' , substantially as set forth.

5. The combination, with the supporting-frame and the lazy-tongs system suspended and held by the bolt E , of a lever, L , links o, p, q , and r , and a crank-shaft, substantially as set forth.

FERDINAND E. CANDA.

Witnesses:

C. SEDGWICK,
EDWARD KENT, Jr.