

C. T. HARVEY.

2 Sheets—Sheet 2.

Car Propeller

No. 64,862.

Patented May 21, 1867.

Fig. 9

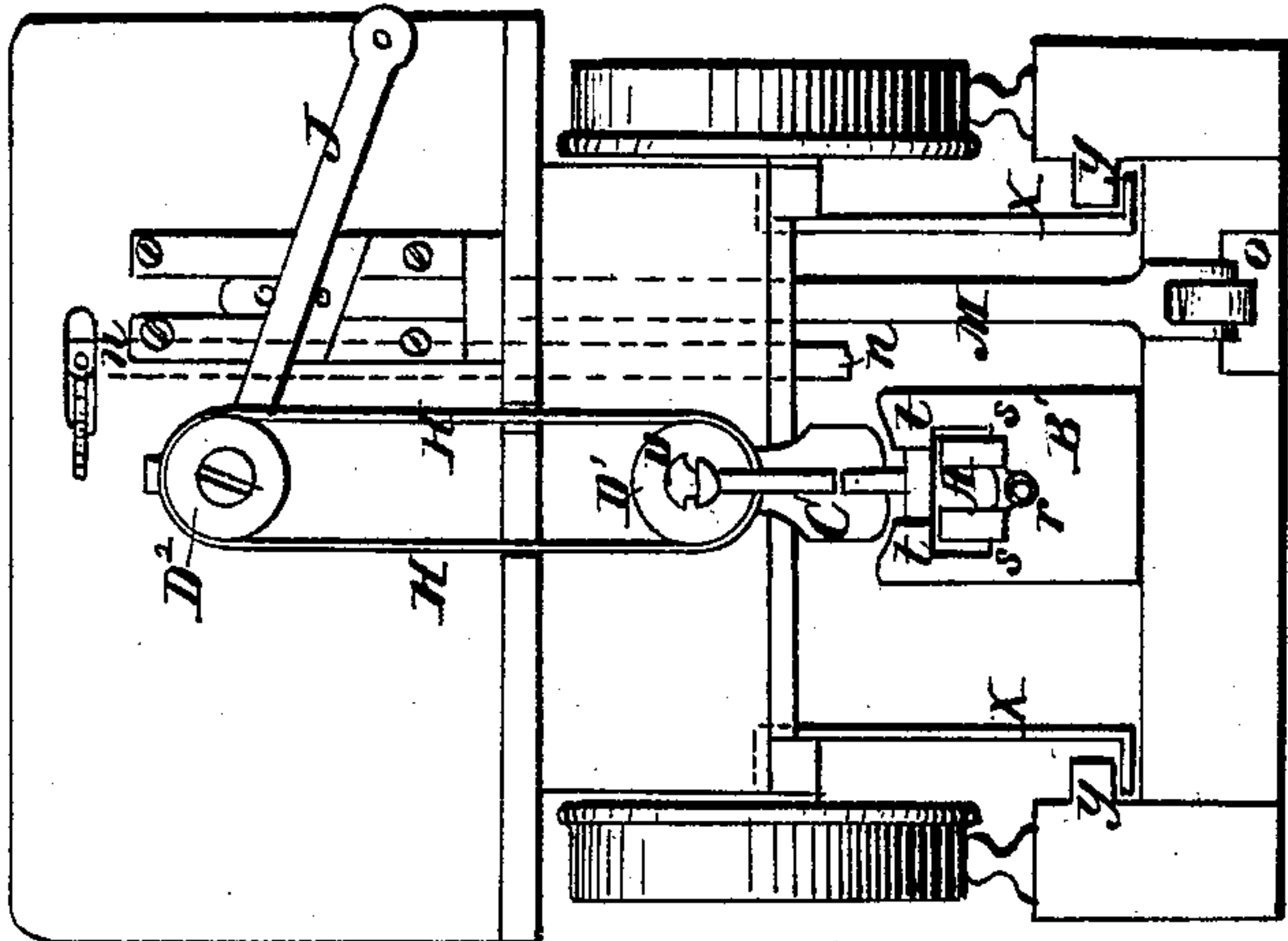
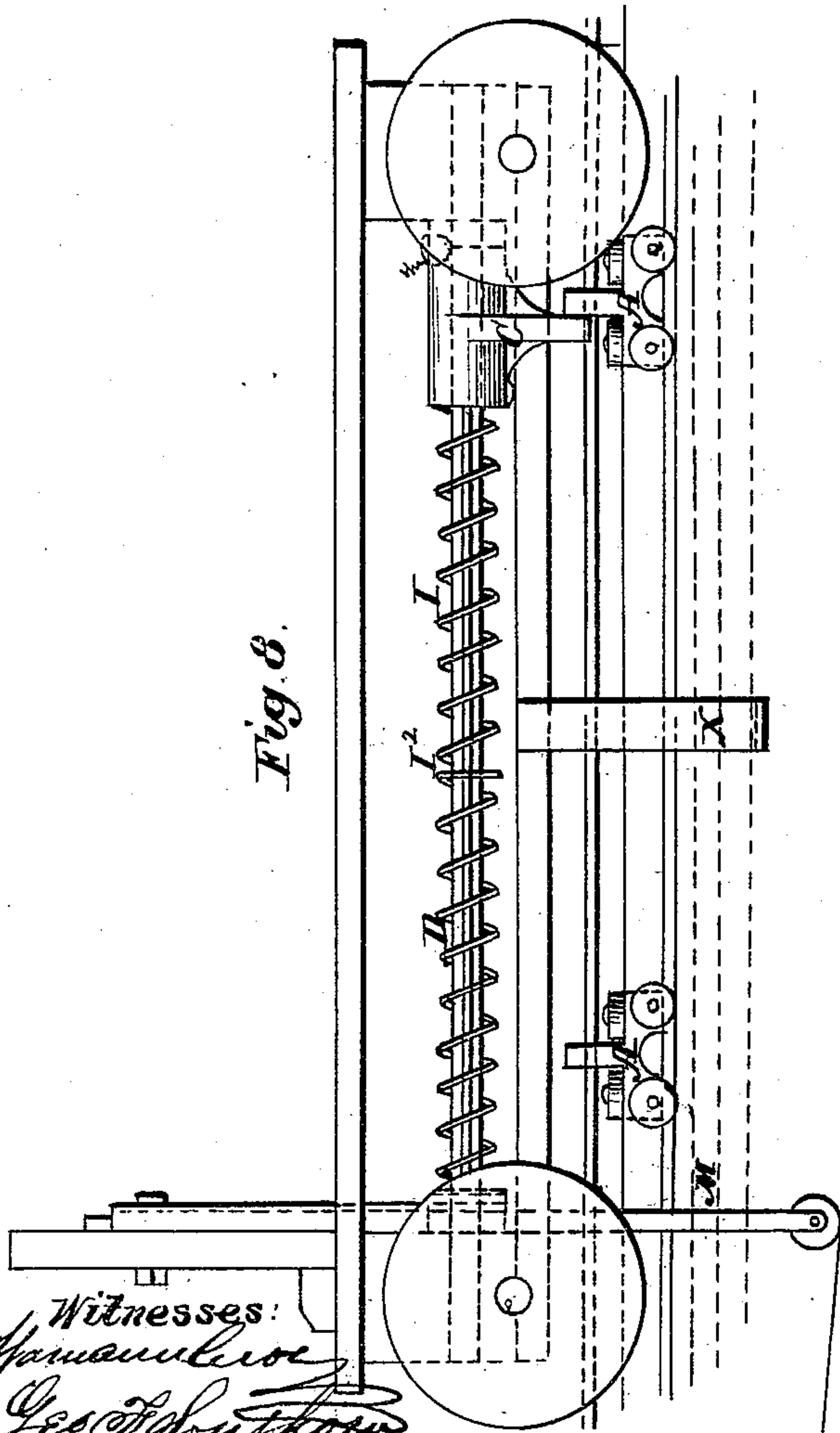
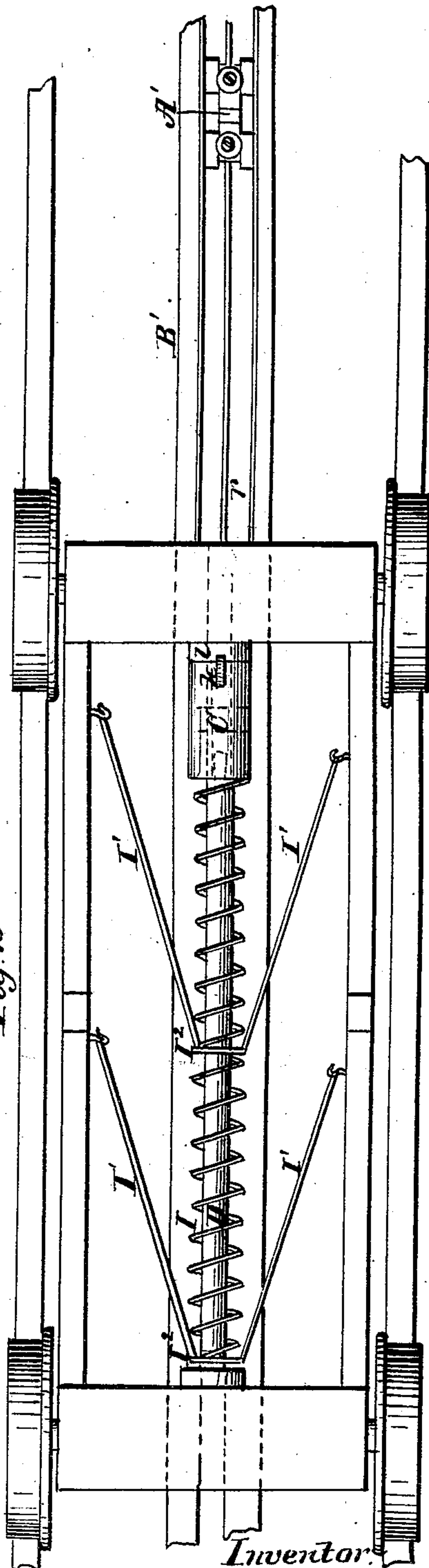


Fig. 8.



Witnesses:
Hammaker
Geo. A. Southon

Fig. 10



Inventor.

Charles T. Harvey

United States Patent Office.

CHARLES T. HARVEY, OF TARRYTOWN, NEW YORK.

Letters Patent No. 64,862, dated May 21, 1867.

IMPROVED METHOD OF PROPELLING CARS, &c.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES T. HARVEY, of Tarrytown, in the county of Westchester, and State of New York, have invented a new and useful Improvement in Cars for Railways and Mode of Propulsion therefor; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which drawings, consisting of two sheets—

Figure 1, sheet 1, is an elevation of a longitudinal section of a portion of a car.

Figure 2 is a plan view of those parts which are below the floor of a car.

Figure 3 is an end view.

Figure 4 is a detailed view of the male and female parts of the box and pulley *a b*.

Figure 5 is an axial section of said box and pulley.

Figure 6 is a side view of the bar and its appurtenances detached from the car, by means of which the cable-clutch of the car is turned out of the way of the cable.

Figure 7 is a front view of the same, also detached from the car, but showing the levers through which the bar acts.

Figure 8, sheet 2, represents part of a car with a modified form of cable-clutch and other features of my improvement.

Figure 9 is an end view of the same.

Figure 10 is a top view of the lower part of a car placed on a track.

This invention relates, among other things, to means for stopping and starting cars automatically; also to means for connecting cars temporarily with a propelling rope or chain; also to means for collecting and retaining upon or about the cars any rain which may fall on their roofs, and for discharging the same near the ground when desired.

The letter A designates the front axle of a car which is intended to be moved or propelled by a cable, as shown in my Letters Patent numbered 54,537, upon which axle I have in this example applied the apparatus for stopping and starting the car, although it may be applied as well to one of the other axles. By means of this part of my invention I treasure up the power exerted in stopping the car in the spring or springs connected with the clutch or other device which receives the impulse of the propelling cable. In carrying out this part of my invention I use a circular box, *a*, which is connected to the axle by a pin or bolt and a loose box, *b*, the two constituting together a fast and loose pulley, the same being made a fast pulley, so as to move with the axle when the two parts or boxes *a b* are connected to each other, and the part *b* constituting a loose pulley when it is not connected with the part *a*. The apparatus for stopping and starting the car is operated in connection with the springs of the cable-clutch. The parts *a* and *b* are shown detached in fig. 4. The male part *a* is attached to the axle by means of a pin through the hub *c*, so that it turns with the axle. Said male part *a* has a circular groove, *d*, on its inner face, in which works the projection *e* of a curved friction-lever, B, which is secured on the inside or inner face of the female part *b* in the manner shown in fig. 4, one end being held by a pin, *f*, and the other by a spring, *g*, whose office it is to hold the lever in the required position in the groove *d*. This lever acts as a pawl against the sides of groove *d* at certain times, as hereinafter explained, and causes the motion of part *b* of the box to be communicated to part *a* in order to start the car. The female part *b* constitutes a pulley, and it is loose on the axle, but is not allowed to slide endwise; and when the car is moving in a forward direction the said parts *a b* are not in connection; but when the part or pulley *b* is turned in a forward direction the friction-pawl or lever B immediately acts so as to connect them, as is also the case when the axle A is turned backwards; and consequently when said axle is turned backwards the pawl B acts as a brake to resist such backward motion, the degree of resistance-being the power of the springs, which are connected with said pulley *b* by a cord or chain, *h*, that is fastened to its periphery, so as, in effect, to make two independent cords or chains. One end thereof is fastened to the cable-clutch C, which clutch slides upon a rod, D, placed beneath and lengthwise of the car, on which rod, before or forward of the clutch, is placed a spiral spring, I, that forces the clutch towards the back part of the car, as is seen in figs. 1 and 2. This spring is aided by

numerous other springs I^1 , that are fastened by one end to the under side of the car or to its frame in any convenient way, and by the other to plates I^2 , which are fixed at intervals along the spiral spring I . The other free end of the cord or chain h comes from the pulley or part b in the opposite direction, and is taken around a pulley, j , fixed to the frame or floor of the car, and thence to the "follower" l , which consists of a collar placed on rod D behind the cable-clutch, to which follower it is fastened. It may, however, be fastened with the like result directly to the cable-clutch. The follower l is drawn backwards on said rod by a spring, m , seen in fig. 2, and it is drawn forwards (pushing the cable-clutch before it) by means of the cord or chain R , seen in fig. 2, one end of which cord is fastened to the front part of the car, and the other end, after passing around pulley i on said "follower," is conducted to a cone-pulley, Q , with spiral grooves, which pulley is formed on a sleeve, P , that surrounds the axle A , there being on the inner end of said sleeve a series of teeth, which engages with a like series of teeth formed on a collar that is fastened to the axle adjoining to but independent of the female part b of the pulley-box aforesaid. When the sleeve and the collar are coupled it is evident that they will revolve together. The sleeve P is moved on the axle by a forked shipper-lever, n , (see fig. 9,) that embraces the sleeve and goes upward through the floor or platform of the car, where it is within convenient reach of the conductor or brakeman. The upper end of said shipper-lever is drawn by a spring in such a way as always to force the clutch open, and the lever is pushed in the contrary direction, automatically, so as to close the clutch by means of cams fixed on the track, but not here shown, at places where the car is to be stopped, such cams being enabled to act on said lever by extending the latter below the sleeve and axle A , its extremity being provided with an anti-friction roller that comes in contact with such cams. The said shipper-lever is immediately brought back to its original position by the force of the spring which is attached to it, so soon as the lower end of the lever is released from such cams, or so soon as the person operating it releases his hold of it, thereby opening the clutch by moving the sleeve outward on said axle A . The sleeve P has also a circular disk or flange p formed around it near its toothed end; and between said disk and the part b of the pulley-box is suspended an anti-friction roller, q , seen in fig. 2, which roller is brought against the face of said part b by the inward movement of the said disk, and held in contact with both, so that rotary motion from said disk, but in a contrary direction, is communicated to the said part b . When the sleeve is moved so as to open the clutch the hanging-roller q falls away out of contact with said part b by gravity. When the sleeve P is moved so as to close its clutch the rotary movement of the axle A is communicated to the conical pulley, and the latter is thereby caused to wind upon itself the cord or chain R , and to draw the "follower" or collar l and the cable-clutch C forward upon the rod D against the springs I^1 , which become compressed in proportion to the extent of movement of the said clutch and "follower." It will be observed that the purchase or leverage of the conical pulley against the springs I^1 increases as the cord or chain R is wound up on the said pulley, by reason of the increased diameter of said pulley, the cord or chain beginning at the smaller end and winding up towards the larger end. The forward movement of the cable-clutch makes that part of the rope h which is attached to the forward part of the cable-clutch to become slack, and said slack is taken up by the pulley b , which is made to revolve, as before explained, by the disk p and roller q . At the same time the other portion of said rope h , to wit, the part which goes from the other side of said pulley to the "follower" l , around the pulley j , is given off by being unwound from said pulley b , and is taken up by the forward movement of said follower, so that it is not left slack. It will be observed that by means of this arrangement the momentum of the car is resisted by the springs I^1 , which become compressed and are held compressed by said cords or chains R and h , the former of which is wound up more or less on conical pulley Q , and the latter on pulley b . When the sleeve P is moved outwards to open its clutch the springs I^1 are left free to exert their force upon that part of cord h which is wound on pulley b , and through it to turn said pulley in a contrary direction to its last motion. So soon as the pulley begins to revolve its pawl B , acting against the part a , imparts to it and to the axle A a like rotary motion, thereby starting the car or aiding to start the car by the united force of said springs. As the said springs expand and force the cable-clutch and its follower l backwards, the cord or chain R is unwound from the conical pulley Q , which, being then detached from its clutch, is loose and free to turn on the axle. The buffers or clamps E , which hold the cable-clutch tight upon the cable, (when said clutch is so made as to open in lateral directions,) are closed by cams G G , whose shafts have attached to them quadrant-shaped levers F F , on whose peripheries are fastened straps that unite to form a bar or rod, H , whose upper end is fastened to a lever, J , of the first order. A spring, K , is applied to said lever J to hold the inner end thereof up, in which position it is held also by a latch, L , placed in or upon the front of the car or other part to which said lever J is attached. The latch L is made elastic, and is so formed and applied as to project forward from a recess into which it may be forced. Upon said latch, below the catch or shoulder which receives the end of lever J , are inclines L' L' , which project forward from the body of the latch, said inclines being separated far enough to allow an upright bar, M , to extend upwards between them. Said bar has a vertical motion imparted to it at certain times by cams O , placed wherever they are necessary on the track of the railway on which the car runs. Attached to said bar M are anti-friction rollers, so placed that whenever the bar is moved upwards by said cams, or otherwise, they come in contact with and roll over said inclines, the latter being thereby, with the latch of which they form a part, forced backwards into the recess behind, so as to release the lever J and allow the buffers to fall apart and allow the cable-clutch to be opened and to become detached from the cable. The bar M is held down by a spring, N , that bears on a pin on its front face; and the bar is prevented from falling down too low by means of the same pin which rests upon one of the staples behind which the bar moves. When cable-clutches or arms of this form are used it is only necessary to turn or swing them to one side of the path of the cable in order to clear them from contact with the cable-heads, since such arms C do not enter the cable-guide but move above it. In order to swing said arms aside I use the bar M and fixed cam O , as above explained, operating therewith lever J , and a latch or other convenient device for securing said lever in its proper position. And in addition thereto I con-

nect said lever J to a pulley, D^2 , to whose periphery is fastened a metallic or other strap, H, that descends and is passed around and fastened to another pulley D^1 placed upon the cable-clutch or arm C. The latter is connected to the guide-rod D by means of ribs or feathers formed on the cylindrical part of the head and grooves formed on the sides of the rod, so that the head can move lengthwise, but cannot be turned thereon. The guide-rod is so arranged that it can be turned on its journals, and its rotation is effected by means of said pulleys. From this arrangement it follows that whenever the lever J is turned on its fulcrum, which in this example is in the stud on which the pulley D^2 is placed, the said pulley is rotated and its motion is communicated through the straps H H to the guide-rod and the cable-clutch or arm C. In order to relieve the cable-clutch or arm C from friction during its movements on the guide-rod D, I provide it with a sufficient number of anti-friction rollers z , only one of which is shown in this example, (see figs. 8 and 10,) which rollers work in slots made in the cylindrical part of the cable-clutch or arm, and come in contact with said guide-rod and facilitate the movements of said clutch.

The windows of the car are made transparent, and are also provided with wire gauze T. The roof S of the car has gutters for collecting rain-water, which runs into a conducting pipe, U, in which is a faucet, V, that is opened by an arm, W. These devices are more particularly explained in another application, though they are also shown in these drawings, as are also the flanges Y Y on the rails of the track, the cable-heads or ferrules A' , the cable-guide B' , and the opposing flanges $t t$ of its recess, and the steam pipe r for preventing the formation of ice in said recess, none of which devices are claimed in the present application. The flanges Y Y are embraced by angular arms X X of great strength, which project from the car or from its truck, and are bent around or below said flanges, but not so as to be in contact therewith when the car is properly on the rails. The object of the arms is to prevent the accidental displacement of a car. In order to prevent friction between the arms X and flanges Y, I place anti-friction rollers in the arms, as is shown in red outline in fig. 9.

Figs. 8, 9, and 10 show a modification in the form of cable-heads A' , and also in the form of the cable-clutches or arms C. The latter extend downwards from the car, so as to be in the path of the heads of the propelling cable, as is explained in my Letters Patent aforesaid. The face of the clutch or arm C is plain or square, and is intended to receive the impulse necessary to move the car by the mere contact of the cable-head against said face. Instead of being square or plain, said face may be hooked or curved, and the face of the cable-head may be likewise hooked or curved, so that their faces may clasp or interlock each other when they come in contact, but in such a manner that they are separated merely by the turning aside or lateral movement of the clutch or arm C.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the sliding pulley Q with the series of teeth on the axle by which the said pulley is made fast to the axle, and with the springs I I' of the guide-rod D, for the purpose of stopping the motion of a car, substantially as shown.
2. I also claim the combination of the parts a and b , composing both a fast and loose pulley, with the springs I I' and the axle A, for the purpose of starting the car, substantially as shown.
3. I also claim the use, in cars or other objects which are moved by propelling cables, of clutches or arms whose faces that receive the impulse of such cables are plain, substantially as shown.
4. I also claim so arranging the guide-rod D and cable-clutch or arm C that they are compelled to rotate together while the latter is allowed to have a longitudinal movement on the former, substantially as set forth.
5. I also claim the combination of anti-friction rollers z with the cable-clutch or arm C to obviate or prevent friction during the movements of said clutch, substantially as set forth.
6. I also claim the supplementary springs I' for strengthening and aiding the main spring I, and so arranging and connecting them between the sides of spring I and the frame of the car that they are not displaced or injured by any vertical motions of the car body, substantially as set forth.
7. I also claim the application to a car of bent arms X to hold the car down or prevent it from being displaced from the track, substantially as shown.
8. I also claim the combination of the pendulous roller q with the disk p and loose pulley b , substantially as described.
9. I also claim the combination of the bar M and cam O with the lever J that operates the cable-clutch or arm C, substantially as described.

The above specification signed by me this first day of February, 1867.

Witnesses:

HERMANN GROS,
GEO. F. SOUTHERN.

CHARLES T. HARVEY.