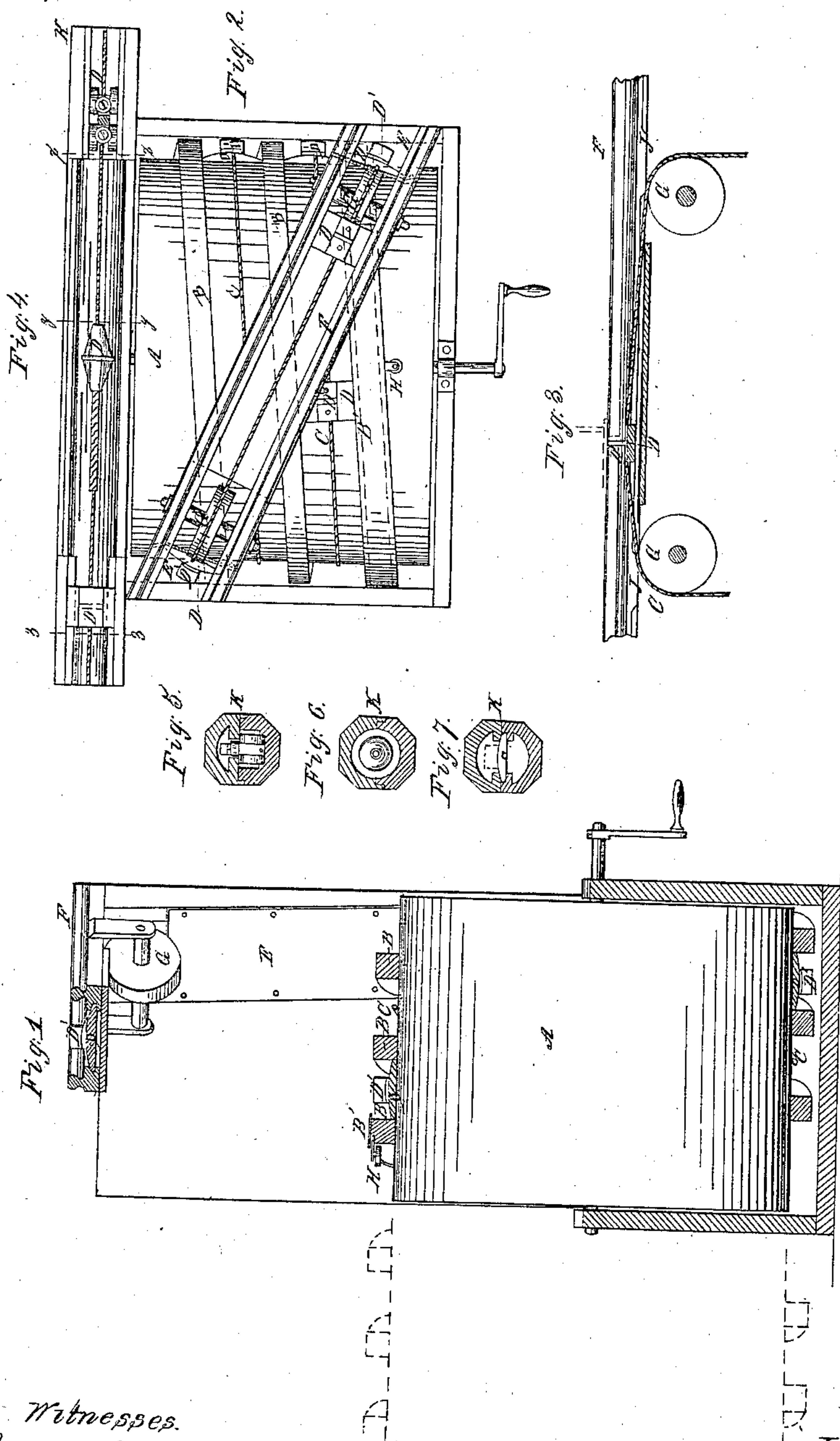


C.T. Harvey.

Railway.

N^o 63,888.

Patented Apr. 16, 1864.



Witnesses.
Geo. H. Southern
Rudolf Thistle
As.

Inventor.
Charles T. Harvey
Blacker.

United States Patent Office.

CHARLES T. HARVEY, OF TARRYTOWN, NEW YORK.

Letters Patent No. 63,888, dated April 16, 1867.

IMPROVED METHOD OF PROPELLING CARS.

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 Propelling Cars or Vehicles; 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 drawing, forming part of this specification, in which—

Figure 1 is a vertical axial section of an apparatus which shows my improvement.

Figure 2 is a plan or top view.

Figure 3 is a side view of so much thereof as shows how a propelling cable is conducted into and out of a cable guide.

Figure 4 is a top view of the interior of a return conducting pipe or guide, showing three different modes of construction, to suit different cable-heads or ferrules.

Figures 5, 6, and 7 are cross-sections at x , y , and z , respectively, of the pipe or guide shown in fig. 4.

This invention relates to the propulsion of cars or other vehicles, or of vessels, and it is applicable to propelling or moving cars on railways whose tracks are elevated above the surface of the ground, and also to those whose tracks are upon the surface or beneath the surface. The invention consists, among other things, in a novel mode of operating or giving motion to the propelling cable or chain by means of a driving-drum or pulley, about which the cable or chain is wound one or more times, in a spiral course between the threads of a spiral guide which surrounds the drum or pulley wholly or partly.

The letter A designates a driving-drum or pulley, which may be placed beneath the surface of the ground, in a chamber excavated for the purpose, or in any other convenient place where the course of a propelling cable or chain ends or begins. Such cable is intended to be endless; and after it leaves the driving-drum it is conducted through proper guides to the other end of its course, where it is carried around a similar drum or pulley, and thence to the cable-guide of the railway track, where it is allowed to act upon a car or cars in propelling them upon the track. After the cable has reached the end of its forward course, it is taken by suitable guides to the driving-drum, where it receives motion by the constant revolution of the drum, said cable being wound around it often enough to prevent slipping. The drawing illustrates the operation of the driving-drum. The letter C designates the cable, and D D are its heads or ferrules, which are used to communicate motion to a car by being allowed to come in contact with a clutch or arm projecting from such car, said heads or ferrules in this example being provided with vertical or square spurs or projections, D', which operate against the clutch or arm of a car by coming flat against it, as shown in fig. 3; where the clutch or arm is shown in red outline. The spurs or projections D' may, however, be made with a curved face, like a hook, and the rear side of the clutch or arm of the car may also be curved so that these parts may interlock when they come in contact with each other. In order to guide the cable or chain in its course around the drum, and to prevent its coils from becoming misplaced, and to prevent it from traversing toward the end and running off the drum, I surround the latter wholly or partly with a spiral guide, B, whose threads or coils are far enough apart to allow the free and easy passage between them of the cable and its heads or ferrules. The sides of the threads of the guide may be grooved to receive the edges of the heads or ferrules D, or they may be left square and plain, or they may have an overlapping strip, B', whose edges reach beyond the edges of the threads and form a semi-groove that will prevent the escape of the heads or ferrules from their proper path. The sides of the threads of the guide are provided with anti-friction rollers, which prevent friction between the heads or ferrules and the guide. One such roller is shown at H, projecting from the face of one of the threads. When the heads or ferrules are of the form here shown, the anti-friction rollers are placed in recesses made in the threads of the guide, and so arranged as to insure their contact with the moving heads or ferrules. The guide B is stationary and independent of the drum, and does not come in contact with the surface of said drum, but is so near thereto as to effectually guide the cable in its revolution. The drum A may be used for two or more cables by extending its length. In such case the guide B on the extension may be in the reverse direction, so that the drum may drive two or more cables at one time, permitting the cars propelled by such cables to move in the same direction. The cable is conducted to and from the driving-drum by means of guides E, which are so made and arranged as to change the plane of movement of the heads or ferrules whenever the cable passes a curve or corner, or

whenever on approaching or on leaving the drum the heads or ferrules are required to move in a plane which is at an angle with the surface of the drum. The guides E, both of which are seen in fig. 2 in top view, rise alongside of the surface or periphery of the drum; and their sides, which come in contact with the under sides of the heads D, are twisted as they are carried upward, for the purpose of twisting or turning the said heads, until they are brought square with the course they are thereafter to take, whether over guiding-pulleys, or through cable-guides like F, or guides like I in fig. 4. In fig. 1 the conducting-guide E begins behind the drum, and its front side is gradually bent or twisted as it ascends, until when it has reached the cable-guide F it is diagonal to the periphery of the drum, but at right angles with the plane of the said cable-guide. If the course of the cable requires it, the conducting-guide E is bent or twisted still more, so as always to cause the heads or ferrules to present themselves to the cable-guide in the same plane therewith. When the cable approaches the drum, it goes through a like twisted conducting-guide, so that the heads come flat against its periphery. Pulleys, G, are placed at the angles which occur in the course of the cable. They may be arranged so as to be movable in their bearings, or may have bearings in swinging-arms, so that, by moving the pulleys in the proper direction, the cable will be tightened and its slack taken up; or such tightening-pulleys may be placed elsewhere. The cable-guide F, shown in fig. 3, may, for the purposes of this explanation, be considered to reach the whole distance of the course of a cable along a railway track, so as to be above the points where it descends to and ascends from the return course, (during which return course it is supposed to receive motion from one or more driving-drums.) The under side of the cable-guide has suitable openings, J J, so placed as to permit the cable to enter and leave at the proper places; and if the sides of the guide are channelled or grooved to receive the edges of the heads or ferrules, such channels or grooves are widened to allow the heads to enter and leave without binding. I do not limit myself to the form of heads or ferrules herein described, but the form thereof can be modified without departing from the principle of my invention of moving a car or other body, by letting a spur or projection of a propelling cable push against a car or other body, or against an arm projecting therefrom. The cable-guide may be continued with the track in both directions, beyond the ascending and descending points of the cable, the motion which a car has acquired being sufficient to take it to the place where the next cable enters said cable-guide. The heads or ferrules D slide on their edges or on their under surfaces, and they prevent the cable from becoming displaced or twisted on itself. The pipe or guide K, which conducts the cable in its return course, (whether above or below ground,) after it leaves the forward driving-drum, is shown in fig. 4. Its interior form is modified according to the shape or character of the cable, and of its heads or ferrules. In said fig. 4 I have shown three different-shaped heads or ferrules attached to a cable, and three modifications of the interior of the pipe or guide K. They are also shown in cross-section in figs. 5, 6, and 7. The pipe is made in convenient lengths, and in order to obtain access to the cable within it at pleasure, I make said pipe in such a manner that portions of its top or upper side can be removed, or the whole pipe can be made in longitudinal sections, whereof one shall be the lower and one the upper, the sections or divisions of the latter being short in length, so that only a small part of the interior of the pipe need be opened at a time.

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

1. The combination of a cable-driving drum, A, with the stationary guides B, to control and guide a propelling cable while passing round such driving-drum, substantially as set forth.
2. I also claim the twisting conducting-guide E, between a driving-drum and railway track, or any conducting pipe or guide, substantially as set forth.
3. I also claim the construction and arrangement of a driving-drum for propelling cables of two or more independent stationary guides, coiled in opposite directions, substantially as set forth.
4. I also claim the construction and arrangement of propelling cables, with heads or ferrules, whose operating faces or spurs project at right angles from the heads, substantially as described.
5. I also claim the sliding heads or ferrules for keeping a moving cable in proper position, and preventing it from turning in its guides, substantially as set forth.
6. I also claim combining with the spiral guide B, anti-friction rollers for relieving the cable of friction, substantially as described.
7. I also claim the hollow pipe K, constructed and arranged for conducting a propelling cable, substantially as set forth.

The above specification signed by me this twenty-third day of January, 1867.

CHARLES T. HARVEY.

Witnesses:

J. VAN SANTVOORD,
GEO. F. SOUTHERN.