No. 762,311. PATENTED JUNE 14, 1904.

W. W. HOPKINS.

WAGON PULL DEVICE.

APPLICATION FILED FEB. 11, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

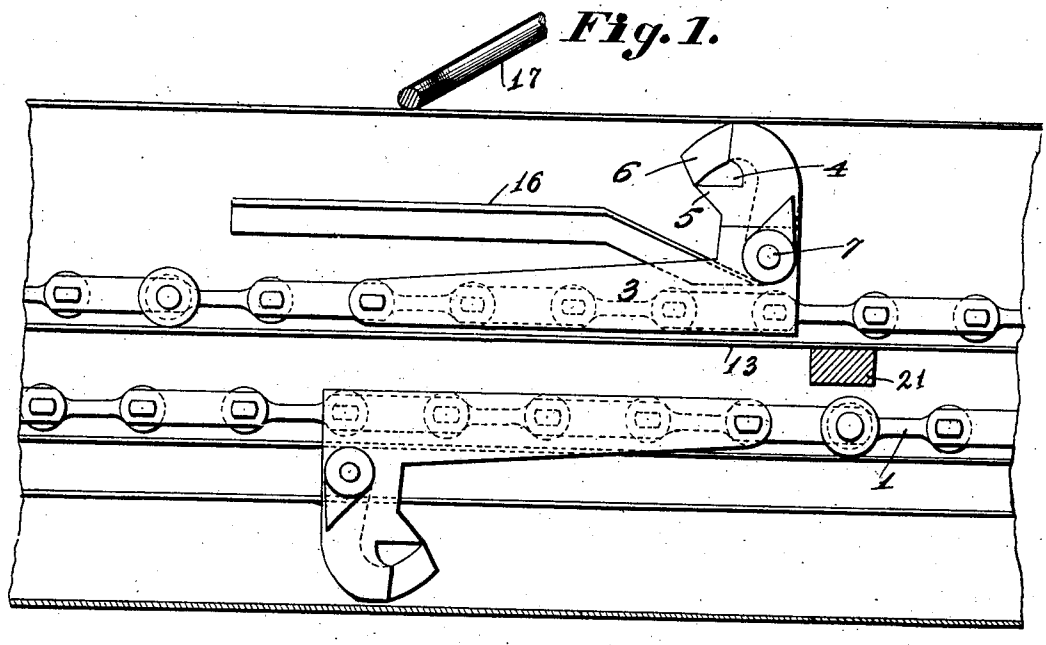


Fig. 2.

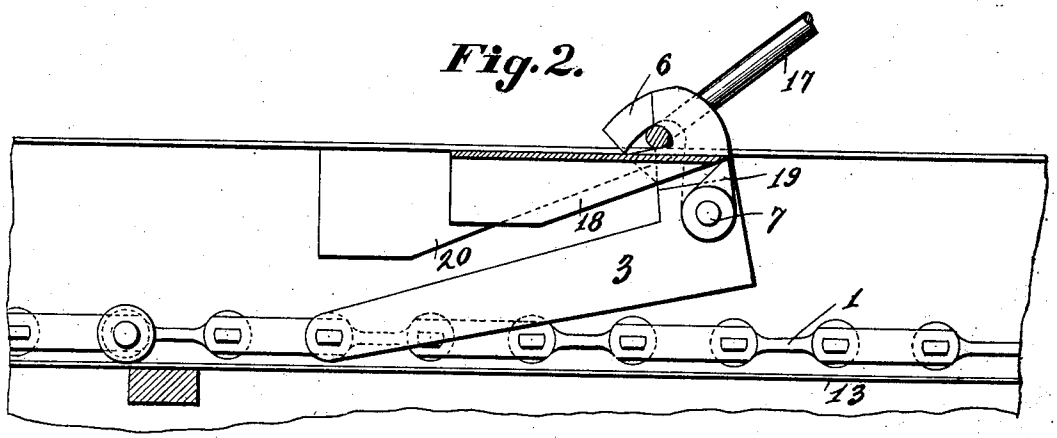
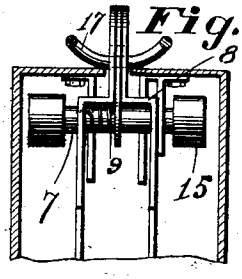


Fig. 4.



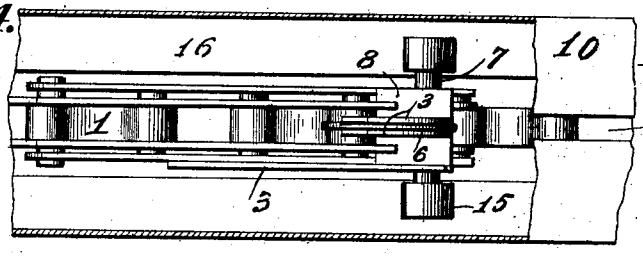


Fig. 3.

Attest:
Edw. L. Dillon
Stanley J. Turneff.

Inventor:
W. W. Hopkins
by J. R. Rippey
Att'y.

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

No. 762,311.

PATENTED JUNE 14, 1904.

W. W. HOPKINS.

WAGON PULL DEVICE.

APPLICATION FILED FEB. 11, 1904.

NO MODEL.

2 SHEETS—SHEET 2.

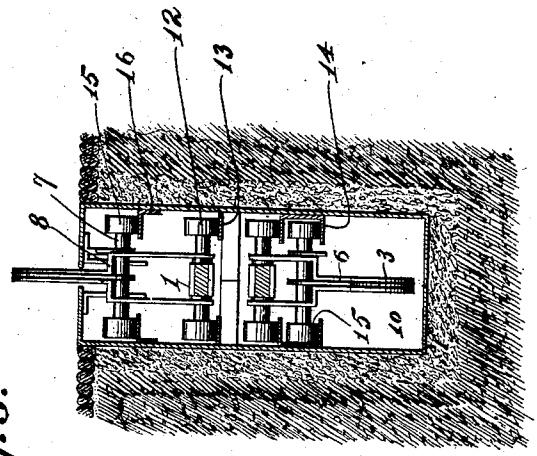


Fig. 5.

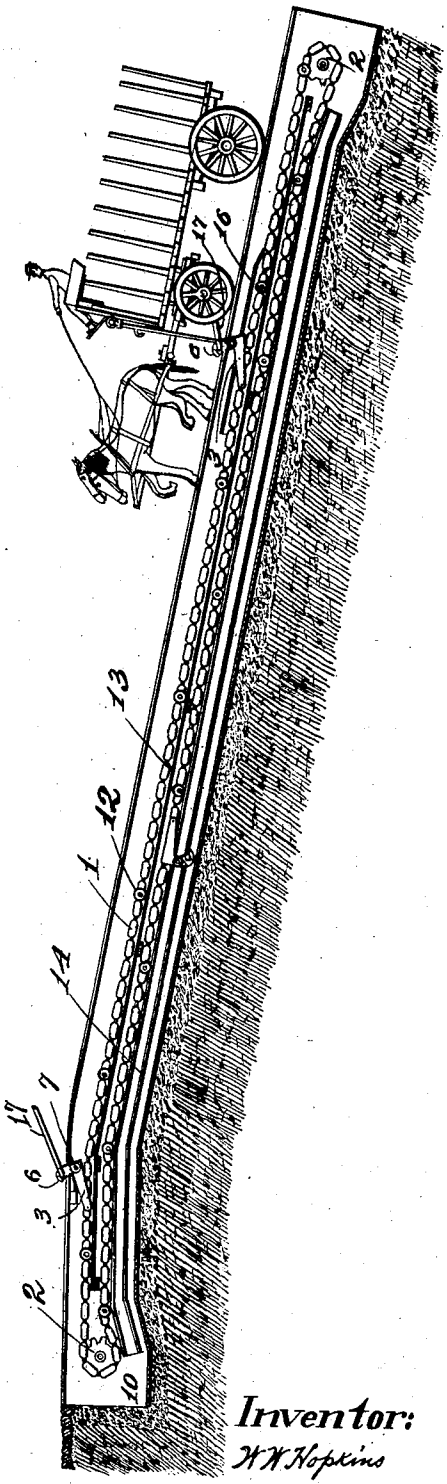


Fig. 6.

Attest:
Edw. L. Dillon
Stanley J. Turner

Inventor:
W. W. Hopkins
by J. L. Rippey
Att'y.

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

No. 762,311. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM W. HOPKINS, OF ST. LOUIS, MISSOURI.

WAGON PULL DEVICE.

SPECIFICATION forming part of Letters Patent No. 762,311, dated June 14, 1904.

Application filed February 11, 1904. Serial No. 193,039. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. HOPKINS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Wagon Pull Devices, of which the following is a specification, which, together with the drawings, fully describes and illustrates the construction, functions, and operation of the invention.

One object of the invention is to provide a suitable device operative to pull or draw wagons and other vehicles up hills, grades, and inclines and provided with mechanism for making automatic engagement with some predisposed appliance connected with the wagon or vehicle while the pull device is in motion and without manual adjustment other than that required to place the said appliance in position to be engaged by the pull device.

Another object is to provide a device of this character adapted to be mounted and operated below the level of the street or road and comprising a chain, cable, rope, or similar object with means for moving the same up the hill, grade, or incline with sufficient force to pull or draw any vehicle or wagon, loaded or not, and having devices attached thereto at intervals with means for raising them above the street or road-bed for engagement with some suitable connection on the wagon at the base of the declivity and arranged to disappear below the surface a short distance up when not employed to draw any wagon or vehicle.

A further object is to provide in a device of the class mentioned suitable means for automatically releasing the wagon or vehicle at the top of the hill, grade, or incline without stopping either the wagon or the draft appliance.

In the drawings, Figure 1 illustrates the catch device and the means whereby it is raised to engage with the appliance attached to the wagon. Fig. 2 shows the catch device in engagement and the position of the parts just prior to being released from the wagon at the top of the hill or grade. Fig. 3 is a top view of a portion of the apparatus. Fig. 4 is a cross-section of a portion of the device, showing the engagement with the appliance on the vehicle. Fig. 5 is a full sectional view with the catch device raised above the street or road surface. Fig. 6 is a view of complete apparatus in operation.

Essentially this apparatus consists of a chain or cable 1, preferably in endless form and mounted on suitable propelling devices, such as wheels or pulleys 2, drawn by any desired motive power. At intervals along the part 1 there are attached catch devices, the preferred construction of which is shown in the drawings, each comprising an angular member 3, pivoted at one end to the part 1 and the opposite or free end projecting upward when traveling up the hill or incline and downward when descending, as may be clearly understood by referring to Fig. 6. On the front side, near the free end of the member 3, there is formed a notch 4, adapted to receive the draft appliance extending from the wagon or vehicle, and the lower side of the said notch extends forward, forming a shoulder 5, which is slightly above the street or road surface when the device is in use, the purpose thereof being to hold the part which is in engagement therewith out of contact with the surface and to form an abutment for the free end of a spring-actuated jaw 6, attached rigidly to a transverse rod 7, supported by the member 3. Said member 3 is in two pieces, one attached to each side of the chain or cable 1, and the free ends thereof being bent together to form shoulders 8, just below which the rod 7 is mounted. The jaw 6 is between the free ends of the two parts forming the member 3 and when in normal position abuts upon the shoulder 5, but leaving an open space wherein the draft appliance from the wagon or vehicle may be received. When projected above the surface, the jaw 6 forms an acute angle therewith, so that while being carried forward it will pass over the prearranged draft appliance without stopping by turning the rod 8 in opposition to the spring 9, attached thereto, the tendency of the spring being to hold the jaw upon the shoulder 5.

The entire mechanism operates within a conduit 10, comprising two trough-shaped pieces arranged in the ground, as shown in

Fig. 5, the upper sides being substantially flush with the street or road surface, and there being a slot 11, through which the catch device may be projected to engage the vehicle-draft appliance, the sides of the conduit being braced by transverse projections 10^a. The chain or cable 1 being endless travels continuously up and down the conduit driven by the propelling wheels or pulleys 2. At suitable intervals along the chain or cable 1 there are rollers 12, or lateral projections may be used, if desired, which ride upon the track-pieces 13, fixed to the sides of the conduit and forming the ascending track. For a descending track two substantially U-shaped members 14 are employed having their bases attached to the sides of the conduit and their sides projecting inward. (See Fig. 5.) The rollers 12 or projections, if used, ride upon the upper sides of these track members during descent of the chain or cable. The rods 7 when traveling upward and idle rest upon the chain or cable 1, and thereby uphold the members 3. Said rods 7 preferably carry small rollers 15, which during descent ride upon the lower parts of the track members 14, and thereby uphold the free ends of the members 3 from the base of the conduit. At a suitable point in the conduit are the devices for automatically projecting the members 3 through the slot 11, and said devices consist of the short tracks 16, attached to the sides of the conduit and having their lower ends bent downward, as shown in Fig. 1, so that the rollers 15 will travel thereupon. The main parts of the tracks 16 are near enough to the top of the conduit to raise the devices 3 to the position shown in Fig. 2, so that the draft appliance, such as 17, when overlying the conduit will cause the jaw 6 to be raised against the tension of its spring until said jaw passes over and is again drawn down to the shoulder 5. This is the proper connection, and the vehicle will be drawn up the hill, grade, or incline until the parts are disconnected. Within and near the upper terminus of the conduit there is an inclined projection 18, and attached to the rod 7 is a cam 19, which during travel of the chain or cable 1 rubs under said projection, and thereby turns the rod 7 and raises the jaw 6, which, as before stated, is rigid on the rod. On each side of the slot 11 there is an inclined projection 20, against the under edges of which the rod 7 rubs after the jaw 6 has been raised, and this operation draws the part 3 down into the conduit and releases the part 17, and after passing beyond the projections 18 and 20 the jaw 6 will be snapped back to its normal position by the spring 9. The tracks 16 terminate a suitable distance above the lower end of the conduit, so that when the devices 3 are not employed to draw any wagon or vehicle they will after short travel be permitted to resume their idle position in the conduit, and hence form no obstruction above the street or road surface, but disappear below the level thereof only to appear again when commencing another ascent.

In making the connection for drawing the wagon or vehicle up the hill or grade some suitable device connected thereto is disposed across the conduit over the short track 16, so that the part 3 will automatically engage therewith, as above set out, and the wagon will be drawn steadily upward until released at the top, whereupon the team assumes the burden, from which it had been almost or entirely relieved during the aforesaid operation.

This invention is designed especially for steep hills, grades, and inclines in cities where wagon traffic is great to relieve the necessity of providing additional teams to assist in ascending and to prevent overstrain and overwork of the regular teams employed. It may of course be used in other places, and it forms practically no obstruction or irregularity over the usual street or road surface inasmuch as the catch devices are arranged to disappear entirely below the surface when not in use. The lower end of the conduit may be provided with an outlet, so that the interior may be kept free from foreign matter by flushing from the upper end.

I claim—

1. A wagon pull device comprising a conduit having a slot, a traveling chain or cable in the conduit, catch devices on the chain or cable, and normally entirely inside the conduit, and means for projecting said devices through the slot, substantially as specified.

2. A wagon pull device comprising a conduit having a slot, a traveling chain or cable within the conduit, catch devices connected to the chain or cable, and means for projecting said devices through the slot, said means being constructed to permit the devices to move back into the conduit when not engaged exteriorly of the conduit, substantially as specified.

3. A wagon pull device comprising a conduit having a slot, a traveling chain or cable in the conduit, catch devices connected to the chain or cable and adapted to be projected through the slot, means whereby said devices may be connected to any suitable prearranged draft appliance, near one terminus of the conduit, and means for automatically releasing the same near the opposite terminus, substantially as specified.

4. A wagon pull device comprising a conduit having a slot, a traveling chain or cable in the conduit, catch devices on the chain or cable entirely within the conduit, and means for moving the catch devices at intervals to project them through, and withdraw them from, the slot, substantially as specified.

5. A wagon pull device comprising a conduit having a slot, a traveling chain or cable

in the conduit, suitable catch devices on the chain or cable within the conduit and adapted to be projected through the slot to be engaged exteriorly of the conduit and to move back entirely into the conduit unless so engaged, for the purpose as set forth.

6. A wagon pull device comprising a conduit having a slot, a traveling chain or cable in the conduit, catch devices on the chain or cable, and means for projecting said catch devices through and withdrawing them from, the said slot, respectively, near the opposite termini of the conduit for the purposes specified.

7. A wagon pull device comprising a conduit having a slot, a traveling chain or cable in the conduit, catch devices on the chain or cable held entirely within the conduit by gravity unless mechanically moved relative to the chain or cable, and means for projecting said devices through the slot to engage with prearranged draft appliances, substantially as specified.

8. A wagon pull device comprising a conduit, a traveling chain or cable in the conduit, catch devices connected to the chain or cable, suitable means near one end of the conduit for moving the catch devices away from the chain or cable, and means near the other end of the conduit for drawing the catch devices toward the chain or cable, substantially as specified.

9. In a device of the character described, a chain or cable, and a catch device attached thereto, said catch device comprising an angular member, and a coöperating member pivotally supported by the angular member, substantially as specified.

10. In a device of the character described, a chain or cable, an angular member connected therewith, a spring-actuated jaw supported by the angular member, a conduit provided with a slot, all of said devices being within the conduit, and means whereby the parts connected with the chain or cable will be projected through and withdrawn from the slot, substantially as specified.

11. In a wagon pull device, a conduit having a slot, upper and lower tracks in the conduit, a traveling chain or cable in the conduit, devices carried by the chain or cable adapted to ride on said tracks, catch devices connected to the chain or cable, means near one terminus of the conduit to project the catch devices through the slot, and means for withdrawing them from the slot, substantially as specified.

12. In a device of the character described, a conduit having a slot, a traveling chain or cable in the conduit, catch devices connected to the chain or cable and adapted to be retained entirely in the conduit by gravity, and means for projecting the catch devices through the slot to be engaged exteriorly of the conduit, said means being constructed to permit the devices to be moved by gravity entirely into the conduit, unless engaged exteriorly, substantially as specified.

13. In a wagon pull device, a conduit having a slot, upper and lower tracks in the conduit, a traveling chain or cable supported by said tracks, catch devices on the chain or cable, projections on the catch devices, tracks near one end of the conduit upon which said projections pass during travel of the chain and inclined projections near the opposite end of the conduit for the purposes specified.

14. The combination with the conduit and the traveling chain or cable mounted therein, of a catch device connected with the chain or cable, a spring-actuated jaw connected therewith, and means for operating the jaw against its spring, substantially as specified.

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

WILLIAM W. HOPKINS. [L. S.]

Witnesses:

F. J. McCaslin,

J. D. Rippey.