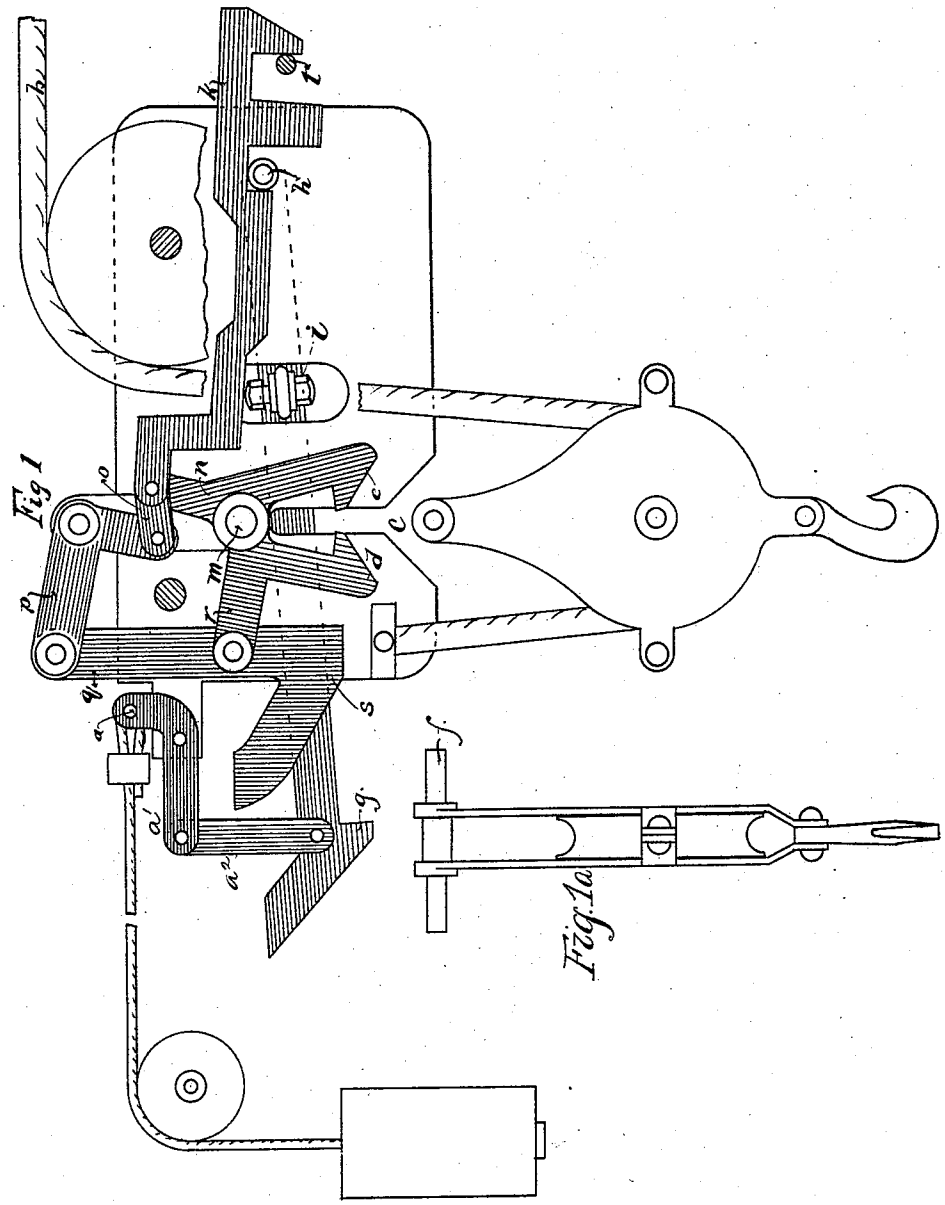
(No Model.) 2 Sheets—Sheet 1.

J. E. KINNEY, J. H. BROWN & C. G. WADE.

TROLLEY.

No. 456,148. Patented July 21, 1891.



Witnesses.
George L. Gragg.
Ella Esler

Inventors;
James E. Kinney,
John H. Brown,
Charles G. Wade.
By George P. Burton Atty

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

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Fig. 3.

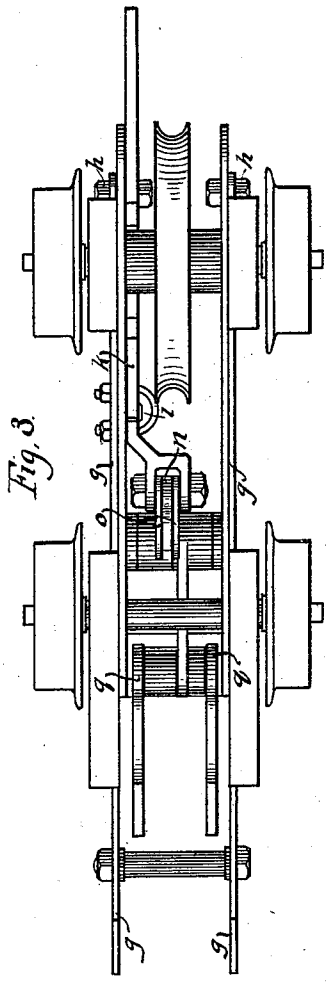
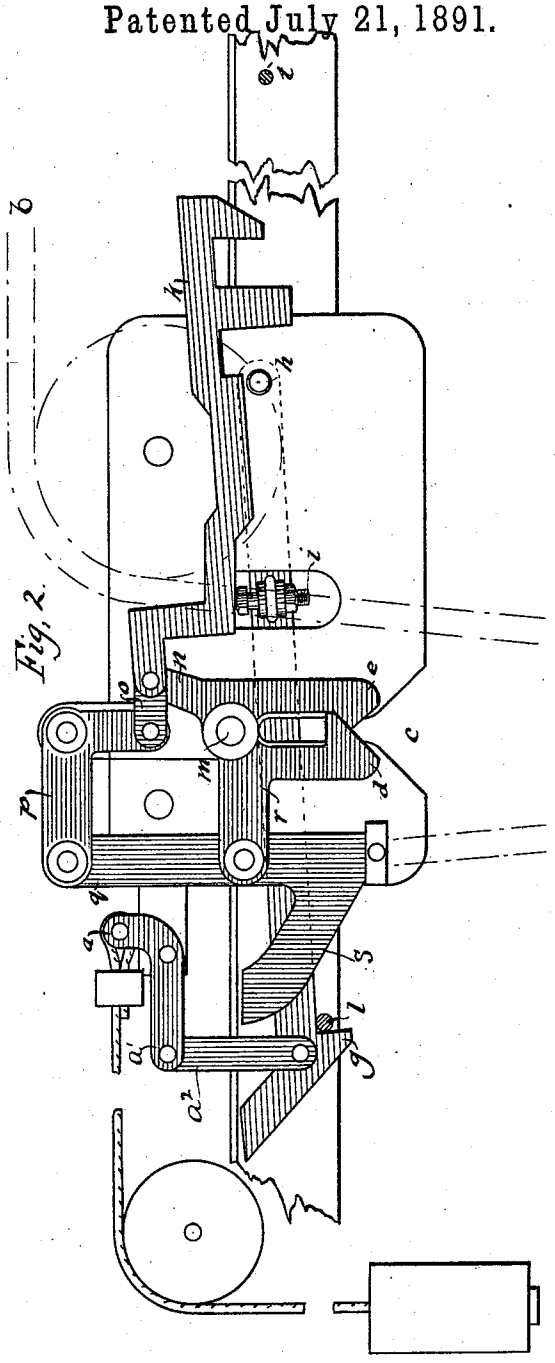


Fig. 2.



Witnesses;
George L. Cragg
Ella Edler

Inventors;
James E. Kinney,
John H. Brown,
Charles G. Wade.
By Geo. P. Barton
Atty.

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

UNITED STATES PATENT OFFICE.

JAMES E. KINNEY, JOHN H. BROWN, AND CHARLES G. WADE, OF CHICAGO, ILLINOIS; SAID WADE ASSIGNOR TO SAID KINNEY AND SAID BROWN.

TROLLEY.

SPECIFICATION forming part of Letters Patent No. 456,148, dated July 21, 1891.

Application filed October 20, 1890. Serial No. 368,767. (No model.)

To all whom it may concern:

Be it known that we, JAMES E. KINNEY, JOHN H. BROWN, and CHARLES G. WADE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Trolleys, (Case 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to trolleys of the class usually employed on elevated tracks for transferring coal, ore, and like material.

Heretofore no trolley simple and inexpensive in construction has been provided having positive jaws adapted to be automatically operated by the pin of the tub-block, so as to positively engage therewith and be disengaged therefrom by lever mechanism operated by the draft-rope. Moreover, no satisfactory automatic means have been employed heretofore for locking the trolley in position at both ends of each trip and automatically unlocking the same.

Our invention herein is designed to provide a trolley simple and cheap in construction and adapted to carry the load in either direction or back and forth between two places. The bucket containing the material to be carried, being once attached to the hook of the tub-block suspended from the trolley, is first raised and then positively and automatically locked by the jaws of the trolley, the act of bringing the bale into place serving to disengage the trolley from its stop at the place of starting, after which, by continuing the pull upon the draft-rope in case the load is to be carried forward or by slackening the draft-rope if the load is to be carried backward, the trolley is moved, carrying with it the load in one direction or the other. On reaching its destination, (assuming that the trolley is carried forward,) a lug upon a pivoted arm projecting forward from the jaws with which the arm is linked comes against a stop at the stopping-place, thus arresting the movement of the trolley and opening the jaws, and at the same time a notch in the arm by falling is brought into engagement with the stop, while at the same time the jaws are locked open by another notch in the arm being brought into engagement with a lug provided upon the frame of the trolley. By slackening the draft-rope the tub may be lowered to be dumped or unhooked. After the tub is unloaded, by again drawing the draft-rope forward the tub will be raised and the tub-block comes up under a lever on which is provided an adjustable screw. This lever and the screw carried thereon being lifted, the screw is brought against the notched arm, which is raised to disengage the same and permit the jaws to positively close together again, at the same time releasing the trolley and leaving it free to return when the rope is slackened. A counter-balance attached at the trolley is of sufficient weight to carry the trolley back to its required position, whereupon the latch portion of the levers, passing over a pin, serves to hold the trolley in place. An inclined portion of the link mechanism connected with the jaws now rides upon the stop at the starting-point, thus causing the jaws to open and release the tub-block, whereupon the tub will immediately descend until the paying out of the rope ceases.

Our invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of our trolley with the tub suspended as in the act of being lowered, the notched arm being in position to prevent the trolley from being carried back, while at the same time holding the jaws open, a side plate of the trolley being removed to show more clearly the jaws and lever mechanism connected therewith. Fig. 1ª is a front view of the tub-block. Fig. 2 is a view showing the notched arm in its raised position and the latch at the rear in engagement with the pin-stop for preventing the forward movement of the trolley. Fig. 3 is a plan view of the trolley with the bell-crank with which the counter-balance is connected and the bell-crank above the jaws removed.

Like parts are indicated by similar letters of reference throughout the different figures.

We will assume that the trolley is to be used for transferring a substance, we will say, from the portion of the track as indicated in Fig. 2, which we will call the "starting-point," to the

position upon the track indicated in Fig. 1, which may be considered as the end of the route, and we will first describe the mechanism in the position indicated in Figs. 2 and 3. The counter-balance may be a weight connected by a rope with the pin a, the pin a being preferably connected by the bell-crank a' and link a^2 with the lever below the same, as shown. This counter-balance must be of sufficient weight to draw the trolley back toward the starting-point whenever the draft-rope b is slackened. The draft-rope b, it will be understood, may be connected with a drum driven by any suitable means, so that it may be drawn forward or allowed to be drawn back by the counter-balance, as the operator may desire.

The side plates of the machine are provided with V-shaped slots c under the jaws d and e, the lower ends of the jaws being beveled, so that when the pin f of the tub-block is lifted up through the slot c against the jaws the pin will act as a wedge to spread the jaws apart, the jaws closing by gravity as soon as the pin passes.

Lever g, pivoted at h, is provided with an adjustable screw i, projecting through a slot in the side plate of the machine. The notched arm k is placed above the screw i. When the tub-block is lifted, the pin f, after it has passed the jaws, comes under the lever g, serving to raise the lever g and disengage it from the stop-pin l. Whenever the pin f of the tub-block is carried up a sufficient distance beyond the jaws, the lever g will be lifted thereby, and the arm k will be lifted by the adjustable screw i, carried by arm g, coming against the same, so that, no matter what may be the position of the trolley, at one end of the course or track or at the other it will be disengaged from its stop upon the track when the tub-block is sufficiently raised.

We will now consider the mechanism in detail. The jaws d and e are pivoted upon the pin m. The jaw e is provided with an arm n, to which the arm k is pivoted. The arm k and the arm n are linked to the other jaw d by the links o, connected to one end of the bell-crank p, said bell-crank being connected with the links q, to which the arm r of the jaw d is pivoted. Thus, as shown in Fig. 1, whenever the notched bar k is down in engagement with the stop h the jaws will be held open, and whenever the arm k is lifted, as shown in Fig. 2, the jaws will be free to close positively by the action of gravity. For symmetry and convenience of construction the link q is made duplicate, as also are the lever g and the link o. The inclined portion s of the link or links q runs up upon the pin-stop l as the trolley is carried back. In this manner the link q is raised, and being pivoted directly to the arm r of the jaw d, and being connected to the arm n of jaw e by means of the bell-crank p and link o, it is evident that the jaws will be opened when the inclined portion s is forced upon the stop l. The pin l is placed at such height that there will be just sufficient room between the jaws and the levers g at the jaws to permit the jaws to close under the pin of the tub-block without actually lifting the levers g from the stop l. By this construction the operator is enabled to suspend the load upon the trolley before lifting the latch from the pin l, a continuation of the pull upon the draft-rope being required in order that the pin of the tub-block may be brought against the levers g to lift the same and disengage the trolley. The screw i, carried upon lever g, should be adjusted so that when the levers g are latched to the pin l the notched bar k will be supported by the head of said screw, so as to clear the top of the stop h, as indicated in Fig. 2. The notched bar k is thus prevented from coming into engagement with said stop h to lock the jaws open whenever the levers g are resting upon the pin l. In case the jaws are locked open, as indicated in Fig. 1, it is evident that the pin f, when it comes up between the jaws, must raise the levers g before the jaws can close. We preferably connect the counter-balance with a bell-crank linked to the levers g, as shown. By this arrangement, in case the counter-balance is quite heavy as compared with the empty tub, the levers g will be more surely held down, for unless the levers g remain down as the trolley approaches its destination the arm k might be held so high as to pass over the stop or pin t, in which case the jaws would not open. It is evident that this counter-balance might be connected directly to any portion of the trolley-frame, since it is not necessary under all circumstances to cause the counter-balance to aid in holding the levers g in place, since their own weight will be sufficient. If it is not desired to lower the bucket at the end of the route—as, for example, when the bucket is dumped without lowering or filled without lowering—the arm k may be dispensed with, in which case it would also be preferable to connect the counter-balance directly to the frame of the machine, as before stated, and omit the bell-crank a' and link a^2.

We have constructed several machines according to the constructive details of the drawings accompanying this specification, and our invention has proven entirely successful in actual use.

It is evident that the details might be varied in many ways which would readily suggest themselves to those skilled in the art, and we therefore do not limit ourselves to the precise details of construction shown.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination, with the arm k, having pivoted connection with the jaws and provided with notches on opposite sides of a lug carried upon said arm, of a stop t, against which the lug is brought to arrest the forward movement of the trolley, and the stop h,

provided upon the frame of the trolley, whereby when the forward movement of the trolley is arrested the pivoted bar will be brought into engagement with stop *t* and stop *h* to hold the jaws separated, while the trolley is at the same time held in position, substantially as and for the purpose specified.

2. The combination, with the trolley placed upon a track, of the draft-rope passing under the movable pulley of the tub-block and thence over a guiding-pulley, a counter-balance tending to draw the trolley backward, a latch device at the rear of the trolley, and link mechanism connected with the jaws, said link mechanism having an inclined portion *s* adapted to engage with a stop on the track, substantially as and for the purpose specified.

3. The combination, with a notched arm *k*, of the pivoted jaws having pivoted connection therewith, the pivoted lever *g*, the adjustable screw *i*, carried upon lever *g*, and the stop *h*, carried upon the frame of the machine, substantially as and for the purpose specified.

4. The combination, with the pivoted jaws, of the latch-lever *g*, adapted to engage a stop *l*, the adjustable screw *i*, and the notched bar *k*, adapted to be supported by said screw, whereby when the jaws are closed the bar *k* is held so as to clear the stop *h*, substantially as and for the purpose specified.

5. The jaws having the members *d e* pivoted at *m*, the bell-crank *p*, and the links *o q*, whereby motion of either member of the jaws imparts movement to the other jaw to open or close the members of the jaws simultaneously, substantially as and for the purpose specified.

In witness whereof we hereunto subscribe our names this 15th day of October, A. D. 1890.

JAMES E. KINNEY.
JOHN H. BROWN.
CHARLES G. WADE.

Witnesses:
ELLA EDLER,
GEORGE L. CRAGG.