(No Model.)

T. S. MILLER.

CONVEYING APPARATUS.

No. 458,183. Patented Aug. 25, 1891.

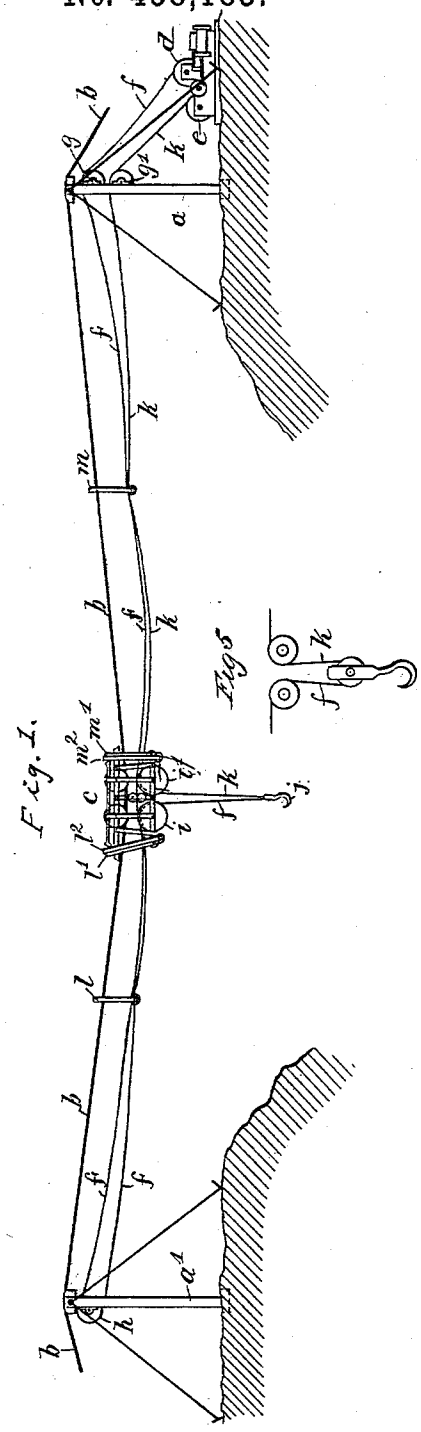


Fig. 1.

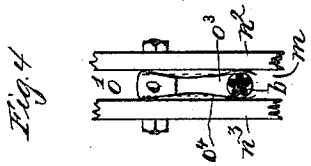


Fig. 4.

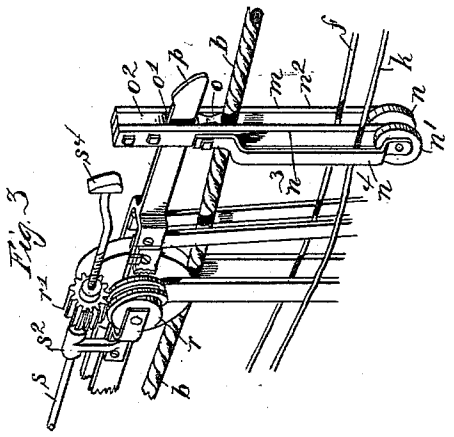


Fig. 3.

Fig. 5.

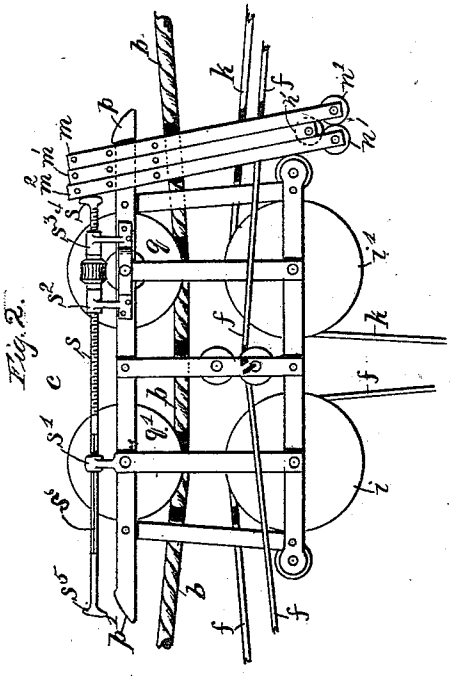


Fig. 2.

Witnesses
J. A. Greer.
Fred Kemper.

Inventor
Thomas S. Miller.
By his Attorneys
Gifford & Law

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

UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF NEW YORK, N. Y.

CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 458,183, dated August 25, 1891.

Application filed March 31, 1891. Serial No. 387,118. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SPENCER MILLER, of New York, in the county and State of New York, have invented a new and useful Improvement in Conveying Apparatus, of which the following is a specification.

Figure 1 shows my conveying apparatus in position to convey material from one side of the chasm to the other. Figs. 2, 3, and 4 show the carriage in detail. Fig. 5 is a modification showing a fall-block substituted for the hook.

a a' are the two towers.

b is the cable or trackway.

c is the carriage.

d and *e* are two reversible and friction drums of a hoisting-engine.

f is a rope, which extends from the drum *d* over the sheave *g* across to the other tower, where it passes over the sheave *h*, and thence back again to the carriage, where it passes over the sheave *i* and extends down to the hook *j*.

k is a rope, which extends from the drum *e*, over the sheave *g'*, to the carriage *c*, where it passes over the sheave *i'*, and thence down to the hook *j*.

Sometimes I make *f* and *k* separate ropes and connect their outer ends to the hook *j*, as shown in Fig. 1; but other times I make them in one piece and pass around a sheave *j'* on the fall-block, as shown in Fig. 5.

For the purpose of supporting the ropes *f* and *k*, I provide rope-carriers *l l' l²* and *m*, *m'*, and *m²*, the construction of which is more particularly shown in Figs. 3 and 4, where the wheels on which the ropes *f* and *k* run are lettered respectively *n* and *n'* and are journaled in the lower extremities of the hangers n^2, n^3, and n^4. The hangers n^2 and n^3 are connected at the top by a cross-piece *o*, by which the hangers are suspended on the cable *b*. Above this cross-piece is an opening *o'*, and still above this opening is a cross-piece o^2. The opening *o'* is to receive the horn or lifter *p*, which is attached to the carriage, there being two lifters *p* and *p'* attached to the carriage, respectively, on opposite sides thereof and projecting therefrom horizontally over the cable.

In Fig. 4 I have shown a portion of the carrier in the position it occupies with respect to the cable when lifted by the lifter *p*. It will here be seen that below the cross-piece *o* are two springs o^3 and o^4, which rest against the sides of the hangers n^2 n^3 at their lower extremities and bow inward toward each other as they approach the cross-piece *o*, to which they are secured in any suitable manner. When the carrier is lifted to the position shown in Fig. 4, the distance between the side pieces n^2 n^3 or between the lower extremities of the springs is such that they move freely along the cable. The function of the springs o^3 and o^4 is to prevent this freedom of movement when the carrier is dropped from the lifter and its support transferred from the lifter to the cable. These springs will then rest upon the cable and the weight of the rope-carrier will press the springs down on each side of the cable, so as to bring the cable between their inwardly-bowed sides, where they approach each other nearer than the diameter of the cable. These springs will therefore grip the cable sufficiently so that the carrier is held stationary on the cable until it is again picked up by the lifter *p*. I have referred to the parts o^3 and o^4 as springs. They are preferably such, but not necessarily, since, even if rigid, their converging form will evidently have a tendency to clamp the cable and hold the rope-carrier stationary thereon.

As the carriage approaches either of the towers, it picks up the rope-carriers one after another and holds them upon one of its lifters, as shown in Fig. 2, the lifters *p* and *p'* being constructed in the form of a latch-piece at its outer extremity, so that as it is inserted into the opening *o'* of any of the rope-carriers, the rope-carrier will automatically slide up the incline of the lifter onto the horizontal portion, where it will rest. At the same time the cross-piece *o* will be lifted off of the cable and the support of the rope-carrier will be transferred entirely to the carriage.

As the carriage recedes from either of the towers, it is necessary that it should drop the rope-carriers singly from time to time and leave them in proper position for supporting the ropes at various points along the cable, and I have provided mechanism for this purpose located upon the carriage and operated by the motions of the carriage, the best form

of which mechanism now known to me I will proceed to describe.

q and q' are the wheels of the carriage, which run on the cable or trackway b. Upon the axle of one of these wheels, as q, is fixed a worm r. A worm-gear r' engages with the worm at its periphery and forms an internal screw-threaded connection with a longitudinally-reciprocating screw-shaft s, extending alongside of the wheels q and q' and mounted in bearings s', s^2, and s^3, attached to the carriage. The shaft s is prevented from revolving in bearing s' by spline s^6. The ends s^4 and s^5 of this shaft s are located, respectively, directly above the lifters p and p', so that when the shaft s reciprocates in one direction its end s^4 will push the rope-carriers m, m', and m^2 one after another off of the lifter p. The reciprocation of the shaft s in this direction withdraws the end s^5 into such position as to enable the lifter p' to take up the rope-carriers l^2, l', and l, and the reciprocation of the shaft s in the opposite direction will cause it to force these rope-carriers one after another off of the lifter p'.

By the proper regulation of the pitch of the worm and screw-threads the shaft s is always made to reciprocate in the opposite direction to that in which the carriage is traveling, and the extent of this reciprocation relatively to the distance that the carriage travels being always constant the points at which the several rope-carriers will be deposited upon the cable or trackway may be predetermined.

I am aware that heretofore in conveying apparatus stops consisting either of flexible connections or of buttons fixed along the cable have been employed for the distribution of rope-carriers; but I believe that I am the first to locate a mechanism upon the carriage, operated by the movements of the carriage, so as to deposit the rope-carriers, as required, and I do not desire to limit myself to the particular form of mechanism in which this new principle is embodied, since I am well aware that in form of construction many modifications may be made.

I claim—

1. In a conveying apparatus, in combination, a carriage, a rope-carrier, means mounted upon the carriage, whereby the rope-carrier may be engaged and carried therewith, means also mounted upon the carriage, whereby the rope-carrier may be disengaged therefrom, and mechanism operated by the travel of the carriage, whereby said disengaging means is operated, substantially as described.

2. In a conveying apparatus, in combination, a carriage, a rope-carrier on each side of the carriage, means mounted upon the carriage, whereby each rope-carrier may be engaged and carried therewith, means also mounted upon the carriage whereby the rope-carriers may be separately disengaged therefrom, and mechanism operated by the travel of the carriage, whereby said disengaging means is operated, substantially as described.

3. In a conveying apparatus, in combination, a carriage, a rope-carrier on each side of the carriage, a reciprocating rod mounted upon the carriage, and means for reciprocating the same, whereby by moving in one direction one rope-carrier is shoved from the carriage and by moving in the other direction the other rope-carrier is shoved from the carriage, substantially as described.

4. In a conveying apparatus, in combination, a carriage, a rope-carrier, a cable upon which they are both mounted, a latch-shaped projection mounted on the carriage and adapted to automatically lift the rope-carrier off the cable, and means mounted on the carriage and operated by the travel thereof, whereby the carrier is disengaged from said projection and left to rest on the cable, substantially as described.

5. In a conveying apparatus, in combination, the cable, a carriage to travel thereon, a fall-block, a hoisting-drum, a distant tower, a rope extending from the drum to the distant tower, thence back to the fall-block, thence to the place of starting, and a rope-carrier adapted to support both branches of said rope, substantially as described.

6. In the carriage for a conveying apparatus, in combination, a sheave adapted to run on the cable, a gear connected with the axle of said sheave, a second gear meshing with the first, and a part connected with the second gear and adapted to be reciprocated thereby, substantially as described.

7. In a rope-carrier for a conveying apparatus, in combination, the rollers n and n', the hangers supporting the same, a cross-piece o, and a cross-piece o^2, adapted to engage with a projection on a carriage, substantially as described.

8. In a conveying apparatus, in combination, a carriage, a rope-carrier, means whereby said rope-carrier may be picked up and supported by the carriage, and a member on said rope-carrier, whereby it is supported on the cable when not supported by the carriage, the said member being provided with converging sides adapted to clamp the cable and hold the carrier stationery thereon, substantially as described.

THOMAS SPENCER MILLER.

Witnesses:
FRED KEMPER,
J. E. GREER.