(No Model.)

2 Sheets—Sheet 1.

# W. DÜSEDAU.

## CABLE HOIST.

No. 548,973. Patented Oct. 29, 1895.

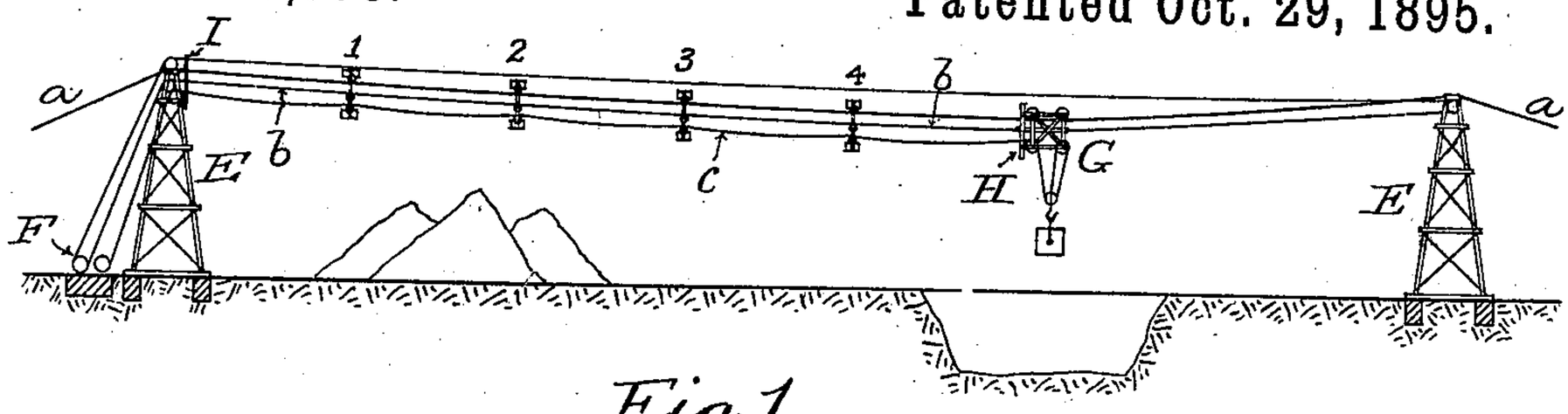



Fig. 1.

Fig. 2.

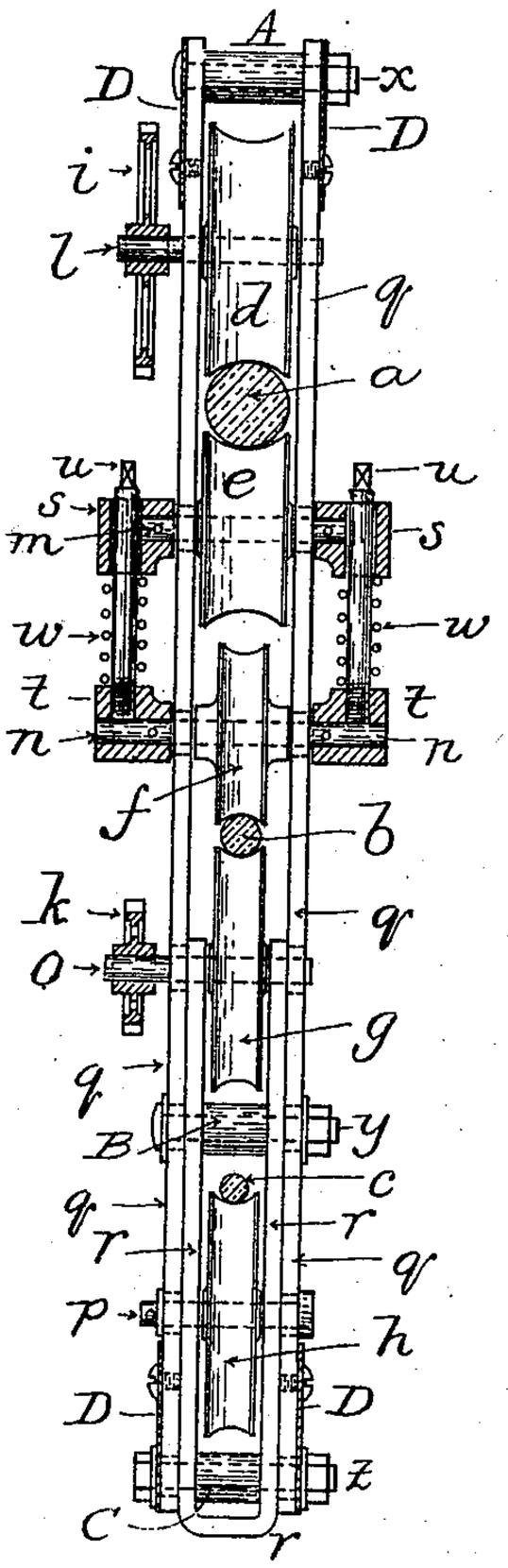
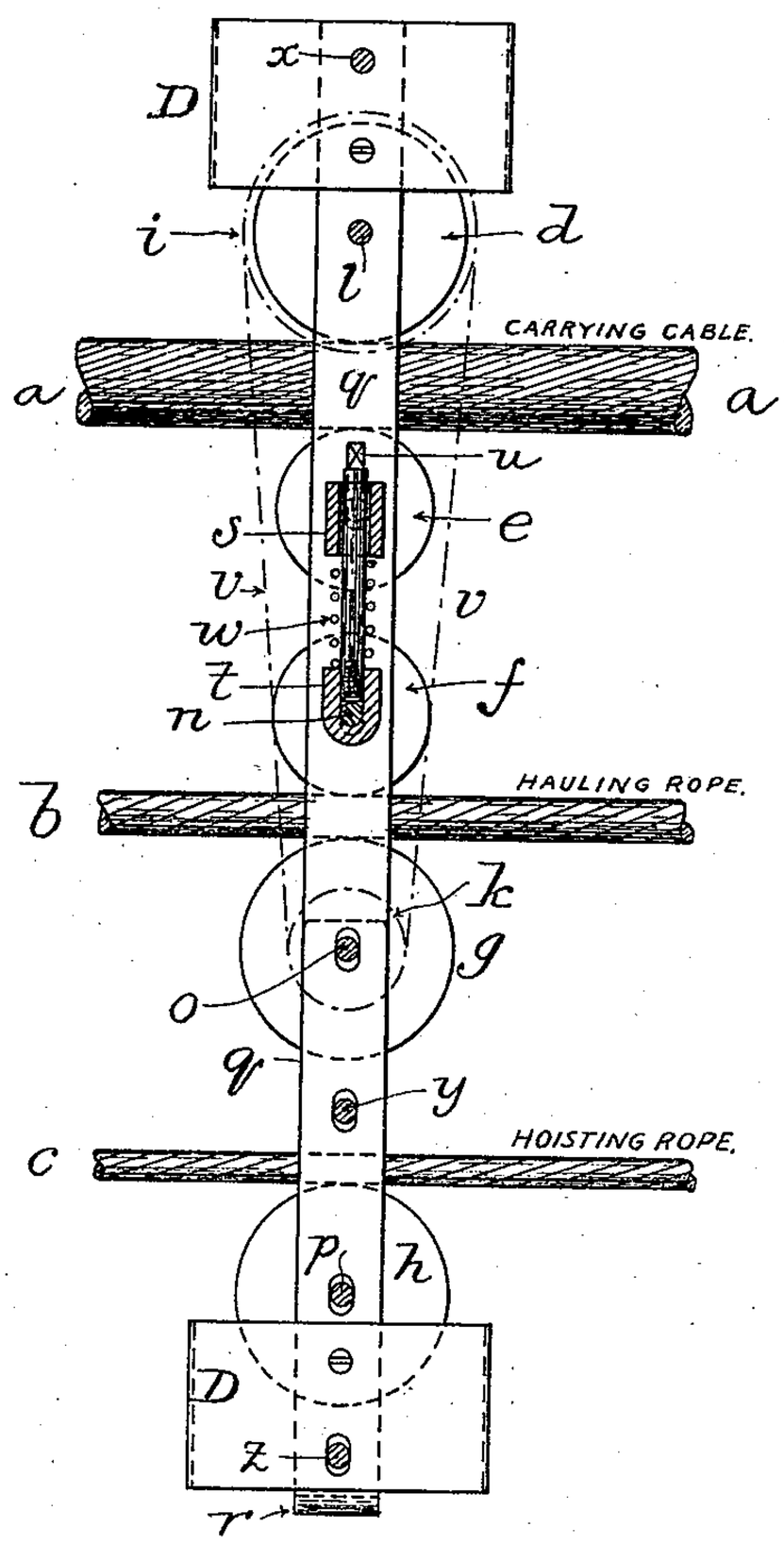



Fig. 3.




WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

# W. DÜSEDAU.

## CABLE HOIST.

No. 548,973. Patented Oct. 29, 1895.

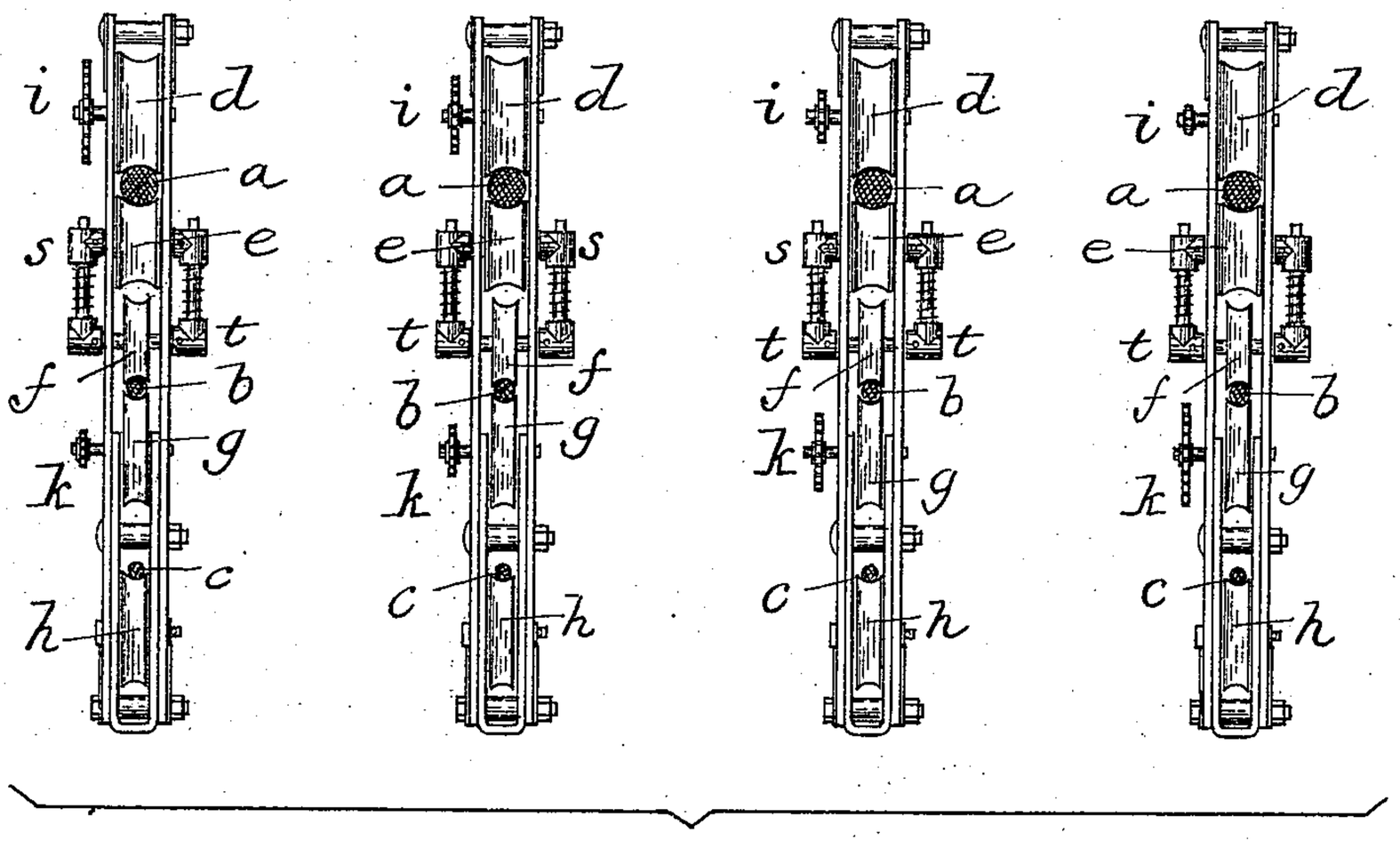


Fig. 4.

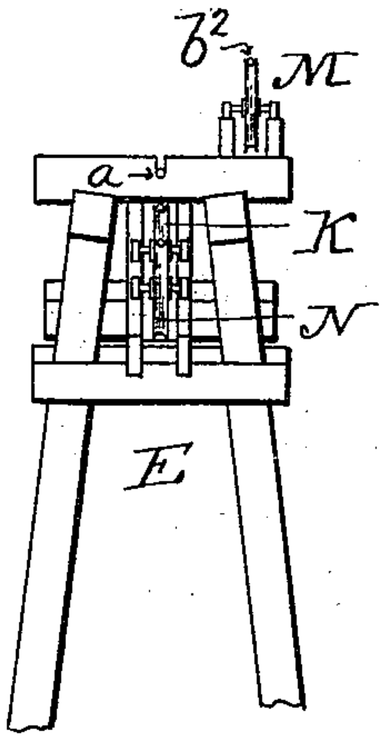


Fig. 5.

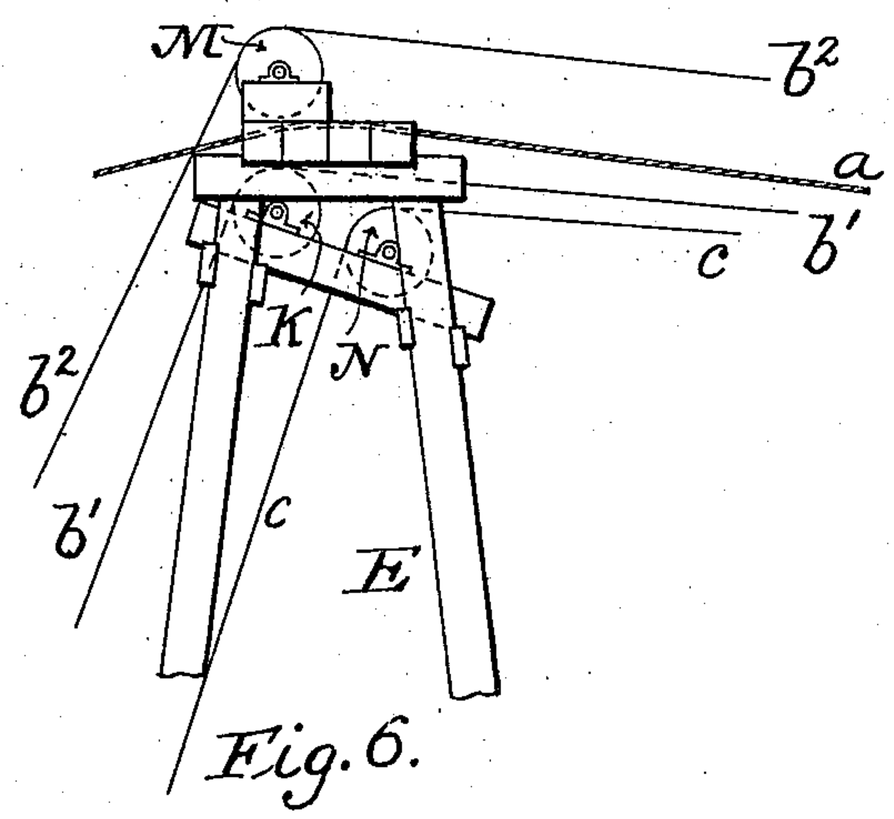


Fig. 6.

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# UNITED STATES PATENT OFFICE.

WILHELM DÜSEDAU, OF TRENTON, NEW JERSEY.

## CABLE-HOIST.

SPECIFICATION forming part of Letters Patent No. 548,973, dated October 29, 1895.

Application filed May 28, 1895. Serial No. 550,996. (No model.)

*To all whom it may concern:*

Be it known that I, WILHELM DÜSEDAU, a citizen of Prussia, residing temporarily at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Cable-Hoists, of which the following is a specification.

My invention relates to cable-hoists; and it consists, first, in a novel construction of the supports or carriers for the hoisting, the hauling, or the hoisting and hauling ropes, and, second, in a novel means for causing the proper movement of said supports or carriers upon the supporting cable or track.

The present invention has reference more particularly to that class of cable-hoists in which there is a moving hauling-rope and a stationary carrying or supporting cable—such, for instance, as that shown in Letters Patent No. 480,029, to North, dated August 2, 1892. In the construction shown in this patent that part of the hauling-rope which sets the carriers in motion is placed above the carrying-cable, and as the hauling-rope is alternately more slack on one side of the carriage than the other, according to the direction in which the carriage is traveling, it will readily be seen that this arrangement necessitates the use of a number of carriers on each side of the carriage to prevent the ropes from becoming entangled. In other words, that portion of the hauling-rope used to move the carriage inward, and which I term the "inhauling-rope," is more taut than that portion used to move the carriage outward, and which when the carriage travels inward is termed the "outhauling-rope." The weight of the slack outhauling-rope, in addition to the weight of that part of the carriers above the cable, makes the carriers on the far side of the carriage top-heavy, and they are likely to turn over and thereby disable the cable-hoist.

The object of my invention is to avoid these difficulties; and to this end the invention consists, first, in a novel construction of the carriers, and, second, in a novel arrangement of the propelling means.

In carrying out the second part of my invention I place the driving portion of the hauling-rope—the inhauling-rope—beneath the carrying-cable and the outhauling-rope out of line with the carriers, thus enabling me to locate them on that side of the carriage where the hoisting-rope is located. I attain these objects by the construction shown in the drawings, in which—

Figure 1 is an elevation of a cable-hoist; Fig. 2, an end view of one of the carriers, partly in section; Fig. 3, a side view of the same, also partly in section; Fig. 4, a view illustrating the modification in the gearing requisite to the proper travel of the respective carriers, and Figs. 5 and 6 views illustrating the arrangement of the rope-supporting sheaves at the tower near the engine.

In the drawings, *a* indicates the supporting or carrying cable, *b* the hauling-rope, comprising two parts—the inhauling part *b'* and the outhauling part $b^2$—and *c* the hoisting-rope.

Each carrier 1 2 3 4, &c., has a main frame composed of cheek-pieces *q q*, spaced or separated by the blocks A B C and united by the bolts *x*, *y*, and *z*. At the lower end of the main frame and forming part thereof is the supplemental frame *r*, which is fitted to the parts *q q*, so that it may have an adjustment thereon, the said supplemental frame being held in its adjusted positions by means of the bolts *y* and *z* before referred to.

At the upper end of the carrier is a grooved sheave *d*, secured to a shaft or axle *l* journaled in the side pieces *q q*, the said shaft extending beyond the frame, where it is provided with a sprocket-wheel *i*. The sheave *d* runs upon the supporting or carrying cable *a*. Below the sheave *d* is a grooved sheave *g*, whose shaft or axle *o* is likewise extended beyond the side of the frame and provided with a sprocket-wheel *k* in line with the sprocket-wheel *i*, the said sprocket-wheels *i* and *k* being adapted to receive a sprocket-chain *v*, (shown in dotted lines in Fig. 3,) so that the motion imparted to wheel or sheave *g* will be transmitted to the sheave *d*. Sheave *g* will receive its motion from the hauling-rope *b*, which rests on said sheave, and of course the rotation imparted to sheave *d* by the connections just described will cause the said sheave, and in fact the entire carrier, to travel along the cable.

As the carriers are to be equally spaced between the carriage and the tower or starting-point, it is necessary that they shall have a speed proportionate to the distance to be traveled, so that as the carriage is moved in and out the carriers will automatically assume their proper respective positions on the cable; or, to state it differently—assuming four carriers to be employed—the carrier 1 travels one-fifth of the distance the carriage G travels; carrier 2 travels two-fifths of the distance; carrier 3 travels three-fifths, and carrier 4 travels four-fifths the distance, and in order that the carriers shall travel these distances it is only necessary to properly determine the ratio of the parts *g*, *d*, *i*, and *k* of the respective carriers. It is, therefore, clear that if the ratio of the propelling means of the respective carriers be properly determined, the said carriers will, when the carriage moves outward, assume their proper positions upon the cable, as in Fig. 1, and when the carriage moves inward they will arrive at the starting-point at the same time with the carriage. Of course any variation in the number of the carriers will require a corresponding variation or change in the ratio of the propelling means.

In Fig. 4 I have shown four carriers provided, respectively, with gearing calculated to insure their proper travel upon the supporting-cable.

The shaft or axle *o* of the sheave *g* is journaled in the supplemental frame *r* and passes through slots in the side pieces of the main frame, so that the shaft may be adjusted toward and from the upper shaft *l* to give the proper tension to the belt or chain *v*. It is obvious that other means may be substituted for the sprocket-gearing for transmitting motion from sheave *g* to sheave *d*.

In order to prevent slipping of the sheaves *g* and *d* upon the rope *b* and cable *a*, the frame is provided with two additional sheaves *e* and *f*, grooved to bear, respectively, upon the cable and rope. The shafts *m* and *n* of these sheaves are carried in blocks *s* and *t*, which are urged apart by the coiled springs *w*, encircling the guide-rods *u*, the side pieces *q* of the frame being slotted to permit of a slight movement of the sheave-axles From this it will be seen that the springs tend to force the sheaves *e* and *f* apart or away from each other, and they in turn press the cable *a* and rope *b* against the sheaves *d* and *g* with the desired pressure. When, therefore, the hauling-rope *b* is moved in one direction, it causes the sheave *g* to rotate, and the latter, through the gearing *k*, *v*, and *i*, causes the sheave *d* to turn or rotate and thus carry the whole carrier along the cable *a*. When the direction of travel of the hauling-rope *b* is reversed, the carrier will through the same instrumentalities be caused to travel in a direction the reverse of that just described. In other words, the hauling-rope *b* serves to move each carrier in one direction or the other according to the direction in which the hauling-rope moves, said hauling-rope imparting the desired motion to the traversing sheave *d* through sheave *g* and the sprocket-wheels and chain.

Hoisting-rope *c* is carried by a sheave *h*, which may be fast to or loose upon the shaft *p*, which latter is located, preferably, at the lower end of the frame or casing.

The carriers may run upon two or more instead of one carrying-cable, and the number of ropes may also be increased as circumstances may require, a corresponding number of sheaves, &c., being provided according to the number of ropes and cables employed.

As shown in Fig. 1, the hoist comprises the towers E E, the engine F, the carriage G, the carrying-cable *a*, the hauling-rope *b*, the hoisting-rope *c*, and as many carriers 1 2 3 4 as circumstances may require.

The inhauling-rope *b'* is fixed to the carriage G and passes thence to and around sheave K, while the outhauling-rope $b^2$ passes over sheave M, which is to one side of the vertical plane in which the carriers travel or to one side of the plane of sheave K. The hoisting-rope *c* passes over the sheave N, as shown in Figs. 5 and 6. It will be seen that the hoisting-rope carriers are necessary only on one side of the carriage G—that is, so far as the hoisting-rope extends. It will also be noted that the outhauling part $b^2$ of the hauling-rope *b*, which is placed above the cable *a*, does not need to be guided by carriers, as it is placed so far to one side that it cannot become entangled with the cable or with the ropes.

That part of the outhauling-rope $b^2$ which is located beneath the cable *a* on the far side of the carriage likewise does not have to be guided by carriers, for thereas on that it sags or has less tension than the cable *a*.

The carriage G may be provided with pieces H and one of the towers E with pieces I, which act as buffers when the carriage runs to starting-point.

The carrier-frame may be made wide enough to protect the sheaves from injury or may be provided with blocks or projections D to act as buffers when the carriers are brought together. So, too, the mechanism outside of the frame may, if desired, be protected by any suitable guard or casing against injury by ropes, &c.

Having thus described my invention, what I claim is—

1. In a cable-hoist, the combination with a carrying cable; of a carrier mounted thereon, and provided with traversing gear; and a rope to impart motion to said gear and thereby cause the carrier to travel along the cable; said rope being connected with said gear beneath the cable.

2. In a cable-hoist, the combination with a carrying cable; of a carrier mounted thereon, and provided with traversing gear; and a

hauling rope to impart motion to said gear and thereby cause the carrier to travel along the cable; said rope being connected with said gear beneath the cable.

3. In a cable-hoist, the combination with a carrying cable; of a carrier provided with two sheaves *g* and *d*,—one of which, *d*, travels upon the cable and the other located below the cable; a rope to engage and turn the sheave *g;* and means for transmitting motion from sheave *g* to sheave *d*.

4. In a cable-hoist, the combination with a carrying cable; of a carrier mounted thereon, and provided with a supporting wheel or sheave to run on the cable; and a hauling rope arranged below the cable to impart motion to the sheave.

5. In a cable hoist, the combination with a supporting cable; of a carrier provided with sheaves *d* and *g*, sprocket wheels *i* and *k*, and chain *v;* and a rope beneath the cable engaging the sheave *g*.

6. In a cable hoist, the combination with a supporting cable; of a carrier provided with sheaves *d* and *g*, and connecting gear; a rope to engage the sheave *g;* and a friction device to press the cable and rope in contact with said sheaves.

7. In a cable hoist, the combination with a supporting cable; of a carrier provided with connected sheaves *d* and *g;* a rope to engage sheave *g;* sheaves *e* and *f* bearing respectively upon the cable and rope; and springs *w* to cause the sheaves *e* and *f* to press the cable and rope against the sheaves *d* and *g*.

8. In a cable hoist, the combination with a supporting cable; of the carrier provided with connected sheaves *d* and *g;* a rope to engage sheave *g;* sheaves *e* and *f* bearing upon the cable and rope; blocks or bearings *s* and *t* for the shafts of the sheaves *e* and *f;* guide rods *u u;* and springs *w* encircling the rods and tending to separate the sheaves *e* and *f*.

9. In a cable hoist, the combination with a carrying cable; of a carrier provided with sheaves *d* and *g* and connecting gear; a rope to turn sheave *g;* and a friction device movable with reference to the frame of the carrier, and adapted to press the cable and rope against the sheaves *d g*.

10. In a cable hoist, the combination with a carrying cable; of a carrier provided with two sheaves *d* and *g;* a rope to turn sheave *g;* connecting gear for transmitting motion from sheave *g* to sheave *d;* means for adjusting the sheave *g;* and a self-adjustable friction device interposed between the cable and rope.

11. In a cable hoist, the combination with a carrying cable; of a series of carriers mounted thereon; and a rope operatively connected with said carriers beneath the cable to move said carriers simultaneously upon the cable.

12. In a cable hoist, the combination with a carrying cable; of a series of carriers mounted thereon; and a rope operatively connected with said carriers beneath the cable whereby said carriers are caused to travel simultaneously but at different speeds.

13. In a cable hoist, the combination with a carrying cable; of a series of carriers mounted thereon; and a hauling rope operatively connected with the carriers beneath the cable, and adapted to move all of said carriers simultaneously.

14. In a cable hoist, the combination with a carrying cable; of a series of carriers mounted thereon; a hauling rope operatively connected with the carriers beneath the cable, and adapted to move all of said carriers simultaneously but at different speeds.

15. In a cable hoist, the combination with a carrying cable; of a series of carriers mounted thereon and each carrier having traversing gear corresponding to the position it is to occupy on the cable; and a rope beneath the cable for actuating said carriers, whereby they will distribute themselves automatically at the desired points.

16. In a cable hoist, the combination with a supporting cable; of a series of carriers thereon; and a rope having only its inhauling portion operatively connected with the carriers to move all of said carriers simultaneously but at different speeds.

17. In a cable hoist, the combination with a supporting cable; of a carriage mounted on the cable; a series of carriers mounted on the cable on the near side of the carriage; and a rope having only its inhauling portion connected with the carriers, whereby they will distribute themselves simultaneously but at different speeds.

In witness whereof I hereunto set my hand in the presence of two witnesses.

WILHELM DÜSEDAU.

Witnesses:

HORACE A. DODGE,

WALTER S. DODGE.