

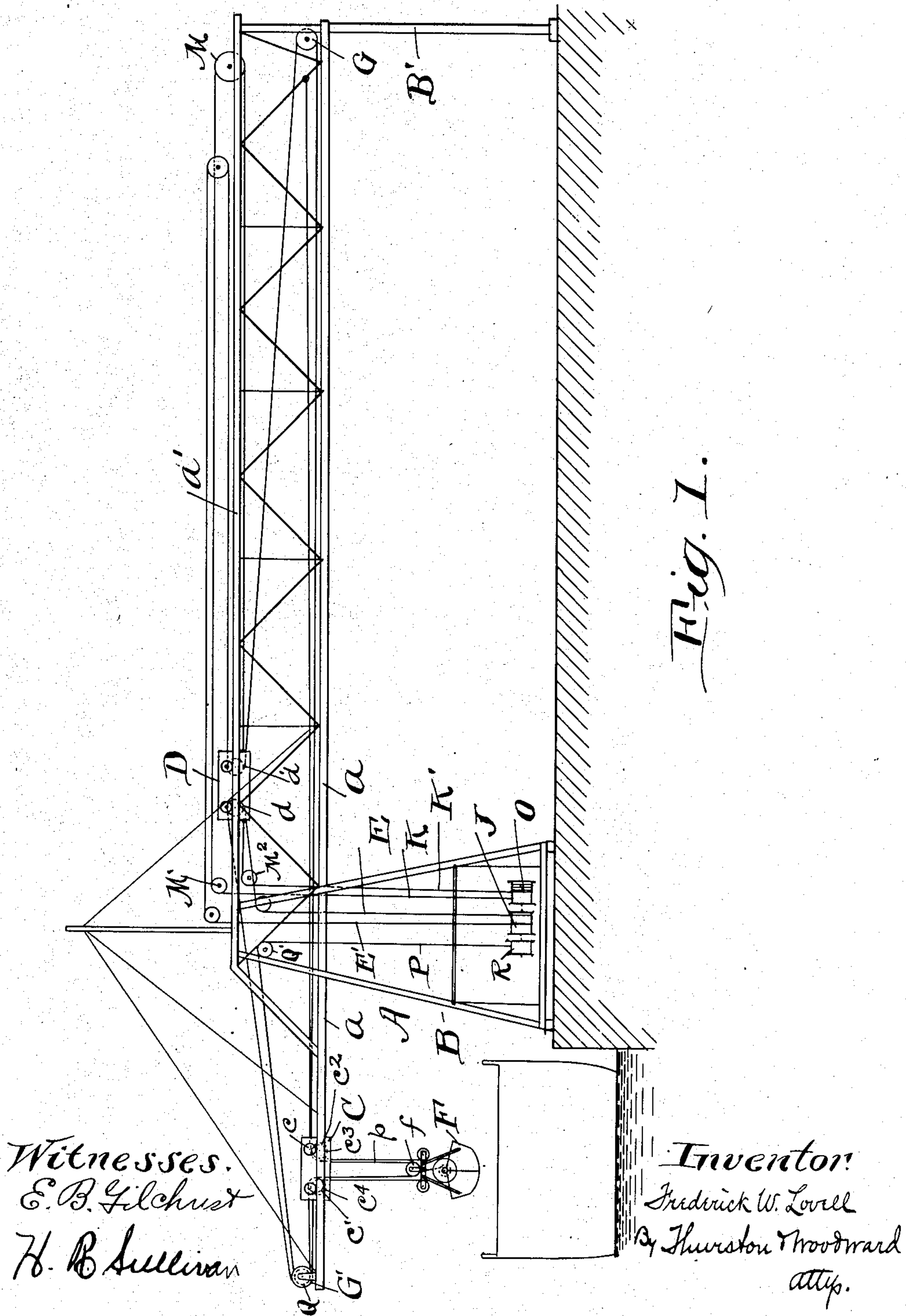
No. 827,247.

PATENTED JULY 31, 1906.

F. W. LOVELL.
HOISTING AND CONVEYING APPARATUS.

APPLICATION FILED APR. 9, 1906.

2 SHEETS—SHEET 1.



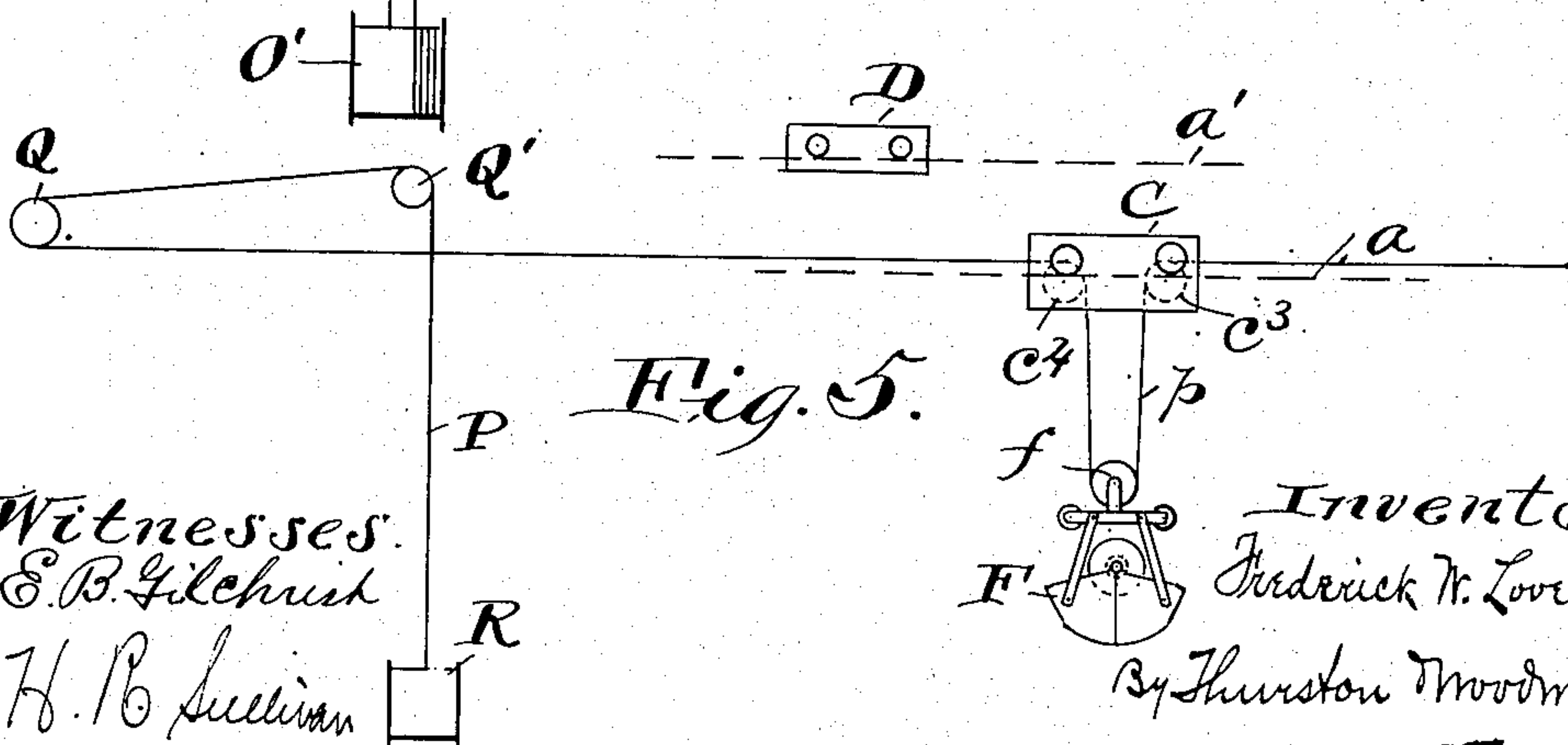
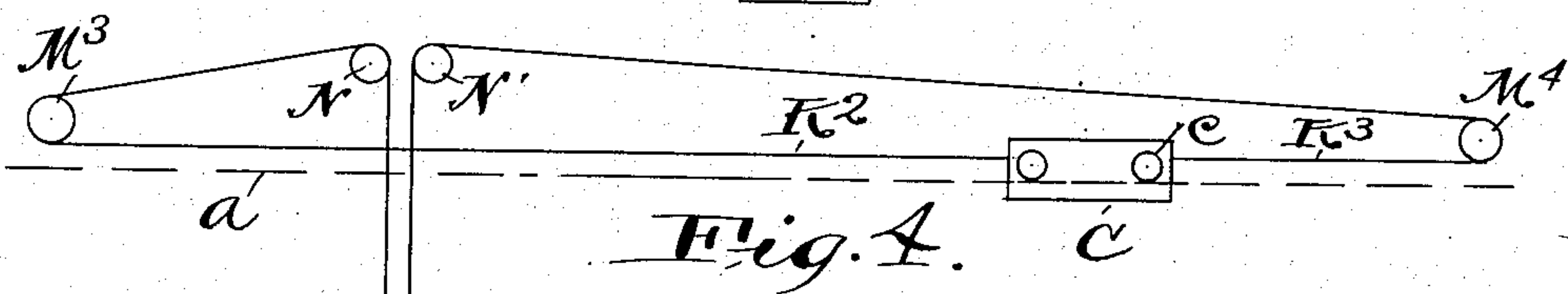
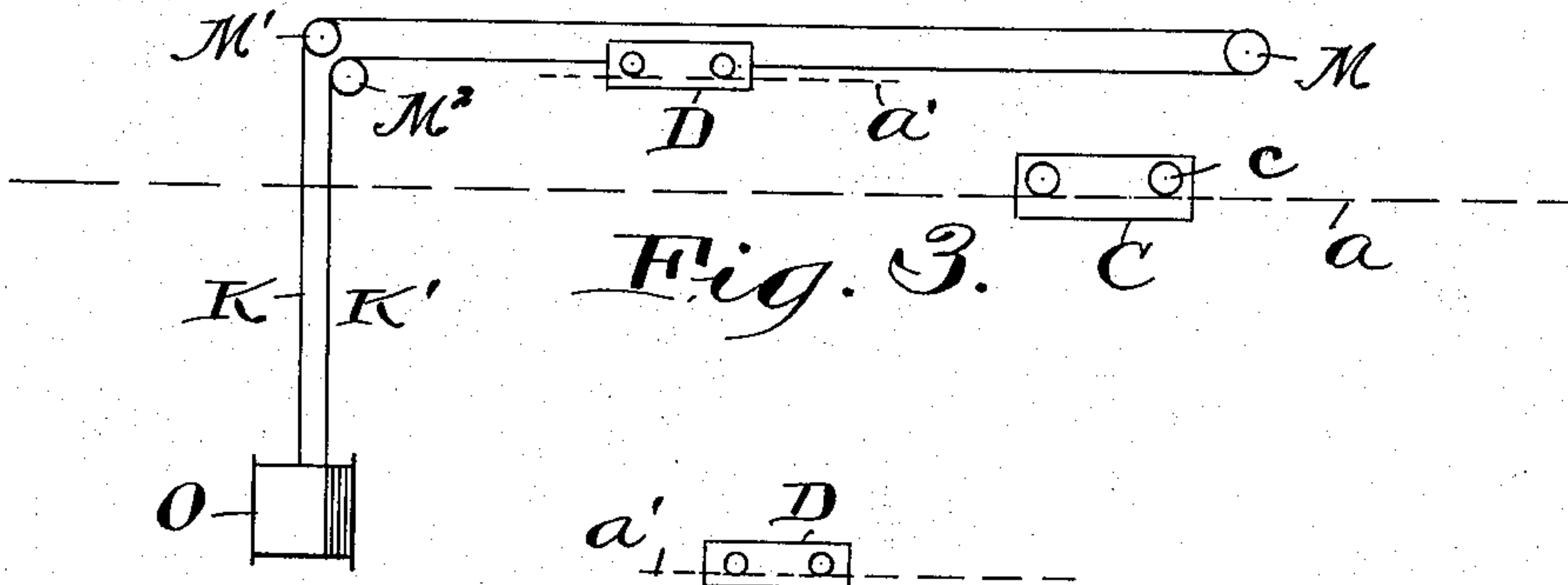
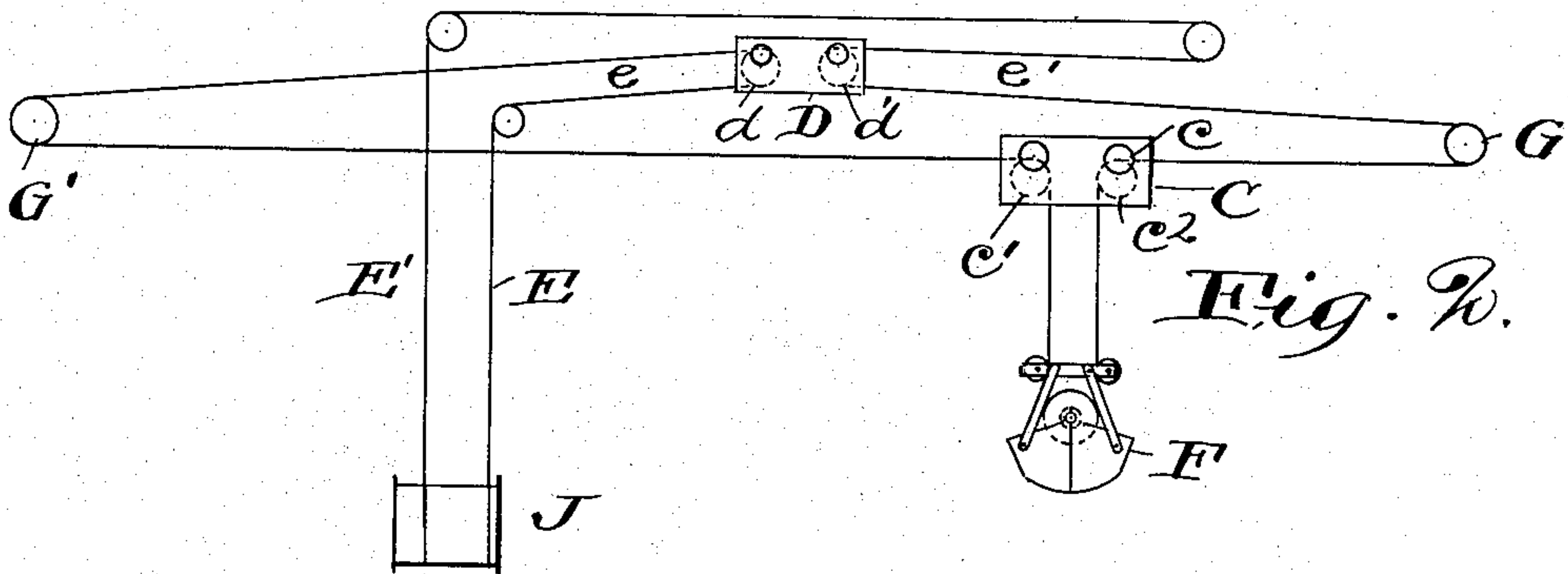
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2 SHEETS—SHEET 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

FREDERICK W. LOVELL, OF CLEVELAND, OHIO, ASSIGNOR TO THE
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HOISTING AND CONVEYING APPARATUS.

No. 827,247.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed April 9, 1906. Serial No. 310,688.

To all whom it may concern:

Be it known that I, FREDERICK W. LOVELL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Hoisting and Conveying Apparatus, of which the following is a full, clear, and exact description.

The invention relates to certain improvements in the class of hoisting and conveying apparatus which commonly includes a bridge, a trolley movable thereon, a bucket supported from said trolley by suitable ropes, guide-sheaves, and rope-take-up mechanisms by means of which the trolley may be moved backward and forward on the bridge and the bucket may be raised or lowered and opened or closed.

The object of the invention is to provide novel means whereby the trolley may be made to traverse the bridge in either direction while the bucket is being raised or lowered and which permits the bucket to be raised or lowered and opened or closed irrespective of the position of the trolley; and one of the special objects of the invention is to provide for the stated purpose means which permits the use of comparatively short hoisting-ropes.

The distinctively novel features of the invention reside particularly in the arrangement of the hoisting-ropes and their adjunctive devices intermediate of the bucket and the take-up devices, and also in the means which may be employed in connection therewith to cause the required movement of the trolley, all of which will be hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a side elevation of a hoisting and conveying apparatus equipped with my invention. Fig. 2 is a diagrammatic view showing the ropes and take-up mechanism for raising and closing the bucket. Fig. 3 is a diagrammatic view showing one arrangement of the ropes and take-up mechanism for causing the trolley to move backward and forward upon the bridge. Fig. 4 is a diagrammatic view of an alternate arrangement of the instrumentalities shown in Fig. 3, and Fig. 5 is a diagrammatic view showing a satisfactory arrangement of the holding-rope and its take-up mechanism.

Referring to the parts by letters, A repre-

sents the track-supporting member, which is usually in the form of a bridge supported at the proper elevation by any suitable means—as, for example, by the built-up standards B B'.

C represents the trolley, which is provided with wheels *c*, designed to run on tracks *a* upon the bridge, which tracks extend, preferably, from one end of the bridge to the other. *a'* represents other tracks on the upper portion of the bridge, which tracks are provided for the support of an auxiliary carriage D, which is movable thereon.

The two hoisting-ropes E E', which are also utilized for closing the bucket, are connected therewith at one end in such manner, well understood in this art, as will enable them to perform that function. At their other ends these ropes are connected with rope-take-up mechanism, which may be a winding-drum J, on which both ropes are wound in the same direction. From the bucket the ropes extend upward to the trolley over sheaves *c'* *c''* thereon, and thence in opposite directions to points near the ends of tracks *a*, where said ropes run, respectively, over sheaves G G', mounted upon the bridge. Following these ropes beyond these points where said sheaves are located, it will be seen that said ropes are respectively provided with the loops *e e'*, which extend toward each other and respectively embrace the two sheaves *d d'* on the auxiliary carriage D. Beyond these loops the ropes E E' are bent over the required sheaves to lead them to the winding-drum. It is evident that by simultaneously taking in or paying out these ropes the bucket will be closed and raised or lowered without imparting to the trolley any tendency to move in either direction. It is equally evident that if the trolley be moved without at the same time turning the drum J the bucket F will be neither raised nor lowered nor opened or closed, because when the trolley moves to the left, for example, the loop *e'* of the rope E', which goes around the sheave *d'*, will be shortened, while simultaneously the loop *e* of the rope E, which passes around the sheave *d*, will be lengthened, which will of course result in the movement to the right of the auxiliary carriage D one-half the distance which the trolley C moves.

The rope for traversing the trolley may be

arranged as shown clearly in Fig. 3—that is to say, rope K may be connected with the auxiliary carriage and pass over the sheave M, then over a guide-sheave M', down to the winding-drum O, while the rope K' may be secured to the other end of said carriage and may pass over the sheave M² and thence down to the same winding-drum O; but the two ropes K K' must be wound in opposite directions from this drum, so that as one rope is taken up the other will be paid out.

As alternative to the above-described arrangement of the trolley-ropes the construction shown in Fig. 4 may be adopted—that is to say, two ropes K² K³ may be secured to opposite ends of the trolley and may pass, respectively, therefrom in opposite directions over the sheaves M³ M⁴ and thence toward each other over sheaves N N' down to the winding-drum O', upon which said ropes will be wound in opposite directions.

It is the intention to employ in connection with the mechanism shown a bucket of the type which is automatically opened and closed by means of suitable ropes. The ropes E E', as described, are the ropes for closing the bucket. In Fig. 5 is shown an arrangement of the rope for opening the bucket, which rope is commonly called the "holding-rope." This rope (indicated by P) is dead-ended at one end of the bridge and passes over sheaves c³ c⁴ on the trolley down in the form of a loop p between said sheaves, which loop receives a sheave f on the bucket. The rope after leaving sheave c⁴ passes over a sheave Q at the end of the bridge, then over a guide-sheave Q' to an independent winding-drum R. When the trolley is being moved back and forth upon the bridge, one side of the loop p, in which the sheave f is hung, is taken up, while the other side of said loop is equally paid out, so that the length of the loop is not affected. It is obvious that the hoisting or lowering of the bucket may go on while the trolley is moving in either direction, as well as while it is stationary. Attention is further called to the fact that less rope is required with the construction above described than with any other apparatus having like functions.

Having described my invention, I claim—

1. In hoisting and conveying mechanism, the combination of a guideway, a trolley movable thereon, a bucket, and rope-take-up mechanism, with two rope-strands which engage with the bucket and are connected with the take-up mechanism, which rope-strands pass from the bucket up to the trolley and thence in opposite directions to points near the ends of said guideway, said rope-strands being respectively provided, beyond said points, with loops which extend toward each other, two sheaves in said loops respectively, and a movable member in which said two sheaves are mounted.

2. In hoisting and conveying mechanism, the combination of a bridge, two tracks thereon, a trolley movable on one track, an auxiliary carriage movable upon the other track, a bucket, and rope-take-up mechanism, with two ropes which pass from the bucket upward to the trolley, two sheaves mounted on the trolley over which said ropes pass and from which they extend in opposite directions, sheaves near the end of the trolley-track over which said ropes pass and from thence extend toward each other and toward the auxiliary carriage, two sheaves mounted upon said auxiliary carriage over which said ropes respectively pass and from which they extend in opposite directions, and guide-sheaves between said supplemental carriage and take-up mechanism.

3. In hoisting and conveying mechanism, the combination of a guideway, a trolley movable thereon, a bucket and rope-take-up mechanism, with two ropes which are connected at their respective ends with the bucket and with the take-up mechanism, which ropes pass from the bucket up to the trolley and thence in opposite directions to points near the ends of said guideway, said ropes being respectively provided beyond said points with loops which extend toward each other, two sheaves in said loops respectively, a movable member in which said two sheaves are mounted, and means for traversing said trolley backward and forward on said guideway.

4. In hoisting and conveying mechanism, the combination of a guideway, a trolley movable thereon, a bucket, and rope-take-up mechanism, with two ropes which are connected at their respective ends with the bucket and with the take-up mechanism, which ropes pass from the bucket up to the trolley and thence in opposite directions to a point near the ends of said guideway, said ropes being respectively provided beyond said points with loops which extend toward each other, two sheaves in said loops respectively, a movable member in which said two sheaves are mounted, two ropes secured to opposite ends of the movable member and extending therefrom in opposite directions, guide-sheaves over which said ropes are extended, and mechanism for simultaneously taking up one of the last-mentioned ropes and equally paying out the other.

5. In hoisting and conveying mechanism, the combination of a guideway, a trolley movable thereon, a bucket, and rope-take-up mechanism, with two ropes which are connected at their respective ends with the bucket and with the take-up mechanism, which ropes pass from the bucket up to the trolley and thence in opposite directions to a point near the ends of said guideway, said ropes being respectively provided beyond said points with loops which extend toward

each other, two sheaves in said loops respectively, a movable member in which said two sheaves are mounted, means for traversing said trolley backward and forward in said
5 guideway, a holding-rope which extends between points near the ends of the guideway, sheaves on the trolley over which said rope extends downward to form a loop, a sheave mounted in said bucket and hung in said loop,

and mechanism for taking in and paying out said rope as required.

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

FREDERICK W. LOVELL.

Witnesses:

E. L. THURSTON,
E. B. GILCHRIST.