

(No Model.)

A. H. DE CAMP, Dec'd.

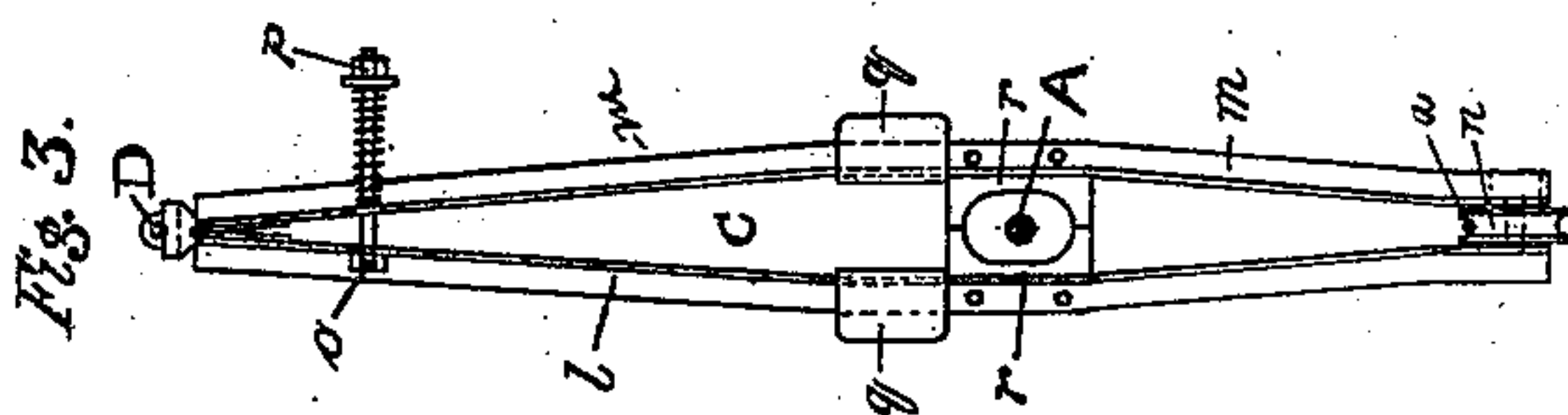
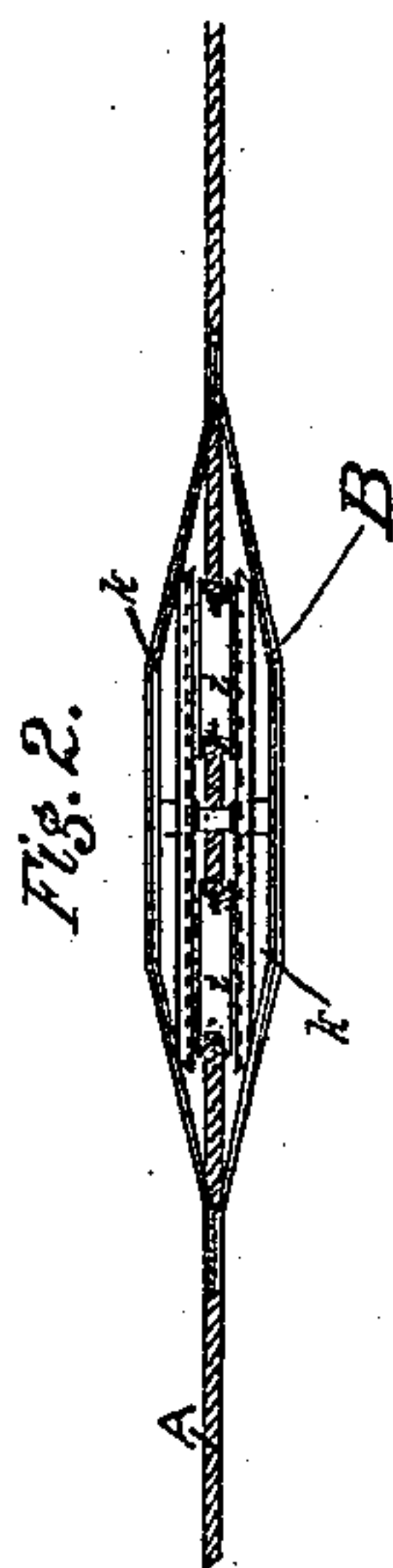
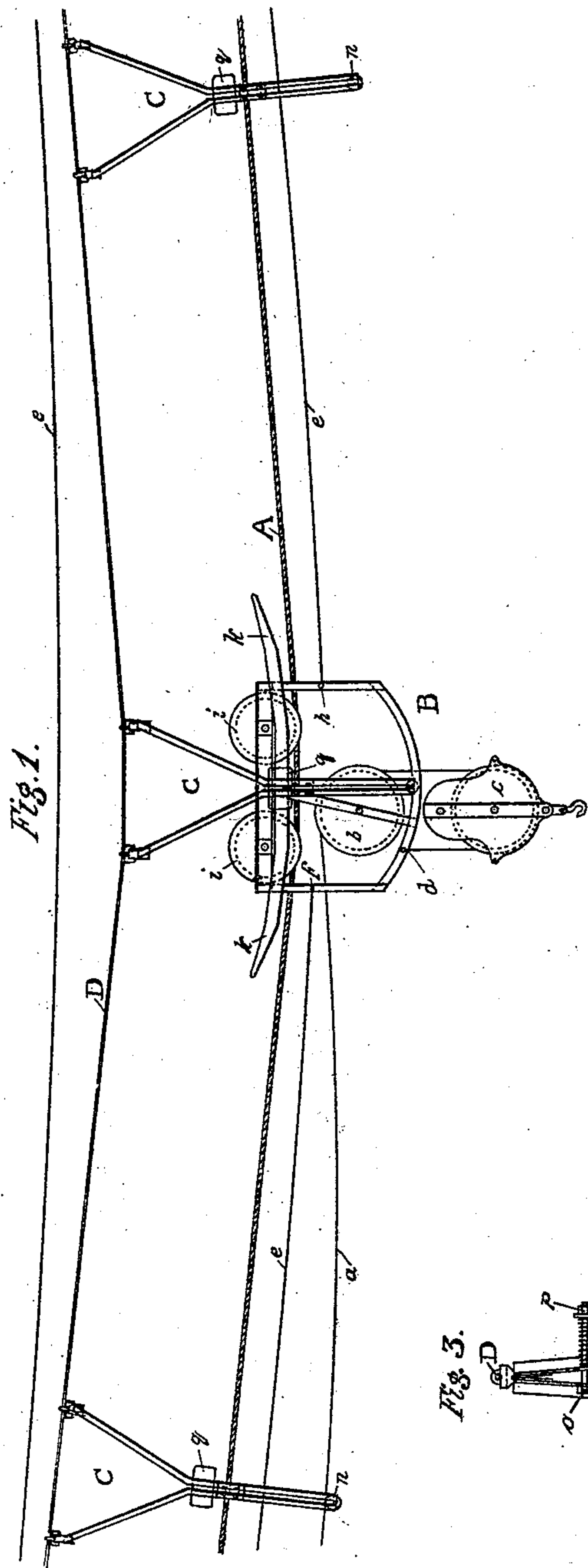
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E. A. & C. A. DE CAMP, Executors.

HOISTING AND CONVEYING MACHINE.

No. 553,778.

Patented Jan. 28, 1896.



WITNESSES:

Walter W. Barker
B. Thompson

INVENTOR

Alfred H. De Camp
BY F. C. Thompson

ATTORNEY

(No Model.)

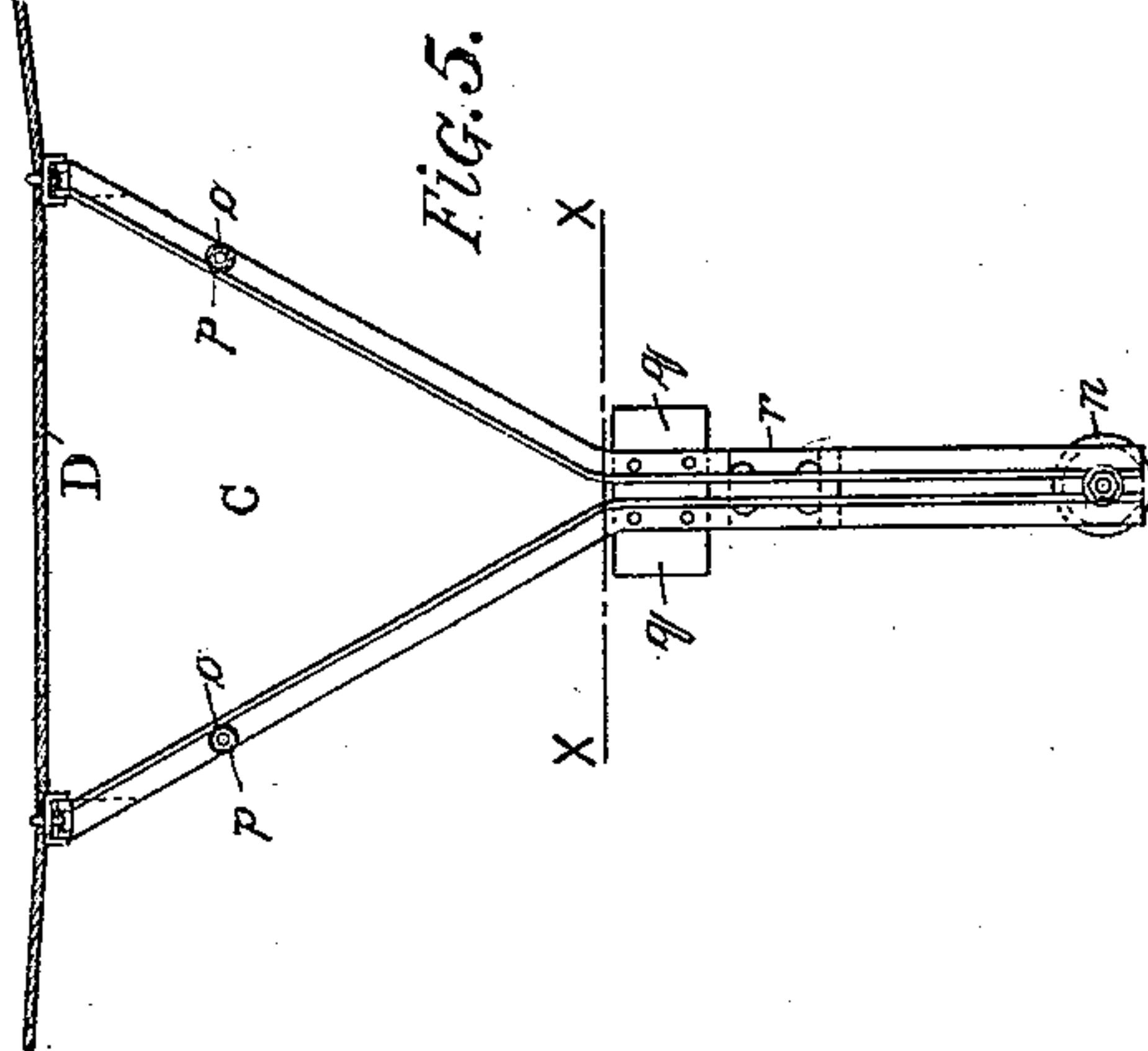
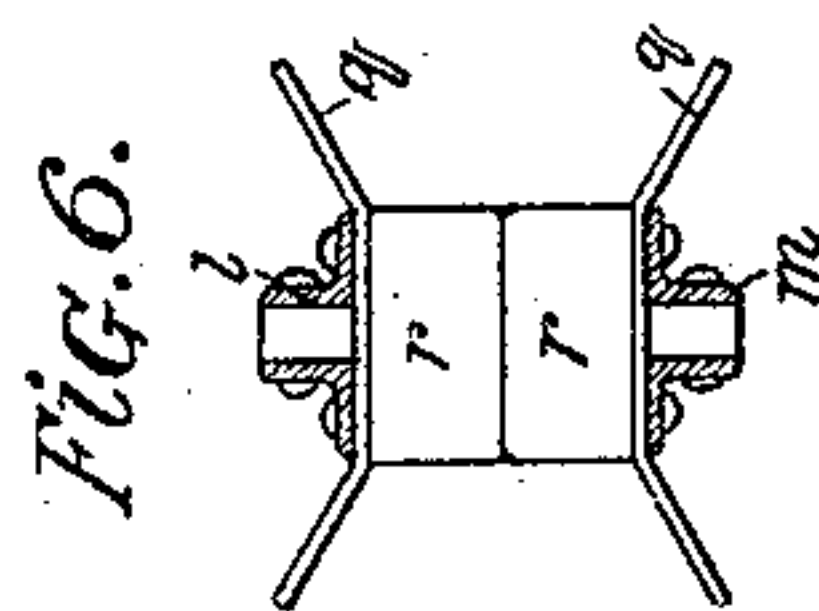
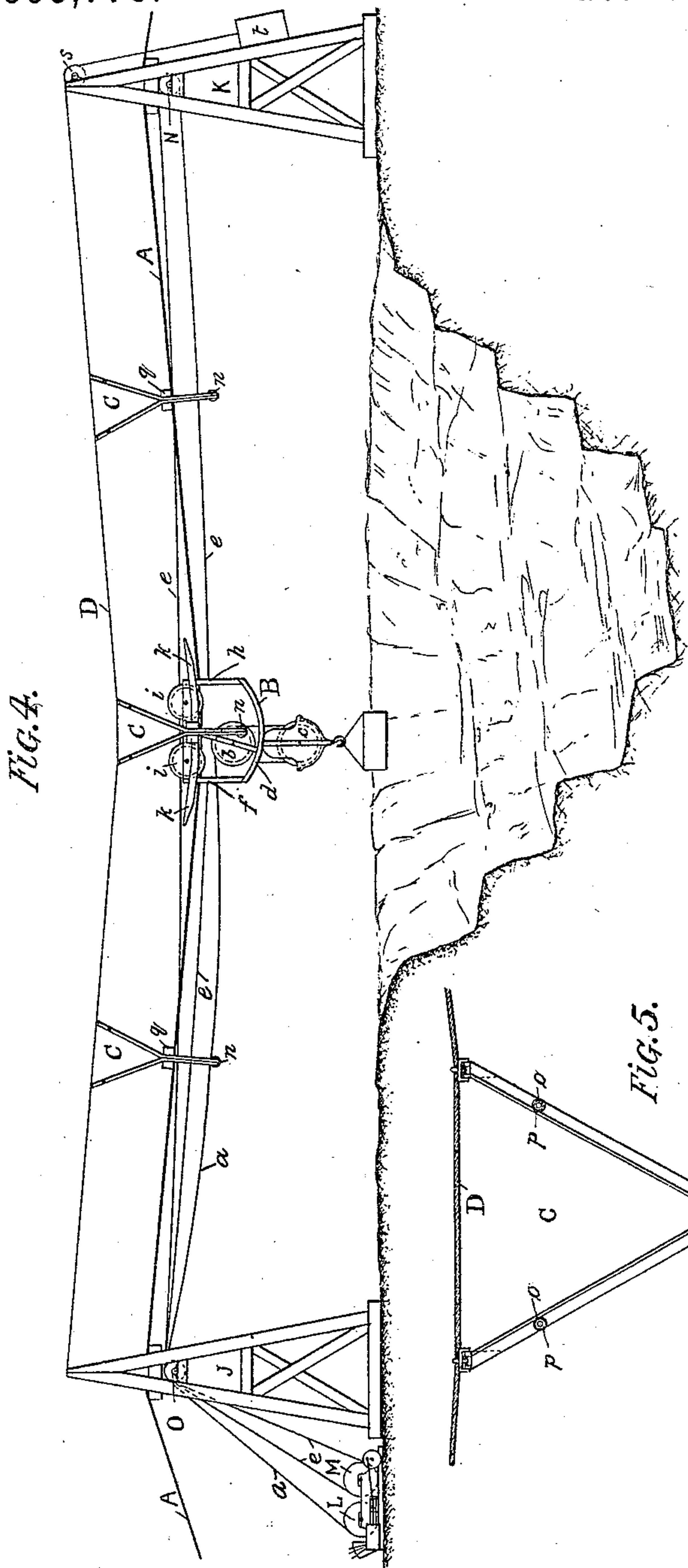
A. H. DE CAMP, Dec'd. 2 Sheets—Sheet 2.

E. A. & C. A. DE CAMP, Executors.

HOISTING AND CONVEYING MACHINE.

No. 553,778.

Patented Jan. 23, 1896.



WITNESSES:

John V. Snedeker
B. Thompson.

INVENTOR

Alfred H. DeCamp

BY

F. C. [Signature]

ATTORNEY

UNITED STATES PATENT OFFICE.

ALFRED H. DE CAMP, OF TRENTON JUNCTION, NEW JERSEY; ESTELLE AUSTIN DE CAMP AND CLARENCE A. DE CAMP, EXECUTORS OF SAID ALFRED H. DE CAMP, DECEASED, ASSIGNORS TO THE TRENTON IRON COMPANY, OF TRENTON, NEW JERSEY.

HOISTING AND CONVEYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,778, dated January 28, 1896.

Application filed November 13, 1894. Serial No. 528,682. (No model.)

To all whom it may concern:

Be it known that I, ALFRED H. DE CAMP, a citizen of the United States, residing at Trenton Junction, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Hoisting and Conveying Apparatus, of which the following is a specification.

My improvement relates to that class of tramways in which a carriage running upon an elevated tramway or cable is provided with a sheave over which passes what is known as the "hoisting" or "fall" rope, which is used for elevating the receptacle which carries the load to be transported and for maintaining it in an elevated position beneath the carriage during transit. In this class of apparatuses much difficulty has been experienced with the fall-rope when the apparatus is in operation, owing to the tendency of the rope to swing to the ground by force of gravity at a point or points between the carriage and the sheave which supports the fall-rope at or near the operating-drum upon which it is wound. Various means have been devised for sustaining that portion of the fall-rope liable to so sag or drop upon the ground, and the supports for the fall-rope thus provided have been so arranged as to be removed from the course of the traveling carriage at the time it is passing the points at which they are located.

The object of my invention is to provide a series of suitable supports for the fall-ropes of such apparatus which may be spaced or separated as desired without the use of supporting-standards other than those used for sustaining the tramway by fixing and sustaining such supports upon an independent cable fixed upon the standards which support the tramway at points above the tramway or tram-cable.

My invention also has for its object the provision of novel means for automatically removing these fall-rope supports, however they may be sustained, from the course of the traveling carriage when the apparatus is in operation and means for maintaining the tram-cable, the fall-rope and the cable sus-

taining the fall-rope supports in practically parallel lines.

In the drawings annexed to this specification and forming a part hereof, Figure 1 represents a portion of an apparatus embodying my improvements. Fig. 2 represents a plan view of the traveling carriage and its guide-frame. Fig. 3 represents an end elevation of one of my improved rope-supports, drawn on an enlarged scale. Fig. 4 represents a general view of an apparatus embodying my said invention as the same appears when in operation. Fig. 5 represents a side elevation of one of my fall-rope supports; and Fig. 6 represents a horizontal cross-section of one of said supports, taken on the line $x x$ in Fig. 5.

In the drawings, A is the tram-cable of the apparatus, upon which runs the carriage B.

C C C are fall-rope supports constructed according to my invention sustained upon a cable D made taut and suspended from the supports of the tramway at an altitude slightly greater than that of the cable A and in a vertical plane therewith.

J K are the end standards or supports upon which the apparatus is supported, the cable A being stretched over the same and anchored at its ends, said anchorages being not shown.

a is the fall-rope, which is wound upon a drum L and passes thence over a sheave O in the terminal standard J to and over the sheave b in the carriage B and around the sheave in the fall-block c , and is attached at its end to the frame of the carriage B at d in any substantial manner.

e is the hauling-rope, which is attached to the frame of the carriage B at f and passes thence over a sheave in the terminal standard J in line with the sheave O to the drum M, around which it is wound several times, and passes thence back and over a sheave similar to the sheave O and in line therewith in the terminal standard J and thence around the sheave N in the terminal standard K and thence back to the carriage B, to the frame of which it is attached at h .

The carriage B is constructed as shown in Figs. 1 and 2, its frame being made of iron or

steel, and takes in two grooved wheels *i i*, which run upon the tram-cable A, and is provided with a sheave *b* set in the frame of the carriage, as shown in Fig. 1. The carriage is further provided with a guide-frame *k* formed of two strips of steel or iron, which are joined together at their ends and flare outwardly from each other throughout their middle portions, as indicated in Fig. 2. The ends of the guide-frame *k* are also slightly elevated, as indicated in Fig. 1.

The fall-rope supports C are made preferably of iron or steel in two parts *l m*, which are preferably bifurcated in their upper portions, as shown in Fig. 1, in order to prevent longitudinal sway when the apparatus is in operation. These bifurcated upper portions of the frames *l m* are preferably hinged together at their upper ends, and are suspended from the cable D by iron loops attached to the upper portions of said hinges and which firmly embrace the cable D. The lower end of one member of each of the pairs of frames *l m* is provided with a spindle or pivot projecting inwardly toward the other member of the frame, on which spindle or pivot is placed a grooved sheave *n*. Just below the hinges at the upper ends of the bifurcated frames *l m* said frames are drilled or slotted to permit of the passing through them of a bolt or spindle *o*, which is upset or headed at one end. (See Fig. 3.) Two of these bolts are preferably provided for each pair of frames. (See Fig. 5.) These bolts are passed through the frames *l m* and are prevented from passing entirely through them by the upset ends thereof. On that part of each bolt or spindle *o* projecting beyond the frame *m* is passed a stiff spiral spring, which bears strongly against the side of the frame *m* and against an adjustable nut *p* screwed upon said spindle, which is threaded to receive the same.

At about the middle of the frames *l m* are attached, on the inner faces of the said frames, two metallic guides *q q*. These guides flare outwardly and away from each other at their outer ends, (see Fig. 6,) and their function is to contact with the horns or elevated ends of the guide-frame *k* on the carriage B, and in case of any slight deviation of the said horns in the course of their travel from the true line the guides *q* serve to enter the horns of the guide-frame *k* between the frames *l* and *m* and to take the wear due to the friction produced by the guide-frame *k* in its passage. Immediately below the guides *q q* on each pair of frames *l m* is placed, upon the inner face of each of said frames *l m*, a hollowed block *r*, the upper and lower projecting ends of which blocks contact with each other when the frames are closed and loosely inclose between them the tram-cable A.

Having thus described the construction of a hoisting and conveying apparatus embodying my improvement, I shall now proceed to describe its mode of operation.

In putting the apparatus in operation the

winding-drums are set in motion to move the carriage B out upon the tramway to deliver or receive a load, and to let out the fall-rope simultaneously. As the carriage moves on its way, its weight depresses the tram-cable upon which it runs, and the fall-rope supports C, as they embrace the tram-cable, are drawn down with it as the carriage approaches them and depresses them, also the supporting-cable D from which they are suspended. As will be readily understood, it is essential that these fall-rope supports C should always hold substantially the same positions relative to the tram-cable A. As the carriage approaches one of these fall-rope supports C, the forward elevated and pointed end of its guide-frame *k* enters between the guides *q q* on the frames *l m* of the support, and the lower faces of the guide-frame *k* bear down upon the upper faces of the blocks *r r* and depress the support C until the tram-cable A rises slightly within the opening formed between the hollowed blocks *r r*. The flaring portions of the guide-frame *k*, still riding upon the upper faces of the blocks *r r*, operate also to deflect the two frames *l m*, and spread them apart at their lower ends so as to permit the carriage B to pass between them without interruption. When the receding parts of the guide-frame *k* reach the guides *q q*, the force of the springs upon the spindles *o* operates to close the frames *l m* together, and to keep the blocks *r r* beneath the guide-frame *k* until the frame *k* has entirely passed the fall-rope support C. The carriage and its guide-frame *k* having passed through the fall-rope support and the members *l m* of the support having closed together at their lower ends a supporting-sheave *n* is provided for the fall-rope *a* upon which it travels as the carriage proceeds on its way, and said sheaves *n* operate to prevent all sagging of the fall-rope between the carriage and the power-station when the fall-rope itself is being operated to raise or lower a load.

So far I have described my peculiar form of fall-rope support in connection with a hoisting and conveying apparatus, in which the way upon which the carriage travels consists of a wire rope or tram-cable, and I have also described said supports as being sustained by an independent cable placed above the tram-cable of the apparatus. It will be obvious, however, that my said fall-rope supports may be used in a hoisting and conveying apparatus in which the carriage travels upon a rail or rigid way, in which case the said fall-rope supports may be sustained by a rigid frame or standard above the way of the apparatus, which way it would embrace between its frames, as in the apparatus shown and described it embraces the tram-cable. Its operation would be practically similar in both situations. My said supports may also be used in connection with an apparatus having a tram-cable supported by standards intermediate the end supports, and in that case

may be suspended directly from the intermediate standards supporting the way of the apparatus.

Having thus described my invention, what I claim is—

1. In a hoisting and conveying apparatus, a way, a fall-rope, a fall-rope support suspended from a point above said way said fall-rope support consisting of a frame composed of two members straddling said way and extended below the same on each side thereof and adapted to be deflected outwardly from each other, and means for sustaining said fall-rope support, in combination with a carriage mounted on said way and passing in its movements between and deflecting outwardly the members of the fall-rope support, and means for closing together said members of the fall-rope support and retaining them normally in a closed position; substantially as shown and described.

2. In a hoisting and conveying apparatus, a tram-cable and a carriage adapted to travel thereon, said carriage having a frame fixed longitudinally upon it, said frame having pointed ends and flaring sides, a fall-rope passing over a sheave on said carriage, and means for operating said carriage and means for operating said fall-rope, in combination with an independent supporting-cable hung above the said tram-cable, and one or more fall-rope supports suspended from said supporting-cable in the path of said carriage, said fall-rope supports consisting of duplicate frames adapted to contact with the sides of said frame of said carriage and to be separated thereby during the passage of the carriage between them, and means for closing said frames together when said carriage has passed them; substantially as shown and described.

3. In a hoisting and conveying apparatus, a tram-cable and a carriage adapted to travel thereon, said carriage having a frame fixed longitudinally thereon, said frame having pointed and elevated ends and flaring sides,

a fall-rope passing over a sheave on said carriage, and means for operating said carriage and fall-rope, in combination with an independent supporting-cable hung above said tram-cable, and one or more fall-rope supports suspended from said supporting-cable in the path of said carriage, said fall-rope supports consisting of duplicate frames hinged together at their upper ends, and each of said frames having upon its inner side a bearing for the frame of said carriage, said bearings being hollowed on their opposing faces so as to contact with each other only at their upper and lower ends, and said duplicate frames being also provided with outwardly-flaring guides adapted to contact with the sides of said frame of said carriage, and a spring-actuated connection between said duplicate frames of the fall-rope support adapted to close said frames together at their lower ends, and a sheave mounted upon one of said duplicate frames on its side facing the other of said frames and near its lower end, substantially as shown and described.

4. In a hoisting and conveying apparatus a fall-rope support adapted to be suspended from a point above the tram-cable of the apparatus and comprising two frames provided with inwardly-projecting parts inclosing between them said tram-cable and serving as bearings for the frame of the carriage of the apparatus when passing said frames, one of said frames having a sheave at its lower end for supporting the fall-rope, said frames being deflectible outwardly from each other by the carriage of the apparatus sufficiently to permit the passage between them of said carriage, and means for enforcing and maintaining a closure of the lower ends of said frames when said carriage is passed; substantially as shown and described.

ALFRED H. DE CAMP.

Witnesses:

B. THOMPSON,
SAML. D. OLIPHANT, Jr.