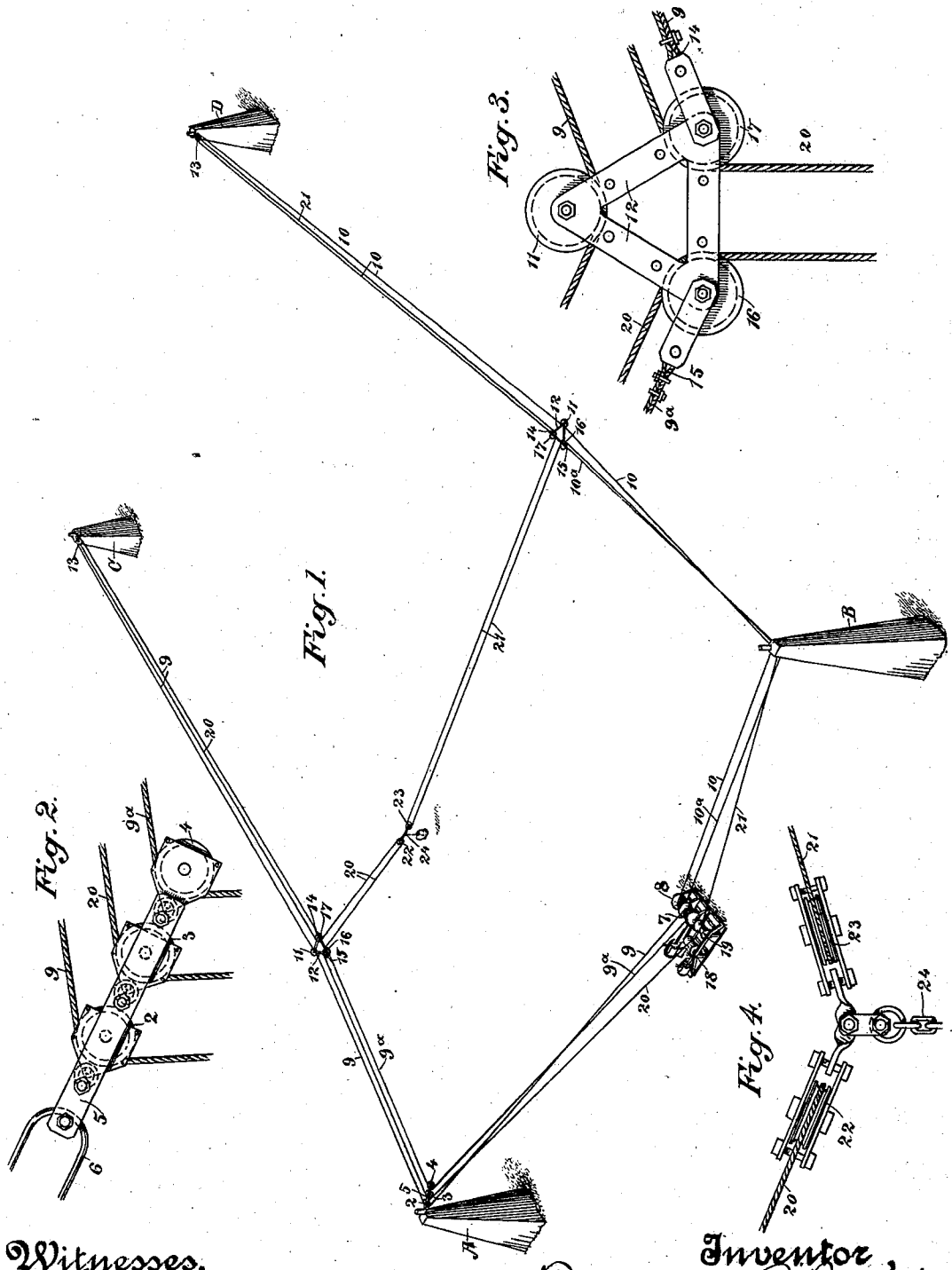
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CONVEYING APPARATUS.

(Application filed Sept. 4, 1901.)

(No Model.)



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CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 700,321, dated May 20, 1902.

Application filed September 4, 1901. Serial No. 74,290. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK R. FRENCH, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Conveying Apparatus; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus designed for transporting burdens in both horizontal and vertical directions.

It consists of parallel suspended cables inclosing an area and adapted to operate between four supports, a transverse burden-carrier movable between said supports, and means for also moving the burden-carrier transversely between the cables and at any point between the supports, whereby the burden can be transferred to any point within the area and raised or lowered without an independent main "fall-line."

My invention also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a general perspective view of the apparatus. Fig. 2 is a view of the sheaves which are attached to the top of the towers. Fig. 3 shows the arrangement of the trolleys carried upon the suspended cables, and Fig. 4 shows the arrangement of the sheaves and the burden-suspending device.

The object of my present invention is to transfer burdens from any given point within the area included between the four cable-supports to any other point within said area.

As illustrated in Fig. 1, A, B, C, and D are towers or supports. These supports may be of any suitable or desired form or construction, depending upon the contour of the ground or the position where the apparatus is to be operated. Spars or timbers with suitable guys or supports may serve, or built towers or where the contour of the ground is suitable the elevation of the ground may serve, for the support of the cable-carrying sheaves. The sheaves upon the towers A B are constructed as shown in Fig. 2, in which three different pulleys 2, 3, and 4 are turnable upon pins in a single frame or frames, as at 5, and these frames or blocks are suitably connected with the towers or supports by links, as at 6, or other suitable connections, which will allow the parts to yield to the changing positions or strains upon the cables which pass around them.

7 and 8 are two drums, connected so as to be revolved together by a suitable engine or motor. Around these drums pass cables 9 and 9^a and 10 10^a, the first two passing around the drum 7 and the second pair around the drum 8. The cables 9 and 9^a and 10 10^a may either be separate and have their ends secured to their respective drums or they may be continuous and wound around the drums, the object in either case being that one cable of each pair should pay out while the other is drawn in.

As shown in the drawings, the cables 9 and 10 pass, respectively, around the sheaves 2, thence beneath guiding-pulleys 11 upon trolley-carriers 12, thence around pulleys 13, attached to the supports C and D, thence returning to the point where they are attached to the trolley-carriers, as at 14, the other cables 9^a 10^a passing from the opposite sides of the drums 7 and 8 around the sheaves 4 of the tower-blocks 5, thence to the trolley-carriers 12, to which they are attached, as at 15, upon the sides opposite to the attachments 14 of the cables 10. By this arrangement it will be seen that whenever the drums are revolved in unison in either direction the trolley-carriers 12 will be simultaneously moved outward away from the towers A and B or toward the towers, according to the direction of revolution of the drums.

The trolley-carriers 12 may be of any suitable form or construction. I have here shown them as triangular frames, in one angle of which the pulleys or sheaves 11 are journaled, and in the other two angles are journaled the sheaves 16 and 17.

18 and 19 are two drums revoluble in unison and around which are wound the ropes 20 and 21 in such a manner that one of said ropes will pay out or be lengthened, while the other will be correspondingly drawn in or shortened. The rope 20 passes outwardly around the sheave 3 of the tower A, thence around the sheave 16 of the trolley-carrier, thence around a sheave 22, which is journaled in a frame or block connected with the burden-support, thence around the sheave 17 of

the trolley outwardly to the tower C, where it is fixed. The cable 21 in like manner passes around a sheave upon the tower B, thence around the pulley 16 of the trolley upon that side, thence around the pulley 23, which is connected with the burden-carrier, thence around the pulley 17 of the trolley and outwardly to the tower D, where it is fixed.

The burden is suspended from the frame or device between the sheaves 22 23 by a chain or other suspending device, as at 24.

The operation of the device will then be as follows: The two drums 7 and 8, revolving together, if they are turned so that their top sides move to the left the cables will be coiled and uncoiled upon the drums in unison, so that the trolleys will move in unison toward the engine. If the drums are reversed, the cables will cause the trolleys to move in the opposite direction or away from the engine. While this motion is taking place, the burden 25 will remain at the same relative position between the trolleys 12, having first been lifted from the surface by the operation of the drums 18 and 19 and the cables 20 and 21. Thus a burden having been lifted from a point near the tower A may be transported by the movements of the drums 7 and 8 and the cables 9 and 10 to a point near to the tower C, and then by the operation of the drums 18 and 19 and the cables 20 and 21 it may be transferred transversely to a point near the tower D, after which by stopping one of the drums 18 or 19 and allowing the cable to uncoil from the other the load may be lowered by the lengthening of the supporting-cable and deposited at any desired point. In this manner the load or burden may be picked up at any point within the area between the towers or supports A B C D and transferred to any other point within said area and there deposited.

If it is desired to make aerial dumps, as in discharging loads of earth or rock, it may be effected by any well known or suitable device employed for such purposes.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a conveying apparatus of parallel pairs of suspending-cables, supports over which said cables pass, winding-drums around which the cables are movable, trolleys suspended and movable upon the cables, other cables passing around sheaves in said trolleys and a burden-carrier suspended by said cables between the parallel cables, and means by which said burden-carrier may be moved transversely between the parallel cables.

2. The combination in a conveying apparatus of pairs of parallel cables, supports over which said cables pass, trolleys suspended and movable upon the cables, mechanism by which said cables are moved to cause the trolleys to travel outwardly or inwardly in unison, a burden-carrier, supplemental cables from which the carrier is suspended between the parallel cables, and means for actuating the supplemental cables to move the carrier transversely between the parallel cables.

3. The combination in a conveying apparatus of two sets of parallel inhaul and outhaul cables, trolleys with which said cables are connected from opposite sides whereby said trolleys are movable in unison, a burden-carrier and supplemental cables by which it is suspended between the parallel cables, guide-sheaves upon the trolleys and upon the fixed supports, and winding-drums by which the supplemental cables are actuated to move the burden transversely, or to raise or lower it.

4. The combination in a conveying apparatus of two pairs of parallel inhaul and outhaul cables, with direction-pulleys over which they pass, trolleys movable one upon each of said parallel cables, and with opposite sides of which the ends of the cables are connected whereby the trolleys are moved in unison, and a burden-carrier and supplemental cables by which it is suspended between the trolley-carriers, and means by which the cables are actuated to raise or lower the burden or to move it transversely between the parallel cables.

5. The combination with pairs of parallel cables and their actuating mechanism, and trolleys suspended and movable upon the cables, of supplemental cables connected to the trolleys, a burden-carrier connected to the latter cables, and means for actuating the supplemental cables to cause the burden-carrier to be moved transversely between the parallel cables.

6. The combination in a conveying apparatus of two sets of parallel inhaul and outhaul cables, trolleys with which said cables are connected from opposite sides, winding-drums by which the cables are driven and the trolleys moved in unison in either direction, supplemental winding-drums and supplemental cables connected and movable thereby, guide-sheaves upon the towers and the trolleys, and a burden-carrier connected to the supplemental cables and located between the main cables, and capable of being moved transversely thereby between the parallel cables.

7. The combination in a conveying apparatus of two sets of inhaul and outhaul cables and winding-drums operable in unison to move the cables, trolleys to which the cables are connected at opposite sides, and supplemental cables passing over sheaves in each of the trolleys, a bundle-carrier suspended from the supplemental cables, winding-drums, guiding-sheaves, and connections whereby the "fall" is operated without a standing cable.

8. The combination in a conveying apparatus of parallel traveling cables, trolleys connected and movable in unison therewith, a pair of cables passing over sheaves in the

trolleys, and thence extending inward toward each other, a burden-carrier suspended from the last-named cables and movable transversely to points between the parallel cables, and mechanism actuating the cables whereby the burden is raised, transferred and deposited.

In witness whereof I have hereunto set my hand.

FREDERICK R. FRENCH.

Witnesses:
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