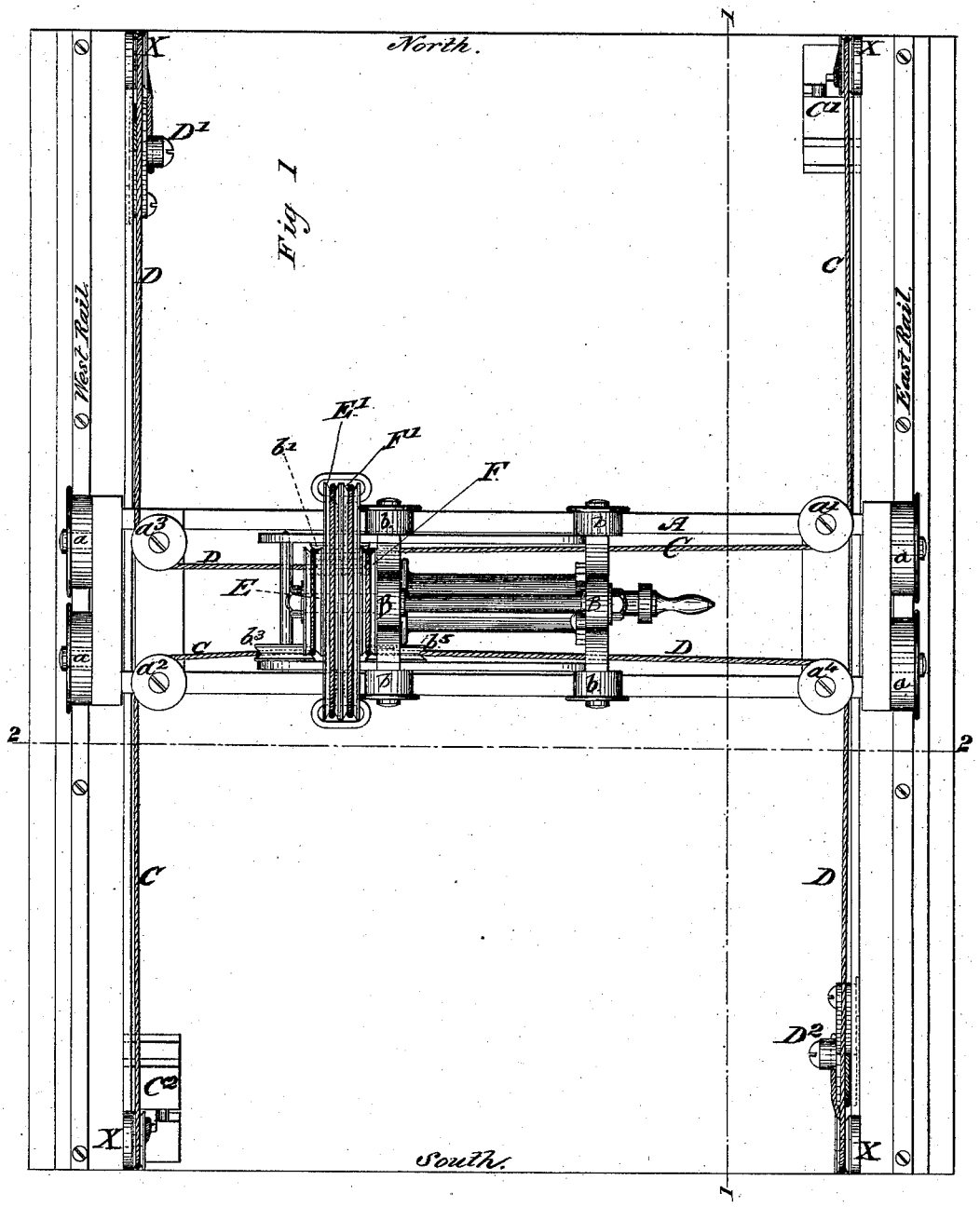
4 Sheets—Sheet 1.

T. A. WESTON.

Traveling Crane.

No. 198,718. **Patented Dec. 25, 1877.**



WITNESSES

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F. Stich

INVENTOR

Thomas. A. Weston

By his Attorneys.

Baldwin, Hopkins & Peyton.

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Fig 2.

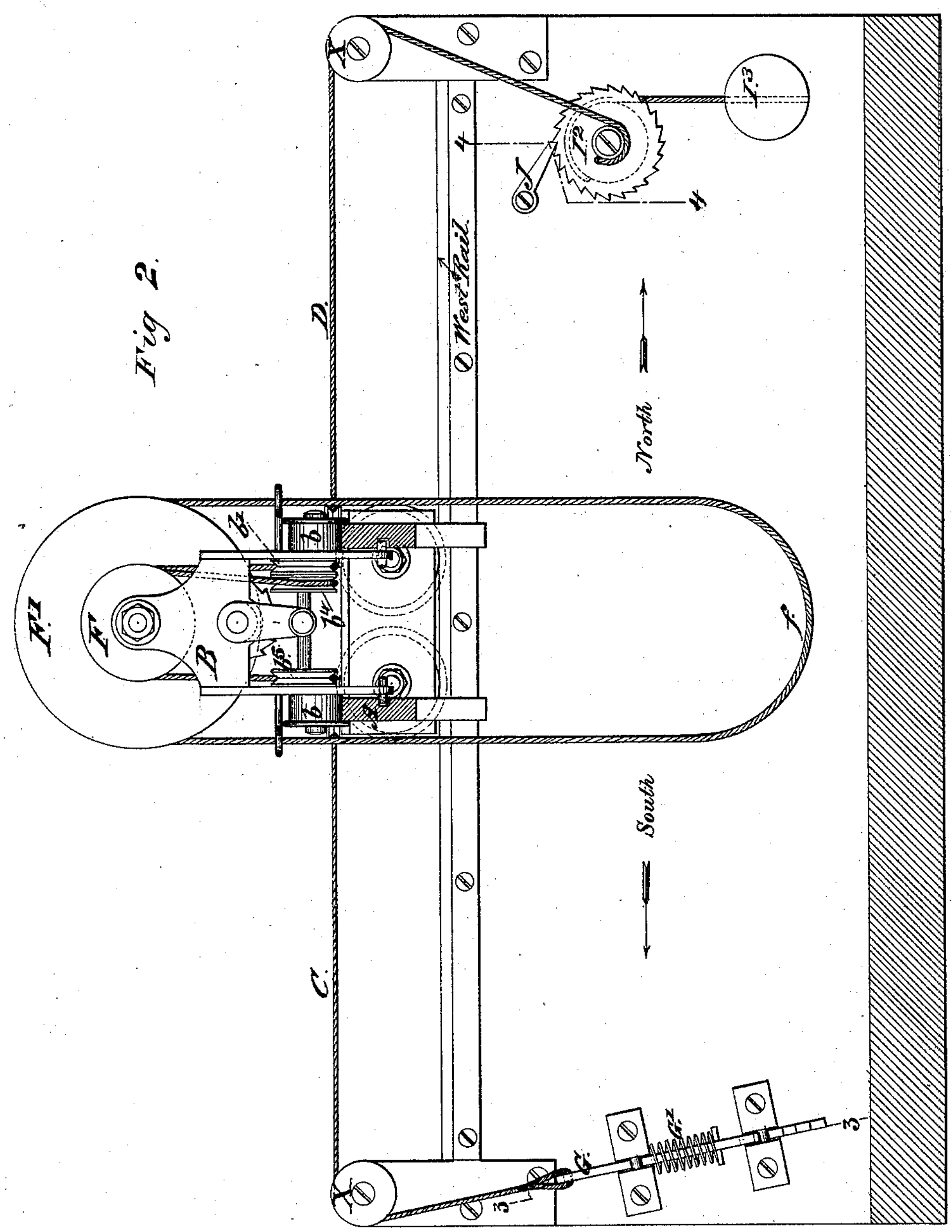

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Fig 3.

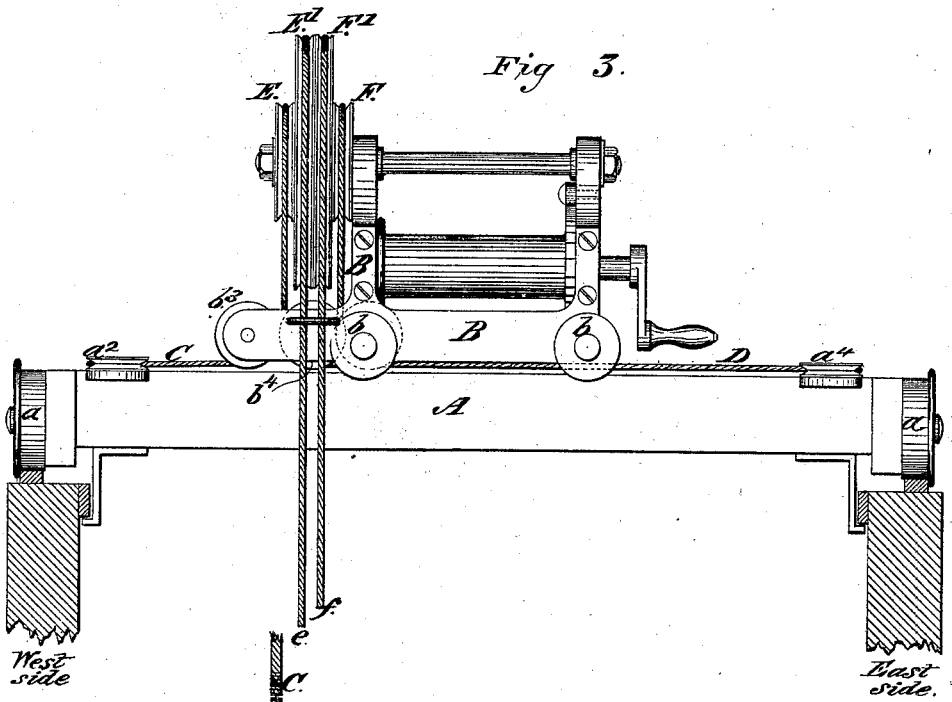


Fig 4

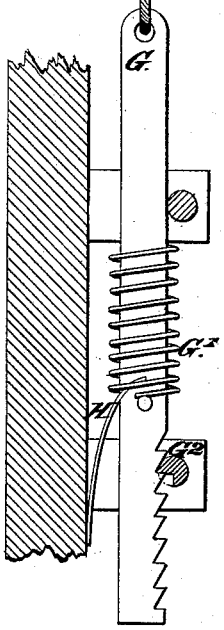
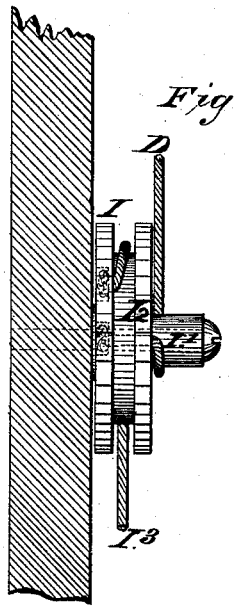


Fig 5.



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4 Sheets—Sheet 4.

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Fig 7

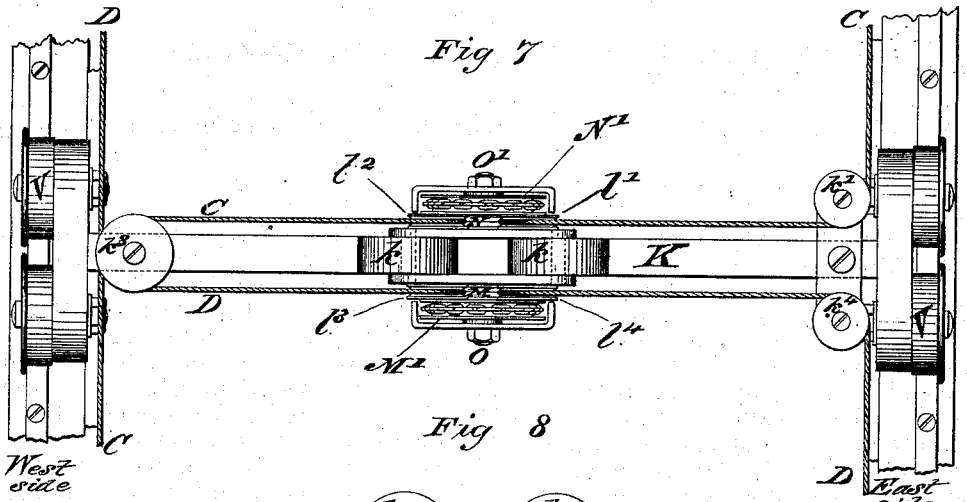


Fig 8

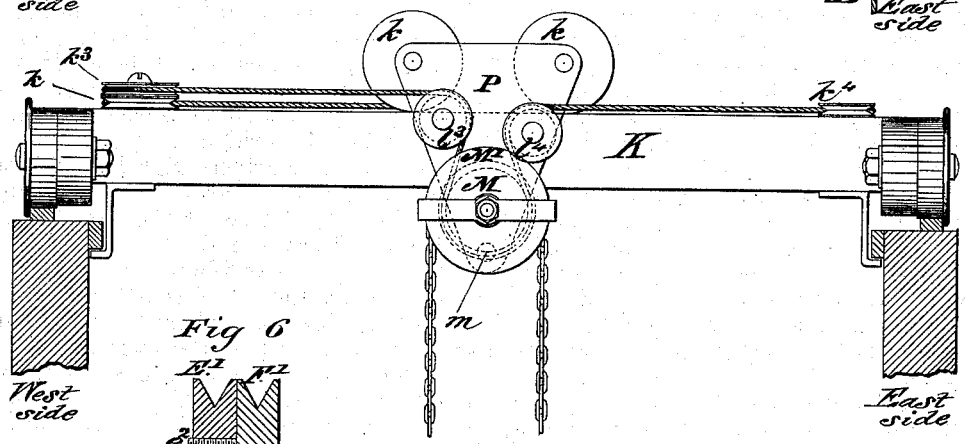
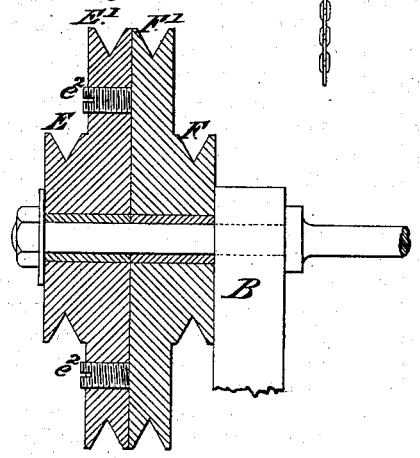


Fig 6



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INVENTOR

Thomas A. Weston.

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UNITED STATES PATENT OFFICE.

THOMAS A. WESTON, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE LOCK MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN TRAVELING CRANES.

Specification forming part of Letters Patent No. **198,718**, dated December 25, 1877; application filed November 12, 1877.

To all whom it may concern:

Be it known that I, THOMAS A. WESTON, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain Improvements in Traveling Cranes, of which the following is a specification:

My invention relates to a new mode of employing wire cables, chains, or flexible bands in place of rotary shafts and spur-gearing, for the purpose of imparting the horizontal traveling or traversing motions to the moving truck or carriage of a traveling crane, and to the moving bridge or frame upon which the said carriage travels, or to any carriage or truck requiring such motions, whereby greater economy of construction and greater dispatch and convenience in working are obtained.

Figure 1 is a plan of my invention applied to an ordinary traveling crane. Fig. 2 is an elevation, partly sectional, in the line 1 1 in Fig. 1. Fig. 3 is a transverse elevation, showing the railway in section on the line 2 2 in Fig. 1. Figs. 4, 5, and 6 are details; and Figs. 7 and 8 show a modification of my invention.

B is a movable carriage or truck, supporting the crab or hoisting apparatus of the crane, or any load or object for which the horizontal traveling motions are required, and it has traveling wheels *b*, to facilitate its movements to and fro upon the bridge A, which latter is framed in the usual manner, and is provided with traveling wheels *a a a a*, adapted to the rails of the fixed railway. The two sides of the fixed railway I will, for easy reference, call the east and west sides or rails, and their termini the north and south ends of the crane.

The prominent feature of my invention is the system of two fixed cables, C D, and their respective driving-pulleys E F, whereby the crab or carriage B is hauled along the fixed cables from east to west upon the bridge A, or is, together with the bridge A, hauled north or south along the fixed railway.

The cables, near their extremities, pass around guide-sheaves X, which are a mere convenience, and need not be again referred to. The cable ends are strained by the strainers C^1 C^2 D^1 D^2, both forms being shown separately in Figs. 4 and 5. The cables intersect each other upon the crab, and their respective courses are as follows, viz: The cable C, from the strainer C^1 at its north end, proceeds south to the guide-sheave a^1 on the bridge A; thence west to the sheave b^1 on the crab, (shown edgewise, and the cable in section, in Fig. 2;) thence upward over the driver E, and under the sheave b^3; thence west around the sheave a^2 on the bridge, and south to the strainer C^2. The cable D, from the strainer D^1 at its north end, proceeds south to the guide-sheave a^3 on the bridge A; thence east to the sheave b^4 on the crab; thence upward over the driver F and under the sheave b^5; thence east around the sheave a^4 on the bridge, and south to the strainer D^2. The drivers E F have attached to each a sprocket-wheel, E′ F′, whereby to rotate them by means of the usual endless hand ropes or chains *e f*.

The operation is as follows: By pulling the pendent hand-ropes *e f* simultaneously on their north side, the cables C D are pulled simultaneously around the sheaves a^2 a^4 toward the crab, and the bridge A is thereby hauled bodily along the railway to the south. By pulling the ropes *e f* simultaneously on their south sides, the cables are pulled around the sheaves a^1 a^3 toward the crab, and the bridge is moved north. By pulling the north side of the rope *e* and the south side of the rope *f*, the cables C D are pulled around the sheaves a^2 a^3 toward the crab, which yields to the pull, and moves west toward the said sheaves a^2 a^3. The bridge is then at rest, as the strain upon the cable D around the sheave a^3 equals and neutralizes the pull of the cable C around the sheave a^2. By pulling the rope *e* on its south side and *f* on its north side, the crab is moved east with the bridge at rest. Thus the direction of motion on the crab may be instantly changed, at pleasure, without the shifting of clutches, shafts, gear-wheels, and other attachments forming the ordinary traveling gear of traveling cranes. By pulling singly on one side only of one of the hand-ropes *e f*, the motion of the crab tends to a diagonal direction, the four sides of the two hand-ropes yielding four separate and different diagonal movements. Thus, supposing the

rope *e* of the sprocket-wheel E′ to be pulled on its north side, the cable C is pulled around the sheave a^2 toward the crab, tending to pull the sheave a^2, with its end of the bridge, to the south, and the crab west. This motion of the crab west rotates the driver F and its guide-sheave b^5, by trailing them along the cable D. This trailing action exerts a proportionate pull upon the cable D around the sheave a^4, urging it, with its end of the bridge, south. The sheave a^2 being also pulled south, the bridge moves, both ends at once, in that direction. This motion of the bridge to the south while the crab moves east gives to the latter a resultant diagonal movement. The trailing action of the driver F and connections, and the consequent amount of drag or strain upon the cable D, is naturally due to the friction of the parts so trailed or moved. To vary this frictional resistance, and thus modify the diagonal motion of the crab, any convenient brake or frictional check, such as the set-screws e^2 e^2, may be used to vary and adjust the frictional resistance of the sprockets E′ F′ to the independent motion which occurs when one is rotated one way by hand, and the other contrarily by being trailed along its fixed cable.

The strainers C^1 C^2, (shown enlarged, Fig. 4,) consist of a rack-bar, G, pulled inward by a spring, G^1, and retained by a catch, G^2. H is a spring to insure engagement between the rack-teeth and catch G^2. The strainers D^1 D^2 (shown enlarged, Fig. 5) consist of a ratchet-wheel, I, with toothed flange I^2 and a pawl, J, Fig. 2, to prevent recoil, a boss, I^1, around which the cable is strained, and a weighted cord, I^3, to pull the ratchet-wheel one way continually, and thus strain the cable.

Figs. 7 and 8 show a modification of my invention, in which the bridge consists of a single beam, K, with traveling wheels V; and the truck or carriage P has the ordinary triangular frame, with traveling wheels *k k* and cross-bar or pin *m*, for suspending a pulley-block or other load. In this modification the cables intersect each other at the sheaves k^3 k^2 at the west end of the bridge, and the drivers N M, with their attached sprocket-wheels N′ M′, are placed one on each side of the truck, upon studs O′ O, and at right angles to the position of the drivers in Figs. 1 to 3. The same fixed cables C D answer for any number of bridges or cranes which may be placed upon the same railway, and two or more of the bridges may be run up close together, to unite in sustaining a load for which neither one by itself is adequate. In the modification, Figs. 7 and 8, the cable C from the north passes around the sheave k^1 on the bridge; thence west over the sheave l^1 on the truck P, and beneath the driver N; thence upward over the sheave l^2, west to the sheave k^2, and thence south along the west rail to the other bridge or south terminus.

The cable D from the north passes around the sheave k^3 on the bridge, and east to the sheave l^3 on the truck; thence beneath the driver M, and upward over the sheave l^4, to the sheave k^4, around which it passes south along the east rail to the other bridge or terminus.

The sprockets N′ M′ have the usual endless hand ropes or chains thereon, and by pulling them so as to rotate the drivers simultaneously in the same direction, the truck or carriage P is traversed east or west along the bridge and fixed cables. By rotating the drivers in contrary directions simultaneously, the bridge or beam is traveled north or south along the fixed railway. By pulling one only of the endless hand cords or chains, one of the four diagonal motions is obtained, as explained in reference to Figs. 1 to 3; but the precise angle or direction of this diagonal movement will vary with the varying conditions of the crane as to its load and the frictional resistance of the moving parts. The drivers may be rotated by steam or other power, where available. When the cross motion of the crab or truck upon the bridge east and west is not required, or is otherwise obtained—as, for instance, by a separate stretched cable terminating at the ends of the bridge, and a separate driver therewith—in such case the drivers acting on the cables C D may be placed on studs or pivots carried by the bridge, at any convenient point thereon, and be used exclusively for moving the bridge upon the fixed railway.

What I claim as new, and desire to secure by Letters Patent, is—

1. The fixed cables C D and their driving-sheaves, in combination with a moving bridge or frame and its railway, substantially as set forth.

2. The combination of the fixed cables C D, the driving-sheaves, the moving truck or carriage, and the moving bridge or frame and its railway, substantially as set forth.

3. The fixed cables C D, in combination with an automatic straining device, consisting of a spring and a retaining device, preventing recoil or release of the cables, substantially as set forth.

4. The fixed cables C D, in combination with an automatic straining device, consisting of a weight and a retaining device, preventing the yielding of the cable to the strain thereon, substantially as set forth.

5. The combination of the cables C D, their driving-sheaves, and a device for adjusting the frictional resistance of the said drivers to independent motion, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

THOMAS A. WESTON.

Witnesses:
M. S. HOPKINS,
BALTIS DE LONG.