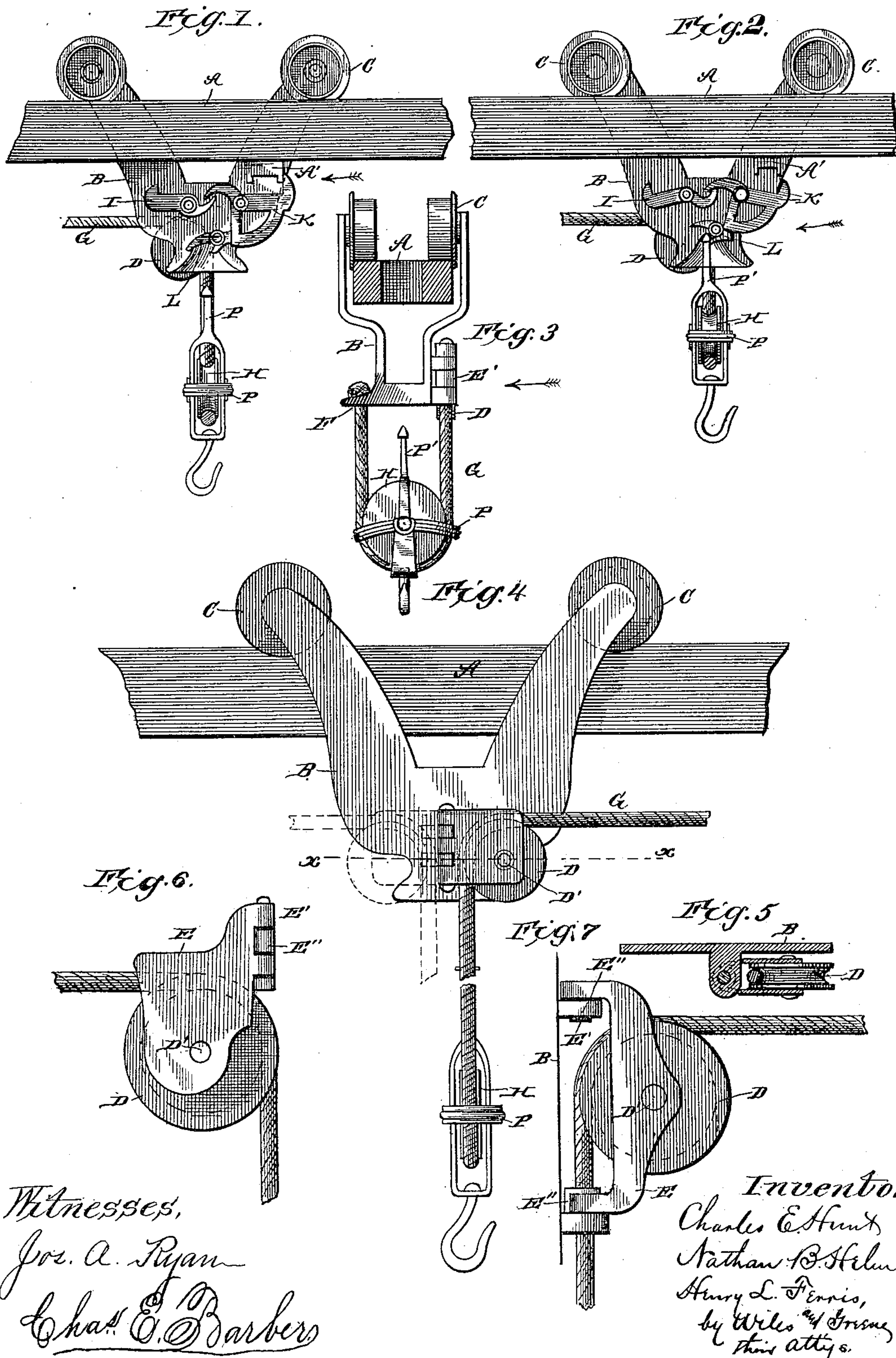


(No Model.)

C. E. HUNT, N. B. HELM & H. L. FERRIS.
HAY ELEVATOR.

No. 351,442.

Patented Oct. 26, 1886.



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UNITED STATES PATENT OFFICE.

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ILLINOIS.

HAY-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 351,442, dated October 26, 1886.

Application filed March 15, 1886. Serial No. 195,279. (No model.)

To all whom it may concern:

Be it known that we, CHARLES E. HUNT, NATHAN B. HELM, and HENRY L. FERRIS, residents of Harvard, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Hay-Elevators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

Our invention relates to improvements in hay-elevators, and especially in elevators of the reversible class, its object being to secure perfect reversibility without the use of the swiveled base, which constitutes a feature of nearly all reversible elevators.

The invention itself and the various means for which it is carried into effect are fully described and explained in the following specification, and shown in the accompanying drawings, in which—

Figure 1 is an internal elevation of one-half of our elevator, showing locking mechanism in engagement with a track-stop, A'; Fig. 2, a similar view showing locking mechanism released from track-stop and in engagement with fork-pulley frame; Fig. 3, an end elevation of the elevator without locking mechanism, the view being in the direction indicated by the arrows in Figs. 1, 2; Fig. 4, a side elevation of the elevator, looking in the direction indicated by arrow in Fig. 3; Fig. 5, a horizontal section through the line *x x*, Fig. 4; Figs. 6 and 7, elevations showing modified forms of the device for hinging the caster-pulley D to the elevator-frame.

In these views, A is the ordinary elevator-track. A' is a stop fastened to the lower face of the track, for the purpose of holding the elevator stationary when desired. B is one-half of a two-part elevator-frame, and C C are rollers pivoted to the frame and resting on the track. A fork-pulley, H, is suspended under the center of the frame by means of a rope, G, fastened to the elevator in the manner hereinafter set forth, and on the pulley H is hung a frame or housing, P, provided with an upward-projecting headed pin, P'.

A series of coacting parts, I K L, Figs. 1, 2, are pivoted to the elevator-frame, and form a locking mechanism adapted to engage the track-stop A' or the head of the pin P', thus securing the elevator in position on the track, or fastening the frame P to the elevator.

The track, the stop, the elevator-frame, the locking mechanism I K L, and the headed pin P' are substantially the same and have the same operation as the corresponding parts in the elevator shown and described in our Patent No. 316,463; hence no further explanation of them is thought necessary here.

In nearly all the hay-elevators patented or in use the fork-pulley (corresponding to the pulley H in these drawings) hangs in a loop in the main rope, the loop being formed by fastening the end of the rope to the elevator-frame, carrying the rope thence downward and under the fork-pulley, and thence upward and over a pulley attached to the frame, (from which latter pulley the rope passes to and over a pulley at or near the end of the elevator-track.) In every construction of the class prior to the one shown herein the end of the rope has been fastened at or near one end of the carrier, and the pulley, forming the support of the rope, has been fastened at or near the opposite end of the carrier, so that the loop supporting the fork-pulley has hung lengthwise of the carrier—that is, in a plane parallel to the plane of the track.

In elevators constructed in the manner referred to the direction of the rope has been reversed in different ways, but most commonly by providing the elevator with a swiveled base, to which are fastened the end of the rope and the rope-supporting pulley, the effect of the rotation of the swiveled base being to reverse the entire pulley-supporting loop.

In the elevator shown herein we have secured reversibility in a different but equally effective way, and one which is cheaper and simpler of construction than that mentioned above. The end of the main rope G is fastened to the elevator-frame B at the side, instead of at the end thereof, is carried thence downward and under the fork-pulley H, and thence upward and over a caster-pulley, D,

mounted in a frame, E, which is connected with the elevator-frame by a hinge-joint, E', at a point directly opposite the point of attachment of the end of the rope. From the
 5 caster-pulley D the rope passes in a line parallel to the track to a suitable pulley at the end of the track; but the pulley-supporting loop and the fork-pulley itself hang in a plane at right angles to the plane of the track. The
 10 fork-pulley H has a diameter preferably just equal to the distance between the point of attachment of the end of the rope G and the grooved edge of the pulley D, so that the two sides of the pulley-supporting loop are vertical, and the rope thus passes from the transverse plane of the loop to the plane of the
 15 track without the intervention of any pulley, except the caster-pulley D. It is evident that with this construction the direction of the rope may be reversed by swinging the caster-pulley about its hinge E' from the position shown in full lines to that shown in dotted lines in Fig. 4, and that the change of position of the pulley will change the position of the horizontal portion of the rope G, but not that of the
 20 loop or the pulley H, the loop and pulley remaining constantly in a plane at right angles to the plane of the beam or track.

As shown in Fig. 4, the part of the rope that
 30 hangs from the pulley is slightly off the center, so that the swinging of the pulley-frame E would change slightly the position of the pulley H and the pin P'. This variation is not sufficient to interfere with the working of
 35 the locking mechanism; but slight as it is it may be easily prevented. The frame and its hinge may be constructed as shown in Fig. 6, the hinge being above the pulley and the groove in the pulley being directly on the center; or the frame E may work on two pivotal
 40 points, E'', on the elevator-frame, the lower of said pivots being hollow, so that the rope can pass through it, and the grooved edge of the pulley being in the axis of the hinge and between the two points of connection of the frame
 45 E with the elevator-frame.

The details of construction of the pulley-frame E and the manner in which it is hinged to the elevator-frame are not essential, since
 50 any mechanic can vary these in many ways without altering the principle of operation of our elevator as a whole. We do not, therefore, confine our invention to the use of any of the forms of the caster-pulley shown in the
 55 drawings; neither do we limit our invention (so far as it consists in hanging the pulley-supporting loop at right angles or approximately at right angles to the track) to the use of that feature, in combination with
 60 a caster-pulley, since it is evident that the caster-pulley might be made stationary, and the device would still be operative, though not reversible; neither do we limit the combination of the transversely-hung loop and
 65 the supporting-pulley normally parallel to the

track to their use in combination with a fork-pulley of such diameter as to make the sides of the loop vertical, since the size of the fork-pulley may be varied within certain limits without materially impairing the operation
 70 of the machine.

Having now described and explained our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with an elevator-frame
 75 adapted to move along a suitable track and mechanism attached to the frame and adapted to lock it to the track, of a pulley attached to the side of the elevator-frame and normally parallel to the line of motion of the ele-
 80 vator, a rope passing over said pulley and having its end fastened to the elevator-frame at a point opposite the pulley, a fork-pulley hung on said rope between the end of the rope and the rope-supporting pulley, and
 85 a housing supported by the fork-pulley and provided with means for operating said locking mechanism, said fork-pulley and the part of the rope which supports it being approximately at right angles to the line of motion of
 90 the elevator on said track.

2. The combination, with an elevator-frame adapted to move along a suitable track, of a reversible pulley-frame hinged to the side of the elevator-frame, a pulley mounted in said
 95 frame, and an operating-rope passing over said pulley and having its end fastened to said elevator-frame at a point opposite the hinge which connects the pulley-frame and the elevator-frame, the part of the rope be-
 100 tween its end and the supporting-pulley being approximately at right angles to the line of motion of the elevator.

3. The combination, with an elevator-frame adapted to move along a suitable track, of a
 105 pulley-frame hinged to the side of the elevator-frame, a pulley mounted in said frame, an operating-rope passing over said pulley and having its end fastened to the elevator-frame at a point opposite said hinge, and a
 110 fork-pulley hung on the rope between its end and said rope-supporting pulley, said pulley and the loop of rope supporting it being transverse to the line of motion of the carrier, and the diameter of the fork-pulley being such
 115 that the sides of the loop are approximately parallel.

4. The combination, with the elevator-frame B, of the pulley-frame E, hinged to one side of the frame, the pulley D, mounted therein,
 120 the rope G, passing over said pulley and having its end fastened to the elevator-frame at a point opposite the hinge, the fork-pulley H, hung on the rope, the housing P, hung on the pulley and having a headed pin, P', and
 125 suitable locking mechanism fastened to the elevator-frame and adapted to co-operate with said pin, substantially as and for the purpose set forth.

5. The combination, with the elevator-frame 130

B, of the pulley-frame E, and the pulley D, mounted in the pulley-frame, the frames B E being connected by two knuckle-joints, one above and one below the pulley, and the
5 lower of said knuckle-joints being hollow for the passage of a rope resting on the pulley D, substantially as and for the purpose set forth.

In testimony whereof we have signed this

specification in the presence of two subscribing witnesses.

CHARLES E. HUNT.
NATHAN B. HELM.
HENRY L. FERRIS.

Witnesses:

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P. E. SAUNDERS.