(No Model.)

W. H. KNAPP.

ELEVATOR.

No. 414,712. Patented Nov. 12, 1889.

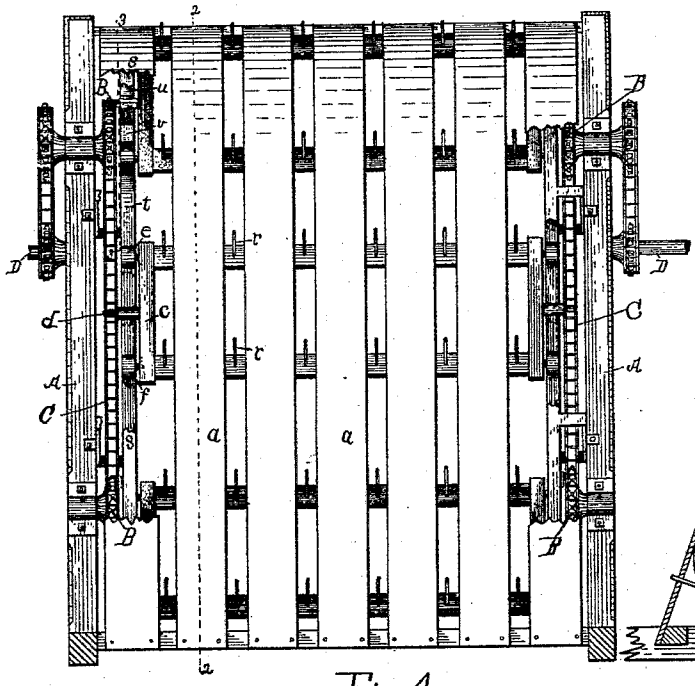


Fig. 1

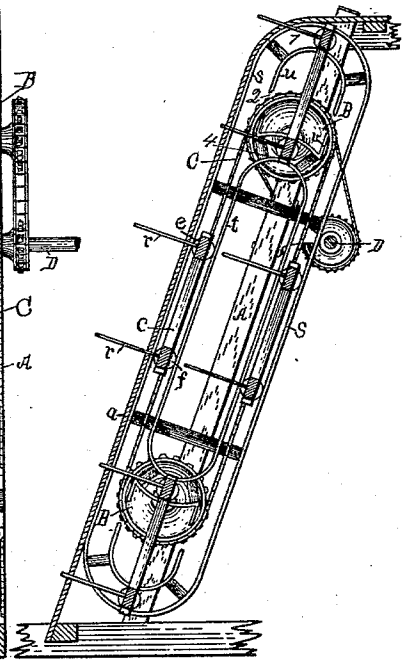


Fig. 2

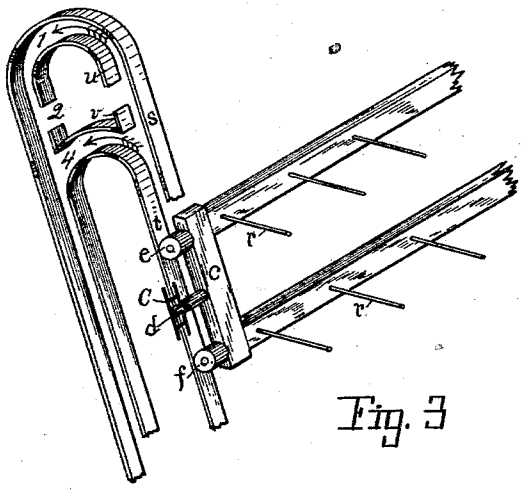


Fig. 3

Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM H. KNAPP, OF GALESBURG, MICHIGAN.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 414,712, dated November 12, 1889.

Application filed May 4, 1889. Serial No. 309,613. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KNAPP, a citizen of the United States, residing at Galesburg, county of Kalamazoo, State of Michigan, have invented a new and useful Elevator, of which the following is a specification.

This invention relates to a construction disclosed in another application filed by me March 26, 1889, Serial No. 304,813, in which the frames which bear the elevator-fingers are pivoted at diagonally-opposite corners to the sprocket-belts, and in which apparatus guide tracks or ways are not absolutely necessary.

The object of the present invention is to pivot the frames at or near the center of the ends to the sprocket-belts and to provide suitable guides to keep the frames in position, as more fully set forth below.

In the drawings forming a part of this specification, Figure 1 is an elevation as when looking from a point at left of Fig. 2; Fig. 2, a section on line 2 2 in Fig. 1, looking from a point at the right; and Fig. 3 shows broken lettered details in enlarged perspective, looking at parts at the right of line 3 3 in Fig. 1 from a point at the left of said line.

Referring to the lettered parts of the drawings, A is the elevator-frame, in which the sprocket-wheels B B have bearings. These wheels (two on a side) bear the sprocket-belts C. As here shown, the wheels B and belts C are driven by power-shaft D; but this is a matter of choice. The frames *c* may have one bar bearing fingers *r r*, or more than one bar. Two are here shown. The ends of the frames have two friction-rollers *e f*, which traverse the guideways. (More fully explained below.) At or near the center of the ends of the frames *c* they are pivoted at *d* to the chains or belts C.

In the operation the frames *c* are carried up, as in Fig. 2, with the fingers *r* projecting through the spaces between the slats *a a*. The frames *c* being always carried at the same angle up the front, down the back, and past the ends, the fingers *r* are always at the same angle, and are hence drawn directly back from beneath the grain (or other burdens, as this same device may be used to elevate whatever is desired) at the top of the elevator. From the fact that the ends of the frames *c* are oppositely and centrally pivoted, or nearly so, to the chains, guides are employed of any suitable nature to prevent the frames tilting on their pivots. The idea is illustrated by the outer guide *s* and the smaller inner guide *t v u*, having a space or way between them entirely around one or both sides of the elevator for the friction-rollers to traverse. While in some instances the rollers *e f* might be dispensed with, it is preferable to employ them. The guideways are the same at the upper and lower end and at one or both sides of the elevator, as Fig. 2, and especially Fig. 3, clearly shows. The arrows in Fig. 3 show the direction the belts and frames are moving. When the frame *c* moves past the upper end, roller *e* will pass through space 1, roller *f* through space 4, and the pivot *d* through gap 2 between the parts *v u* of the inner guide, and of course when the frame *c* moves past the lower end the roller *f* will pass through the lower space corresponding to the upper space 1, and the roller *e* will pass through the space corresponding to a space 4, while the pivot *d* will pass through a gap 2, the same as above. As indicated, the elevator need not necessarily have a guideway only on one side, and when only on one side of course the frame *c* would need the rollers *e f* only at the corners of the end at the side of the elevator which had the guideway.

Lateral projections may be employed in lieu of the rollers, and the axle of the rollers *e f* will serve to illustrate such projections; but rollers are preferred.

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

The combination of the traveling belts at the sides of the elevator, the frame bearing the fingers or arms and having corner rollers or projections, the ends of said frame being oppositely pivoted at or near the center to

said belts, and suitable guides having gaps at the upper and lower ends thereof for the pivotal projections and the corner rollers or projections of the fingered frame to pass through while preserving a like angle throughout the transit of said frame, substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in presence of two witnesses.

WILLIAM H. KNAPP.

Witnesses:
EUGENE SCOTT,
GEO. E. FOOTE.