(No Model.)

W. H. KNAPP.

GRAIN CARRIER.

No. 483,617. Patented Oct. 4, 1892.

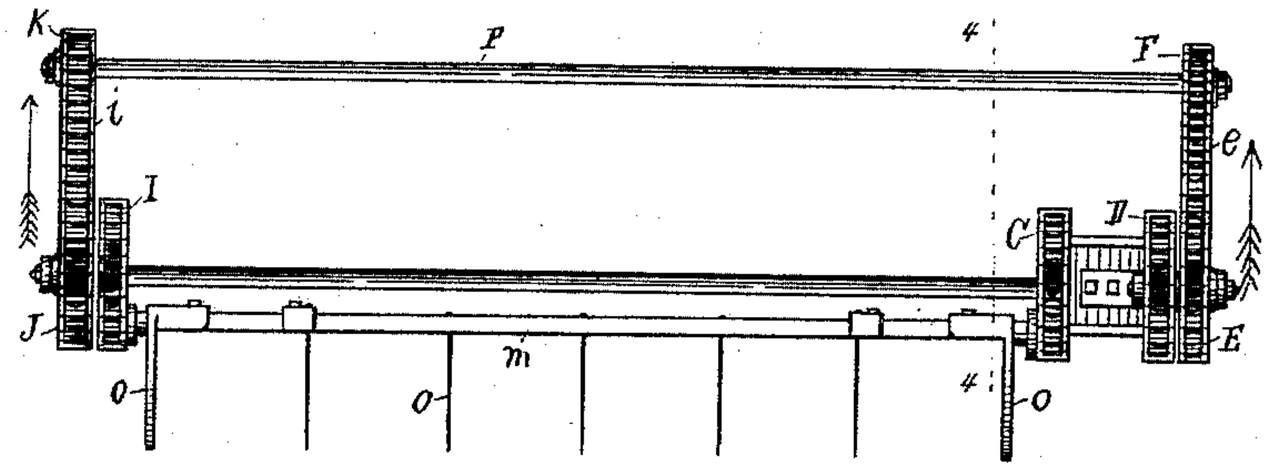

Fig. 3.

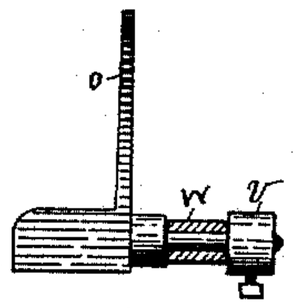

Fig. 4

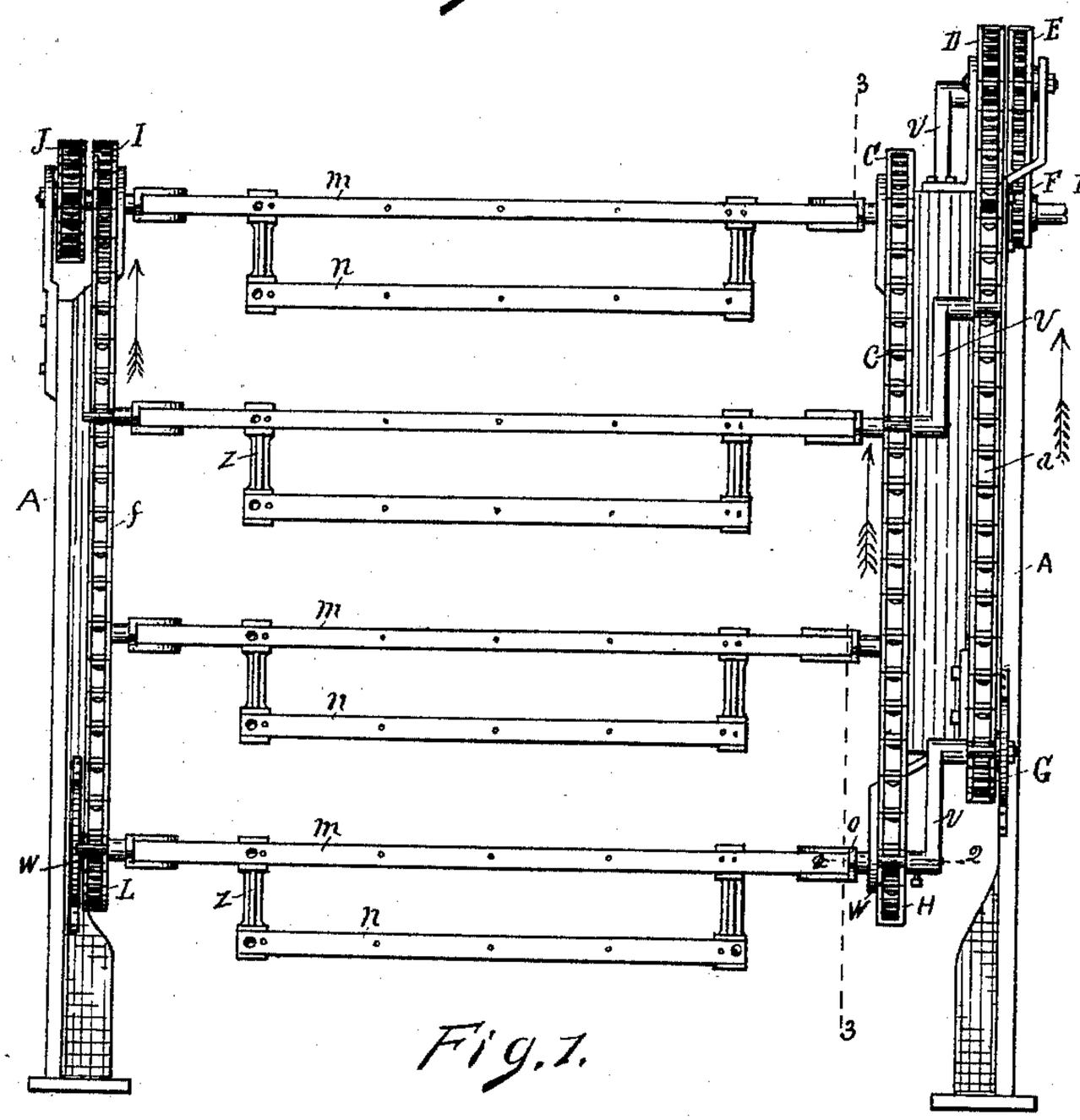

Fig. 1.

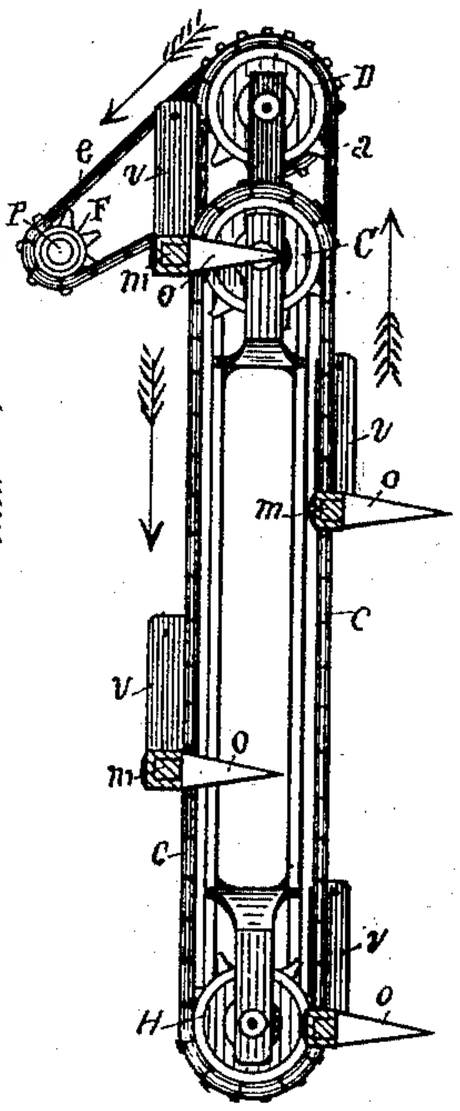

Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM H. KNAPP, OF KALAMAZOO, MICHIGAN.

GRAIN-CARRIER.

SPECIFICATION forming part of Letters Patent No. 483,617, dated October 4, 1892.

Application filed March 30, 1892. Serial No. 427,038. (No model.)

To all whom it may concern:

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

This invention relates to that class of grain-carriers in which bars bearing teeth are carried by endless belts or sprocket-chains around end pulleys in a manner that the teeth are always held at the same angle when traveling in both directions and when passing around the pulleys, so as to be thrust directly into and out of the grain. Such apparatuses are sometimes termed "elevators" and "packers," as the same principle holds good for the three uses, and also in machines for carrying or elevating other commodities and articles aside from grain.

The main object of this invention consists in certain improvements to make more practical the use of long tooth-bars extending across the carrier-frame, the power in a construction embodying my improvements being applied at both ends of said tooth-bars.

In the drawings forming a part of this specification, Figure 1 is an elevation, parts being broken away; Fig. 2, a sectional elevation on line 3 3 in Fig. 1, looking from a point at the left; Fig. 3, a top view of Figs. 1 and 2; and Fig. 4 shows enlarged lettered details from Fig. 1, a portion being in section on line 2 2 in the latter-named figure.

Referring to the lettered parts of the drawings, A represents a frame in which the several sprocket-wheels below described are revolubly mounted. On one side of the frame are two sets of sprocket-wheels D C and G H, the sprocket-wheels D C being at one end of the frame and G H at the other. These sets of sprocket-wheels are on separated parallel planes, and one set jogs by the other, as in Fig. 1. The sprocket-wheels D G carry the sprocket-belt *a* and the sprocket-wheels C H carry the sprocket-belt *c*. The sprocket-wheels I L on the opposite side of the frame A carry a sprocket-belt *f*. The sprocket-wheels I L are the same distance apart as the sprocket-wheels C H.

Transversely between the sprocket-belts *f c* is a series of tooth-bars *m*, having teeth *o*, said bars being pivotally attached to eye-links *w* of the belts *f c*. Fig. 4 will serve to illustrate the manner of pivoting, since the eye of the link is shown in section at *w* in said figure.

Between the sprocket-belts *c a* are arms *v*, elbowed at each end in opposite directions, Figs. 2 and 3. The same number of arms *v* are employed as there are tooth-bars *m*, and one elbow end of these arms *v* is rigidly attached to the pivotal ends of the tooth-bars *m*, Figs. 1 and 4. The other elbow end of the arms *v* is pivotally attached to the eyed links of its sprocket-belt *a*, Fig. 1, the same as the ends of the tooth-bars *m* are pivoted.

Power is first imparted, preferably, to the sprocket-wheels C H and the sprocket-belt *c*, which they carry by any suitable connecting means, no such means being herein shown, since it will be well understood. Motion is transmitted from sprocket-belt *c* to sprocket-belt *a* through the connecting-arms *v*.

To prevent cramping by the tendency of the ends of the tooth-bars attached to sprocket-belt *f* to lag behind, I provide a transverse shaft P, having sprocket-gears F and K, rigidly attached to the ends, Figs. 2 and 3, and thus by means of sprocket-belt *e* on sprocket-wheels E F and sprocket-belt *i* on the sprocket-wheels J K motion is imparted and power applied to the sprocket-belt *f* to carry along its end of the tooth-bars *m*, the same as do the sprocket-belts *c a* their end of said tooth-bars. In this connection it should be observed that the sprocket-wheels D E are rigidly attached together, or to an axis common to both, as are the sprocket-wheels I J as well.

In use the front face of the carrier-frame will be provided with separate slats in the ordinary manner, on which slats the grain slides when being carried by the teeth *o* to the binding-deck above, said teeth projecting out through the longitudinal spaces between said slats. No slats are here shown, since they are common in reaping-machines. No binding-deck is here shown, but is sufficiently common in relation to carriers in like relation to be well understood.

The carrier in a reaping-machine is at an oblique angle instead of perpendicular, as in Fig. 2; but this does not affect the invention herein described.

In many reaping-machines it is necessary to carry the teeth of the tooth-bars lower than can be done by the tooth-bars *m*, because, owing to the construction of said machines, the sprocket-wheels L H in Fig. 1 cannot be placed low enough to carry the tooth-bars *m* down to the grain-platform, which is in the immediate rear of the cutter-bar, and upward from which grain-platform the carrier extends.

It is not deemed necessary to show the grain-platform, because its location in a reaping-machine in its relation to the carrier which takes the grain therefrom and carries it to the binding-deck above is well known.

In order to carry the teeth lower than they can be carried by the tooth-bars *m*, as above stated, I employ supplemental tooth-bars *n*, Fig. 1, made somewhat shorter than the tooth-bars *m*, and attached to the latter by means of arms *z*, attached to said tooth-bars *m* and to the ends of the supplemental tooth-bars *n*, so that the latter bars will be separated from the former and run parallel therewith. By this means the supplemental tooth-bars *n* are of course carried lower than the tooth-bars *m* can be carried, and thus enable the teeth to gather grain from a point lower than could the teeth of the tooth-bars *m*.

While I have described sprocket-wheels and sprocket-belts, of course any suitable pulleys and belts may be employed, whether sprocket or otherwise. Carriers made on this principle may be employed in a horizontal position or at any angle for carrying or elevating any article or commodity desirable.

The arrows in the different figures show the direction in which the sprocket-belts move.

Referring to Figs. 1 and 2, supposing the apparatus to be in operation, the outer tooth-bars, with their teeth, (the right-hand ones in Fig. 2,) are moving upward, and when they pass around the sprocket-wheels C H said tooth-bars, by means of the arms *v*, will be held in the same position without tilting, so that the teeth *o* will always be at the same angle, whether going up or down or around the pulleys, by which means they strike directly into the grain at the lower end and directly out of the grain at the upper end.

For the means I have described for transmitting power from one side of the carrier to the other, the same being sprocket-wheels E F J K and sprocket-wheels *e i*, of course gearing or any other suitable mechanism may be substituted, although the means here shown are preferable.

I have said that power is preferably first applied directly to the pulleys C H and their belt *c*, and this is desirable, because the tooth-bars are attached at one end to said belt *c*; but the power may be first applied to the sprocket-wheels D G and their sprocket-belt *a*, in which case the power is transmitted to the belt *c* through the arms *v*, and to the belt *f*, as before stated, through the shaft P and its connecting means. In regard to the jogging of the bolts *c a* one by the other, the distance of said jog is the same as the length of the arms *v*, so that when these arms pass around the pulleys C and D at one end and H and G at the other end said arms are kept at the same angle as when moving from one end of the carrier to the other, said arms being thus held by the belt *a*, to which they are pivoted, and it follows that since these arms *v* are rigidly attached to the tooth-bars *m* said tooth-bars are always held in the same position, so that their teeth are always carried at the same angle, as before stated.

While I have stated that this carrier may be located at any angle—horizontal, perpendicular, or otherwise—it may also be employed in a reverse position, end for end.

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

1. A carrier comprising a suitable frame, a series of transverse bars provided with teeth, a traveling belt and pulleys at each side, to which belts the ends of the tooth-bars are pivotally attached, arms elbowed at the ends in opposite directions, one end of said arm being rigidly attached to the tooth-bars, a traveling belt to which the other ends of said arms are pivotally attached, this latter-named belt being jogged by the other belt at the same side of the carrier, and suitable means for transmitting power from one side of the carrier to the other side of the carrier, substantially as set forth.

2. A carrier comprising a suitable frame, a series of transverse bars provided with teeth, supplemental bars provided with teeth and attached to the former-named tooth-bars, a traveling belt and pulleys at each side, to which belts the ends of the tooth-bars are pivotally attached, arms elbowed at the ends in opposite directions, one end of said arm being rigidly attached to the tooth-bars, a traveling belt to which the other ends of said arms are pivotally attached, this latter-named belt being jogged by the other belt at the same side of the carrier, and suitable means for transmitting power from one side of the carrier to the other side of the carrier, substantially as set forth.

3. The combination of a suitable frame, a series of transverse bars provided with teeth, a traveling belt at one side of the carrier, to which belt the ends of the tooth-bars are pivoted, two parallel belts jogging by each other at the other side of the carrier and to one of which belts the other ends of the tooth-bars are pivoted, the elbow-arms between said belts, one end of said arm being rigidly attached to the tooth-bars and the other end pivoted to the outermost belt, wheels or pulleys upon which said belts are mounted, wheels or pulleys at one end of the carrier for transmitting power, one being rigidly attached to the wheel or pulley of the belt to which the elbow-arms are pivoted and the other rigidly attached to the wheel or pulley of the belt at

the opposite side of the carrier, a transverse shaft having a wheel or pulley at each end, and belts mounted upon said wheels or pulleys and upon the above-named power-transmitting wheels or pulleys, substantially as set forth.

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

WILLIAM H. KNAPP.

Witnesses:
CARL RUDOW,
GEO. RORABECK.