Dec. 27, 1927. 1,653,975

A. P. WINTER

ELEVATOR DRIVING MECHANISM

Filed Jan. 21, 1926

Fig. 1

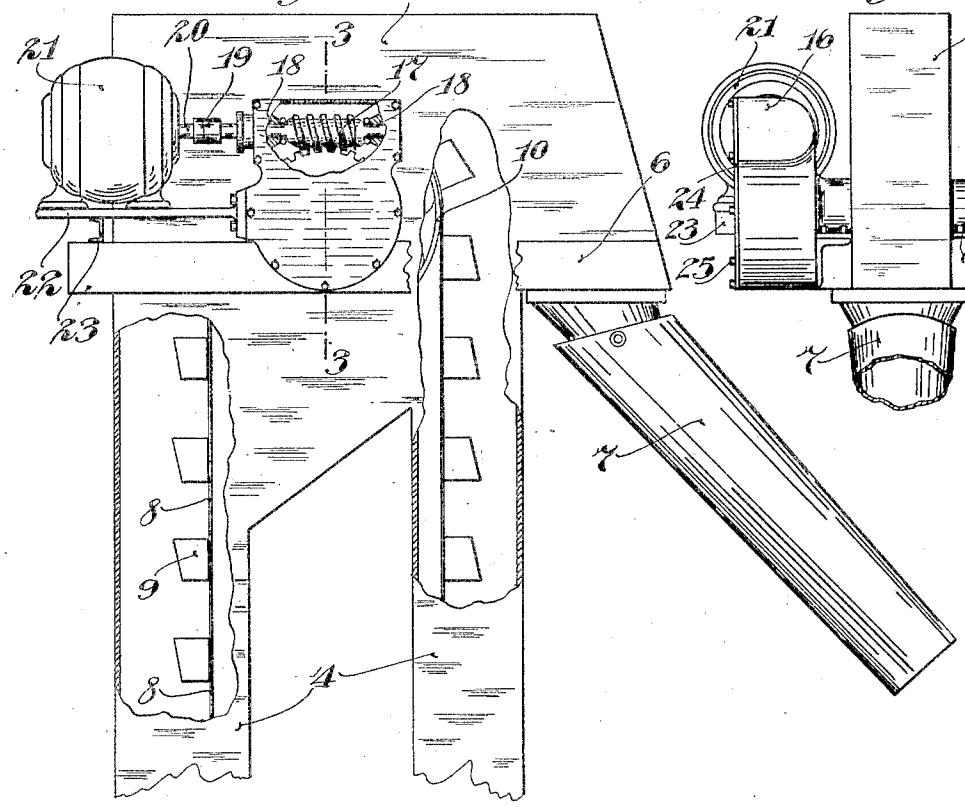
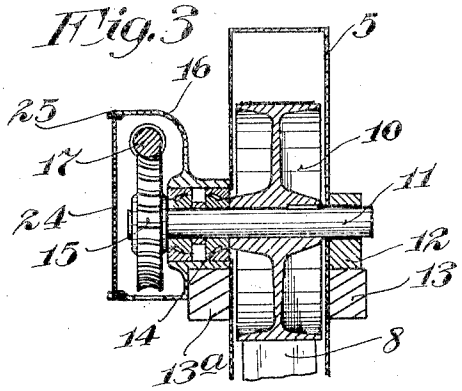


Fig. 2

Fig. 3



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ELEVATOR-DRIVING MECHANISM.

Application filed January 21, 1926. Serial No. 82,839.

My present invention relates particularly to elevators of the bucket-equipped belt type such as used very generally in grain elevators, and has for its object to provide an improved power-actuated driving mechanism for such elevator belts.

Generally stated, the invention consists of the novel devices and combinations of devices and arrangement of parts hereinafter described and defined in the claims.

In grain elevating devices of the character above indicated the buckets on the rising side of the elevator belt will of course be filled with grain while those on the opposite side will be empty; and this throws such an excessive amount of weight on the loaded side of the belt that with the driving mechanism usually provided, when the latter is disconnected from the power-supplying means there will be produced a backward movement of the elevator belt, and of course all such back movement will have to be again taken up before the elevator will be again thrown into discharging action.

My improved belt driving mechanism is of such construction and arrangement that it is self locking; that is, when the power is cut off from the drive the elevator belt will be locked against rotation so that the weight at the side of the belt cannot produce a backward movement of the belt.

The accompanying drawings illustrate the invention applied to a grain elevating device of the character referred to above. Referring to the accompanying drawings, wherein like characters indicate like parts throughout the several views,

Fig. 1 is a side elevation, with some parts broken away, showing the improved driving mechanism applied to drive the elevator belt through its upper pulley;

Fig. 2 is a front elevation of the parts shown in Fig. 1; and

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1.

The elevator casing includes the customary elevator legs 4 that extend downward from a head 5 which, at its receiving side, is formed with a receiving hopper 6. For the distribution of the elevated grain the customary pivoted and oscillatory distributing spout 7 is shown as connected to the bottom of the receiving hopper 6. An elevator belt 8 is equipped with grain-elevating buckets 9 and is arranged to run under a lower pulley, not shown, and over an upper pulley 10 which latter is secured to a short shaft 11. At one end, shaft 11 is journaled in a bearing 12 fixed to a beam 13 on the elevator head 5. The other end of shaft 11 is extended through a bearing 14 and has a rigidly secured worm gear 15. The bearing 14 is in one side of a gear housing 16 that is rigidly secured to a beam 13ª on the exterior of the elevator head 5. The worm gear 15 is located within the housing 16 and is in mesh with a worm 17 journaled in suitable thrust bearings 18 formed on or applied to the upper portion of the housing 16. The shaft of the worm 17, as shown, is connected by a clutch coupling 19 to the armature shaft 20 of a small electric motor 21 the base of which is shown as anchored to a flange 22 bolted or otherwise rigidly secured to the gear housing 16 and to a cross beam 23, which latter is secured to the beams 13 and 13ª of the elevator head 5. This arrangement just above described not only anchors all of the several parts to the elevator head but ties them together in proper relative positions.

The gear housing 16 is formed open at its outer side but is normally closed by a head plate 24 shown as rigidly but detachably secured thereto by screws 25. This gear housing, therefore, is adapted to contain lubricating oil so that the worm and gear will run in oil.

It will be noted by reference particularly to Fig. 3 that the shaft 11 is supported by bearings located both at the same side of the worm gear 15 and at a side away from the removable head plate 24. This arrangement permits ready access to the worm and worm gear and will also permit the shaft 11 to be drawn or forced from working position and removed with the worm gear when the head plate 23 is removed.

The worm and worm gear afford an extremely simple speed-reducing mechanism between the electric motor and the elevator belt and in the arrangement described the worm, when idle, forms a positive lock to prevent rotation of the worm gear 15, shaft 11, and pulley 10, and hence positively locks the elevator belt against backward rotation under the preponderous weight on the loaded side thereof.

When grain elevating devices are installed in grain storage elevators the head

of the elevator leg will be far from the ground and at the upper portion of the elevator structure. As is well known, the power should be applied to the upper elevator pulley. A power device located at or near the ground would require long or extended power transmission belts, chains or the like. By the application of the worm gear directly to the shaft of the upper elevator pulley and by connecting the electric motor directly to a worm of the drive a very simple yet highly efficient arrangement is provided. The importance of applying the motor-driven worm and gear directly to the upper pulley of the elevator will be appreciated when it is understood that these elevators in vertical length usually vary from sixty to one hundred feet. By mounting the worm gear shaft 11 and the shaft of the worm 17 in the same casing, alignment thereof is insured and maintained so that settling of the parts will not throw the same out of alignment.

What I claim is:

1. An article of manufacture comprising a power unit for driving an elevating bucket belt of a grain elevator or the like adapted to replace a sprocket wheel on the head pulley shaft and the driving mechanism associated therewith, comprising a gear housing, means for attaching the gear housing to the head of the elevator leg, a worm gear within said housing on the head pulley shaft, a bearing carried by said housing for aligning the said worm gear and housing with the head pulley shaft, a worm meshing with said gear and journaled in said housing, and a motor mounted rigidly with respect to said gear housing and operatively connected to drive said worm.

2. The structure defined in claim 1 in which said gear housing has a removable outer side plate for permitting removal of said worm gear while the other parts are in position.

In testimony whereof I affix my signature.

AUGUST P. WINTER.