(No Model.)

2 Sheets—Sheet 1.

W. H. LOTZ.

GRAIN ELEVATOR.

No. 257,446. Patented May 2, 1882.

Fig. 1

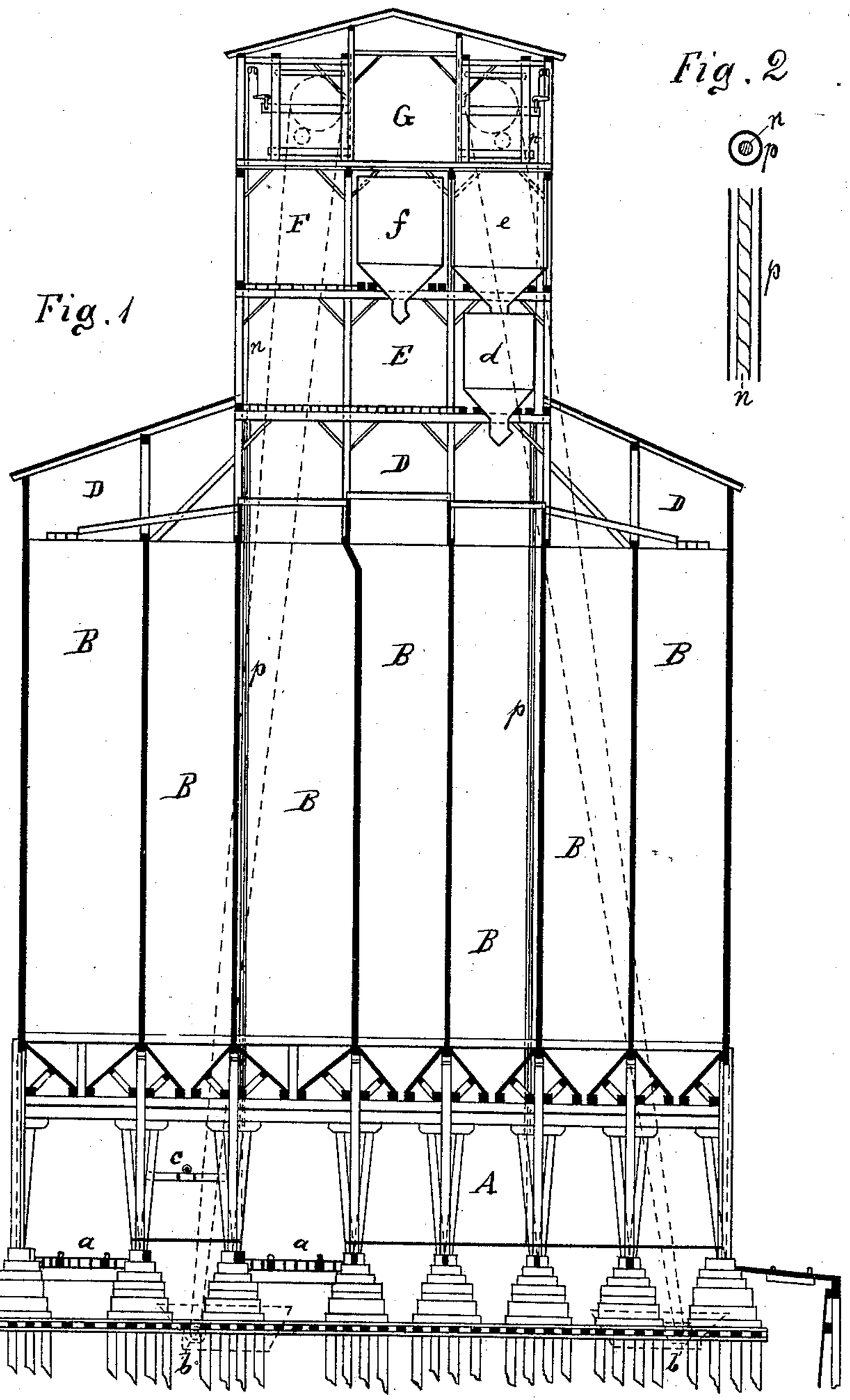

Fig. 2

WITNESSES—

F. W. Kasehagen.

H. Paustian.

INVENTOR—

Wm. H. Lotz

(No Model.)

2 Sheets—Sheet 2.

W. H. LOTZ.

GRAIN ELEVATOR.

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Fig. 4

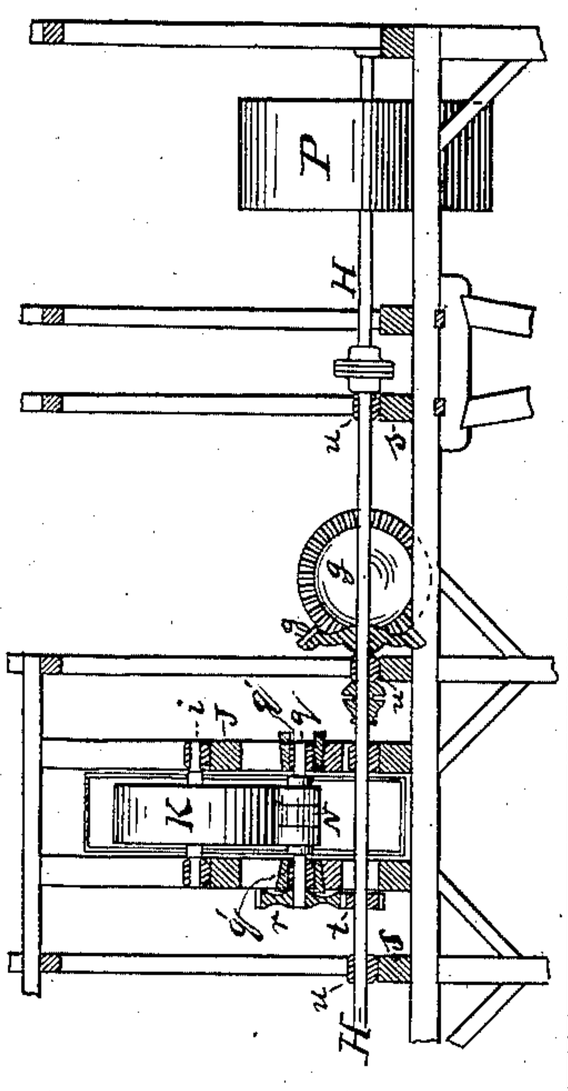


Fig. 5

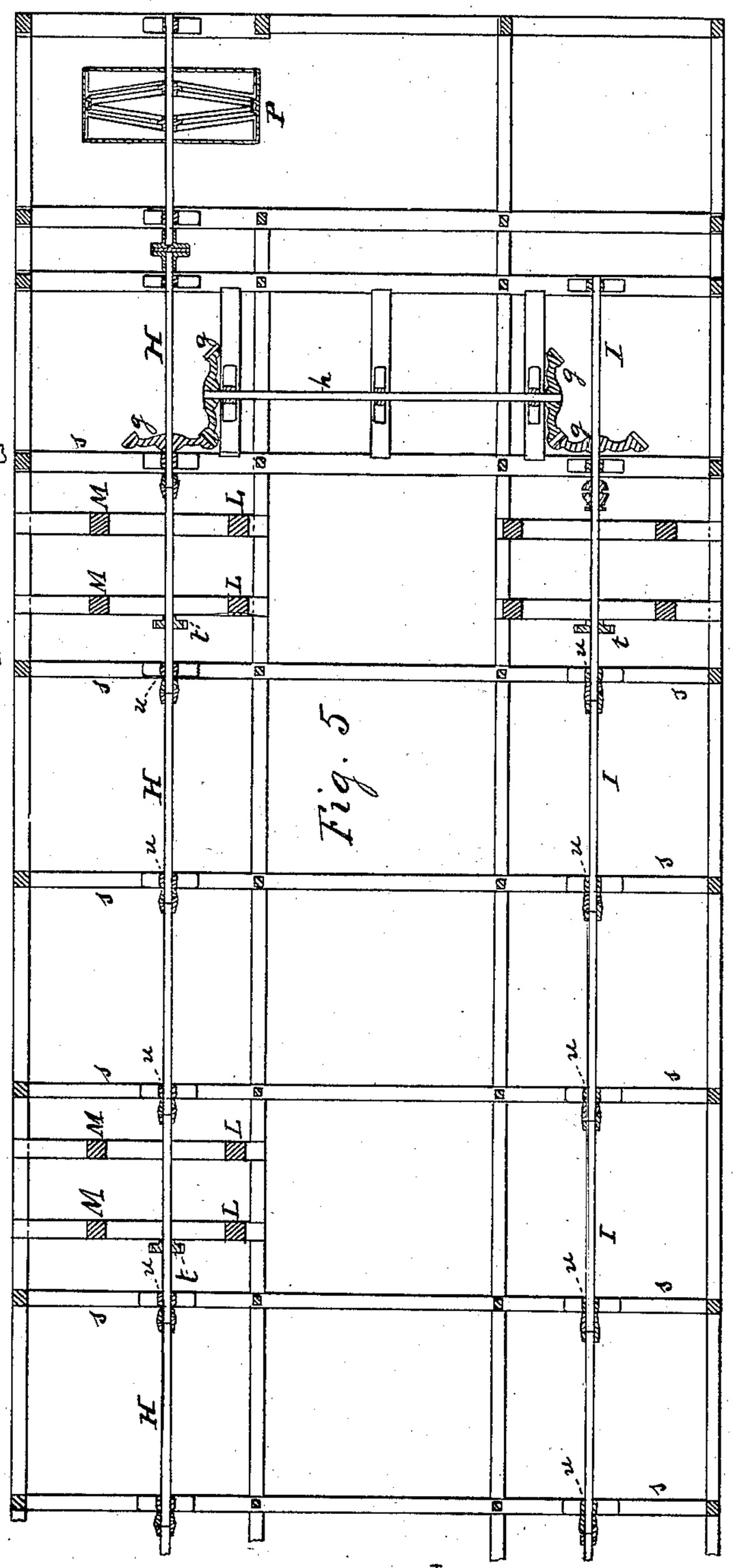
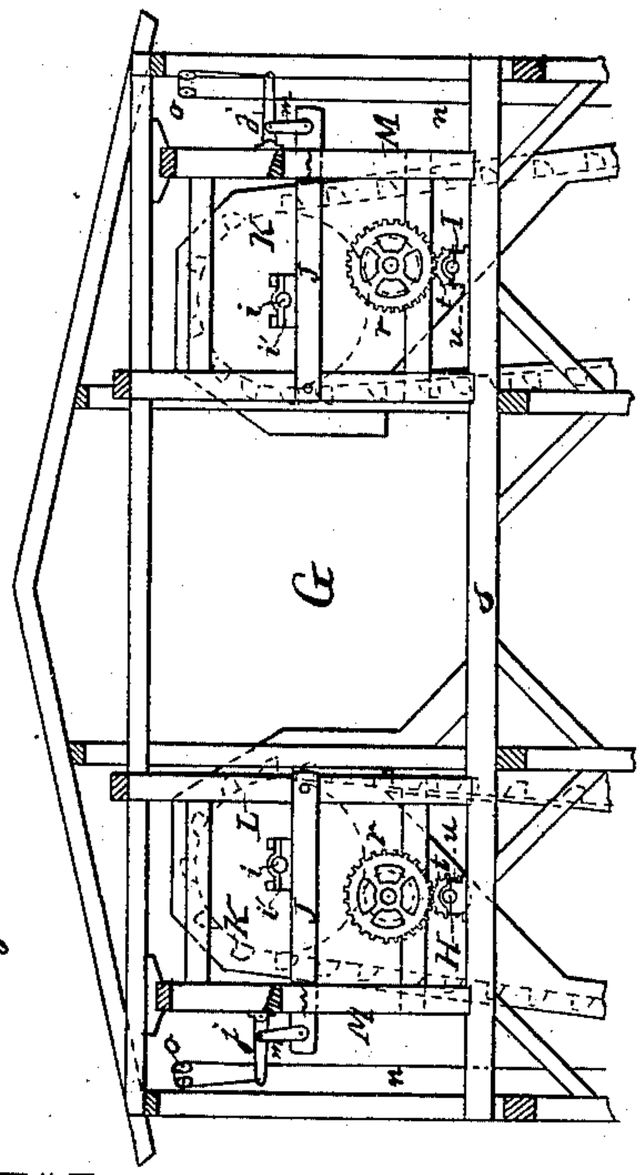


Fig. 3



Witnesses:

Frank Thomason

F. W. Kasehagen

Inventor:

Wm H Lotz

UNITED STATES PATENT OFFICE.

WILLIAM H. LOTZ, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO EDWARD BAUMANN, OF SAME PLACE.

GRAIN-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 257,446, dated May 2, 1882.

Application filed November 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. LOTZ, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain-Elevators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention relates to buildings for storing and transferring grain; and it is the object of my invention to arrange the machinery for elevating the grain more advantageously, so as to occupy and to obstruct less room, and also that each elevator can be thrown out of gear from the lower story of the building.

In a large grain-house are from two to three lines of elevators. The main line for hoisting the grain that is dumped out of the cars are known as the "receiving-elevators," and the others for rehoisting the grain that is discharged from one of the bins to be transferred into another bin, or to be weighed and then to be delivered into a boat or car, are known generally as the "shipping-elevators." Heretofore the receiving-elevators only were driven directly from a continuous line-shafting, and the shipping-elevators were each driven from a pulley upon said line-shafting and by a belt, and because these belts could not be of sufficient length for the necessary stress each had to be provided with a tightening-pulley to prevent their slipping. These cross-belts not only required constant attention and caused frequent trouble, but also did obstruct the upper or machinery floor of the cupola of the building in a manner to make it difficult for the attendant to move about for watching and lubricating the machinery parts. Another serious difficulty heretofore was that an elevator, whether choked so that the bucket-belt would slip, or when obstructed by a piece of wood or iron entering the boot of the elevator so as to tear off the buckets, could not be thrown out of gear from the lower floor, where the accident would be first observed, but only by the man on the upper floor, who had to be first notified through a speaking-tube from below, which required so much time that it was preferred to stop the whole machinery by stopping the driving-power to save the elevator-belt as much as possible.

My invention consists, first, in using a continuous line-shafting for each line of elevators, the several lines of shafting being driven from a main pulley and by gear-wheels at one end of the building; second, in a bucket-belt pulley for each elevator, riding upon a paper friction-wheel, and each friction-wheel driven from the line-shafting by gear-wheels; and, third, in the bucket-belt pulley journaled in bearings resting upon two swinging beams that are raised and lowered by a wire rope passed vertically through pipes or tubes in the grain-bins, so as to extend to the lower floor, all as fully hereinafter explained.

To enable others skilled in the art to make and use my invention, I proceed to describe the same in connection with the accompanying drawings, in which—

Figure 1 represents a transverse section of a large grain-elevator; Fig. 2, a horizontal and vertical section of a portion of a tube with a rope passed through it; Fig. 3, a transverse section of the upper or machinery floor of the cupola of the elevator; Fig. 4, a longitudinal sectional elevation of a portion of the same, and Fig. 5 a sectional plan view of the upper floor.

Like letters designate corresponding parts in all the figures.

In Fig. 1, A denotes the lower floor of an elevator, with the car-tracks *a a*, elevator-boots *b b*, and shafting for grain-shoveling machines *c*.

B B B are the grain-bins, having hopper-shaped bottoms.

D is the spouting-floor.

E is the floor that contains the shipping-scale hoppers *d*.

F is the floor that contains the shipping-garners *e* and the receiving-scale hoppers *f*, and G is the upper or machinery floor. On this floor G, at one end, is the main pulley P, which is driven by a belt from the band-wheel of the engine, and the shaft of which is coupled with the line-shafting H, that drives the receiving-elevator pulleys.

I is the line-shafting that drives the shipping-elevator pulleys, and which is driven by miter gear-wheels *g* and by a transverse shaft, *h*, from the line-shafting H.

K K are the pulleys over which the bucket-belts are stretched. The shafts *i* of these pulleys are journaled in boxes that are secured upon beams J. These beams J, at one end, are pivoted to posts L, and at their opposite ends they are thinned out and passed through slots in posts M, so as to be guided and to move vertically therein. Levers *j* are pivoted against the posts M, and by links *m* the ends of the beams J are suspended to these levers *j*. A rope, *n*, is connected with the ends of these levers *j*, is thence passed upward over sheaves *o*, and thence it extends vertically downward through the several stories of the cupola of the elevator, and is passed through gas-pipes *p*, that are placed for that purpose into the grain-storage bins, and at the lower floor this rope is connected either to a tackle, to a lever, or to a windlass, by which it is pulled by the operators whenever it becomes necessary to throw the elevator out of gear.

In place of a rope, I may use a chain or either a rope or chain coupled to the ends of an iron rod, and in place of the levers *j* and links *m* for lifting the beams J, I may use any other device that will furnish the necessary leverage and that can be connected with the wire rope. The pulleys K ride upon paper wheels N, from which they are driven by friction. These paper wheels I may mount upon the several line-shaftings for all the several elevators, which is quite an advantage over the former arrangements, in which a portion of the elevators were driven by belts from a single line of shafting. To this new arrangement, of which, to my best knowledge and belief, I am the originator, there is one objection, and that is that the line-shaftings reach from about two and a half to three feet above the floor, and are an obstruction to the attendant to move about. Besides that, the shafting has to be supported upon special timber framing.

My latest improvement consists in mounting each paper wheel N upon an independent shaft, *q*, having vertically-adjustable journal-boxes *q'*, and carrying upon one end a spur-wheel, *r*; in placing the line-shafting H and I in bearings *u*, secured upon the floor-beams *s*, which shafting is driven at a high speed; and in mounting pinions *t* upon said shafts that engage with the wheels *r* and drive the paper wheels N.

The advantages obtained by the above-described arrangement of placing the lines of shaftings close to or upon the floor-beams are that they are entirely out of the way, so as not to obstruct the floor, that they can be easily covered and protected against the dust, that no special frame-work is required for supporting the journal-boxes, that lighter shafting can be used on account of the increased leverage and speed, and that a fast-running engine can be used as the driving-power.

What I claim is—

1. The combination, with the elevator-pulleys and paper wheels for driving such pulleys, of a continuous shaft-line for each line of elevators, such shaft-lines being driven from one end by a single pulley and by gear-wheels and a transverse shaft or shafts, and a wire rope, chain, or rod passed through tubes in the grain-storing bins for raising and lowering the upper elevator-pulley, substantially as set forth.

2. The combination, with a continuous line-shafting carrying gear-wheels, of an independent shaft for each paper wheel, journaled in vertically-adjustable boxes and having a gear-wheel that meshes the gear-wheel on the line-shafting, and of the elevator-pulley riding upon such paper wheel, substantially as and for the purpose set forth.

3. In a grain-elevator, the elevator-pulley supported upon swinging beams that are raised and lowered by a wire rope passed through tubes in the grain-storing bins, so as to reach to and be operated from the lower floor of the building, all substantially as set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

WILLIAM H. LOTZ.

Witnesses:

F. W. KASEHAGEN,

H. PAUSTIAN.