

(No Model.)

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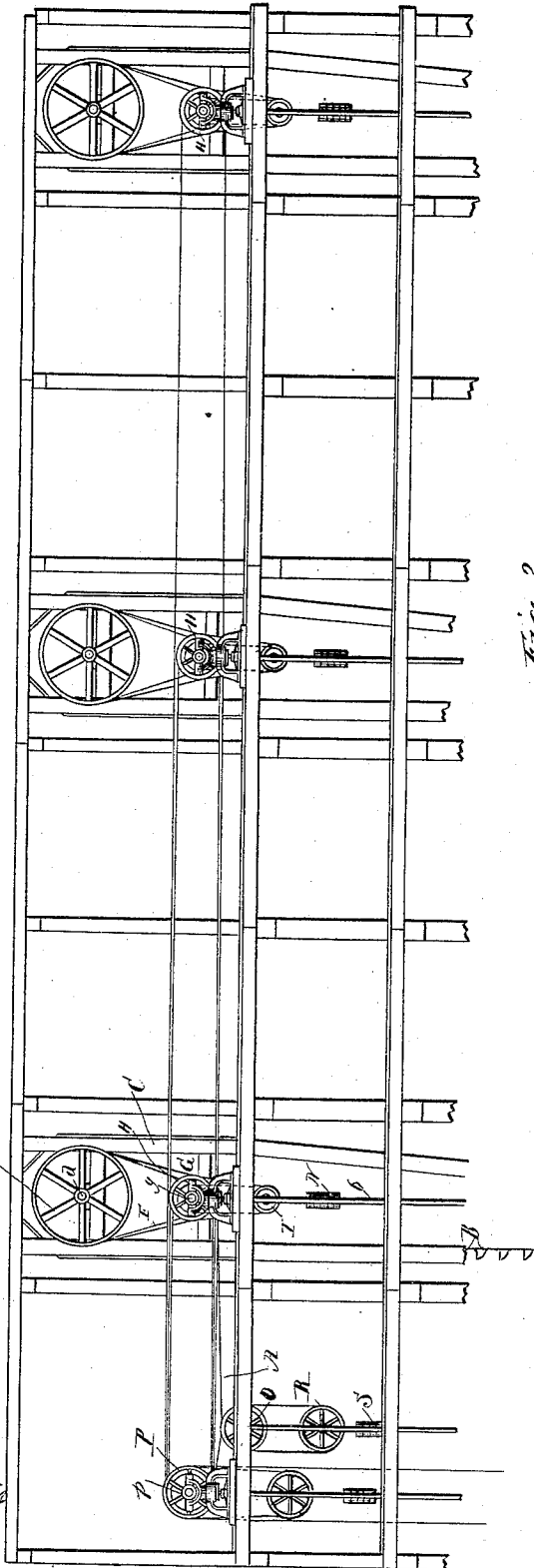
E. L. HEIDENREICH.

POWER TRANSMISSION FOR GRAIN ELEVATORS.

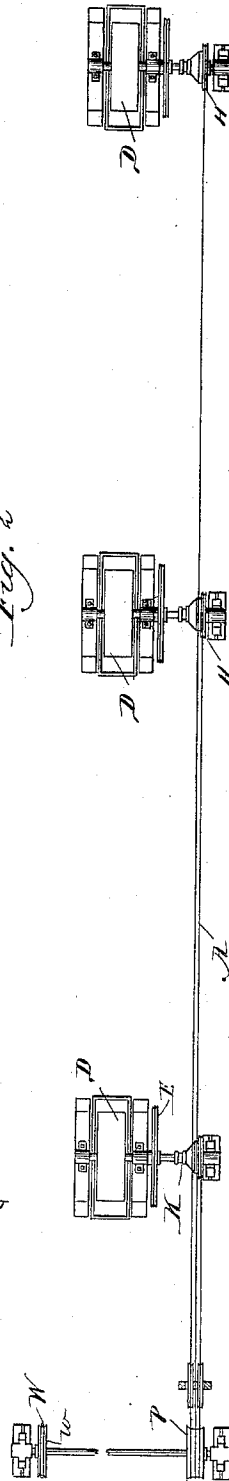
No. 469,421.

Patented Feb. 23, 1892.

*Fig. 1*



*Fig. 2*



*Witnesses*

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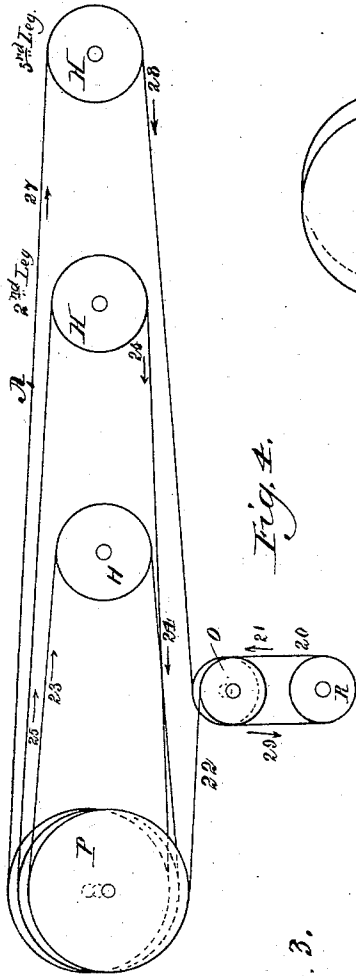


Fig. 3.

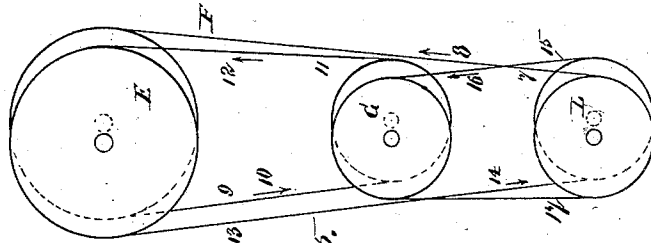
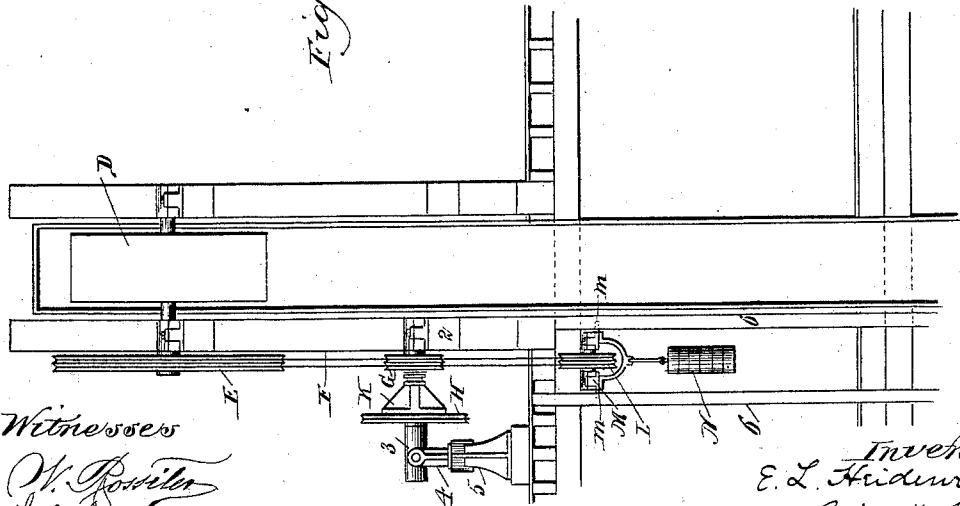


Fig. 5.



Witnesses

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# UNITED STATES PATENT OFFICE,

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## POWER-TRANSMISSION FOR GRAIN-ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 469,421, dated February 23, 1892.

Application filed July 16, 1890. Serial No. 358,968. (No model.)

*To all whom it may concern:*

Be it known that I, EYVIND LEE HEIDENREICH, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevator Mechanism for Grain-Warehouses, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In the construction of elevator mechanism of grain-warehouses, as at present commonly practiced, it is customary to provide at the top of the building, and extending from end to end thereof, a long line-shaft that receives motion from the main vertical drive belt or shaft located at one end of the building. This line-shaft is provided at intervals corresponding in number and location with the "elevator-legs" with gear mechanism, by which power is transmitted from the main line-shaft to the individual shafts of the various elevator-legs by which the grain is lifted from the bottom to the top of the warehouse. This employment of a long line-shaft extending from end to end of the building is found very objectionable, not merely because of the original expense incident to such a shaft, but because of the constant repairs made necessary by the irregular settling or warping of the building, which tends to throw the shaft out of true line.

My present invention has for its object to do away with the expensive and objectionable line-shaft heretofore employed, and as well, also, the vertical drive belt or shaft by which in prior constructions motion has been imparted to the line-shaft, and at the same time to supply a means for driving the individual bucket-belts that can be furnished at a much less expense than the shafts before employed, and which will not be incident to the objections found to such shafts. This object of invention I have accomplished by providing the individual bucket-belts, whereby the grain is raised from the bottom to the top of the warehouse, with suitable gear mechanism adapted to be driven by an endless rope, chain, or belt that receives motion from the source of power.

My invention consists in the novel features hereinafter described, illustrated in the ac-

companying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a view in vertical longitudinal section through the upper story of a grain-warehouse having my invention applied thereto. Fig. 2 is a plan view showing the elevator-legs and the gear mechanism for the individual bucket-belts. Fig. 3 is a view in side elevation of the gear mechanism of one of the bucket-belts, showing also the leg wherein the usual conveyer-belt will travel. Figs. 4 and 5 are diagrammatic views showing the arrangement of the ropes and pulleys.

In the construction shown but three elevator-legs are illustrated for raising the grain, although it will be understood that there will ordinarily be more of these legs, arranged at convenient distances apart from end to end of the building.

From a suitable engine at the base of the building power will be transmitted to a driving-cable W, whereby the various bucket-belts B of the elevator-legs C throughout the building will be driven. The bucket-belts B pass over suitable drums D, journaled at the top of the legs, and upon the shaft *d* of each of these drums is mounted a rope pulley E, that will be connected by means of a rope F to a pulley G, that is mounted upon a shaft *g*. This shaft *g* has one end sustained by a cross-beam 2, while its opposite end is sustained upon a bearing 3, mounted upon the standard 4. The bearing 3 is preferably a gimbal-bearing, and that is held between the yoke-shaped end of the standard 4, this yoke-shaped end of the standard being preferably arranged so that it can be raised and lowered with respect to its base 5, in order to properly line up the shaft *g*. Upon each of the shafts *g* is loosely mounted a drive-pulley H, and adjacent this pulley is mounted a suitable friction-clutch K, that is keyed to the shaft *g*, so that when the friction-clutch K is caused to engage with the pulley H it will serve to transmit motion from the pulley H to the shaft *g*, and from this shaft, by means of the pulley G and the rope F, to the pulley E upon the end of the shaft *d* of the bucket-belt drum D. The rope F, whereby motion is transmitted from the pulley G to the pulley E, is preferably kept taut by means of a tightener-pulley L, that is hung

in a suitable yoke-shaped bearing M, to which is attached a weight N. The yoke-shaped bearing M is provided with arms *m*, that are guided by means of the vertical rods 6 in order to keep the tightener-pulley L in accurate line. Each of the pulleys E, G, and L is provided with two grooves about its periphery, and in the diagrammatic view, Fig. 5, the course of the rope F over the several pulleys is illustrated. Thus, assume that the rope starts at the point 7, it will pass thence in the direction of the arrow 8, Fig. 5, over the pulley E to the point 9, thence in the direction of the arrow 10, around the pulley G, to the point 11, thence in the direction of the arrow 12, over the second groove of the pulley E, to the point 13, thence in the direction of the arrow 14, around the pulley L, to the point 15, thence in the direction of the arrow 16, around the second groove of the pulley G, to the point 17, and thence around the second groove of the pulley L to the starting-point 7.

It will be understood, of course, that the rope F is continuous and that the sections of the several pulleys, while shown out of alignment in the diagrammatic view, Fig. 5, are in true alignment on the faces of the pulleys. From this construction it will be seen that when motion is transmitted from the driving-pulley H, through the medium of the friction-clutch K, to the pulley G and shaft *g* such movement will be transmitted by the rope F to the pulley E, and thence by the shaft *d* and drum D to the bucket-belt, and at the same time the weight N will serve to pull downward the tightener-pulley L, and will thus hold the rope F in firm frictional contact with the several pulleys and insure the proper driving of the bucket-belts.

In order to transmit motion to the drive-pulley H adjacent each of the elevator-legs, I prefer to arrange the main drive-cable in the manner illustrated by the diagrammatic view, Fig. 4—that is to say, assuming that the main cable A starts at the point 20, it will pass thence in the direction of the arrow 21 over the pulley O to the point 22, thence over the first groove of the pulley P to the arrow 23, thence in the direction of this arrow around the drive-pulley H at the first elevator-leg. From the pulley H the rope will pass in the direction of the arrow 24 around the second groove of the pulley P to the arrow 25, and thence in the direction of this arrow it will pass to and around the drive-pulley H of the second elevator-leg to the arrow 26. Thence it will pass in the direction of the arrow 26 around the third groove of the pulley P to the arrow 27, and thence in the direction of this arrow it will pass to and around the drive-pulley H of the third elevator-leg to the arrow 28. From the arrow 28 the rope A will pass over the second groove of the pulley O to the arrow 29, and thence it will pass in the direction of this arrow around the pulley R to the starting-point 20. It will be under-

stood, of course, that the rope A will be a continuous rope. The pulley P is mounted upon the shaft *p*, upon which shaft also is mounted the pulley *w*, over which passes the main cable W, whereby motion is imparted to the various individual bucket-belts through the medium of the cables A and F in the manner above described. The pulley R is a tightener-pulley and is journaled in a yoke similar to the yokes M, wherein each of the tightener-pulleys L is journaled, and the yoke of this pulley R is provided with a weight S, whereby the proper tension will be given to the rope A.

From the foregoing description it will be seen that any desired number of bucket-belts may be driven and can be thrown into and out of action by the operation of their respective clutch mechanism. So, also, it is apparent that by the mere introduction of suitable pulleys to change the direction of the cable A the elevator-legs can be set at different parts of the building, where it would be very difficult to locate them if they were to be driven by means of shafting. In prior construction of elevators in which a line-shaft extended from end to end of the building for the purpose of driving the bucket-belts it has been customary to mount the elevator-legs transversely to the direction of the line-shaft, as by this means the drums of the bucket-belts could be connected up with the line-shaft without the need of beveled gearing, which is expensive and the accurate position of which is easily disturbed. This arrangement of the elevator-legs is objectionable, however, because the car-tracks in the base of the building usually extend upon each side of the elevator-legs, and consequently, when these legs extend at right angles to the car-tracks, it is necessary to use an "under feed" from the cars that unload upon one track, and this under feed in practice is regarded as objectionable. By my improved construction, however, I am enabled to arrange the elevator-legs in the direction of the length of the car-tracks, and consequently the cars from either track can unload into the bins upon the same side of the elevator-leg, and therefore an "up feed" can be had in unloading from either track.

It will be readily understood that the precise details of construction and arrangement above set out may be varied without departing from the spirit of my invention.

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

1. In a grain-elevator, the combination, with a series of elevator-legs and their bucket belts and drums, of grooved drive-pulleys H, one from each of said elevator-legs and suitably geared with the drums thereof, a main drive-pulley P, provided with a series of grooves, a vertically-movable tightener-pulley, and a main drive-cable A, passing from said main drive-pulley P around one of said drive-pul-

leys H, then back and around said main drive-pulley P, and then around the next drive-pulley H, then back and around said main drive-pulley P, then from said main drive-pulley to  
5 the third pulley H, then around said tightener-pulley, and then back to the main drive-pulley P, substantially as described.

2. In a grain-elevator, the combination, with  
a series of elevator-legs arranged in alignment  
10 and having bucket belts and drums arranged to revolve in the line of the car-tracks, of a drive-rope and individual drive-pulleys for imparting movement to the drums of the bucket-belts, and suitable gear mechanism for  
15 connecting said bucket-belt drums with said drive-pulleys, substantially as described.

3. In a grain-elevator, the combination, with

a series of elevator-legs, each provided with a bucket-belt B and with a drum D and with an individual drive-shaft, of a pulley E upon  
20 the shaft of said drum, a pulley G upon the individual drive-shaft, a vertically-shiftable tightener-pulley L, and weight N, connected with said tightener-pulley, a rope F, passing  
25 around said several pulleys, a clutch K, and a drive-pulley H for each of said individual drive-shafts, and a main drive-cable A, whereby motion is imparted to the several individual drive-pulleys H, substantially as described.

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