

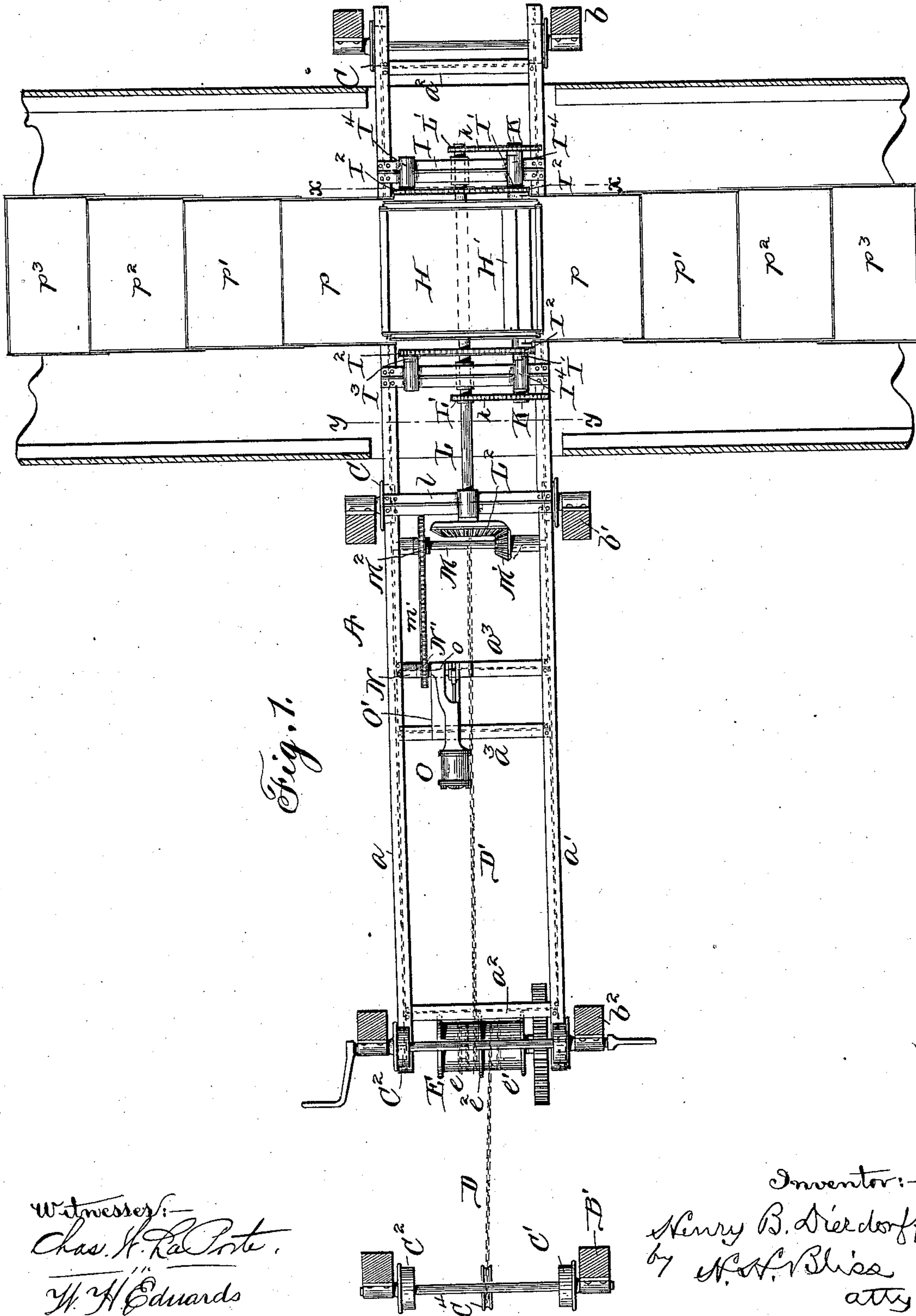
(No Model.)

4 Sheets—Sheet 1.

H. B. DIERDORFF.  
BOX CAR LOADER.

No. 575,028.

Patented Jan. 12, 1897.



Witnesses:  
Chas. H. K. Rote.  
W. H. Edwards

Inventor:—  
Henry B. Dierdorff  
by W. A. Bliss  
attys

(No Model.)

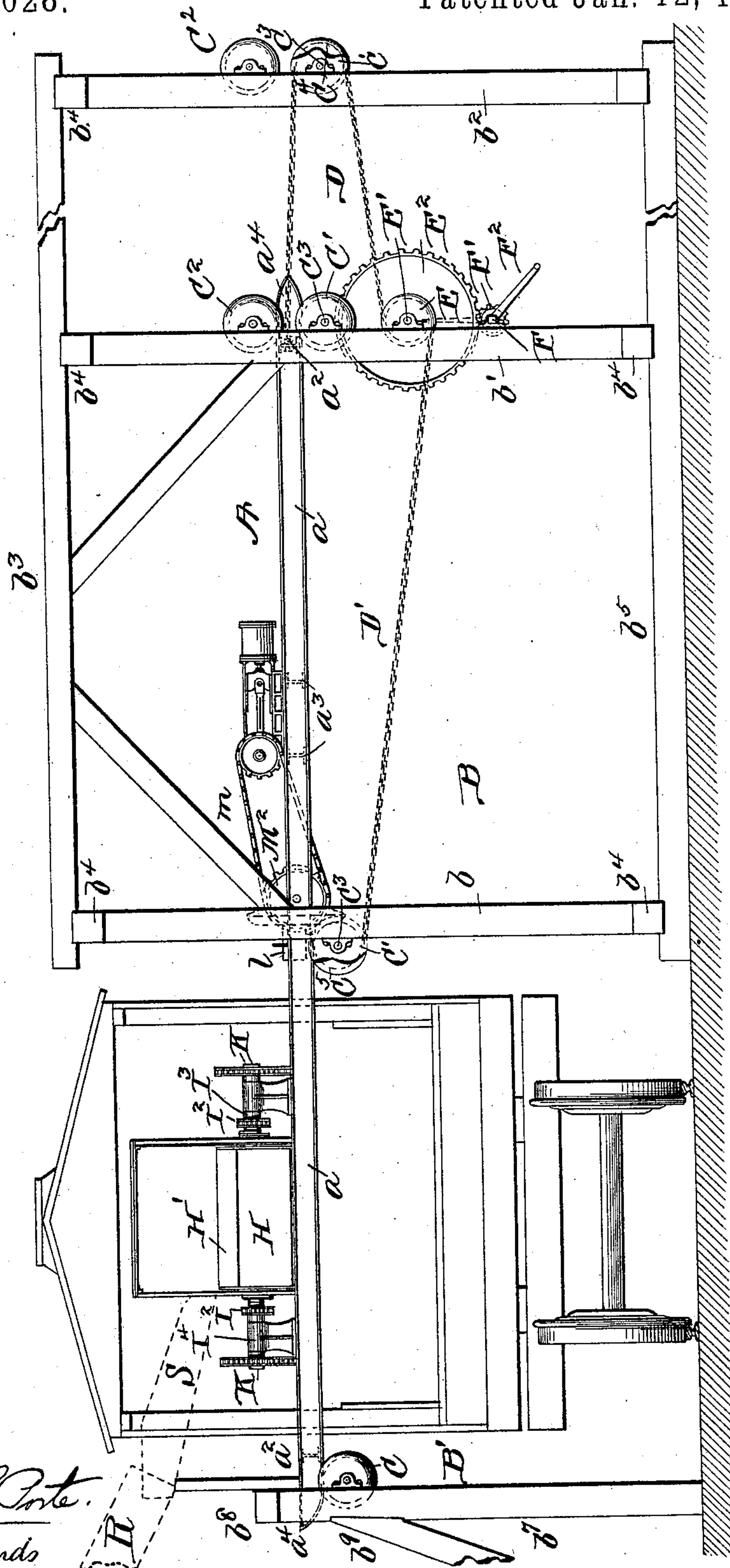
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*Fig. 2.*



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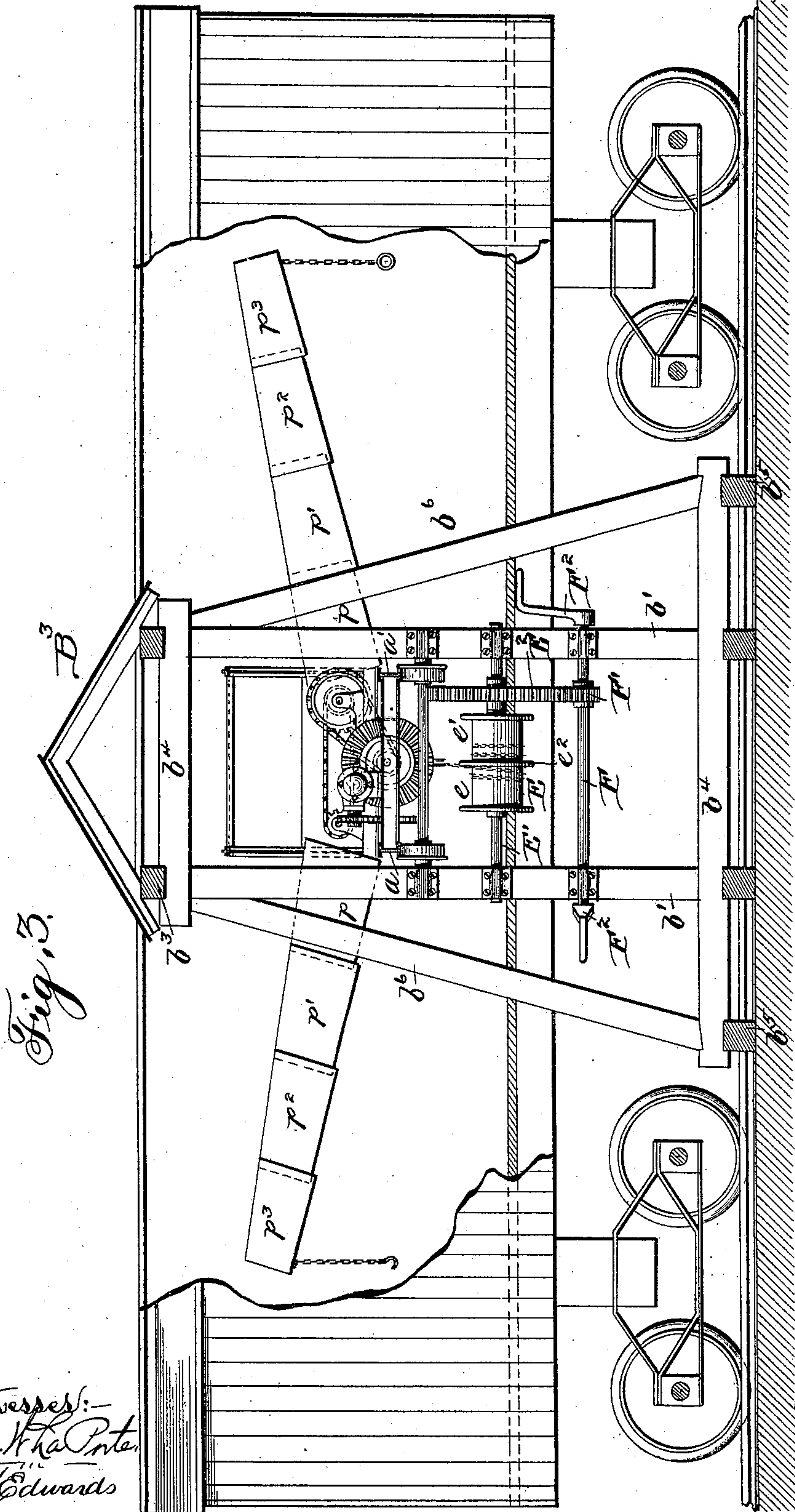
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H. B. DIERDORFF.  
BOX CAR LOADER.

No. 575,028.

Patented Jan. 12, 1897.



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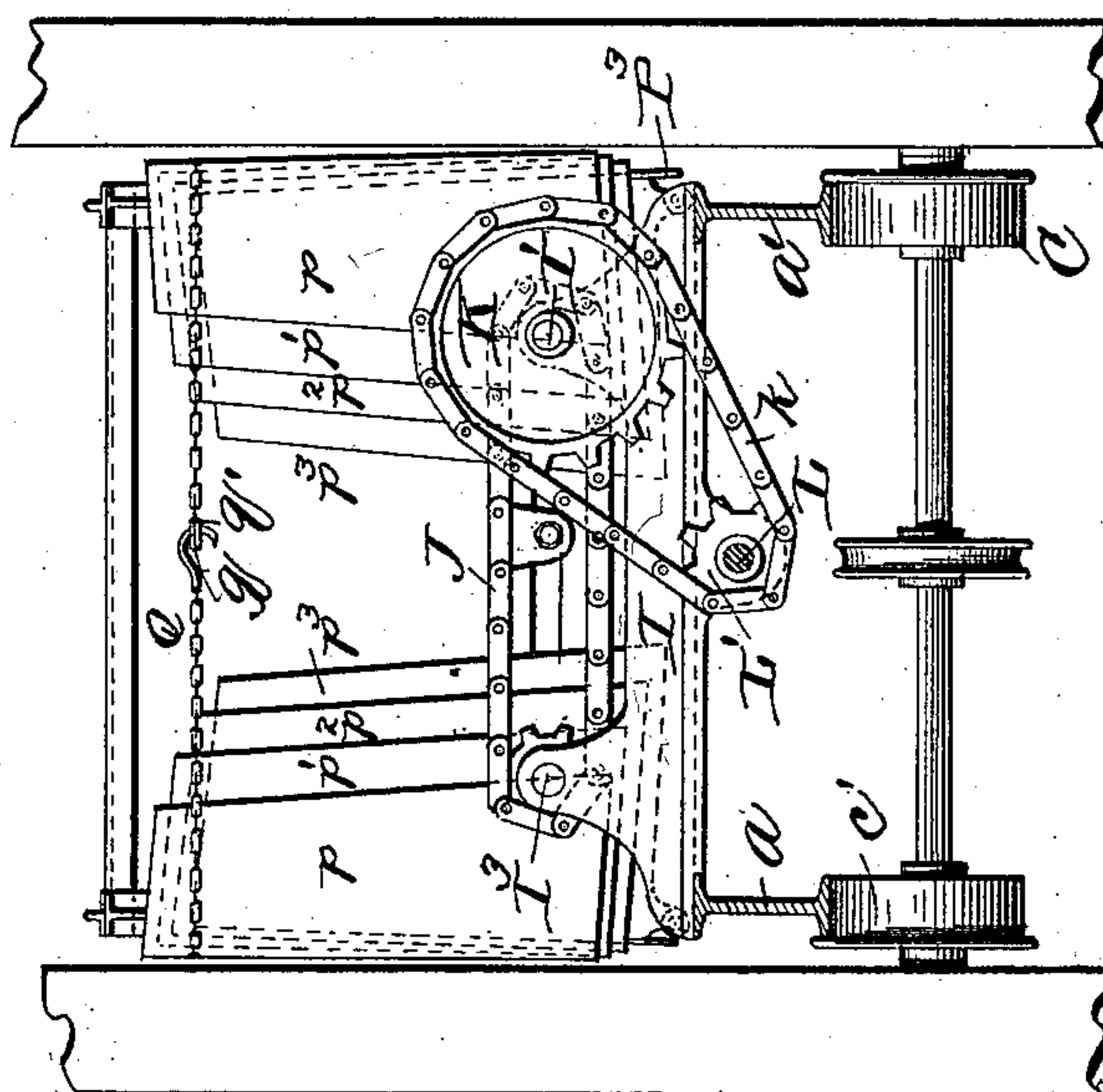
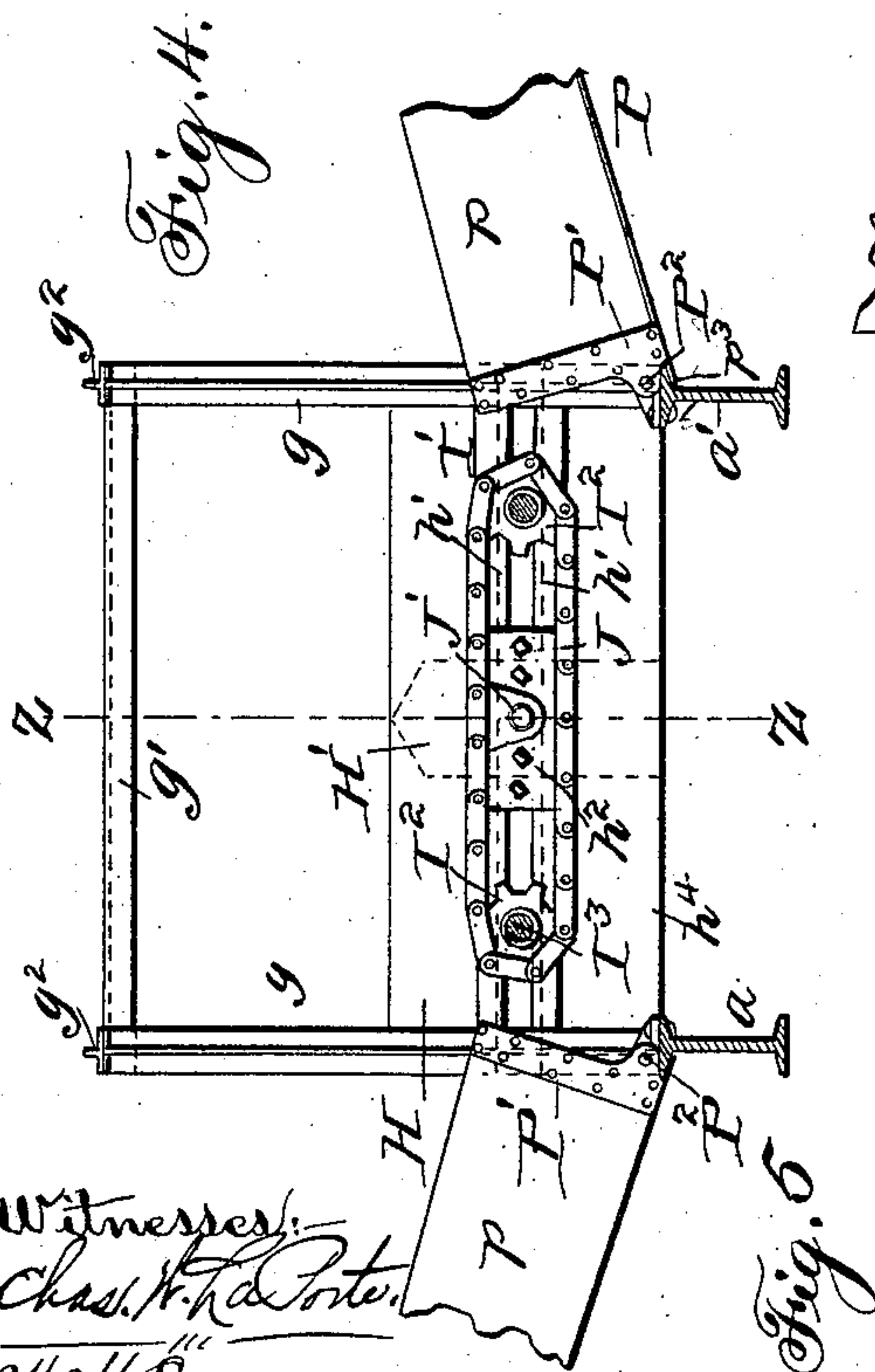
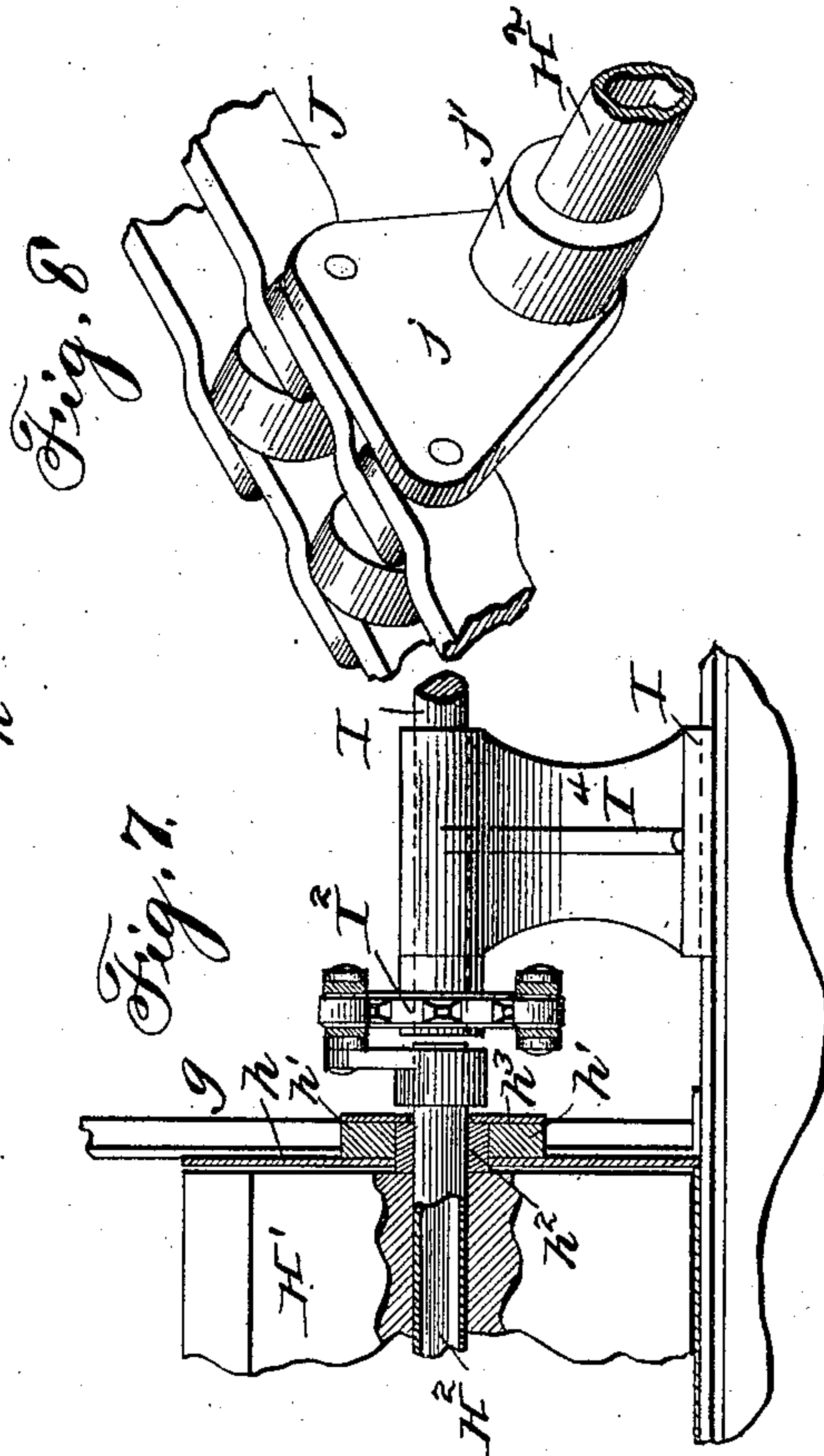
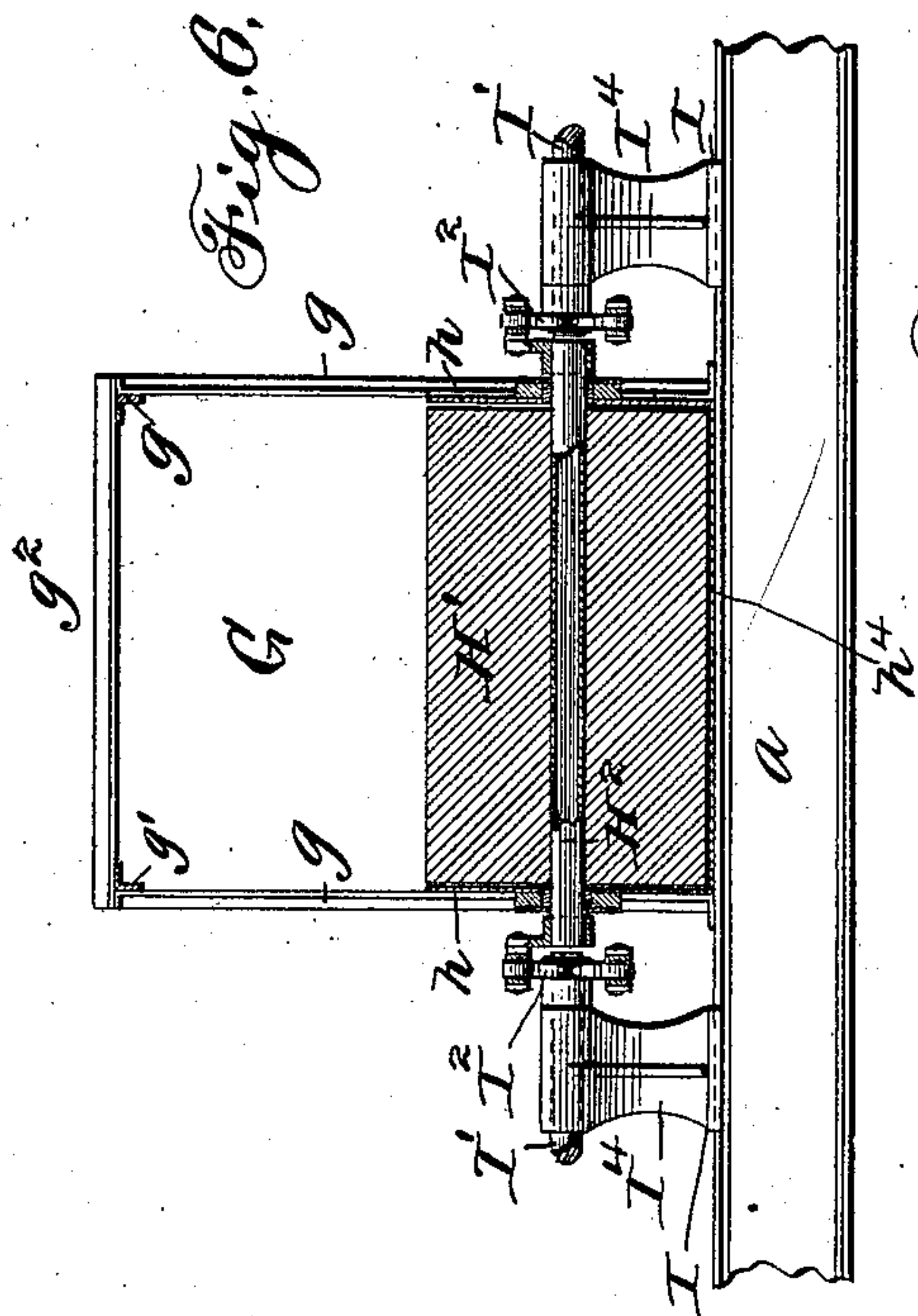
(No Model.)

4 Sheets—Sheet 4

H. B. DIERDORFF.  
BOX CAR LOADER.

No. 575,028.

Patented Jan. 12, 1897.



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# UNITED STATES PATENT OFFICE.

HENRY B. DIERDORFF, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY, OF SAME PLACE.

## BOX-CAR LOADER.

SPECIFICATION forming part of Letters Patent No. 575,028, dated January 12, 1897.

Application filed November 9, 1894. Serial No. 528,313. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY B. DIERDORFF, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Box-Car Loaders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a plan view of my improved car-loading apparatus. Fig. 2 is a side view of the same, looking at it in the direction of the arrow 1 in Fig. 1. Fig. 3 is an end view of the same. Fig. 4 is a section on the line  $xx$ , Fig. 1, showing the plunger-frame. Fig. 5 is a section on the line  $yy$ , Fig. 1, showing the trough-sections withdrawn, so as to permit the plunger-frame to be inserted through the door of an ordinary box-car. Fig. 6 is a section on the line  $zz$ , Fig. 4. Fig. 7 is an enlarged view of some of the parts shown in Fig. 6. Fig. 8 shows in perspective the drive-chain and its attachment for operating the plunger.

My invention relates to improvements in apparatus for loading cars with grain, coal, or other similar materials, its object being to provide a means whereby covered box-cars may be loaded with such material automatically and economically.

My invention therefore consists of a carriage mounted upon a stationary bed, there being means for moving the carriage backward and forward relatively to the stationary frame, combined with devices for receiving the coal from a bin or chute and piling it in the ends of the car. Preferably an engine or motor is mounted upon the sliding frame or carriage for actuating the piling mechanism, the latter mechanism in this case consisting of a reciprocating plunger adapted to force the grain, coal, or the material through troughs to the ends of the car. The troughs are preferably composed of sliding sections adapted to be withdrawn and folded together in small space, so that the plunger support or frame

and the trough-sections on the sliding carriage can be readily inserted through the doors in the side of the car to be loaded. The details incident to the construction and arrangement of my improved apparatus will be hereinafter fully described, and set forth in the claims.

In the accompanying drawings I have shown one form of an apparatus embodying my improvements, but it will be understood that my invention is not limited thereto, as any one skilled in the art may make many and various changes without departing from the spirit of my invention.

Referring to the drawings, I have shown a movable carriage-frame, (designated by A,) which is composed of two or more parallel I-beams  $a a$ , joined by connecting brace-bars  $a^2 a^2$  at the front and rear ends thereof and intermediate cross-braces  $a^3 a^3$ . This frame is as light as is practicable and it is constructed of few parts. The I-beams  $a a$  project slightly beyond the front and rear cross-braces  $a^2 a^2$  and have pointed or wedge-shaped ends  $a^4 a^4$ . This frame is supported and guided upon a stationary frame B, the latter having the upright supports  $b b'$ , top and bottom sills  $b^3 b^5$ , and cross braces or bars  $b^4 b^4$  extending across the top and bottom thereof. In order to make the frame more rigid and better adapted to support the weight which rests upon it, supplemental braces  $b^6 b^6$  may be employed. (See Fig. 3.) Journaled upon the uprights  $b b'$  are shafts  $C^3$ , upon which are mounted loose rolls or wheels  $C' C'$ , upon which the sliding frame A is supported. Wheels  $C^2 C^2$  are mounted in shafts journaled upon the supports  $b' b^2$  above the wheels  $C' C'$  to prevent any vertical movement of the frame A when the latter is moved forward. In order to support the front end of the frame A when it is extended, I provide a supplemental frame B', having the uprights  $b^7$ , cross-brace  $b^8$ , and the inclined supports or braces  $b^9 b^9$ . Upon this frame B' are mounted wheels C, upon which the forward end of the sliding frame rests when the latter is extended.

For moving the frame A forward and back upon the wheels  $C'$ , I employ a chain or cable D, fastened at one end to the rear cross-brace  $a^2$  and passing around a guide-pulley  $C^4$ ,



mounted on the frame B in rear of the wheels C' to a reel E, upon which it is wrapped, and a chain or cable D', passing forward around a loose pulley C<sup>5</sup> and attached to the cross-brace *l*. The reel is divided into two parts *e e'* by a flange *e<sup>2</sup>*, the chain D being wrapped upon the part *e'*, and the chain D' is wrapped upon the part *e*, they extending oppositely around the reel, so that when the latter is rotated in one direction the chain D is unwrapped therefrom and the chain D' is wrapped thereon, or vice versa.

To rotate the reel, I provide a gear-wheel E<sup>2</sup>, mounted upon a sleeve rigid with the reel, and with which a pinion F' meshes, the latter being keyed to a shaft F, journaled in the uprights *b' b'*, there being cranks or handles at F<sup>2</sup> F<sup>2</sup> for rotating it. Thus it will be seen that when, by means of the handles F<sup>2</sup>, the reel is rotated in one direction the chain D' will be wrapped thereon and will draw the frame A slowly forward, the chain D being unwrapped to allow its advance.

Upon the forward end of the frame A is mounted the apparatus for receiving the coal from a bin or chute and distributing it at or near the ends of the car. A rectangular skeleton frame G is provided, it being formed of angle-iron throughout and having the four corner-uprights *g g*, connected at the top by braces *g'* and sills *g<sup>2</sup>*. (See Figs. 4 and 6.) This frame is bolted or riveted to the flanges of the I-beams *a a* of the frame A. Extending half-way up the frame and bolted to the corner-supports *g g* are two transversely-extending plates *h h*, each provided with a central horizontal slot, and *h<sup>4</sup>* is a horizontal flat metallic plate extending across the I-pieces and bolted to them. Within the trough or guideway II thus formed by the vertical side plates *h* and the bottom plate *h<sup>4</sup>* is a reciprocating plunger H', through which passes a shaft or bar H<sup>2</sup>, the latter extending out through the slot of the said plates *h*. The ends of the said shaft H<sup>2</sup> rest in guide-blocks *h<sup>2</sup>*, held in parallel bars *h' h'*, which extend across the frame G outside of the plates *h* and above and below the slots in said plates for the purpose of supporting and guiding the plunger H'. A slotted guide-plate *h<sup>3</sup>* is secured to the guide-bars *h'* on the outer side thereof, the slot extending the length of the movement of the plunger H'. This plate partially closes the slot between the guide-bars *h'* and the blocks *h<sup>2</sup>* to prevent the escape of coal from the trough II.

The plunger H' is reciprocated in the trough or guideway II by means of the following devices: Loosely mounted on each end of the shaft or bar H<sup>2</sup> is a collar *j'*, formed integrally with an attachment *j*, which forms part of or is secured to one of the links of a chain J. The chains J J pass around sprocket-wheels I<sup>2</sup>, the latter being mounted on the ends of short stud-shafts I' I<sup>3</sup>, journaled in standards I<sup>4</sup>, which are formed on cross-braces I. Keyed to the outer ends of shafts I' I' are large

sprocket-wheels K K, to which power is applied from shaft L by means of sprocket-wheels L' L' and chains *k k*. The shaft L is mounted in bearings on the cross-braces I I and has upon its inner end a bevel-wheel L<sup>2</sup>, meshing with and driven by a smaller bevel-wheel M' on a cross-shaft M.

On a plate O', secured to the cross-braces *a<sup>3</sup> a<sup>3</sup>*, is mounted a suitable motor, preferably in the form of an engine O, which drives a crank-shaft N, also mounted in bearings on plate O', which has a standard *o* for that purpose. On the outer projecting end of shaft N is a sprocket-wheel N', connected by a chain *m'* to a wheel M<sup>2</sup> on the shaft M. Thus it will be seen that power will be applied from the crank-shaft N to reciprocate the plunger H' by means of chain *m'*, wheel M<sup>2</sup>, shaft M, bevel-wheel M', vertical bevel-wheel L<sup>2</sup>, longitudinally-arranged shaft L, sprocket-wheels L', chains *k*, wheels K, shafts I', chains J, and rod H<sup>2</sup>.

In order that the coal which is fed into the trough in frame G may be deposited in the ends of the car, I combine with the initially-receiving trough H extensible troughs P P, each composed of a series of sections *p p' p<sup>2</sup> p<sup>3</sup>*, adapted to slide into each other. These sections are preferably made of such form as that when any one is extended it will be held securely in place by frictional contact with the adjacent intersection, although, if desired, separate fastening means may be employed to connect the sections when extended. Each trough-section *p* has a metallic end brace P', cast with lugs having eyes through which pintles P<sup>2</sup> pass and secure it to the uprights *g*. Stops are provided by the outer flange of I-beam *a* and the lug or bracket P' to prevent the trough from being lowered beyond a certain plane.

The troughs P P are rocked upward (see Fig. 5) when the machine is being moved into the car, the sections fitting into each other and being provided with a chain Q, having hook *q* and eye *q'* for securing them in their non-working position.

When it is desired to load the car, (the parts being in the position shown in Fig. 5,) the carriage is fed forward through the car-door and the troughs P P are extended, as in Fig. 2. Then, coal being fed into the trough H from chutes R and S, the engine is started, which immediately causes the plunger to reciprocate through the intermediate shafting and gearing. The coal is gradually forced out through the troughs P P into the ends of the car.

I am aware that car-loaders have been heretofore proposed, the same consisting of a frame, a movable carriage thereon, and a pivoted blade swinging in a curvilinear line or path and violently striking the coal to throw it to the ends of the car, and I do not claim such a construction as of my invention.

I find that such devices tend to break the coal into small lumps and require too great



power to operate them successfully. I use a trough which extends practically to the ends of the car and through which the coal is forced step by step by a rectilinearly-moving plunger. The many and various advantages incident to such need not be enumerated, as they are apparent to any one acquainted with such devices.

By having the plate or plunger H' move rectilinearly on lines substantially parallel to the lengths of the car I can impart to it during each throw a substantially uniform force and motion, so that hurling or throwing of the coal is avoided, and the movement imparted to it is a relatively slow pushing action, of such nature that at each reciprocation a relatively large quantity of coal can be advanced toward the end of the supplemental delivery-trough, and when it reaches the latter it will drop with but little force and breakage is avoided.

What I claim is—

1. In a car-loading mechanism, the combination of the outer stationary frame, the carriage movable thereon into the car, the trough mounted on the carriage and having a central part on the transverse lines of the car-door and opposite end parts, all of said parts having stationary bottoms and sides, and a pushing device reciprocating longitudinally in the central part of the trough and above the stationary bottom, and means for moving it bodily back and forth therein, substantially as set forth.

2. The combination of the outside frame, the carriage, the trough having a central part fixed upon the carriage, and two opposing end parts formed of foldable or telescoping sections adapted to be folded to the side lines of the carriage and when in operation having stationary bottoms and sides, a reciprocating pusher mounted in the fixed central part of the trough, and means for reciprocating it bodily above the bottom thereof, whereby the material is pushed through the end parts of the trough in contradistinction from being tossed or thrown substantially as set forth.

3. The combination with the carriage, a platform, the trough, and the plunger, of the chain connected to the plunger for reciprocating it, substantially as set forth.

4. The combination with the carriage or platform, the trough, a plunger therein, parallel chains on each side of said plunger and loosely connected thereto, and means for moving said chains, substantially as set forth.

5. The combination with the carriage or platform, and the transverse trough thereon, of parallel chains traveling longitudinally of said trough, sprocket-wheels for supporting and driving the chains, a cross-plate connected to said chains, and traveling in said trough, a power-shaft on said carriage and power-transmitting devices connecting said sprocket-wheels with said power-shaft, substantially as set forth.

6. The combination with the main frame, and the carriage thereon adapted to be inserted into a car transversely thereof, of a rectilinearly-reciprocating plunger mounted on the carriage, means for imparting movement to the plunger on lines parallel to the length of the car, a stationary trough or guide below the plunger, and a delivery-trough extending from the plunger longitudinally of the car to points beyond the sides of the door, substantially as set forth.

7. The combination with the main frame, and the carriage thereon movable into and transversely of a car, of a trough on the carriage situated longitudinally of the car, a plate in said trough moving rectilinearly longitudinally of the car, and a supplemental delivery-trough extending from the aforesaid trough longitudinally of the car to points beyond the sides of the door, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY B. DIERDORFF.

Witnesses:

RUFUS HUTCHINS,  
FRANK WEADON.