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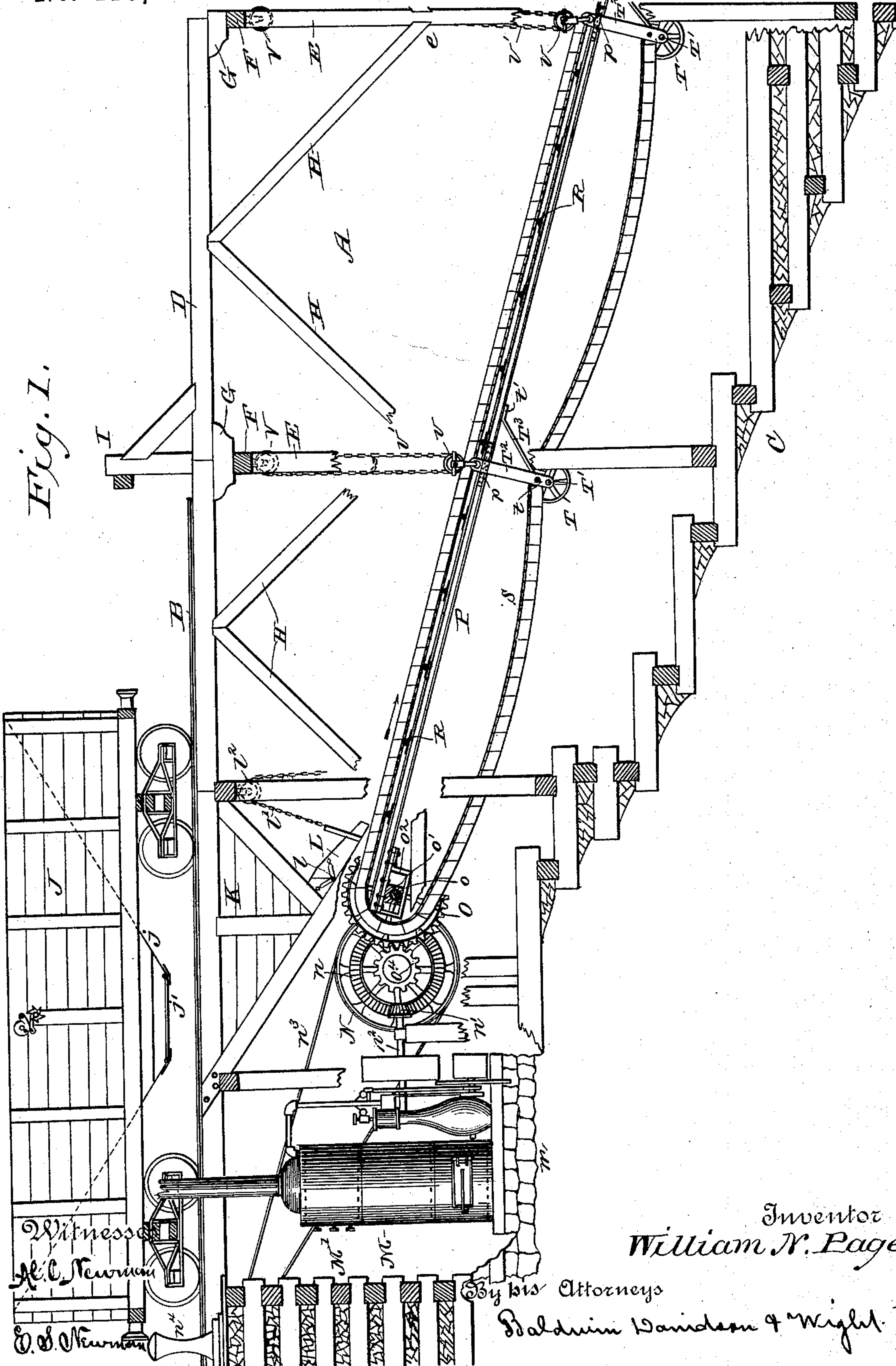
4 Sheets—Sheet 1.

W. N. PAGE.  
COAL CONVEYER.

No. 410,185.

Patented Sept. 3, 1889.

Fig. 1.



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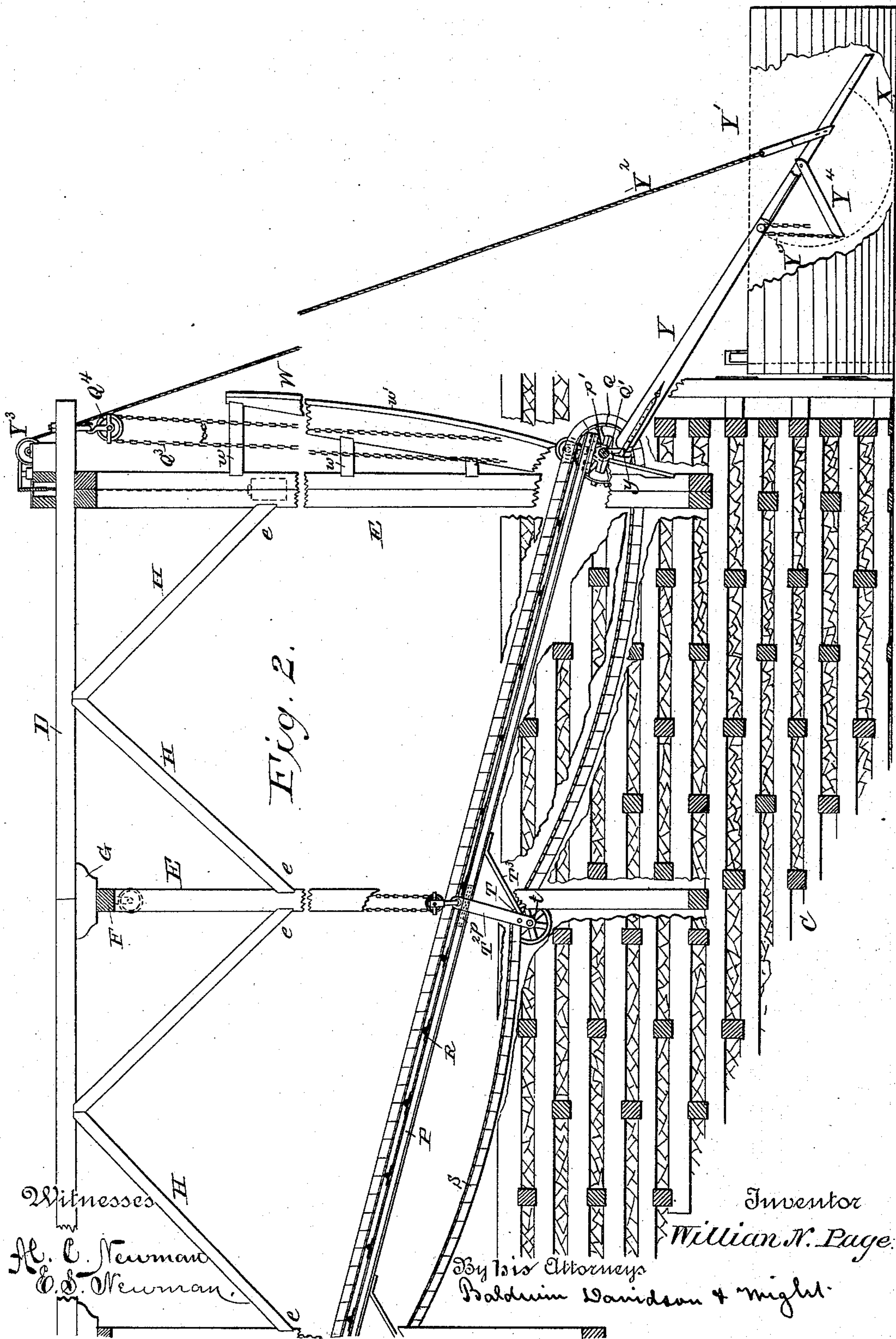
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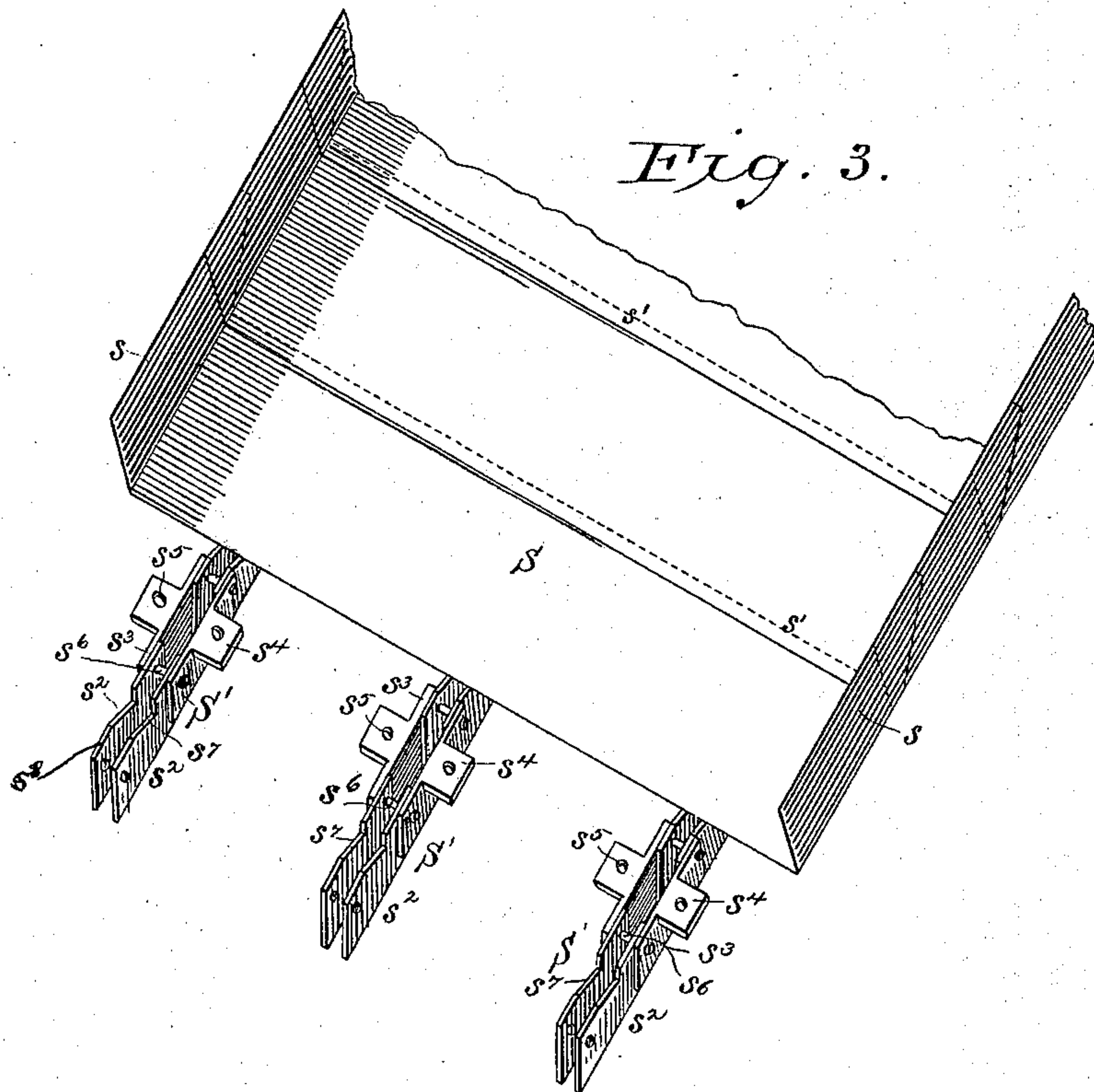
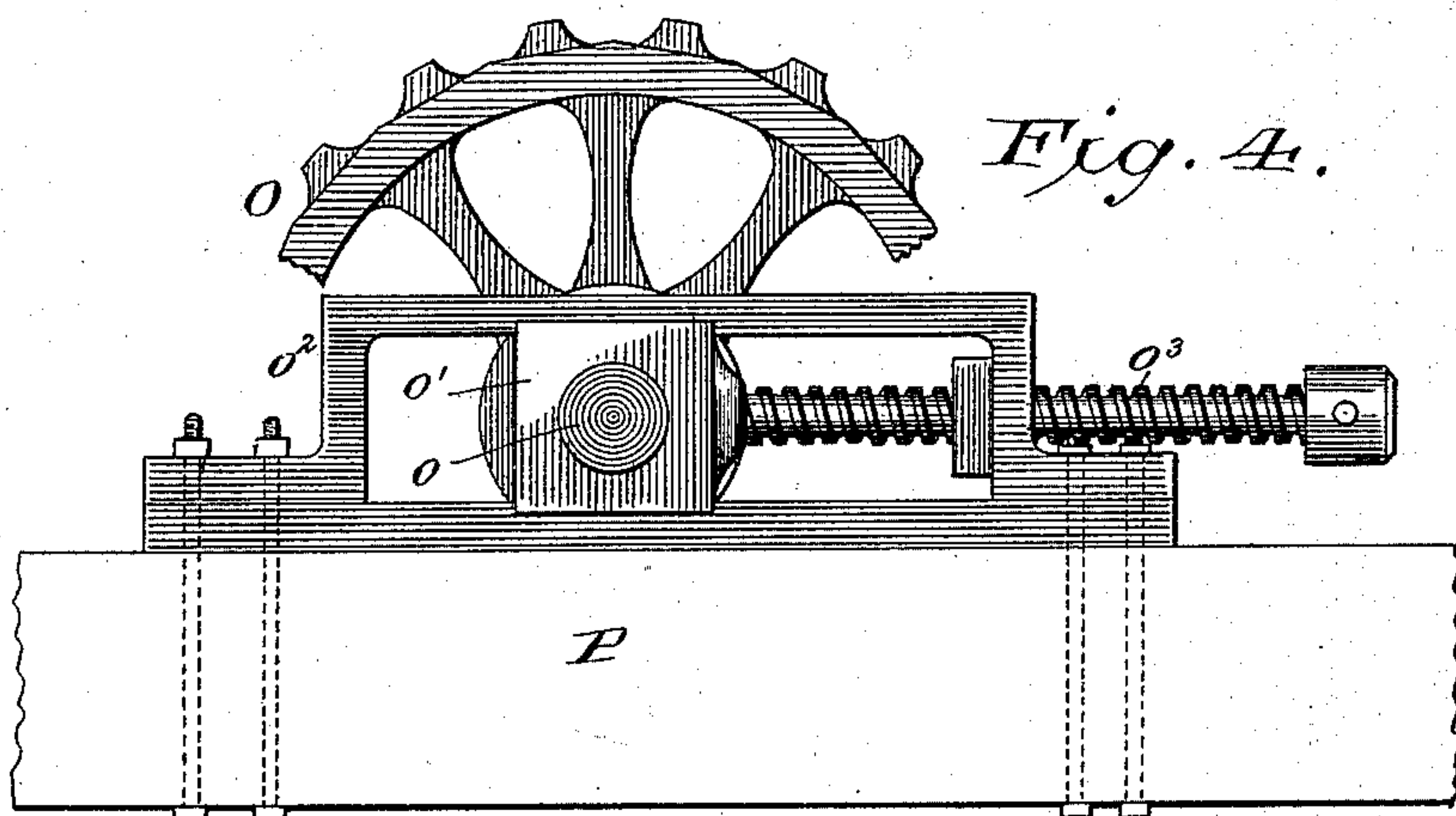
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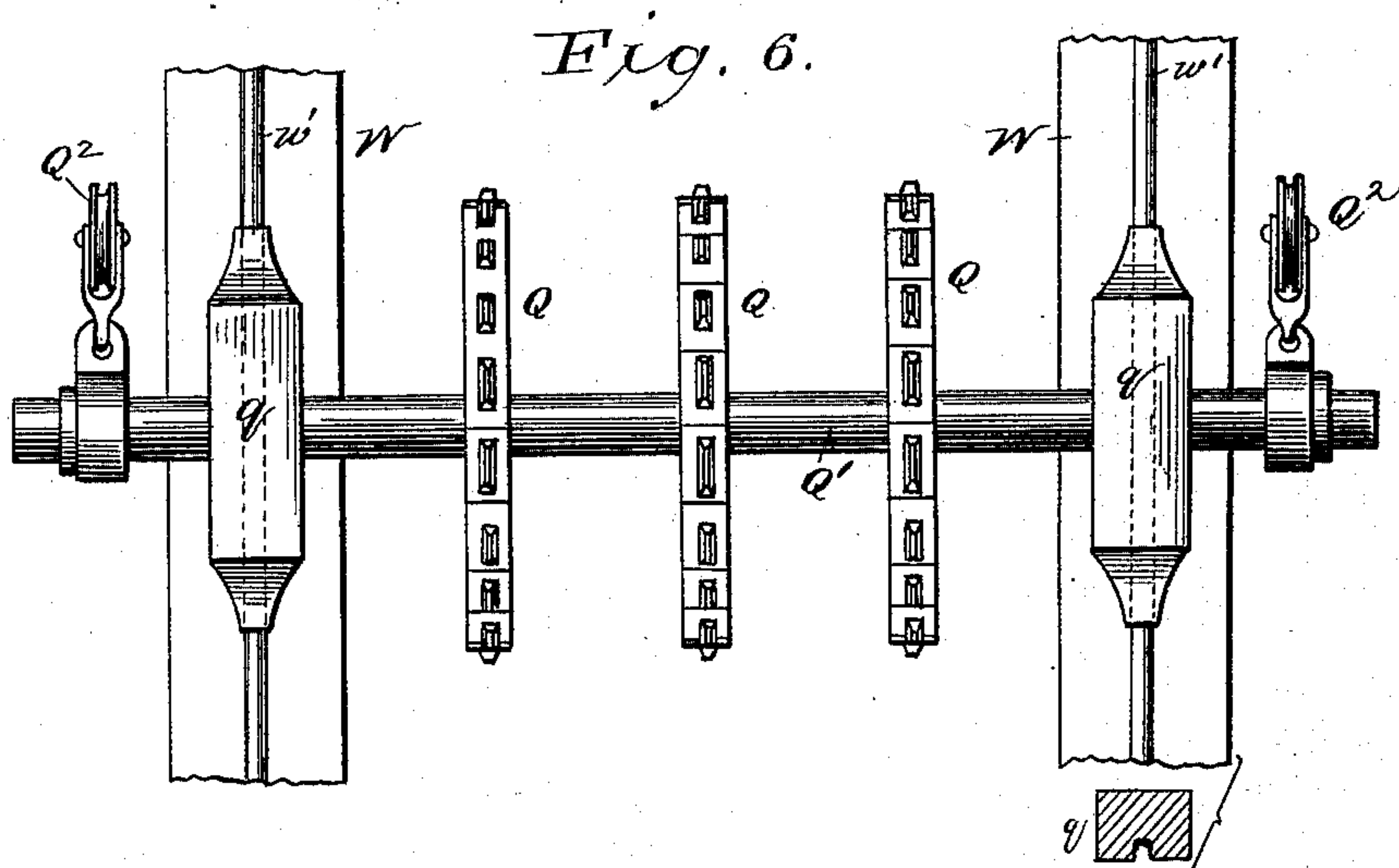
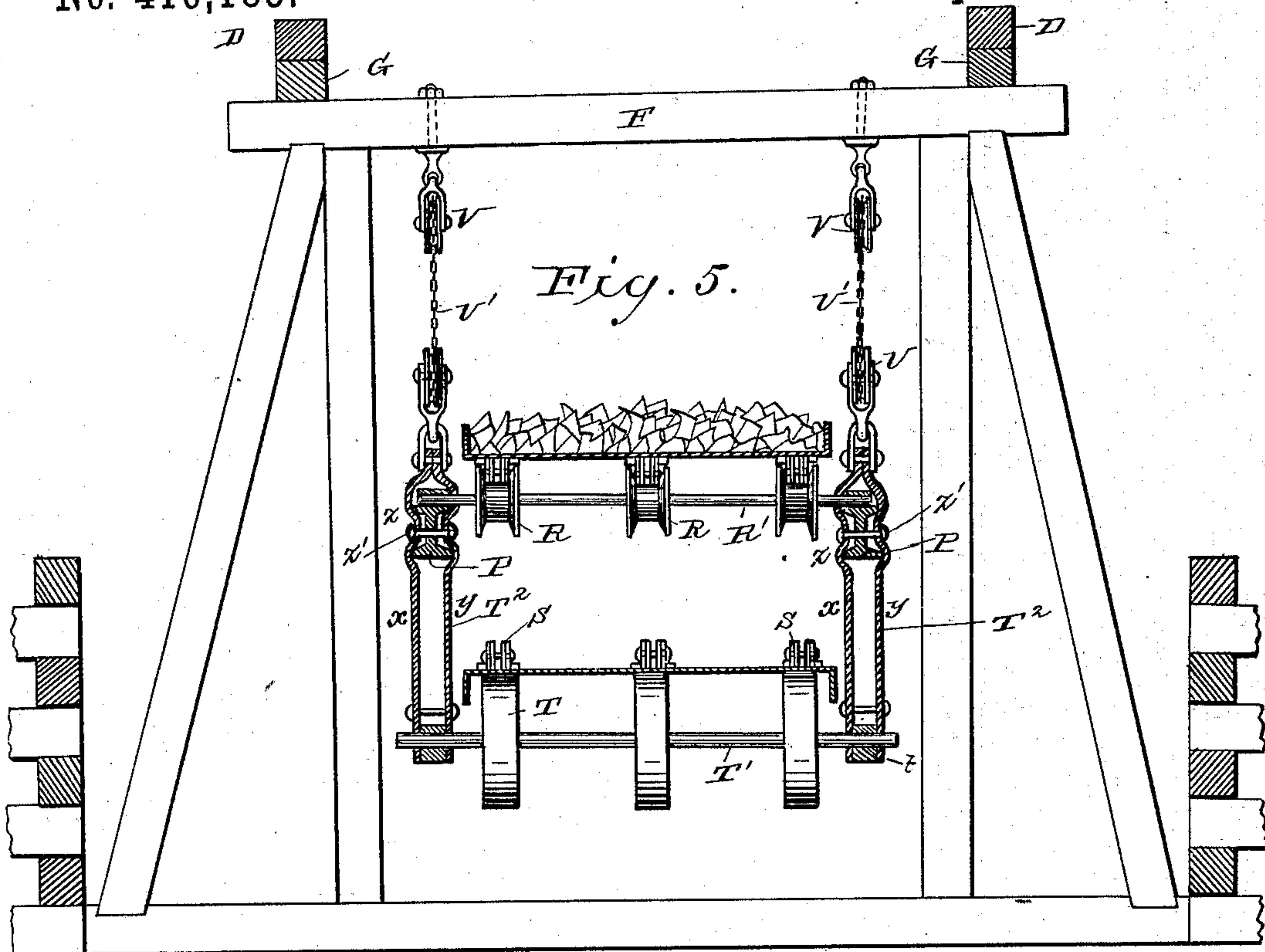
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# UNITED STATES PATENT OFFICE.

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## COAL-CONVEYER.

SPECIFICATION forming part of Letters Patent No. 410,185, dated September 3, 1889.

Application filed April 15, 1889. Serial No. 307,309. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM N. PAGE, a citizen of the United States, residing at Powellton, in the county of Fayette and State of West Virginia, have invented certain new and useful Improvements in Coal-Conveyers, of which the following is a specification.

My invention is especially designed for conveying coal or other material from railway-cars to barges or other similar vessels. It is desirable that the railway-track should be located above the water-level, so as to be protected from freshets and other like troubles, and that conveniently-adjustable apparatus should be employed for conveying the load from the cars to the barges below. It is also desirable that the conveyer should be arranged to convey the coal as gently as possible to guard against breakage. Apparatus which will carry the coal along with it, instead of allowing it to slide upon it, is therefore to be preferred.

The object of my invention is to provide apparatus possessing these advantages, and also to construct the apparatus at as small a cost as possible consistent with strength and durability.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation, with some of the parts broken away and some in section, of the upper end of my improved coal-conveyer. Fig. 2 is a similar view of the lower end. Fig. 3 is an isometric view of a section of the conveying belt or apron. Fig. 4 is an elevation showing in detail one of the sprocket-pulleys and means for adjusting it. Fig. 5 is an end view of the supporting-frame, and showing, also, in transverse section the conveying belt or apron and its supporting devices; and Fig. 6 is a detail end view of the lower sprocket-wheels and their adjusting devices.

The frame-work A, on which the railway-track B is mounted and which supports the conveyer, is preferably constructed by forming a bed-work C of timbers, arranged in any preferred form to afford strength and durability and gradually inclining from the water-level X upwardly. The top beams D are arranged nearly in a horizontal plane, and on them the platform is mounted which carries

the tracks B. The beams D are supported on uprights or standards E, firmly embedded in the bed-work C, and each connected by a cross-piece F, between which and the beams D are preferably interposed supporting-bolsters G. Braces H connect with the beams D centrally between the posts E, and are also secured to the posts E at *e* to render the frame strong and rigid. A bumper I is mounted on the top of the frame-work at the end of the track B to limit the movement of the car J. The car J is preferably made with a hopper *j*, having at the bottom a door *j'*, adapted to deliver the load to a hopper K at the upper end of the frame-work. The hopper K is provided at its lower end with a chute L, hinged at *l* and provided with an adjusting-chain *l'*, which passes over a pulley *l''*.

An engine M, of any suitable construction, is located at the upper end of the frame-work in a compartment M', the floor or bottom of which is preferably constructed of masonry *m*. A driving-wheel N, mounted in suitable bearings, carries a bevel-wheel *n*, which gears with a pinion *n'* on a shaft *n''*, connected with the engine M. A belt *n'''*, passing over the wheel N, leads to the capstan *n''''*. The conveyer may, however, be run by gravity without the aid of the engine when the inclination is sufficient.

The upper sprocket-pulleys O (one of which is shown on an enlarged scale in Fig. 4) are carried by a shaft *o*, having bearings in blocks *o'*, free to slide in guide-straps *o''*. The straps *o''* are firmly bolted in the girders P, which extend the entire length of the frame-work. The blocks *o'* are connected with adjusting-screws *o'''*, as shown in Fig. 4, by means of which they may be slid along in the straps, and thereby adjust the shaft *o* longitudinally relatively to the girders. A cog-wheel O' on the shaft *o* is geared with a cog-wheel *o''*, carried on the shaft of the wheel N, by which means the sprocket-wheels are driven. The girders P are jointed at intervals by fish-plates *p*, and at their lower ends are secured to blocks *p'*, in which is journaled the shaft Q' of the lower sprocket-pulleys Q. The girders carry on their upper sides rollers R, (shown in detail in Fig. 5,) and arranged at intervals apart, as shown, Figs. 1 and 2.



An endless apron or conveying-belt S traverses the sprocket-wheels O and Q at each end of the apparatus. The belt or apron is preferably constructed as shown in Fig. 3, being formed of sheet metal plates having side flanges s, and overlapping at s' to form a strong and rigid connection. To the under side of the apron are secured chains S', preferably formed of hinged double links s<sup>2</sup>. The links s<sup>3</sup> are provided with laterally-projecting lugs or ears s<sup>4</sup>, with perforations s<sup>5</sup>, through which extend the rivets or bolts for securing the apron to the chain. The links s<sup>3</sup> are arranged a suitable distance apart and are secured to the adjacent links by bolts s<sup>6</sup>. The adjacent links are formed with notches s<sup>7</sup> and inclined ends s<sup>8</sup> to conform to the under side of the belt. The teeth of the sprocket-pulleys extend through the links and engage with them, so that as the pulleys revolve, the chain, and consequently the apron, is carried along correspondingly.

The lower portion of the endless belt or apron S is supported by wheels or rollers T, arranged on a shaft T', having bearings in links T<sup>2</sup>, secured at their upper ends to the girders P, and at their lower ends t secured to braces T<sup>3</sup>, attached to the under sides of the girders at t' on that side of the rollers toward which they revolve. The links T<sup>2</sup> are preferably constructed, as shown in Fig. 5, in two parts, x and y, embracing the girders at z, and secured to them by bolts or rivets z'.

The shaft R' of the rollers R rests in boxes on the girders P. To the upper ends of the links T<sup>2</sup> are flexibly-connected pulleys U, over which extend adjusting-chains U', connected with differential pulleys V, at the top of the frame-work. Similar adjusting-pulleys and connections are located at intervals along the conveyer. In the drawings I have shown four, but a greater or less number may be employed.

At the lower end of the frame-work are secured vertical guide-bars W, curved, as shown, and secured to the end standards E by braces w. The guide-bars W are provided with guide-rails w', curved in the arc of a circle from the shaft o of the upper sprocket-pulleys as a center.

The boxes q of the pulleys Q are grooved and fit over the guide-rails w', on which they are free to slide. On the outer end of the shaft Q' of the sprocket-pulleys Q are connected pulleys Q<sup>2</sup>, over which pass chains Q<sup>3</sup>, passing also over differential pulleys Q<sup>4</sup>, suspended from the top beams D.

A chute Y, hinged at y at the lower end of the conveying-apron, is adapted to extend into a barge or similar vessel Y', and at its outer end is connected with a rope or chain Y<sup>2</sup>, which extends over a pulley Y<sup>3</sup> at the top of the frame-work, and may also carry a dead weight to in a measure counterbalance it.

The chute Y, near its lower end, is provided with an opening opened and closed by a sup-

plemental chute Y<sup>4</sup>, raised and lowered by a chain Y<sup>5</sup>. As the upper sprocket-wheel O is driven from the engine M, the endless belt or apron S will be carried along in the direction indicated by the arrow, and the load delivered through the hopper K and chute L will be carried to the barge Y' below.

To provide for variations in the water-level, the endless apron is adjusted by means of the chains U' and Q<sup>3</sup> and their connecting mechanisms. The chain Q<sup>3</sup> is first operated to raise or lower the lower end of the conveyer, and then the chains U' are similarly operated, the joints of the girders P being sufficiently flexible to allow of such adjustment; or, if preferred, all the adjusting-chains may be operated simultaneously. Differential pulleys being employed, the conveyer will remain in the position to which it is adjusted. The chute Y may be adjusted correspondingly with the adjustment of the conveyer.

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of the frame-work, the endless apron or conveyer, the end wheels over which it traverses, the girders extending longitudinally beneath the upper side of the apron, the links secured to the girders, the supporting wheels or rollers journaled in the lower ends of the links, and the adjusting devices connected with the upper ends of the links, for the purpose specified.

2. The combination, substantially as hereinbefore set forth, of the frame-work, the endless apron or conveyer, the upper end wheels over which it traverses, the lower end wheels, the vertical guide-rails curved in the arc of a circle from the upper end wheel as a center, and the grooved bearing-blocks of the lower end wheel, adjustable vertically on the guide-rails.

3. The herein-described apparatus, comprising the bed-work, the uprights or standards, the top beams carried thereby, the tracks mounted on the top beams, the hopper at the upper end of the frame-work, the adjustable chute at its lower end, the inclined vertically-adjustable conveyer extending under the top beams, from which it is suspended at each end and intermediately.

4. The herein-described apparatus, comprising the frame-work, the endless apron or conveyer, the wheels at each end thereof which it traverses, the longitudinal girders, the shafts R', mounted in bearings on the girders, the rollers carried by the shafts and on which the apron is supported, the links T<sup>2</sup>, secured to the girders and suspended from pulleys on the frame-work, the shafts T', mounted in the lower ends of the links, and wheels T thereon for supporting the endless conveyer or apron on its lower or returning side.

5. The herein-described apparatus, comprising the frame-work, the endless apron or



conveyer, the upper end wheels over which it  
traverses, the girders, the lower end wheels,  
the vertical guide-rails at the lower end of  
the frame-work, and means, substantially such  
5 as described, for adjusting the lower end of  
the apron and the girders along the guide-rails  
and from the axis of the upper end wheels as  
a center.

In testimony whereof I have hereunto sub-  
scribed my name.

WILLIAM N. PAGE.

Witnesses:

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