

(No Model.)

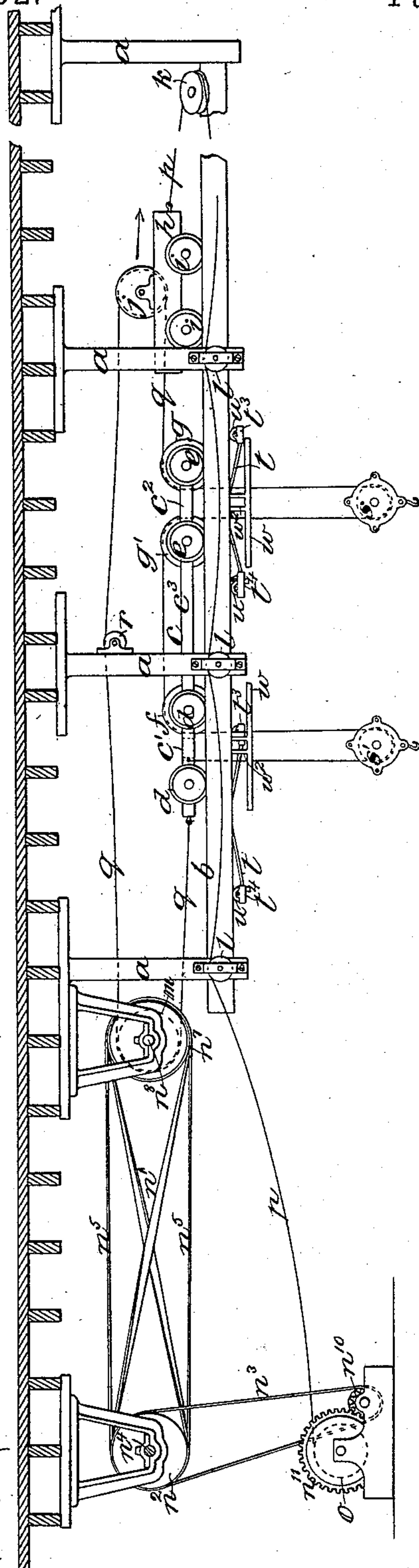
3 Sheets—Sheet 1.

T. S. MILLER.  
CONVEYING APPARATUS.

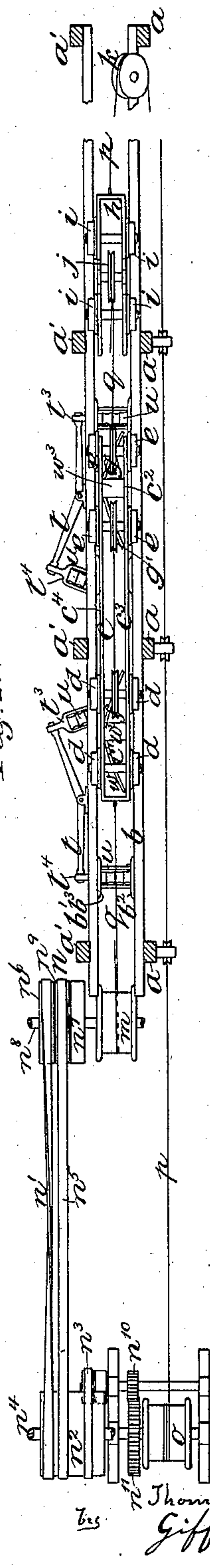
No. 577,192.

Patented Feb. 16, 1897.

*Fig. 1.*



*Fig. 2.*



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Fig. 3.

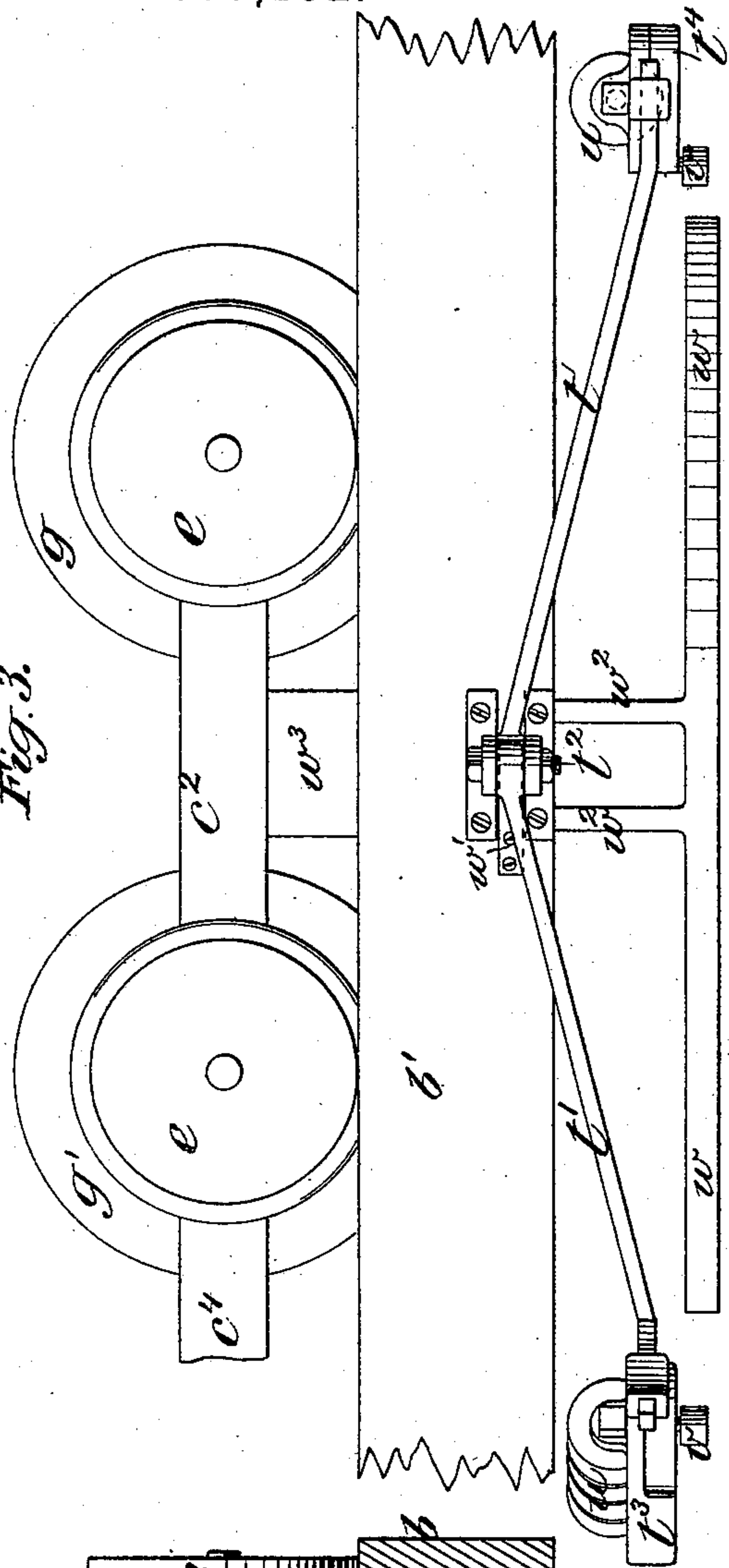


Fig. 4.

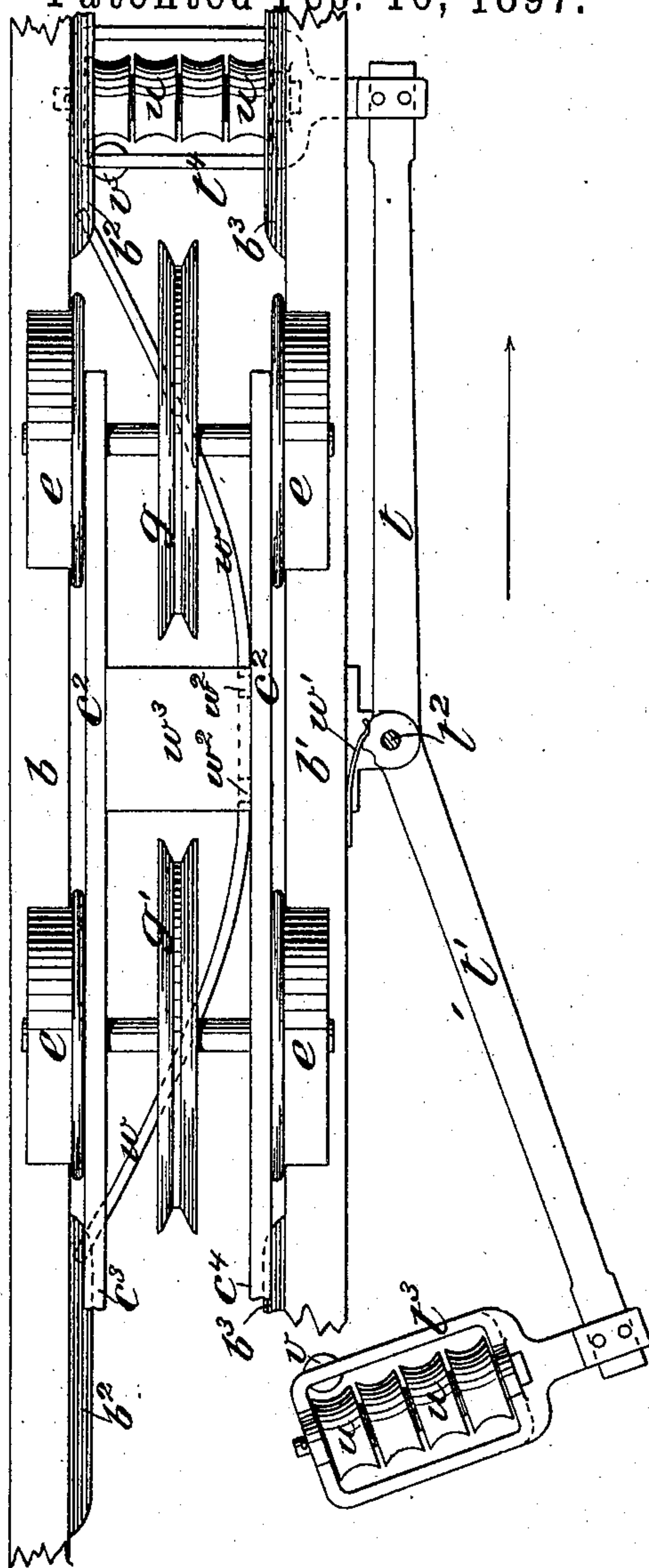
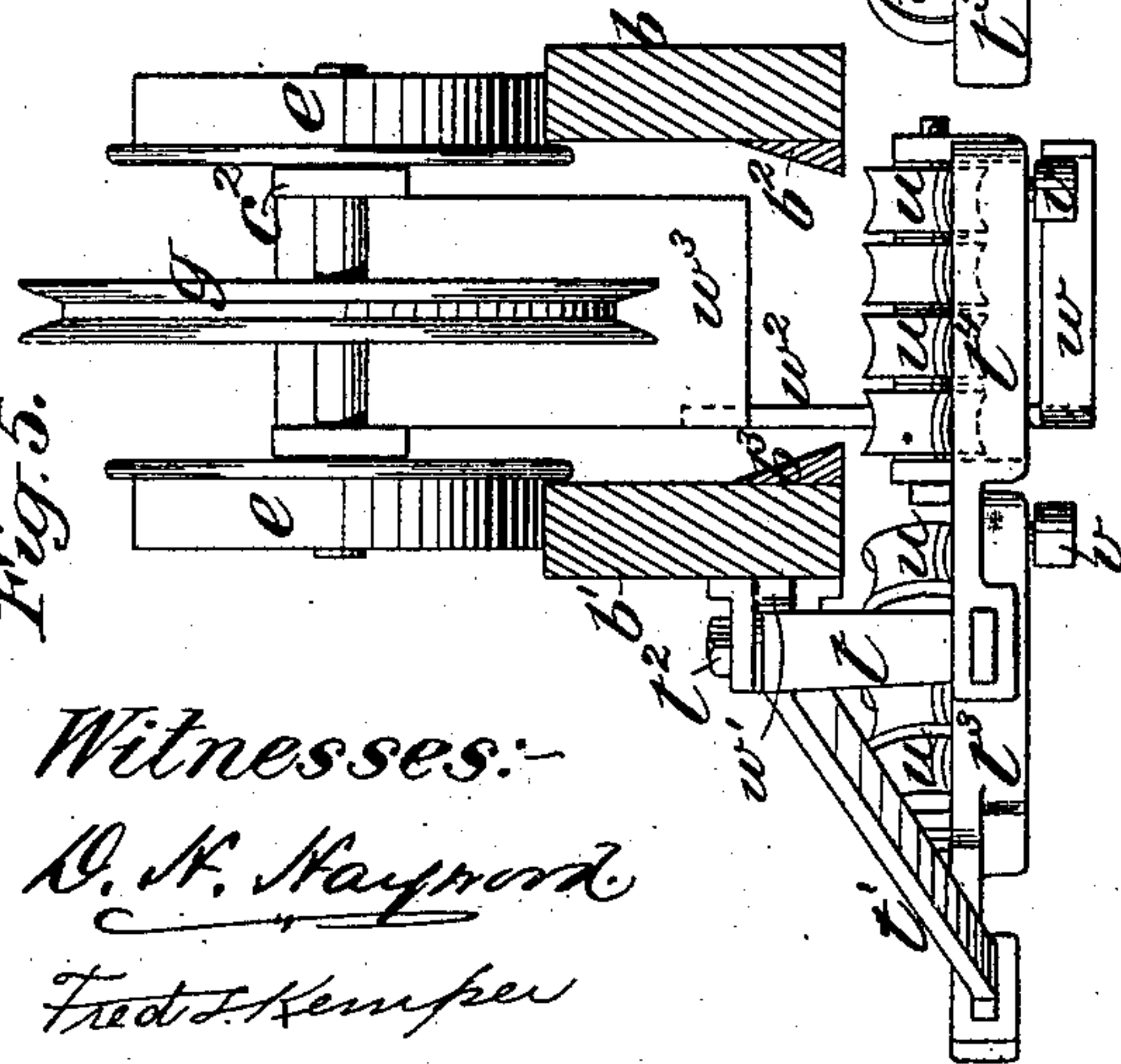


Fig. 5.



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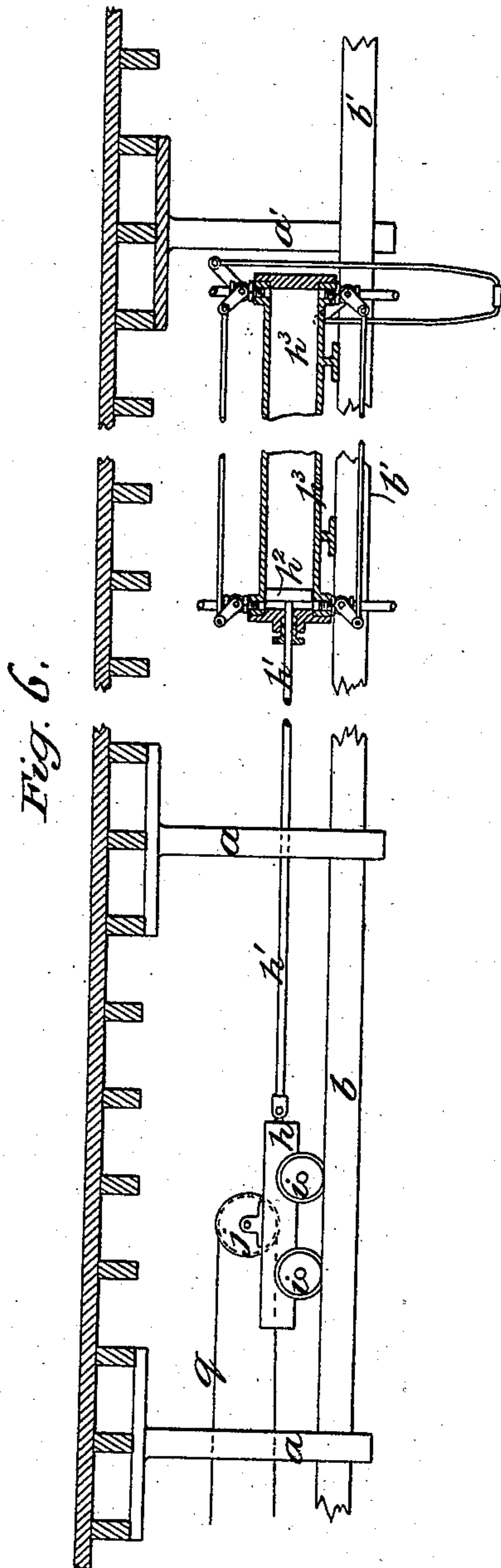
(No Model.)

3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF SOUTH ORANGE, NEW JERSEY.

## CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 577,192, dated February 16, 1897.

Application filed September 12, 1892. Serial No. 445,643. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS SPENCER MILLER, of South Orange, in the State of New Jersey, have invented a new and useful Improvement in Conveying Apparatus, of which the following is a specification.

One feature of my invention is a rope-carrier one member of which will be thrown into supporting position as the other member is thrown out of the carriage-pathway. Another feature is the mounting and actuating of the fall-rope, so that by separating or spreading its supports the fall-block is raised, and in that position the carriage is caused to travel.

Other features are set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of one form of the apparatus containing my invention. Fig. 2 is a plan view of same. Fig. 3 is a side elevation of part of the carriage and one fall-rope support. Fig. 4 is a plan view of the same. Fig. 5 is an end elevation, partly in section. Fig. 6 is a modification in detail.

*a* and *a'* are hangers supporting the parallel trackways *b b'*.

*c* is a load-carriage composed of the two parts *c' c''*, connected by the bars or other connections *c<sup>3</sup> c<sup>4</sup>*. The part *c'* is provided with the four wheels *d*, and the part *c''* (shown in in Fig. 5) with the four wheels *e*. The part *c'* is also provided with a sheave *f*, and the part *c''* with the sheaves *g* and *g'*.

*h* is a traveler supported on the trackways by the wheels *i* and supporting the sheave *j*.

*k* is a sheave secured at the end of the trackways, and *l* are guide-rolls mounted upon the outside of the hangers *a*.

*m* is a drum fixed upon a shaft *n<sup>8</sup>* at the end of the space between the trackways.

*n* is a pulley mounted upon the same shaft with the drum *m*. The pulley is in three parts, the two outside parts *n<sup>6</sup>* and *n<sup>7</sup>* being fast on the shaft *n<sup>8</sup>* and the central part *n<sup>9</sup>* being loose on the shaft. The cross-belt *n<sup>1</sup>* and straight belt *n<sup>5</sup>* connect the pulley *n* with a pulley *n<sup>2</sup>*, mounted on a driven line-shaft *n<sup>4</sup>*.

*o* is a drum which may be driven from the line-shaft *n<sup>4</sup>* by the belt *n<sup>3</sup>* through gears *n<sup>10</sup>* *n<sup>11</sup>*. These cross and straight belts may be arranged to run side by side on the pulley *n<sup>2</sup>*, which is broad enough for that purpose, and

the pulley *n*, consisting of two fast parts separated by a loose part. By shifting the belts either the straight belt or the cross-belt may be made to drive.

*p* is an outward-hauling rope extending from the drum *o* over the friction-rollers *l*, around the sheave *k*, and back to the traveler *h*, to which it is made fast.

*q* is an endless rope made fast at one end to the carriage *c'* and extending with one or more turns around the drum *m*, over friction-rollers *r*, around the sheave *j*, over the sheave *g*, down to a fall-block *s*, up again and over a sheave *g'*, over the sheave *f*, down to the fall-block *s'*, and up again to the carriage *c'*, where it is made fast.

*t* are the rope-carriers, one of which is shown in detail in Figs. 3 and 4. Each of them consists of a rocker *t'*, pivoted at *t<sup>2</sup>* to one of the tracks and carrying at opposite ends the rope-supports *t<sup>3</sup> t<sup>4</sup>*, each containing a series of independent friction-rollers *u*. The rope-supports are so secured to the rocker *t'* that when the rocker is in position shown in Fig. 4 the rollers carried by support *t<sup>4</sup>* will be in the position shown in Fig. 4, where they occupy a supporting position directly beneath the space between the trackways. At the same time the rope-support *t<sup>3</sup>* will occupy the position shown in Fig. 4 at one side. When the rocker *t'* is rocked into its other position, the rollers carried by the rope-support *t<sup>3</sup>* will be directly beneath the space between the trackways, and the support *t<sup>4</sup>* will be at one side. Projecting from each of the rope-supports *t<sup>3</sup>* and *t<sup>4</sup>* is a friction-roller *v*, and hanging rigidly from the block *w<sup>3</sup>* of each carriage by side hangers *w<sup>2</sup>* is a deflector *w*, inclined laterally at both ends, as shown in dotted lines, Fig. 4, in position to strike against the roller *v* of either of the rope-supports *t<sup>3</sup>* or *t<sup>4</sup>* that happens to be in supporting position and push it to one side. The rocker *t'* is long enough so that the distance between the rope-supports *t<sup>3</sup>* and *t<sup>4</sup>* is greater than the length of the carriage, so that as the forward end of the deflector on the carriage, moving in the direction of the arrow, Fig. 4, pushes rope-support *t<sup>4</sup>* to one side the other rope-support *t<sup>3</sup>* will swing into supporting position immediately behind the carriage. Therefore one or the other of the rope-supports *t<sup>3</sup>* or *t<sup>4</sup>* must be in supporting



position. The spring  $w'$ , operating in the two notches shown on the rocker  $t'$ , will prevent the rocker from occupying any intermediate position. The inclines  $b^2$   $b^3$  serve to center  
5 the rope onto the supporting-rollers  $u$ .

The operation is as follows: Suppose a load is being hoisted on each of the fall-blocks shown in Fig. 1, that on the fall-block  $s$  being one ton and that on the fall-block  $s'$  being  
10 two tons. The rope  $p$  is wound in upon the drum  $o$ . The first effect will be to haul out the traveler  $h$ , so as to haul the fall-block  $s$  up till it strikes the block  $w^3$  of carriage-section  $c^2$ . The next effect will be to haul the  
15 fall-block  $s'$ , carrying the heavier weight, up till it strikes the block  $w^3$  of carriage-section  $c'$ . This is all caused by the movement of the traveler  $h$  in the direction of the arrow. The drum  $o$  is now stopped and the drum  $m$   
20 is started. Thus the traveler  $h$  remains stationary and the rope  $q$  travels in either direction required, conveying the carriage  $c$  correspondingly along the trackway to the point required, when the drum  $m$  is stopped  
25 again and the rope  $p$  paid out until the loads are lowered. The rope-carriers  $t$  support the sag of rope  $q$ , particularly when the rope  $p$  is being paid out for the purpose of lowering the unloaded fall-blocks  $s$  and  $s'$ .

30 The sections contained in the carriage  $c$ , which I have shown as two, may be reduced to one or may be multiplied to any extent desired, in which latter case the fall-rope will be correspondingly extended to each. In lieu  
35 of actuating the traveler  $h$  by the drum  $o$  through the rope  $p$  it may be actuated by a rod  $h'$  or other member, Fig. 6, connected with a piston  $h^2$ , reciprocated within the cylinder  $h^3$  by any power.

40 The function of the rocker  $t'$  being to throw one of the rope-supports into position as the other is thrown out, other members may be used as equivalents for the same purpose.

45 The supports  $t^3$  and  $t^4$  are shown as being carried by the rocker  $t'$ , but they might be carried in guideways fixed to the track or otherwise supported.

I do not wish to confine myself to the double trackway shown and described.

50 I claim—

1. In a conveying apparatus, in combination, a trackway, a load-carriage traveling thereon, a fall-rope hanging from said load-carriage and extending horizontally to an end  
55 of the span, two fall-rope supports below the level of the horizontal portion of said fall-rope, means whereby the same are successively moved out of the way of the vertical part of said fall-rope and a connection between the  
60 two whereby the movement of one out of the way throws the other into supporting position below the horizontal portion of said fall-rope, substantially as described.

65 2. In a conveying apparatus, in combination, a trackway, a load-carriage traveling thereon, a fall-rope hanging from said load-carriage and extending horizontally to an end

of the span, two fall-rope supports below the level of the horizontal portion of said fall-rope, means whereby the same are successively  
70 moved out of the way of the vertical part of said fall-rope and a connection between the two whereby the movement of one out of the way throws the other into supporting position below the horizontal portion of said fall-rope  
75 and a spring in antagonism to which said movement is made substantially as described.

3. In a conveying apparatus, in combination, the two tracks, the load-carriage traveling thereon, a fall-rope hanging from said  
80 carriage and extending horizontally to an end of the span, a rocker pivotally supported intermediate its two ends and adapted to rock in a horizontal plane laterally of said tracks, a fall-rope-supporting roller mounted in ver-  
85 tical position upon and moved by each extremity of said rocker below the level of the horizontal portion of said fall-rope and means whereby said rocker is reciprocated as the load-carriage passes, substantially as de-  
90 scribed.

4. In a conveying apparatus in combination a trackway, a load-carriage traveling thereon, a traveler located at the farther end  
95 of said trackway, means whereby said traveler is propelled outwardly, a fall-rope sheave mounted upon said traveler, a sheave at the near end of said trackway, an endless fall-rope supported by said two sheaves and by the  
100 load-carriage and forming a loop depending from the load-carriage whereby as the traveler moves out the fall-rope performs the function of hoisting and the fall-block supported by said loop, substantially as described.

5. In a conveying apparatus in combina-  
105 tion, a trackway, a load-carriage traveling thereon and provided with the block  $w^3$  secured between the side frames of the load-carriage, a rope-support adapted to be deflected as the carriage passes and a deflector carried  
110 by said carriage; the said deflector being suspended upon a hanger secured to the block  $w^3$  of the load-carriage, substantially as described.

6. In a conveying apparatus in combina-  
115 tion, a trackway, a load-carriage running upon said trackway, a traveler running upon said trackway continued, a fall-rope sheave mounted upon said traveler, means for propelling said traveler outwardly, a fall-rope ex-  
120 tending from said traveler to said load-carriage below which it forms a loop and thence to the near end of said trackway whereby as the traveler moves out the fall-rope performs the function of hoisting, a fall-block sus-  
125 pended by said loop and means whereby said load-carriage is propelled, substantially as described.

7. In a conveying apparatus in combina-  
130 tion, a trackway, two load-carriages traveling thereon, a traveler located at the farther end of said trackway, a fall-rope sheave mounted upon said traveler, means whereby said traveler is propelled outwardly, a fall-rope ex-



tending from said traveler to one of said load-carriages below which it forms a loop, thence to the other of said load-carriages below which it forms another loop, thence to the near  
5 end of the trackway whereby as the traveler moves out the fall-rope performs the function of hoisting, a fall-block suspended in each of said loops and means whereby said load-carriages are propelled, substantially as de-  
10 scribed.

8. In a conveying apparatus in combination, a near-by stationary-rope support, a distant traveling-rope support, a fall-rope sheave mounted upon said support, a trackway ex-  
15 tending between said rope-supports, a load-

carriage mounted upon said trackway, a rope extending between said rope-supports and forming a loop beneath the load-carriage intermediate the two and operating to perform the function of hoisting as the traveling-rope  
20 support is moved outward, a fall-block suspended by said loop, means whereby said load-carriage may be propelled and independent means whereby said traveling-rope support  
25 may be propelled, substantially as described.

THOS. SPENCER MILLER.

Witnesses:

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F. B. KNIGHT.