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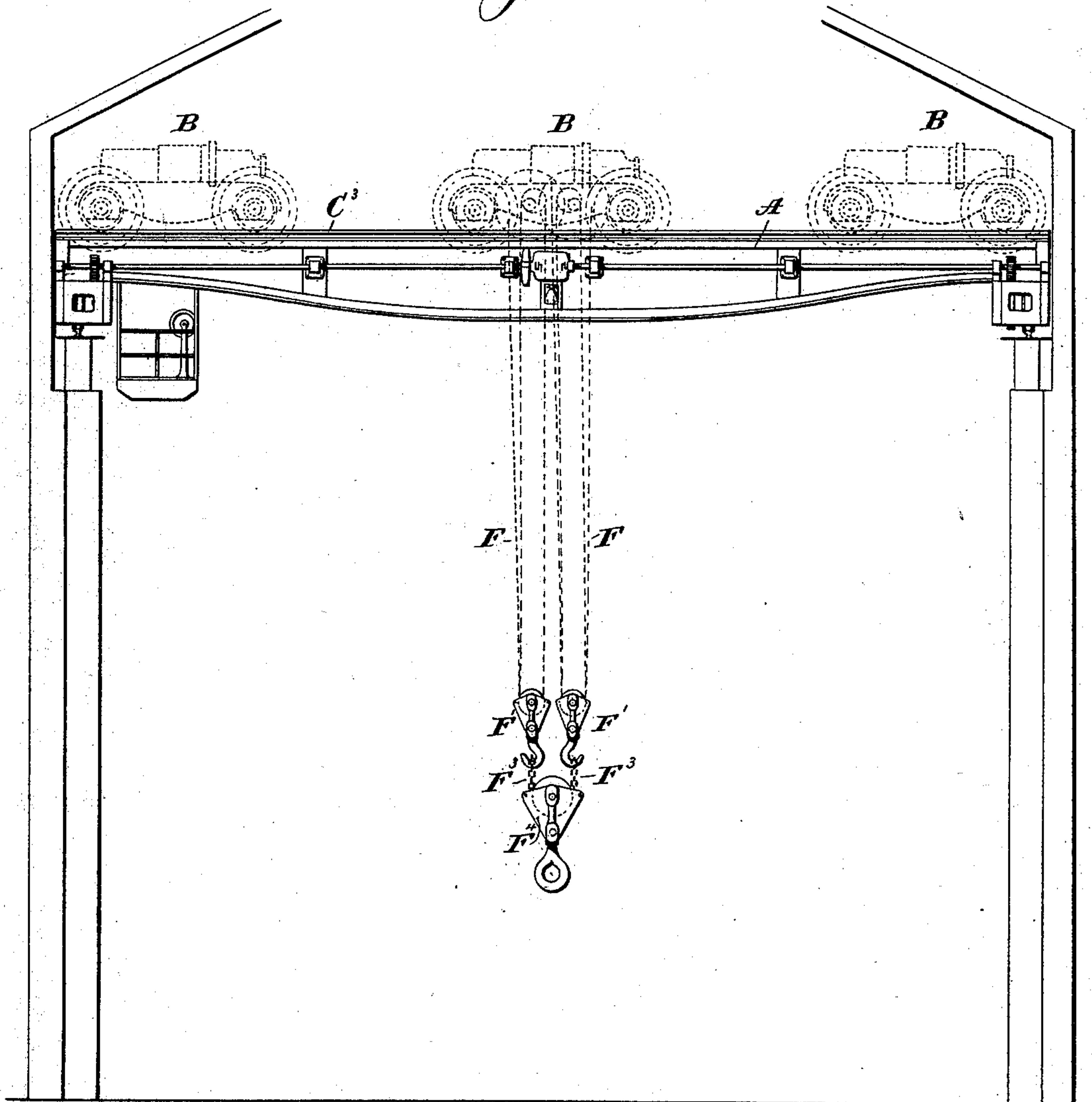
4 Sheets—Sheet 1.

T. R. MORGAN, Sr. & W. H. MORGAN.  
TROLLEY FOR OVERHEAD TRAVELING CRANES.

No. 509,758.

Patented Nov. 28, 1893.

*Fig. 1.*



Witnesses  
*Jas. E. Hutchinson.*  
*G. F. Downing.*

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By *H. A. Seymour*  
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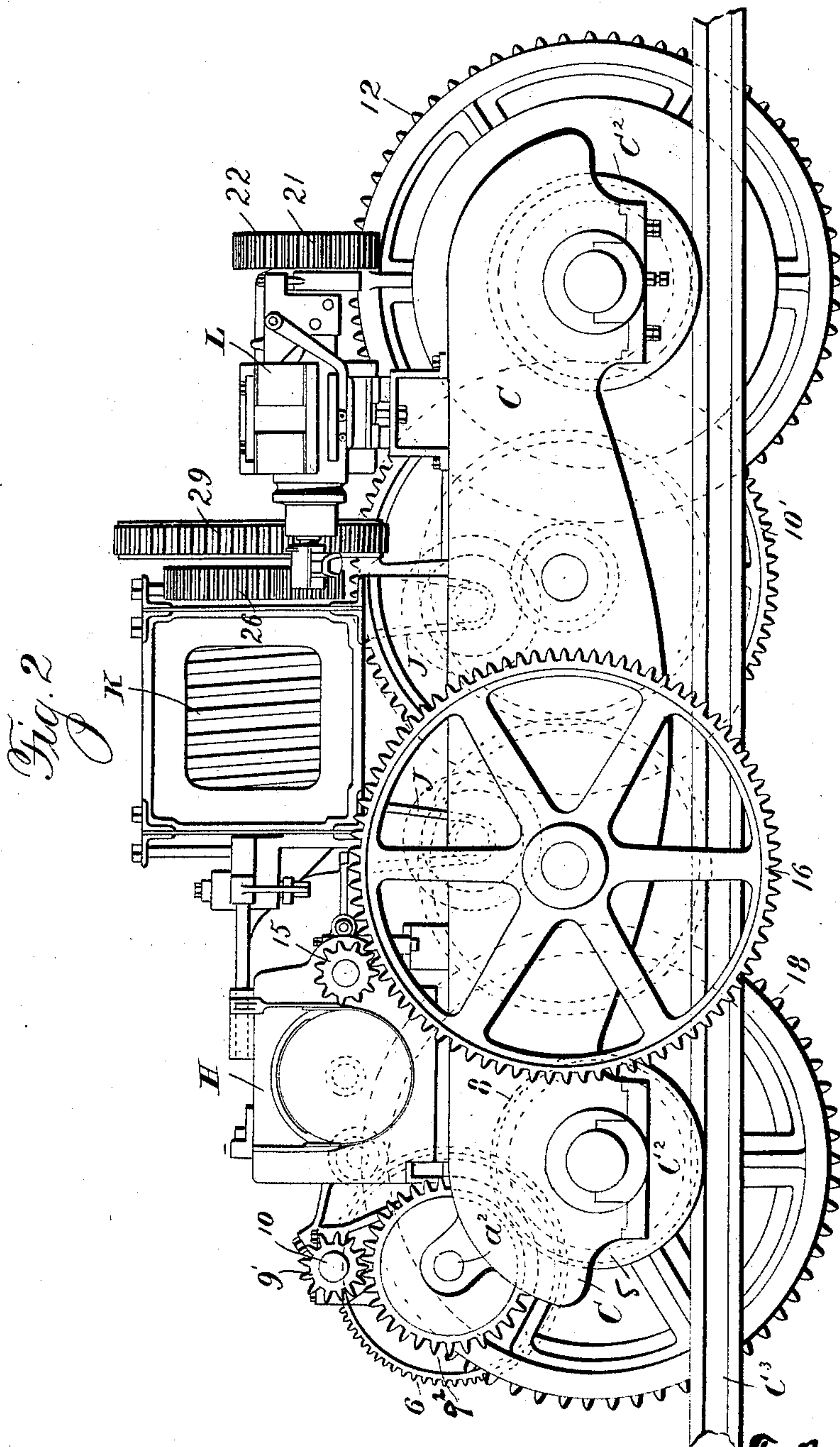
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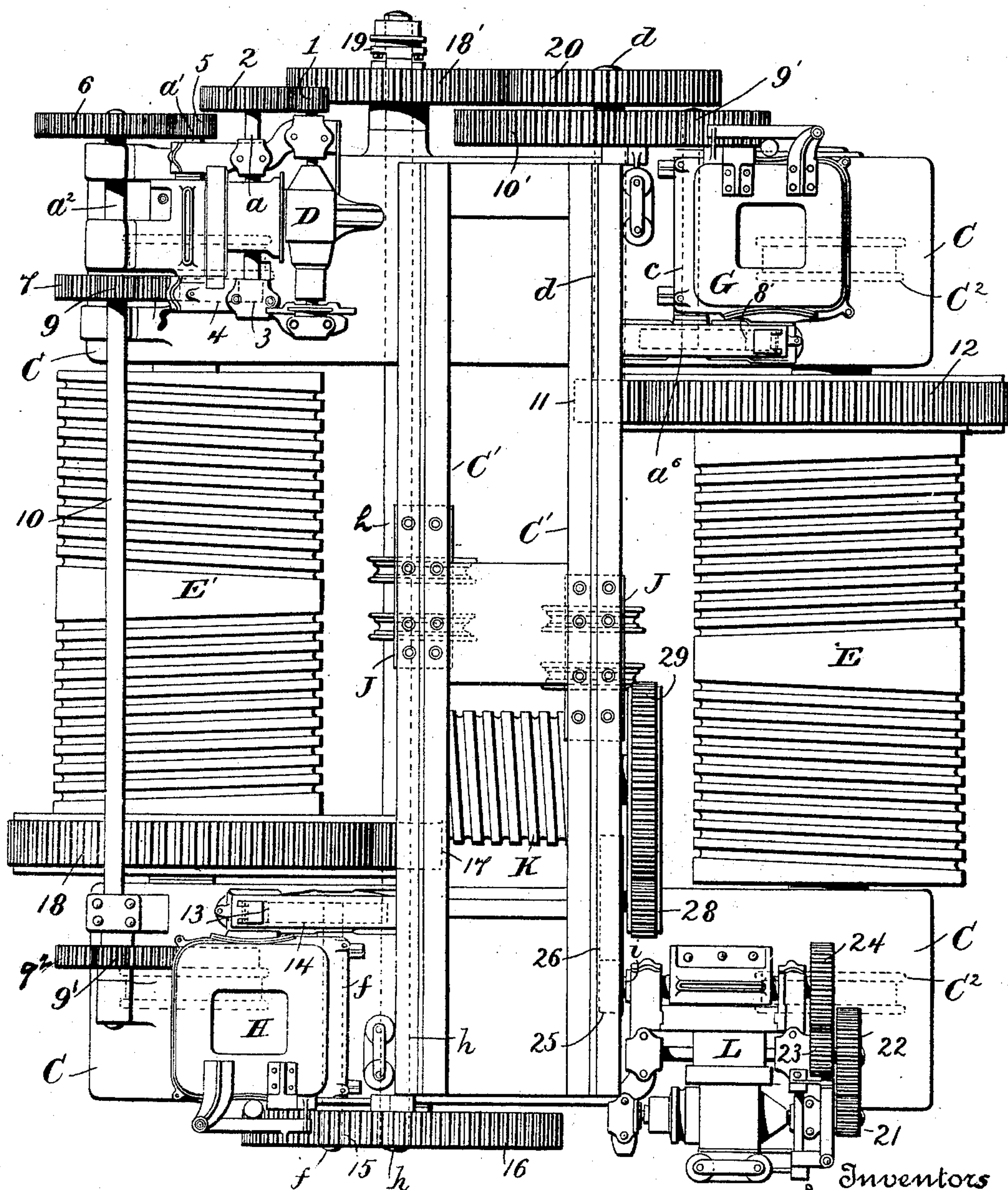


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Fig. 3.



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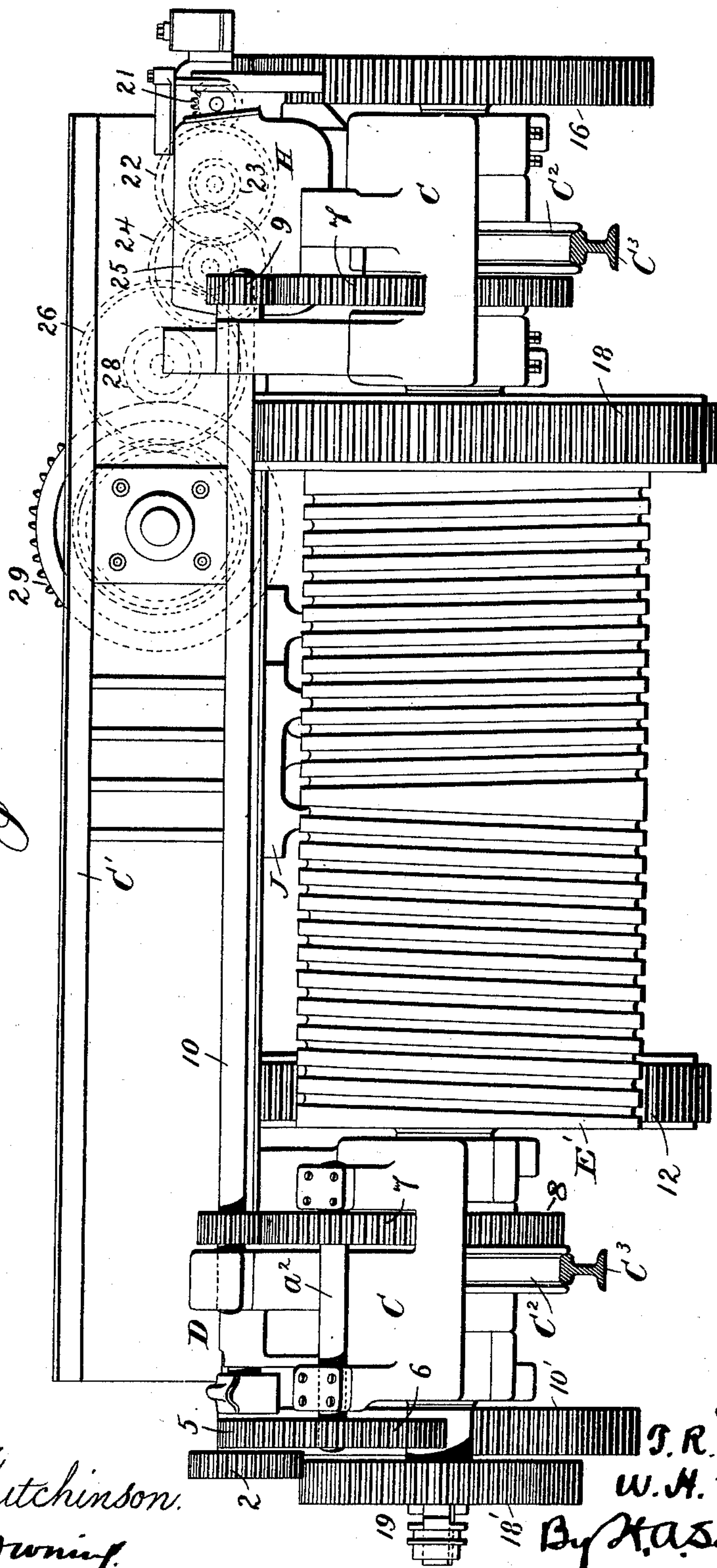


Fig. 4.

Witnesses

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# UNITED STATES PATENT OFFICE.

THOMAS R. MORGAN, SR., AND WILLIAM HENRY MORGAN, OF ALLIANCE, OHIO, ASSIGNORS OF ONE-HALF TO THOMAS R. MORGAN, JR., AND JOHN R. MORGAN, OF SAME PLACE.

## TROLLEY FOR OVERHEAD TRAVELING CRANES.

SPECIFICATION forming part of Letters Patent No. 509,758, dated November 28, 1893.

Application filed April 8, 1893. Serial No. 469,602. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS R. MORGAN, Sr., and WILLIAM HENRY MORGAN, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Trolleys for Overhead Traveling Cranes; and we do hereby 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.

Our invention relates to an improvement in trolleys for overhead traveling cranes, and it consists in a trolley provided with two drums each carrying an independent lifting chain, and actuated by an independent motor, the two lifting chains adapted to be used independently for lifting comparatively light weights, or coupled up for heavier weights.

Our invention further consists in the combination of two drums each actuated by an independent motor, and means for coupling up the drums whereby they are caused to move in unison.

In the accompanying drawings, Figure 1 is a view in side elevation of an overhead crane showing our improved trolley thereon. Fig. 2 is a view in side elevation of the trolley. Fig. 3 is a plan and Fig. 4 an end view of same.

A represents a traveling bridge and B the trolley thereon adapted to travel lengthwise of the bridge. This trolley consists essentially of two side sections C, chain beams or girders C' secured on said side sections, drums mounted in said side sections and an auxiliary drum mounted in the chain beams or girders. The trolley is mounted on the flanged wheels C<sup>2</sup> which latter travel on the rails C<sup>3</sup> on the bridge A, and are propelled by the electric motor D through the gearing to be now described. The armature shaft of the motor is provided with a pinion 1 which meshes with pinion 2 on shaft *a*. This shaft is provided with pinion 3 which meshes with pinion 4 on shaft *a'*. Shaft *a'* carries pinion 5 which meshes with pinion 6 on shaft *a*<sup>2</sup>. This shaft extends across one side section C only, of the trolley, and is provided with the pinion 7 which engages a toothed wheel fast to a flanged track wheel C<sup>2</sup>, and also pinions

9 on shaft 10 which latter extends across the trolley and is provided on its opposite end with pinion 9' which meshes with pinion 9<sup>2</sup> which engages pinion 8 on flanged track wheel C<sup>2</sup>. Thus it will be seen that by rotating the armature shaft of motor D in one direction the trolley moves toward one end of the bridge and by reversing the direction of rotation of the armature, the trolley is caused to travel in the opposite direction.

The drums E E' are mounted at their ends in the side frames of the trolley and each carries a lifting chain F provided at its lower end with a chain block F'.

The drum E is driven by the motor G. This motor is provided on its armature shaft with a pinion 8' which meshes with pinion *a*<sup>6</sup> on shaft *c*. This shaft carries pinion 9' which meshes with the large toothed wheel 10' on shaft *d*, and the latter carries wheel 11 which engages the toothed wheel 12 fast on drum E. As thus far described drum E is independent of drum E' and can be actuated through motor G and its gearing independently of drum E'.

Drum E' is located near the opposite end of trolley and actuated by motor H. This motor is provided on its armature shaft with pinion 13 which meshes with pinion 14 on shaft *f*. This shaft carries pinion 15 which meshes with toothed wheel 16 fast on shaft *h*. This shaft carries pinion 17 which engages the toothed wheel 18 on drum E'. By means of the motor H, and the gearing last described drum E' can be rotated independently of drum E.

Each drum as before stated is provided with a chain F having a block F'. These blocks can be used independently for lifting light loads or they can be coupled up as shown in Fig. 1 by means of endless chain F<sup>3</sup> to the block F<sup>4</sup>, and by operating the drums E and E' in unison the combined power of both drums is utilized in lifting the object.

While the two drums could be actuated in unison by starting both motors simultaneously a slight variation of speed in the motors would cause one drum to turn faster than the other and thus cause one chain to wind or unwind as the case might be, faster than the



other. A slight increase of movement of one chain would be compensated for by endless chain  $F^3$ , but to guard against independent or unequal movement of the chains when  
 5 coupled up we provide shaft  $h$  carrying pinion 17 with a toothed wheel 18' and with a clutch 19. Wheel 18' is loose on the shaft and is in engagement with wheel 20 fast on shaft  $d$  which as before stated actuates drum  
 10  $E'$ . By locking wheel 18' to shaft  $h$  by means of clutch 19, it will be seen that the drum actuating shafts  $d$  and  $h$  are coupled up so as to move in unison.

$J$  are the chain blocks depending from the  
 15 chain beam or girders  $C'$ , and  $K$  is an auxiliary drum located between said girders. This drum is designed simply for lifting light loads or tilting ladles suspended from the main drum or drums and is actuated by the  
 20 motor  $L$ . The armature shaft of this motor carries pinion 21 which meshes with wheel 22. This wheel 22 carries a smaller pinion 23 which in turn meshes with pinion 24 fast on shaft  $i$ . Secured on shaft  $i$  is a pinion 25  
 25 which meshes with pinion 26 carrying pinion 28, which is in constant engagement with pinion 29 carried by the auxiliary drum. This drum is located at right angles to and in a plane between the main drums and is geared  
 30 up to rotate more rapidly than the larger drums and hence is admirably adapted for lifting light loads and also for tilting or turning objects suspended from the main drums.

The chain connecting the two blocks need  
 35 not necessarily be an endless chain as it is evident that a chain having rings at its ends would answer the same purpose. When an endless chain is used the block thereon must be provided with two pulleys. When however  
 40 is a chain having rings or loops at its ends used, the block need have but a single pulley.

It is evident that numerous slight changes might be resorted to in the relative arrangement of parts herein shown without depart-

ing from the spirit and scope of our invention; hence we would have it understood that we do not wish to confine ourselves to the exact construction herein shown and described, but,

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a trolley frame, of two drums mounted thereon, a hoisting chain and block for each drum, a chain connecting the two blocks, and a block carried by said latter chain.

2. The combination, with a trolley frame, of two drums mounted thereon, a hoisting chain and block for each drum, a chain connecting the blocks, a block carried by said connecting chain, and a motor for each drum.

3. The combination, with a trolley frame and two drums thereon, of a motor for each drum and means for coupling up the drums whereby they are caused to move in unison.

4. The combination, with a trolley frame and two drums thereon, of a motor for each drum, a chain, a chain block carried by each chain, and means for coupling up the two drums whereby they are caused to move in unison.

5. The combination, with a trolley frame, two drums thereon, and a motor for each drum, of a chain for each drum, a block carried by each chain, a chain connecting the two blocks, a block carried by said connecting chain and means for coupling up the drums whereby they are caused to move in unison.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

THOMAS R. MORGAN, SR.

WILLIAM HENRY MORGAN.

Witnesses:

H. W. HARRIS,

F. D. RUSSELL.