

(No Model.)

2 Sheets—Sheet 1.

W. THORNBURGH.

HOISTING AND CONVEYING MACHINE.

No. 373,255.

Patented Nov. 15, 1887.

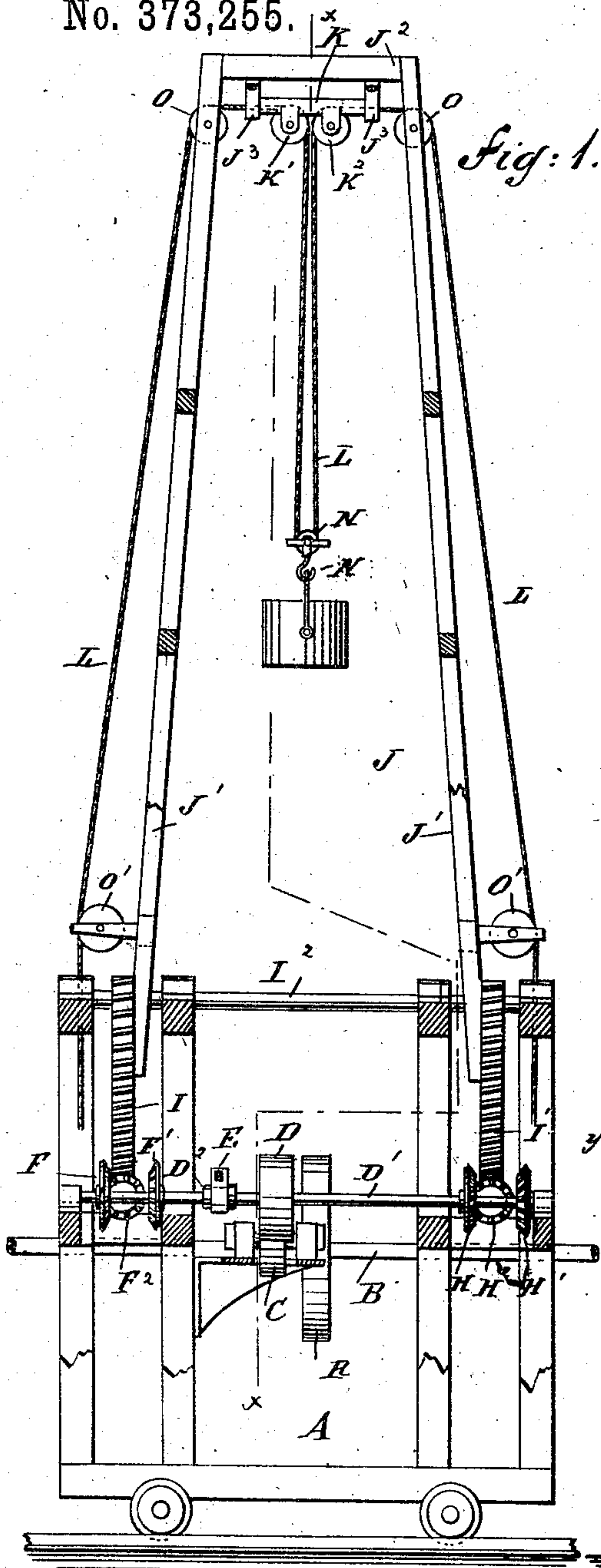


Fig: 1.

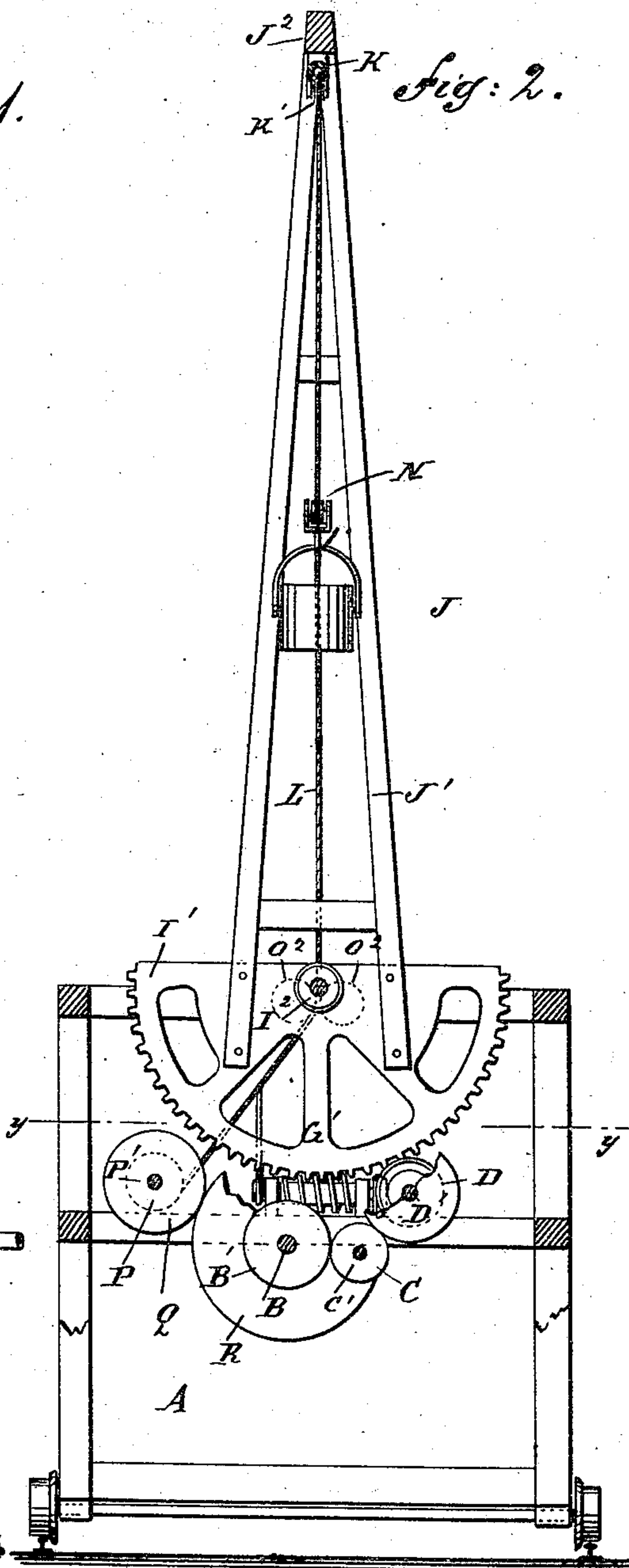


Fig: 2.

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Fig. 3. Patented Nov. 15, 1887.

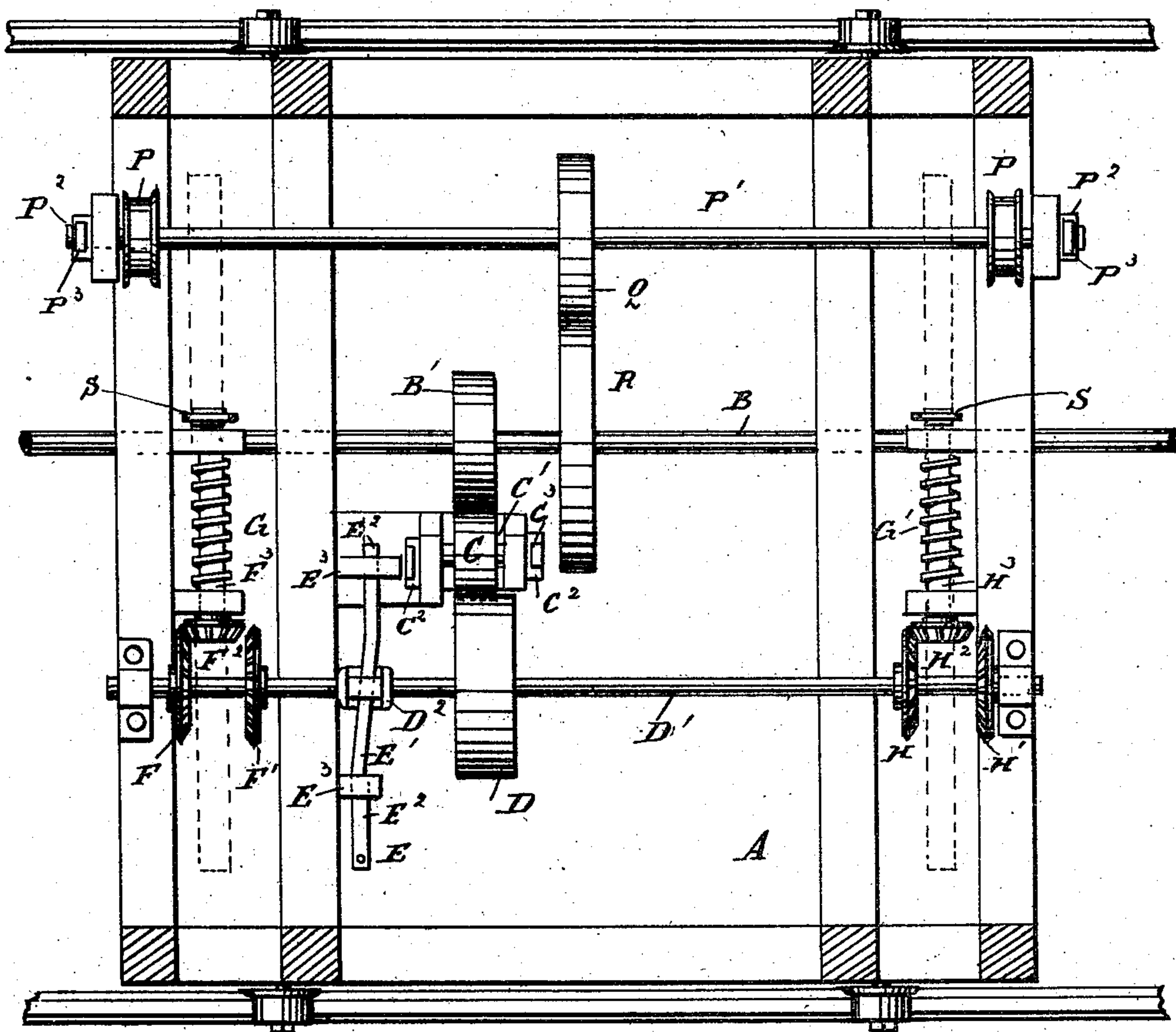


Fig. 4.

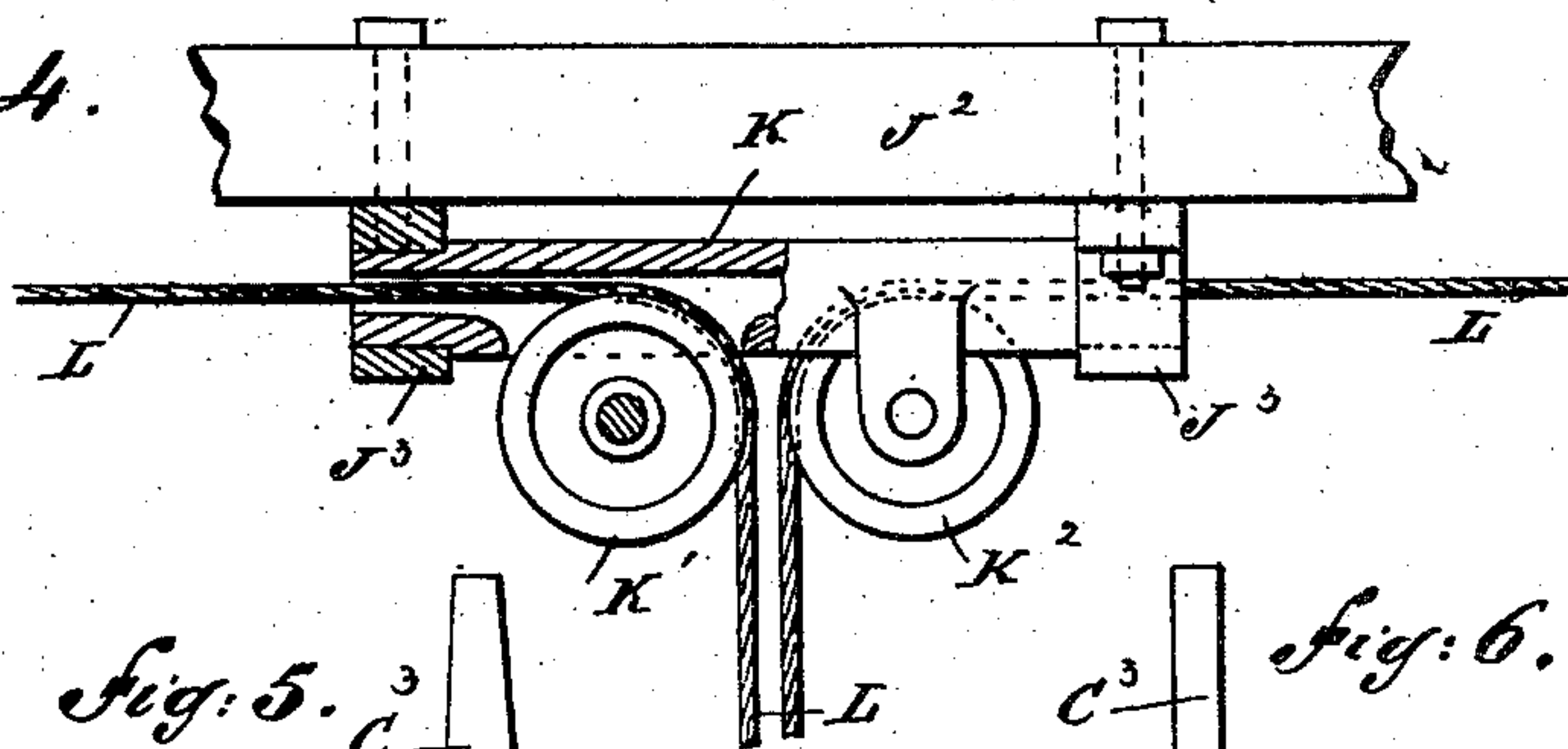


Fig. 5.

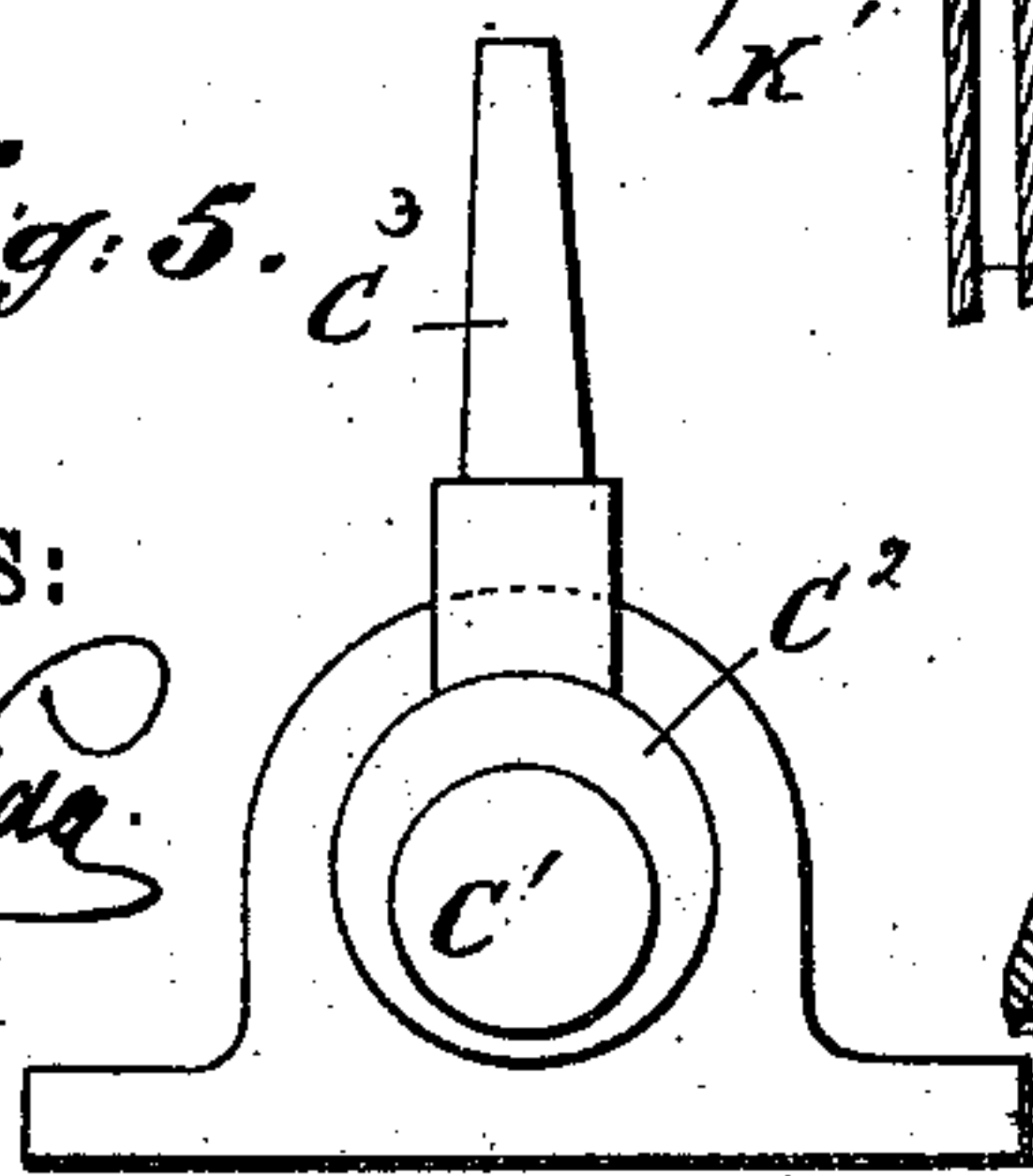
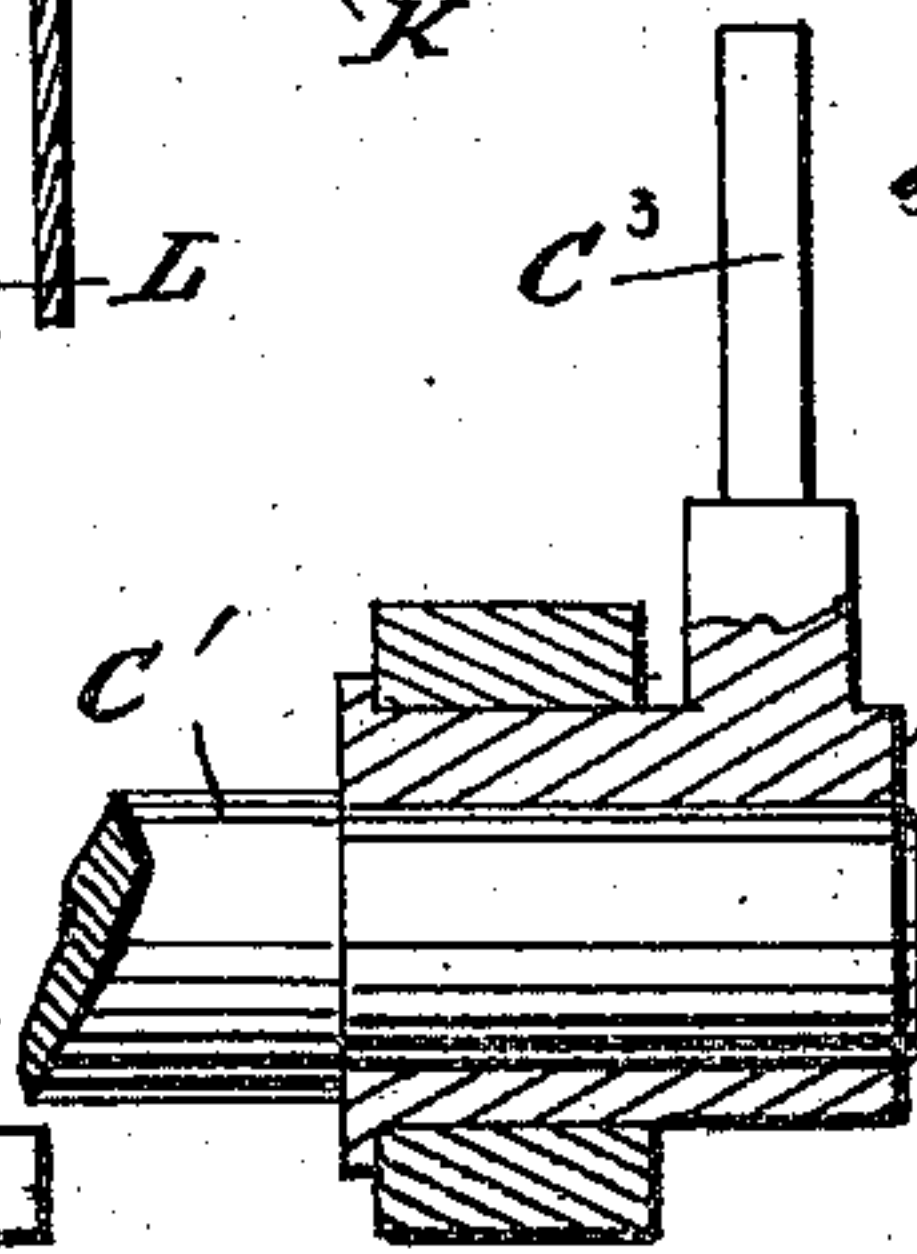


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM THORNBURGH, OF ELYRIA, OHIO.

HOISTING AND CONVEYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 373,255, dated November 15, 1887.

Application filed March 22, 1887. Serial No. 231,920. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM THORNBURGH, of Elyria, in the county of Lorain and State of Ohio, have invented a new and Improved Hoisting and Conveying Device, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved hoisting and conveying machine which is durable in construction and very effective and rapid in operation.

The invention consists in the construction and arrangement of various parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional front elevation of my improvement. Fig. 2 is a side elevation of the same on the line *x x* of Fig. 1. Fig. 3 is an enlarged sectional plan view of the same on the line *y y* of Fig. 2. Fig. 4 is an enlarged front elevation, partly in section, of the upper oscillating pulley-hanger. Fig. 5 is an end elevation of the friction-shaft and its bearings, and Fig. 6 is a sectional elevation of the same.

On a suitably-constructed frame, A, is mounted the main shaft B, which receives a rotary motion by suitable means and carries a pulley, B', engaging the friction-pulley C, secured to the shaft C', mounted in the eccentric bushing C², held in bearings attached to the main frame A, and the said bushings are adapted to be turned in the said bearings by the handle C³, secured to the said bushings C². The pulley C is located in such a manner that it can be moved in contact with the said main-shaft pulley B', and at the same time is moved in frictional contact with the pulley D, secured to the shaft D', adapted to slide longitudinally on bearings secured to the main frame A.

The shaft D' is moved sidewise by a handle, E, provided with a middle part, E', held at an angle to the shaft D', and passing through an aperture formed in the ear D², secured to the shaft D'. The ends E² of the arm E stand at right angles to the shaft D', and are mounted in bearings E³, secured to the main frame A.

The shaft D' is provided near one end with the bevel gear-wheels F and F', adapted to engage alternately the bevel-pinion F², secured to the shaft F³, mounted in suitable bearings on the main frame A, and the said shaft carries a worm, G. On the other end of the shaft D' are secured the bevel gear-wheels H and E, adapted to engage alternately the bevel-pinion H², fastened on the shaft H³, mounted in suitable bearings secured to the main frame A, and the said shaft H³ carries worm G'.

The worms G and G' mesh into the semicircular worm-wheels I and I', secured to a shaft, I², mounted in suitable bearings on top of the main frame A. On the semicircular wheels I and I' are secured the side arms, J', of the hoisting-frame J, which is provided with the outer cross-beam, J², uniting the said side beams, J'. To the inside of the cross-beam J² are secured the bearings J³, in which is mounted to turn the hollow pulley-hanger shaft K, supporting the pulleys K' and K², over which passes part of the doubled rope L, supporting in the middle of the frame J the carrier-pulley N, provided with a hook, N'.

The parts of the rope L passing over the pulleys K' diverge in opposite directions and pass through the hollow pulley-hanger shaft K, upon and over the pulleys O O and O' O', held in suitable bearings in the side beams J', and then pass between the pulleys O², held in the main frame A, and then the ends of the rope L are wound upon the respective drums P P, secured to the shaft P', mounted in the eccentric bushings P², held in bearings secured to the main frame A. The eccentric bushings P² are similar in construction to the eccentric bushings C², and are each provided with an arm, P³, by which the said bushings and the shaft P' can be turned so as to move the pulley Q, secured to the shaft P', into an outer frictional contact with the pulley R, attached to the main shaft B.

The operation is as follows: A continuous rotary motion is imparted to the main shaft B by suitable means, and the friction-pulleys Q and C are held out of frictional contact with the pulleys B' and R on the said main shaft B until required. If the machine is in the position shown in Figs. 1 and 2 and the load held on the hook N' is to be hoisted straight up, then the pulley Q is thrown in frictional con-

tact with the main-shaft pulley R by moving the arm P³ of the bushing P² to one side, and the shaft P' is rotated by the frictional contact of its pulley Q with the pulley R, and the drums P on the said shaft P' wind up the rope L, thus hoisting the load hung on the carrying-pulley N. As soon as the load attains the required height, then the friction-pulley Q is thrown out of frictional contact with the pulley R and the shaft P' is held in a locked position by suitable means. (Not shown.) If it is desirable to move the load sidewise, then the pulley C is thrown in frictional contact with the pulley B' on the main shaft B, and at the same time with the pulley D on the shaft D', and simultaneously the arm E is moved correspondingly inward or outward, as either the bevel gear-wheels F and H or F' and H' are thrown in or out of mesh with the pinions F² and H², which are thus rotated in one direction, and cause the worms G and G' to turn the semicircular gear-wheels I and I', whereby the frame J is swung at its lower end to one side. It will be seen that as soon as the frame J leaves its vertical position the weight of the load will cause the pulley-hanger K to turn in its bearings J³ on the cross-beams J², so that the pulleys K' and K² keep in line with the load and the rope L is not displaced from the said pulleys K' and K². As soon as the frame J is swung to one side until its desired position is reached, then the load can be lowered by unlocking the shaft P' and operating the levers P⁴, so that the shaft P' is free to turn and unwinds the rope L from its drums P. The pulley R on the main shaft B can be used as a frictional brake-wheel in case the load is very heavy and descends very rapidly.

A load can be hoisted when the frame J is in a sidewise position by throwing the pulley Q into frictional contact with the pulley R on the main shaft B by turning one of the levers P³ of the eccentric bushing P². The frame J is swung into a vertical position or to the opposite side by moving the arm E, so that the disengaged set of bevel gear-wheels F H or F' H' on the shaft B' is thrown in-mesh with the bevel-pinions F², whereby the worms G and G' are rotated in an opposite direction and impart a similar motion to the semicircular gear-wheels I and I', which causes the frame A to swing upward to a vertical position and then to the other side.

The frame A is preferably mounted on wheels traveling on a track, so as to permit of moving the machine rapidly from one place to another.

It will further be seen that both shafts D' and P' can be set in operation at the same time, whereby the load held on the carrying-pulley N is raised, and at the same time the frame J swings on its fulcrum the shaft I².

The machine can be used for hoisting, loading, unloading, or discharging iron or coal or other material out of or off from vessels, cars, or other places, and putting the same upon cars, docks, vessels, or other places, or depos-

iting the same in holds of vessels or elsewhere, and the machine also serves for hoisting ore, coal, or other material for any purpose whatever.

It will be seen that by my improvement I obviate the necessity of using separate power for each machine and am able to work all the hatches of a vessel, for instance, at one and the same time.

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

1. The combination, with a main shaft, of a frame adapted to swing longitudinally and operated from the said main shaft and a swinging pulley-hanger held on the outer end of the said swinging frame, substantially as shown and described.

2. The combination, with a main shaft, of a frame adapted to swing sidewise in a semicircle and operated from the said main shaft, a swinging pulley-hanger held on the outer end of the said swinging frame, and hoisting-drums operated from the said main shaft, substantially as shown and described.

3. The combination, with a main shaft, of a frame adapted to swing sidewise in a semicircle and operated from the said main shaft, a swinging pulley-hanger held on the outer end of the said swinging frame, hoisting-drums operated from the said main shaft, and a rope connected with the said hoisting-drums and the said swinging pulley-hanger, substantially as shown and described.

4. The combination, with the main shaft B and a friction-pulley, B', secured on the said shaft, of the shaft D'; adapted to be moved longitudinally, the pulley D on the said shaft, the friction-pulley C, held between the said pulleys D and B', and means, substantially as described, for moving the said friction-pulley C into contact with the said pulleys D and B', as set forth.

5. The combination, with the shaft D' and the ear D², secured on the said shaft D', of the arm E, having its middle part, E', operating in the said ear D², and having its ends E² sliding in fixed bearings, substantially as shown and described.

6. The combination, with the shaft D', the sets of bevel gear-wheels F F' and H H', secured to the said shaft D', and means, substantially as described, for moving the said shaft D' longitudinally, and the bevel-pinions H² and F², the worm-shafts F³ and H³, carrying the said bevel-pinions, the worms G and G', secured on the said shafts F³ and H³, the segmental gear-wheels I and I', meshing into the said worms G and G', the shaft I², carrying the said segmental gear-wheels I and I', and the swinging frame J, secured to the said segmental gear-wheels, substantially as described.

7. The combination, with the swinging frame J, carrying the hangers J³, of the hollow pulley-hanger K, mounted to turn in the said hangers J³, pulleys K' and K², held on the said

hanger K, and the rope L, passing over the said pulleys K' and K² and through the hollow hanger K, substantially as shown and described.

5 8. The combination, with the pulleys B' and D, of the pulley C, held between the said pulleys B' and D, the shaft C', carrying the said pulley, the eccentric bushings C², supporting the said shaft and turning in suitable bearings, 10 and the arms C³, secured to the said bushings for turning the same, so as to move the said pulley C in or out of contact with the said pulleys B' and D, as set forth.

9. The combination, with the swinging 15 frame J, of the hoisting drums P, operated from the main shaft, the rope L, wound on the said hoisting drums P, the pulleys O, O', and O², over which the said rope passes, the swinging hanger K, held on the said main frame J, 20 and through which passes the said rope, and the

pulleys K' and K², held on the said hanger K and carrying the pulley N, held on the said rope L and supporting the load to be moved, substantially as shown and described.

10. The combination, with the shaft D', 25 adapted to move longitudinally, and the sets of bevel-gears F F' and H H', of the pinions F² H², adapted to engage the said sets of gear-wheels, the shafts F³ and H³, carrying the said bevel-pinions, the worms G and G', secured to 30 the said shafts, the segmental worm-wheels I and I', meshing into the said worms G and G', and the swinging frame J, secured to the said segmental worm-wheels I and I' and turning with the same, substantially as shown and de- 35 scribed.

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Witnesses:

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