

No. 740,660.

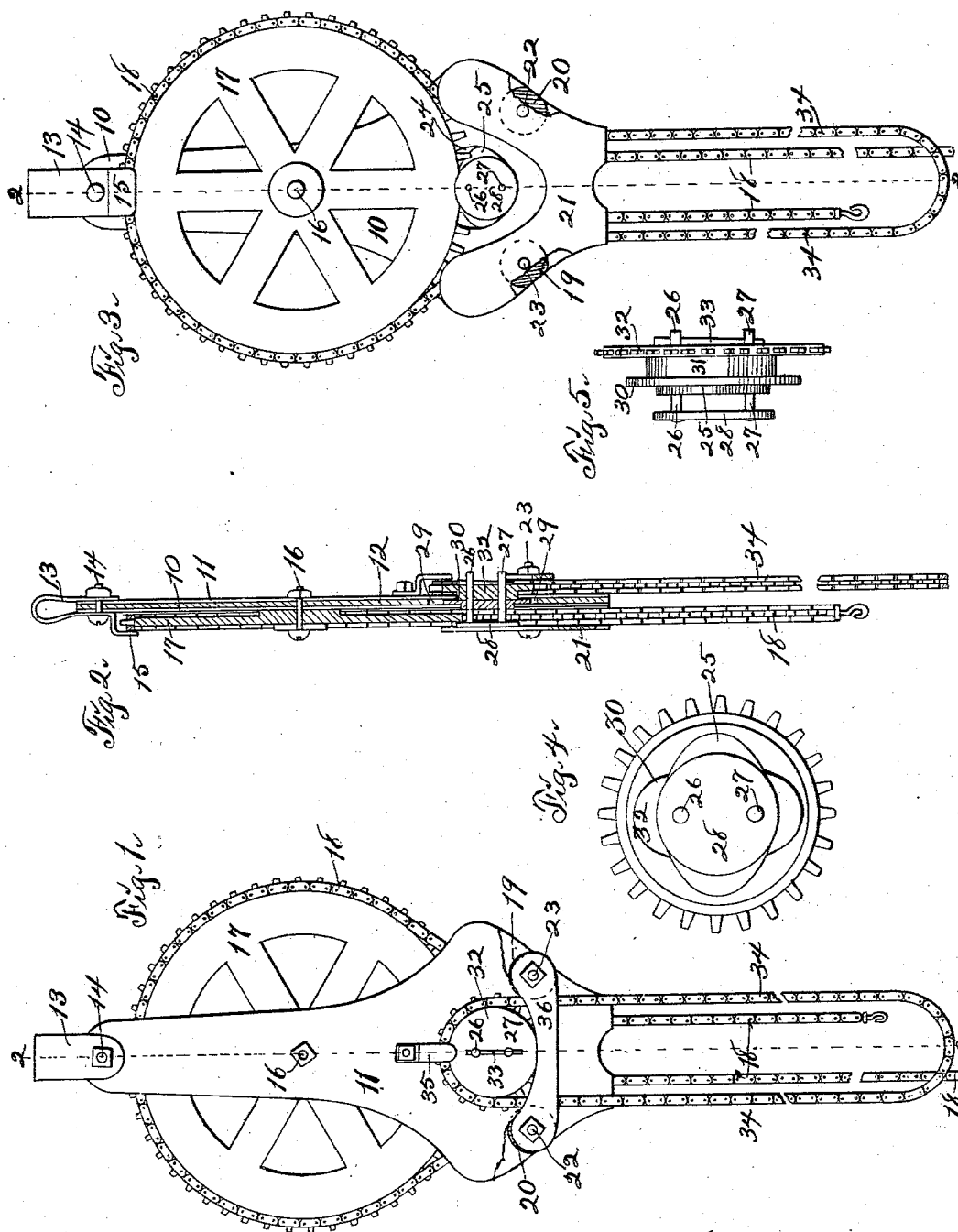
PATENTED OCT. 6, 1903.

J. JOHNSON.
CHAIN HOIST.

APPLICATION FILED OCT. 27, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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296

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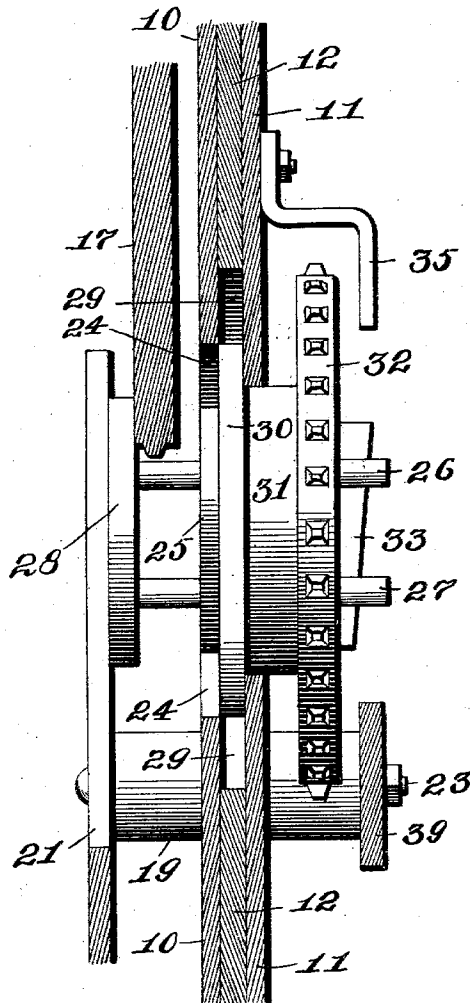
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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN JOHNSON, OF DES MOINES, IOWA.

CHAIN HOIST.

SPECIFICATION forming part of Letters Patent No. 740,660, dated October 6, 1903.

Application filed October 27, 1902. Serial No. 129,055. (No model.)

To all whom it may concern:

Be it known that I, JOHN JOHNSON, a citizen of the United States of America, and a resident of Des Moines, Polk county, Iowa, have invented a new and useful Chain Hoist, of which the following is a specification.

The object of this invention is to provide improved means for multiplying the leverage on the lifting-pulley of a chain hoist and at the same time furnishing means for locking said lifting-pulley against reverse movement at any point in its revolution.

My invention consists in the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a face elevation of my device, portions of the chain being broken away to economize space. Fig. 2 is a central vertical section of the device. Fig. 3 is a rear elevation of the device. Fig. 4 is a detail view of the driving-gear detached from the driven wheel. Fig. 5 is a detail view of the driving-gear and parts rigidly connected therewith in edge elevation. Fig. 6 is a greatly-magnified view of the elements shown in the middle part of Fig. 2.

In the construction of the device, as shown, the numeral 10 designates a hanger-plate, and 11 a face-plate of the same size and shape as the hanger-plate and arranged parallel therewith. A plate 12 is mounted between the hanger-plate and face-plate, and an eye-clip 13 is mounted on and embraces the plates at their upper ends and is fixed thereto by a bolt 14. It is the function of the eye-clip 13 to provide means for suspending the device from a hook, bracket, or beam, (not shown,) as is common in the use of hoists. A tongue 15 is formed on the lower end of the eye-clip 13 and extends outward and downward parallel with the outer face of the hanger-plate 10. A bolt 16 is mounted in and transversely of the plates 10, 11, and 12, and a lifting-pulley 17 of sprocket variety is mounted for revolution on said bolt and arranged parallel with the outer face of the hanger-plate 10. The lifting-pulley 17 is of relative large diameter, and a lifting-chain 18 of sprocket variety is mounted on the periphery thereof and engages its sprockets. The bight of the lifting-

chain 18 rests on and engages the sprockets of the lifting-wheel, and the end portions of said chain are drawn toward each other to a distance of separation materially less than the diameter of the wheel and depend vertically therefrom. The outer faces of the end portions of the chain 18 run on and are confined by guide-blocks 19 20, fixed in obliquely-converging positions on the lower portion of the outer face of the hanger-plate 10. A guide-plate 21 is fixed to the outer faces of the guide-blocks 19 20 and overlaps the path of the chain 18 in contact with said blocks. Bolts 22 23 serve to connect the guide-plate, guide-blocks, hanger-plate, face-plate, and inner plate 12. A hole 24 is formed in the hanger-plate 10 below the wheel 17. The hole 24 is not circular, but is of a shape intermediate of a circle and an equilateral triangle—that is to say, with three rounded corners connected by arcs on a greater radius than the corners. A cam-plate 25 of elliptical form is mounted in the hole 24, and the length of said cam-plate is approximately equal to the shortest diameter of the hole. Pins 26 27 are mounted in and transversely of the cam-plate 25 and are spaced apart approximately the same distances as the sprockets of the wheel 17. The pins 26 27 are in alinement transversely of the cam-plate 25 and are arranged to engage with the wheel 17 by embracing one or another of the sprockets thereof between them. A head-piece 28 is fixed to the rear ends of the pins 26 27 and serves as a guiding-rim to confine the wheel 17 at one point, the tongue 15 on the eye-clip 13 confining said wheel at the diametrically opposite point. A hole 29 is formed in the plate 12 of materially greater diameter than the hole 24 and of the same general shape. A cam-plate 30 is fixed to or formed on the cam-plate 25 and is mounted for rotation in the hole 29. The cam-plate 30 is elliptical in form and is arranged with its longest diameter at right angles to the longest diameter of the plate 25. A hole is formed in the face-plate 11, and a hub 31 of circular form is mounted loosely for rotation therein and formed on or fixed to the cam-plate 30. A driving-gear 32 of sprocket form is mounted on the pins 26 27 adjacent the hub 31 and is held in contact with said hub by a key 33,

mounted in and transversely of the projecting end portions of said pins. A driving-chain 34 of sprocket character and of endless form is mounted on and engages with the sprockets of the driving-wheel 32. A clip 35 is mounted on the outer face of the face-plate 11 and overlaps and confines the driving-chain and the top portion of the driving-wheel. A cross-bar 36 is mounted on and connects the outer ends of the bolts 22 23 and crosses and confines the driving-chain below the driving-wheel.

In practical use a load is attached to one end of the lifting-chain 18 and manual force is applied to the driving-chain 34 to rotate the driving-wheel 32. The driving-wheel rotates with the cam-plates 25 and 30 and the bearing therefor is provided by engagement of the peripheries of the cam-plates on the walls of the holes 24 and 29. Since the holes are of irregular circularity, the center or axis of rotation of the driving-wheel will vary and oscillate. Such provision is made in order that in the rotation of the driving-wheel the pins 26 27 may successively and evenly engage successive sprockets of the lifting-wheel 17 and rotate the latter wheel. In the rotation of the lifting-wheel the lifting-chain 18 is caused to travel longitudinally with the periphery thereof and raise the weight attached thereto. A reverse movement of the driving-chain will lower a weight attached to the same end of the lifting-chain. The manual force may be withdrawn from the driving-chain at any time and the load will hang suspended by the lifting-chain, the lifting-wheel being locked against rotation under the strain of the load by engagement of its sprockets with the pins 26 27.

I claim as my invention—

1. The chain hoist comprising the driving-wheel, the endless chain thereon, the cam-plates connected with the driving-wheel, the pins connected with the cam-plates and driving-wheel, the lifting-wheel arranged with one or another of its teeth in engagement with the pins and the lifting-chain on the lifting-wheel.

2. The chain hoist comprising the hanger-plate, the face-plate parallel with the hanger-plate, the plate 12 between the hanger and face plates, the means for suspending the plates, the lifting-wheel mounted for revolution on the plates, the lifting-chain on and engaging the lifting-wheel, the guides arranged to draw the depending portions of the chain toward each other, the cam-plates of elliptical form mounted with their longest diameters at right angles to each other and arranged for rotation in the plates on a varying axis, pins arranged parallel with each other in and projecting from said cam-plates, projecting end portions of said pins contacting with teeth of the lifting-wheel, a driving-gear on said pins and an endless chain mounted on said driving-gear.

3. The chain hoist comprising the hanger, the lifting-wheel thereon, the lifting-chain on the lifting-wheel, the driving-gear arranged for rotation on a varying axis, means for connecting the driving-gear to the lifting-wheel, which means serves as a lock for the lifting-wheel at times, and a driving-chain on the driving-wheel.

Signed by me at Des Moines, Iowa, this 26th day of September, 1901.

JOHN JOHNSON.

Witnesses:

S. C. SWEET,
W. E. ELLIS.