No. 845,506. PATENTED FEB. 26, 1907.

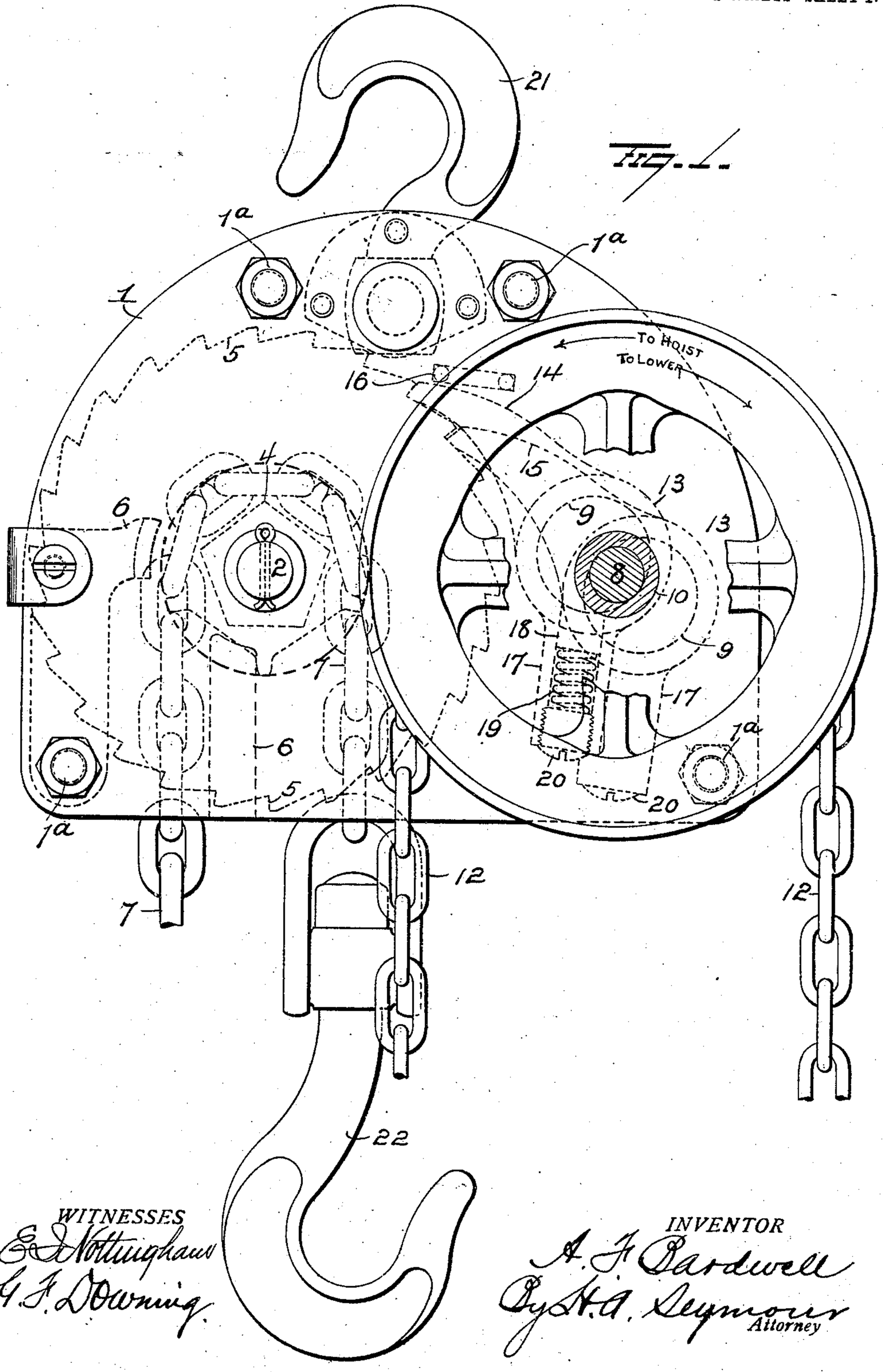
A. F. BARDWELL.

HOISTING APPARATUS.

APPLICATION FILED DEC. 1, 1906.

2 SHEETS—SHEET 1.

FIG. 1.



WITNESSES

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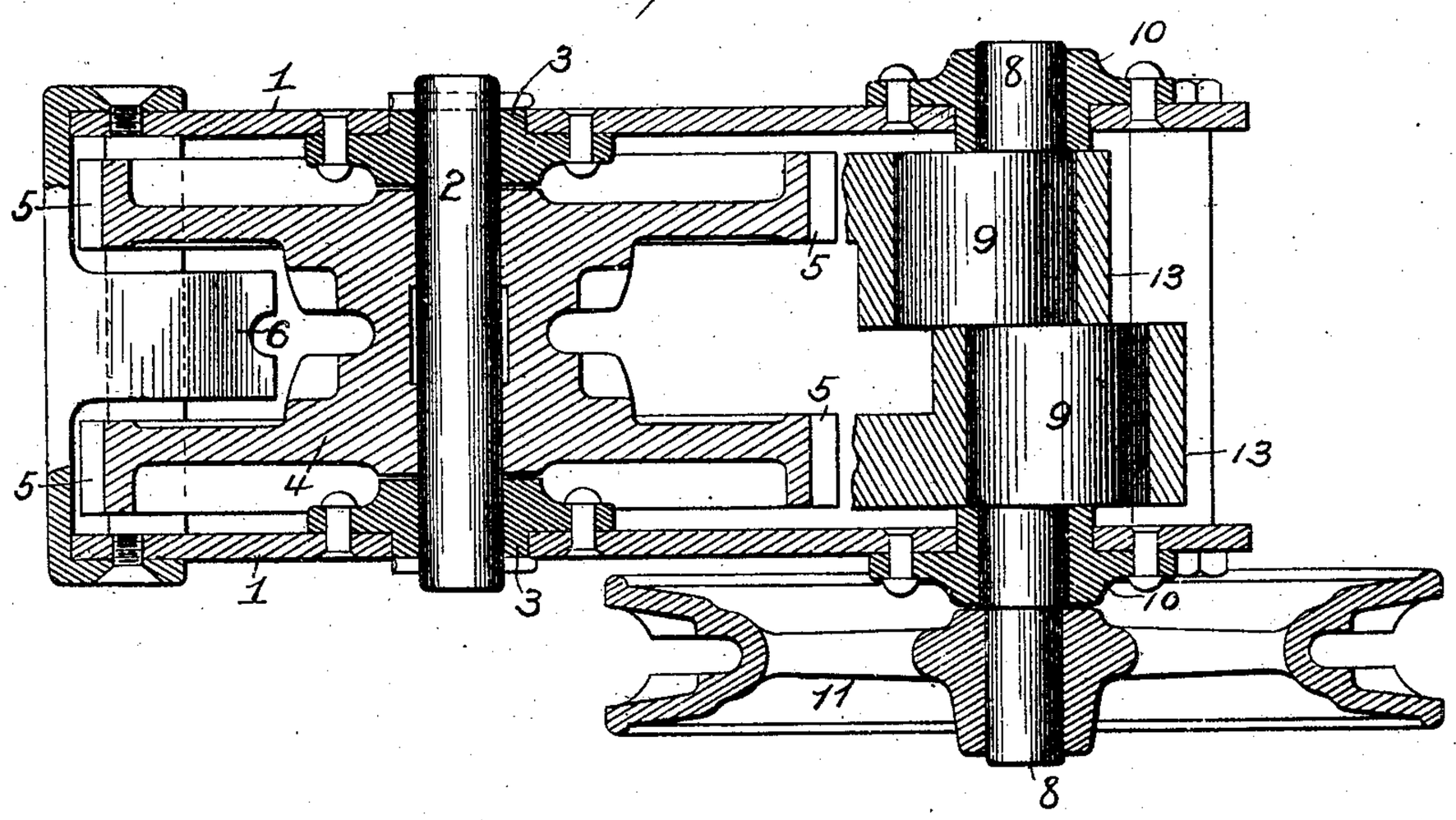
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

ARTHUR F. BARDWELL, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE & TOWNE MANUFACTURING COMPANY, OF STAMFORD, CONNECTICUT.

HOISTING APPARATUS.

No. 845,506. Specification of Letters Patent. Patented Feb. 26, 1907.

Application filed December 1, 1906. Serial No. 345,905.

To all whom it may concern:

Be it known that I, ARTHUR F. BARDWELL, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Hoisting Apparatus; and I 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.

My invention relates to improvements in hoisting apparatus, the object of the invention being to provide an entirely efficient and durable hoist, one that can be easily operated, simple in construction, and comparatively cheap to manufacture.

With these and other objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation, showing the hand-wheel partly broken away; and Fig. 2 is a view in section on the line A A of Fig. 1 with the chains removed and the pawls broken away.

1 represents the sides or frames supporting my improvements and connected by cross bolts or rods 1^a.

2 indicates a shaft mounted in bearings 3 in the side plates 1, and a load-sheave 4 is located on the shaft 2 between the side plates.

Comparatively large ratchet-wheels 5 are made integral with load-sheave 4, and strippers 6 are provided to prevent the load-chain 7 winding on the load-sheave.

8 represents an eccentric-shaft having two eccentrics 9 thereon oppositely disposed. This eccentric-shaft 8 is supported in bearings 10, and a hand-wheel 11 is secured on the outer end of shaft 8 and turned by a chain 12.

Rings or straps 13 are mounted on the eccentrics 9 and carry pawls 14 and 15, respectively, to engage the ratchet-wheels 5, and a fixed cam 16 on the frame limits the upward movement of the pawls. Integral cylinders 17 are carried by the eccentric rings or straps 13, and friction blocks or plungers 18 in said cylinders are held against the eccentrics by springs 19 behind them, and screws 20 in the outer ends of the cylinders 17 bear against the outer ends of the springs and serve to adjust the tension of the springs.

21 represents a supporting-hook for the hoist, and 22 is a load-hook secured on the load-chain 7.

The operation is as follows: The load-sheave 4 is provided with pockets for carrying the load-chain 7, thereby in rotating the sheave the load-hook 22 is raised or lowered according to the direction of rotation of sheave 4. The ratchet-wheels 5, being integral with load-sheave 4, are rotated by the pawls 14 and 15, the pawls being actuated by eccentrics 9 when eccentric-shaft 8 is turned by hand-wheel 11, as will now be explained. By moving the hand-wheel 11 in the direction of the arrow "to hoist," the eccentrics 9 are rotated and, due to the friction blocks or plungers 18, pressed against the eccentrics by springs 19, the friction thereby produced causes the outer ends of the pawls 14 and 15 to turn downward until they come into contact with ratchet-wheels 5, and by a further turn of the eccentrics the pawls are projected toward the ratchet-wheels. One pawl engaging a tooth thereof turns the ratchet-wheels and load-sheave, while the other pawl moves back to engage the next tooth of its ratchet-wheel. Thus one pawl will be always advancing the ratchet-wheels and load-sheave while the other is moving back to take a fresh hold. To lower the load, hand-wheel 11 is moved in the opposite direction, as indicated by the arrow "to lower," and friction-blocks 19 will cause first pawl 14 to rise from ratchet-wheel 5 until it comes into contact with fixed cam 16, and at the same time pawl 15 will recede, the load on hook 22 causing the load-sheave and ratchet-wheels to turn. Pawl 14 advances and is gradually cammed into ratchet-wheel 5, at which time pawl 15 has reached the position formerly held by pawl 14. Without load upon hook 22, by moving hand-wheel 11 in the direction to lower about ninety degrees both pawls 14 and 15 may be disengaged from ratchet-wheels 5 and permit the load-chain to be rapidly drawn down, as the pawls will not interfere with the turning of the load-sheave. This is accomplished by making eccentrics 9 to throw a trifle more than the pitch of the ratchet-teeth.

It is evident that many slight changes

might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of my invention. Hence I would have it understood that I do not wish to confine myself to the exact construction and arrangement of parts herein shown and described.

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

1. The combination of a load-sheave, ratchet-wheels rigid therewith, an eccentric-shaft, pawls engaging the ratchet-wheels and operated by the eccentric-shaft and means for operating the eccentric-shaft.

2. The combination with a load-sheave, of ratchet-wheels fixed thereto, an eccentric-shaft, a hand-wheel thereon, and pawls engaging the ratchet-wheels and operated by the eccentric-shaft.

3. The combination with a load-sheave, of ratchet-wheels fixed thereto, an eccentric-shaft, a hand-wheel thereon, straps or rings on the eccentrics of the eccentric-shaft, pawls carried by the rings or straps and engaging the ratchet-wheels, and friction-blocks carried by the rings or bands and engaging the eccentrics.

4. The combination with a load-sheave, of ratchet-wheels fixed thereto, an eccentric-shaft, a hand-wheel thereon, straps or rings on the eccentrics of said shaft, pawls carried by the rings or straps and engaging the ratchet-wheels, and a fixed cam guiding the pawls into proper engagement with the ratchet-wheels.

5. The combination with a load-sheave, of ratchet-wheels fixed thereto, an eccentric-shaft, a hand-wheel thereon, rings or straps on the eccentrics of said shaft, pawls carried by the rings or straps and engaging the ratchet-wheels, cylinders on the straps or eccentric-rings, friction blocks or plungers in said cylinders against the eccentrics, springs back of the blocks, and screws in the ends of the cylinders against the springs.

6. The combination with a load-sheave, of ratchet-wheels fixed thereto, an eccentric-shaft, a hand-wheel thereon, rings or straps on the eccentrics of said shaft, pawls carried by the rings or straps and engaging the ratchet-wheels, cylinders on the straps or eccentric-rings, friction blocks or plungers in said cylinders against the eccentrics, springs back of the blocks, screws in the ends of the cylinders against the springs, and a fixed cam to guide the pawls in proper engagement with the ratchet-wheels.

7. The combination with a load-sheave, of ratchet-wheels fixed thereto, an eccentric-shaft, a hand-wheel thereon, straps or rings on the eccentrics of said shaft, pawls carried by the rings or straps and engaging the ratchet-wheels, and means permitting both pawls to be moved away from the ratchet-wheels to free the load-sheave.

8. The combination with a load-sheave, of ratchet-wheels fixed thereto, an eccentric-shaft, a hand-wheel thereon, straps or rings on the eccentrics of said shaft, pawls carried by the rings or straps, and engaging the ratchet-wheels, friction-blocks carried by the rings or straps and engaging the eccentrics, and cams against which both pawls may be moved to free the load-sheave.

9. The combination with a load-sheave, of ratchet-wheels fixed thereto, an eccentric-shaft, a hand-wheel thereon, straps or rings on the eccentrics of said shaft, pawls carried by the rings or straps and said eccentrics arranged or disposed to operate the pawls alternately, friction-blocks carried by the rings or straps and engaging the eccentrics, a cam to direct the pawls against the ratchet-wheels, and against which cam the pawls may be moved to free the load-sheave.

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

A. F. BARDWELL.

Witnesses:
W. H. TAYLOR,
B. C. LEWIS.