

No. 725,128.

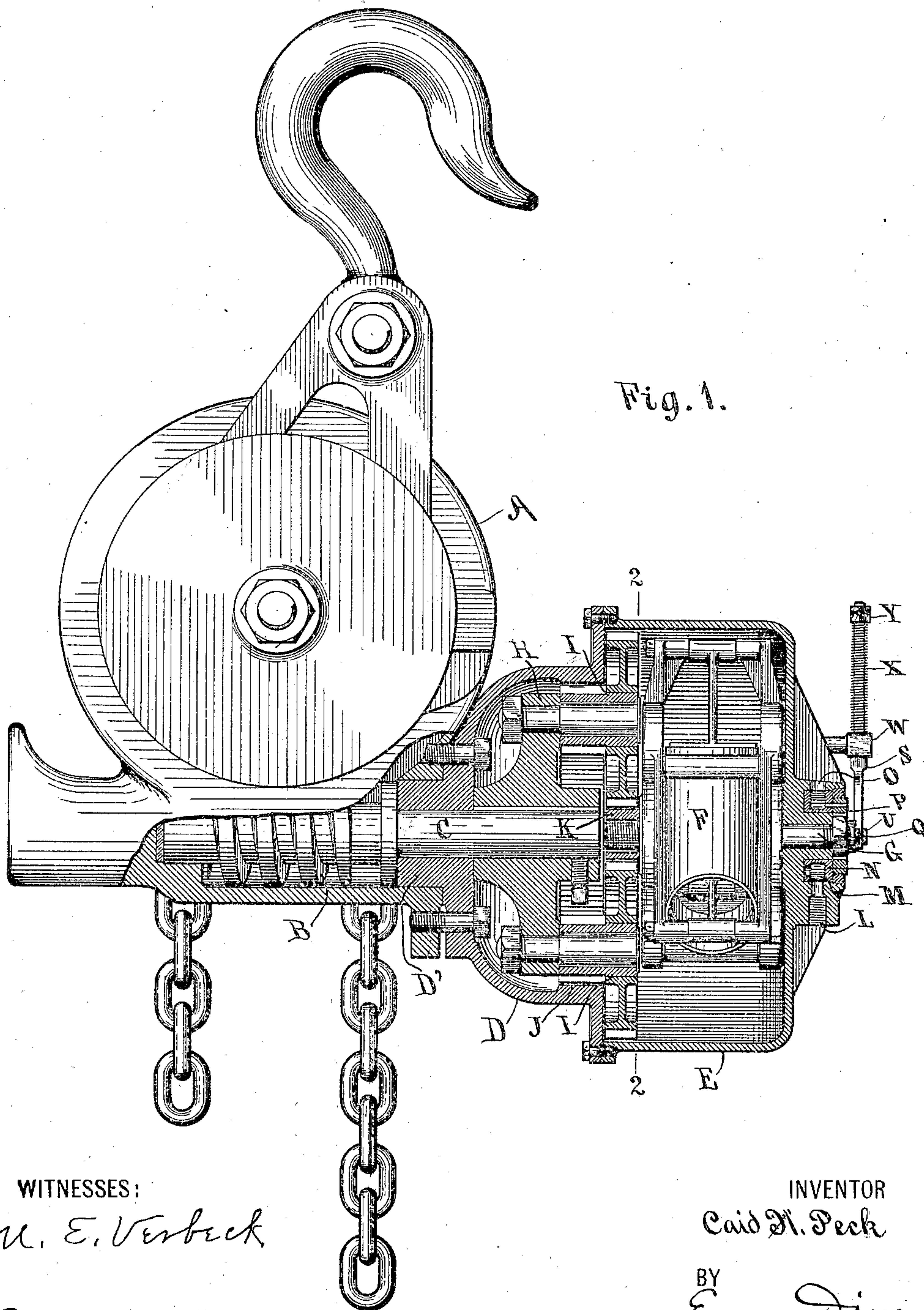
PATENTED APR. 14, 1903.

C. H. PECK.
MOTOR FOR HOISTS OR OTHER APPLIANCES.

APPLICATION FILED JUNE 9, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

M. E. Verbeck

Dwight S. Wiseman

INVENTOR

Caid H. Peck

BY

Eugene Diven
ATTORNEY

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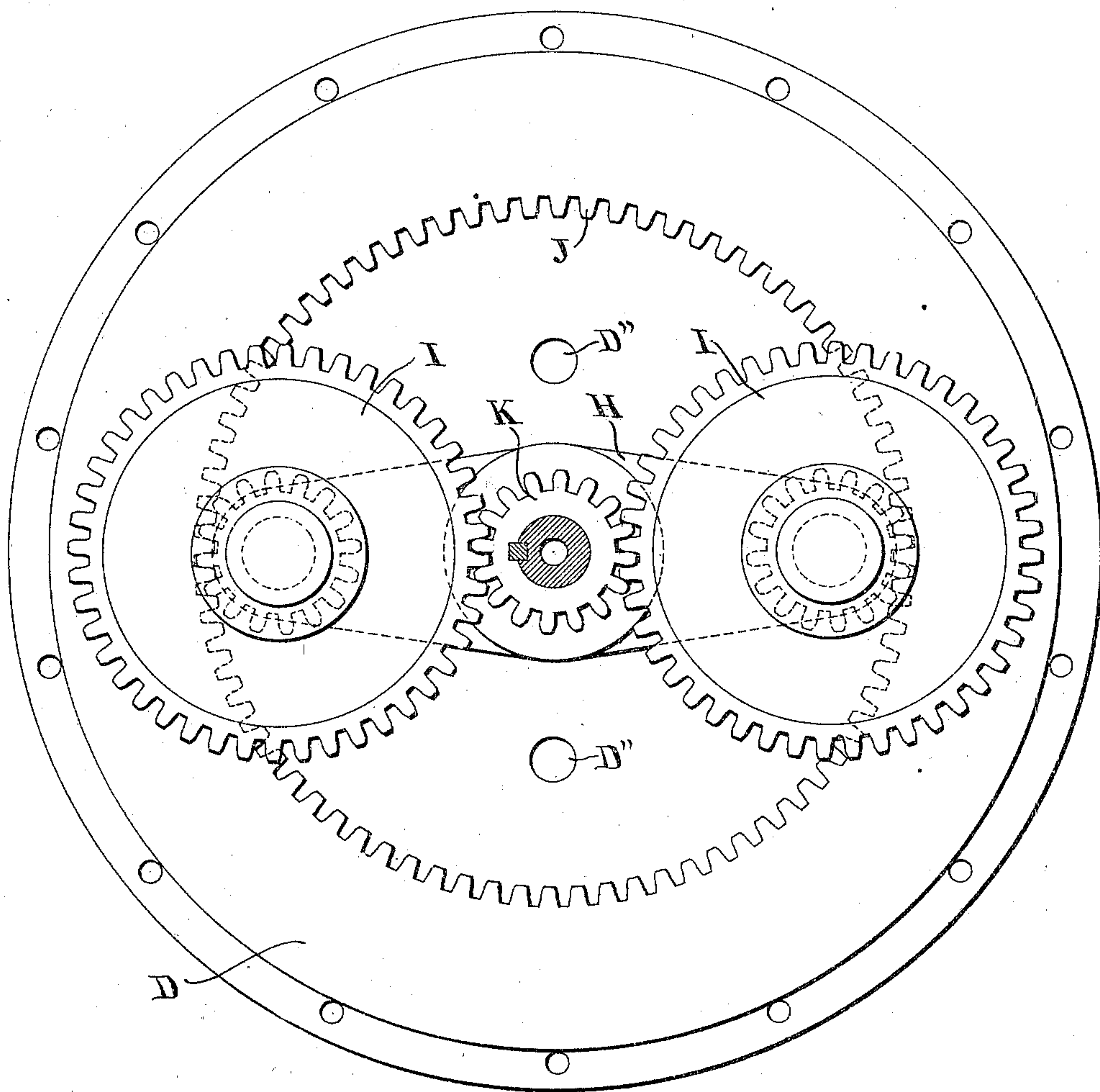


Fig. 2.

WITNESSES:

M. E. Verbeck

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INVENTOR

Carl H. Peck

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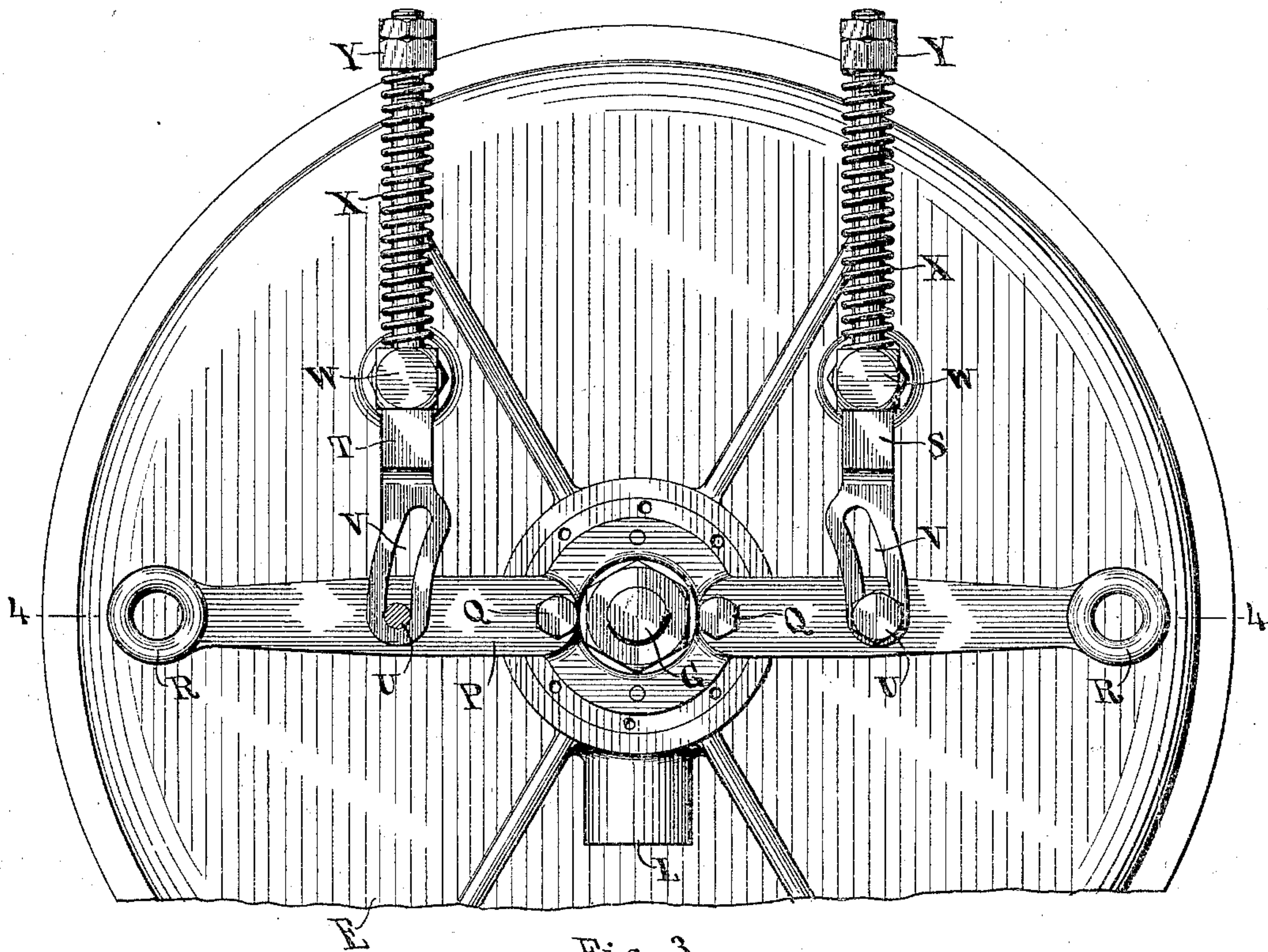


Fig. 3.

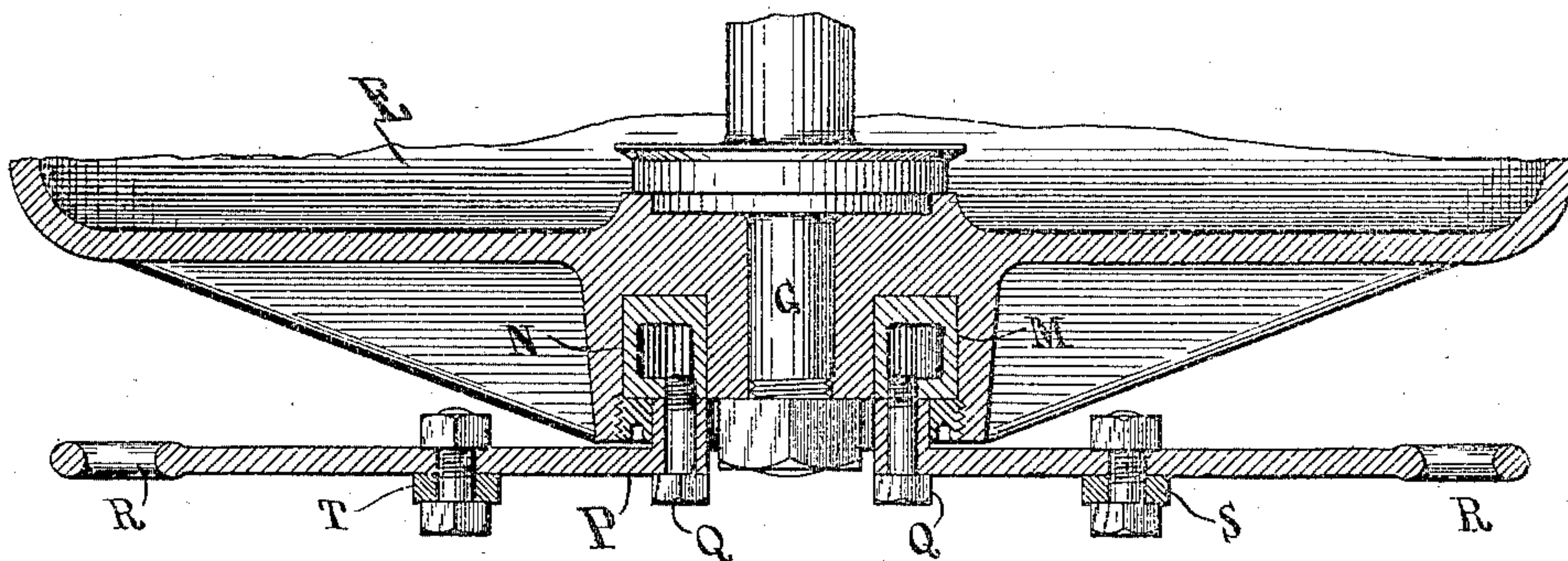


Fig. 4.

WITNESSES:

M. E. Verbeck.

Dwight S. Wiseman.

INVENTOR

C. H. Peck

BY

Eugene Diven
ATTORNEY

UNITED STATES PATENT OFFICE.

CAID H. PECK, OF ELMIRA, NEW YORK, ASSIGNOR TO IMPERIAL PNEUMATIC TOOL COMPANY, OF ATHENS, PENNSYLVANIA.

MOTOR FOR HOISTS OR OTHER APPLIANCES.

SPECIFICATION forming part of Letters Patent No. 725,128, dated April 14, 1903.

Application filed June 9, 1902. Serial No. 110,731. (No model.)

To all whom it may concern:

Be it known that I, CAID H. PECK, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Motors for Hoists or other Appliances, of which the following is a specification.

My invention relates to improvements in motors to be driven by compressed air or other motive fluids under pressure whereby this type of motor may be rendered applicable more particularly to driving that class of hoists commonly known and designated as "tackle-hoists," "hoisting-tackles," "chain-hoists," and the like which are used in machine-shops and other structural works for lifting and manipulating objects of more or less weight. The type of hoist more commonly in use for this purpose is that in which a chain sprocket or sprockets carrying the lifting-chain is driven by a worm-wheel and worm or other driving device by which the hoist is rendered self-sustaining to whatever elevation a weight within the capacity of the hoist is raised. The worm-shaft or other driving-shaft of the hoist is rotated by a hand-chain sprocket secured upon the shaft and propelled by manual power. In using such a hoist a greater or less number of men are required to operate the hoist according to the weight of the object to be raised or moved. For instance, in a five-ton hoist of this description it now requires from four to five men to operate the hoist at its full capacity.

The object of my invention is to substitute a motor for the hand-chain sprocket as a driving power in this class of hoists and to so construct and arrange the motor that it may be readily applied to the different makes of these manual hoists now in use by a mere substitution of the motor for the hand-chain sprocket without otherwise altering the hoist.

A further object is to provide means whereby by such a motor may be readily controlled from a distance, to the end that the hoist may be readily and quickly started, stopped, and reversed at the will of the operator.

While my main object is to provide a motor applicable to tackle-hoists, as above set forth, I do not wish to be understood as confining

myself to the use and application of my motor, as hereinafter described, solely in connection with such hoist, since my motor as so described may be also applied to other appliances which operate under similar requirements.

In the accompanying drawings I have illustrated my motor as applied to a chain-hoist of a well-known make, in which the lifting chain or tackle is propelled by means of a worm, to the shaft of which a hand-chain sprocket has heretofore been applied.

The arrangement and construction of the several parts of the motor necessary to attain my object are fully illustrated in said drawings, in which—

Figure 1 represents a side elevation of the hoist and a transverse vertical section of the motor, a portion of the hoist being shown as broken away in order to disclose the manner of attaching the motor to the hoist. Fig. 2 is a transverse section on the line 2 2 in Fig. 1; Fig. 3, an end elevation of the motor, showing the reversing-valve gear; and Fig. 4, a detail showing a section on the line 4 4 in Fig. 3.

Like letters of reference designate like parts in the several views.

A represents the hoist, in which is journaled the driving-worm B. The driving-shaft C of this worm projects out from the hoist, and as the hoists are now placed upon the market this end of the shaft C is journaled in the support for the hand-chain sprocket and said sprocket is keyed or otherwise fastened to the projecting end of the shaft. In applying my motor I simply remove the hand-chain sprocket and its support and substitute therefor the gear-case D and the gear-head H. The gear-case is provided with a hub or boss D', which fits into the casing of the hoist and forms a journal for the shaft C, and with the bolt-holes D'', so located as to receive the same fastening-bolts that were used to secure the support for the hand-chain sprocket in place, this portion of the gear-case being constructed to correspond with said support in the above two particulars. The gear-case carries a flange on its outer rim, to which is attached a motor-case E, in which runs the motor F, and the two cases D and E form together a two-part

casing with intercommunicating chambers. The motor F consists of a rotary frame journaled upon bearings fixed to the head of the casing E at the center thereof, said frames
 5 being propelled by a plurality of cylinders journaled upon an eccentric-shaft between the side plates of the frame, the cylinders and frame-plates being so connected as to coact with one another to produce rotary motion in
 10 the whole. This motor is described fully and at length in my copending application for Letters Patent for improvements in reversible motors and reversing-valve therefor, Serial No. 120,574, filed August 21, 1902. Differ-
 15 ferently-constructed motors which will fulfil the requirements may, however, be utilized to furnish the driving power, and I do not confine myself, therefore, to any particular construction of the motor for my present pur-
 20 pose.

The gear-head H is provided on diametrically opposite sides of the shaft C with a pair of differential gears I, which are journaled upon the gear-head upon suitable studs
 25 or arbors. These differential gears at their smaller diameter mesh with the teeth of a gear J, formed on the inner peripheral wall of the gear-case D, and the larger diameters of said gears mesh with the pinion K, which
 30 projects from and is driven by the rotary frame of the motor F, this arrangement of the gear-head and differential gears being shown in Fig. 2. As the gearings are here shown the motor is geared down to the shaft
 35 in the proportion of thirteen to one—that is, thirteen revolutions of the motor are required to produce one revolution of the shaft C—and the power transmitted from the motor to the shaft is consequently increased in the ratio of
 40 one to thirteen. My motor as so constructed will be found most powerful and efficient, considering the small compass to which such a motor must be reduced to answer the require-
 45 ments. In actual practice a motor constructed as herein shown and described and inclosed within a casing of fifteen inches outside di-
 50 ameter has been applied to a five-ton hoist, so as to drive the hoist at its full capacity with an air-pressure of ninety pounds to the square inch. In order to render such a mo-
 tor practicable in its operation for this purpose, there must be means for starting, stop-
 ping, and reversing the motor at the will of the operator. To this end the annular valve
 55 N, which controls the direction of flow through the valve-chamber M from the inlet connection L to and from the cylinders of the motor F and out by the way of the exhaust O, is provided with a two-armed operating-lever
 60 P. This lever is provided with a central annulus or hub encircling the nut on the stud G, by which the bearings of the motor F are secured to the head of the motor-case E, and this annulus is secured to the valve N by
 65 means of the cap-screws Q, so that the two will rotate together when the lever P is shifted. Upon each side of the valve and con-

nected to the lever by a pin-and-slot connection U V, I place what I term “right” and “left” spring-stops S and T. These stops
 70 are provided with shoulders abutting against the supports or guides W, which project out from the head of the motor-case E, and the stops pass up through the guide-holes in said guides. A coiled spring is located between
 75 said guides and the outer ends of the stops, the spring being held in place by means of jam-nuts Y, secured to the ends of said stops. At the outer ends of the lever P are the eyes
 80 R, to which may be attached operating-cords, which will run to the operator standing on the ground below the hoist or in any other conven-
 85 ient locality. As the valve is set in Fig. 3 the ports in the valve which control the communication from the valve-chamber M to the pas-
 90 sages leading to the cylinders will be closed, and the valve will be held in this position by reason of the springs X, which draw the stops S and T up against the guides W, the lower end
 95 of the slots V on each stop engaging the pin U on the lever P and forcing said lever to its medial position. To start the motor, the right-hand cord attached to the lever P will be
 100 pulled, thereby drawing down stop S and causing the pin U on the left-hand arm of the lever to engage the upper end of the slot in stop T when the ports are fully opened. Re-
 105 leasing operating-cord will permit the spring X on stop S to return the stop to its normal position, thereby closing the valve and shutting down the motor. To reverse the motor,
 110 the left-hand cord will be pulled, thereby changing the direction of flow through the chamber to and from the cylinders. In so reversing the valve the stop T will be drawn
 115 out and the slot in stop S will limit the throw of the valve, and the valve will be returned to a closed position as soon as the left-hand cord is released by reason of the pressure of
 120 the spring X on the stop T. The motor may be run at less than full speed in either direction by pulling down to a greater or less extent upon the operating-cords on either side.

Having thus described the novel and essential features necessary to render my present improvements completely operative and
 115 without restricting myself to the particular form and manner of assembling and applying the parts as herein illustrated, what I claim as my invention, and desire to secure
 120 by Letters Patent, is—

1. The combination with a tackle-hoist, of a casing, a motor within said casing coupled by a train of gears to a gear-head also contained within said casing, said gear-head and casing being adapted to be substituted for the
 125 hand-chain sprocket upon the hoist.

2. As a complete article of manufacture, a casing, a motor to be driven by compressed air, or other fluid under pressure, and a reducing-gearing contained within said casing,
 130 the whole being adapted to be substituted for the hand-chain sprocket upon a hoist.

3. As a complete article of manufacture, a

casing, a reversible motor to be driven by compressed air, or other fluid under pressure, and a reducing-gearing contained within said casing, the whole being adapted to be substituted for the hand-chain sprocket on a hoist, a reversing-valve in the casing-head, and means for controlling said valve.

4. As a complete article of manufacture, a motor to be driven by compressed air or other fluid under pressure, a casing containing said motor together with a gear-head and train of gears coupled thereto, said gear-head and casing being adapted to be substituted for the hand-chain sprocket and its support upon the driving-shaft of a hoist.

5. As a complete article of manufacture, a motor inclosed in a two-part casing, said casing comprising a motor-case, in which the motor is secured, and a gear-case, containing a gear-head and a train of gears to which the motor is coupled, said gear-case and gear-head being adapted to be fitted to a hoist in place of a hand-chain sprocket and its support.

6. The combination with a tackle-hoist, of a gear-case in which one end of the driving-shaft of the hoist is journaled, a gear-head within said case secured to said driving-shaft, a motor contained in a motor-case, means for uniting the two cases, and a train of gears coupling the motor to the gear-head.

7. The combination with a tackle-hoist, of a casing, means for attaching the casing to the hoist with the driving-shaft thereof projecting into the casing, a motor to be driven by compressed air or other fluid under pressure within said casing, and a train of gears also contained within said casing by which the motor is coupled to said shaft.

8. The combination with a tackle-hoist, of a casing, means for attaching the casing to the hoist with the driving-shaft thereof pro-

jecting into the casing, a gear-head on said shaft within the casing, differential gears journaled on said head and meshing with an internal gear formed around the casing, and a motor within the casing driving a pinion in mesh with said differential gears.

9. The combination with a tackle-hoist, of a two-part casing, one part constituting a gear-case and the other a motor-case, means for attaching the gear-case to the hoist with the driving-shaft thereof projecting thereinto, a gear-head secured to said shaft within the gear-case, gears journaled on said head and meshing with an internal gear formed on the walls of the gear-case, a motor in the motor-case, and a pinion driven by the motor meshing with said gears when the two parts of the casing are joined together.

10. The combination with a tackle-hoist, or like appliance, of a casing into which the driving-shaft thereof passes, a reversible rotary motor secured to the head of the casing in axial alinement with said shaft, a train of gears coupling the motor to the shaft, and means carried by the casing-head for starting, stopping and reversing the motor.

11. The combination with the driving-shaft C of a tackle-hoist or like appliance, of the reversible rotary motor F running in axial alinement with said shaft, pinion K on said motor in mesh with differential gears I I on gear-head H secured to said shaft, a casing inclosing and supporting said parts, a gear J on the interior of said casing meshing with said differential gears, and means for starting, stopping and reversing the motor.

In testimony whereof I have affixed my signature in presence of two witnesses.

CAID H: PECK.

Witnesses:

A. S. DIVEN,
M. E. VERBECK.