

(No Model.)

2 Sheets—Sheet 1.

T. W. CAPEN.
HOISTING APPARATUS.

No. 279,704.

Patented June 19, 1883.

Fig. 1.

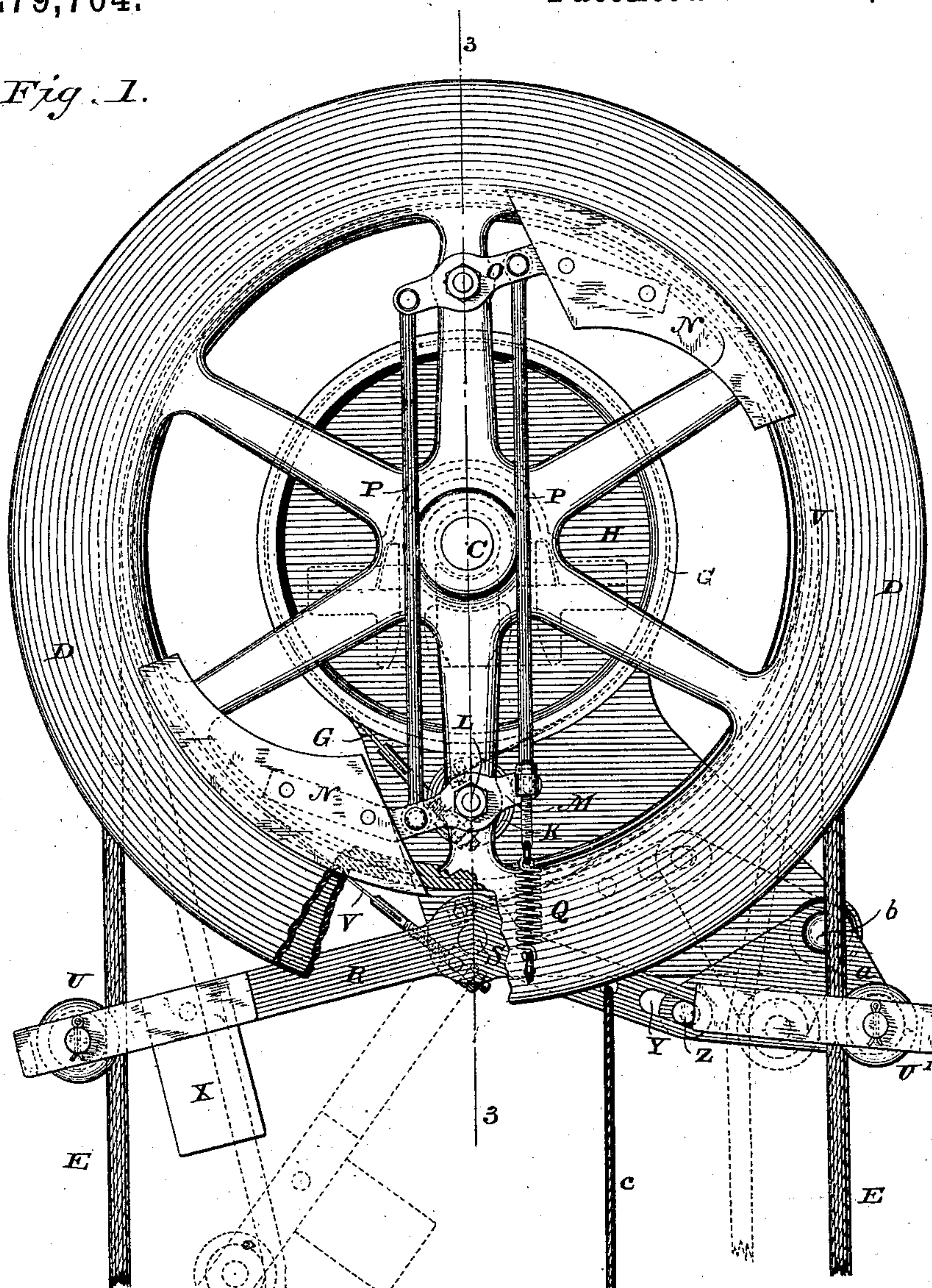
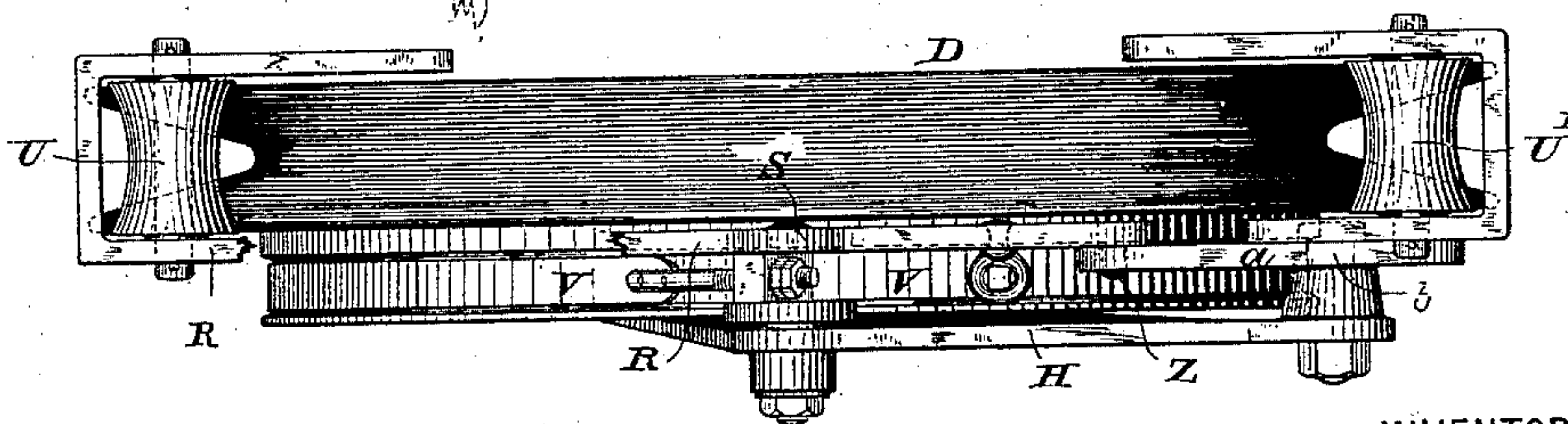


Fig. 2.



WITNESSES

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By his Attorneys

Raldwin, Hopkins, & Peyton.

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Fig. 3.

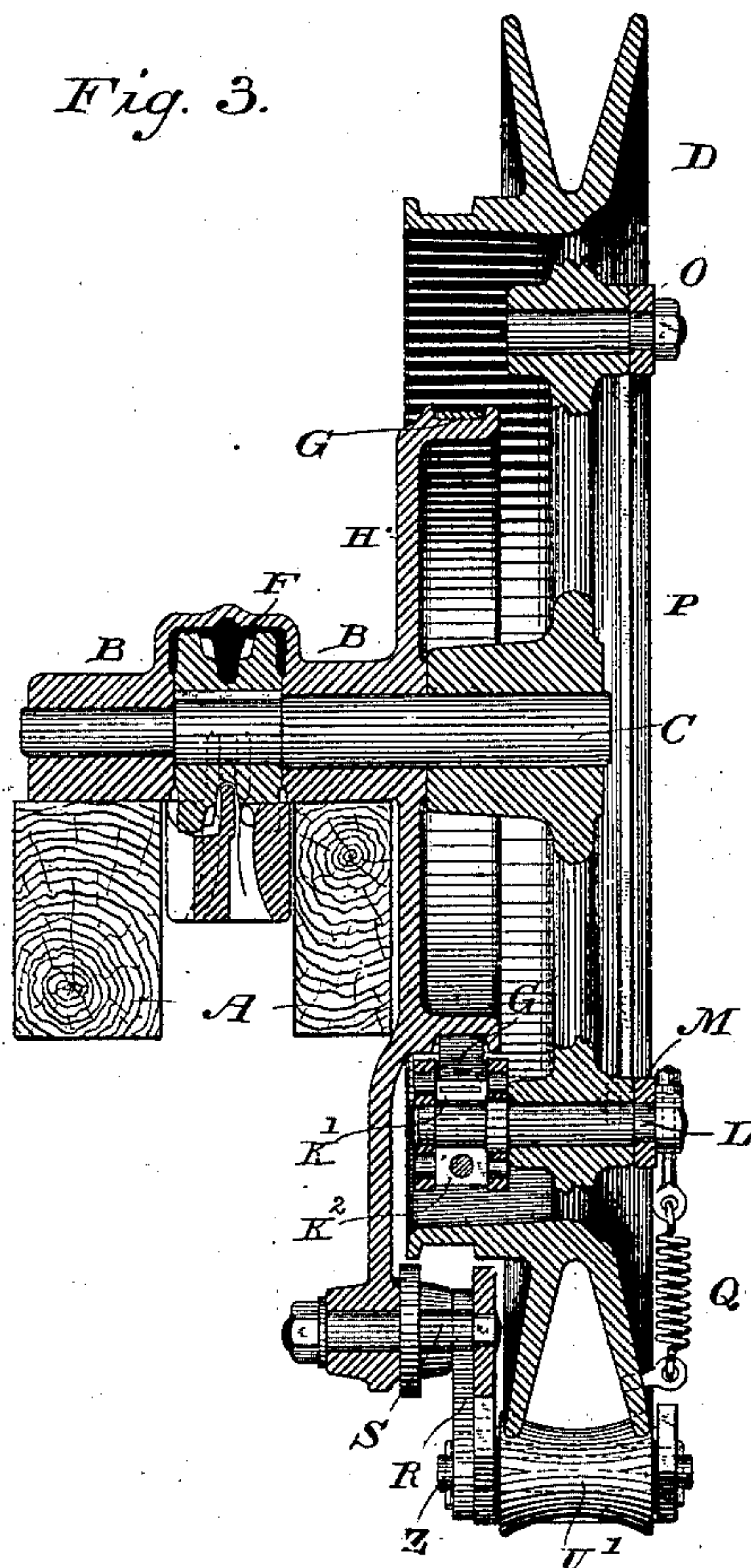


Fig. 4.

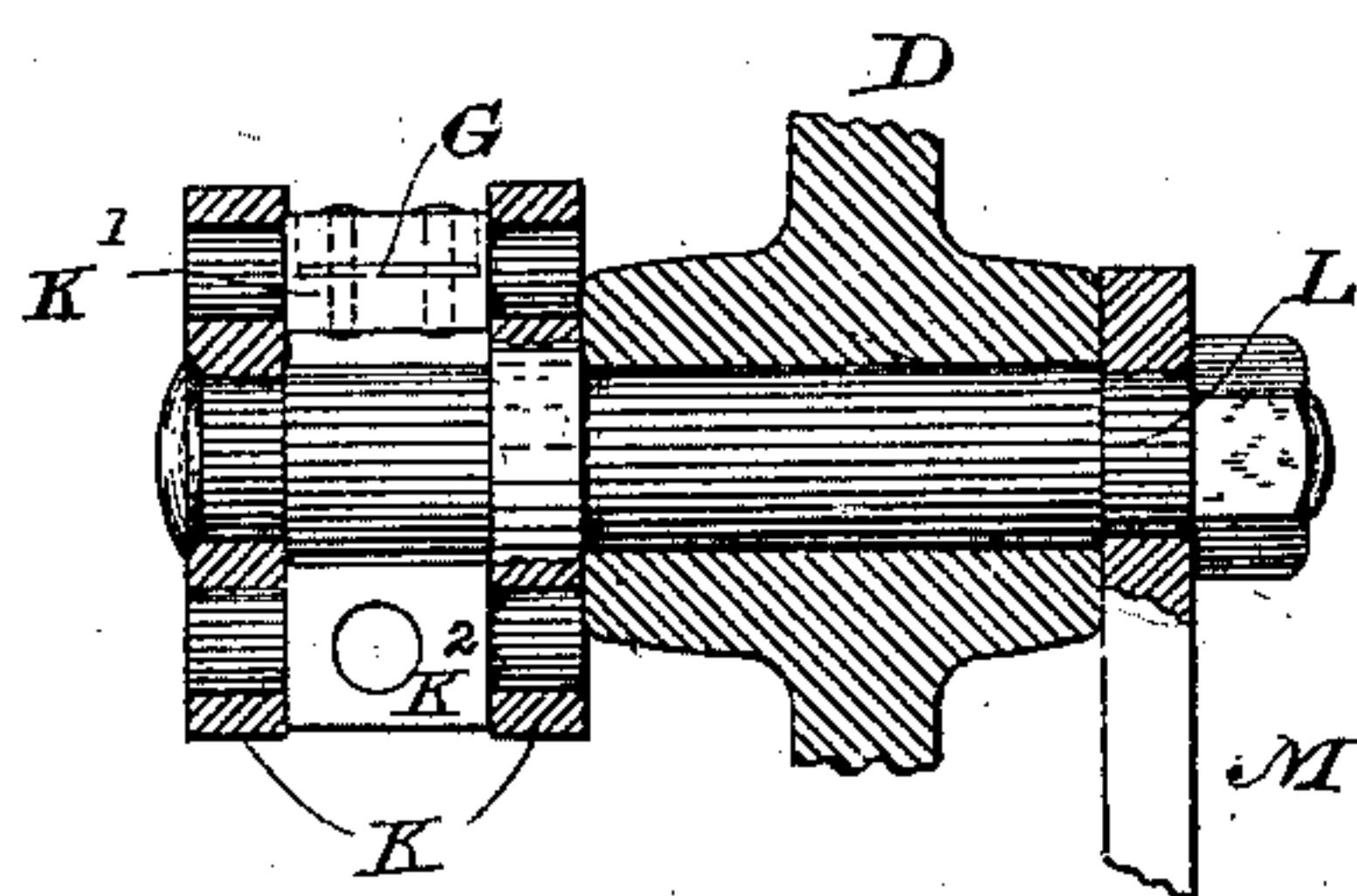
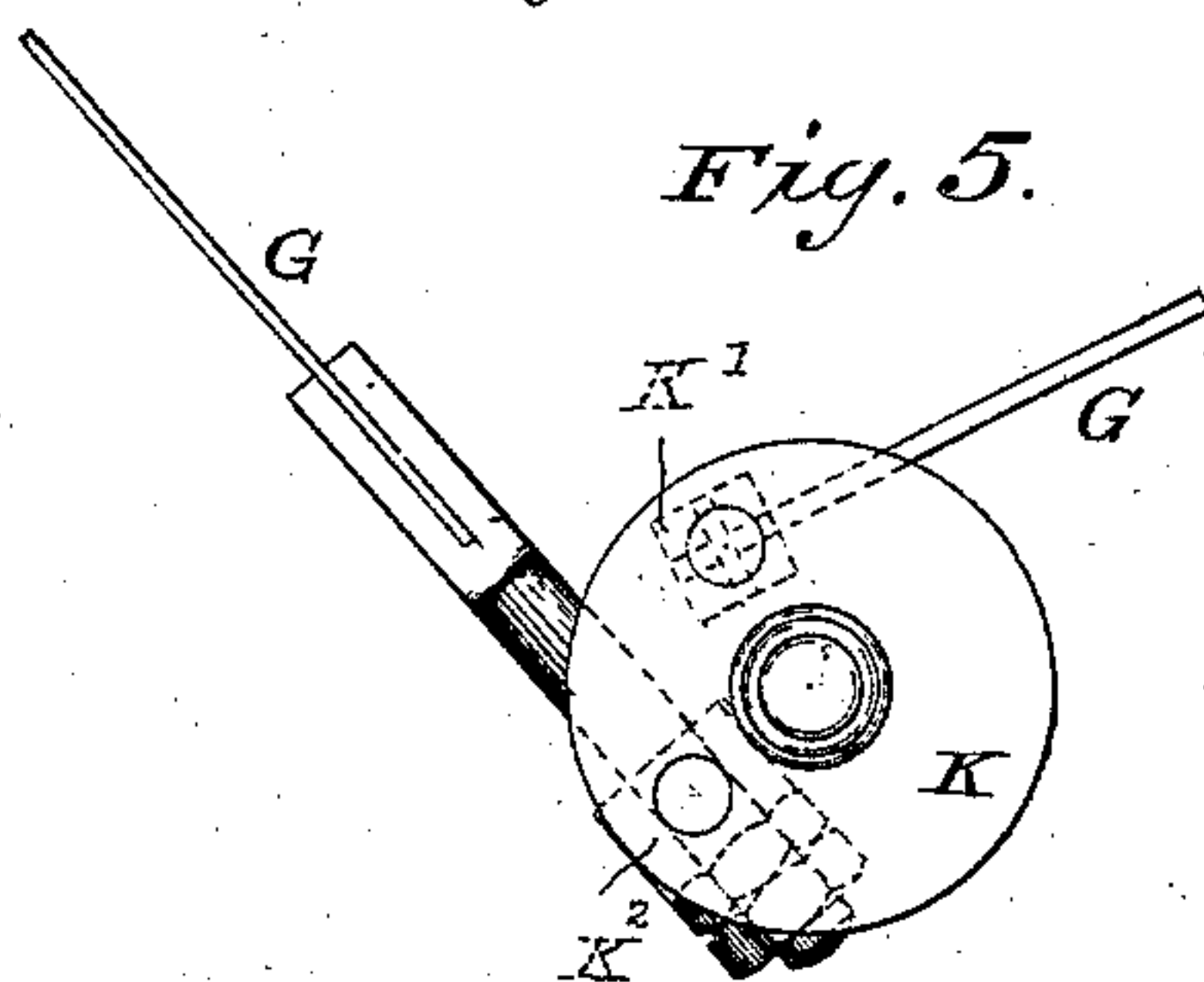


Fig. 5.



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UNITED STATES PATENT OFFICE.

THOMAS W. CAPEN, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE
& TOWNE MANUFACTURING COMPANY, OF SAME PLACE.

HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 279,704, dated June 19, 1883.

Application filed May 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. CAPEN, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain useful
5 Improvements in Hoisting Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to produce a double-lift hoisting apparatus—that is, an ap-
10 paratus whose lifting-chain is provided with a hook at each end, so that when a load has been lifted the other hook is lowered to receive another load.

As shown in the drawings, my apparatus is
15 designed ordinarily for the use of hand power, but it is not confined to this, and can easily be adapted to be run by steam or other power.

I provide my apparatus with a safety-brake, which acts upon the driving-wheel and nor-
20 mally holds it stationary and the load suspended at any point. The brake of this safety apparatus is, however, at once thrown off so soon as power is applied to the hand or driving rope to operate the machine; but the brake
25 is immediately applied again and the load held stationary as soon as the strain is removed from the driving-rope. This is true whether the driving-rope is operated for hoisting or lowering. It is very often convenient to allow
30 a load to run down without any action on the part of the operator; but it is of course undesirable to allow the load to descend with a constantly-accelerated motion, as it would do under ordinary circumstances. Accordingly
35 I provide an automatic governor so arranged in combination with the machine and the safety-brake attachment that the brake can be thrown off and the load descend at a uniform speed under the action of the automatic gov-
40 ernor. I therefore provide a machine which is a double lift, which will automatically sustain the load at any point, and which will allow the load to safely run down at a uniform speed under the action of a governor.

45 Figure 1 of the drawings represents an end elevation of my apparatus. Fig. 2 represents a bottom plan view of the same, omitting the chain-wheel; and Fig. 3 represents a vertical section on the line 3 3 of Fig. 1. Figs. 4 and
50 5 represent details.

Describing the apparatus in detail by reference to the letters on the drawings, A indicates cross-beams or any suitable supports for the bearings B of the shaft C, to which latter
is fixed the hand-wheel or driving-wheel D, 55 sustaining the hand or driving rope E.

F indicates a pocket chain-wheel, over which a lifting-chain may pass in the usual way, which is adapted to lift upon one side and lower upon
the other, or vice versa, according to the di- 60 rection in which shaft C is turned.

Referring to the governor mechanism, G indicates a brake-strap, which is attached to the hand-wheel or driving-wheel, and when not in
action travels freely around a fixed annular 65 casting, H, which is a part of the frame or housing of the device. The opposite ends of the strap are secured to a crank-piece, K, the detail of which is shown in Figs. 4 and 5. It
consists of two plates, between which are 70 loosely pivoted two pins, K' and K². A strap is pinned to one and adjustably secured to the other by means of a bolt and nut. The object of this is to cause equal strains on each end of
the brake-strap whenever the governor causes 75 the crank to rotate, as it will do in whichever direction the wheel is turned, provided it turns with sufficient rapidity, which is the only case where it is desirable for the gov-
ernor to act. The rock-shaft L of the crank- 80 piece has a bearing in one of the arms of the driving-wheel.

Rigidly secured to the rock-shaft is a lever, M, having a weight, N, and this lever is con-
nected to another similar weighted lever, O, 85 by two rods, P. The spring Q is connected adjustably to the hand-wheel or driving-wheel, and to the lever M, so that its tension can be regulated, and it is normally sufficient to coun-
teract any slight centrifugal force acting on the 90 weights, due to rotary motion which is not rapid enough to be injurious. The weights N tend outward by centrifugal force, and when the velocity of rotation of the hand-wheel or
driving-wheel is sufficient will fly outward, 95 and they consequently pull on the spring Q, turn the crank-piece K, wind up the brake-strap G, cause it to clasp tightly around the casting H, check the speed of rotation, and
thus the device acts automatically to safely 100

govern the descent of a heavy load set free to come down by [its own gravity. This governor mechanism, broadly, is, however, not of my invention, being shown in substance in
 5 United States Patent of Thomas A. Weston, No. 217,030. The device here shown, however, is an improvement upon that of Weston in some regards—namely, as both ends of the brake-strap are pulled in my device, the same
 10 leverage will cause greater friction. My device also acts equally well in whichever direction the wheel is turned, so that it is applicable to a double lift, whereas Weston's device only operates well when the wheel is turned in
 15 one direction. In connection with this governor mechanism I provide in the same hoisting apparatus a brake or stop mechanism, which, unlike the governor mechanism, normally acts automatically to stop the descent
 20 of a load and hold it at rest in any desired position of suspension. In this stop mechanism R indicates a lever, pivoted at S in the housing, and slotted or bifurcated at the outer end of its long arm to receive one part of the
 25 pull-rope E and an anti-friction pulley, U.

The opposite ends of a brake-strap, V, which encircles an annular flange, W, projecting from the hand-wheel or driving-wheel, are secured to this wheel, as illustrated, and a
 30 weight, X, tends to lower the lever to the position shown in dotted lines, Fig. 1, and to clasp the strap V tightly around the flange W, and stop and hold the hand-wheel or driving-wheel fast, so that no load can run down. It is not necessary to adhere to the form of a strap and a
 35 flange or flat surface for it to encircle, although these are very good forms. A cable fitting in an annular groove would also be a good form of stop mechanism, and it would be practicable to use a lever, one end of which should be
 40 moved to cause the other to engage by friction and act as a stop. I do not intend to limit my invention, therefore, in this or any other particular to the exact forms or details here illustrated.
 45

The short arm of the lever R is provided with a slot, Y, to receive and permit the proper play of a pin, Z, projecting from another lever, a, pivoted at b in the housing, thus forming an
 50 extensible-joint connection between the ends of the two levers. The lever a is slotted or bifurcated at its outer end to receive another anti-friction pulley, U', and the other part of the pull-rope E.

It will be seen by this construction and arrangement of parts that the weight X normally acts not only to apply the strap V and stop the hoist and hold it fast, but also causes the two pendent parts of the driving-rope to be bent inward toward each other, as shown
 60 by dotted lines in Fig. 1. Supposing the apparatus to be in that condition, it is obvious that a pull upon either part of the driving-rope will straighten it and bring the parts to the position shown in full lines, Fig. 1, throw the stop mechanism out of operation and raise or lower a load, as the case may be. At the

same time the governor mechanism is ready for automatic action, in case too great speed is attained, to graduate the motion. 70

If it be desired to rely on the governor mechanism altogether to regulate the action of gravity in lowering a load, then it is only necessary to pull upon a pendent cord, c, which I have connected to the short arm of the lever R, when
 75 the stop mechanism will be thrown out of action and the load will come down at moderate speed safely. If from any cause the governor should not act properly, then, by discontinuing the pull on the cord c, the stop mechanism
 80 would quickly act automatically to stop the rotation of the shaft and the descent of the load. It thus serves, in conjunction with the governor mechanism, as an extra safety attachment, so that with my double hoisting apparatus no accident is possible, or at least all accidents are securely guarded against by two
 85 simple automatic safety appliances, which make liability to accidents exceedingly slight and enable the apparatus to be worked safely
 90 by careless, ignorant, or unskillful persons, as well as by the most expert.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is— 95

1. In a hoisting apparatus, the combination of an automatic governor mechanism and an automatic stop mechanism, substantially as set forth.

2. In a hoisting apparatus, the combination 100 of a driving-wheel and a double-acting governor, so that the rotation of the driving-wheel sufficiently fast in either direction will cause the governor to act, substantially as described.

3. In a hoisting apparatus, a governor brake-strap, both ends of which are attached to a crank-piece, so that the turning of the crank by the action of the governor pulls both ends of the strap, substantially as described. 105

4. In a hoisting apparatus, the combination 110 of a driving-wheel and driving-rope and a brake which normally holds said driving-wheel stationary, but which is thrown off and the wheel released whenever power is applied to said driving-rope to operate the apparatus, substantially as described. 115

5. In a hoisting apparatus, the combination of a driving-wheel and brake normally holding the wheel stationary under the action of a weighted lever, which lever may be moved to release said brake either by means of the driving-rope or a separate device, substantially as described. 120

6. In a hoisting apparatus, the combination of a governor, a brake, a weighted lever, and 125 a pull-cord or other device, so that by pulling the cord the brake may be thrown off and the load descend under the action of the governor, and by releasing the cord the load will remain stationary at any point, substantially as described. 130

7. In combination with a governor-brake, a crank-piece, K, to which both ends of the brake are attached, substantially as described.

8. The combination, with a driving-wheel
and its driving-rope, of a lever, R, a lever, a,
and a brake-strap or equivalent for stopping
and for preventing rotary motion, substantially
5 as set forth.

9. The combination, with a driving-wheel
and its driving-rope, of the pivoted levers R
and a, provided with slots and anti-friction
pulleys, and a strap, V, encircling an annular
10 flange, W, substantially as set forth.

In testimony whereof I have hereunto sub-
scribed my name this 5th day of May, A. D.
1883.

THOS. W. CAPEN.

Witnesses:

SCHUYLER MERRITT,
GEO. E. WHITE.