No. 757,381. PATENTED APR. 12, 1904.

J. D. WRIGHT.

AUTOMATIC CHECK AND RELEASE MECHANISM.

APPLICATION FILED MAY 28, 1903.

NO MODEL.

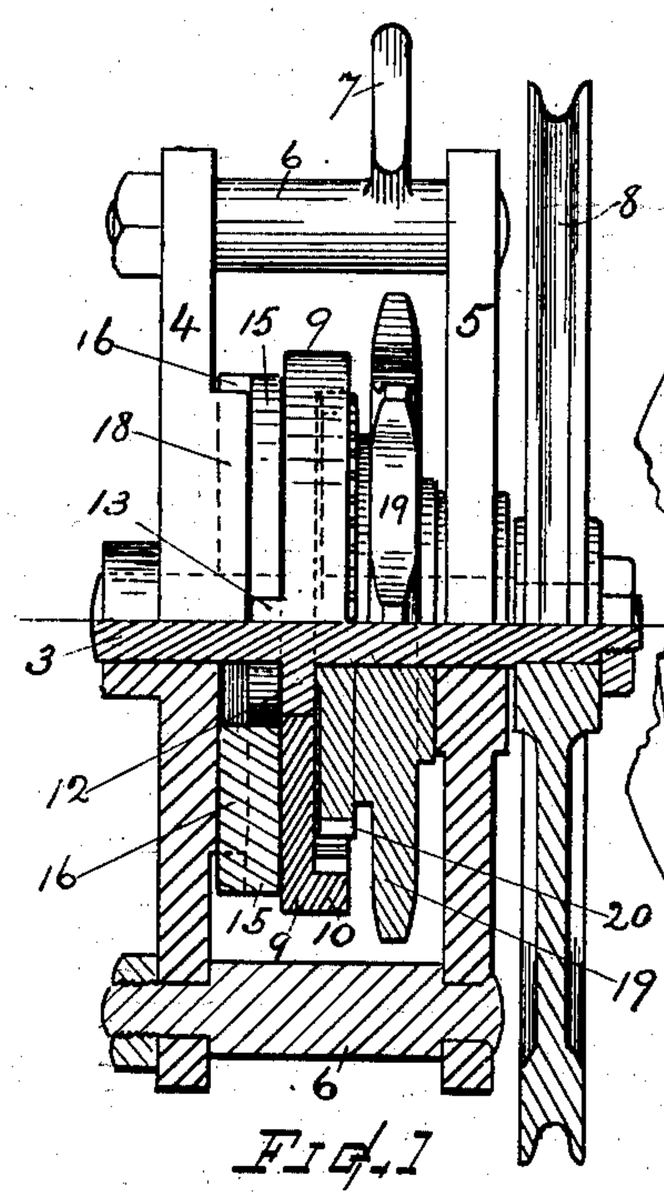

FIG. 1

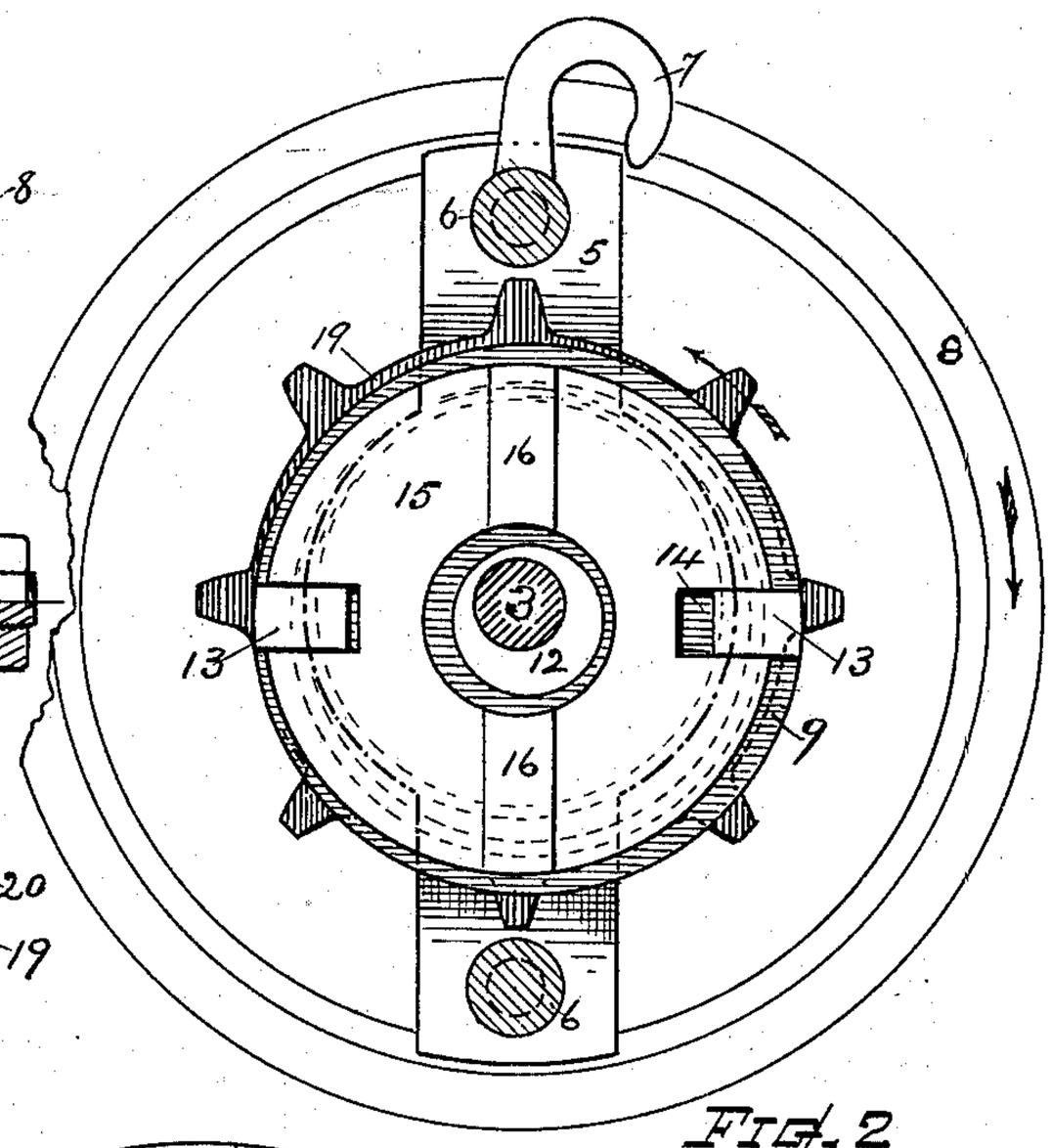

FIG. 2

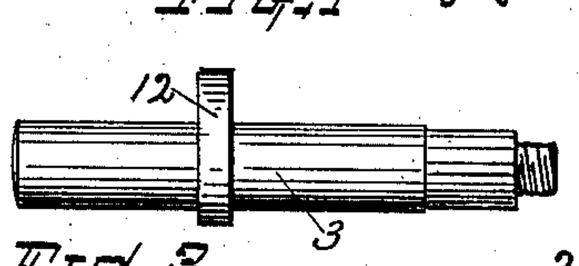

FIG. 3

FIG. 4

FIG. 5

FIG. 6

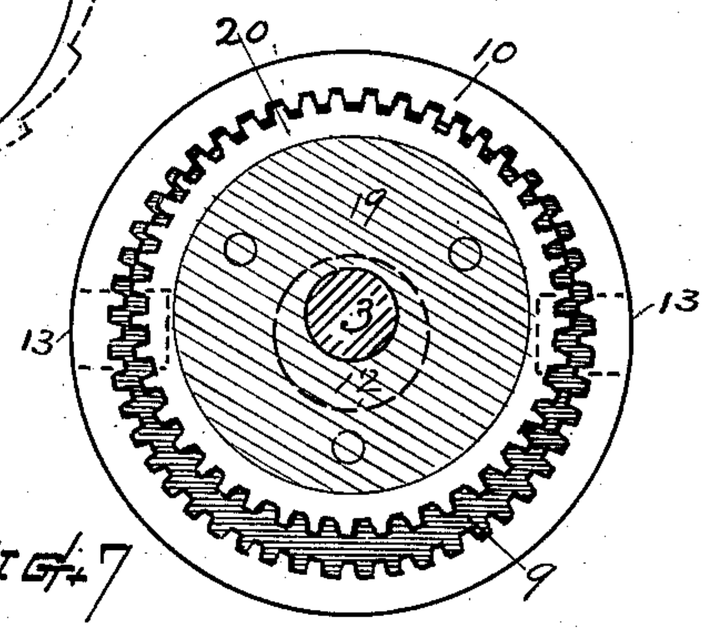

FIG. 7

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No. 757,381. Patented April 12, 1904.

UNITED STATES PATENT OFFICE.

JACOB D. WRIGHT, OF WORCESTER, MASSACHUSETTS.

AUTOMATIC CHECK AND RELEASE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 757,381, dated April 12, 1904.

Application filed May 28, 1903. Serial No. 159,072. (No model.)

To all whom it may concern:

Be it known that I, JACOB D. WRIGHT, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Automatic Check and Release Mechanism, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

This invention relates to a novel means or combination for transmitting and converting power and motion, the same being applicable to various kinds of machinery, and especially useful in elevator mechanisms and differential hoisting apparatus.

The object of my invention is to provide an efficient power-transmitting mechanism or gearing-train adapted for ready and easy movement of its mechanism when power is applied at one part or the driver-shaft, but capable of resisting the tendency of reactive forces or self-holding for its load or against power applied at the opposite end of the train, said mechanism also being adapted for working in either right or left direction of rotation, as more fully hereinafter explained. I attain these objects by a mechanical contrivance or structure organized for operation as illustrated in the drawings, which show the application thereof to a hoisting apparatus, and wherein—

Figure 1 represents a half-front half-section view of a mechanism embodying my invention. Fig. 2 represents a side view with a portion of the frame omitted and the shaft and frame connecting members shown in section. Fig. 3 is a separate view of the shaft and eccentric. Fig. 4 represents the inner face of one part of the frame and a modification indicated thereon by dotted lines. Figs. 5 and 6 show the detail of the holding-disk in side and section views, and Fig. 7 shows a detail view of the intermeshing gears.

My improved mechanism comprises the following-named parts combined and organized for operation as set forth: an axial shaft (indicated by the reference-numeral 3) arranged to turn in bearings in the frame-pieces 4 and 5, which frame-pieces may be stationarily supported as a portion of a machine or, as in the present instance, joined together by transverse members 6 and provided with a suspending means, as the hook 7. The shaft 3 is the driving member and is shown provided with an operating-wheel 8, which in practice can be fitted for receiving power either as a band-wheel, a chain-sprocket, a toothed gear, or otherwise, as in any instance may be desired. A gear or disk 9, having an internally-toothed rim 10, is mounted upon an eccentric 12, fixed on the shaft 3. Said disk is provided with lugs 13, that engage in slots or recesses 14 in a reciprocating plate or disk member 15, surrounding the shaft adjacent to the gear-disk 9 and having on its outer side lugs 16, that engage and slide in grooves 17, formed in a guiding member 18, which may be a separate part, as a confined disk or an integral part of the frame-piece 4. In the present illustration the groove 17 is formed in the frame-piece 4, which holds the plate 15 against lateral movement, but allows it to reciprocate up and down the groove, while the recesses 14 and lugs 13 allow the gear-disk 9 to move laterally in relation thereto. The lugs 13 of the gear-disk and the lugs 16 of the reciprocating member 15 are disposed radially in relation to the axis and at right angles in relation to each other, so that the parts are retained non-rotative, but are free to slide in the directions of the respective interlocking lugs and recesses.

A load-wheel 19, rigidly connected with a spur-gear 20, is mounted to revolve on the shaft 3, the teeth of said gear 20 meshing with the internal teeth 10 of the gear-disk 9, as best shown in Fig. 7. The load-wheel 19, as shown, is provided with sprocket-teeth for carrying a hoisting-chain; but said load-wheel, which is the driven member, can be formed as a winding-drum, a toothed gear, or for transmission of power in other manner, as may in any instance be desired. The gear 20 is permitted rotation only by rolling about the interior of the toothed rim 10 of the gear-disk 9, with which its teeth differentially intermesh, and inasmuch as such rolling action can result only when the gear-disk is given a gy-

ratory movement by the action of the eccentric 12 it will be seen that when the eccentric is idle the gear-disk is non-movable, since the disk cannot turn the eccentric and is held from rotation by the engaging grooves and lugs 13, 14, 16, and 17. Hence the intermesh of the gear-teeth between the gear 20 and rim 10 then serves as a dead-lock for resisting backward action of said gear and the load-wheel attached thereto.

It will be understood that when employed in a hoisting apparatus a load-supporting chain is arranged over the load-wheel and a hand-pull chain or rope is arranged over the operating-wheel; but these chains are not shown in the drawings, as they are not essential to the working of the invention as a mechanical movement.

The operation is as follows: Power is applied to rotate the shaft 3 and eccentric 12. The internally-toothed gear is moved by the eccentric with a gyratory movement, but is held from rotating by the reciprocating plate 15 and engaging lugs 13 and 16. This movement and the engagement of the intermeshing gear-teeth effects a differential rotative movement of the gear-wheel 20 and load-wheel 19, attached thereto, in a direction opposite to the movement of the operating-wheel 8. (See pointers on Fig. 2.) This movement can be in either direction of rotation, transmitted from the operating-wheel 8 or shaft 3 to the load-wheel; but the train resists all tendency to reverse action and will not effect movement or transmission of power from the opposite direction or applied to the load-wheel, the mechanism being self-locked for holding a load suspended from either side of the load-wheel 19.

The amount of differential speed or ratio of increase of power between the operating-wheel 8 and the load-wheel 19 can be made greater or less, as in any instance required, by changing the proportional diameters and relative numbers of teeth in the two gears and the throw of the cam.

In some instances, as in some elevator mechanisms or where it is desired to have a mechanism that can be released to run down, I construct the guide member 18, having the grooves 17 therein, as a separate part or disk-wheel and provide it with ratchet-teeth 28, also providing a suitable pawl 29 or means for retaining said ratcheted guide member 18 stationary under ordinary conditions of working, but capable of being released when desired by raising the pawl or dog to permit rotation of the entire mechanism. An example of such modification is indicated by dotted lines on Fig. 4.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A mechanism comprising a rotatable power-shaft, an eccentric fixed on said shaft, an internally-toothed gear mounted on said eccentric, an externally-toothed gear-wheel of less diameter mounted loose on the shaft and meshing with said internally-toothed gear, means for preventing rotation but permitting bodily gyratory movement of said internally-toothed gear, and a driven member attached to said externally-toothed gear, substantially as set forth.

2. In combination, as described, a rotatable shaft, an eccentric fixed thereon, a gear-disk mounted on said eccentric, a gear-wheel mounted loose on said shaft with its teeth differentially meshing with the teeth of said gear-disk, an open-centered reciprocating disk adjacent to said gear-disk, intermatching radial lugs and recesses that prevent rotation of said gear-disk, and intermatching lugs and grooves approximately at right angles to the first named, that confine said reciprocating disk to a stationary member, a load-wheel mounted loose on the shaft and rigidly attached to said gear-wheel, and means for applying power to said shaft.

3. The combination, substantially as described, of the supporting-frame, a rotatable axial shaft mounted therein, an eccentric fixed on said shaft, a stationary member having a guideway transverse to the shaft-axis, a movable plate provided with confining guides that move in said guideway, a transverse guideway in said movable plate, a gear-wheel or disk mounted on said eccentric and provided with an internally-toothed rim, means engaging said disk with the transverse guideway on said plate, a driven member or load-wheel mounted loose on the shaft and having a spur-gear that meshes with the internally-toothed rim of said disk, and an operating-wheel or means for rotating said axial shaft.

Witness my hand this 26th day of May, 1903.

JACOB D. WRIGHT.

Witnesses:
CHAS. H. BURLEIGH,
SIMEON E. KING.