

(No Model.)

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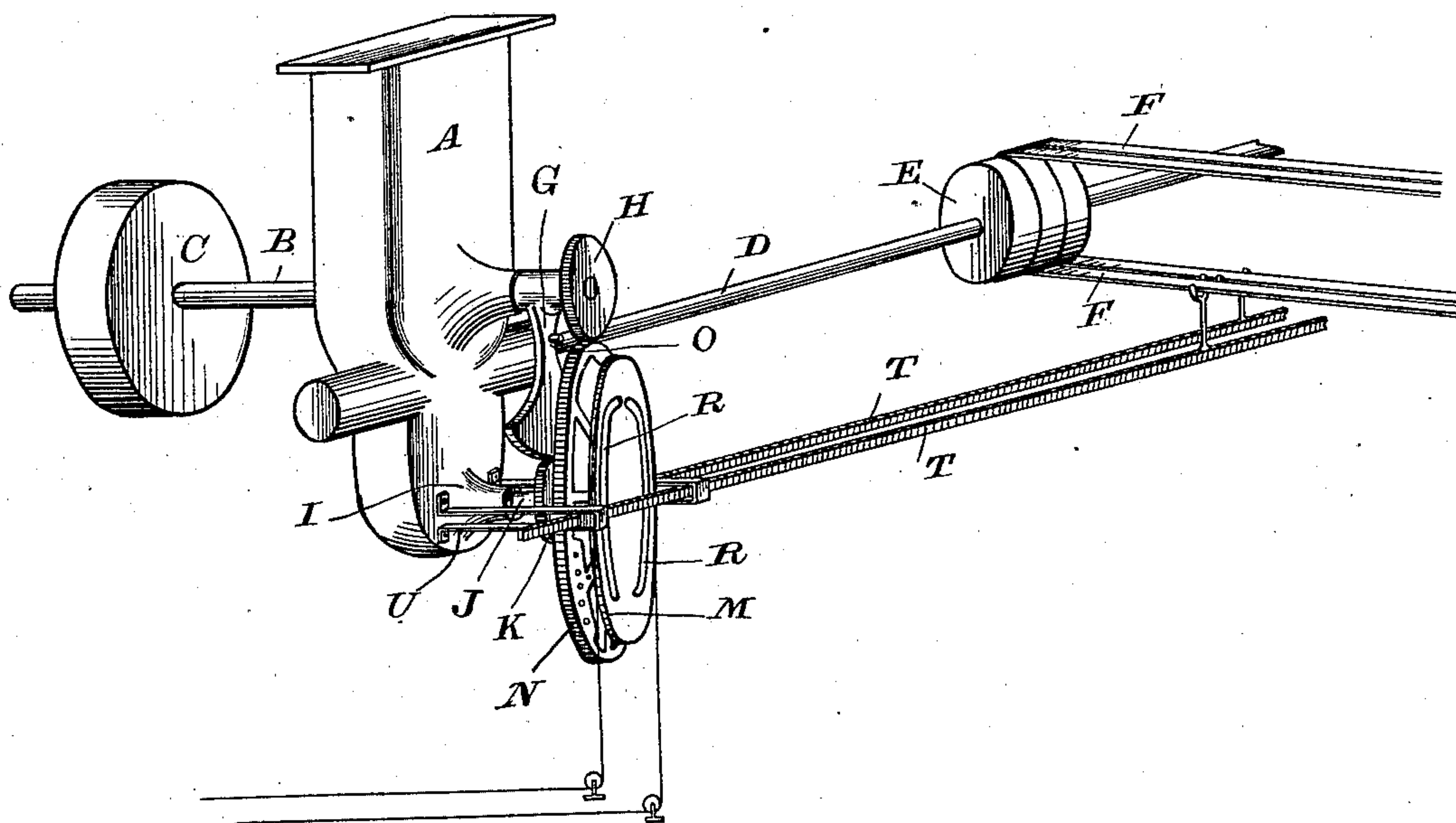
F. W. FULLER.

AUTOMATIC BELT SHIFTER FOR ELEVATORS.

No. 290,674.

Patented Dec. 25, 1883.

FIG. 1.



WITNESSES.

Wilbur Bradford
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(No Model.)

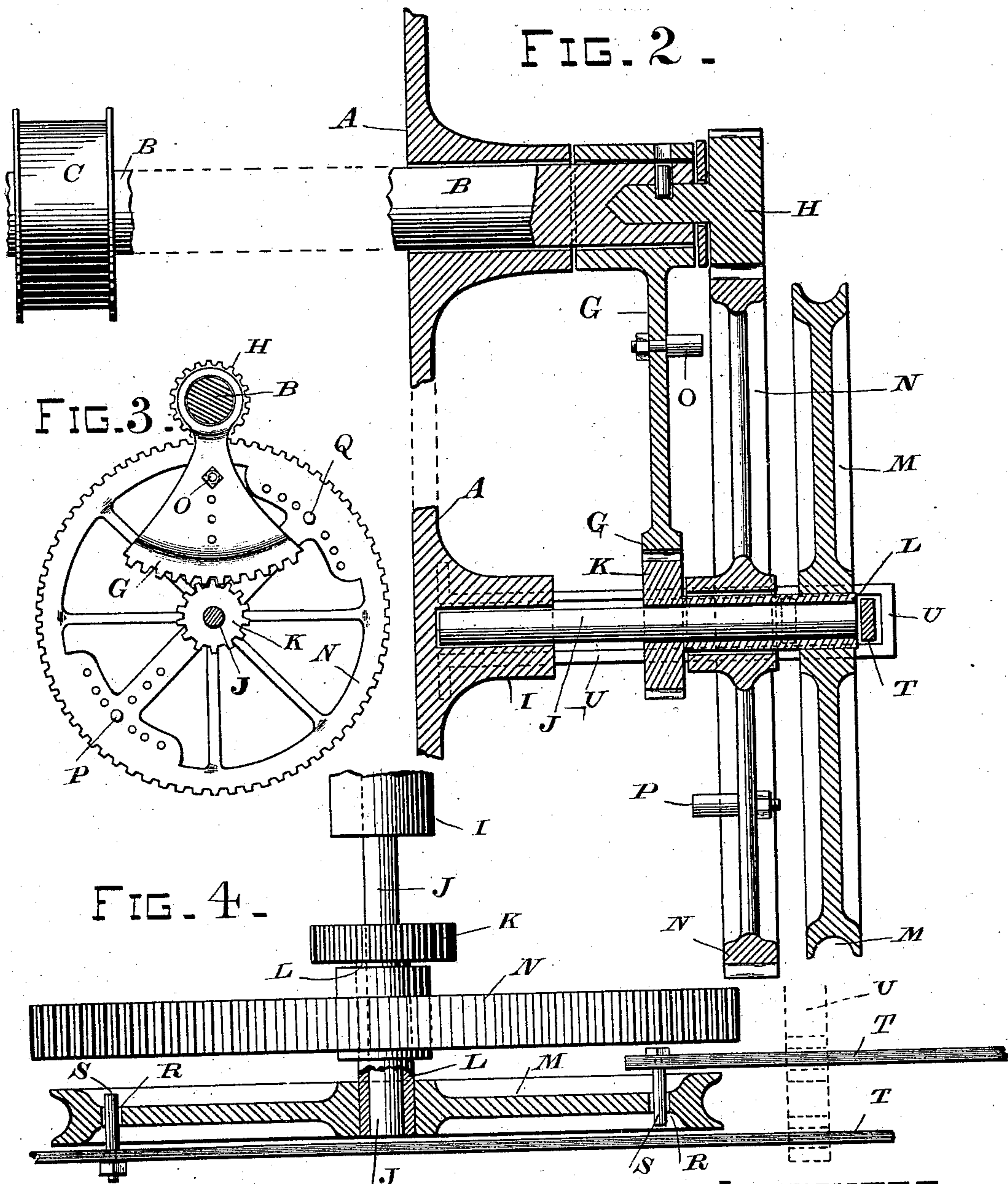
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No. 290,674.

Patented Dec. 25, 1883.



WITNESSES

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(No Model.)

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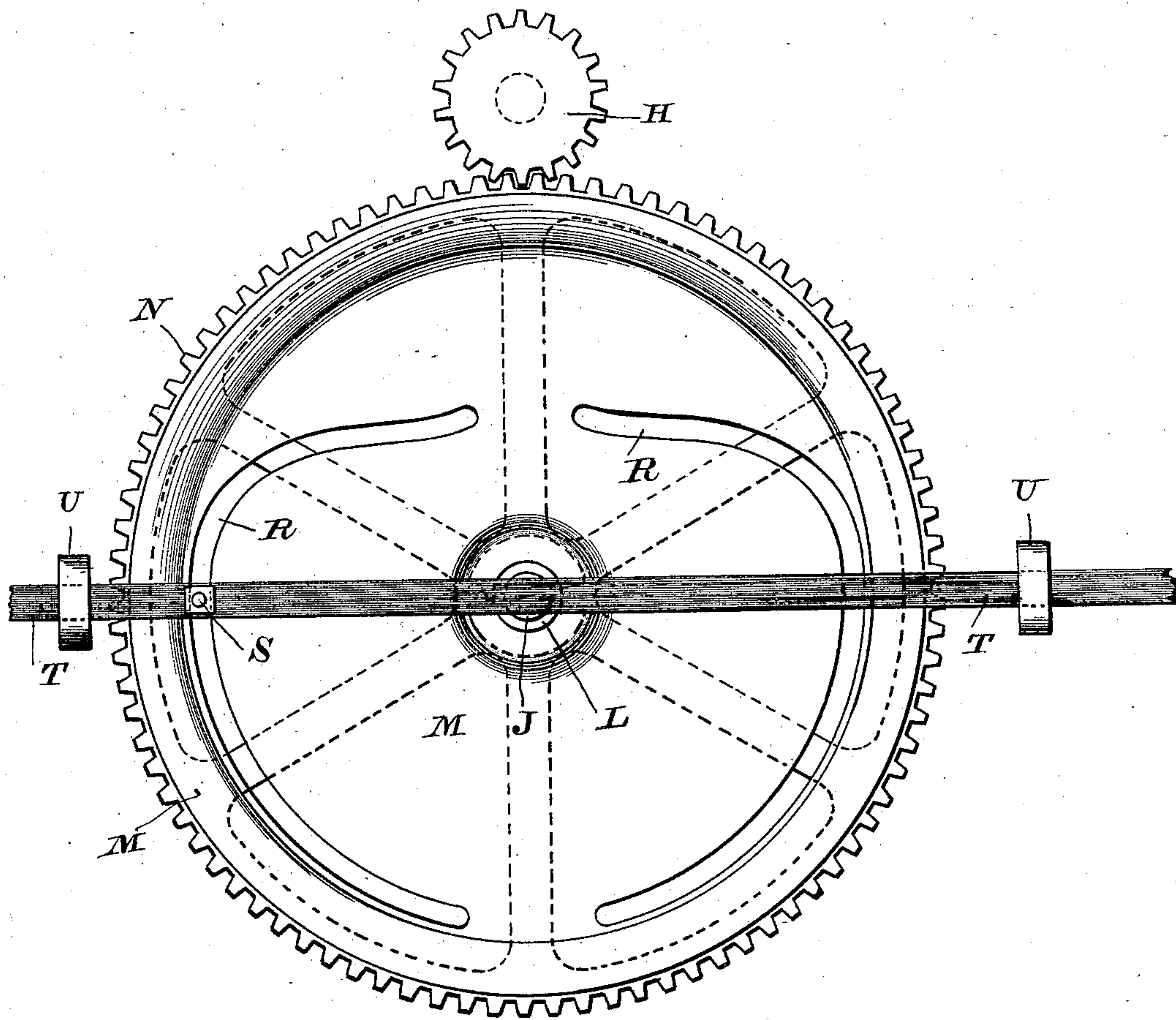
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FIG. 5.



WITNESSES.

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FRANK W. FULLER, OF SAN FRANCISCO, CALIFORNIA.

AUTOMATIC BELT-SHIFTER FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 290,674, dated December 25, 1883.

Application filed October 22, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. FULLER, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Automatic Belt-Shifters for Elevators, of which the following is a specification.

My invention relates to an improved belt-shifter or stop mechanism for the hoisting-gear of elevators; and it is equally applicable to such elevators as are operated by endless belts and to those which are operated by hydraulic power and are controlled by valves or stop-cocks, the object of my invention being to provide a motion-controlling device which shall be automatic in its operation when the elevator-cage shall have reached the end of its travel, whether at the top or bottom of the well-hole, and yet at the same time be susceptible of operation by hand at any intermediate point. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view, showing the general construction and arrangement of my improved automatic belt-shifter. Fig. 2 is a vertical sectional view of the belt-shifting gearing. Fig. 3 is a face view of the toothed segment and its connecting-gearing. Fig. 4 is a sectional plan view of the rope-sheave, the belt-shifting rods and a portion of the gearing; and Fig. 5 is a face view of the same.

Similar letters of reference are used to indicate like parts throughout the several figures.

In the drawings I have shown my improved device applied to an elevator hoisting mechanism in which the cable-winding drum is operated by a worm-and-pinion gear and endless belts. The worm-and-pinion gear are contained within the case A, Fig. 1, and are of the usual form.

B is the winding-shaft, upon which is keyed the winding-drum C, around which is wound the bight or fall of the rope or cable attached to the elevator-cage and passing over sheaves at the top of the well-hole in the usual manner.

D is the drive-shaft, upon which is placed the usual number of fast and loose pulleys, E E, and F F are the endless belts, by which the whole mechanism is operated.

The winding-shaft B is carried through the

case A, and is provided upon its outer end with a loosely-journaled toothed segment, G, and a fixed pinion, H. (See Fig. 2.) In practice the hub of the segment is first slipped over the end of the winding-shaft, and then the pintle or shaft of the pinion is forced into a hole drilled in the center of the end face of the shaft, and keyed in any suitable manner. A small washer should be placed between the end of the segment-hub and the side of the pinion to prevent friction.

Upon the lower portion of the case A, I form a socketed stud, I, into which is forced the end of a short shaft, J, which carries the loosely-journaled pinion K, meshing with the toothed segment G. The said pinion K is provided with an elongated hub or sleeve, L, which extends to the outer end of its supporting-shaft J, and upon the extreme end of this sleeve I key the rope-sheave M, around which is passed a small cord or rope leading up through the well-hole and within convenient reach of the operator.

Upon the sleeve L, between the pinion K and the rope-sheave M, I place the loosely-journaled cog-wheel N, which meshes with the pinion H upon the end of the winding-shaft; and it should here be remarked that the outer face of the segment G is to be provided with an adjustable lug, O, while the opposed face or side of the cog-wheel N is to be provided with adjustable lugs P Q, arranged in a nearly diametrical line, all for a purpose to be hereinafter more fully described.

The web of the rope-sheave is made solid, or without arms, and is formed with two cam-slots, R R, of equal size and equally distant from the hub. (See Fig. 5.) These cam-slots receive the wrist-pins S of the belt-shifting rods T T, which reciprocate in suitable slides, U U, attached to the case A, and are placed one upon each side of the rope-sheave, as shown in Fig. 4. The outer ends of the shifting-rods are furnished with the usual upwardly-projecting prongs or forks, that pass on either side of the belts.

The operation of my improved automatic stop or belt-shifter will be as follows, to wit: Let it be supposed that the cage is at the bottom of the well-hole, and that it is desired to ascend. The operator then pulls upon the cord passing around the rope-sheave M, and, by partly rotating the said sheave, moves the

shifting-rods T T in a horizontal direction for a distance sufficient to throw the winding-belt upon the fast pulley, when the drum C and its shaft will be rotated and the cage will ascend. As the shaft B revolves its motion will be communicated through the pinion H to the cog-wheel N, which, owing to its large size, will revolve at a comparatively slow speed. By the time that the cage has nearly reached the limit of its travel the said cog-wheel N will have revolved sufficiently far to bring the lug Q into contact with the lug O on the segment G and produce a semi-revolution of the same, which will be imparted to the pinion K, and through it to the rope-sheave M, and, through the medium of the cam-slots R and rods T, cause a quick shifting of the belts and a stoppage of the elevator. In descending, the movement of the parts will be reversed, but the result when the cage shall have reached the bottom of the well-hole will be the same as that last above described.

I do not propose to confine the application of this belt-shifting device to elevators alone, as it is equally applicable to all machines in which a carriage or frame is reciprocated along a horizontal track.

Attached to the segment G there should be placed a small cam operating a lever controlling the usual brake; but I have not deemed it necessary to illustrate this brake, as it forms no part of my invention.

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

In a stop-action or belt-shifting device, the combination, with the power-imparting mechanism, of the operating-shaft D, carrying a loose segment, G, and fixed pinion H, of the loose pinion K, having an elongated hub, L, carrying a loosely-journaled cog-wheel, N, having lugs engaging with a lug upon the segment G, and a fixed rope-sheave, M, having in its web cam-slots R R, for the reception of wrist-pins upon the reversing or belt-shifting rods T T, substantially as shown, and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

FRANK W. FULLER. [L. S.]

Witnesses:

WILMER BRADFORD,
CHAS. E. KELLY.