No. 720,487. PATENTED FEB. 10, 1903.

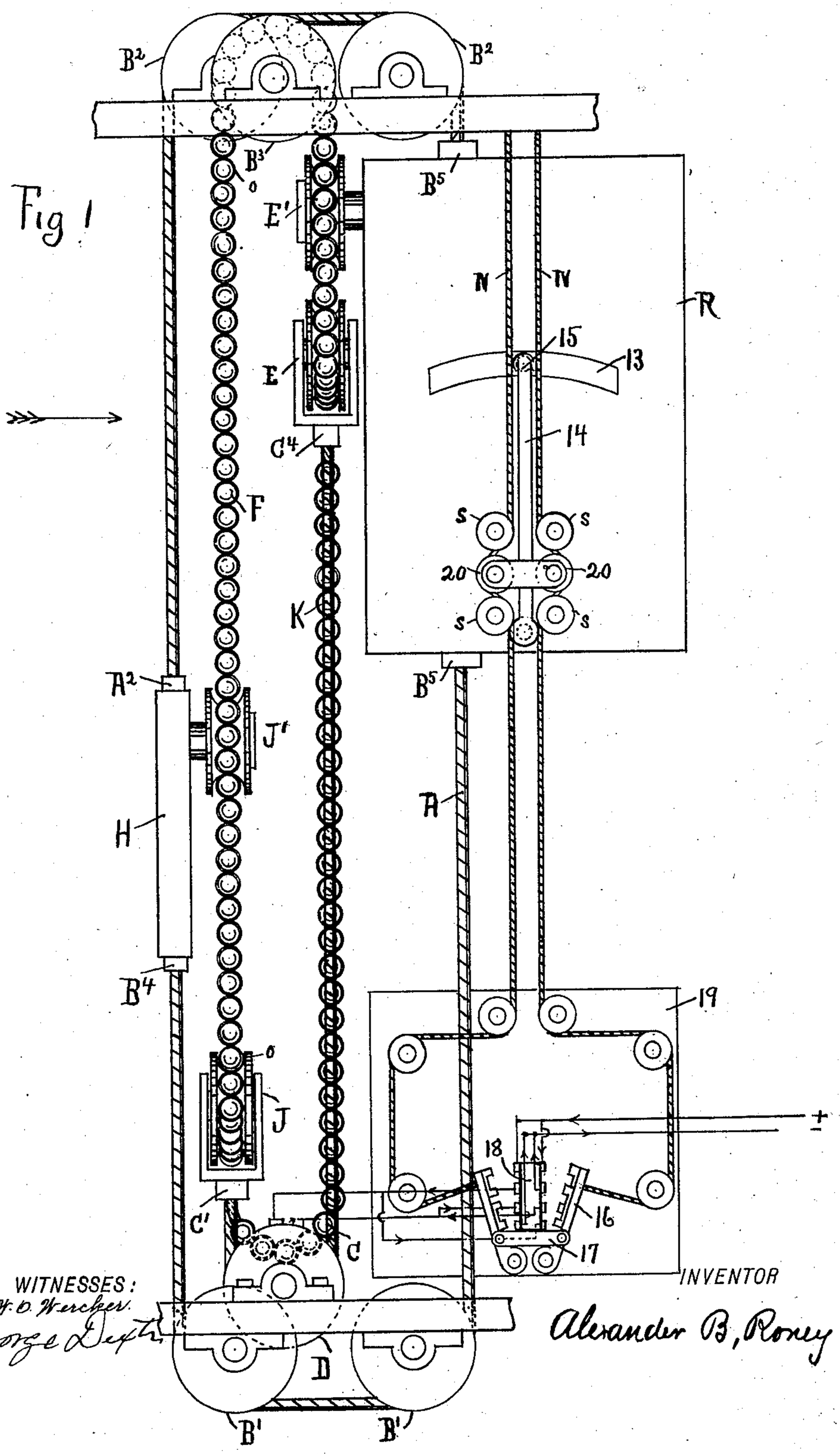
A. B. RONEY.

ELEVATOR.

APPLICATION FILED AUG. 28, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig 1



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NO MODEL. 3 SHEETS—SHEET 2.

Fig 2.

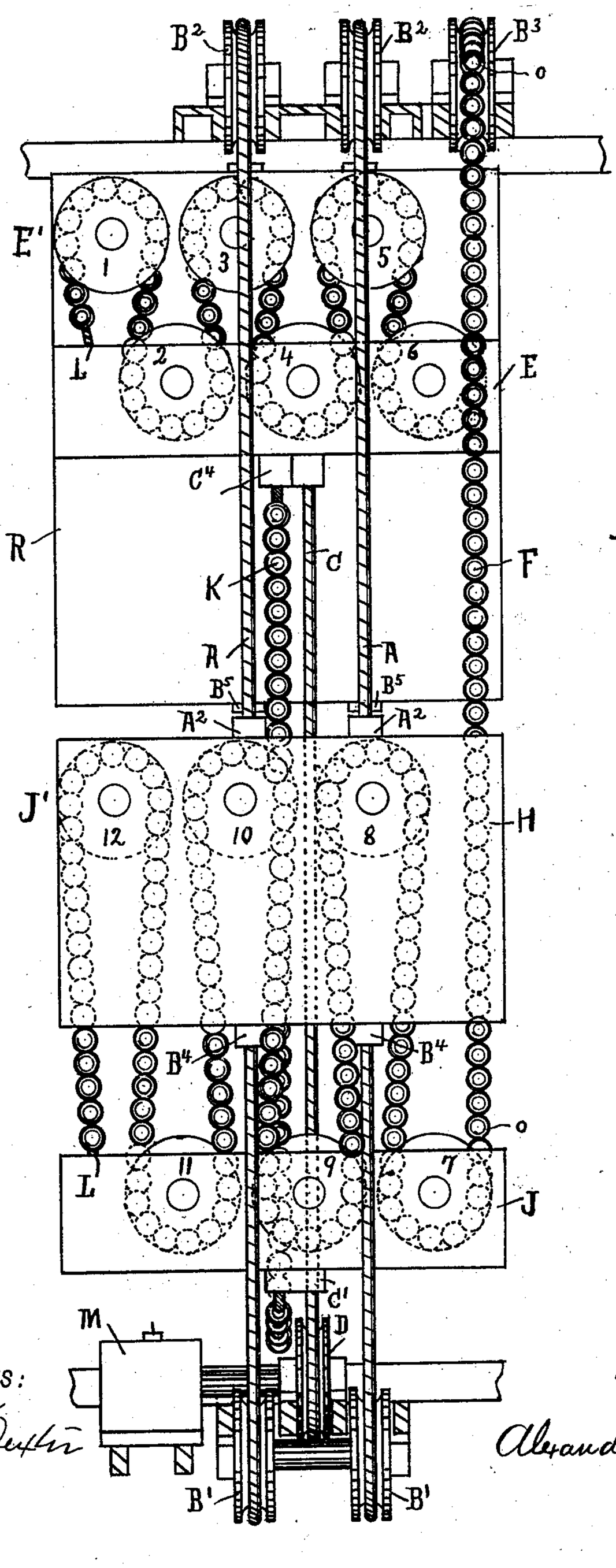

Fig 3

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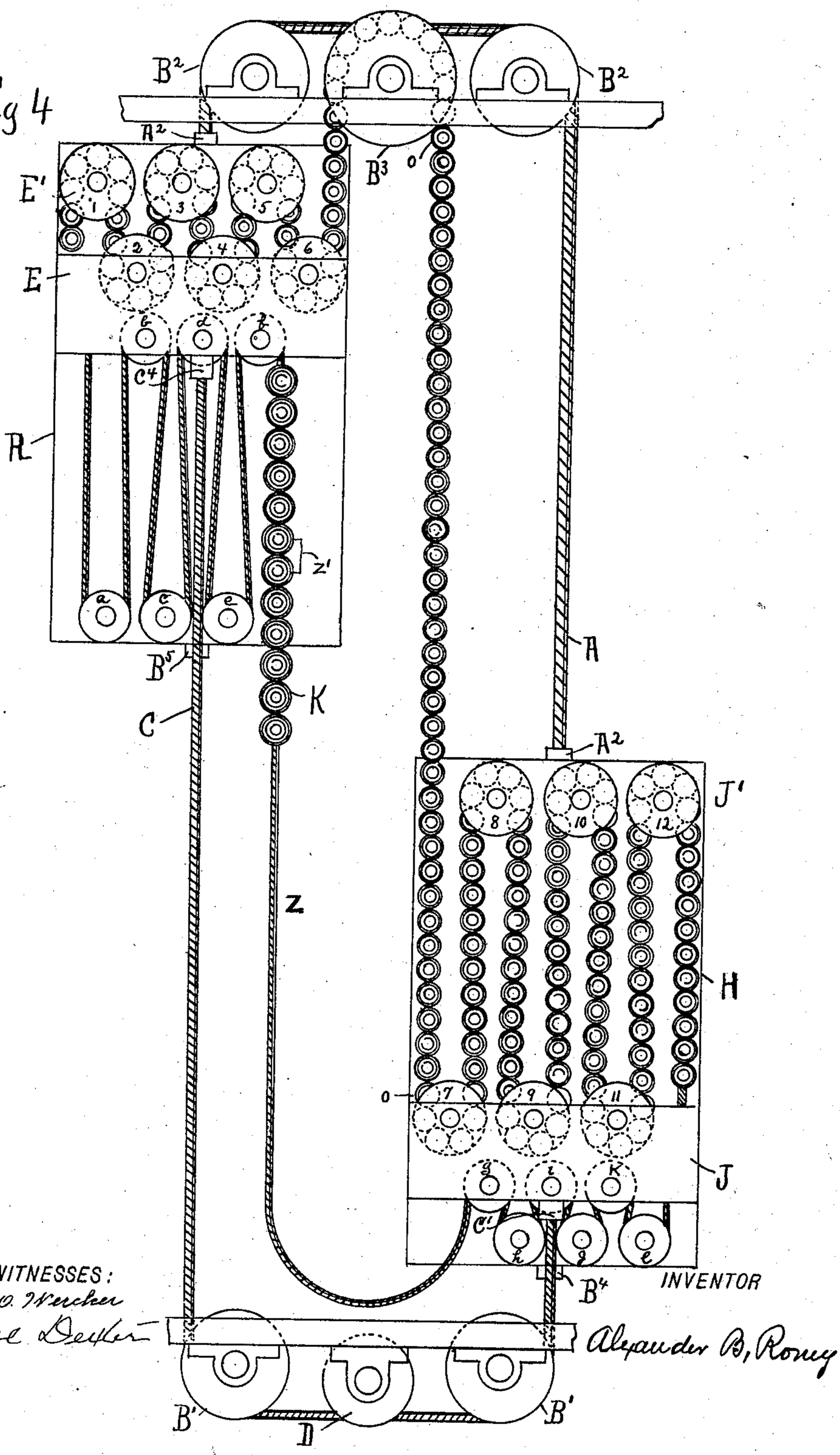
NO MODEL. 3 SHEETS—SHEET 3.

Fig 4



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UNITED STATES PATENT OFFICE.

ALEXANDER B. RONEY, OF CHICAGO, ILLINOIS.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 720,487, dated February 10, 1903.

Application filed August 28, 1902. Serial No. 121,284. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER B. RONEY, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented new and useful Improvements in Elevators, of which the following is a specification.

My invention comprises, in an elevator, the combination consisting of a car and counterweight suspended from the opposite ends of a cable, with a suspended load, after the manner of a chain, which is adapted to be transferred from the counterweight to the car or from the car to the counterweight, so as to balance or overbalance one or the other and cause the car to rise or fall with the least expenditure of power in the operation of the elevator; and my invention further includes connection of the car and counterweight with the opposite ends of a cable run under a sheave-wheel fixed in a block anchored at the bottom of the elevator-shaftway, thus making of the car and counterweight an endless running cable system, the object of which is to distribute equally to both the braking action required to retard and stop the momentum of the car and counterweight, for in the present elevator practice a loose running counterweight at high speed is very dangerous.

Figure 1 is a side view of the elevator. Fig. 2 is a view of Fig. 1 looking in the direction of the arrow. Fig. 3 is a section of the chain F, showing its construction. Fig. 4 is a diagrammatic view of the working principle of my invention.

Figs. 1 and 2 represent the car R, and counterweight H, suspended from the opposite ends of the cable, runs over the sheave-wheels B^2 B^2, with the car and counterweight connected at B^5 and B^4 with the opposite ends of the cable A, which runs under the sheave-wheels B′ B′ and constituting the endless running cable system referred to. The chain-weight F is in running suspension over the sheave-wheel B^3, with one end fastened to the movable block E of the car R, then looped over the sheave-wheels 1 2 3 4 5 6 of the fixed and movable blocks E and E′, that constitute the multiplying-sheaves movable with the car. The other end is fastened to the movable block J of the counterweight H, then looped over the sheave-wheels 7 8 9 10 11 12 of the fixed and movable blocks J J′, which constitute the multiplying-sheaves that move with the counterweight. A second chain-weight K is suspended by its opposite ends at C′ C^4 from the movable blocks E and J, that move with the car and counterweight.

The diagrammatic view, Fig 4, shows a modified application of the chain K to the movable blocks E and J. The modified form of chain K consists of a cable Z, provided with ball-weights Z′, made fast to the middle part of the cable, with one end of the cable fastened to the movable block E of the car, then looped over the sheave-wheels *a b c d e f*, and the other end is fastened to the movable block J of the counterweight H, then looped over the sheave-wheels *g h i j k l*.

The driving-cable C has its opposite ends fastened at C′ C^4 to the movable blocks E and J and has a friction drive-wheel D, connected with the armature-shaft of the motor M.

19 is a reversing-switch operated from the car by means of the cords N N, which when shortened up on one side and lengthened out on the other rock the pivoted blocks connected together by the link 17 and have metal strips that contact with the metal strips on the stationed block 18 and close the electric circuit through the motor in the opposite direction. The cords N N are shortened up and lengthened out by the pivoted lever 14, which, with its sheave-wheels 20 20 engaging the cords N N between the idlers *s s s s*, forces one cord into a longer loop while letting out the loop of the other.

Observe the length of chain F, hanging in free suspension over the sheave-wheel B^3, consider its weight and the strain of that weight on the movable block E, multiplied by the number of its loops around the sheave-wheels of the fixed and movable blocks E and E′.

Observe the second chain-weight K, hanging in free suspension from the movable blocks E and J, so as to counterbalance the weight of chain F; but chain K must be seven times the weight of chain F to effect an exact balance, because the strain of chain F on the movable block E is multiplied by the number of its loops over the sheave-wheels of the fixed and movable blocks E E′, which is seven times.

Observe in Fig. 4 a diagram view in which the chain K is shorter but of equal weight to chain F, yet the counterstrain of its weight is equal to the strain of F on the movable blocks E and J, because in this instance the strains of K and F are multiplied by the same number of loops around the sheave-wheels acting on the movable blocks E and J, thus insuring great economy of power in the operation of the elevator.

Observe the brake effect on the car and counterweight when the weight of chain F is transferred quickly by the motor from the counterweight to the car. For instance, suppose the car to be descending at high speed and the motor to be stopped and brakes applied suddenly. Inertia would tend to carry the counterweight up; but this would result in the opening of blocks J and J′ and in transferring the weight of chain F from the car to the counterweight, which would tend to stop both and also prevent jarring of the car by the falling back of the weight.

Having described in detail the advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an elevator, the combination of a car and counterweight, a cable from the opposite ends of which the car and counterweight are suspended, a chain-weight connected at its ends respectively through multiplying-sheaves with the car and counterweight, a driving-cable having its opposite ends connected to the movable parts of said sheaves, respectively, whereby the pull of the driving-cable on the movable sheave-blocks tends to transfer a part of the chain from one set of multiplying-sheaves to the other, for the purpose set forth.

2. In an elevator, the combination of a car and counterweight, a cable to the opposite ends of which the same are suspended, a chain-weight connected with the car and counterweight through multiplying sheave-wheels, turning in fixed and movable sheave-blocks, a driving-cable having its opposite ends connected to the movable blocks, respectively, a second chain-weight opposing the first and similarly connected with the car and counterweight, for the purpose set forth.

3. In an elevator, the combination of a car, a counterweight therefor, a transferable weight supported partially by the car and partially by the counterweight, a driving-cable and means whereby excessive strains communicated through the driving-cable to either the car or the counterweight will result in transferring a portion of said transferable weight from the car to the counterweight or vice versa, substantially as described.

ALEXANDER B. RONEY.

Witnesses:
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