

No. 619,429.

Patented Feb. 14, 1899.

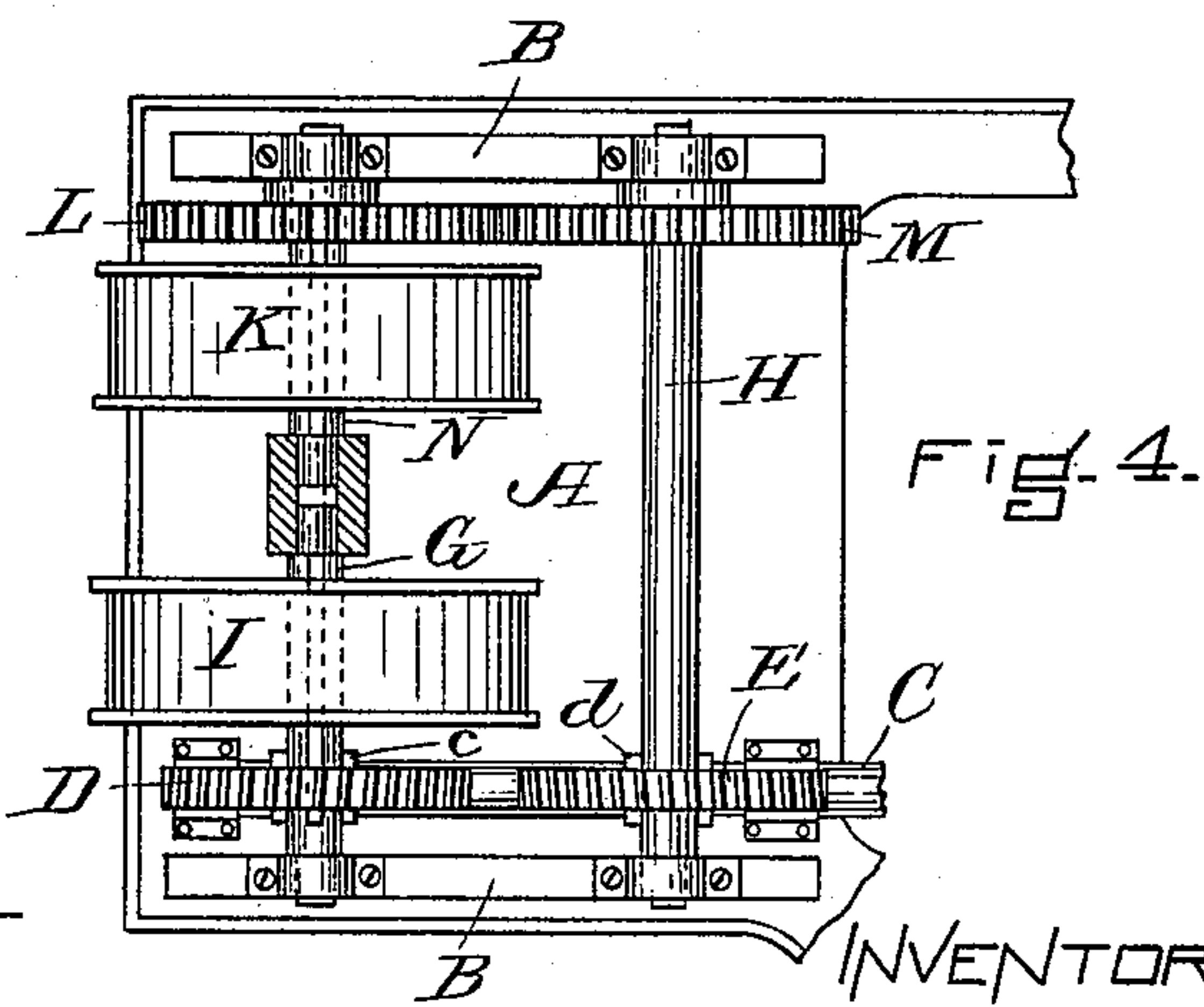
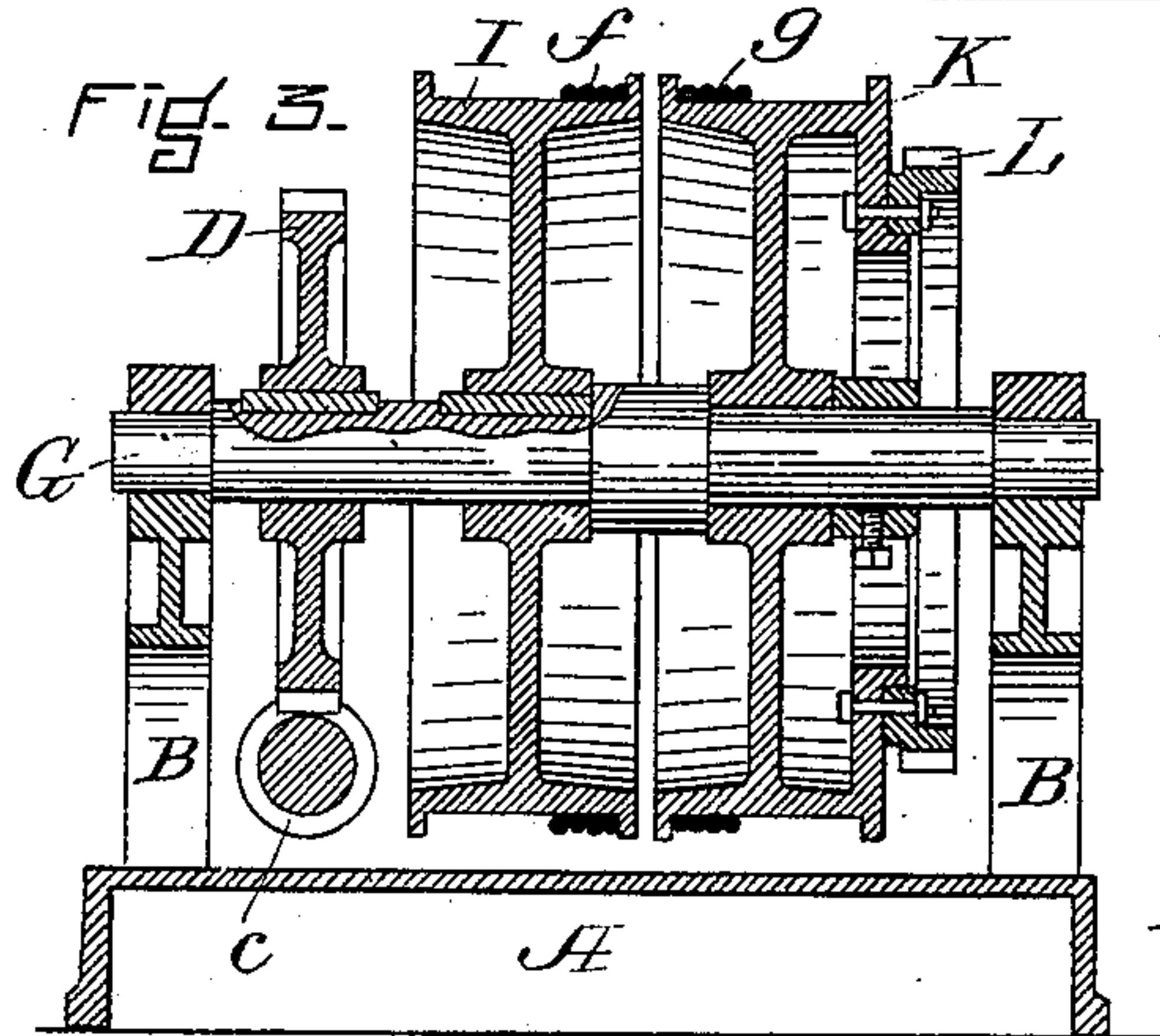
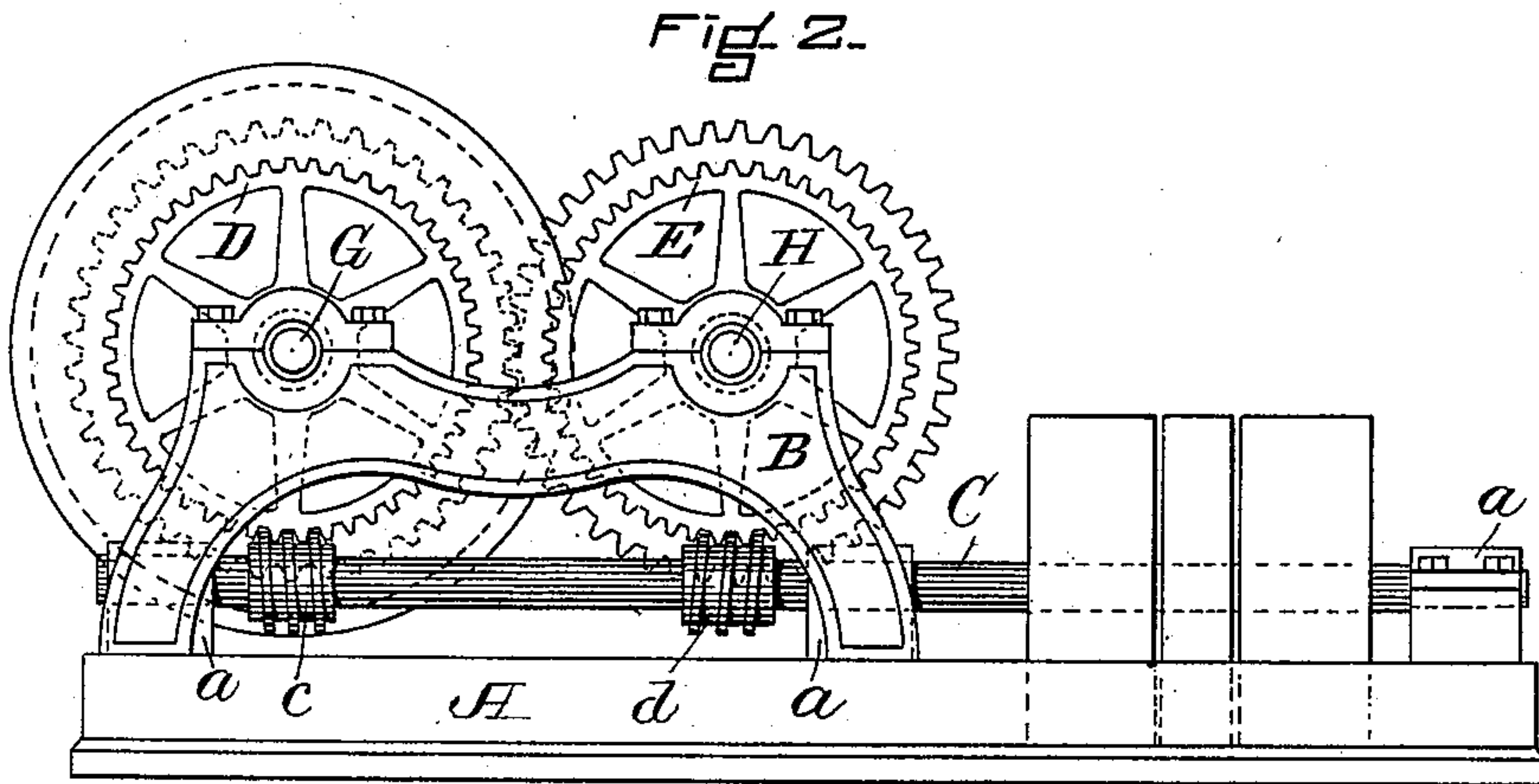
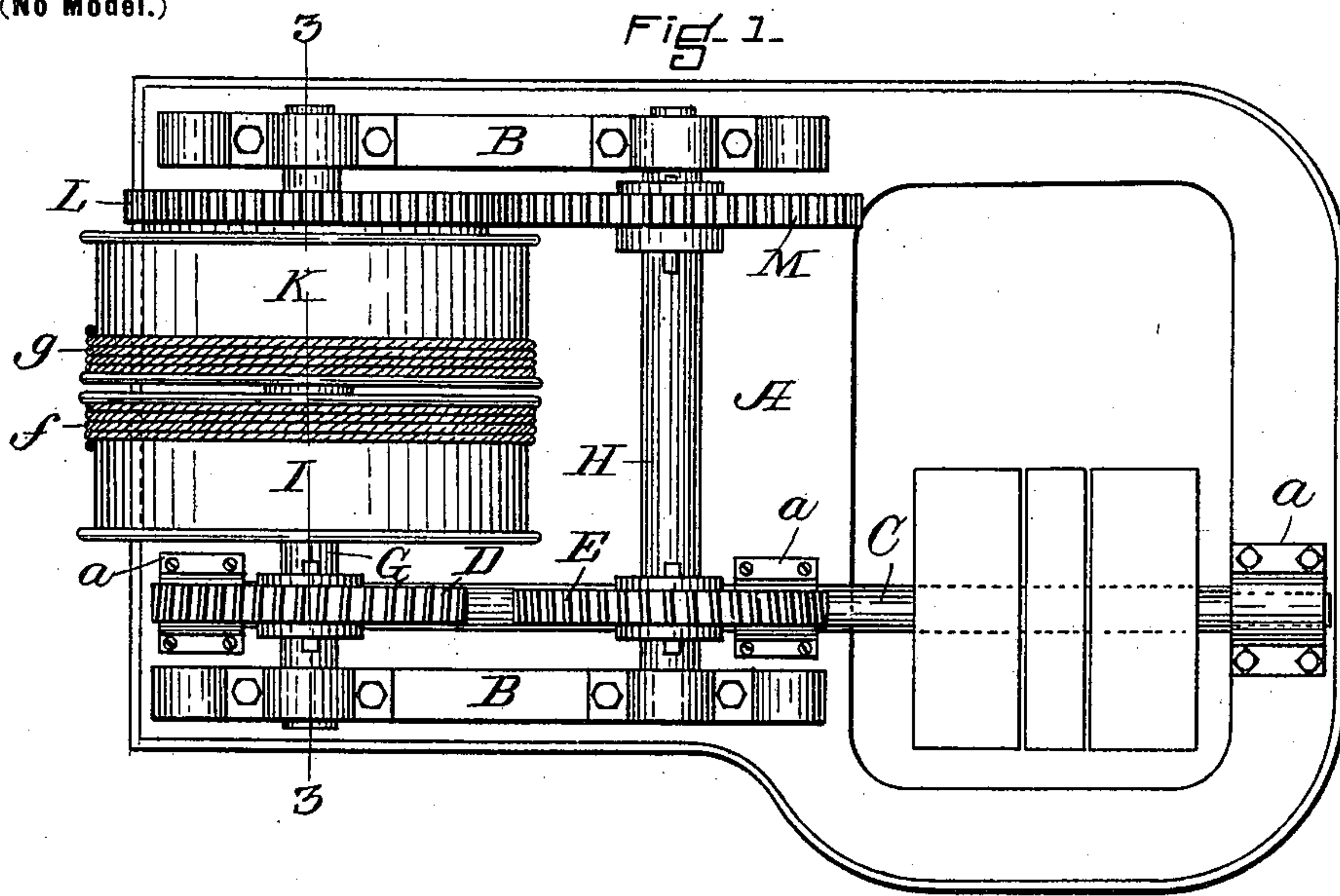
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ELEVATOR.

(Application filed May 26, 1898.)

(No Model.)



WITNESSES.

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UNITED STATES PATENT OFFICE.

CHARLES E. MOORE, OF NEWTON, MASSACHUSETTS; CHARLES D. MOORE
ADMINISTRATOR OF SAID CHARLES E. MOORE, DECEASED.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 619,429, dated February 14, 1899.

Application filed May 26, 1898. Serial No. 681,839. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. MOORE, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Elevators, of which the following is a specification.

My invention relates to that class of elevator hoisting apparatus known as "double-screw elevators," in which the hoisting-drums are driven by means of right and left worms mounted on a single shaft and engaging two worm-gears secured to a pair of parallel shafts, such construction having for its object to distribute the load or pressure equally on the teeth of the worms and gears and to relieve the driving-shaft from "end thrust."

Where two hoisting-drums have been secured to two parallel shafts having worm-gears driven by right and left worms on a single driving-shaft, if it was desired to run the hoisting-ropes up the hoistway in the same line and in close proximity with each other it became necessary to use a "leader-wheel" to change the direction of the rope from one drum over to a position above the other drum, which was objectionable, as it produced additional friction and wear on the rope passing over said leader-wheel. To overcome this difficulty and retain the advantages of the double worm and gear, two hoisting-drums have been immovably secured upon a single shaft having a gear meshing with a similar gear on a counter-shaft, said shafts also having had worm-gears secured thereto, which were respectively engaged and driven by right and left threaded worms on the driving-shaft. This construction although theoretically securing the desired results required that all the gears and worms should be absolutely perfect, for the reason that as all of said gearing and mechanism was connected together the slightest inaccuracy in the gearing would cause a binding of the teeth owing to one part of the mechanism gaining slightly on the other, which caused a jarring and uneven or jerky motion of the car, especially when running at a high speed, as is now customary with passenger-elevators. To overcome all these defects and difficulties is the object of my invention, which consists in an elevator-

hoisting mechanism comprising two hoisting drums arranged with their axes in the same line and rotatable in the same direction independently of each other by means of separate worms and worm-gears, said worms being mounted on a single driving-shaft, and suitable independent connections between said worm-gears and drums, whereby the latter are both rotated simultaneously but independently by the same single worm-shaft, as hereinafter set forth.

My invention also consists in certain novel combinations of parts and details of construction, as hereinafter fully set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan of an elevator hoisting mechanism embodying my improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse vertical section on the line 3 3 of Fig. 1. Fig. 4 is a sectional plan of a portion of the mechanism, illustrating a modification of my invention.

In the drawings, A represents the base or bed of an elevator hoisting apparatus, and B the framework, of suitable shape to support the operating mechanism.

C denotes the driving-shaft, arranged horizontally, as shown, in suitable bearings *a* and adapted to receive motion from any suitable motor by means of a belt and pulley or otherwise. Mounted on this shaft C are two worms or screws *c d*, one having a right and the other a left thread, said worms respectively meshing with and driving two worm-gears D E, secured to two parallel shafts G H, having their bearings in the framework B, said shafts revolving in opposite directions.

I represents a hoisting-drum, around which is wound one of the elevator hoisting-ropes *f*, said drum being tightly fastened to the shaft G, which is driven by the worm *c*, which meshes with the worm-gear D on said shaft. K represents a similar hoisting-drum, around which is wound the other elevator hoisting-rope *g*, said drum K being loose upon the shaft G and having secured to it a spur-gear L, which meshes with and is driven by a similar spur-gear M, secured to the counter-shaft H, which is independently driven by the worm *d*, which meshes with the gear E, as

above described, whereby the drum K is rotated in the same direction as the drum I, which, as before stated, is fast on the shaft G, the driving-shaft being relieved from end thrust in a well-known manner by the equalizing action of the right and left worms *c d* and the worm-gears D and E, meshing therewith. By this construction it will be seen that both drums are arranged with their axes in the same line, thereby rendering it possible to run the two hoisting-ropes in a direct line close together up the hoistway without the employment of a leader-wheel, and as each drum is rotated independently of the other by means of its own separate worm and worm-gear it will be obvious that there can be no binding whatever of the gears by reason of any inaccuracy in the cutting of their teeth or defect in their construction, as would be the case if both drums were fast on the same shaft, and consequently the gears will run smoothly and evenly at all times and the jarring and uneven or jerky motion of the elevator-car when running at a high speed entirely avoided.

In Fig. 4 is represented a modification of my invention, in which the two hoisting-drums instead of being placed upon the same shaft are mounted upon two separate and independent shafts G N, having their axes in the same line, each drum being driven by its own separate worm and worm-gear and intermediate connections in the same manner as previously described. This construction I consider to be the full equivalent of that first described, as it secures the same results and advantages in substantially the same manner.

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

1. An elevator hoisting mechanism comprising two hoisting-drums arranged with their axes in the same line and rotatable in

the same direction independently of each other, a single driving-shaft provided with right and left worms, worm-gears meshing with and driven by said worms, and suitable independent connections between said worm-gears and drums, whereby the latter are both rotated simultaneously but independently by the same single worm-shaft, substantially as described.

2. In an elevator, two hoisting-drums having their axes in line with each other, each drum being rotatable in the same direction independently of the other, in combination with right and left worms and worm-gears and two intermediate spur-gears, the worms being placed on a single driving-shaft and the worm-gears secured to independent shafts, and the intermediate gears driving one of the drums from one of the worm-gear shafts, the other drum being driven directly from the other worm-gear shaft, substantially as described.

3. In an elevator, the combination of two hoisting-drums arranged upon a single shaft, one being fast and the other loose thereon, a single driving-shaft provided with right and left worms, a worm-gear on the drum-shaft meshing with and driven by one of said worms, a counter-shaft provided with a worm-gear meshing with and driven by the other worm, and a spur-gear on the counter-shaft meshing with a spur-gear connected with the loose hoisting-drum, whereby said drums are rotated simultaneously and independently of each other by separate worms on a single worm-shaft, substantially as described.

Witness my hand this 21st day of May, A. D. 1898.

CHARLES E. MOORE.

In presence of—

P. E. TESCHEMACHER,
LOUISE A. CHACE.