

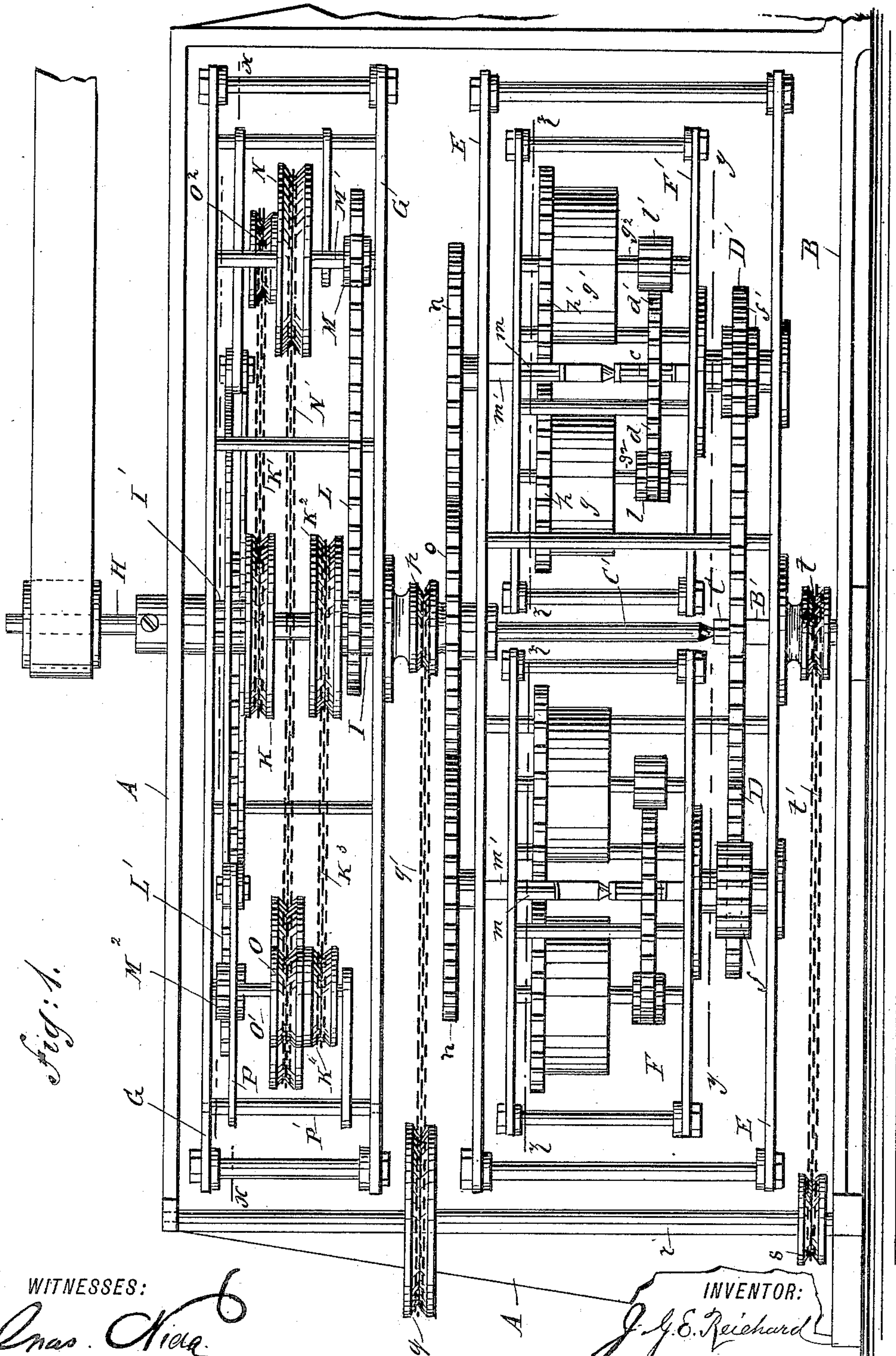
(No Model.)

3 Sheets—Sheet 1.

J. G. E. REICHARD.
SPRING MOTOR.

No. 424,220.

Patented Mar. 25, 1890.



WITNESSES:

Chas. A. Rice
C. Sedgwick

INVENTOR:

J. G. E. Reichard
BY *Munn & Co*
ATTORNEYS.

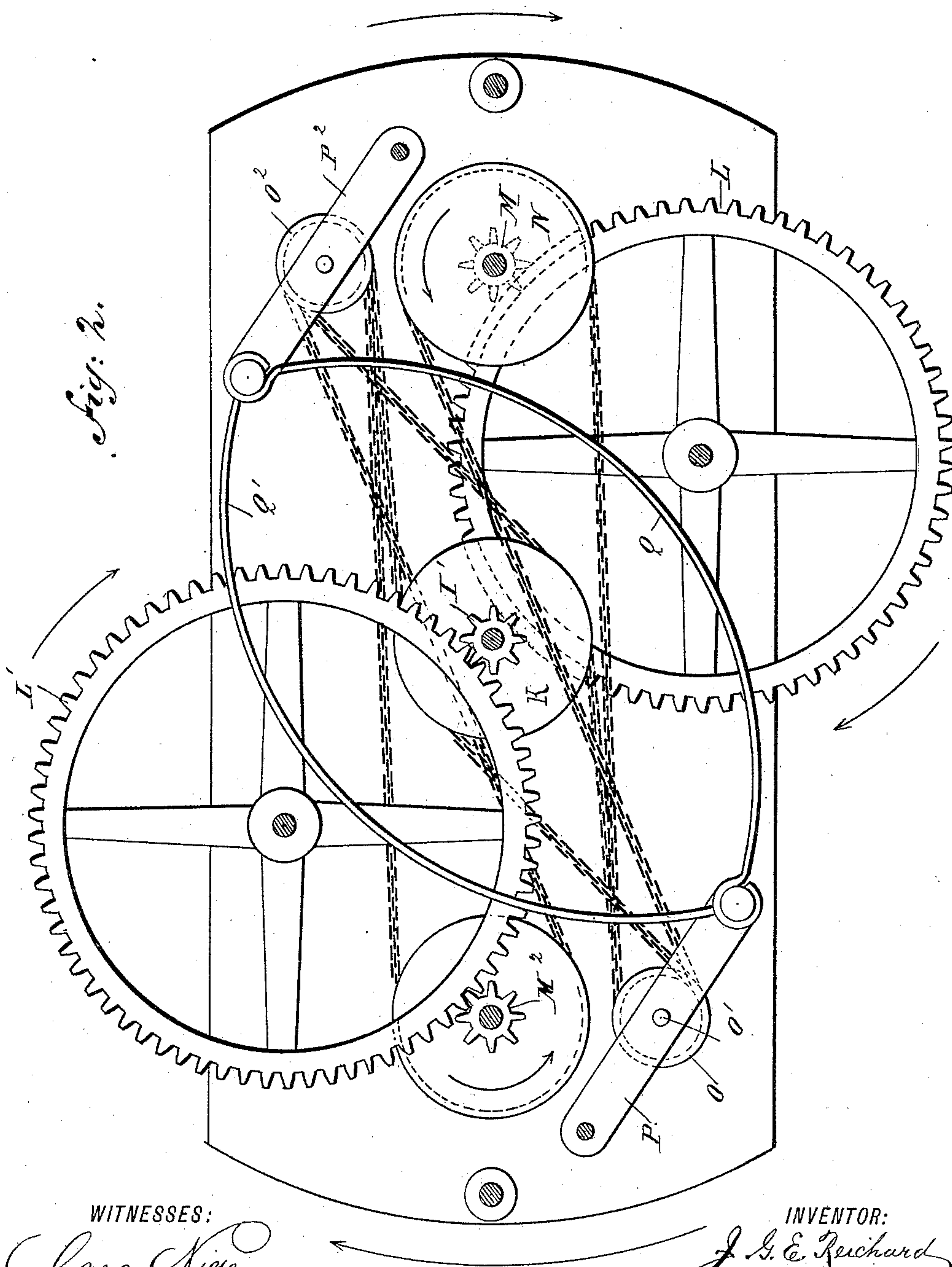
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3 Sheets—Sheet 2.

J. G. E. REICHARD.
SPRING MOTOR.

No. 424,220.

Patented Mar. 25, 1890.



WITNESSES:

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(No Model.)

3 Sheets—Sheet 3.

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Fig. 3.

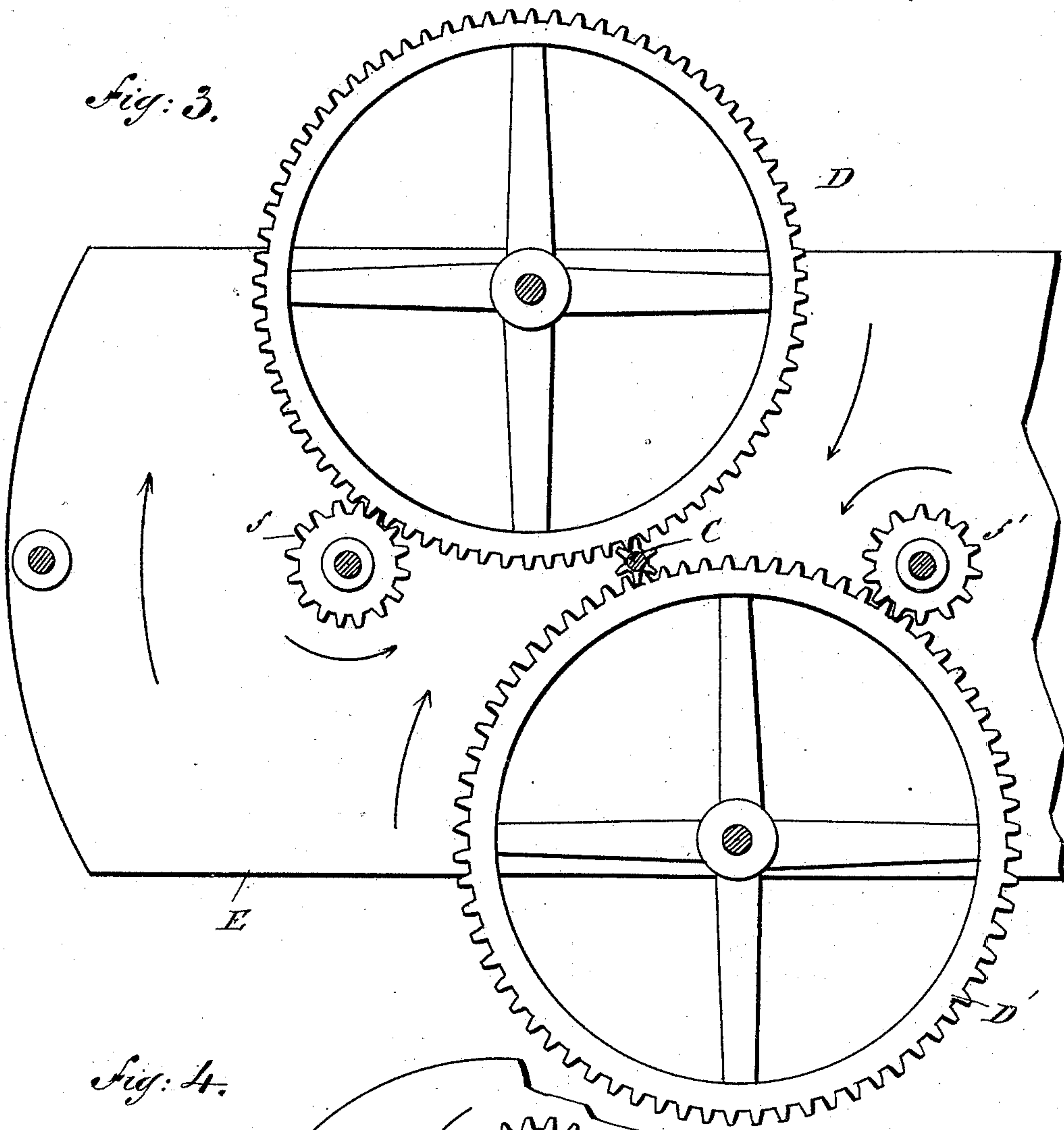
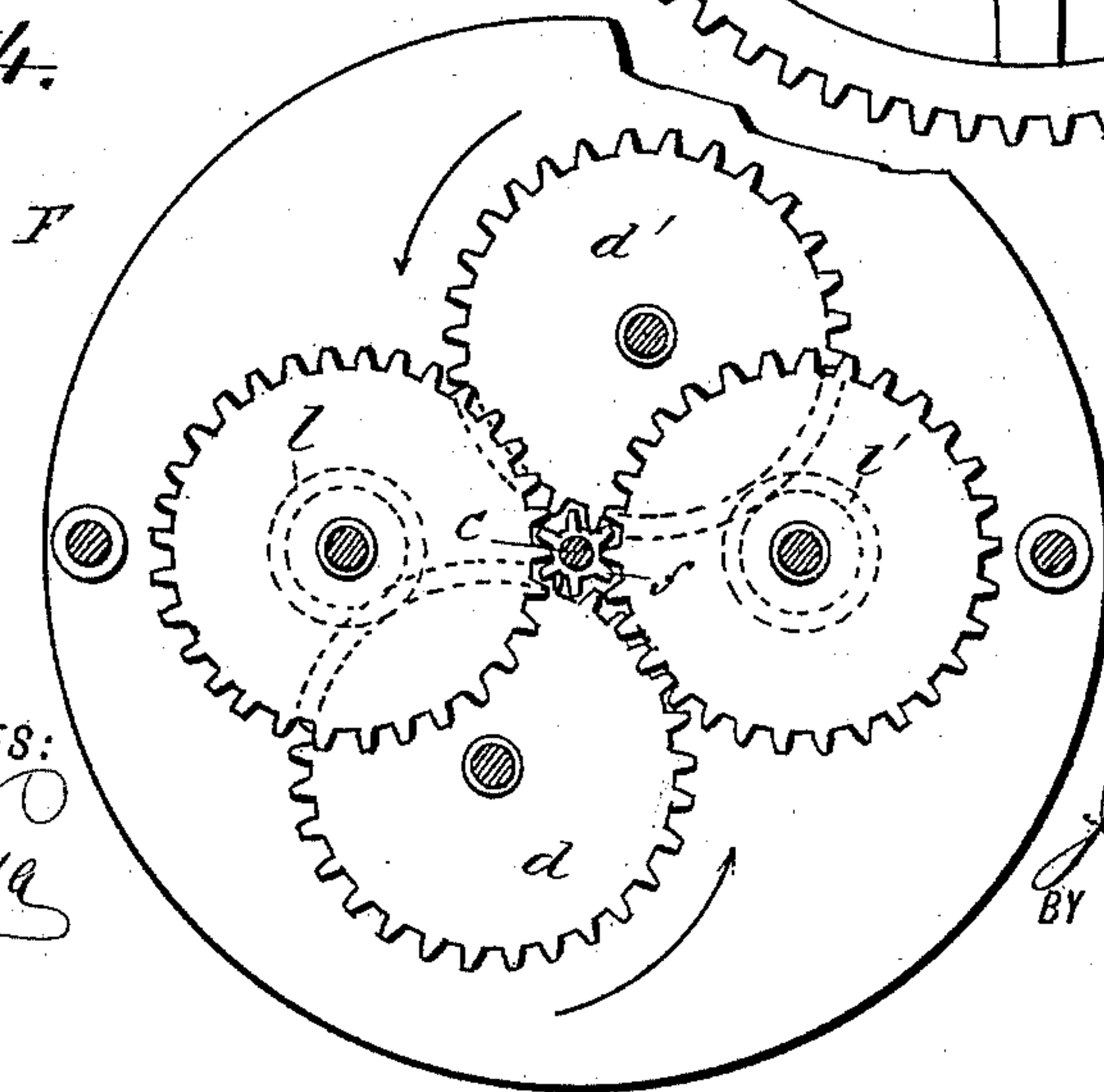


Fig. 4.



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UNITED STATES PATENT OFFICE.

J. G. ERNST REICHARD, OF BORNA, SAXONY, GERMANY, ASSIGNOR OF ONE-HALF TO CHRISTIAN CARL TREIBER, OF LONE ELM, MISSOURI.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 424,220, dated March 25, 1890.

Application filed March 20, 1889. Serial No. 304,056. (No model.)

To all whom it may concern:

Be it known that I, J. G. ERNST REICHARD, a subject of the Emperor of Germany, residing at Borna, Saxony, Germany, have invented a new and Improved Spring-Motor, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved spring-motor which is simple and durable in construction and very effective in operation.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a sectional plan view of the same on the line xx of Fig. 1. Fig. 3 is a like view of the same on the line yy of Fig. 1, and Fig. 4 is a similar view of the same on the line zz of Fig. 1.

The main frame A, of suitable construction, is provided with a bed-plate B, on which is fastened a vertical spindle B', carrying a fixed pinion C, into which mesh the gear-wheels D D', located diametrically opposite each other and mounted in a frame E, turning on the fixed spindle B'. Into the gear-wheels D and D' mesh the pinions $f f'$, respectively, fastened on the frames F and F', respectively, mounted to turn in the frame E, the centers of the pinions $f f'$ being the centers for the said frames F and F'. Since the mechanisms carried by the frames F F' are similar, it will suffice to describe one—the frame F'. In the said frame is held a fixed pinion c , into which mesh the gear-wheels $d d'$, located diametrically opposite each other and mounted to turn on suitable shafts held in the frame F'. The gear-wheels d and d' mesh into pinions $l l'$, secured on the shafts g^2 , mounted to turn in suitable bearings in the frame F'. The shafts g^2 carry the springs and the barrels g and g' , said springs being fastened by one end to the respective shaft g^2 and by its other end to the respective barrel g or g' . The barrels

g and g' are provided with the gear-wheels h and h' , respectively, meshing into a pinion m , secured on a shaft m' , mounted to turn in suitable bearings in the frame E and forming the center for the frame F'. The shaft m' and the pinion c are in line with each other, and the shafts g^2 , previously mentioned, are located diametrically opposite each other around the said shaft m' and the pinion c . On the upper end of the shaft m' is secured a gear-wheel n , which meshes into a gear-wheel o , fastened on a shaft C' in line with the fixed spindle B', forming the axis for the frame E.

On the frame E is secured a pulley t , rotating loosely on the shaft B' and connected by a chain q' with a pulley s , secured on a shaft r , mounted to turn in suitable bearings in the main frame A. On the shaft r is fastened a pulley q , connected by a chain q' with a pulley p , secured on the shaft C', previously mentioned, and carrying the gear-wheel o . On the pulley p is secured a frame G, which turns with the shaft C', and in the said frame is held in line with the said shaft C' a shaft H, mounted to turn loosely in the said frame G. On the shaft H is secured a pinion I, into which meshes a gear-wheel L, mounted to turn on a shaft held in the frame G. The gear-wheel L meshes into a pinion M, secured on a shaft M', mounted to turn in suitable bearings in the frame G. On this shaft M' is secured a pulley N, connected by a crossed chain N' with a pulley O, secured on a shaft O', mounted to turn in suitable bearings on the lever P, fulcrumed on a shaft P', held in the frame G. On the shaft H is also secured a pulley K, connected by a chain K' with a pulley O², mounted to turn in a lever P², similar in construction to the lever P, before mentioned. The levers P and P² are connected with each other at their free ends by the outwardly-bent springs Q and Q', which exert a tension against the said levers. On the shaft H is also secured a pulley K², connected by a chain K³ with a pulley K⁴, carrying a pinion M², meshing into a gear-wheel L', also meshing into a pinion I', secured on the main shaft H. The latter transmits the power of the motor to other machinery to be driven. When the springs in

the barrels g g' are wound up, they exert a tension at both ends, so that the shafts g^2 and the barrels g and g' are turned. The shafts g^2 by the pinions l and l' impart a rotary motion to the gear-wheels d and d' , so that the latter roll on the pinion c , thereby imparting a turning motion to the respective frames F or F' . As the latter turn they impart a rotary motion to their pinions f or f' , respectively, meshing into the gear-wheels D and D' , rolling on the fixed pinion C , so that the frame E is turned. The motion of the frame E is transmitted by the pulleys t and s and the chain t' to the shaft r , which by the pulleys q and p and the chain q' imparts a rotary motion to the frame G . It will be seen that the motion of the barrels g and g' causes their gear-wheels h and h' to turn, and the latter, on account of meshing into the pinion m , turn the shaft m' , so that the gear-wheel n , held on the shaft m' , turns the large gear-wheel o , secured on the shaft C' , carrying the frame G . It will thus be seen that the springs impart motion to the frame G by pressing against the barrels g g' as well as against the shafts g^2 . When the frame G rotates, as above described, motion is imparted to the several devices in the said frame, so that a rotary motion is finally imparted to the main driving-shaft H . The springs Q and Q' greatly assist in re-enforcing the power derived by the rotation of the frame G , and great power is imparted to the said main shaft H from the springs contained in the barrels g and g' .

To wind up the springs, the chain q' is removed from the roller p , when by holding the frame E with one hand and turning the frame G with the other hand the gear-wheel o , meshing with the gear-wheel n , will impart motion to the shaft m' , and through the medium of the pinion m on the shaft m' , meshing with the gear-wheels h h' , the barrels g g' will be rotated, and the springs thereby wound, or the frame G may be held with one hand and the frame E turned with the other, when the barrels g g' will be turned to wind up the springs through the medium of the gear-wheels D D' , the pinions f f' , the pinion c , the gear-wheels d d' , and the pinions l l' on the shafts g^2 , carrying the barrels g g' .

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

1. The combination, with a fixed pinion, of trains of gear-wheels connected with the said fixed pinion and a frame carrying the said trains of gear-wheels and provided with springs, substantially as shown and described.

2. In a spring-motor, the combination, with a fixed pinion, of trains of gear-wheels meshing into the said fixed pinion, a frame mounted to turn loosely on the shaft of the said fixed

pinion and carrying the said train of gear-wheels, a set of frames mounted to turn in the said first-named frame, shafts held in each of the said sets of frames and connected with the said train of gear-wheels, and springs pressing against the said shaft, substantially as shown and described.

3. In a spring-motor, the combination, with a fixed pinion, of trains of gear-wheels meshing into the said fixed pinion, a frame mounted to turn loosely on the shaft of the said fixed pinion and carrying the said train of gear-wheels, a set of frames mounted to turn in the said first-named frame, shafts held in each of the said set of frames and connected with the said train of gear-wheels, springs pressing against the said shaft, and spring-barrels held on the said shafts and against which operate the said springs, substantially as shown and described.

4. In a spring-motor, the combination, with a fixed pinion, of trains of gear-wheels meshing into the said fixed pinion, a frame mounted to turn loosely on the shaft of the said fixed pinion and carrying the said trains of gear-wheels, a set of frames mounted to turn in the said first-named frame, shafts held in each of the said set of frames and connected with the said train of gear-wheels, springs pressing against the said shafts, spring-barrels held on the said shafts and against which operate the said springs, and means, substantially as described, for transmitting the motion of the first-named frame and of the said shafts to the main driving-shaft, substantially as shown and described.

5. In a spring-motor, the combination, with a fixed pinion, of trains of gear-wheels meshing into the said fixed pinion, a frame mounted to turn loosely on the shaft of the said fixed pinion and carrying the said trains of gear-wheels, a set of frames mounted to turn in the said first-named frame, shafts held in each of the said set of frames and connected with the said train of gear-wheels, springs pressing against the said shafts, spring-barrels held on the said shafts and against which operate the said springs, means, substantially as described, for transmitting the motion of the first-named frame and of the said shafts to the main driving-shaft, and a third frame operated from the said first-named frame and transmitting its motion to the main driving-shaft, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. G. ERNST REICHARD.

Witnesses:

CARL BORNGRAEBER,
HERMANN HOECKEL.