

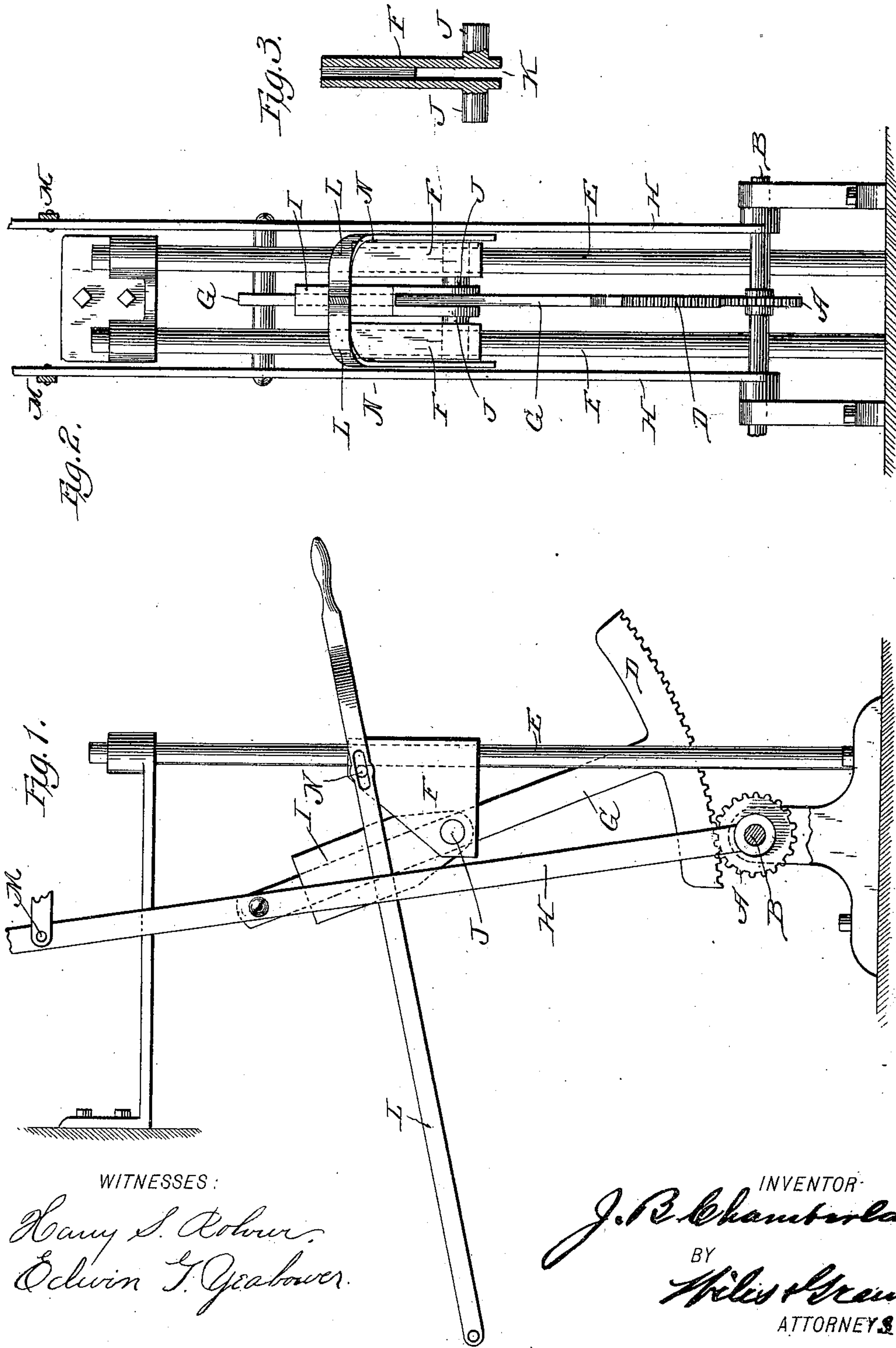
**No. 621,487.**

**Patented Mar. 21, 1899.**

**J. B. CHAMBERLAIN.**  
**MECHANICAL MOVEMENT.**

(Application filed Oct. 21, 1897. Renewed Aug, 23, 1898.)

(No Model.)



WITNESSES :

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# UNITED STATES PATENT OFFICE.

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## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 621,487, dated March 21, 1899.

Application filed October 21, 1897. Renewed August 23, 1898. Serial No. 689,345. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH B. CHAMBERLAIN, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Mechanical Movements; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of the invention is to provide means whereby movement or force transmitted may at will be gradually varied between a maximum and zero independently of variation in the actuating movement or force. This end is attained by combining with a power-transmitting lever means whereby one of its arms may at will be given any length between a maximum and zero. In the better forms of the invention the changes may be made gradually while the apparatus is in motion, it being quite practicable to vary gradually from zero to a maximum, and vice versa, the speed of devices operated by the lever, the possible force exerted varying, of course, inversely with the speed.

The apparatus is especially adapted to meet the requirements of motor-carriages; but it is by no means limited to such use.

One embodiment of the invention is shown in the accompanying drawings, wherein—

Figure 1 is a side elevation of the devices. Fig. 2 shows the same devices looking from the right in Fig. 1. Fig. 3 is an axial section through a certain sleeve and its gudgeons or trunnions.

The lever is shown as transmitting power by means of a segment engaging a gear; but it is to be noted that this is but one of many possible devices.

In the drawings wherever the letters occur, A is a gear mounted upon a shaft B, and D is a segment engaging the gear and borne by a radial power-transmitting lever G.

E E are rigidly fixed bars, one on each side of the segment and parallel to its plane, and upon each of these works a fulcrum-slide F. Upon the lever G is a sleeve I, provided with gudgeons J, projecting oppositely in the same

line and working in bearings in the slides F, respectively. The lever is prevented from sliding longitudinally by links H H, pivotally connecting the power-arm of the lever with the gear or its shaft. Power is conveniently applied to the lever through these links, which are connected at any desired point—for example, at M—with the source of power. The slides F are at will moved in either direction along the bars E by any suitable means, a forked lever L, having its branches slotted to engage studs N upon the slides, being selected for illustration. The sleeve I is slotted at K to pass over the segment and gear in order that the axis of its gudgeons may be carried up to the line of engagement of the segment and gear—that is, to the extreme end of the lever-arm. Now if reciprocating motion be given to any part M of the links the lever G will be oscillated about the axis of the fulcrum-gudgeons J and the gear will move back and forth through an arc varying with the position of that axis, whose distance from the gear is the working arm of the lever; but by swinging the lever L toward the gear, which in no way affects the movements of the links H, the slides F are moved along the bars E, the sleeve I is drawn forward, and the working arm of the lever G is gradually reduced to zero, when it ceases to impart motion to the gear. Obviously whenever the working arm of the lever becomes zero no work is done whatever the mechanical device through which that arm acts upon the work, and hence, broadly considered, the invention includes all possible devices at this point.

In the form of the invention illustrated and in some others only a portion of the gear A is used, and although it is shown entire it is not necessarily so, and the word “gear” is herein used to designate any gear, toothed or frictional, entire or mutilated. Whatever movement is transmitted to the gear may be transmitted from it by a suitable clutch or other mechanism. I have shown only a single segment giving only reciprocating movement and capable of imparting only step-by-step motion. This course has been followed because the simple form shows what is con-



ceived to be the gist of the invention, but my practical construction has not been thus limited.

It is evident that changes in construction  
5 can be made while keeping within the invention, and I therefore wish to claim the invention both broadly and specifically.

What I claim is—

1. The combination with a power-transmit-  
10 ting lever, of a fulcrum for the lever, means for at will sliding the fulcrum to the end of the lever-arm, means for swinging the lever about the fulcrum-axis, and means for holding a point in the lever at a constant distance  
15 from a fixed point without said axis.

2. The combination with a power-transmit-  
ting lever, of a fulcrum for the lever, means for at will sliding the fulcrum to the end of the lever, and a pivotally-attached link hold-  
20 ing a point of the lever at a constant distance from a fixed point not the fulcrum.

3. The combination with a shaft and a gear thereon, of a segment engaging the gear and borne by a lever pivotally supported upon a  
25 transverse axis, a link swinging about the axis of the gear and pivotally fixed at its op-

posite end to said lever, and means for at will varying the distance of the pivotal axis of the lever from the axis of the gear.

4. The combination with a suitably-mount- 30  
ed gear, of a segment engaging said gear and borne by a lever, a fixed bar parallel to the plane of the lever-segment, a slide working upon said bar, a fulcrum-pivot working in said slide and in sliding engagement with the 35  
lever, means for swinging the lever about the axis of said pivot, and means for at will gradually moving the slide along the bar.

5. The combination with a suitably-mount-  
ed gear, of a segment engaging said gear and 40  
borne by a lever, a movable fulcrum sliding along the lever, means for swinging the lever about the fulcrum-axis, and means for at will moving the fulcrum in a fixed path parallel to the plane of the segment. 45

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH B. CHAMBERLAIN.

Witnesses:

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