No. 743,596. PATENTED NOV. 10, 1903.

L. R. TULLOCH.

MECHANICAL MOVEMENT.

APPLICATION FILED MAR. 3, 1903.

NO MODEL.

Fig. 1.

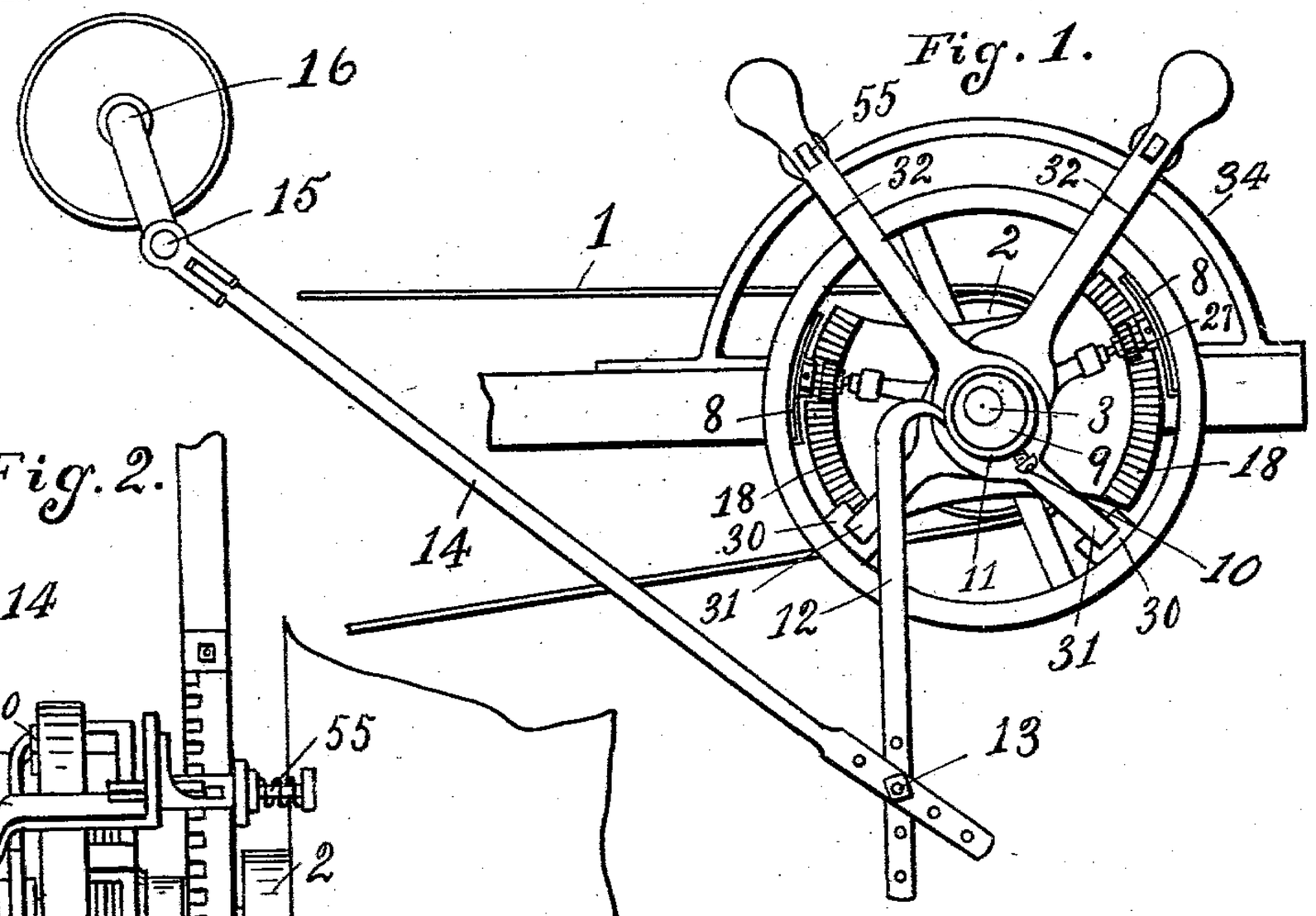


Fig. 2.

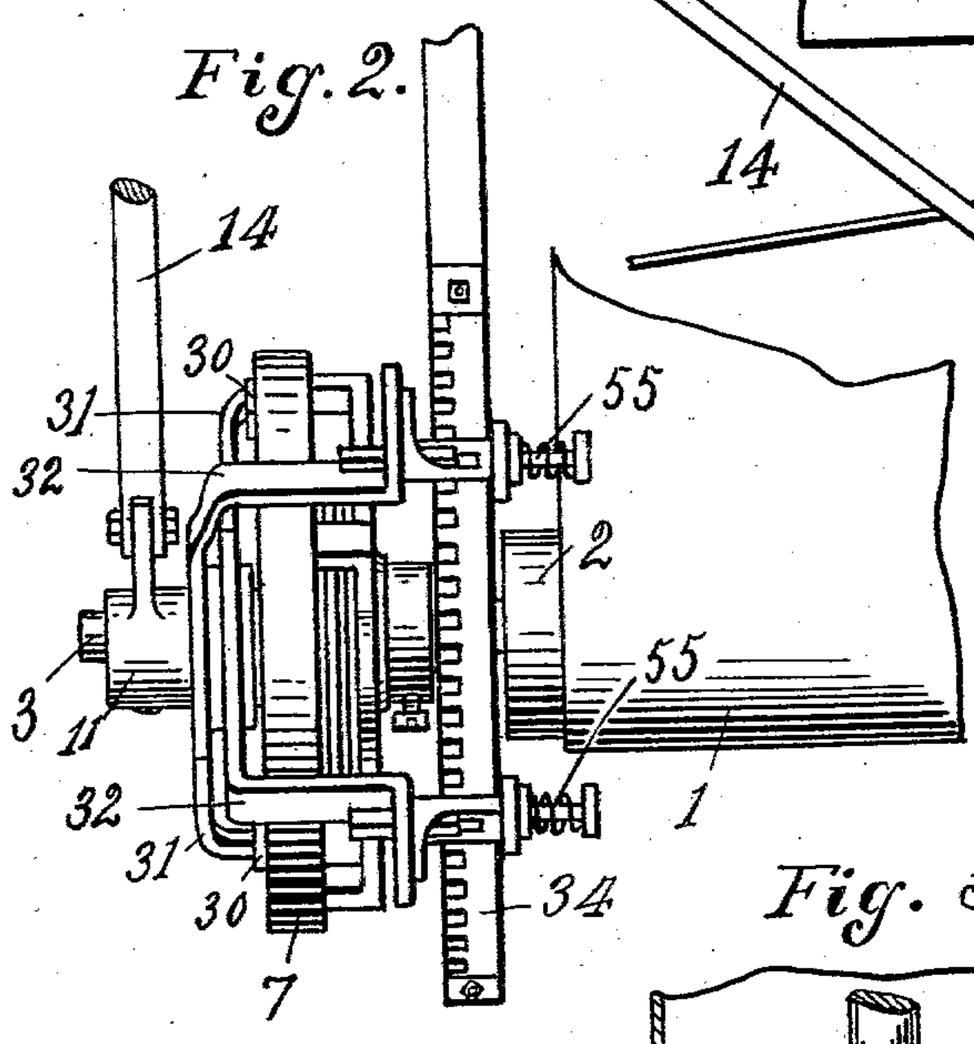


Fig. 3.

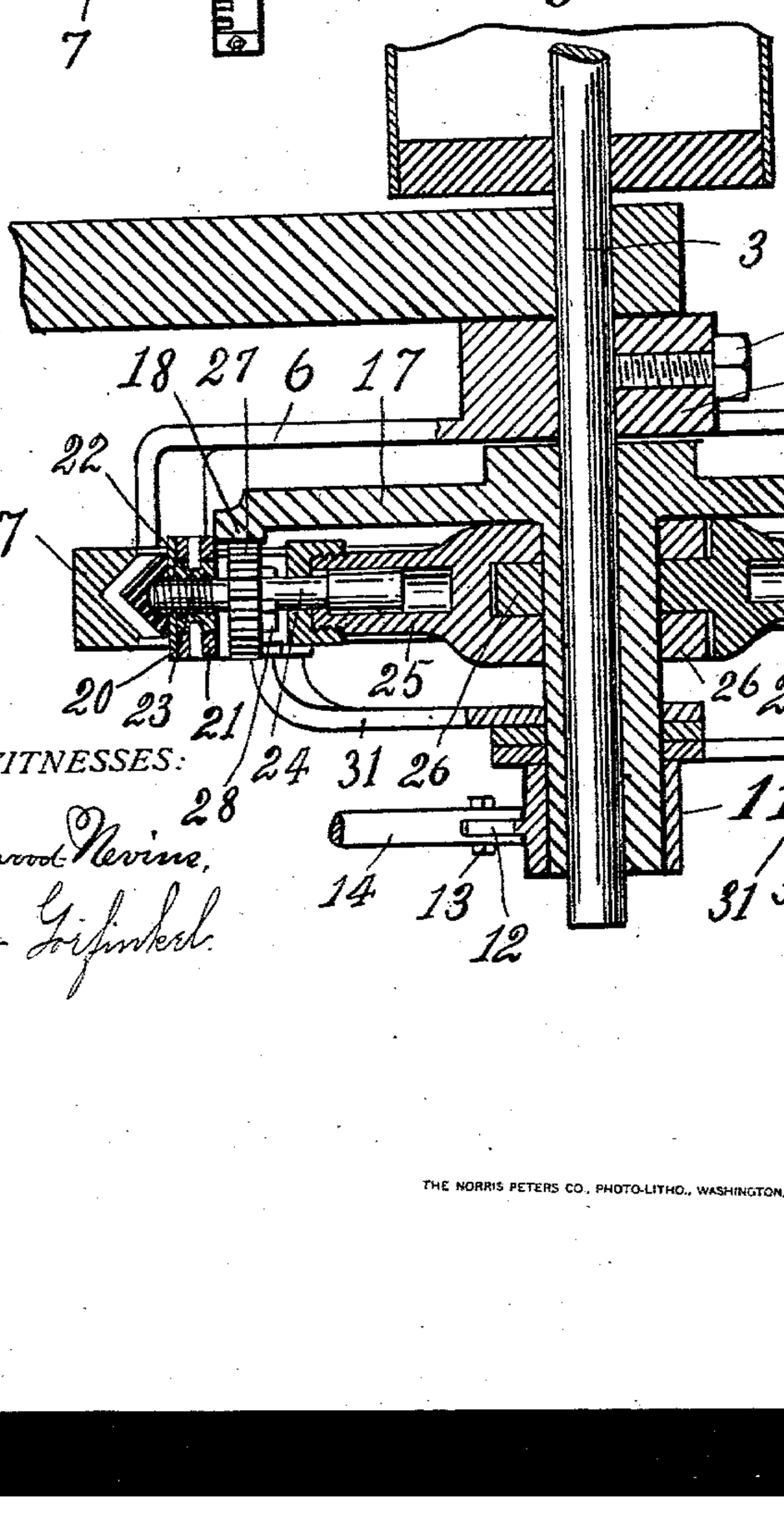
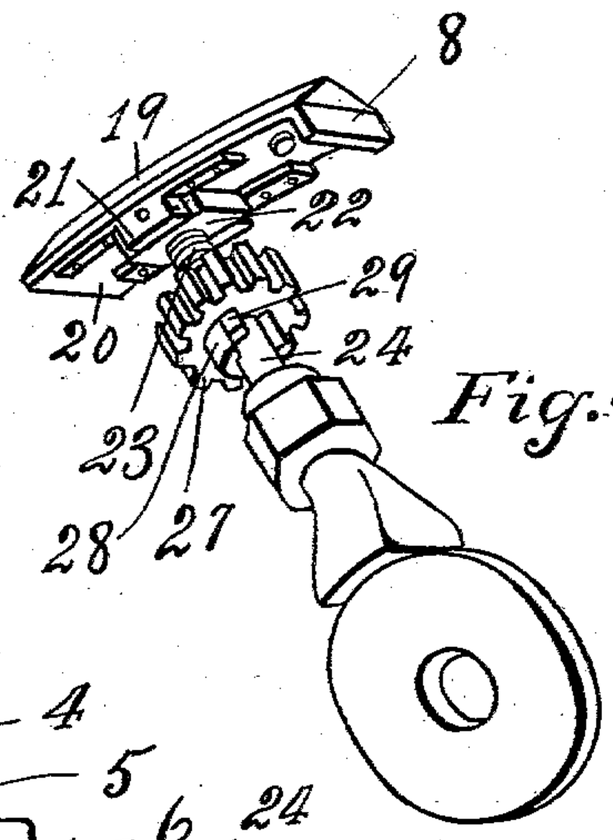


Fig. 4.



WITNESSES:

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No. 743,596. Patented November 10, 1903.

UNITED STATES PATENT OFFICE.

LOUIS R. TULLOCH, OF ANGELS CAMP, CALIFORNIA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 743,596, dated November 10, 1903.

Application filed March 3, 1903. Serial No. 146,016. (No model.)

To all whom it may concern:

Be it known that I, LOUIS R. TULLOCH, a citizen of the United States, residing at Angels Camp, in the county of Calaveras and State of California, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

My invention relates to improvements in mechanical movements, the object of my invention being to provide a mechanical movement by means of which an intermittent progressive movement may be obtained from an oscillating movement.

My invention also comprises means whereby two of such movements may be so combined and adjusted as to afford means for progressing intermittently in either direction and at any desired rate or to obtain an intermittent reciprocating movement.

For the purpose of illustration of my invention I have herein shown it as applied to advancing intermittently a traveling belt. It may, however, be applied for many other purposes, especially where it is desired to feed material intermittently in small quantities.

My invention therefore resides in the novel construction, combination, and arrangement of parts for the above ends hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the apparatus. Fig. 2 is a broken view thereof. Fig. 3 is a horizontal section thereof. Fig. 4 is a detail perspective view of an arm and a grip carried thereby.

Referring to the drawings, 1 represents a belt which travels around a roller 2 upon a shaft 3. Upon said shaft 3 is fixedly secured by a set-screw 4 a collar 5, having arms 6, connected at their ends to a ring 7. Within said ring work friction-grips 8, as hereinafter explained. The shaft 3 is continued through said ring, and upon the end thereof is loosely mounted an eccentric sleeve 9, upon which is fixedly secured by a set-screw 10 a collar 11, having a crank-arm 12 adjustably connected, as shown at 13, with a pitman 14, the rear end of which is connected to the end of a crank 15, extending from a main driving-shaft 16, driven from any suitable source of power. The crank 12 being considerably longer than the crank 15, it results that the rotation of the main shaft 16 imparts a rocking motion to said crank 12 and also to the eccentric sleeve 9. Upon the inner end of said eccentric sleeve is secured to rock therewith the hub of a plate 17, having formed thereon diametrically opposite segment-gears 18. These gears rock loosely with the eccentric within the ring 7. The rocking motion of said plate and segment-gears is communicated to said ring by means of grips 8, each consisting of a shoe 19, secured to grip-plate 20. Mounted in bearings 21 on each grip-plate are the trunnions of the nut 22. In said nut works a screw 23, formed on a stem 24, the inner end of which is revolubly mounted in a radial arm 25. The inner ends of these arms are formed with collars 26, which surround the eccentric, one of said collars being single and the other bifurcated, as shown. The rocking of the eccentric in one direction thus has a tendency to move said arms in and out, one arm always moving inward, while the other moves outward. Upon said stems 24 are revolubly carried pinions 27, which engage the teeth of the segment-gears 18, and said pinions have extensions 28, which contact with lugs 29, formed upon the stems 24, and impart rotation thereto. It will readily be seen that rotation imparted to either of said screws in one direction will by screwing the screw into the nut 22 withdraw the shoe from the inner surface of the ring and permit said shoe to move freely within said inner surface, while by turning the screw in the other direction the nut will move outwardly from said screw, thus forcing the surface of the shoe against the inner surface of the ring and causing it to firmly grip the same. The shoe is thus made to grip the ring from two causes—first, the outward motion of the arm as a whole due to the rotation of the eccentric within the collar, and, secondly, on account of the turning of the screw, thus causing the nuts to move outwardly.

In regard to the actions of the two arms, it will appear from the construction that the operation of the rear arm imparts to the belt an intermittent forward movement, while that of the front arm imparts thereto an intermittent backward movement. Each of these arms may be thrown out of operation at will

or both may be operated. In the latter case they transmit their motion to the ring alternately, and a reciprocating movement is imparted to the belt.

Considering first the movement of the rear arm and supposing that the crank 12 is in its lowest position and is raised rearwardly, the effect is first by means of the eccentric to move the rear arm rearwardly away from the center of the shaft, thus causing the shoe 19 to come closer to the inner surface of the ring. Next the rear segment-gear will ascend with the crank and in its ascent will cause the pinion gearing therewith to rotate, and by the extension from the pinion striking the lug upon the screw-stem the rotation of the pinion will be imparted to the screw-stem, and since the screw is revolved in a left-handed direction this will have the effect of drawing the screw out of the nut or, in other words, forcing the nut out upon the screw and pressing the shoe of the grip against the surface of the ring. This will cause said shoe to grip said ring with great pressure and will immediately clamp the same, so that the ring will be carried upward with the segment-gear, and a movement in a forward direction will be imparted to the belt. As soon as the crank-arm stops and begins to return the eccentric begins to return. It then immediately imparts a right-handed rotary movement to the pinion, which causes the screw to screw into the nut or the nut to be drawn onto the screw, thus withdrawing the shoe from its pressure upon the inner surface of the ring and allowing the arm to drop freely by gravity, so that the backward movement of the crank-arm is not accompanied by a backward movement of the belt. In like manner the upward and rearward movement of the front segment-gear will cause the corresponding shoe to engage the ring and move it backward, while upon its return movement the shoe will be released from the ring, so that no corresponding forward movement of the belt will take place.

Since the operative movement of each segment-gear is its movement in an upward direction and since when the rear segment-gear is moving upward the front one is moving downward, and vice versa, it follows that these opposing movements cannot act simultaneously, but they must necessarily act alternately. When both arms are operating, the belt will move forward and backward alternately.

To limit the amount of either movement, I provide a stop 30, preferably formed of a rubber block, supported upon an arm 31, pivotally mounted around the eccentric 9 and having another arm 32 extending to the opposite side of the ring and then bent across the face of a curved rack 34, said bent portion having a spring-actuated dog 35, which can be arranged to engage any of the teeth of said rack, thus adjusting the angular position of the stop. When the stop is placed in its lowest position, the corresponding arm is given its greatest amplitude of motion and the maximum movement is imparted to the ring, and when the stop is raised to its highest position the motion of the arm is not sufficient to close the grip upon the ring. In the latter case the arm is rendered inoperative to turn said ring or to move the belt.

Generally it will be necessary that the rear stop shall be lower than the front stop, thus giving a greater amplitude of motion to the rear arm than to the front arm, the effect of which will be to give a greater forward than backward motion to the belt, so that there will be resultant progressive movement to the belt.

While I have herein shown both segment-gears operating, it is obvious that the principle of my invention may be utilized with one segment-gear alone, in which case the means for rocking the segment-gear may comprise an arm extending on the opposite side of the shaft to said segment-gear, and in which case also only one stop will be required for adjusting the amount of the stroke, or, again, it is obvious that said stop may be omitted, if necessary, and the amount of the stroke may be varied by varying the extent of reciprocation of the crank 12.

I claim—

1. In a mechanical movement, the combination of a shaft, a friction-ring secured thereon, an eccentric mounted loosely on said shaft, a collar having an arm extending therefrom, a friction-shoe carried by said arm, and arranged to engage said friction-ring, and means for rocking said eccentric to bring said shoe into and out of engagement with the friction-ring, substantially as described.

2. In a mechanical movement, the combination of a shaft, a friction-ring secured thereon, an eccentric loose on said shaft, collars around said eccentric each carrying an arm, friction-shoes carried by said arms and engaging said friction-ring, and means for rocking said eccentric, substantially as described.

3. In a mechanical movement, the combination of a shaft, a friction-ring secured thereon, an eccentric mounted loosely on said shaft, a collar having an arm extending therefrom, a friction-shoe carried by said arm, and arranged to engage said friction-ring, means for rocking said eccentric to bring said shoe into and out of engagement with the friction-ring, and an adjustable stop limiting the amplitude of movement of said arms, substantially as described.

4. In a mechanical movement, the combination of a shaft, a friction-ring secured thereon, an eccentric loose on said shaft, collars around said eccentric each carrying an arm, friction-shoes carried by said arms and engaging said friction-ring, means for rocking said eccentric, and adjustable stops limiting the amplitudes of movement of said arms, substantially as described.

5. In a mechanical movement, the combina-

tion of a shaft, a ring secured thereon, a plate rotatable about said shaft and having a segment-gear, an arm independently rotatable about said shaft, a stem rotatably carried by said arm, a pinion on said stem engaged by said segment-gear, a nut engaged by the threaded end of said stem, and a friction-shoe to which said nut is secured, substantially as described.

6. In a mechanical movement, the combination of a shaft, a ring secured thereon, a plate rotatable about said shaft and having segment-gears, means for rocking said plate, arms independently rotatable about said shaft, stems rotatably carried by said arms threaded at their outer ends, pinions carried on said stems and engaging said gears, and shoes carried by the ends of said stems and engaging said ring, substantially as described.

7. In a mechanical movement, the combination of a shaft, a friction-ring secured thereon, an eccentric loosely mounted on said shaft, means for rocking said eccentric, segment-gears carried by said eccentric, collars independently rotatable about said shaft, arms carried by said collars, stems rotatably carried by said arms, and threaded at their outer ends, pinions on said stems engaging said gears, nuts engaged by said threaded ends, and friction-shoes to which said nuts are pivotally attached said friction-shoes engaging said ring, substantially as described.

8. In a mechanical movement, the combination of a shaft, a ring secured thereon, a plate rotatable about said shaft and having segment-gears, means for rocking said plate, arms independently rotatable about said shaft, stems rotatably carried by said arms threaded at their outer ends, pinions carried on said stems and engaging said gears, and shoes carried by the ends of said stems and engaging said ring, and independently-adjustable stops for limiting the movements of said arms, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LOUIS R. TULLOCH.

Witnesses:
FRANCIS M. WRIGHT,
BESSIE GORFINKEL.