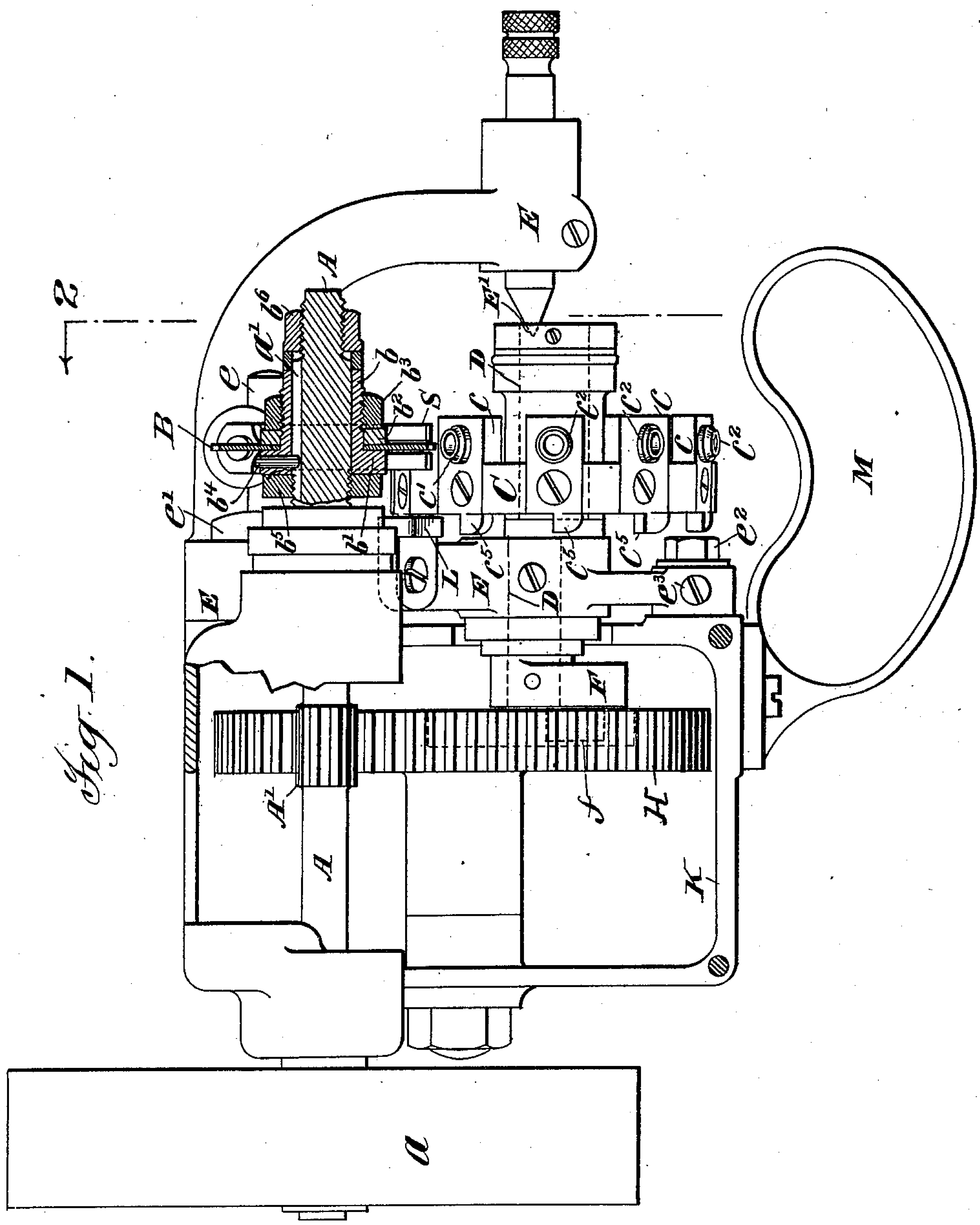
No. 660,860. Patented Oct. 30, 1900.

F. LAMBERT.

MECHANICAL MOTION.

(Application filed Dec. 1, 1899.)

(No Model.) 3 Sheets—Sheet 1.



Attest:
Geo H Botts
E. L. Sarles.

Inventor:
Frank Lambert
By his attorney
Edith J. Griswold

No. 660,860. | Patented Oct. 30, 1900.

F. LAMBERT.

MECHANICAL MOTION.

(Application filed Dec. 1, 1899.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 2.

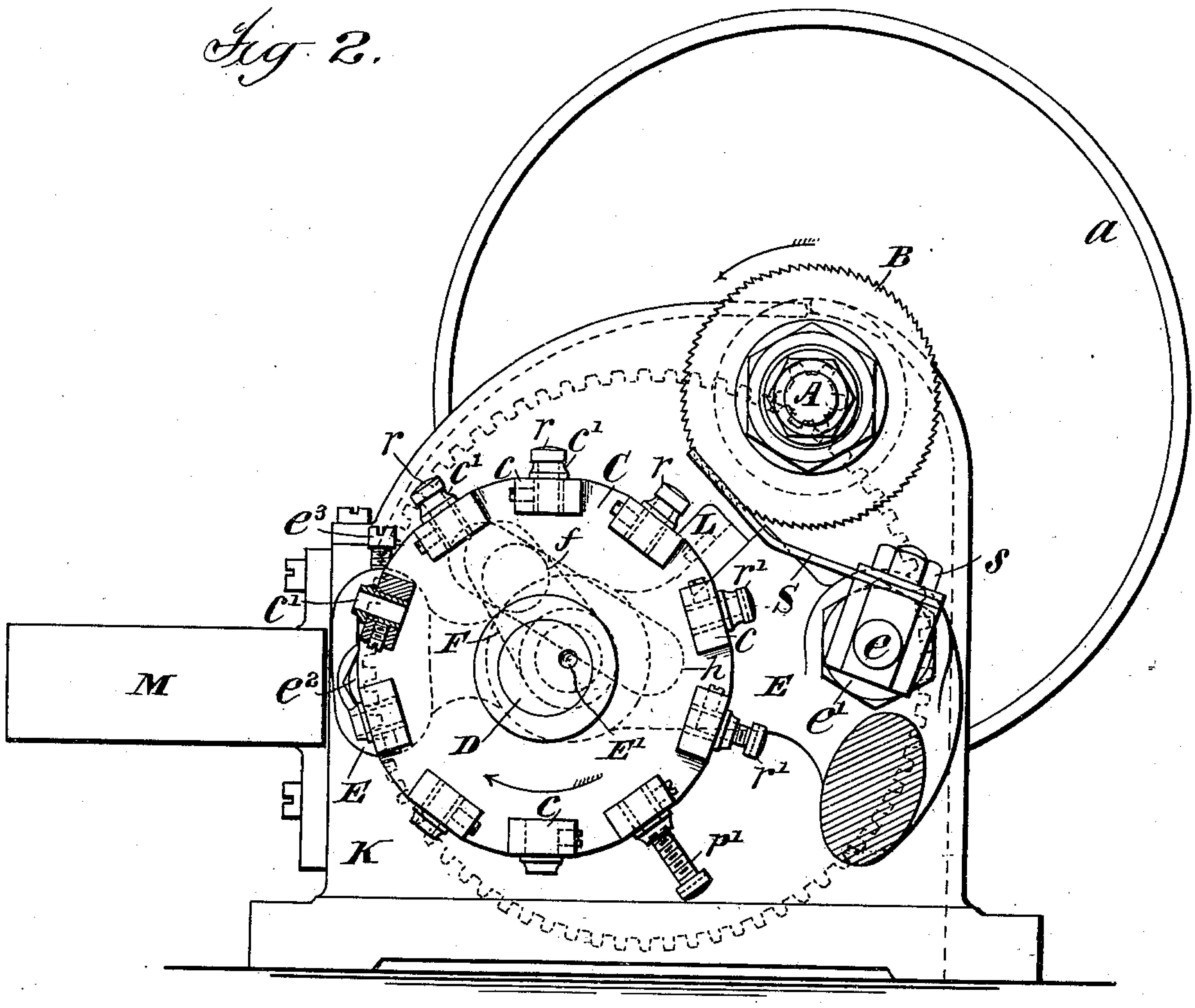
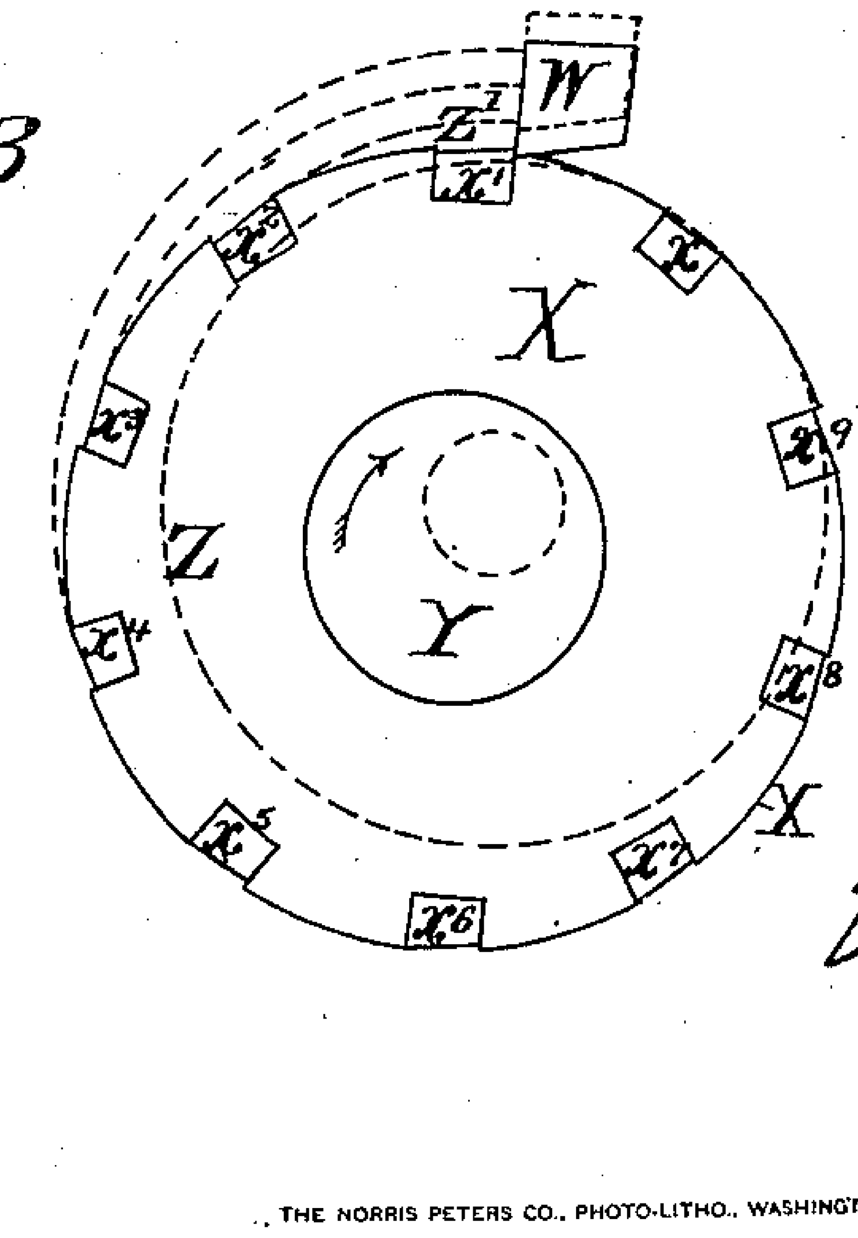


Fig. 3



Attest:
Geo H Botts
E. C. Sarles.

Inventor:
Frank Lambert
By his attorney
Edith J. Griswold

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

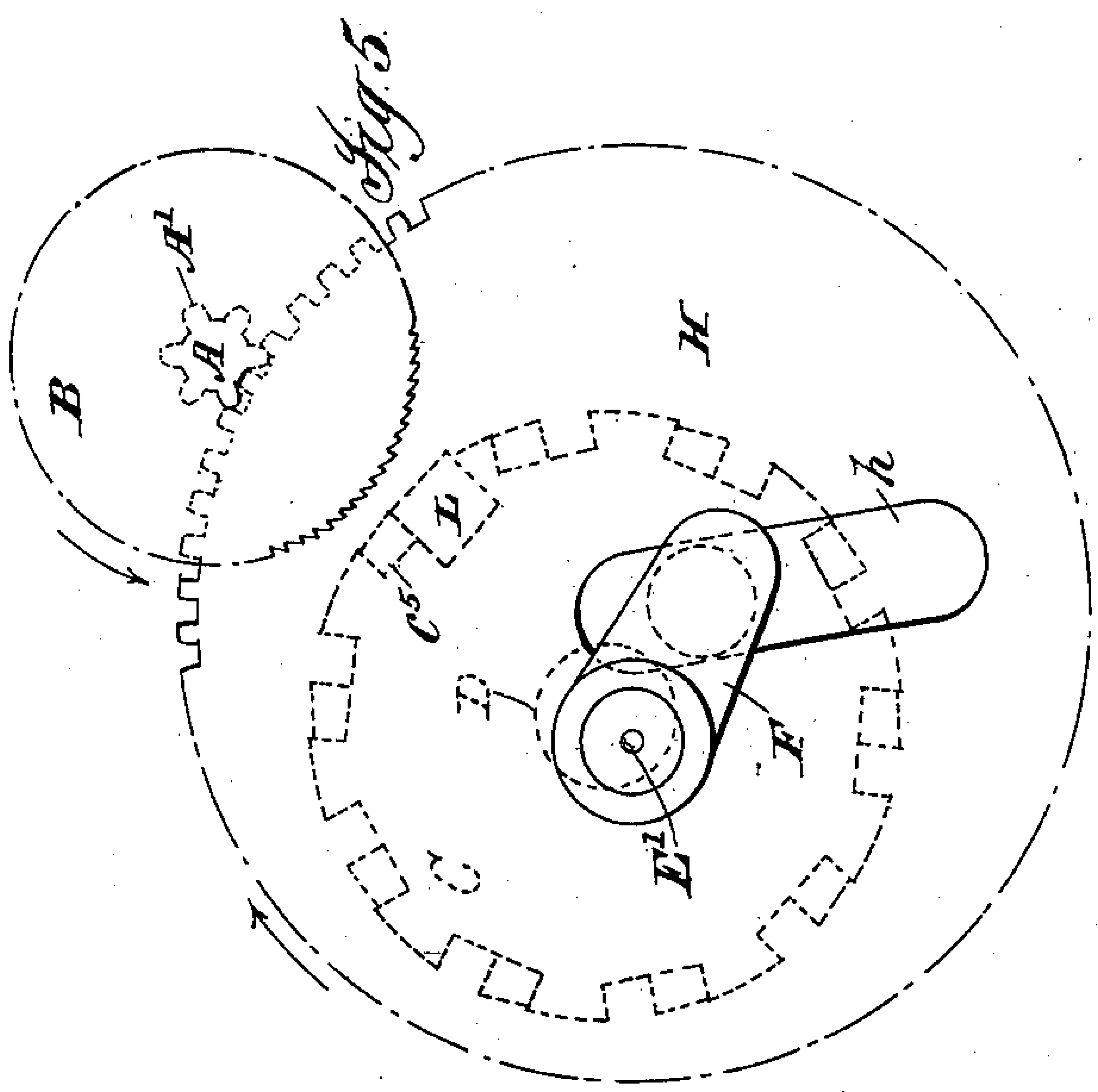
No. 660,860. Patented Oct. 30, 1900.

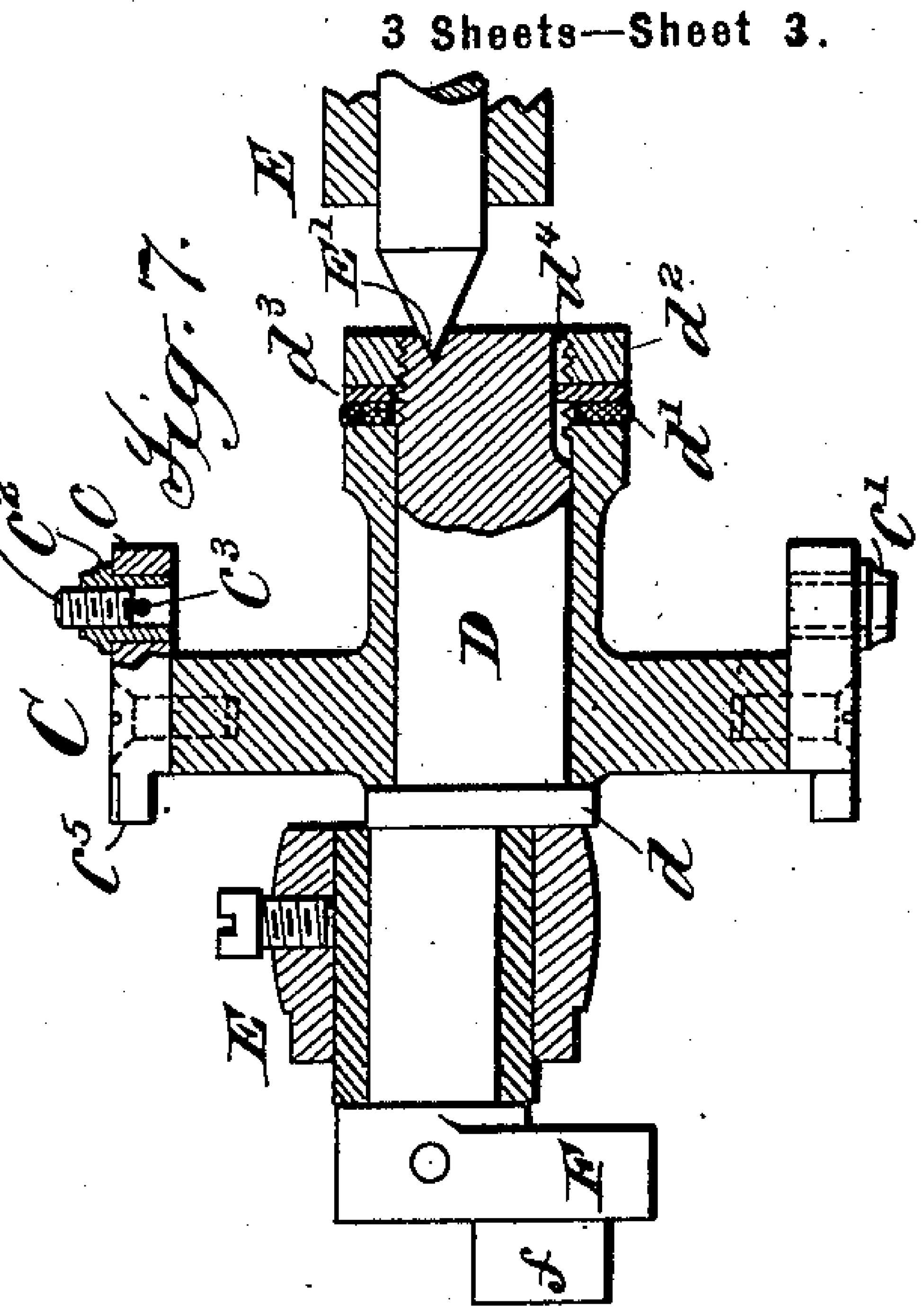
F. LAMBERT.

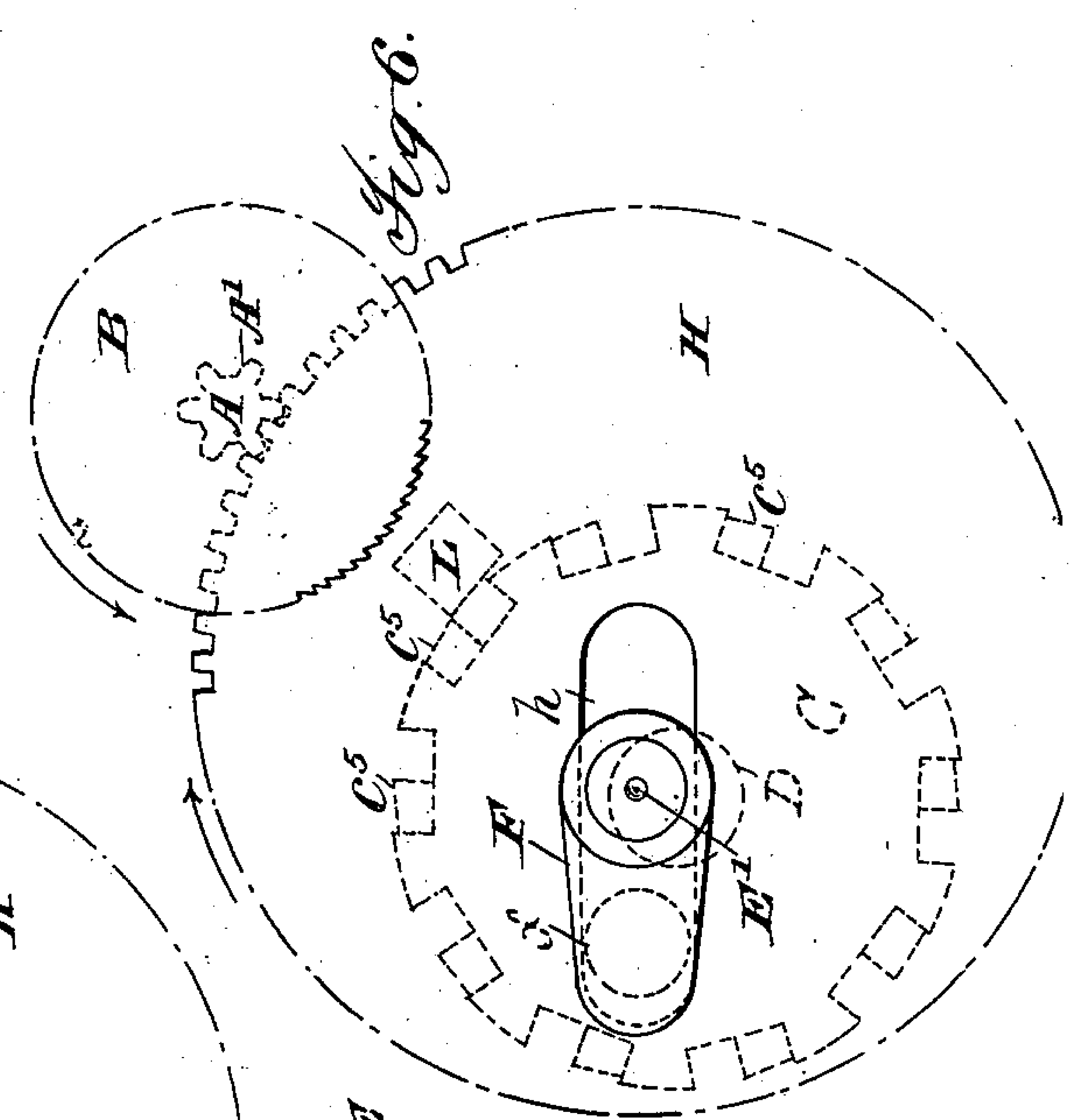
MECHANICAL MOTION.

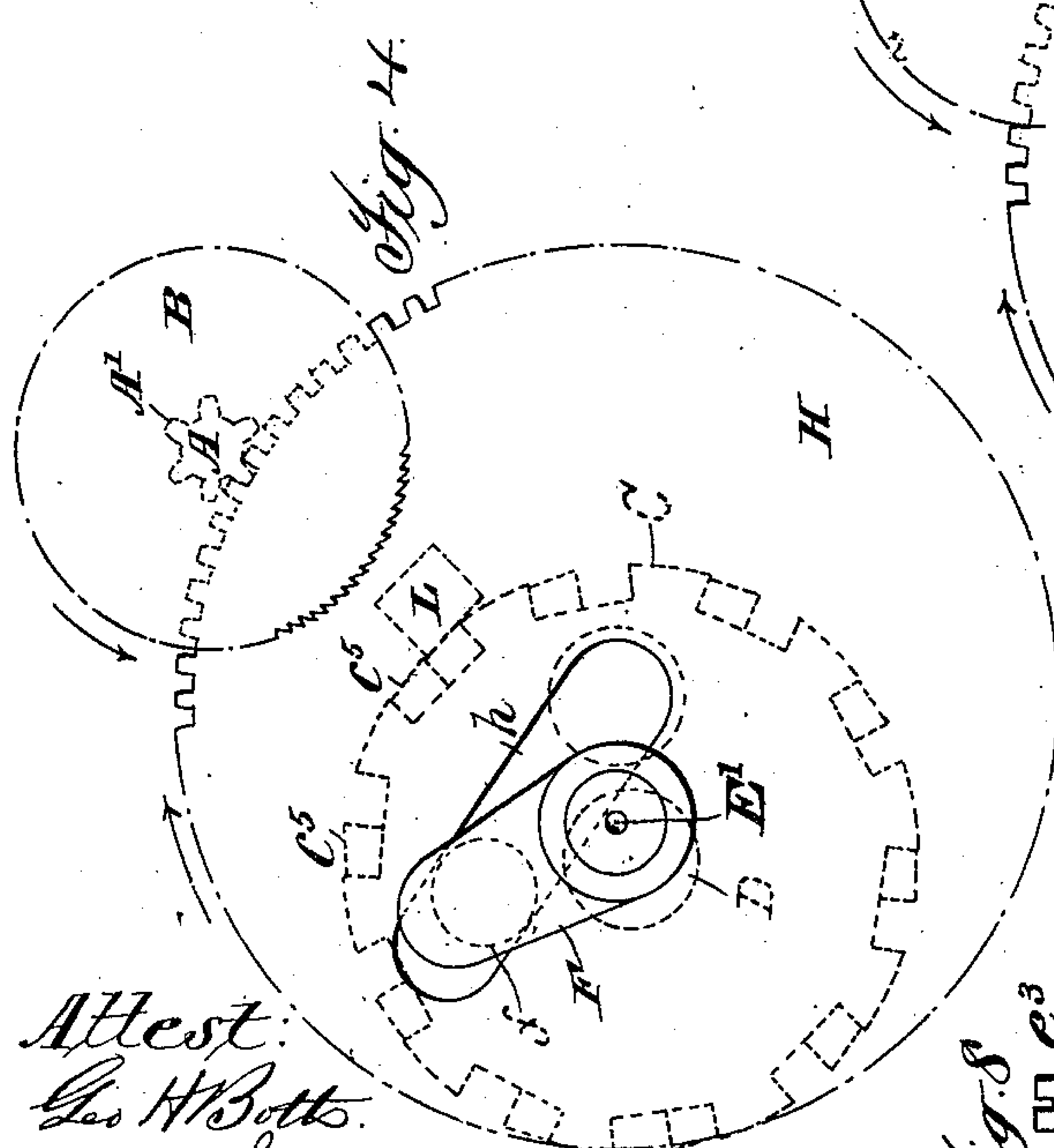
(Application filed Dec. 1, 1899.)

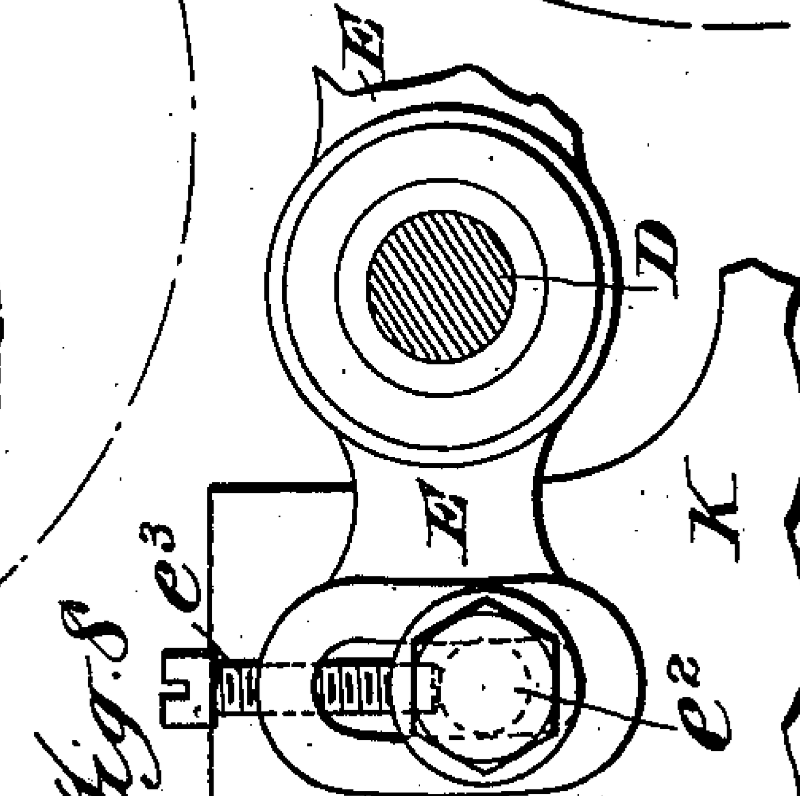
(No Model.) 3 Sheets—Sheet 3.











Attest:
Geo. H. Botts
C. C. Sarles

Inventor:
Frank Lambert
By his attorney
Edith J. Griswold

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK LAMBERT, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO GEORGE T. MONTGOMERY, OF SAME PLACE.

MECHANICAL MOTION.

SPECIFICATION forming part of Letters Patent No. 660,860, dated October 30, 1900.

Application filed December 1, 1899. Serial No. 738,779. (No model.)

To all whom it may concern:

Be it known that I, FRANK LAMBERT, a citizen of the United States, and a resident of New York, (Brooklyn,) Kings county, State of New York, have invented an Improved Mechanical Motion, of which the following is a specification.

My invention relates to a new mechanical motion especially applicable to machines for automatically feeding blanks or the like to a tool for operating thereon in a direction perpendicular to the tool and to the surface to be acted upon. For instance, if the tool is a rotary saw or wheel the blanks are fed toward and from said wheel in a direction in line with the radius thereof.

My invention comprises a rotary eccentric having a disk or the like mounted thereon in such a manner that it will normally rotate therewith and means for intermittently arresting the rotary motion of the disk, whereby the eccentric may act on the disk to displace the same, and preferably the rotary motion is a differential one, so that when the new motion is used in machines adapted to carry blanks to a tool the carrier may be moved very swiftly during its rotary motion to carry forward the blanks and very slowly during its reciprocating motion when a blank is being acted upon by the tool. This latter motion may be made so slow that the carrier is practically at a standstill while the attendant supplies it with blanks.

To illustrate my invention, I have shown in the accompanying drawings a screw-slotting machine provided with a circular saw adapted to cut or mill slots in the heads of screws and a rotary blank-carrier actuated by mechanism operating on the principle of the new mechanical motion. However, it will be evident that this new motion may be used in various other machines.

In the drawings, Figure 1 is a plan view of the screw-slotting machine with certain portions in section. Fig. 2 is a sectional end view of the machine, taken on line 2 of Fig. 1. Fig. 3 is a diagram illustrating the principal of the mechanical movement. Figs. 4, 5, and 6 are views showing a part of the mechanism of the machine in three different positions. Fig. 7 is a sectional view of the shaft on which the carrier is mounted. Fig. 8 is a detail view hereinafter referred to.

Referring to Figs. 1, 2, and 7, the main driving-shaft A is driven in any suitable manner—as, for instance, by means of a pulley *a* and belt. The milling-tool or circular saw B is carried by the shaft A and the rotary blank-carrier C by the shaft D, mounted in bracket E and driven through the medium of the crank-arm F, the roller *f* of which engages in cam-groove *h* in the gear-wheel H, which latter is mounted in bearings in the frame K and driven by a pinion A′ on the main driving-shaft.

Diagram Fig. 3 illustrates the principle of the new mechanical motion adapted to alternately impart to the carrier C a rotary motion to bring a blank in front of the saw and then a reciprocating motion to carry the blank against the saw in a direction in line with a radius thereof.

Suppose the disk X to be mounted on the eccentric Y, so as to normally rotate there-therewith, as by means of friction, and the disk to be provided with projections. In the diagram these projections are shown as lateral, and their positions with relation to the axis of rotation are indicated by x x' x^2, &c. The dotted circle Z represents the path of a projection occupying the position x—that is, nearest the axis of rotation.

If a stop W be placed just outside the circle Z at any point when the eccentric Y and disk X are rotated together in the direction of the arrow, the projection nearest the stop in any position besides x will come in contact with the stop and arrest the rotary motion of the disk. The eccentric continuing its rotation will act as a cam to reciprocate the disk, the stop W acting as a guide and determining the direction of the reciprocation until the eccentric has drawn the projection into the position x—that is, within the circle Z—when the projection will escape the stop W. Then the disk X will rotate with the eccentric Y until the next projection (which will be in position x') comes against the stop W and arrests the rotary motion of the disk. The reciprocation is then repeated, followed by another partial rotation, and so on. With the stop W in the position shown in full lines each projection in turn will come in contact with the stop and arrest the motion of the disk X, as described—that is, the disk X will automatically register its stopping positions at every projection. As the stop W is moved farther away from the axis of rotation the disk X will automatically register only at every second, third, fourth, fifth, &c., projections. For instance, should the stop W be moved into the position shown in dotted lines—that is, just within the circular path Z′—projections in the positions x', x, and x^9 will escape the stop and the disk X will register only at every fourth projection, or if the stop W is in a position intermediate between that shown in full lines and that shown in dotted lines the disk can be made to register at every second or third projection, according to how near to the axis of rotation the eccentric Y must bring a projection before it can escape the stop W. It is evident, therefore, that by simply adjusting the stop W the disk X may be made to automatically register its rotary stopping positions at any desired angle of rotation.

Referring to Fig. 7, the rotary blank-carrier C (corresponding to the disk X) is frictionally mounted on the rotating eccentric-shaft D (corresponding to the eccentric Y) by a bearing between the shoulder d and the washer d', of felt or the like, the amount of friction being regulated by the nut d^2. To prevent this nut d^2 from being turned on the shaft D when the carrier does not rotate therewith, I interpose between the friction-washer d and the nut d^2 a washer d^3, having an inward projection entering a groove d^4 in the shaft D to prevent its turning on the shaft. The axis of rotation of shaft D passes through the point E′.

The carrier C is preferably formed with a disk portion having blocks c secured at intervals around its periphery. These blocks c are perforated for the insertion of bushings adapted to carry the blanks r, and these bushings may be readily changed to suit different sizes or kinds of blanks. As shown in Figs. 1 and 2 and at the lower part of Fig. 7, the bushings c' are adapted to receive screws provided with heads, while the bushing c^2, at the upper part of Fig. 7, is adapted to hold headless screws. For this purpose a pin c^3 may be passed through the lower part of the bushing c^2 in a position to allow the top of the screw to project just enough to be properly grooved. The blocks c may also carry the projections c^5, adapted to engage with the stop L, secured to the bracket E. As shown in Fig. 1, the edge of the projection c^5 that engages the stop L is preferably in line with the center of the bushing, and the stop L is so adjusted that as the carrier is reciprocated the blank in the bushing opposite the projection engaging the stop is moved in a direction in line with a radius of the saw B.

The saw B may be mounted on the driving-shaft A, as shown in section in Fig. 1. The saw is first clamped to the sleeve b, between the shoulder b' and a ring b^2, by the nut b^3. The sleeve b is prevented from turning on the shaft A by means of a key b^4 passing through the sleeve and entering a groove a' in the shaft. The sleeve b is clamped to the shaft A by the adjusting-nut b^5 and the tightening-nut b^6. A blade-spring S, secured to the bracket E by nut s, is bifurcated to pass over the edge of the saw B, as shown in Figs. 1 and 2.

The bracket E turns on the center e, Fig. 2, and is clamped to the frame K of the machine by nuts e' and e^2, Figs. 1 and 8. By loosening these nuts the bracket may be adjusted by means of the adjusting-screw e^3, for the purpose hereinafter explained.

The special arrangement of the cam-groove h in wheel H and crank-arm F of eccentric-shaft D gives a differential rotary motion to the shaft D.

The receptacle M at the front of the machine holds the blanks to be fed to the carrier C.

The operation of the machine is as follows: The attendant in front of the machine places the blanks r in the carrier C as the empty bushings c' are turned uppermost, and the rotary motion of the carrier brings each blank in turn opposite the saw B. When a projection c^5 comes in contact with the stop L, the rotary motion of the carrier is arrested, and the continued rotation of the cam-shaft D reciprocates the carrier, the stop L and projection c^5 guiding the carrier so that the blank is presented to the saw B in line with a radius thereof. As the blank approaches the saw its head comes against the split spring S, which holds the blank firmly in position while it is being milled. When the shaft D has drawn the projection c^5 far enough toward the axis of rotation to escape the stop L, the carrier C again rotates with the shaft D until the next projection comes in contact with the stop. As the completed screws r' are carried around they drop by gravity out of the bushings, as shown at Fig. 2, the sudden stopping of the carrier also helping to shake the screws out.

Referring to Figs. 4, 5, and 6, the relative positions of the axis of rotation E′ of the shaft D, the crank-arm F, groove H, and the saw B are such that from the time a projection c^5 comes in contact with the stop L, Fig. 4, (and a blank begins to move against the saw,) until the blank has been carried to a position nearest the saw, Fig. 5, (when the slot is completed,) the motion of the crank-arm F is comparatively very slow, whereas from the time the slot in one blank is completed, Fig. 5, (while the projection c^5 is being drawn back to a position to escape the stop L, Fig. 6, and the carrier rotated to bring another blank opposite the saw,) until the next blank begins to be moved against the saw, Fig. 4, the motion of the crank-arm F is comparatively very swift.

From the foregoing it will be seen that while the necessary slow motion is imparted to the blank as it is being milled there is no lost time in withdrawing the completed screw and presenting a fresh blank to the tool; also, that while the blank is being milled there is no rotary motion of the carrier, and its reciprocating motion is so slow that the attendant has no difficulty in feeding the carrier with blanks.

If it is desired to mill grooves in the screws of different depths or to adjust the depth of the milling to different milling-tools, the axis of rotation E′ may be moved nearer to or farther from the axis of the saw by adjusting the bracket E by means of the adjusting-screw e^2, as before described.

The stop L may be made adjustable on the bracket E toward and from the axis of rotation of the carrier C in any suitable manner. In the machine shown in the drawings the parts are so arranged that this adjustment may be accomplished by simply turning the stop L on its screw l, Fig. 1, when loosened. A very slight motion only is necessary to change the registering position of the carrier.

In the claims the word "disk" is meant to cover any equivalent device—such, for instance, as the carrier C.

I claim as my invention—

1. A new mechanical motion comprising a rotatable eccentric, a disk mounted thereon and adapted to normally rotate therewith, and means for intermittently arresting the rotary motion of the disk, whereby the eccentric may act on the disk to displace the same.

2. A new mechanical motion comprising a rotatable eccentric, a disk, frictionally mounted thereon, and means for intermittently overcoming the friction to allow the eccentric to displace the disk.

3. A new mechanical motion comprising an eccentric having a differential rotary motion, a disk mounted thereon and adapted to normally rotate therewith, and means for intermittently arresting the rotary motion of the disk whereby the said eccentric may act on the disk to displace the same.

4. A new mechanical motion comprising an eccentric having a differential rotary motion, a disk frictionally mounted thereon, and means for overcoming the friction during the slower part of the differential motion of the eccentric.

5. A new mechanical motion comprising an eccentric having a continuous rotary motion, and a disk mounted on said eccentric and adapted to intermittently rotate therewith, whereby rotary and reciprocating motions are alternately imparted to the said disk by the said eccentric.

6. The combination of a relatively-fixed point, with a rotatable eccentric, a disk mounted thereon and adapted to normally rotate therewith, and means for stopping the rotary motion of the said disk at such a point in the travel of the eccentric that the said eccentric may act upon the said disk to reciprocate it toward and from the said fixed point.

7. The combination of a relatively-fixed point, with a rotatable eccentric, a disk frictionally mounted thereon, and means for overcoming the said friction at such a point in the travel of the eccentric that the said eccentric may act upon the said disk to reciprocate it toward and from the said fixed point, and means to vary the relative positions of the axis of rotation and the said fixed point.

8. A new mechanical motion comprising a rotatable eccentric, a disk frictionally mounted thereon and provided with projections, in combination with a stop in the rotary path of the said projections adapted to arrest the rotation of the disk until the eccentric has withdrawn the projection from the stop.

9. A new mechanical motion comprising a rotatable eccentric, a disk frictionally mounted thereon and provided with projections, in combination with a guide-stop in the rotary path of the said projections adapted to arrest the rotation of the disk and guide the same while the eccentric acts upon the disk to reciprocate it.

10. A new mechanical motion comprising a rotatable eccentric, a disk frictionally mounted thereon and provided with a series of projections, in combination with a stop in the rotary path of the said projections adapted to intermittently arrest the rotation of the disk, and means for adjusting the relative positions of the stop and the disk to vary the angle of rotation of the disk between the stopping-points.

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

FRANK LAMBERT.

Witnesses:
EDITH C. SARLES,
EDITH J. GRISWOLD.