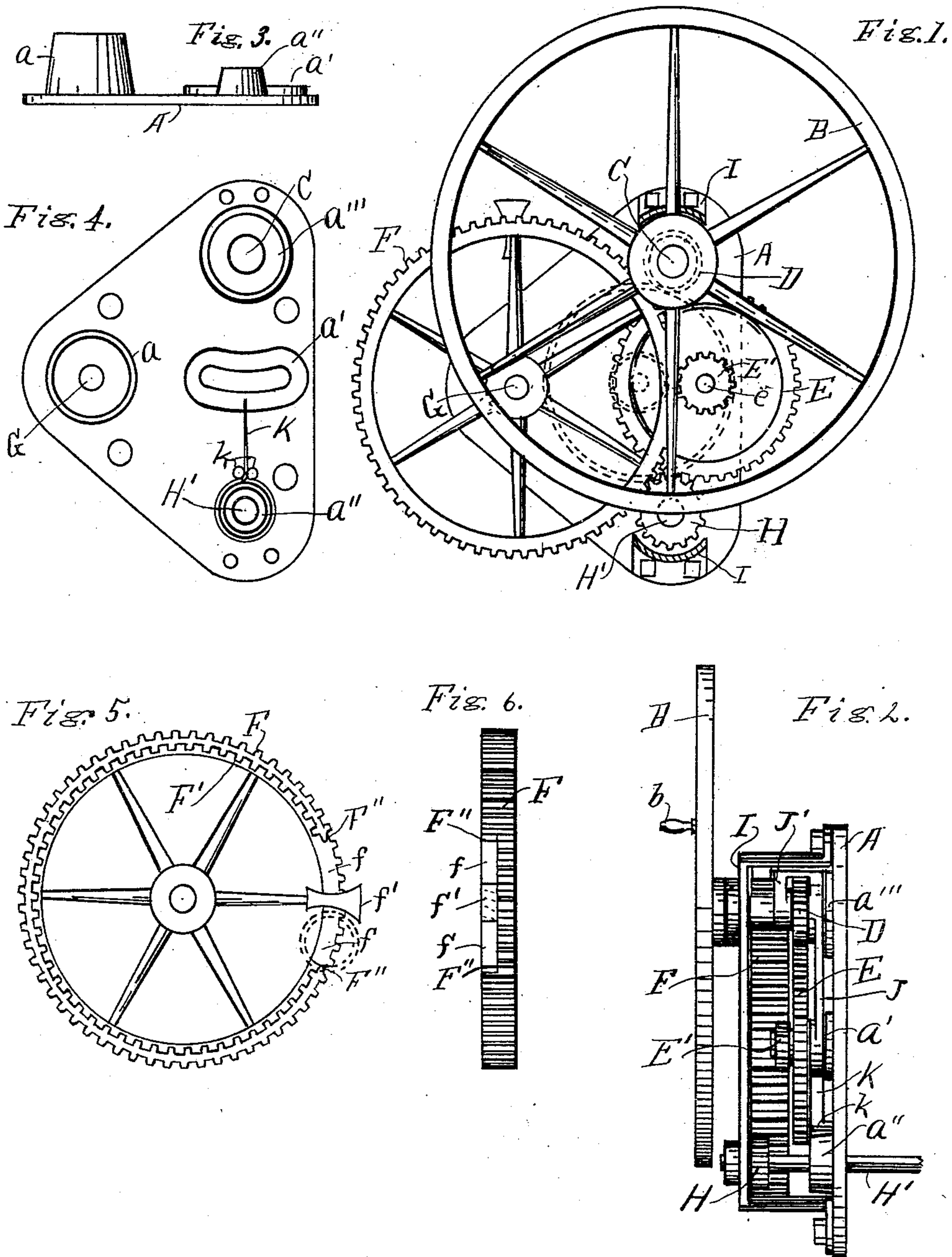


A. P. CRELL.
ALTERNATING MECHANICAL MOVEMENT.
APPLICATION FILED AUG. 13, 1908.

930,271.

Patented Aug. 3, 1909.
2 SHEETS—SHEET 1.



Inventor

Witnesses

L. B. Ware
A. Allgier

By

Albert P. Crell

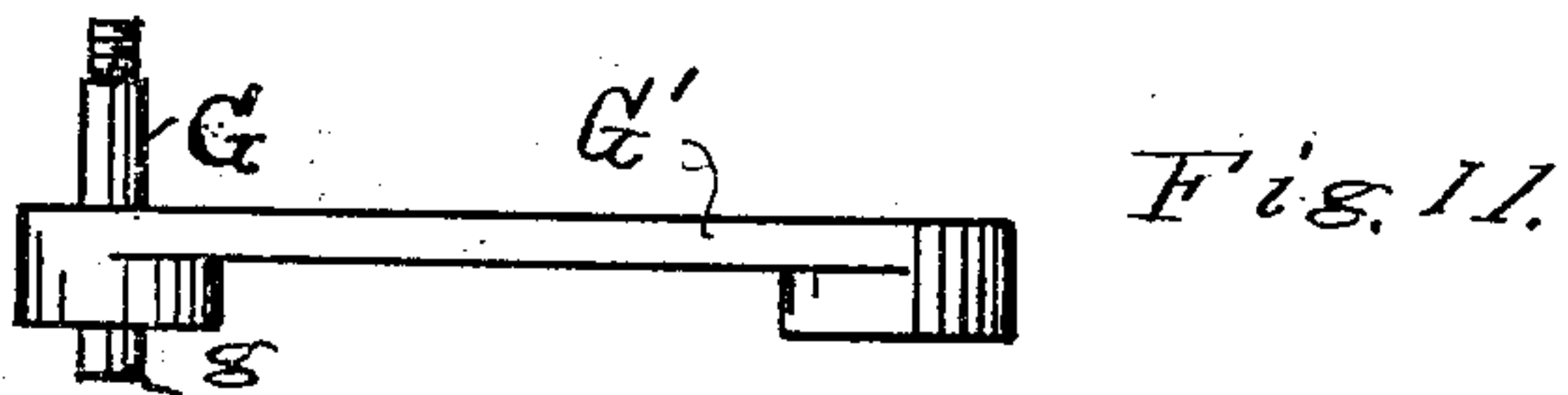
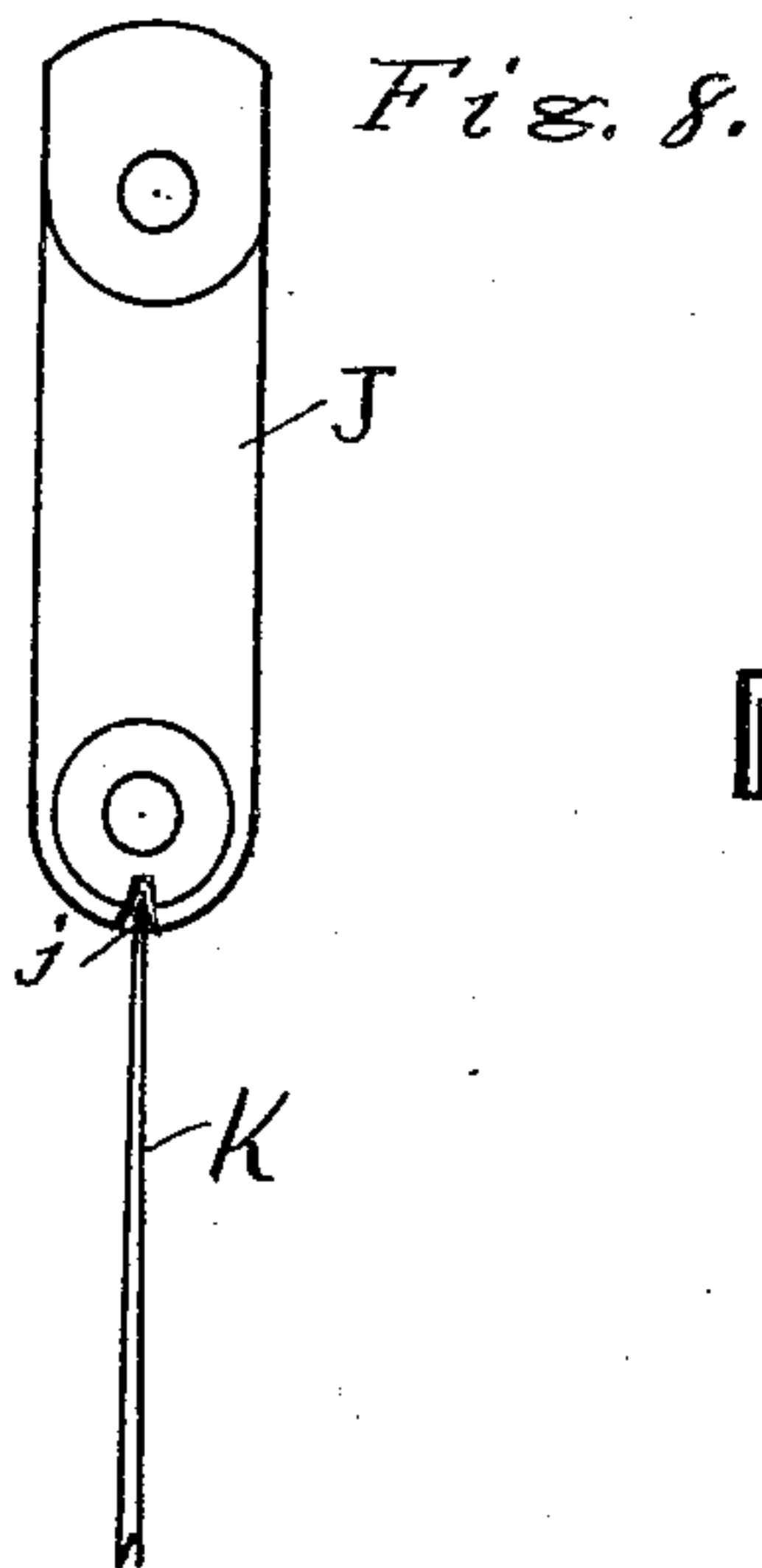
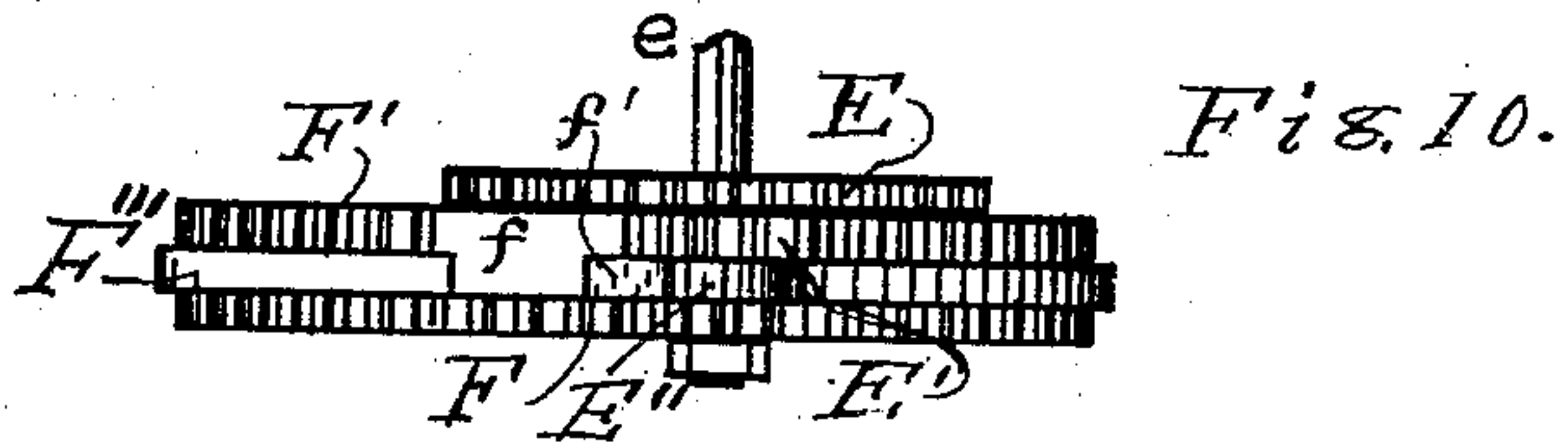
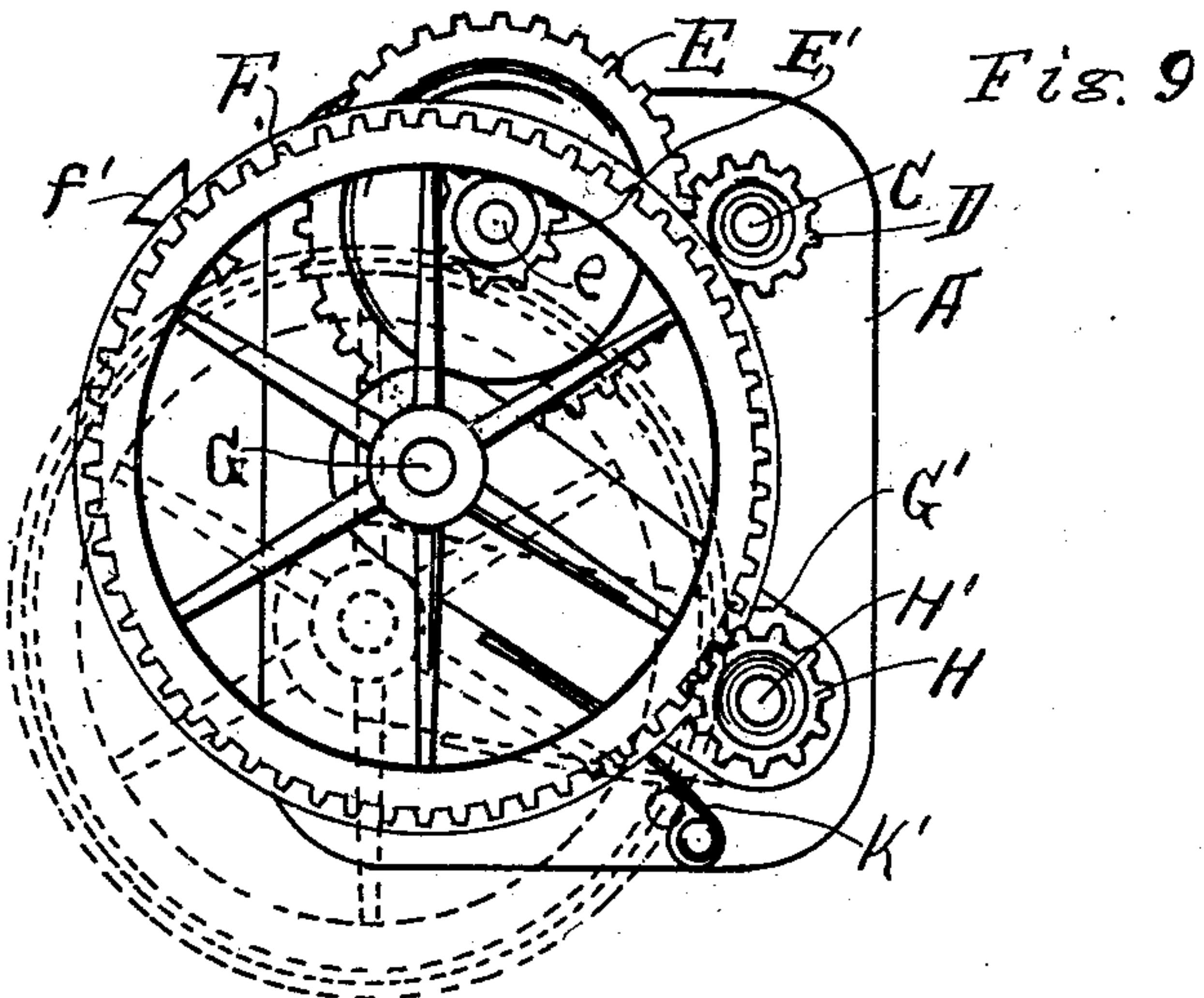
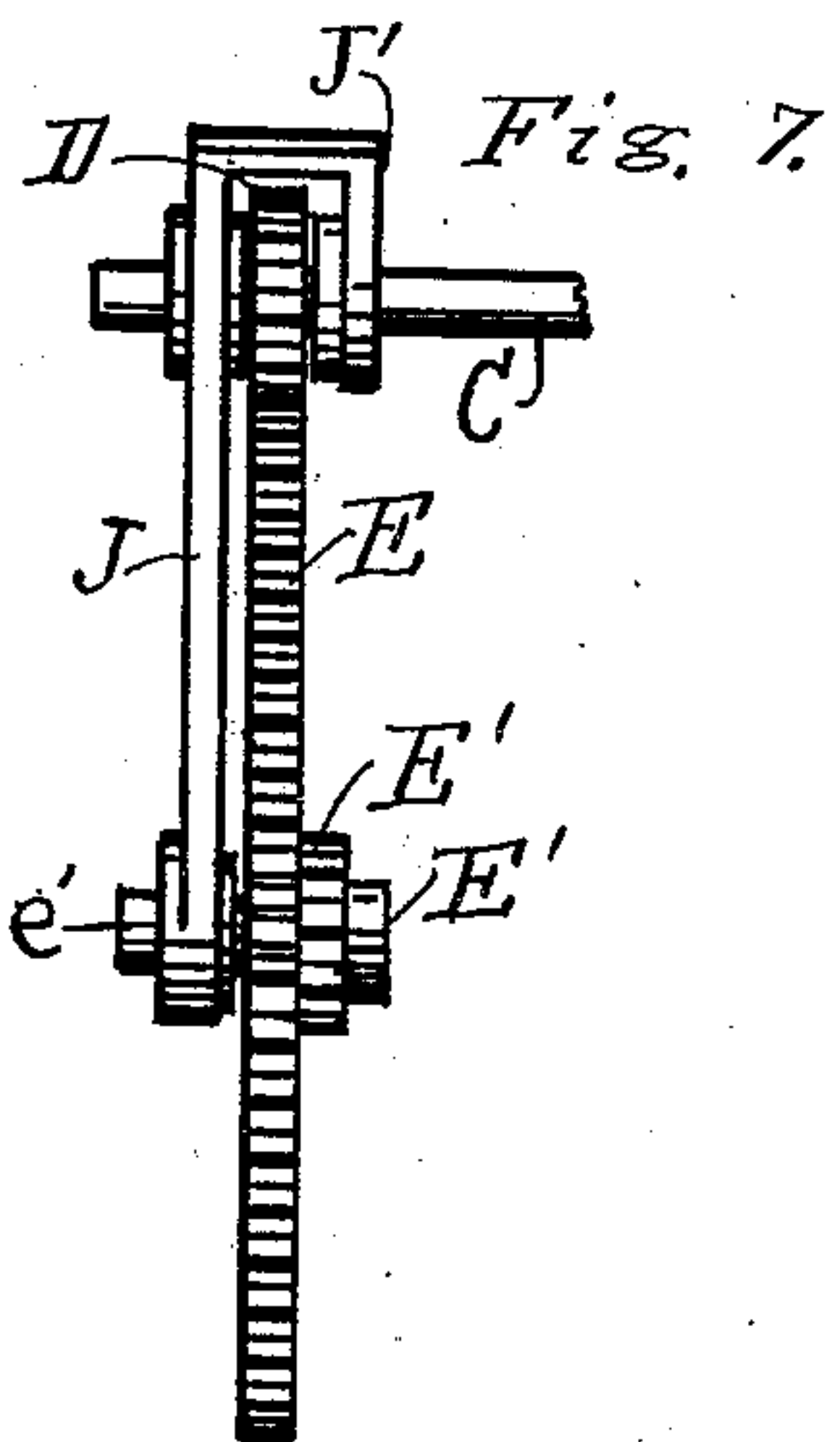
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ALBERT P. CRELL, OF IONIA, MICHIGAN.

ALTERNATING MECHANICAL MOVEMENT.

No. 930,271.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed August 13, 1908. Serial No. 448,427.

To all whom it may concern:

Be it known that I, ALBERT P. CRELL, a citizen of the United States, residing at Ionia, in the county of Ionia and State of Michigan, have invented certain new and useful Improvements in Alternating Mechanical Movements, of which the following is a specification.

My invention relates to improvements in reversing mechanism for use, more particularly, upon washing machines, churns, and kindred machinery, and its object is to provide a mechanical movement with which the continuous rotary movement of the driving mechanism may be readily, conveniently and easily converted into an alternate rotary motion in the driven mechanism without jar or undue strain upon the several parts of the mechanism. I attain this object by the mechanism illustrated in the accompanying drawing, in which—

Figure 1 is a front elevation of the mechanism. Fig. 2 is a side elevation of the same. Fig. 3 is an edge view and Fig. 4 is a plan of the base that supports the machinery. Fig. 5 is a back elevation of the reversing wheel, and Fig. 6 is an edge view of the same. Fig. 7 is an edge view of the reciprocating yoke that carries the driving gear, with said gear in place. Fig. 8 is a front elevation of said yoke. Fig. 9 is a front elevation of a modified form of said machine. Fig. 10 is an edge view of the reversing wheel and its several immediately connected wheels indicating the manner of reversing the driven portion of the machine, and Fig. 11 is an edge view of the reciprocating arm for use upon this modification of the machine.

Similar letters refer to similar parts throughout the several views.

In the construction of this mechanical movement I provide a supporting base A having bosses *a*, *a''* and *a'''* for receiving and supporting the several shafts in the machine, and a boss *a'* having a curved slot for regulating the swing of the reciprocating yoke J, which, in my preferred form of machine, is supported upon the shaft C with the gear wheel D between the arms at the end J', and the gear wheel E pivotally journaled to the other end thereof, so that these two gear wheels will be always in mesh regardless of the position of the yoke as it is swung from side to side for the purpose of changing the engagement of the gear

wheel E' from one side to the other of the rim of the reversing wheel to make it engage, alternately, the teeth F and F', as hereinafter more fully described. The gear, or reversing wheel F is mounted upon the shaft G, which is firmly held to place in the boss *a* on the base A, and has two apertures *f f* through one portion of its rim, and a partitioning guide *f'* located at the longitudinal center of these openings in position so that the gear wheel E' will be made to travel around the outside of the reversing wheel, engaging the teeth F, until it has made said reversing wheel revolve to position where the wheel E' will come in contact with the partition *f'* and, engaging the tooth F'', will be forced through one of the openings in the rim, as indicated by the dotted lines in Fig. 5, which will cause the reciprocating yoke J to swing to position to allow the gear wheel E' to pass entirely through the opening in the rim of the reversing wheel and engage the teeth F' inside said rim and thus cause the reversing wheel to revolve in the opposite direction until the partition *f'* again comes in contact with the gear wheel E' and causes it to again pass through one of the openings *f* and again reverse the motion of the reversing wheel.

It will be seen that the openings *f f* do not extend more than one half way across the face of the reversing wheel, leaving the teeth on the other half of the surface of this wheel complete entirely around the periphery of the wheel, and in position to engage the gear wheel H, which is securely attached to the shaft H', which shaft is designed to be connected with, and carry the driven mechanism, as the revolving cylinder of a washing machine, a churn dasher, or any other element to be driven. For driving this machinery I mount a fly, or balance wheel B upon the shaft C, and when it is desired to drive the machine by hand a handle *b* may be placed upon this fly wheel for revolving the wheel by hand in the usual manner of manipulating this class of machinery by hand.

To positively insure the proper action of the reciprocating arm J and the proper and desired action of the gear wheel E', alternately, with the outside and the inside of the rim of the wheel F, I find it well to apply an actuating spring, as K, between the base A and the arm J in such a manner that it will hold the gear wheel E' firmly

against the gear teeth on either the outside or the inside of the rim of the reversing wheel, which may be done, practically, as shown in Figs. 2, 4 and 8, that is, by securing the back end around the boss a'' with supporting pins k to hold it to place, and passing the opposite end into a notch j in the lower end of the arm J, as indicated in Fig. 8.

The modification shown in Figs. 9 and 10 works upon exactly the same principle as the construction just described, except that the gear wheel E is made stationary and the reciprocating arm G' is journaled around the shaft H', and the reversing wheel F is journaled to a supporting pin G that is supported in the opposite or swinging end of the arm so that the reversing wheel F is raised up and down by the passage of the gear wheel E' through the openings $f f$ from outside to inside of the rim of this wheel, as and with the results hereinbefore described. With this construction the actuating spring needs to act but one way upon the reciprocating arm G', and for this purpose I have suggested the use of a spring, as K', secured to the base A and pressing upward upon the arm G', as shown in Fig. 9.

In Fig. 10 I have shown the reversing wheel with a plain portion, F''', and an antifriction bearing E'' on the shaft e , arranged to carry the weight of the gear-wheel E', in lieu of depending wholly upon the bearing of the teeth of the gear wheel E' as they mesh with the teeth on the rim of the reversing wheel.

If desired, a slot may be made in the face of the boss a' as indicated in Fig. 4 for the end e' of the shaft or pin e to travel in for the purpose of preventing the arm J from swinging far enough, in either direction, to disengage the gear teeth thereon from either side of the rim of the reversing wheel, and the end g of the shaft or pin G may be used in like manner and with like effect upon the modified form of machine shown in Figs. 9 and 10, but with the use of the spring shown in Figs. 2, 4 and 8, and with the construction of the machine therein indicated, the spring will prove sufficient without the use of the slot and projecting end of the shaft or pin, thus making the construction more simple and equally as effective.

In Fig. 2 I have shown a cap I that is se-

curely mounted upon the base A and projects outward therefrom, over the working portion of the movement to form a firm support for the shaft that carries the fly wheel B to insure the perfect alinement of this shaft and the arm J that carries and supports the gear wheels E, E'. In Fig. 1 I have removed this cap or bearing to more plainly show the position and connections of the gear wheels E and E'.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. The combination in a mechanical movement, of a base, a driving wheel and shaft mounted thereon, a large gear wheel mounted in position to be driven by the driving gear, a small gear wheel centrally mounted upon, and driven by said large gear wheel, a reversing gear wheel mounted in position to be driven by the small gear wheel, and having an opening in the rim for the passage of the small gear wheel, a guide centrally mounted in said opening, a driven shaft and gear wheel in position to be driven by the reversing gear wheel, and a reciprocating arm so mounted as to cause the small gear wheel to pass through the opening in the rim of the reversing wheel and engage gear teeth upon the outer surface and the inner surface, alternately, of said reversing gear wheel.

2. The combination in a mechanical movement, of a supporting base, a drive wheel and shaft and a reversing wheel having a portion of the rim cut away, mounted thereon, a gear wheel and a reciprocating arm mounted on the drive shaft, a large gear wheel mounted on said arm in position to mesh with the gear wheel on the drive shaft, a small gear wheel centrally mounted upon said large gear wheel in position to engage the reversing gear wheel and to be made to pass through the opening in the rim thereof to engage gear teeth on the outer surface and the inner surface, alternately, a driven shaft and gear in position to be driven by the reversing gear wheel, and a spring in position to engage and properly actuate the reciprocating arm.

Signed at Ionia Michigan August 6th 1908.

ALBERT P. CRELL.

In presence of—

JOHN J. THWAITES,
ALFRED A. NICHOL.