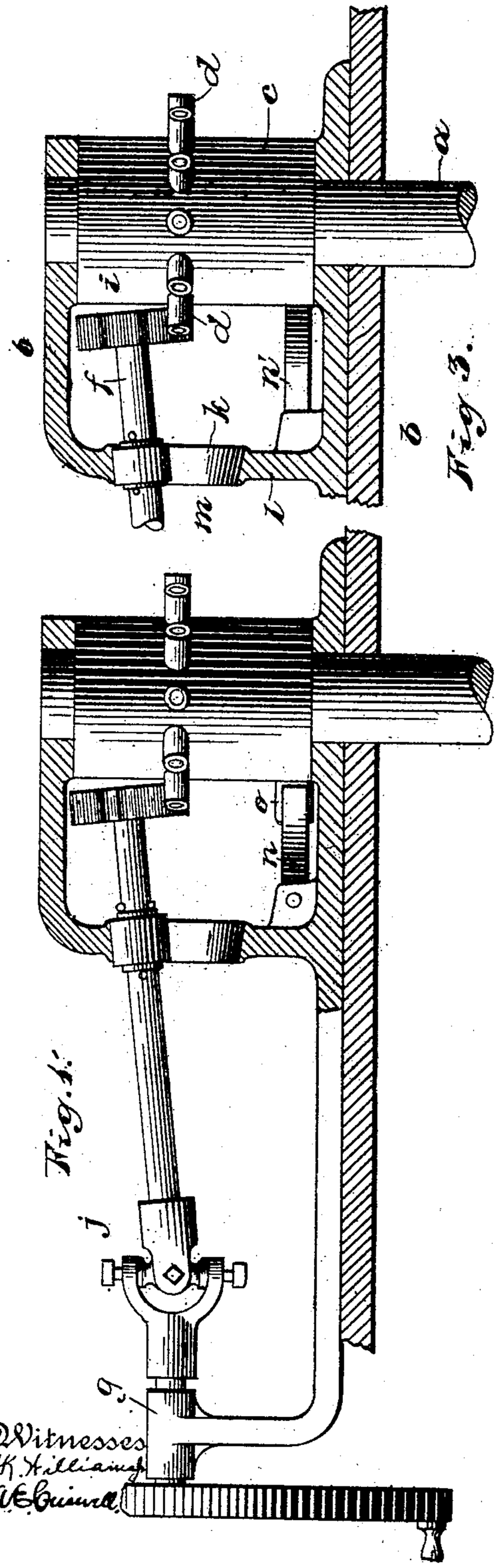
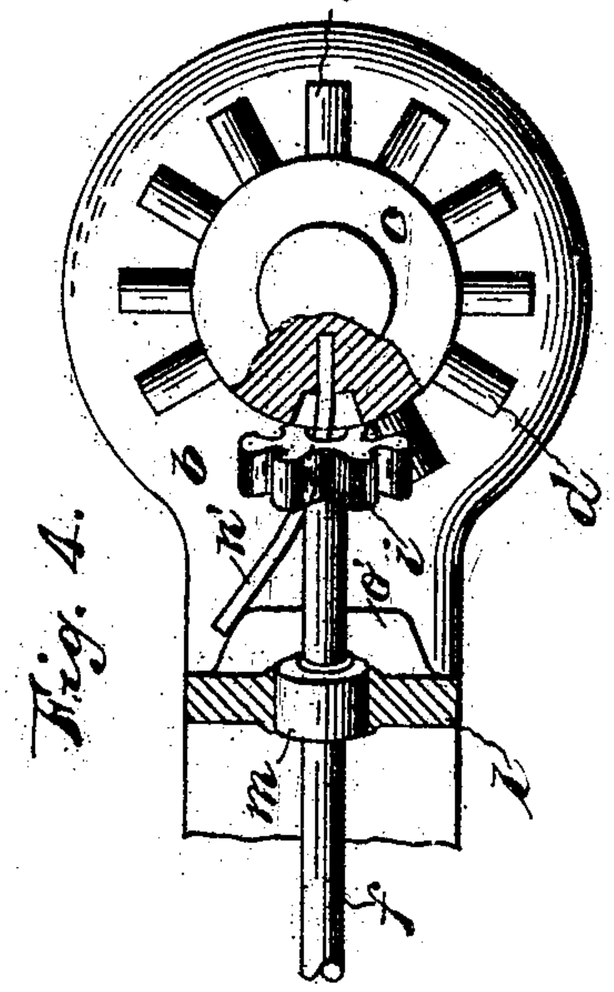
No. 829,852. PATENTED AUG. 28, 1906.

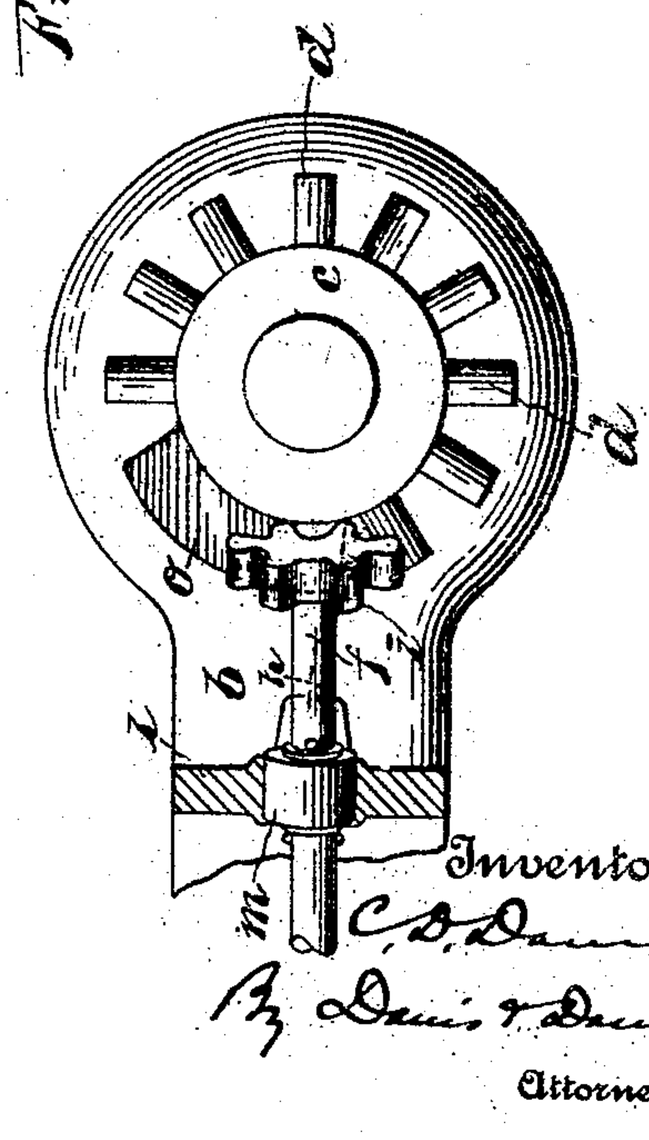
C. D. DAVIS.

MECHANICAL MOVEMENT.

APPLICATION FILED JUNE 20, 1902.







UNITED STATES PATENT OFFICE.

CHARLES D. DAVIS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO RICHMOND CEDAR WORKS, OF HENRICO COUNTY, VIRGINIA, A CORPORATION.

MECHANICAL MOVEMENT.

No. 829,852. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed June 20, 1902. Serial No. 112,498.

To all whom it may concern:

Be it known that I, CHARLES D. DAVIS, a citizen of the United States of America, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Alternating Gearing, of which the following is a full, clear, and exact description.

Figure 1 is a side elevation of the gearing. Fig. 2 is a plan view thereof, and Figs. 3 and 4 are similar views of another form of the gearing.

This invention has relation particularly to that form of alternating gearing in which a cylindrical part of the driven shaft is provided with a row of radial pins and a continuous cam-groove surrounding the pins, and the drive-shaft is provided with a pinion engaging said pins and has its extreme end projecting beyond the pinion and working in said groove, said drive-shaft being jointed to permit the pinion to pass from above the pins to below the same and a suitable slotted standard being employed to guide the shaft in its vertical movements as the pinion passes around the end pins or teeth; and the object of the invention is to obviate the use of the cam-groove and provide other means in lieu thereof for automatically holding the pinion in mesh with the pins and causing it to turn around the end pins at each change of stroke, as more fully hereinafter set forth.

As will be obvious, the invention is also applicable to that type of mangle movements in which instead of a jointed shaft to permit the pinion to rise and fall the mutilated gear is slidably mounted upon the driven shaft.

Referring to the drawings by reference-letters, *a* designates the driven shaft, which in the present instance is the agitator-shaft of a washing-machine and which is provided with a cylindrical enlargement *c*; *b*, two bearings which support the driven shaft and hold it against endwise movement; *d*, the horizontal row of pins projecting radially from the part *c* and preferably provided each with a roller; *f*, the drive-shaft, which is journaled in bearing *g* and is provided with a pinion *i*, meshing with said pins *d*, and a universal joint *j* at a point between said pinion and the bearing *g*, and *l* a standard located between the pinion and the joint *j* and slotted vertically at *k* for the passage of the drive-shaft. All the above parts are constructed substantially as in the Johnson patent referred to, except that the part *c* is not provided with a cam-groove and slot *k* is made shorter, so that said slot will serve, in addition to guiding the shaft, to limit the rise and fall thereof and prevent the pinion rising off or dropping away from the pins, thereby avoiding the necessity of employing a cam-groove for that purpose. To reduce friction, a sleeve *m* may be journaled on the drive-shaft where it works in slot *k*.

In order to stop the driven shaft and reverse its movement at each end of its stroke, I employ a yielding stop device which will keep the end pin pressed against the pinion at each end of the stroke and compel the latter (as it is continuously rotated) to pass around the end pin and engage it upon the opposite side, and thus start the pinion on another stroke. This yielding stop may be constructed in a variety of ways, it being shown in Figs. 1 and 2 as consisting of a flat spring *n*, carried by the base and having its free end projecting into the path of a lug or part *o* on the driven shaft, and in Figs. 3 and 4 as a similar spring *n'*, affixed to the driven shaft and adapted to come in contact with a lug or lugs *o'* on the base-plate, and it is obvious that other forms of resilient stops may be employed without departing from the invention in the least. It will be seen that the spring and its stop-lug are so positioned that they will come in contact after the pinion has engaged the end pin and will thereby not only prevent the pinion becoming disengaged from the end pin, but will also, by reason of the continuous rotation of the drive-shaft and its free movability vertically, compel the pinion to pass around the end pin and engage it upon the opposite side, and thereby reverse the direction of movement of the driven shaft, the spring yielding sufficiently for this purpose and serving to keep the end pin pressed resiliently in between the teeth on the pinion during the reversing movement.

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

1. In combination, a supporting-frame, a driven shaft provided with a row of pins extending part way around the shaft, a drive-shaft, a pinion on one end of said shaft and meshing with said pins, a bearing at its other end, said driving-shaft being jointed at

a point between said bearing and the pinion, means for guiding the drive-shaft and limiting its vertical movement, and a stop device carried by the driven shaft and arranged to engage a fixed part for limiting the motion of the driven shaft in each direction and keeping the end pin in contact with the pinion during each reversal of movement, for the purpose set forth.

2. In combination, a supporting-frame, a driven shaft provided with a row of pins extending part way around the shaft, a drive-shaft, a pinion on one end of said shaft and meshing with said pins, a bearing at its other end, said driving-shaft being jointed at a point between said bearing and the pinion, means for guiding the drive-shaft and limiting its vertical movement, and a yielding stop device for limiting the motion of the driven shaft in each direction and keeping the end pin in contact with the pinion during each reversal of movement, for the purpose set forth.

3. In combination, a supporting-frame, a driven shaft provided with a row of radial pins extending partly around the shaft, a drive-shaft, a pinion carried by said shaft and meshing with said pins, a bearing for the other end of said shaft, driving means connected thereto, means to permit the drive-shaft to have a vertical movement, a spring engaging a part carried by the driven shaft and a stationary part, said spring acting as a stop device to limit the motion of the driven shaft.

4. In combination, a supporting-frame, a driven shaft provided with a mutilated gear having two identical faces perpendicular to the driven shaft, a stop device to limit the rotation of the driven shaft in both directions, a drive-shaft a pinion thereon adapted to engage first with one face of the gear on the driven shaft and then with the other face and means for permitting vertical vibration of the drive-shaft, substantially as set forth.

5. In combination, a supporting-frame, a driven shaft, a mutilated gear carried fixedly thereby, a vibratable driving-shaft, a pinion on this shaft engaging the mutilated gear, and means coacting with the frame and the moving parts whereby continuous rotation of the driving-shaft in one direction and its vibration will give the driven shaft an alternating rotary motion.

6. In combination, a supporting-frame, a driven shaft, a gear carried thereby, means for rotating said gear and yieldable and resilient means coacting with the frame and one of the moving members whereby the continuous operation in one direction of the gear-rotating means will give the driven shaft a to-and-fro partial rotation.

7. In combination, a supporting-frame, a driven shaft, a mutilated gear carried thereby, means for engaging and rotating said mutilated gear, and yieldable and resilient means coacting with the frame, and the mutilated gear whereby the continuous operation of the gear-rotating means in one direction will give the driven shaft a to-and-fro partial rotation.

8. A mechanical movement comprising an ordinary shaft, a mutilated gear thereon, means for engaging and rotating said gear, resilient means carried by said gear and coacting with a part of the frame whereby it will be stopped on a partial rotation and rotate in the opposite direction.

9. In combination, a frame, a jointed drive-shaft and a pinion thereon, a driven shaft, a mutilated gear on the driven shaft, means for supporting and guiding the driving-shaft, and yielding means for assisting in turning the pinion around each end tooth of the mutilated gear.

10. In combination, a frame, a drive-shaft and a pinion thereon, a driven shaft, a mutilated gear on the driven shaft, means for supporting the driving-shaft, and yielding means for assisting in turning the pinion around each end tooth of the mutilated gear.

11. In combination, a frame, a drive-shaft and a pinion thereon, a driven shaft, a mutilated gear on the driven shaft, means for supporting the driving-shaft, and yielding means for assisting in turning the pinion around each end tooth of the mutilated gear, said means coacting with a fixed part of the frame and one of the moving parts.

12. In combination, a frame, a drive-shaft and a pinion thereon, a driven shaft, a mutilated gear on the driven shaft, means for supporting the driving-shaft, and a yielding stop device coacting with one of the moving parts and an adjacent part of the frame for assisting in turning the pinion around each end tooth of the mutilated gear.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 25th day of March, 1902.

CHARLES D. DAVIS.

Witnesses:

HERBERT C. EMERY,

F. C. GLORIUS.