

J. D. A. JOHNSON.
MECHANICAL MOVEMENT.
APPLICATION FILED MAR. 18, 1905.

915,606.

Patented Mar. 16, 1909.
2 SHEETS—SHEET 1.

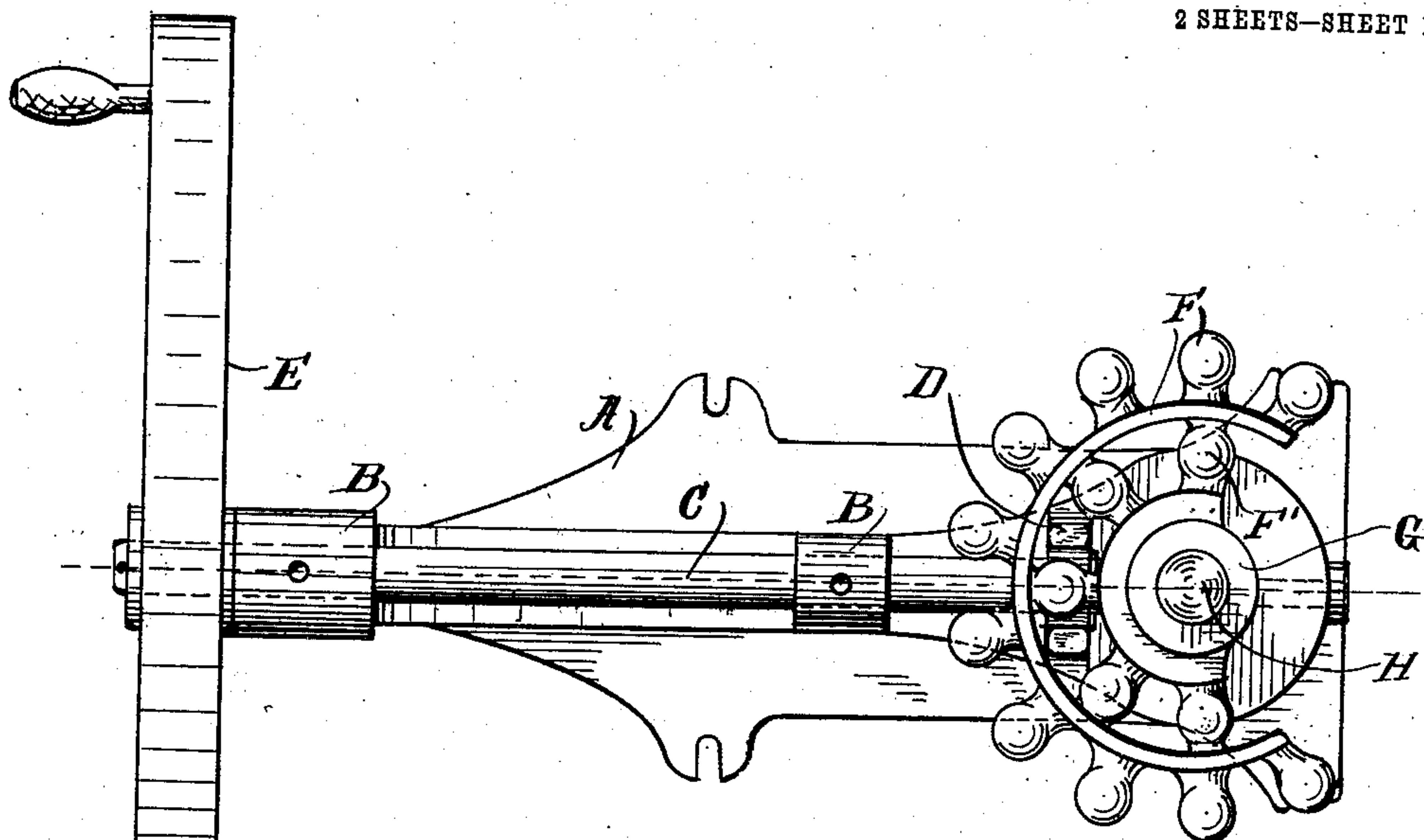


Fig. 1.

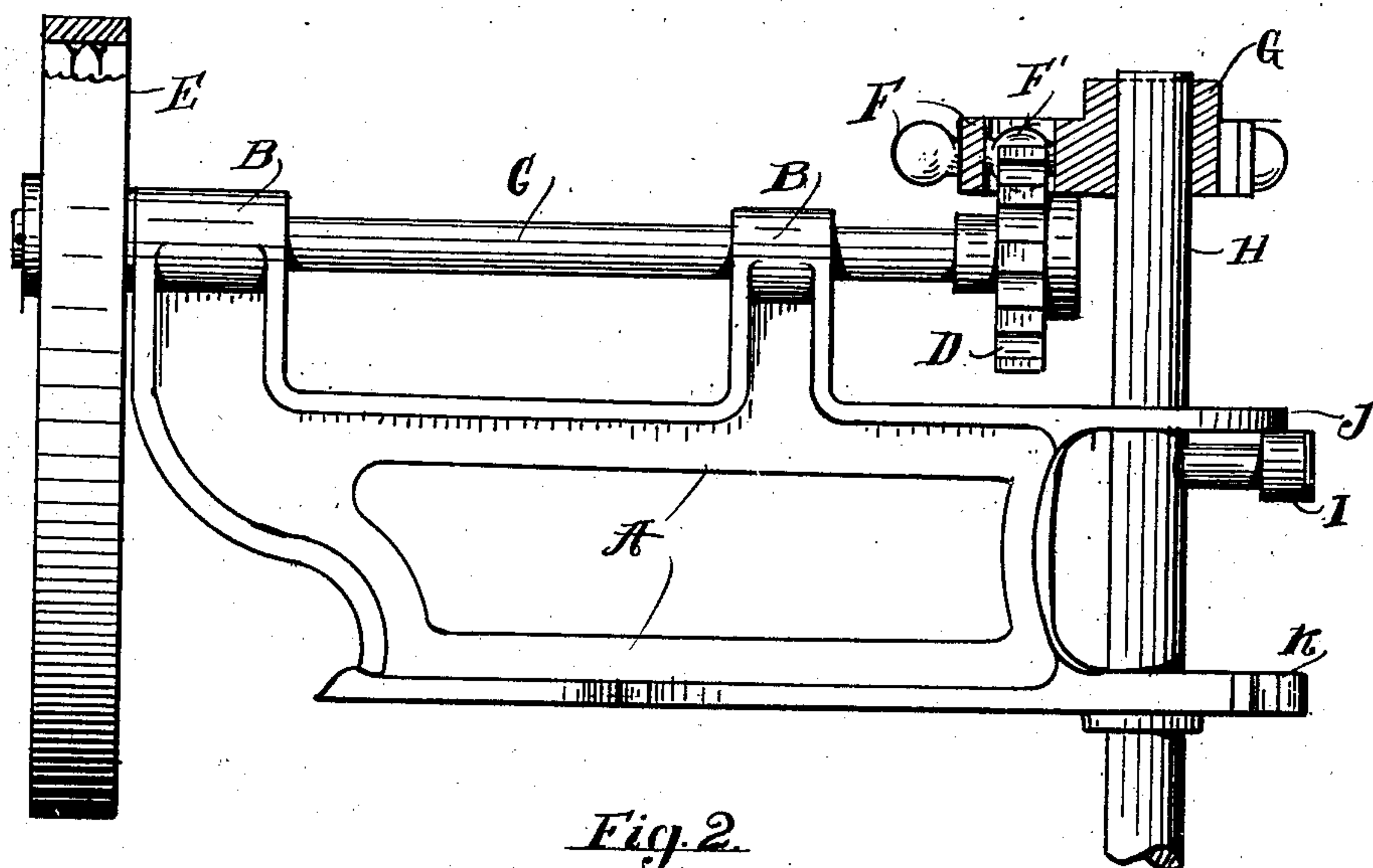


Fig. 2.

Witnesses

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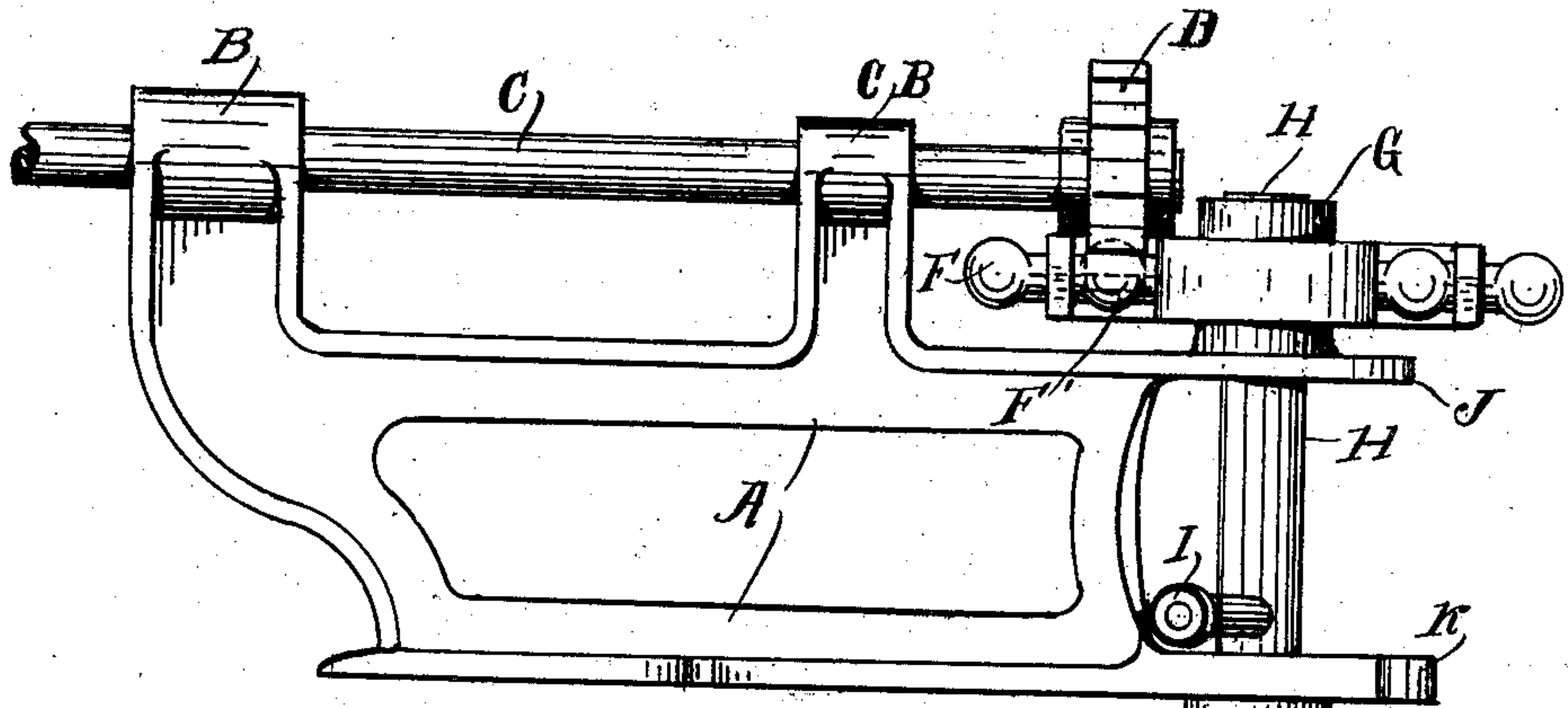


Fig. 3.

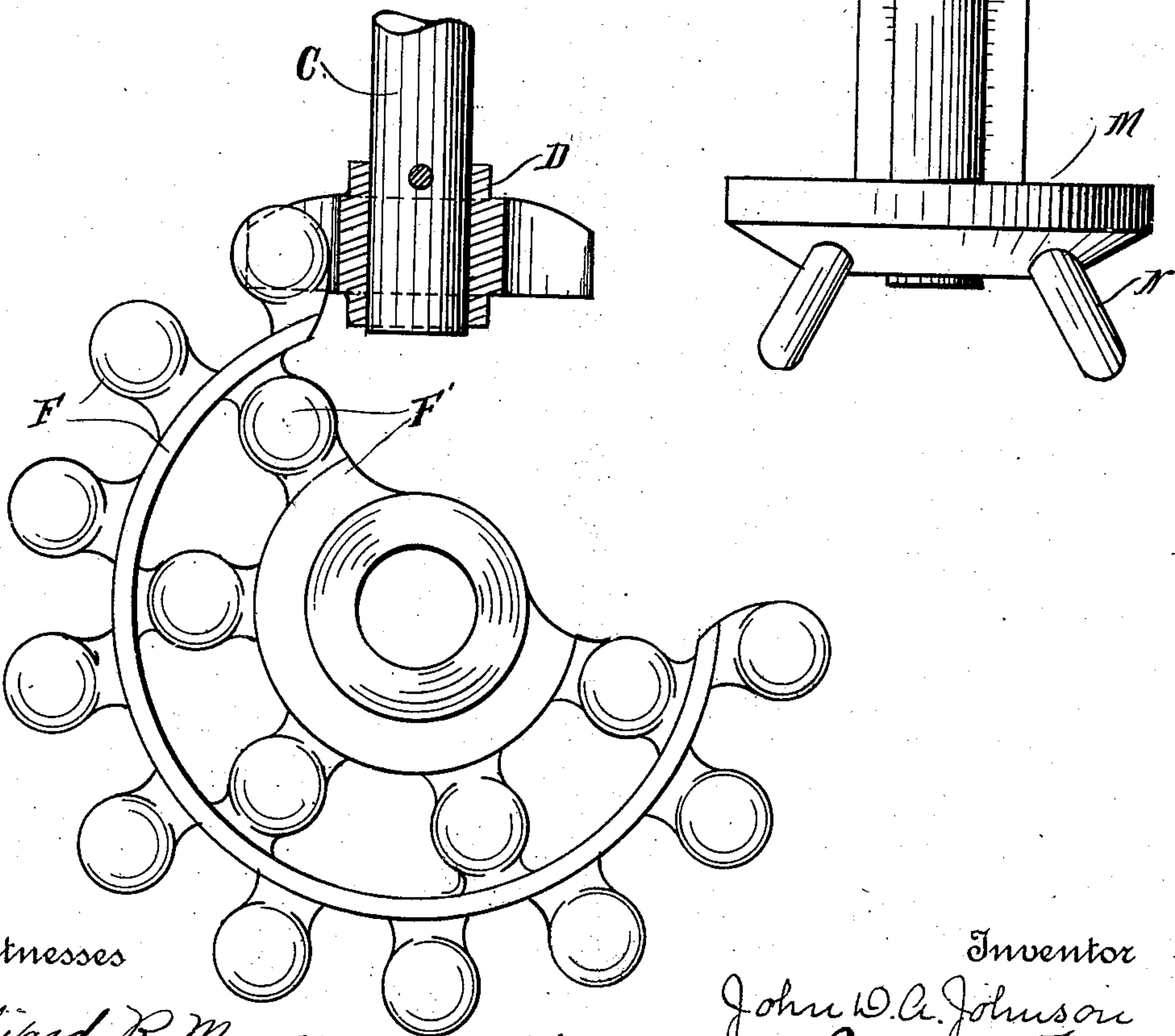


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN D. A. JOHNSON, OF OMAHA, NEBRASKA.

MECHANICAL MOVEMENT.

No. 915,606.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed March 18, 1905. Serial No. 250,828.

To all whom it may concern:

Be it known that I, JOHN D. A. JOHNSON, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented new and useful Improvements in Mechanical Movements, of which the following is a specification.

My invention is adapted for use in many different mechanical structures, but it is at present especially intended for use in washing machines for imparting to the agitator thereof, and from a shaft which continuously revolves in one direction, a reciprocating vertical movement and an intermittent and reversing or oscillatory rotation, and in connection therewith providing for increasing or diminishing the speed of such oscillatory rotation. These objects I accomplish by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a top plan view of the device as applied to a washing machine. Fig. 2 is a side elevation of a portion of the same with the agitator at the upward limit of its vertical reciprocation. Fig. 3 is a side elevation of the entire device with the agitator at the lower limit of its stroke, and Fig. 4 is a detail upon a larger scale of the changeable gear shown in Fig. 1.

For the application of this invention to the mechanism of a washing machine I provide a main frame or casting A of the general form shown in Fig. 3. By means of suitable boxes or bearings B B this frame carries and supports a revoluble drive shaft C. This shaft is driven in any desired manner, but in Fig. 1 I have shown it operated by a hand crank in connection with a fly wheel E.

D is a spur gear or pinion attached to and revolving with the driving shaft C.

H is the vertically moving shaft of the agitator. It is provided at its lower end with the agitator and attachments L M N which constitute no part of this invention. In its vertical reciprocation it slides in suitable openings in the frame extensions J K. These openings constitute a way or guide which directs and controls the vertical motion of the agitator shaft. I also provide this shaft with the pin I, which maintains sliding contact with the frame extensions J K and with the concave intervening portion of the frame, thereby assisting in limiting, controlling and directing the motion of the parts; but this portion of the structure

is shown in my former patent No. 740,868 and forms no part of this invention.

Fixed to the agitator shaft H is an interrupted gear F F'. I have shown this as comprising from a half to two-thirds of the complete circle, but it evidently may be constructed as desired in this respect. It may also be made in any form appropriate to such a gear, but I have shown instead of the ordinary gear teeth, a series of separated and approximately spherical teeth, as by such construction I lessen the friction.

It is of the essence of this invention that one or the other member of the intermeshing gears should be constructed with an outer and an inner row of teeth; and in the drawing I have shown this double row of teeth in the interrupted gear attached to the vertical shaft. Both the outer and inner rows should be spaced approximately the same, and there will, therefore, be a larger number of teeth in the outer row within the same portion of the circumference. Evidently when the driving gear is in contact with the outer row of teeth upon the driven shaft the revolving motion of the shaft thereby driven will be slower than when the driving gear is in contact with the inner row of teeth; and the same results would follow from a converse arrangement of the parts. During most of the positions assumed by the parts when the device is in operation it will be impossible to shift the contact of the driving gear from the outer to the inner row of teeth in the driven gear, as the projecting teeth of the driving gear would engage with the body in the driven gear and prevent such shifting; but at each end of the mutilated driven gear it is evident that such shift can be made; and if the driving gear has been in contact with the outer row of teeth in the driven gear, then when the last tooth is reached and the parts take the position shown in Fig. 4, the driving shaft C, which is mounted so as to slide as well as to revolve in the boxes B, may be slid inwardly toward the agitator shaft, and, thereupon, the teeth of the driving gear D will come in contact with the inner teeth F' of the driven gear, instead of with the outer teeth. The speed of the agitator shaft in its revolution will thereby be increased, while its reciprocating vertical motion will continue unaffected by the change in the revolving speed.

The operation of the parts which produces the vertical reciprocating motion is apparent from the drawing and is fully described in

my former patent No. 740,868, so that I do not here describe it at length.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent of the United States, is—

1. The combination of a support, a longitudinally shiftable driving shaft held in the support, a pinion on the shaft, a longitudinally reciprocating driven shaft freely slidable in one extremity of the support and disposed at a right angle to the driving shaft and provided with a projection to abut against opposite side portions of the support and also against a part of said support between the said side portions, and a mutilated gear secured on the driven shaft and provided with inner and outer rows of concentric teeth to mesh with the pinion on the driving shaft, the mutilated gear having the body thereof cut away inwardly from the periphery to eliminate portions of both the inner and outer rows of teeth thereof to permit ready engagement of the pinion with either row of teeth.

2. The combination of a support, a longitudinally shiftable driving shaft held by the support, a pinion on the shaft, a longitudinally reciprocating driven shaft disposed at an angle to the driving shaft and also held by the support and provided with a projection at an angle thereto to contact with the opposite portions of the support and also with intermediate portions of the latter, and a mutilated gear carried by the driven shaft and provided with inner and outer rows of spherical teeth with which the pinion of the driving shaft has meshing relation to impart different speeds to the driven shaft, the mutilated gear being cut away to eliminate portions of the inner and outer rows of spherical teeth to permit ready engagement of the pinion with either row of teeth.

3. The combination of a support, a longitudinally shiftable driving shaft held by the support, a pinion on the driving shaft, a longitudinally reciprocating driven shaft disposed at an angle to the driving shaft, and a mutilated gear secured on the driven shaft and provided with inner and outer rows of concentric teeth to mesh with the pinion on the driving shaft, the pinion being movable through the mutilated gear within the plane of the periphery of the latter to permit said pinion to engage opposite faces of the said gear, the driving shaft being maintained against longitudinal movement when the pinion is in engagement with either row of teeth of the mutilated gear.

4. The combination of a support, a longitudinally shiftable driving shaft held by the support, a pinion on the support, a longitudinally reciprocating driven shaft disposed

at an angle to the driving shaft and provided with an angular projection, the support being provided with a device adjacent to said projection with which the latter engages to control the movement of the driven shaft, and a mutilated gear carried by the driven shaft and provided with inner and outer rows of teeth with which the pinion of the driving shaft has meshing relation to impart different speeds to the driven shaft, the pinion being movable through the mutilated gear at a distance from the periphery of the latter and adapted to cooperate with the opposite faces of the said gear.

5. The combination of a support, a longitudinally shiftable driving shaft held by the support, a pinion on the shaft, a longitudinally reciprocating driven shaft disposed at an angle to the driving shaft, and a mutilated gear carried by the driven shaft and provided with inner and outer rows of teeth with which the pinion of the driving shaft has meshing relation to impart different speeds to the driven shaft, the mutilated gear having an opening therethrough extending inwardly a distance from the periphery to permit movement of the pinion through the said gear to engage opposite faces of the latter and also permit a partial rotation of the said gear.

6. The combination of a support, a longitudinally shiftable driving shaft held by the support, a pinion thereon, and a shiftable mutilated gear having inner and outer rows of teeth with which the pinion has meshing relation, the gear being formed with an opening extending a distance from the periphery thereof to permit movement of the pinion therethrough and engagement by the pinion with opposite faces of the said gear, the latter holding the driving shaft against longitudinal movement when the pinion is in engagement with the teeth thereof.

7. The combination of a support, a longitudinally shiftable driving shaft held by the support, a pinion thereon, and a shiftable mutilated gear having inner and outer rows of teeth which are mutilated by a peripheral opening extending into the center of the gear to permit only a partial revolution of the latter, the pinion being at an angle to the gear and movable through the said opening to engage opposite faces and the inner and outer rows of teeth of said gear.

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

JOHN D. A. JOHNSON.

Witnesses:

C. McMENEMY,
A. W. CHAMBERS.