

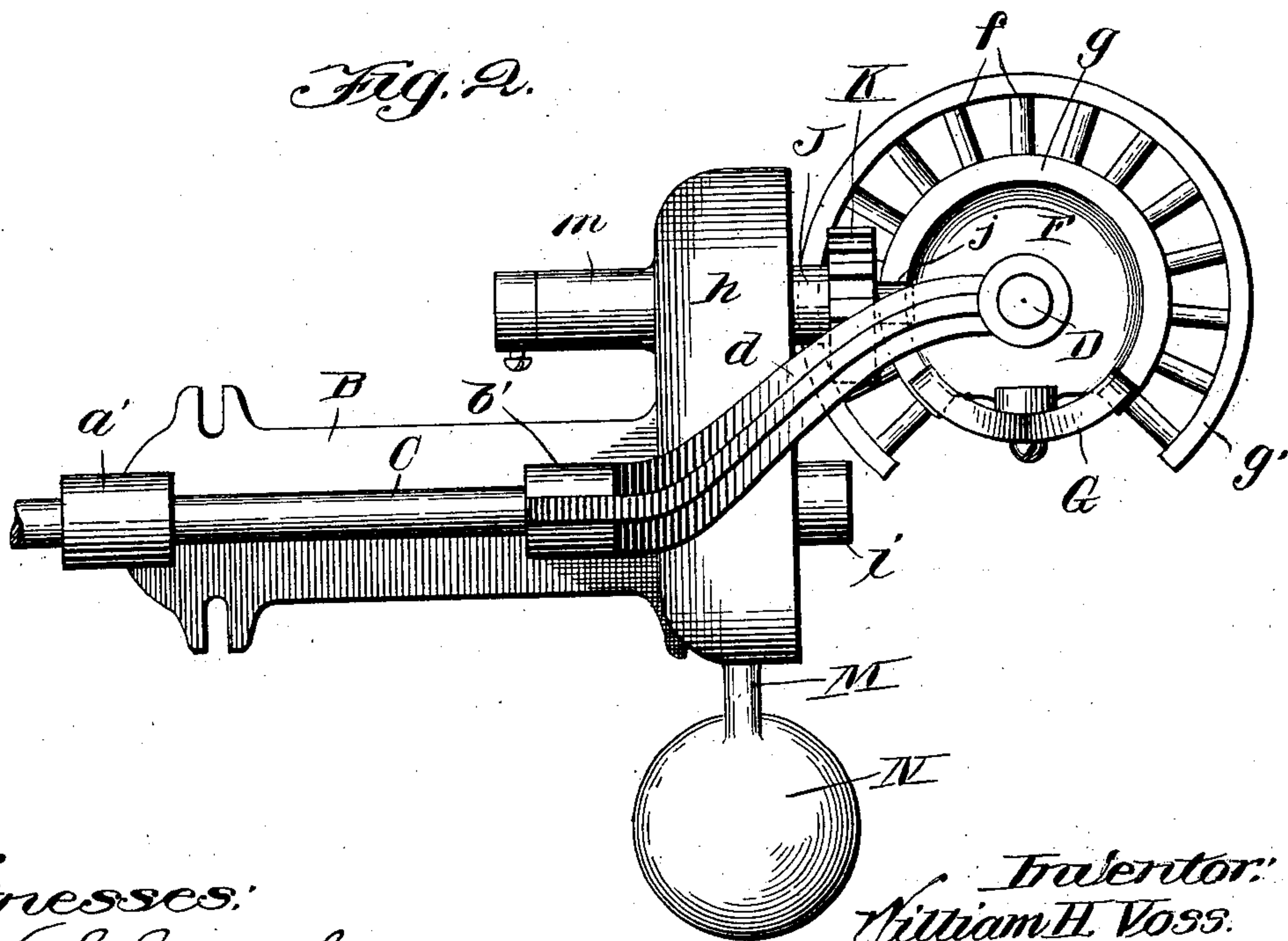
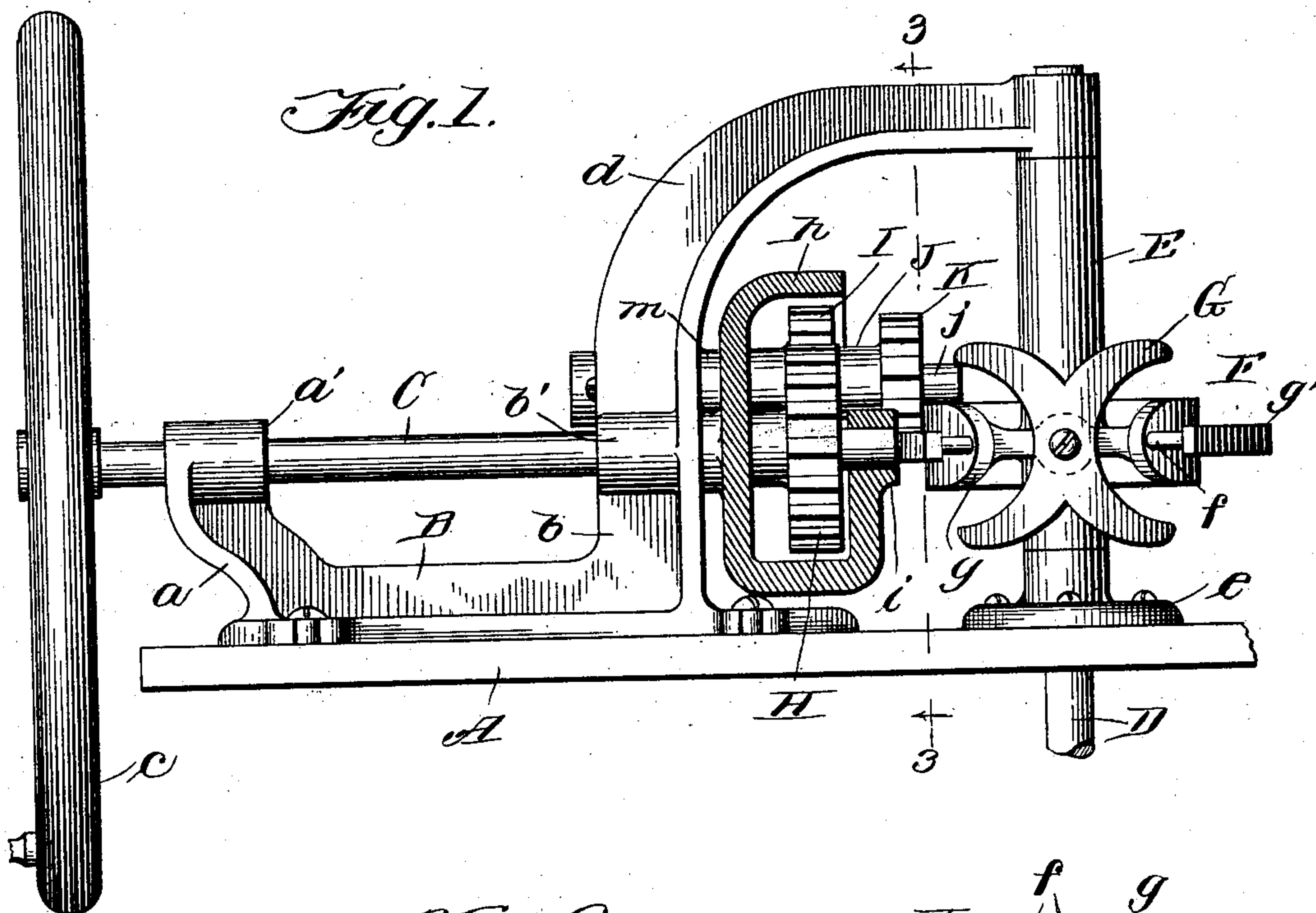
No. 750,136.

PATENTED JAN. 19, 1904.

W. H. VOSS.
MECHANICAL MOVEMENT.
APPLICATION FILED JUNE 22, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
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E. A. Lundy

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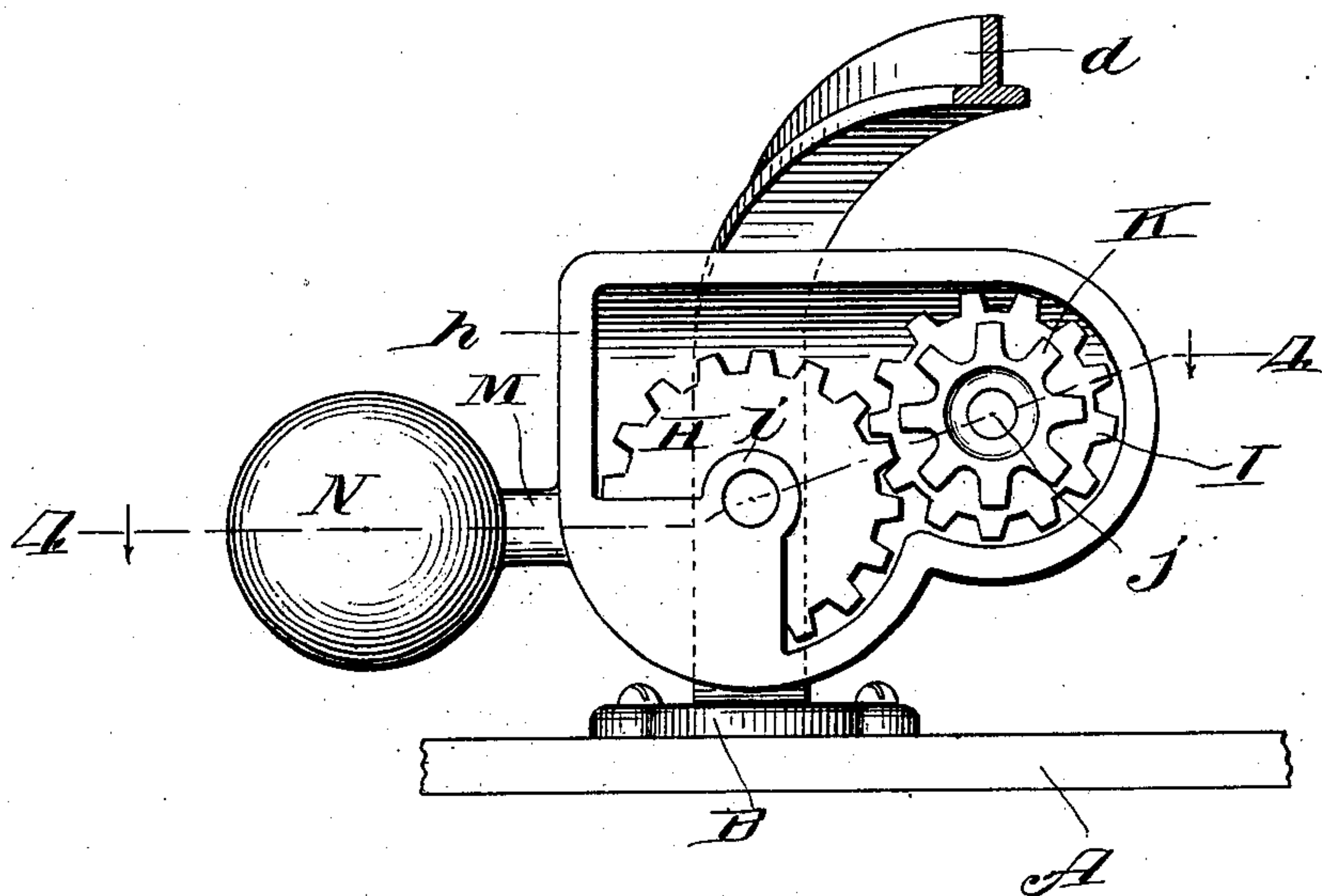
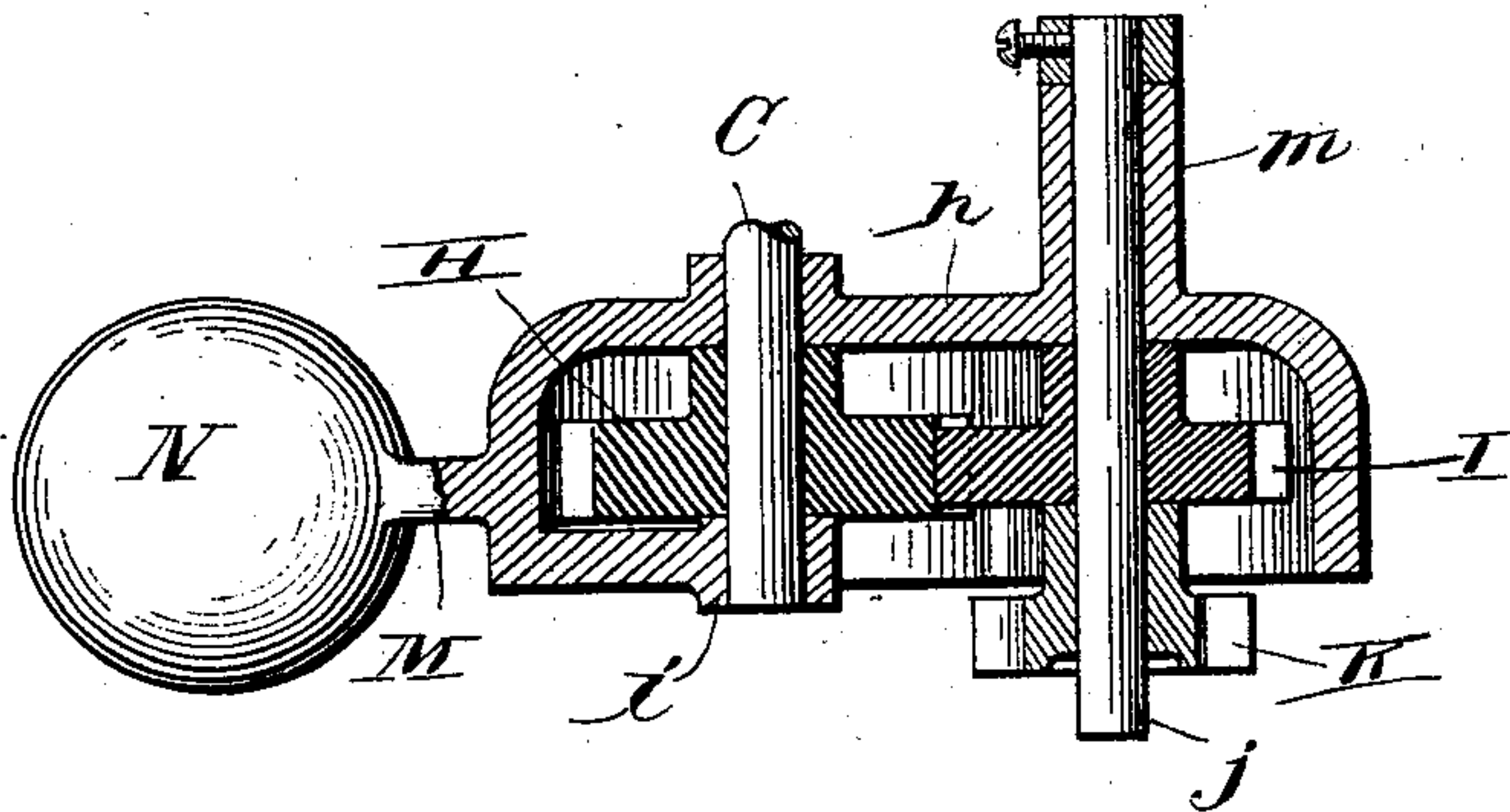


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM H. VOSS, OF DAVENPORT, IOWA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 750,136, dated January 19, 1904.

Application filed June 22, 1903. Serial No. 162,589. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. VOSS, a citizen of the United States, and a resident of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a full, clear, and exact description.

My invention relates to mechanical movements for converting a continuous rotary movement into a rotary reciprocal movement, and while capable of application wherever the conversion of a continuous rotary movement into a rotary reciprocal movement is desired it is particularly applicable to washing-machines. This I accomplish by the means hereinafter described, which will enable the operator to decrease the speed of the continuously-revolving driving element and multiply the power thereof to any practical extent desired and by the means fully pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my improvement. Fig. 2 is a plan view of the same removed from its support. Fig. 3 is a transverse vertical section taken on dotted line 3 3, Fig. 1, looking in the direction indicated by the arrows. Fig. 4 is a horizontal section of the gear-case, taken on dotted line 4 4, Fig. 3, looking in the direction indicated by the arrows.

Referring to the drawings, A represents a bed-plate, and B represents a supporting-frame, which comprises a screw-plate that is secured to said bed-plate and standards *a* and *b*, arising from the ends of said screw-plate, that have bearings *a'* and *b'* therein for journaling the continuously-revolving drive-shaft C, which latter is actuated, preferably, by means of the hand-operated drive-wheel *c*. The standard *b* is extended above the plane of the drive-shaft bearing therein and is curved to form a gooseneck *d*, in the overhanging extremity of which bearings are provided for the upper end of the rotary reciprocal shaft D, which had its lower portion extended through the bed-plate A and journaled in a suitable bearing-boss *e*, secured to the bed-plate. The gooseneck *d* is deflected or bent to

one side of the longitudinal plane of the drive-shaft, and the position of the vertical shaft D will be to one side thereof, substantially as shown in Fig. 2 of the drawings. Shaft D has a suitable sleeve E secured fast thereon between its bearings, and at a point intersected by a horizontal plane striking through the axis of the drive-shaft it has secured thereto a disk or wheel F, which has projecting from its circumference a segmental rack the ends of which approach to within forty-five degrees (45°) of each other, more or less. This segmental rack comprises a central disk or circular plate having its circumference between the ends of the rack correspondingly flanged both upward and downward to form an endless track *g* and a series of equidistant pins *f f*, radiating from the circumference of said disk, the outer ends of which are preferably connected by a segmental rim *g'*. Midway between the ends of this segmental rack the flanged circumferential edge of the disk is cut away and a double crescent-shaped reversing-guide G is secured in any suitable manner in this recessed edge of the disk or wheel F, the curvature of whose concave edges is parallel to and struck from the same center as the rounded end edges of the segmental track *g'*.

In order to convert the continuously-revolving motion of the drive-shaft into the rotary reciprocal motion of the vertical shaft D, the end of the drive-shaft is extended beyond its bearings *b'* and has loosely mounted thereon, so as to permit it to have a limited up-and-down movement, a gear-casing *h*, which latter has its end edges flanged in a direction substantially parallel to the axis of the drive-shaft a suitable distance to inclose and protect the transmission-gears, as will hereinafter more fully appear, and it has the edges of its flanged portion in the vicinity of the extended portion of the drive-shaft bent into a vertical plane and provided with bearings *i* for the adjacent extremity of the drive-shaft. Between this bearing and the vertical wall of the gear-casing nearest standard *b* the drive-shaft has a suitable drive-gear H, secured thereon and revoluble therewith, and this drive-gear meshes with and actuates the pin-

ion I, secured fast to and revoluble with the idle shaft J. The shaft J is journaled in the bearings in the cylindrical boss *m*, extending from the vertical wall of the gear-case in a plane parallel to the drive-shaft and in a vertical plane intersecting the center of the vertical shaft D, and the end of this idle shaft J extends beyond pinion I toward vertical shaft D such a distance that its end *j* or a friction-roller thereon will engage the edge or track of the flanged circumference of the wheel F, substantially as shown in the drawings, and between the extremity of this idle shaft so engaging the edges of the flange *g* and said gear-case said shaft is provided with a spur-wheel K of sufficient diameter to engage the pins *f* of the segmental rack carried by said disk F. Projecting horizontally from the end of the gear-case farthest from that in which shaft *j* is journaled is an arm M, which has a spherical or other shaped weight N, made integral therewith. This weighted arm keeps the spur-wheel in engagement with the under side of the rack and also keeps the spur-wheel in engagement with the upper side of the same by reason of its limited downward movement, which results from the weight carried thereby coming in contact with the bed-plate A.

In operation when the drive-shaft is revolved the drive-gear H imparts its motion through the medium of pinion I to shaft J and spur-wheel K. The latter engages the rack first with its lower segment, in which position it is above the same, and then with its upper segment, in which position it is below the rack, thus imparting a rotary reciprocal motion to said rack and through it to said shaft D. Whether above or below the rack when the spur-wheel reaches the end of the same, no matter whether traveling to the right or left, the extended end *j* of the idle shaft comes in engagement with the opposing concave edge of the crescent guide G, which holds the spur-wheel in engagement with the end pin or cog of the rack and causes said spur-wheel to move to and engage the opposite side of the rack. The independent movement of the gear-case permits the peculiar engagement of the spur-wheel around the endless rack, and the spur-wheel is kept in engagement with the rack when above the same by virtue of its weight and when below by reason of the downward movement of the gear-case being limited by coming in contact with the bed-plate.

I do not wish to be confined to the exact construction of the parts of my invention, as it is obvious they could be changed without departing from the spirit of my invention, which is to utilize the peculiar parallel system of gearing to transmit and convert the continuously-revolving motion of the drive-shaft

in either direction into a rotary reciprocal motion of the vertically-disposed shaft. 65

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a continuously-revolving shaft, of a rotary reciprocal shaft, a segmental rack secured to said rotary reciprocal shaft, a pinion on said continuously-revolving shaft, a continuously-revolving parallel shaft and a gear thereon through the medium of which said pinion indirectly imparts motion to said rotary reciprocal shaft. 75

2. The combination with a continuously-revolving shaft, of a rotary reciprocal shaft, a segmental rack secured to said rotary reciprocal shaft, a pinion on said continuously-revolving shaft, a continuously-revolving parallel shaft and an idle gear thereon through the medium of which said pinion indirectly imparts motion to said rotary reciprocal shaft. 80

3. The combination with a continuously-revolving shaft, of a rotary reciprocal shaft, a segmental rack secured to said rotary reciprocal shaft, a pinion on said continuously-revolving shaft, a continuously-revolving parallel shaft, an idle gear thereon engaged by said pinion and a spur-wheel connected with said idle gear and engaging said rack. 85 90

4. The combination with a continuously-revolving shaft, of a rotary reciprocal shaft, a segmental rack secured to said rotary reciprocal shaft, a pinion on said continuously-revolving shaft, a continuously-revolving parallel shaft, an idle gear thereon engaged by said pinion and a spur-wheel on the same shaft as said idle gear and engaging said rack. 95

5. The combination with a continuously-revolving shaft, of a rotary reciprocal shaft, a segmental rack moving in one plane secured to said rotary reciprocal shaft, a pinion on said continuously-revolving shaft, a continuously-revolving parallel shaft and a gear thereon through the medium of which said pinion indirectly imparts motion to said rotary reciprocal shaft. 100 105

6. The combination with a continuously-revolving shaft, of a rotary reciprocal shaft, a segmental rack moving in one plane secured to said rotary reciprocal shaft, a pinion on said continuously-revolving shaft, a continuously-revolving parallel shaft and an idle gear thereon through the medium of which said pinion indirectly imparts motion to said rotary reciprocal shaft. 110 115

7. The combination with a continuously-revolving shaft, of a rotary reciprocal shaft, a segmental rack moving in one plane secured to said rotary reciprocal shaft, a pinion on said continuously-revolving shaft, a continuously-revolving parallel shaft, an idle gear thereon engaged by said pinion and a spur-wheel connected with said idle gear and engaging said rack. 120 125

8. The combination with a continuously-revolving shaft, of a rotary reciprocal shaft, a segmental rack moving in one plane secured to said rotary reciprocal shaft, a pinion on said continuously-revolving shaft, a continuously-revolving parallel shaft, an idle gear thereon engaged by said pinion and a spur-wheel on the said shaft as said idle gear and engaging said rack.

9. The combination with a continuously-revolving shaft, a pinion thereon, a movable gear-case loosely mounted on said shaft, a short shaft journaled in said gear-case, an idle gear thereon engaged by said pinion and a spur-wheel on the extended end of said short shaft, of a rotary reciprocal shaft and a segmental rack thereon engaged by said spur-wheel.

10. The combination with a continuously-revolving shaft, a pinion thereon, a movable gear-case loosely mounted on said shaft, a short shaft journaled parallel to said continuously-revoluble shaft in said gear-case, an idle gear thereon engaged by said pinion and a spur-wheel on the extended end of said short shaft, of a rotary-reciprocal shaft and a segmental rack thereon engaged by said spur-wheel.

11. The combination with a continuously-revolving shaft, a pinion thereon, and an idle gear meshing therewith and having a limited circumferential movement thereon, of a rotary reciprocal shaft and a segmental rack thereon indirectly actuated by said idle gear.

12. The combination with a continuously-revolving shaft, a pinion thereon, an idle gear meshing therewith, a short shaft upon which said idle gear is mounted having a limited movement whereby said idle gear has reciprocal circumferential movement on said pinion, of a rotary reciprocal shaft, a segmental rack thereon, and a suitable reversing-guide between the ends of said rack, said short shaft having its end adjacent to said rack extended and engaging the guiding elements thereof.

13. The combination with a continuously-revolving drive-shaft, a pinion thereon, a gear-case loosely mounted thereon, a short shaft

journaled in said gear-case, an idle gear thereon which meshes therewith, which gear-case, short shaft and idle gear have a limited movement whereby said idle gear has a reciprocal circumferential movement on said pinion, of a rotary reciprocal shaft, a segmental rack thereon, and a suitable reversing-guide between the ends of said rack, said short shaft having its end adjacent to said rack extended and engaging the guiding elements thereof.

14. The combination with a continuously-revolving drive-shaft, a pinion thereon, a gear-case parallel to said drive-shaft loosely mounted thereon, a short shaft journaled in said gear-case, an idle gear thereon which meshes therewith and a spur-wheel mounted on said short shaft and revoluble therewith, which gear-case, short shaft idle gear and spur-wheel have a limited movement whereby said idle gear has a reciprocal circumferential movement on said pinion, of a rotary reciprocal shaft, a segmental rack thereon, and a suitable reversing-guide between the ends of said rack, said short shaft having its end adjacent to said rack extended and engaging the guiding elements thereof.

15. A mechanical movement, comprising a rotary reciprocal segmental rack; a continuously-revolving pinion, the axis of which is at right angles to that of said rack, and gearing actuated thereby the axis of which is also at right angles to that of said rack, which alternately engages the upper and lower sides of said rack.

16. A mechanical movement, comprising a rotary reciprocal segmental rack rotating in one plane, a continuously-revolving pinion the axis of which is at right angles to that of said rack, and gearing actuated thereby the axis of which is also at right angles to that of said rack, which alternately engages the upper and lower sides of said rack.

In testimony whereof I have hereunto set my hand this 7th day of March, 1903.

WILLIAM H. VOSS.

Witnesses:

WILLIAM E. PULS,

EDWARD L. GULDNER.