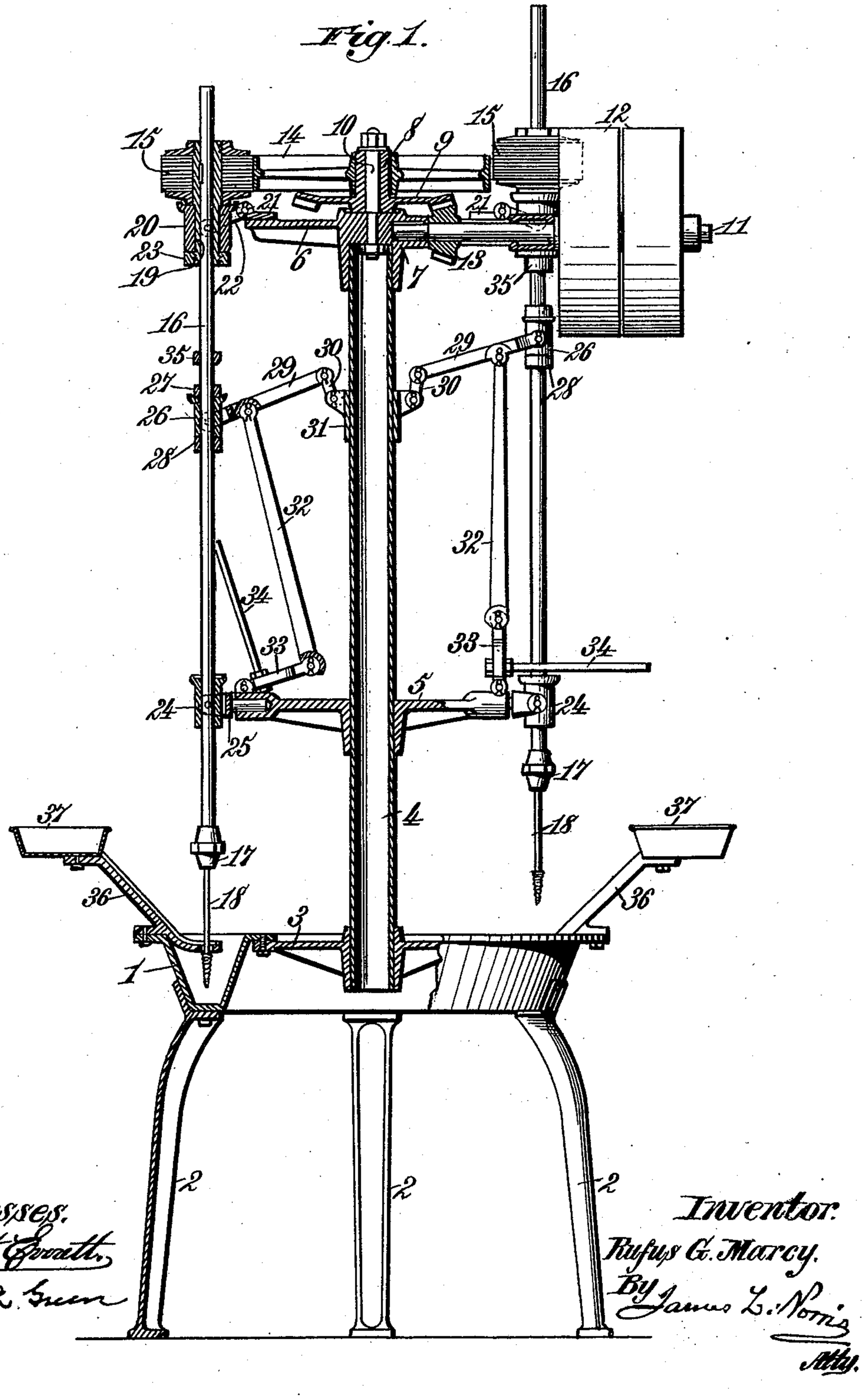
(No Model.) 3 Sheets—Sheet 1.

R. G. MARCY.

NUT TAPPING MACHINE.

No. 582,536. Patented May 11, 1897.

Fig. 1.



Witnesses.
Robert Sewall.
Thos. A. Green

Inventor.
Rufus G. Marcy.
By James L. Norris
Atty.

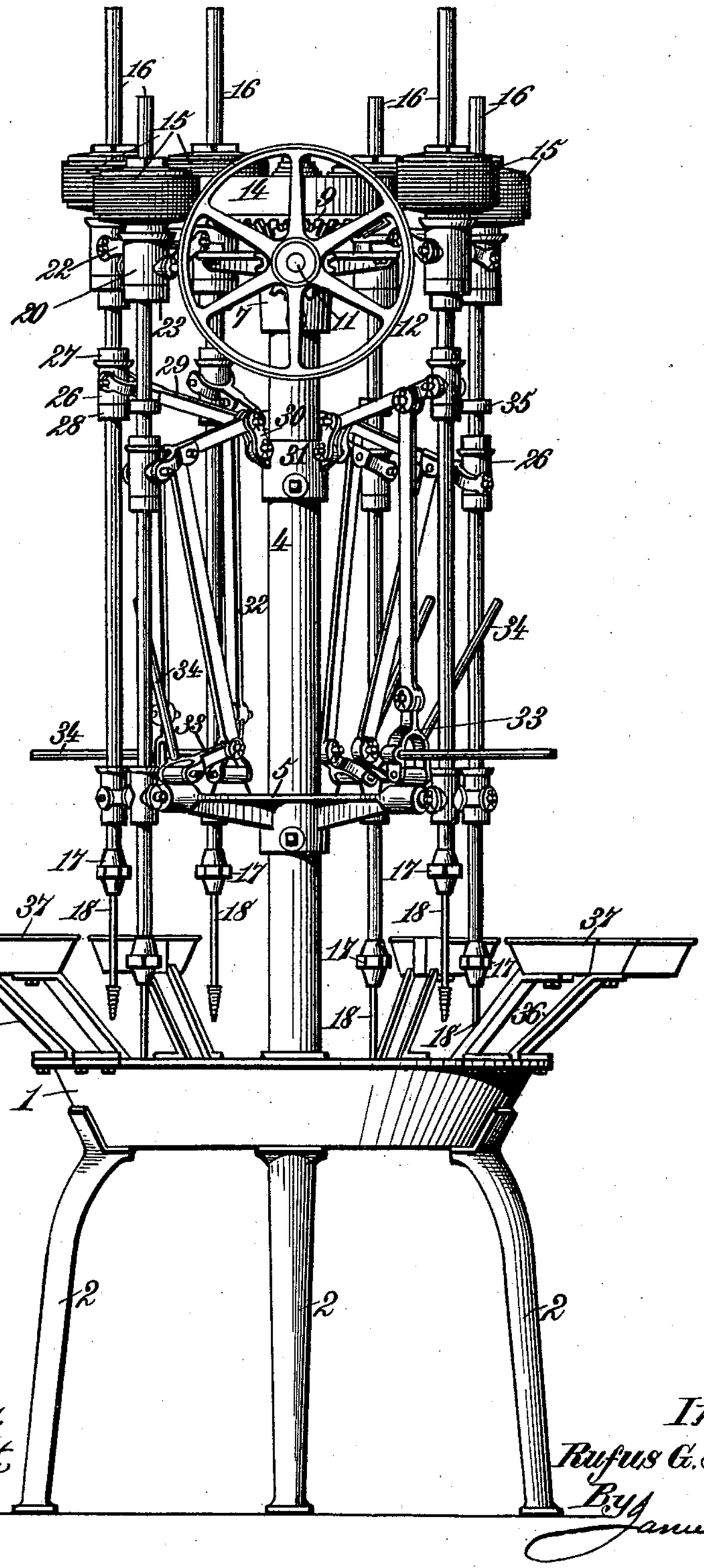
(No Model.) 3 Sheets—Sheet 2.

R. G. MARCY.

NUT TAPPING MACHINE.

No. 582,536. Patented May 11, 1897.

Fig. 2.



Witnesses.
Robt. Gratt.
Thos. A. Grun

Inventor:
Rufus G. Marcy.
By James L. Norris.
Atty.

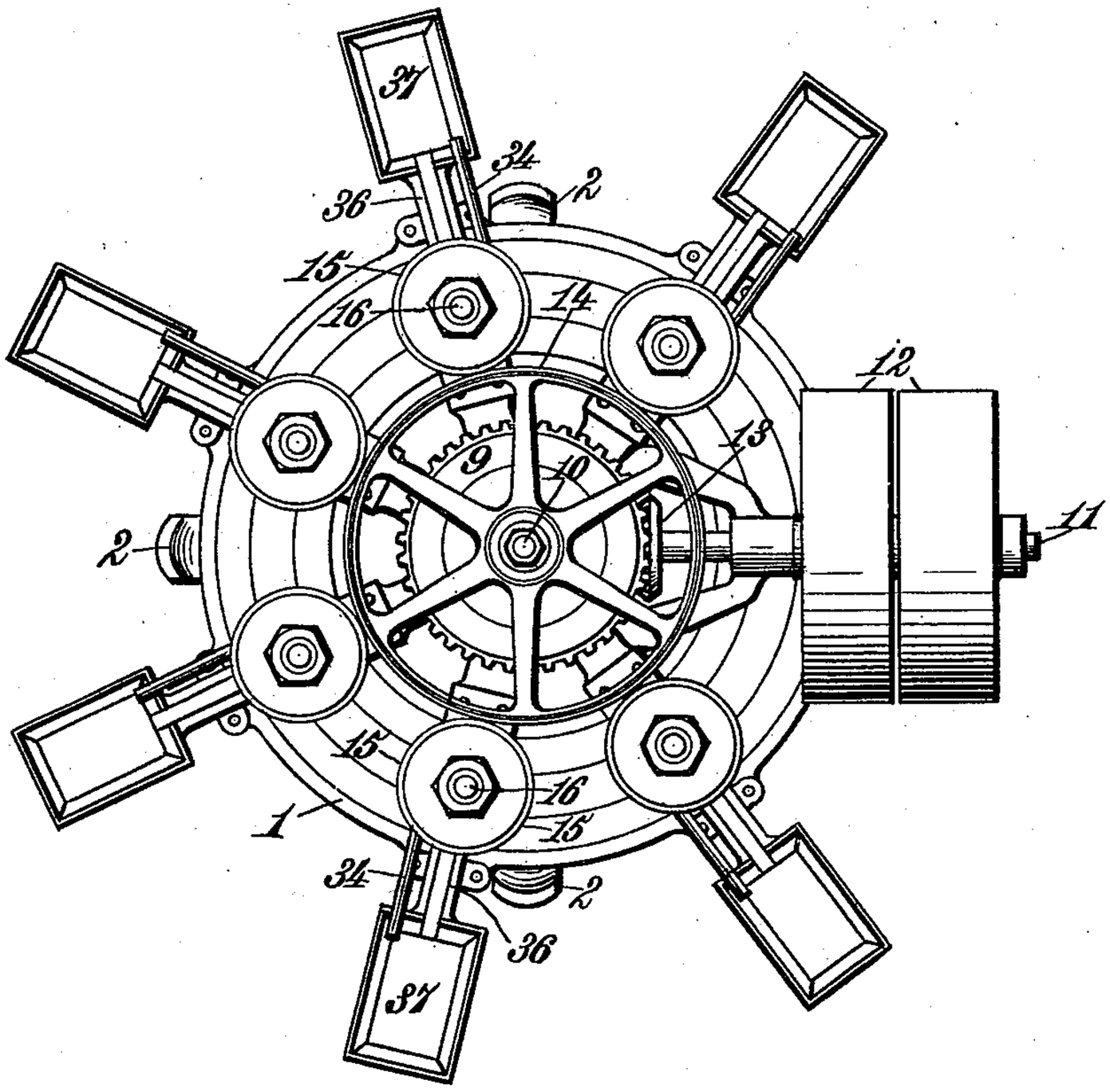
(No Model.) 3 Sheets—Sheet 3.

R. G. MARCY.

NUT TAPPING MACHINE.

No. 582,536. Patented May 11, 1897.

Fig. 3.



Witnesses.
Robert Ewalt.
Thos. A. Green

Inventor.
Rufus G. Marcy.
By James L. Norris.
Atty.

UNITED STATES PATENT OFFICE.

RUFUS G. MARCY, OF KENDALLVILLE, INDIANA.

NUT-TAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,536, dated May 11, 1897.

Application filed August 28, 1896. Serial No. 604,188. (No model.)

To all whom it may concern:

Be it known that I, RUFUS G. MARCY, a citizen of the United States, residing at Kendallville, in the county of Noble and State of Indiana, have invented new and useful Improvements in Gang Nut-Tapping Machines, of which the following is a specification.

This invention relates, primarily, to gang nut-tapping machines, but also comprises features that are applicable as well to other purposes, as in drilling or boring machines.

The invention consists in the novel construction and combination of devices in machines for tapping, drilling, or boring, as hereinafter more particularly described and claimed.

In the annexed drawings, Figure 1 is a sectional elevation of a gang nut-tapping machine, illustrating my improvements, but showing only two tapping-spindles, one in operation and one at rest. Fig. 2 is an elevation of the same at a right angle to the preceding figure and showing six spindles. Fig. 3 is a plan of the machine.

The frame of the machine may comprise an annular basin 1, elevated on legs 2 and inclosing a spider or socket plate 3, in which is stepped a stationary central standard or column 4, from which the principal operative parts of the machine are supported. If preferred, however, the foundation for the machine might be formed by a heavy floor-plate, to which the standard or column 4 could be secured.

Above the annular basin 1 there is secured at a suitable point on the standard 4 a spider-frame 5, and a somewhat similar spider-frame 6 is secured by means of a socketed hub 7 to the top of said column or standard.

As shown in Fig. 1, the hub 7 of the upper spider-frame 6 may support the hub 8 of a horizontally-arranged bevel-gear 9, having its axle or journal 10 formed by a vertically-arranged bolt that is secured in the hub of the upper spider-frame. In the spider-frame 6 is journaled a short horizontal shaft 11, provided with fast and loose pulleys 12 for belting to a line-shaft or counter-shaft, as most convenient. The pulley-shaft 11 carries a bevel-pinion 13, that meshes with and drives the horizontal bevel-gear 9, on the hub of which is secured a large friction-wheel 14, that transmits power through smaller friction-wheels 15 to a gang of rotatable and vertically-sliding spindles 16, as presently explained. These spindles 16 are provided at their lower ends with chucks 17 for holding the taps 18 or other tools required.

The friction-wheels 14 and 15 may be faced with leather or other appropriate frictional material, or, as shown in Fig. 1, the smaller friction-wheels 15 may be made up from superposed leather disks clamped onto a central tubular core or hub 19, which is preferably extended for some distance below the wheel-body. If desired, friction wheels or disks of paper or wood pulp may be employed. It is intended that the spindles 16 shall have a vertically-sliding movement in or through their friction-wheels 15 as well as to be capable of rotation therewith. For this purpose the inner portion of each hub 19 may be provided with a feather, key, or spline engaging a groove or way in the spindle 16 of sufficient length to allow said spindle the required vertical movement without conflicting with its rotation.

It will be obvious that the size of the friction-wheels 15 may be varied, with suitable changes in the arrangement of the corresponding spindles 16 in their supports, so as to permit variation in the speed and power of the spindles according to differing requirements in the operation of nut-tapping, as for large or small nuts. Thus the friction-wheels 15 may differ in size, as required, some being larger and some smaller, according to varying requirements of the work.

The lower portion of each friction-wheel hub 19 is loosely received in a box or sleeve 20, that is pivotally connected with lugs 21 on the upper spider-frame 6 by means of links 22, that form a toggle-joint with said lugs, and when the spindles 16 are at work, as by engagement between friction-wheels 14 and 15, the said links 22 will stand on an incline of about thirty degrees. A nut 23 on the lower end of the wheel-hub 19 holds the box or sleeve 20 in such position that it will not bind onto the hub in making required adjustments of the spindle.

For the purpose of guiding the spindles 16 the lower portion of each is arranged to move freely in a sleeve or box 24, pivotally sup-

ported in a clamp 25, that is swiveled to the periphery of the lower spider-frame 5, as shown in Fig. 1. It will be seen from the drawings that each spider-frame is provided with a number of the boxes 20 and 24, respectively, for supporting and guiding the several rotary and vertically-sliding spindles.

There is provided on each spindle 16, between the boxes 20 and 24, a box or sleeve 26, held loosely on the spindle by means of collars 27 and 28, one at each box end. To each of these boxes or sleeves 26 is pivotally connected one end of a lever 29, the other end of which is hinged or pivoted to a fulcrum-link 30, that is in its turn pivoted to a collar 31, secured on the central column or standard 4, from which all the surrounding spindles are supported. The lever 29 is pivotally connected, near the sleeve or box 26, to the long member 32 of a knuckle-jointed lever, that has its short lower member 33 fulcrumed to the peripheral portion of the lower spider-frame 5, so that the said knuckle-lever 32 33 when extended or thrown into a straight line will raise the spindle 16 through the connection of the lever 29 with said spindle. A hand-lever 34, secured to the lower member 33 of the knuckle-joint lever, provides the means for extending the knuckle-jointed lever and raising the spindle. There is secured to the spindle 16, between the boxes 20 and 26, a collar 35, that is adapted to come in contact with the lower end of the hub 19 of the friction-wheel 15 and thereby lift said friction-wheel away from engagement with the large central friction-wheel 14 when the hand-lever 34 is thrown down in raising the spindle. The collars 35 on the several spindles are so located with relation to the boxes 20 and 26 as to afford ample range of vertically-sliding movement for the spindles when at work without interfering with rotation of the spindle or spindles through engagement of the friction-wheels; but when any spindle is raised to its full height the collar 35 will lift the box 20 and connected friction-wheel 15 until the links 22 are carried to a horizontal position and the friction-wheels are thrown out of gear, thereby arresting rotation of the spindle, as when required for adjusting or emptying the tap. By throwing down the hand-lever 34, thereby extending the lever members 32 and 33, the spindle will be raised and held motionless until its operation is again required, and the spindle can then be lowered and set in rotation by raising the hand-lever 34, and consequently breaking the extension of the connected knuckle-jointed lever. Thus any one or more of the spindles can be stopped or started, as required, and any spindle can be raised when necessary to receive more nuts as the work progresses.

It is preferable to make the annular basin 1 in the form of an inverted truncated pyramid in cross-section, as shown in Fig. 1, or with inclined or flaring sides and of suitable dimensions to receive the taps or other tools when at work. The basin is made sufficiently tight to hold any lubricant that it may be desired to use in nut-tapping or other work to which the machine is adapted, and the basin should be kept sufficiently supplied with lubricant to cover the work being operated upon.

To the top of the outer wall of the basin 1 there are secured at proper intervals a series of grooved and inclined guideways 36 for conducting nuts or like pieces of work to the taps or other tools. The grooved channel of each inclined guideway or race may be filled with nuts to slide down, one after another, to the tap, and the race may be so formed as to hold the nut from turning while the screw-thread is being cut. The upper end of each inclined guideway 36 may have secured thereto a small pan 37 for holding the nut-blanks temporarily, as a convenience only.

The operation of the machine will be readily understood, and it will be obvious that by means of suitable tools carried by the several independent and frictionally-operated spindles several different kinds of work can be carried on either separately or simultaneously.

What I claim as my invention is—

1. In a machine for nut tapping, drilling or boring, the combination of a central support having mounted thereon a main friction-wheel and its driving mechanism, a gang of rotary and vertically-sliding tool-spindles supported from and surrounding the said central support, friction-wheels feathered on said spindles and adapted to be engaged with or disengaged from said main central friction-wheel, swiveled guides for the spindles, and lever mechanism for raising and lowering the said spindles independently, substantially as described.

2. In a machine for nut tapping, drilling or boring, the combination of a central standard having upper and lower spider-frames secured thereon, a gang of rotary and vertically-sliding spindles surrounding said spider-frames, boxes or sleeves pivotally connected with said frames to receive, support and guide the said spindles, friction-wheels mounted on the several spindles and connected with their upper boxes, the said spindles being capable of vertical sliding movement in said boxes and friction-wheels without conflicting with rotation of the spindles, a central main friction-wheel and its driving-gears, and mechanism for lifting the spindles and their friction-wheels to disengage them from the main central friction-wheel, substantially as described.

3. In a machine for nut tapping, drilling or boring, the combination of a central support having mounted thereon a main friction-wheel and its driving-gears, a gang of rotary and vertically-sliding tool-spindles surrounding the said central support and each having in sliding connection therewith a friction-wheel adapted to be engaged with or disengaged from the main central friction-wheel,

pivotally-supported boxes or sleeves to receive, support and guide the spindles, a collar on each spindle below its upper box or sleeve, and lever mechanism connected with the central support and with each spindle between its said collar and the lower spindle box or sleeve, the said lever mechanism adapted to raise and lower the spindles independently and to cause engagement of their friction-wheels with or disengagement from the main central friction-wheel, substantially as described.

4. In a machine for nut tapping, drilling or boring, the combination of a central support, a main friction-wheel and its driving-gears mounted on said support, a gang of independently rotary and vertically-sliding tool-spindles surrounding the said central support and each provided with a friction-wheel adapted to be engaged with or disengaged from the main central friction-wheel, each friction-wheel on the spindles being adapted to permit vertical movement of the spindles without conflicting with their rotation, lever mechanism for raising and lowering the spindles independently, an annular basin for lubricant below the spindles, and guideways to convey nut-blanks or like work to the tools, substantially as described.

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

RUFUS G. MARCY.

Witnesses:
I. J. HANMER,
WILLIAM H. BRILLBART.