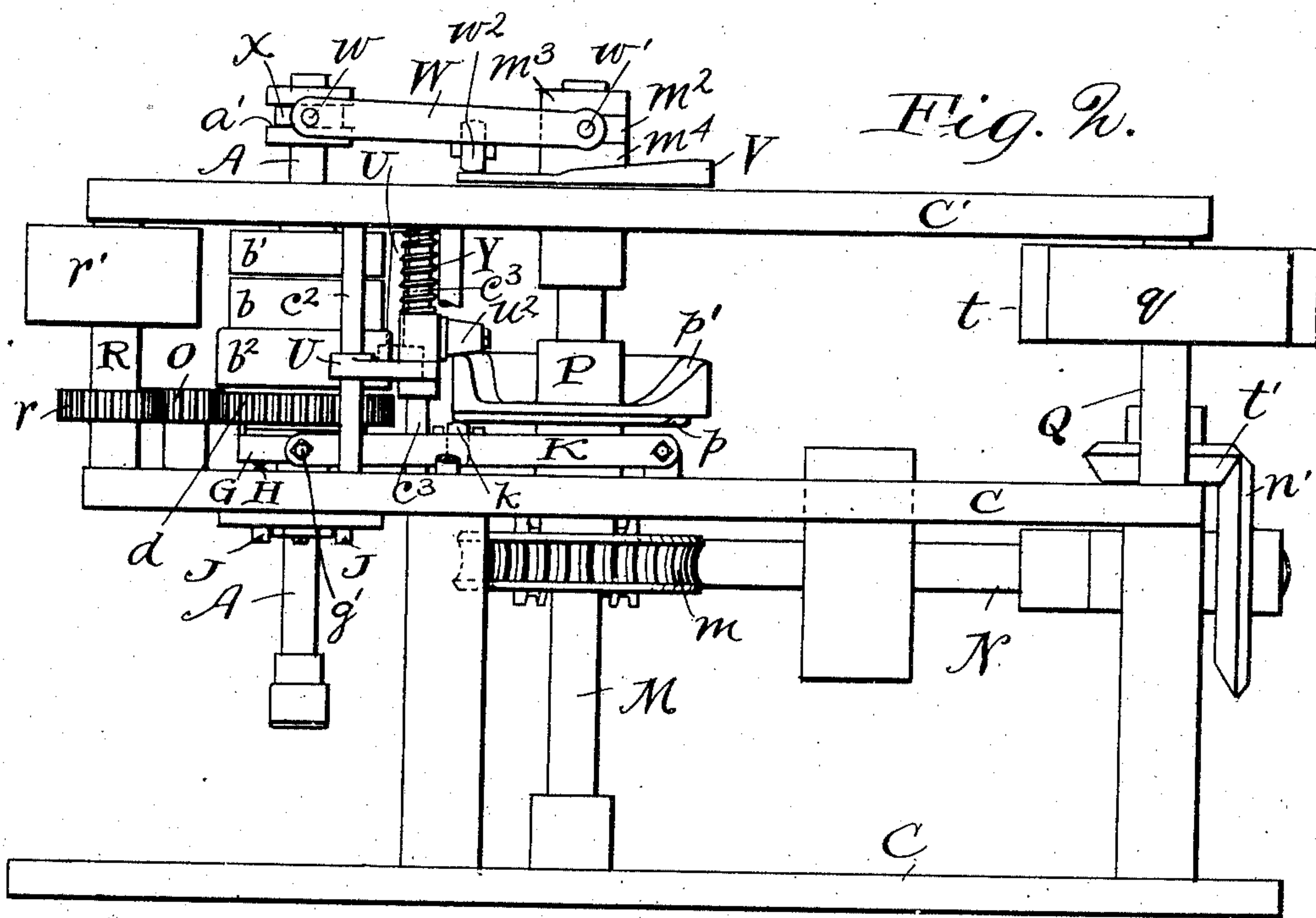
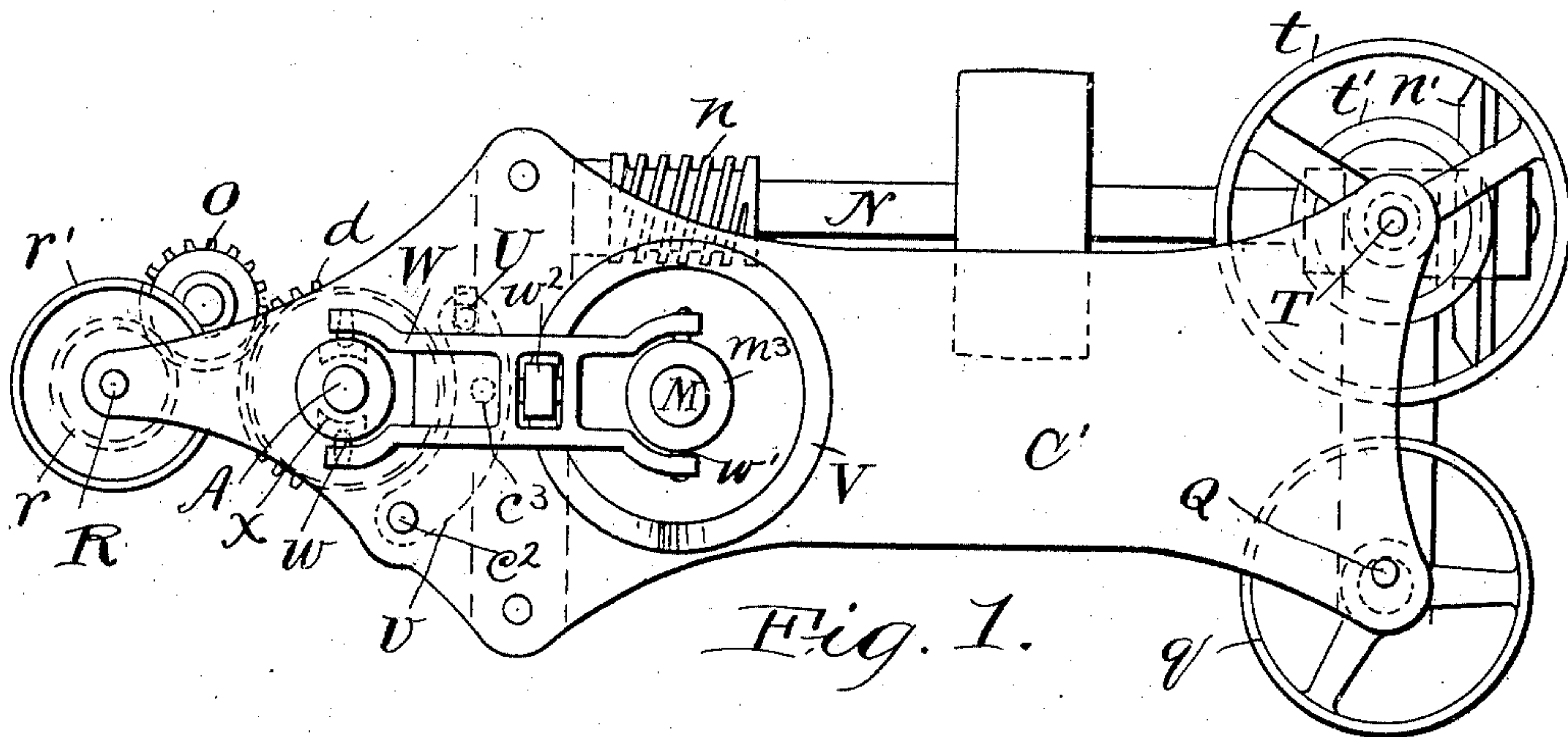


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NUT TAPPING MACHINE.
APPLICATION FILED NOV. 4, 1905.

928,333.

Patented July 20, 1909.

2 SHEETS—SHEET 1.



Witnesses.
E. B. Gilchrist
H. B. Sullivan

Fig. 6.

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Robert J. Rodd,
By his Attorneys,
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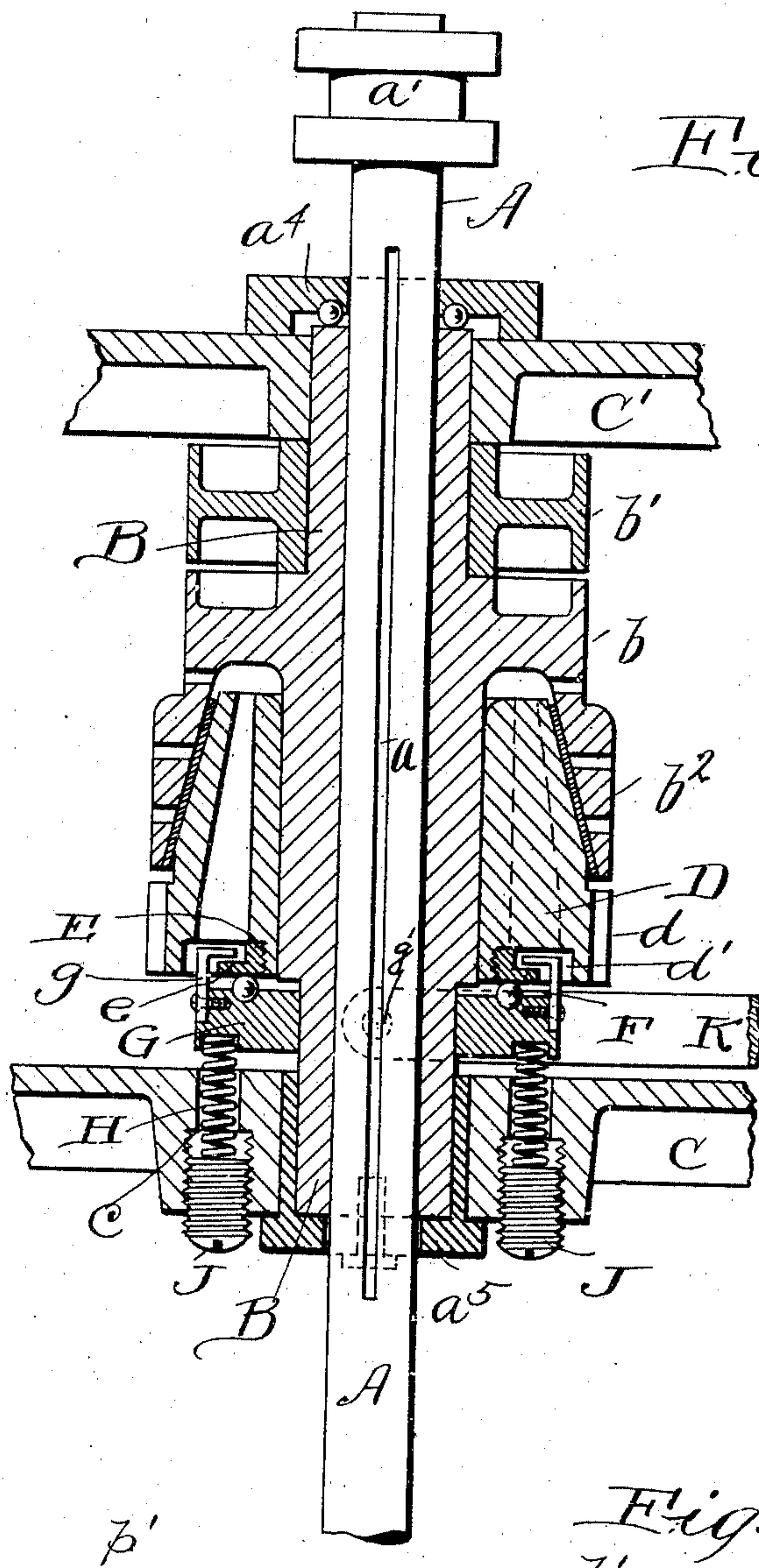


Fig. 3.



Fig. 4.

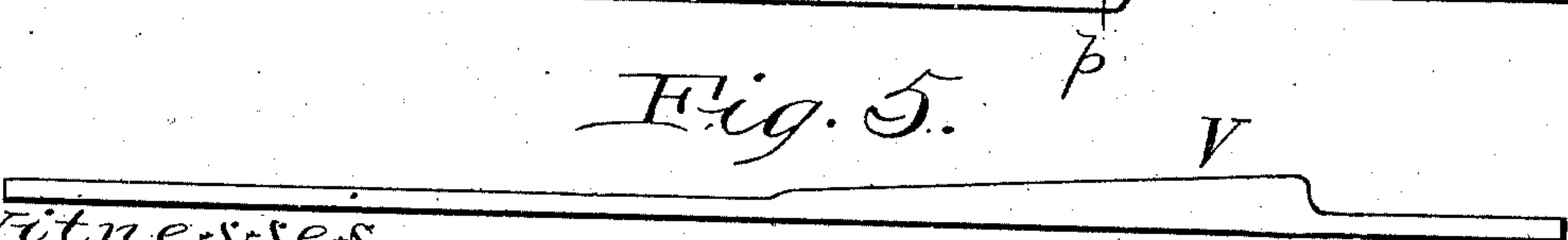


Fig. 5.

Witnesses.
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UNITED STATES PATENT OFFICE.

ROBERT J. RODD, OF CUYAHOGA FALLS, OHIO.

NUT-TAPPING MACHINE.

No. 928,333.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed November 4, 1905. Serial No. 285,835.

To all whom it may concern:

Be it known that I, ROBERT J. RODD, a citizen of the United States, residing at Cuyahoga Falls, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Nut-Tapping Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of the invention is to provide means for automatically rotating the tap spindle of a nut tapping machine first in one direction and then in the reverse direction, and for raising and lowering said shaft at the proper times.

In the drawings, Figure 1 is a plan view of a machine in which the invention is embodied. Fig. 2 is a side elevation thereof. Fig. 3 is a central vertical sectional view through the tap spindle quill and its associated parts. Fig. 4 is a development of the disk carrying the cams for raising and lowering the belt shifter and for operating the clutch. Fig. 5 is a development of the cam by which the tap shaft is raised. Fig. 6 is a diagrammatic plan view of the belt S and the pulleys over which it runs.

The invention, as shown, is embodied in a machine which is in its general characteristics substantially like that which forms the subject matter of the Wood patent No. 785,464. The use of the present invention is not, however, limited to such a machine.

Referring to the parts by letters, A represents the tap spindle which is vertically movable through a rotatable quill B. This quill is rotatably mounted in the two horizontal frame members C, C', which maintain said quill in the same axial line, and the quill is additionally provided with a thrust ball bearing a^4 at its upper end, and a step bearing a^5 at its lower end to prevent endwise movement. The tap spindle is provided with a groove a , which is fitted to a corresponding tongue in the quill, whereby these parts are compelled to rotate in unison, although the tap spindle may be moved up and down independently of the quill, as required. On the quill is a fast pulley b , and just above this fast pulley a loose pulley b' is mounted. Just below the fast pulley the quill is provided with one member b^2 of a cone clutch. Just below this and loosely embracing the quill is the other member D of said cone clutch, which member has around its lower edge the gear teeth d . The

clutch member D is cored out to lighten it, and in its bottom is an annular recess d' , into which is screwed the collar E having the annular external flange e . This collar is made of hardened steel, and it rests upon a row of balls F seated in an annular race way in the top of a vertically movable plate G in which the quill freely rotates. This plate rests upon springs H which enter holes c in the frame member C, and are supported upon adjustable plugs J which are screwed into said holes from the bottom. The springs H, which support this plate, are sufficiently powerful to lift the plate and thereby the clutch member D, so as to cause it to frictionally engage the clutch member b^2 . The plate G, has, however, laterally projecting pins g' placed at diametrically opposite positions; and these pins serve to pivotally connect with said plate, a fork lever K which is pivoted to the frame member C. A roller k is mounted in this lever.

M represents a vertical cam shaft which may be caused to rotate by the worm n on the main driving shaft N of the machine, which worm engages with the worm wheel m on the shaft M. The latter shaft carries a cam disk P. On the under face of the disk is a cam p , which extends approximately one-third of the distance around said disk and is in a position to engage with the roller k , and thereby swing the lever K downward. This, of course, draws down the plate G, which plate carries fingers g' whose upper ends overhang the flange e on the collar E. Wherefore the downward movement of the plate G results in drawing down the clutch member D and thereby disconnecting it from the member b^2 . The gear teeth around the lower edge of the clutch member D mesh with an idler gear O, which in turn meshes with a gear r attached to a vertical shaft R, on which is a wide pulley r' . Where are two other vertical shafts, located at the right end of the machine which are indicated respectively by T and Q. The first of these shafts is driven from the shaft N by beveled gears n' and t' . On the shaft Q is a pulley q and on shaft T is a pulley t . A belt, which is only shown by dotted lines in Fig. 6, is indicated by S, and it runs around the pulleys r' , t , q , and the pulleys b or b' on the quill B, following the course indicated in Fig. 6. This belt is driven by the pulley t , and it in turn drives the other pulleys around

which it runs. The resulting rotation of the shaft R is transmitted through the gears r and o to the gear d on the clutch member D, wherefore this latter member is constantly rotated.

A belt shifter U slides upon two vertical fixed rods c^2 , c^3 ,—a friction roller w^2 is mounted on this belt shifter,—rotating on a horizontal axis. This roller extends over, and is adapted to be engaged by the cam shaped flange p' , which extends up from the disk P.

On the shaft M, above the frame member C' there is another cam V. A forked lever W has inwardly projecting studs w , which project into holes in the shoes X,—said shoes lying loosely in a circumferential groove a' in the upper end of the tap spindle. At the opposite end of this lever are pins w' which project from a collar m^2 loosely mounted on the upper end of the shaft M between the two shoulders m^3 , m^4 , thereon, and enter loosely into holes in said lever. A roller w^2 is mounted on this lever W and engages with the cam V.

The operation of the described mechanism is as follows: When the tap spindle is allowed to move downward,—its own weight being sufficient to cause this movement—the belt shifter is lifted by cam p so that the belt runs on the idle pulley b' . Then the cam p passes off of the roller k and thereupon the springs H push the plate G upward and cause the frictional engagement of the clutch members D and b^2 . The result is that the quill B and tap spindle are rotated by means of gears r and o in the direction to thread the nut. When this has been accomplished the cam p engages with the roller k depressing the lever K and thereby disconnecting the clutch member D and clutch member b^2 . Then cam p' passes out from under the roller w^2 , whereupon a spring Y forces the belt shifter downward, carrying the belt onto the fast pulley b , the result being to rotate the tap spindle in the opposite direction and thereby to withdraw it from the nut. Then the cam V engaging with roller w^2 rocks it and lifts the tap spindle, and the parts continue in substantially the position described until the tap has been withdrawn from the nut.

The various operations above described are repeated automatically.

Having described my invention, I claim:

1. In a nut tapping machine, the combination of a quill rotatable upon a vertical axis, a clutch member fast to said quill, mechanism for driving the quill in one direction, and means for rendering said driving means inoperative at certain times, with a vertically movable tap spindle passing axially through said quill and having a tongue and groove connection therewith, means for moving said tap spindle vertically in said

quill, a constantly driven clutch member loosely embracing the quill below the fast clutch member, a vertically movable horizontal plate below said clutch member and supporting the same, springs on which said plate rests and which act to thrust it upward, means for drawing said plate downward, a finger secured to said plate and projecting upward therefrom, and an annular flange on the last mentioned clutch member with which said finger engages.

2. In a nut tapping mechanism, the combination of a quill rotatable upon a vertical axis, a clutch member fast to said quill, mechanism for driving the quill in one direction, and means for rendering said driving means inoperative at certain times, with a vertically movable tap spindle passing axially through said quill and having a tongue and groove connection therewith, means for moving said tap spindle vertically in said quill, a constantly driven clutch member loosely embracing the quill below the fast clutch member, a vertically movable horizontal plate embracing said quill below the last mentioned clutch member and having an annular ball race way in its top surface, balls in said race way upon which the constantly driven clutch member rests, springs on which said plate rests and which act to thrust it upward, and means for drawing said plate downward.

3. In a nut tapping machine, the combination of a quill rotatable upon a vertical axis and a clutch member and pulley fast to said quill, a pulley loose upon said quill, a belt adapted to engage either of said pulleys, and a belt shifter, with a vertically movable tap spindle passing axially through said quill and having a tongue and groove connection therewith, a constantly driven clutch member loosely embracing said quill below the fast clutch member, a vertically movable horizontal plate below said clutch member and serving as a support therefor, springs upon which said plate rests which act to thrust it upward, mechanism for drawing said plate downward and for simultaneously operating the belt shifter.

4. In a nut tapping machine, the combination of a quill rotatable upon a vertical axis having a stepped bearing at its lower end and a thrust bearing at its upper end, a conical clutch member and a pulley fast to said quill, mechanism for driving said pulley, and means for rendering such driving means ineffective at certain times, a conical clutch member loosely embracing the quill and having an annular gear upon its lower end, a pinion engaging said gear, and means for raising and lowering said clutch member, and a tap shaft passing axially through said quill and having a tongue and groove connection therewith, and means for moving said tap shaft vertically through the quill.

5. In a nut tapping machine, the combination of a quill rotatably mounted upon a vertical axis, a clutch member and a pulley fast to said quill, means from driving the fast pulley, and means for rendering such driving means ineffective at times, with a constantly driven clutch member loosely embracing the quill below the fast clutch member, a plate loosely embracing said quill below said clutch member and serving as a support therefor, and having recesses in its lower face, a fixed plate having recesses in

its top face, spring coils whose lower ends enter the recesses in the fixed plate and whose upper ends enter the recesses in the other plate, and screws that screw vertically through the recesses in the fixed plate against the lower ends of said springs. 15

In testimony whereof, I hereunto affix my signature in the presence of two witnesses. 20

ROBERT J. RODD.

Witnesses:

E. L. THURSTON,

E. B. GILCHRIST.