

(No Model.)

F. H. VAN HOUTEN.

3 Sheets—Sheet 2.

WOOD WORKING MACHINE.

No. 435,265.

Patented Aug. 26, 1890.

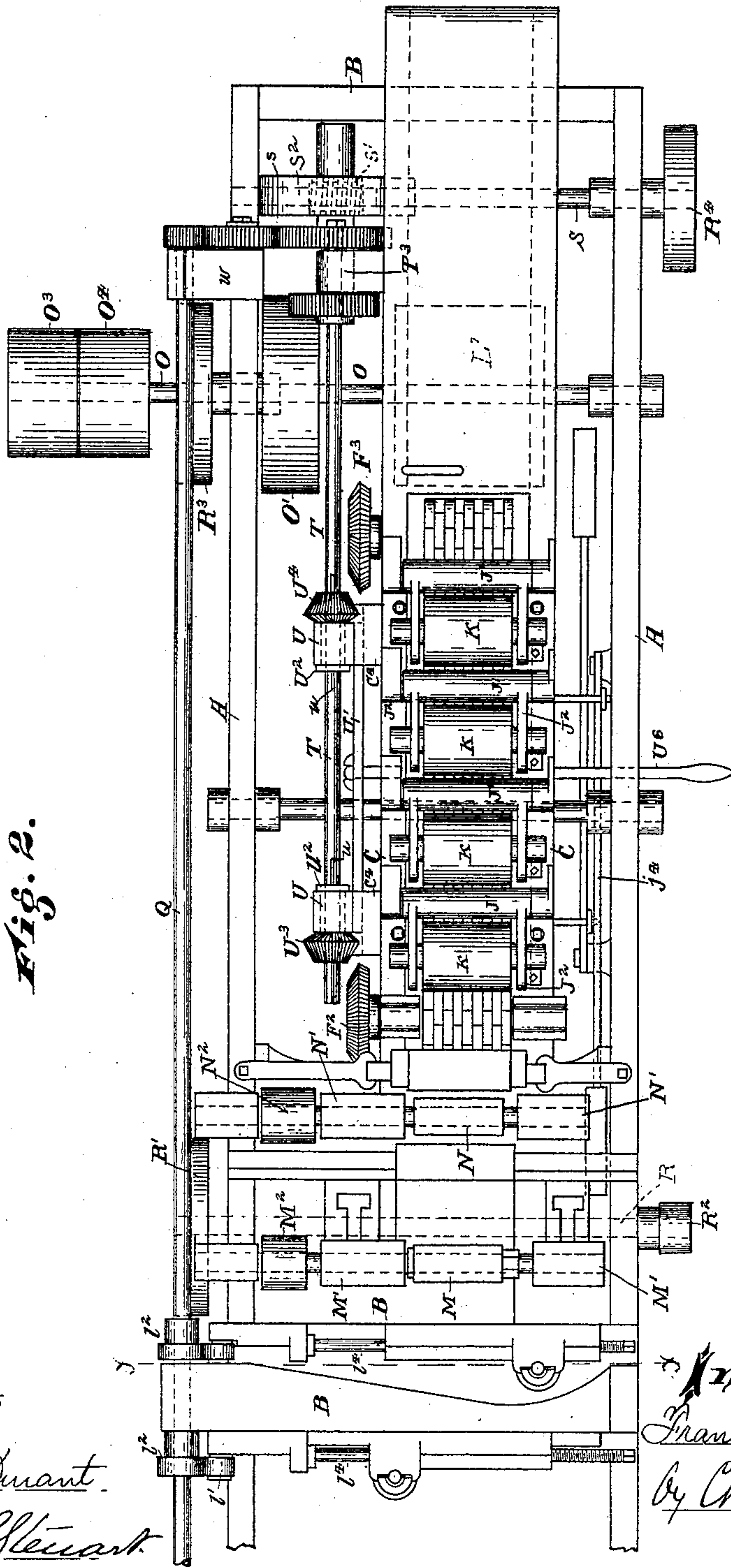


Fig. 2.

Attest

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His Atty.

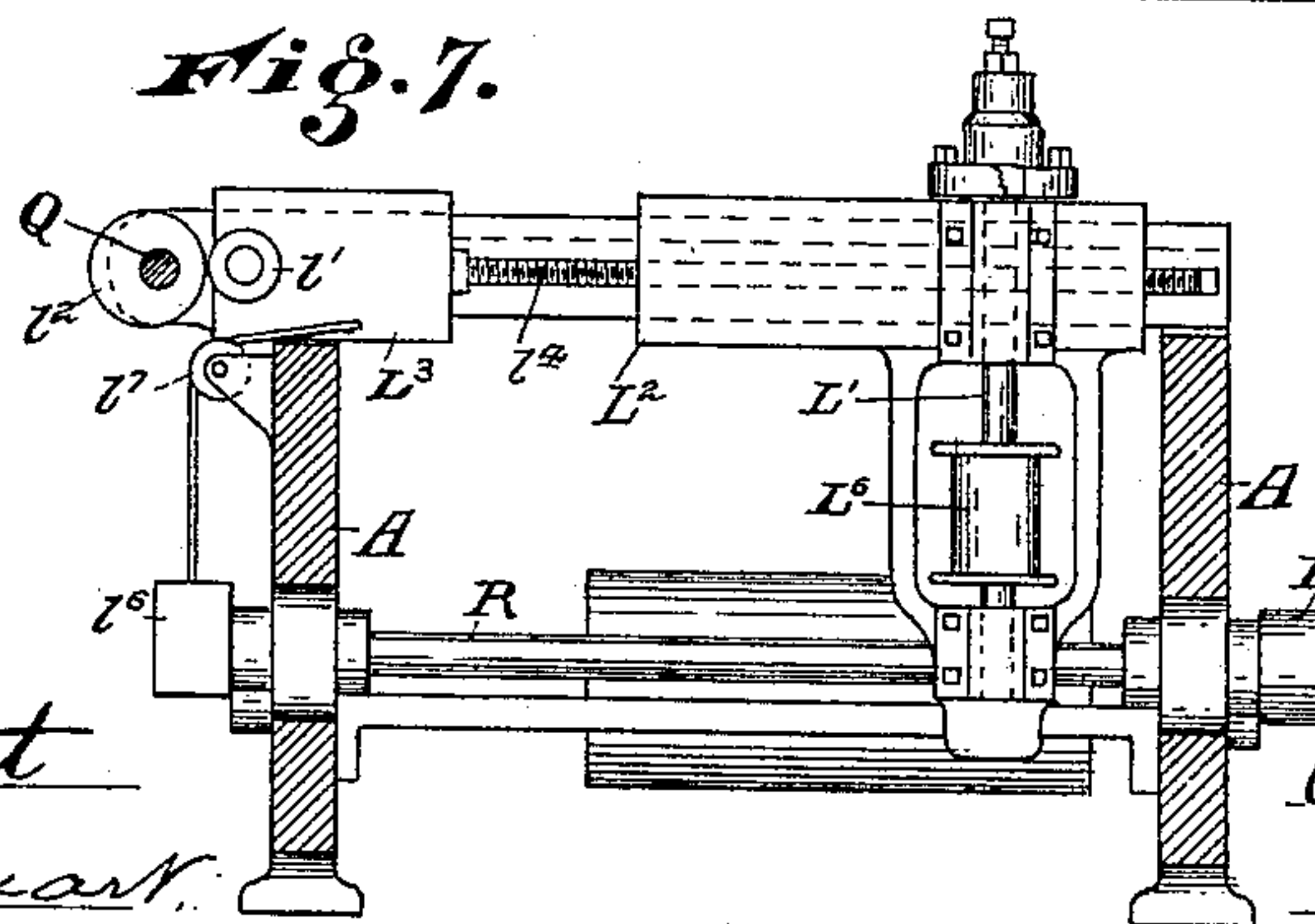
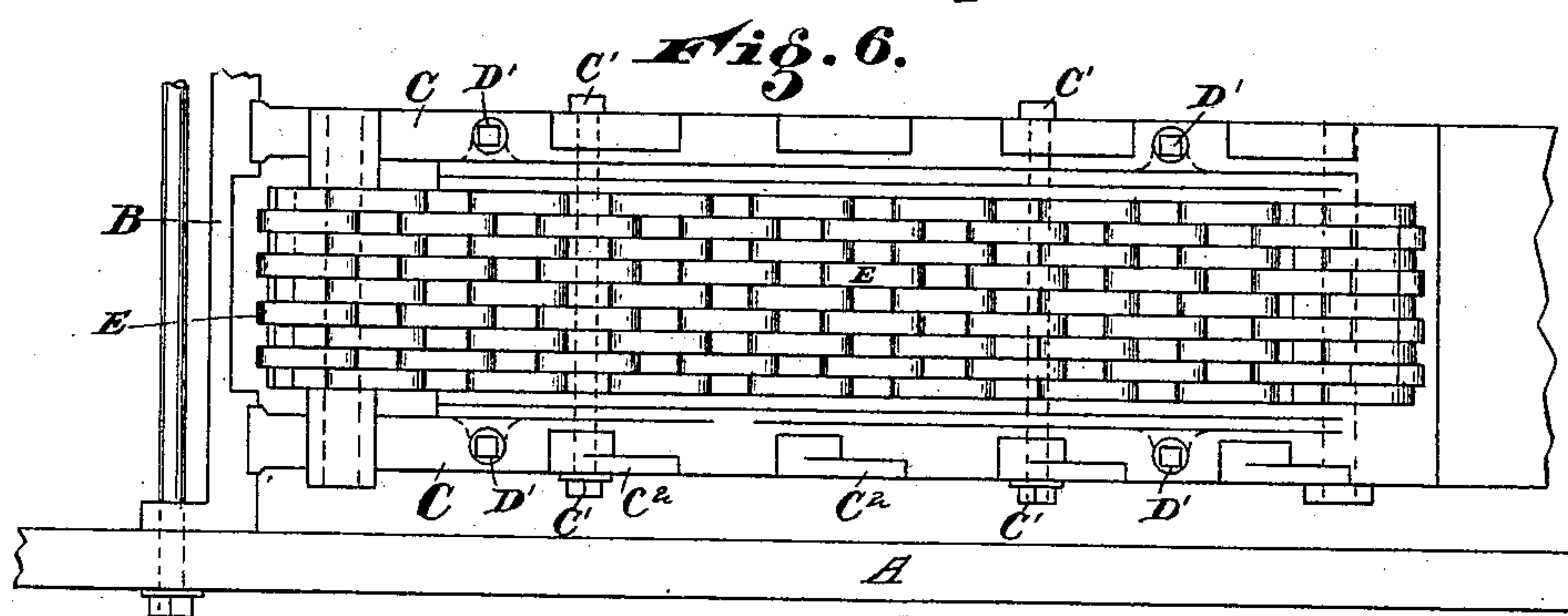
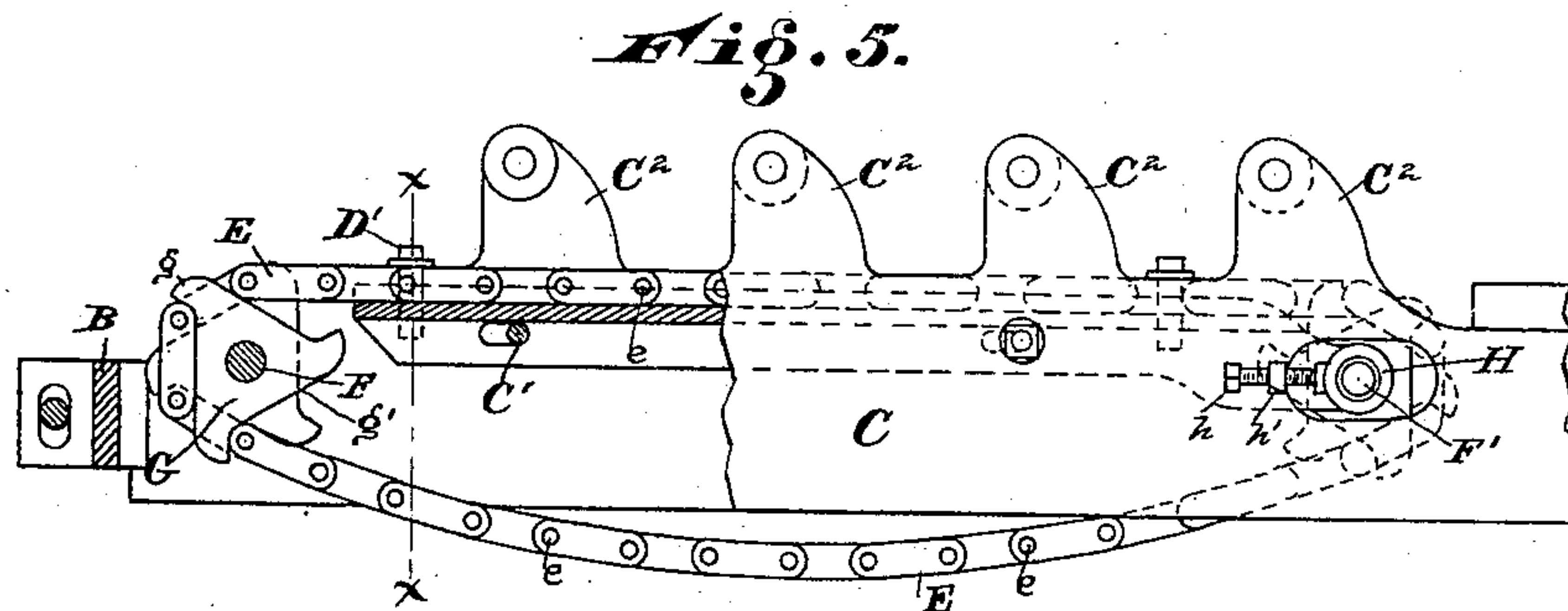
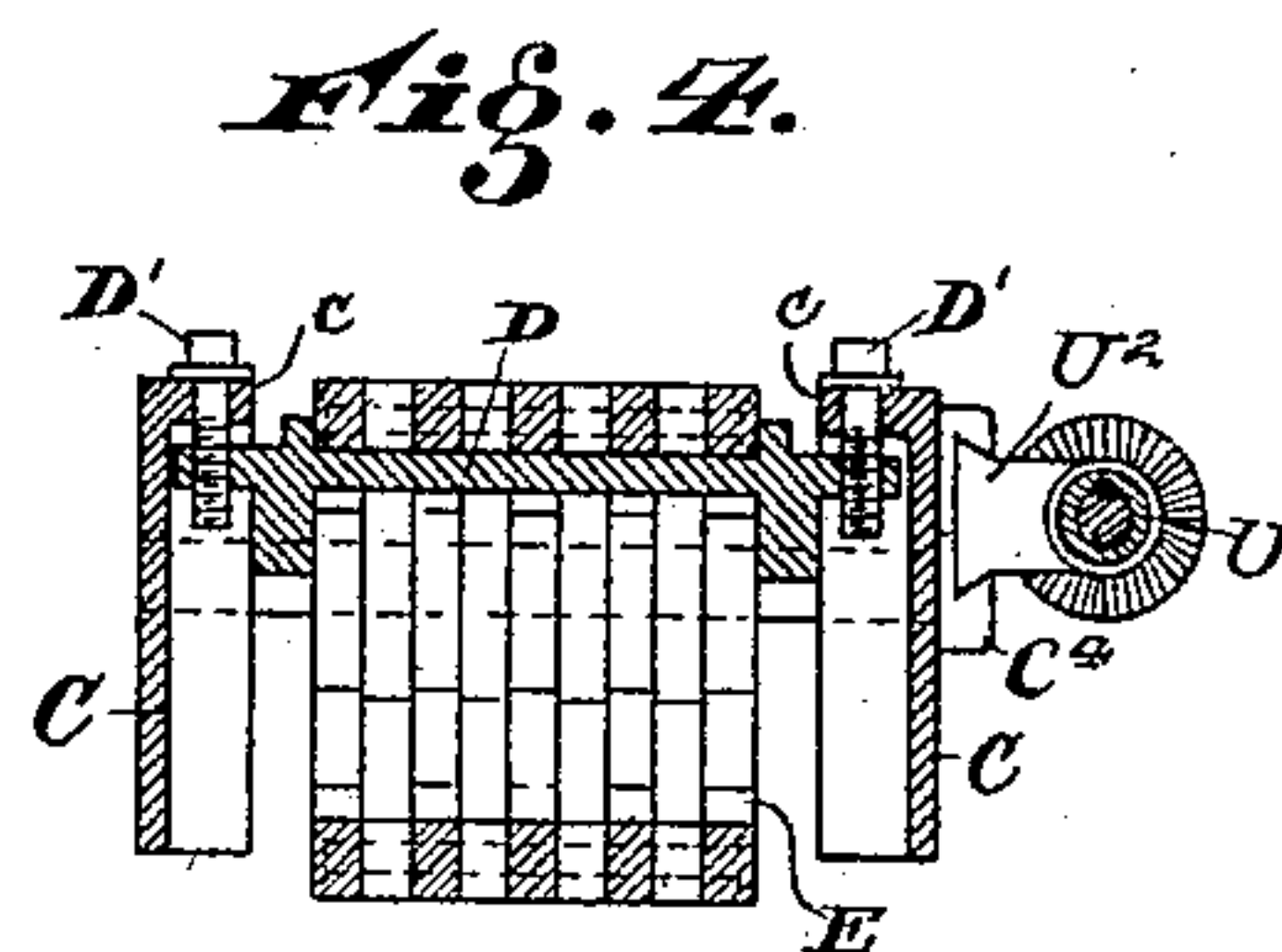
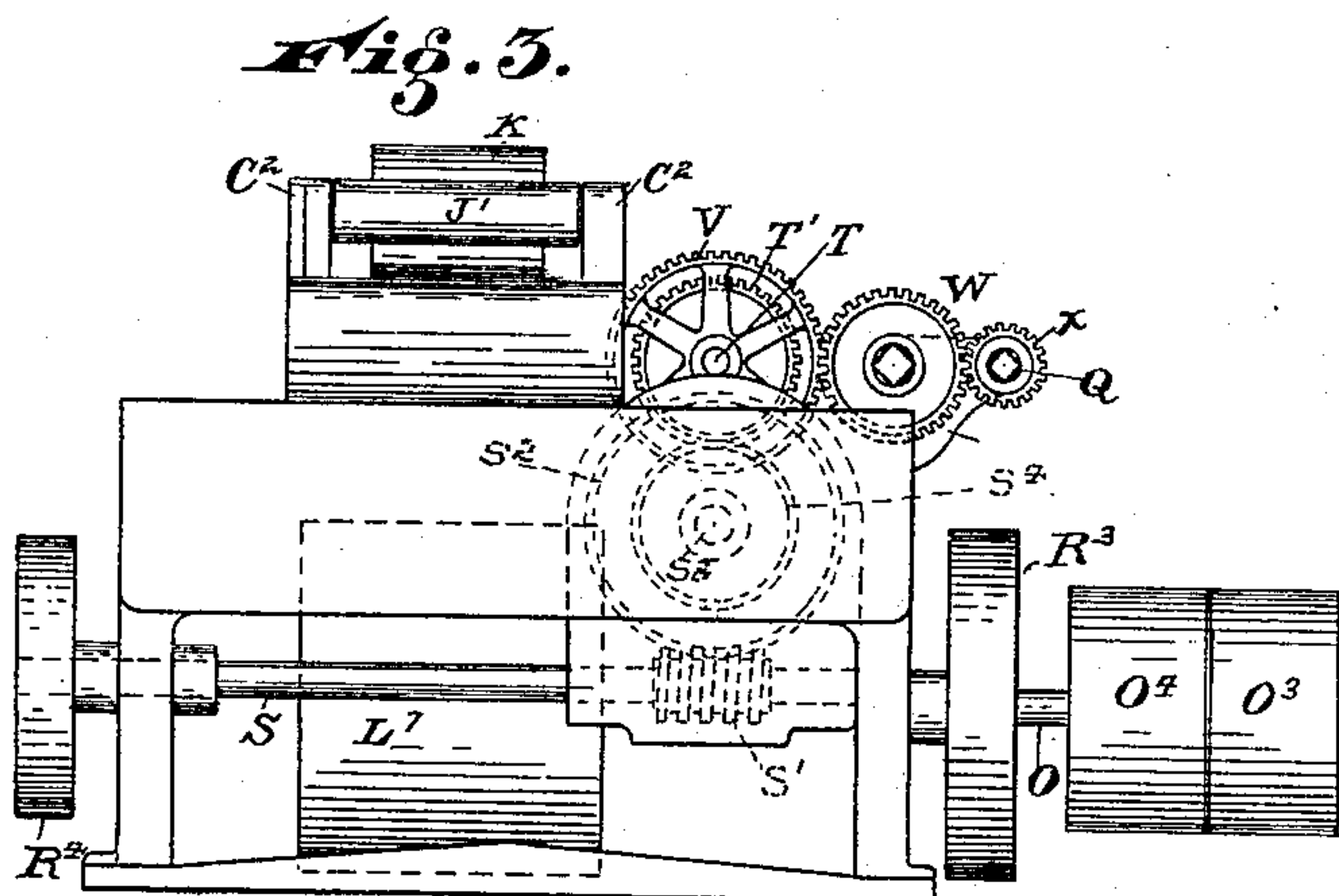
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UNITED STATES PATENT OFFICE.

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WOOD-WORKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,265, dated August 26, 1890.

Application filed November 9, 1889. Serial No. 329,747. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. VAN HOUTEN, of Matteawan, county of Dutchess, and State of New York, have invented certain new and useful Improvements in Wood-Working Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to letters of reference marked thereon.

My present invention relates to that class of wood-working machines in which the board is fed through the machine and is operated upon by various tools or cutters, and portions of it relate particularly to the class of machines described in Patents No. 394,763 and No. 394,766 for operating upon boards or other material and performing other operations than merely planing or matching in straight lines.

The objects of the invention are to improve the construction and operations of the devices for feeding the material through the machine, which apply equally well to all forms of wood-working machines of this general description, to improve the gearing and connections for operating the cutter-heads operating on opposite sides of the material, and generally to improve the construction and operation of the machine.

To these ends the invention consists in certain novelties of construction and combinations and arrangements of parts, all as will be hereinafter fully described, and the novel features pointed out particularly in the claims at the end of this specification.

In the drawings, Figure 1 represents a side view of a portion of a machine embodying my present improvements; Fig. 2, a top plan view of the same; Fig. 3, an end view; Fig. 4, a section on the line *x x* of Fig. 5; Fig. 5, a side view, partly in section, of the traveling bed or feeding device; Fig. 6, a top plan view of the traveling bed or lumber-support and the frame in which it is mounted, and Fig. 7 a section on line *y y* of Fig. 2.

Similar letters of reference in the several figures denote similar parts.

As my present invention relates more particularly to the front or feed end of the ma-

chine, I have only shown the machine nearly complete up to the side cutter-heads, which, however, embodies a machine adapted to plane and match boards with the matched edges waving or irregular, excepting the feeding-out rolls. The portion of the machine not shown herein may be constructed as in the patents before referred to or in any other similar manner.

The main frame of the machine consists of the side frames *A A*, connected at the ends and suitable intermediate points by cross pieces or braces *B B*, and the upper and under surfacing cutter-heads *M N* are mounted in bearings *M' N'* on the frame, are provided with suitable pulleys *M² N²*, and are driven by a belt from a pulley *O'* on the main shaft *O* of the machine; but as these devices form no part of my present invention it will not be necessary to describe them further.

Within the main frame of the machine is secured a supplemental inner frame, consisting, essentially, of two longitudinally-extending side pieces *C C*, fastened at opposite ends to the braces *B B* of the main frame and having at the top, for a portion of their length at least, inwardly-projecting flanges *c c*, to which the bed-plate *D* is connected by screws *D' D'*, as in Fig. 4, said screws passing loosely through the flanges and screwing into the bed-plate, so that by rotating them the said plate may be adjusted vertically, as desired. Suitable tie or brace rods *C' C'* are passed through the sides to the inner frame, having a nut or nuts on one or both ends for stiffening it.

In wood-working machines in general, and this class in particular, it is desirable that the lumber feeding or propelling devices have a long bearing upon the board, thereby insuring its proper positive movement through the machine, and this I accomplish in the present machine by providing a traveling bed or endless belt of peculiar construction adapted to receive the board upon it and feed it positively forward through the machine. In the present construction I prefer to form this bed of a series of links or strips *E*, pivoted together at their ends upon horizontal pivoted pins or rods *e*, leaving apertures between the ends of longitudinally-adjacent links, said

links traveling over the bed-plate D on edge, as shown. This bed may be driven by any suitable mechanism; but I prefer to provide at the ends of the bed-plate shafts F F', on 5 which are located a series of sprocket-wheels G, having three or more projections g thereon, adapted to project between the links of the chain, and link-supporting surfaces g' between them, as shown. The drawing-edges 10 of the projections g, which engage and pull upon the link ends, are preferably arranged at a sharp angle, so that they will perfectly engage and draw forward the bed, while rear sides or corners are rounded off, so as to leave 15 it readily. In order to adjust the tension of the traveling-bed when desired, I mount one of the shafts supporting the sprockets—say F'—in movable bearings H, sliding in the side of the supplemental frame and capable of 20 adjustment by means of an adjusting-screw h, passing through a lug h' on the frame, as shown.

The material may be held down upon the traveling bed by any suitable pressure device; 25 but I prefer to construct the side pieces C C of the frame with upwardly-extending brackets or arms C² C² C² C², in which are secured shafts J J, and upon each of these shafts is located a sleeve J', having forwardly-projecting 30 arms J² J², with bearings in the ends, in which are journaled heavy pressure-rollers K, operating to hold the board down upon the traveling bed and being guided by the arms J² J², as will be understood. I have shown 35 four of these presser-rolls, and I prefer to connect the arms of adjacent ones in pairs by depending links j, connected to cross-bars j², which latter are connected by rods j³ with the weighted levers j⁴. These rolls will serve 40 to keep the board operated upon down tightly on the traveling bed, which latter will move it forward with regularity and certainty, and particularly in the class of machines employing a number of cutters operating against the 45 movement of the board it is desirable that as strong a feeding device as possible be employed.

By forming the traveling bed of the links with apertures between them I not only provide 50 for the more positive driving of the bed, but prevent the lodgment of chips between the sections, permitting them to straighten out properly when coming on top of the bed-plate, and any chips that might drop through 55 the apertures in the traveling bed will be moved along and dropped through at the end of the plate.

The cutter-heads L L at the rear end of the machine, and which are preferably matchers 60 as well, are, as in the before-mentioned patents, adapted to approach and recede from each other at certain times, in order to shape the sides of the material as may be desired, and instead of operating them from opposite 65 sides of the machine by separate mechanisms, as heretofore, I prefer to employ but a single cam-shaft and operate them both from this.

The carriages on which the cutter-head shafts L' L' are mounted are preferably constructed in two parts sliding on suitable dovetailed 70 guides or ways formed on one of the cross-braces of the main frame, the one L² carrying the shaft and the other L³ having near its upper portion a small friction-roller l', adapted to bear against the pattern-cam l² on the lon- 75 gitudinally-extending shaft Q, the two carriage-sections being connected by a screw l⁴, secured to but permitted to turn freely in section L³ and its thread engaging a correspondingly-threaded aperture in L², so that by 80 turning said screw the section and cutter-head can be adjusted relative to each other, as desired. The carriages on which these cutter-heads are mounted are substantially alike, 85 except that the forward one is a little longer and extends across the machine, so that its cutter will be on the opposite side of the work from the rear cutter.

Any suitable means can be employed for keeping the rollers l' on the carriages pressed 90 against the pattern-cams; but I prefer to accomplish this by means of a weight l⁶, connected to the carriage by a cord or chain passing over a small roller l', as in Fig. 7, thereby causing the carriages when the cam- 95 shaft is rotated to move toward or away from the center line of the board and at such times as the cams and the rotation of the cam-shaft relative to the speed of the feeding devices may be adjusted. 100

The pattern-cams l² are preferably adjustable on the shaft Q, and may be of the form shown in Patent No. 394,766 or any other desired, so that the variety of forms given the 105 work may be very great.

The cutter-heads may be driven in any suitable manner; but I prefer to drive them from the belt-drum L⁷ on the main shaft O by means of a partially-turned belt (not shown) passing around the pulleys L⁶ on the 110 shafts L' L', after the manner employed in ordinary flooring-machines. The main shaft O, which is rotated by any suitable motor, is journaled in the main frame and provided with the usual fast and loose pulleys O³ O⁴, 115 and all the cutter-heads are preferably driven directly from this shaft at a very high speed; but it is desirable that the feed of the material and movements of the side cutters be at a much slower speed, which I accomplish by 120 the following mechanism.

Extending across and journaled in the frame parallel with the main shaft is a counter-shaft R, having on its ends pulleys R' and R², the former belted to a pulley R³ on the 125 main shaft, and the latter, which is the smaller, belted to a pulley R⁴ on the end of a shaft S at the front end of the machine. Upon this shaft S is arranged a worm S', (see dotted lines, Fig. 3,) engaging a worm-wheel S² 130 on a short shaft S³, to which latter is also secured a gear S⁴, meshing with gear T' on shaft T. The worm and gear are protected from flying chips, &c., by a cover or housing

s; but the parts are clearly shown by the dotted lines.

On the outer side of one of the sides C of the supplemental frame are formed or secured brackets C⁴ C⁴, having dovetailed recesses therein, in which are arranged correspondingly-fitted blocks U U, connected by a bar U', and in these blocks are journaled sleeves U² U², having on their outer ends beveled gears U³ U⁴, adapted to mesh with corresponding gears F² F³, secured on the ends of shafts F F', respectively, when the blocks are moved in one or the other direction. The shaft T is mounted at one end in a bearing T³, rigidly secured to the frame C, and its other end is supported in the sleeves U² U², the portion passing through the sleeves being provided with a spline or feather u, while the sleeves are provided with corresponding grooves u, so that they will be rotated by the shaft, but may be moved longitudinally upon it. A lever U⁶, pivoted to the under side of the bed-plate and connected at one end to the connecting-bar U', extends to the side of the machine and serves as a convenient means of moving the slide connecting one or the other of the sleeves with the shafts F F', thereby moving the bed forward or backward as the former or latter is engaged. It will be noticed that the traveling bed is arranged to be drawn over the bed, the shaft not connected to the shaft T traveling loosely, and that the teeth on the sprockets on the two shafts are set oppositely, so that no matter in which direction the bed is moved the drawing and clearing operation will be the same.

Mounted upon the end of the shaft T is a gear V, meshing with an idle-gear W, journaled on a stud on bracket w, and through said last-mentioned gear rotating the gear X on the shaft Q, carrying the pattern-cams for the matcher-heads.

By the above-described connections it will be seen that the feeding devices are all driven from the comparatively slowly-moving worm-gear, and also that the shaft Q, which in the present construction operates the pattern-cams of the matchers or side cutters, though I contemplate operating the top or molding cutters therefrom as well, is operated by the gear X and idler W, and that by changing merely these two gears or inserting new ones the action of the side cutters can be regulated relative to the feed so as to produce boards having any desired number of undulations in a given length, and also that the changes can be made very expeditiously.

The feature of so arranging the traveling bed that the direction of feeding can be instantaneously changed is advantageous, in that in any wood-working machine, but particularly those involving cutting mechanisms that have to be adjusted relative to each other, it is desirable sometimes to move the board back and start it in differently when securing the adjustment.

I have not deemed it necessary to show all the driving-belts in the drawings, as it would obscure and confuse the parts, and the description will serve to give a clear understanding of the invention to those skilled in the art, to whom it is addressed.

I claim as my invention—

1. The combination, with the endless traveling bed, the two shafts having the gears, and the sprockets thereon for engaging the bed, of a rotating shaft, the two gears, one for each sprocket-shaft, splined thereon, and connections between them for simultaneously engaging one and disengaging the other, substantially as described.

2. The combination, with the frame, the endless traveling bed, the two shafts having the gears, and the sprockets thereon for driving the bed, of the rotating shaft, the two gears splined thereto, the bearings for the gears arranged between the sprocket-shafts, and connections between them for causing their simultaneous movement, substantially as described.

3. In a wood-working machine, the combination, with the main driving-shaft and a series of cutters driven directly therefrom, of the counter-shaft belted to the main shaft, the shaft having the worm, the worm-wheel operated therefrom, the carriages movable laterally regarding the material operated upon carrying cutter-heads, the pattern-cams for moving said carriages, feeding devices for the material, and gearing between said worm-wheel and the feeding devices and pattern-cams, substantially as described.

4. In a wood-working machine, the combination, with the main driving-shaft and a series of cutters driven directly therefrom, of the counter-shaft belted to the main shaft, the shaft having the worm, the worm-wheel operated therefrom, the laterally-moving cutting-heads, the pattern-cams for moving them, the feeding devices, and gearing between the feeding devices, pattern-cams, and worm-wheel, embodying two removable and changeable gears, substantially as described.

5. The combination, with the main frame provided with a transverse bracket having ways thereon, of a carriage carrying a cutter-head mounted to reciprocate upon said ways, said carriage being constructed in two sections, the one carrying the cutter-head and the other engaging the actuating devices, both sections moving upon the said ways and being connected by an adjusting-screw in a plane parallel with said ways and operating to increase or diminish the distance between the cutter and its actuating devices, substantially as described.

FRANK H. VAN HOUTEN.

Witnesses:

FRED F. CHURCH,
S. E. TRUE.