

(No Model.)

2 Sheets—Sheet 1.

J. L. SIMMONS.
TURNING LATHE.

No. 444,465.

Patented Jan. 13, 1891.

Fig.1

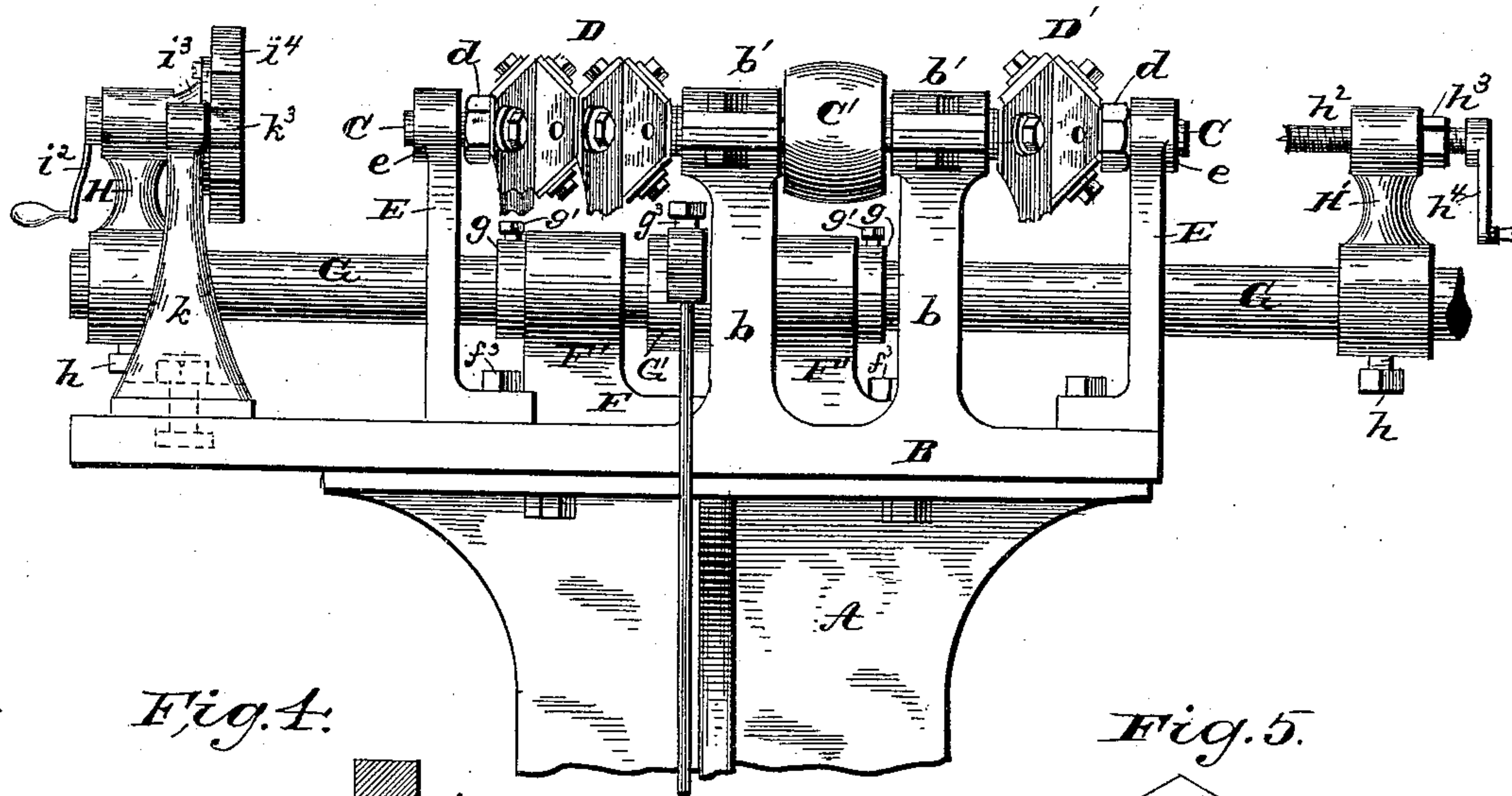


Fig. 4.

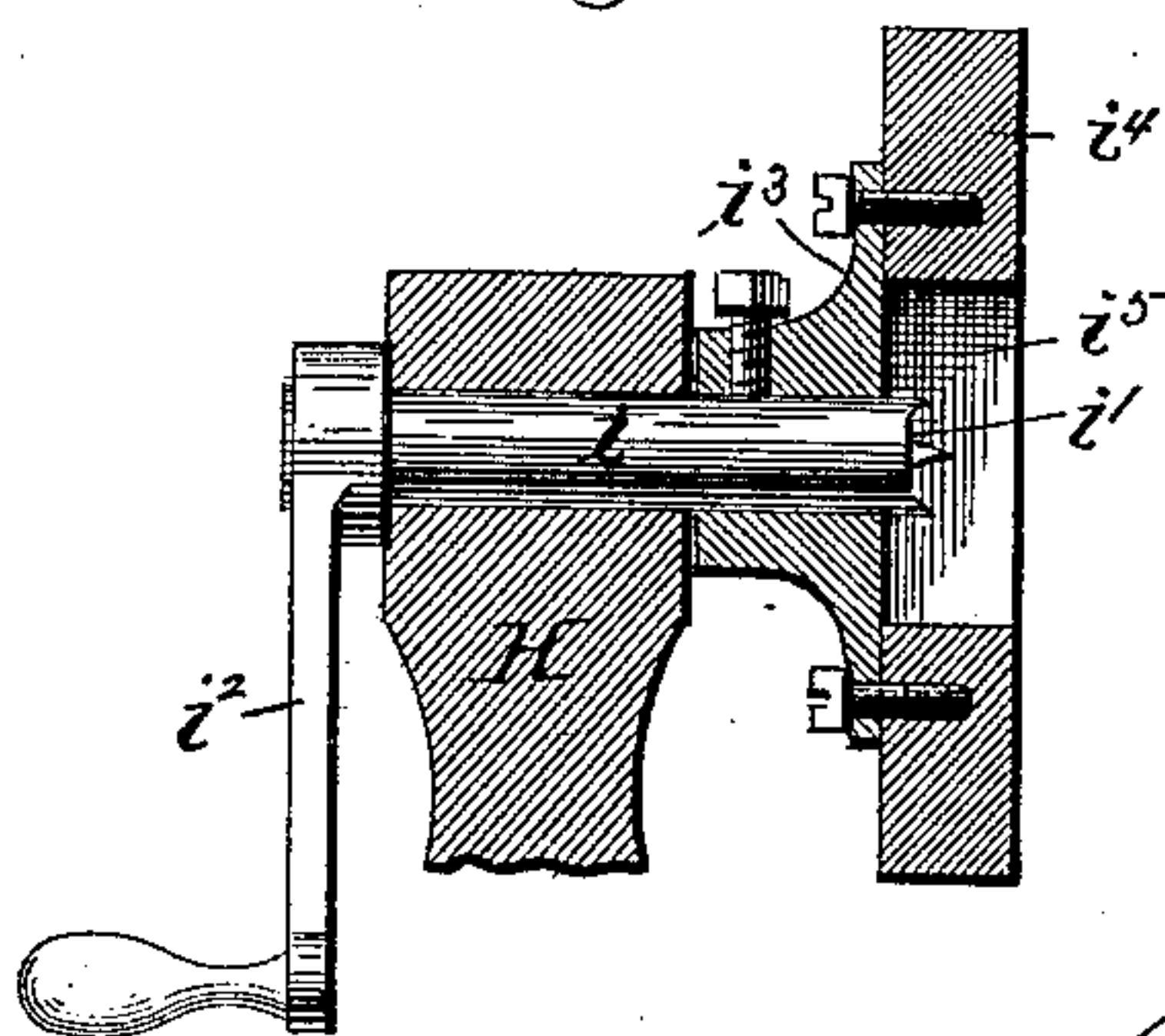


Fig. 5.

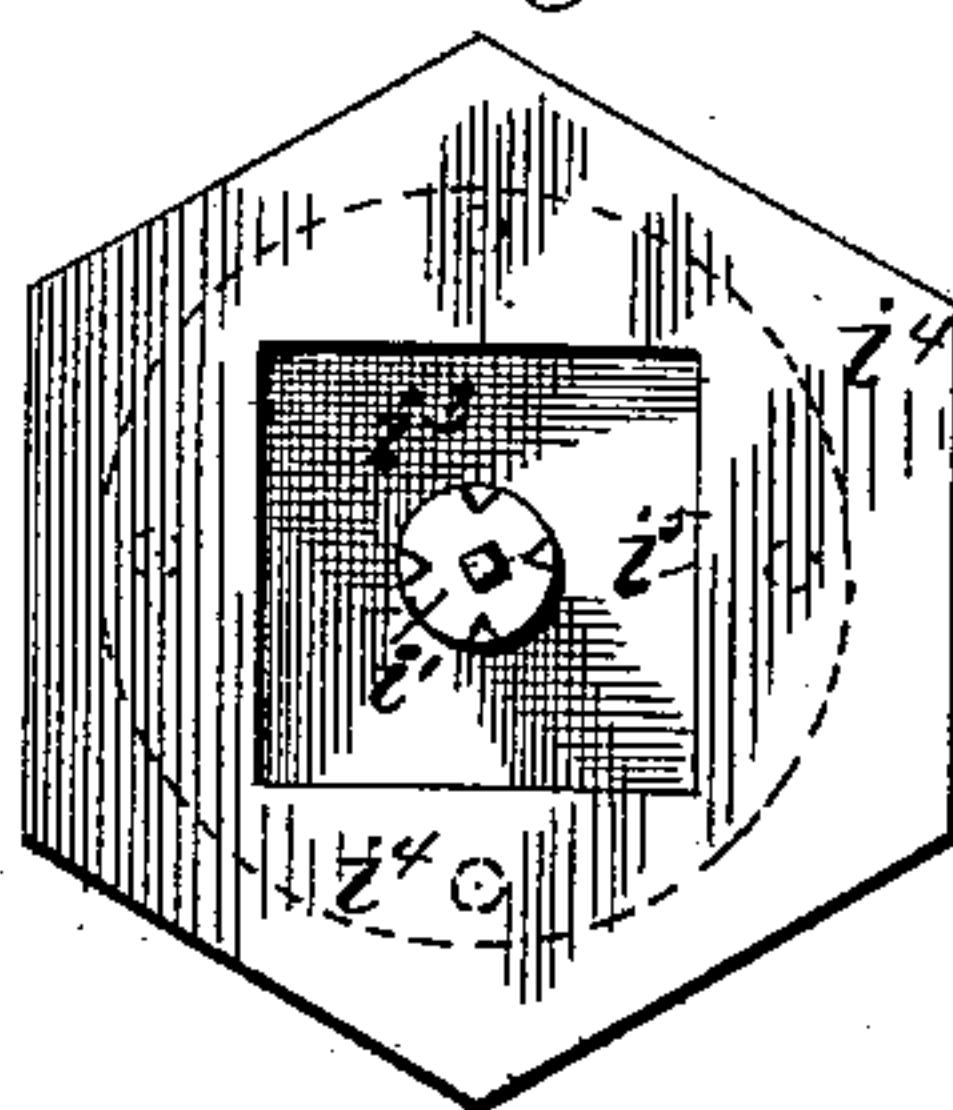
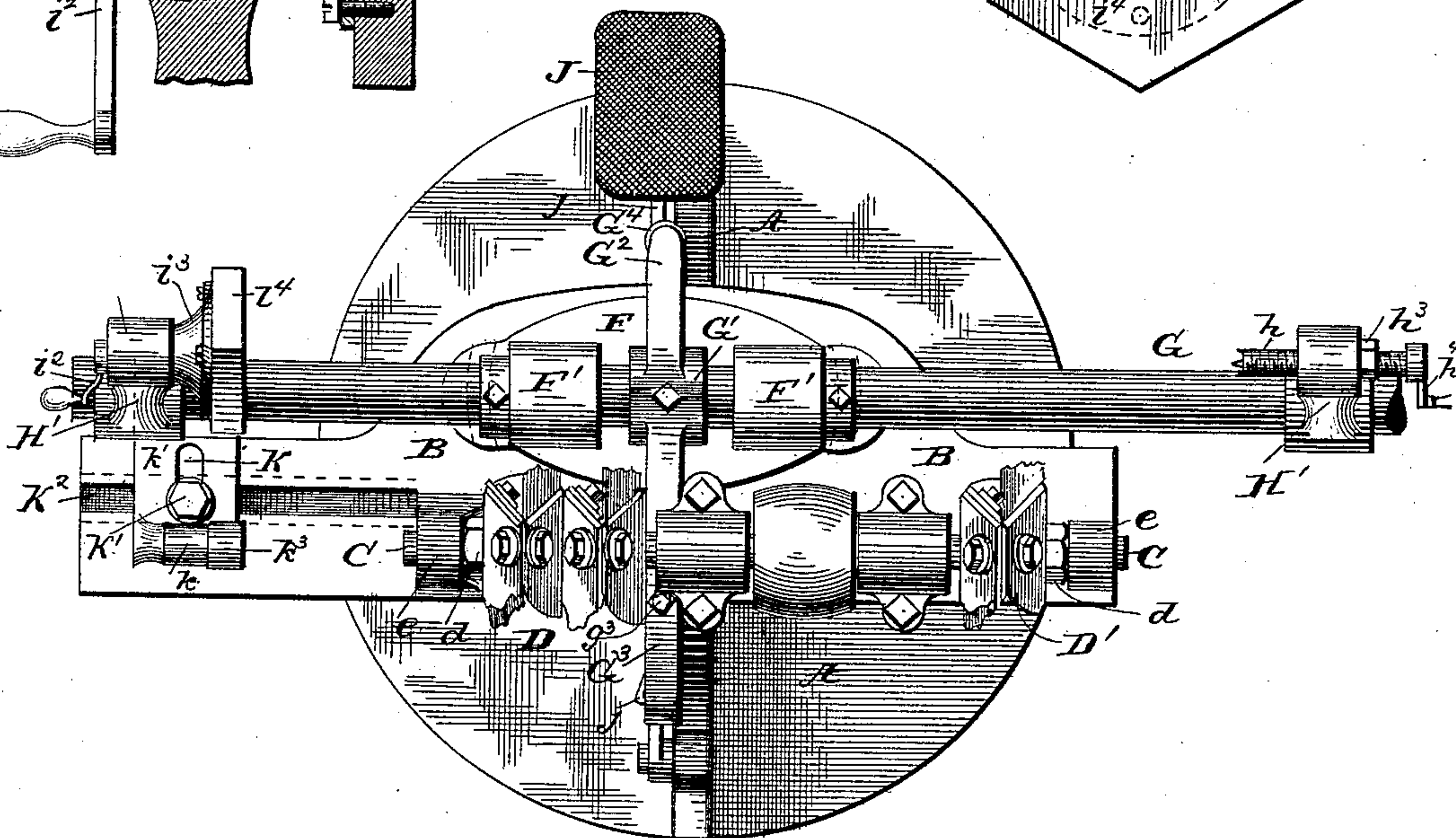


Fig. 2.



Witnesses:
F. W. Rutter
Wm E. Dwyer

Inventor:
James Lee Simmons
by ET Walker
his Attorney.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

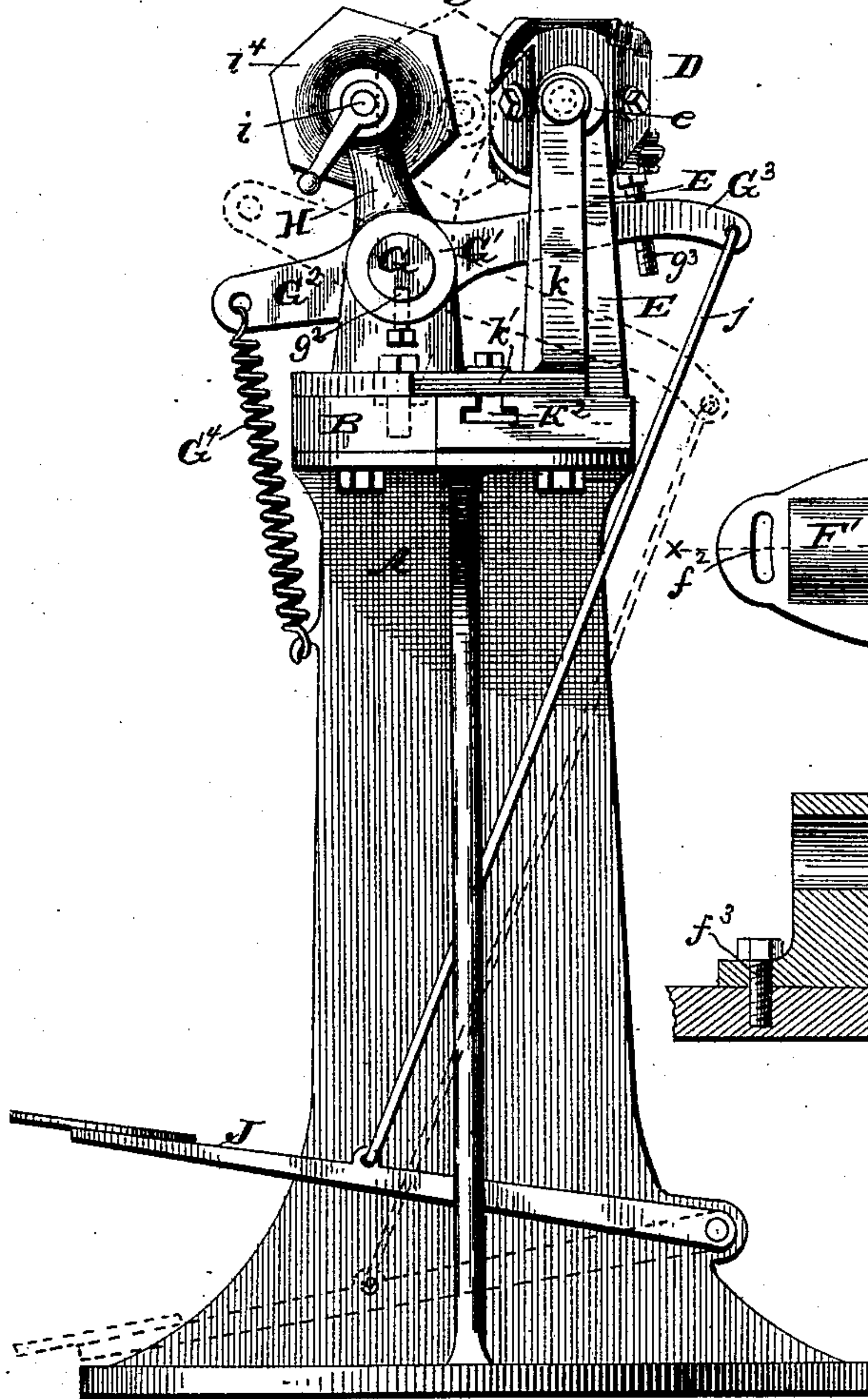


Fig. 6.

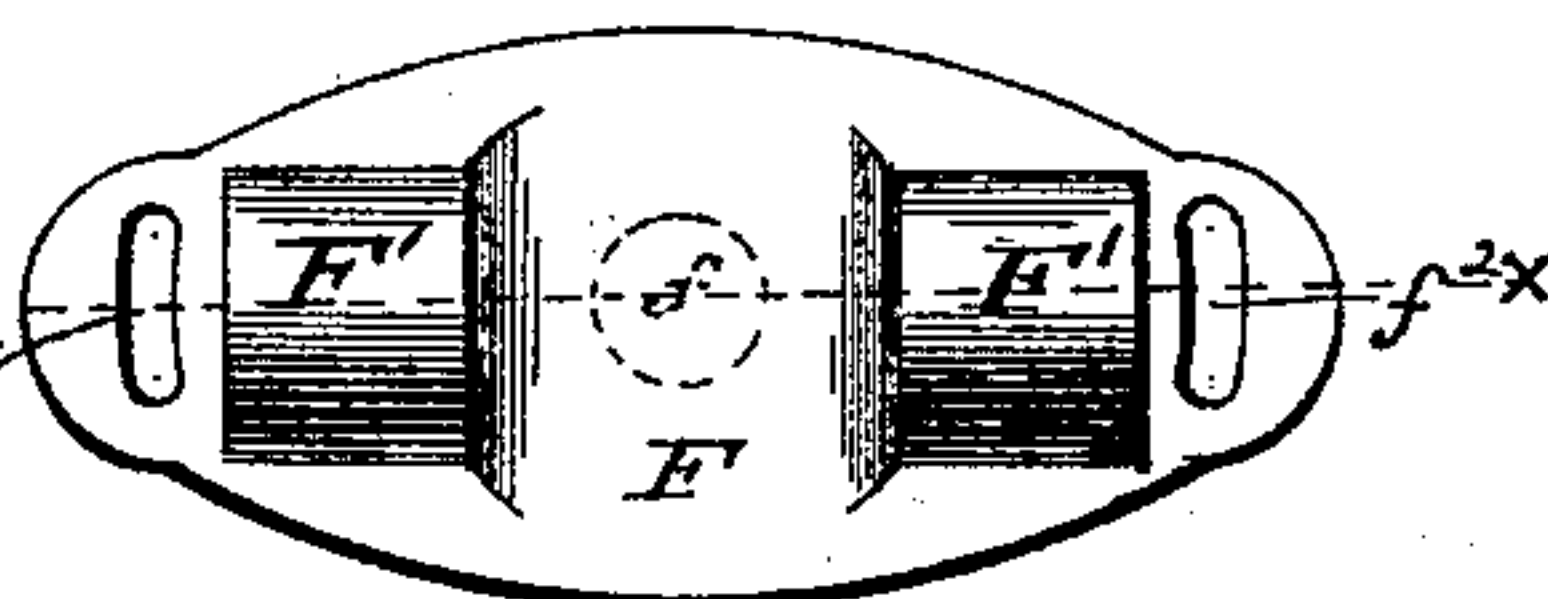


Fig. 7.

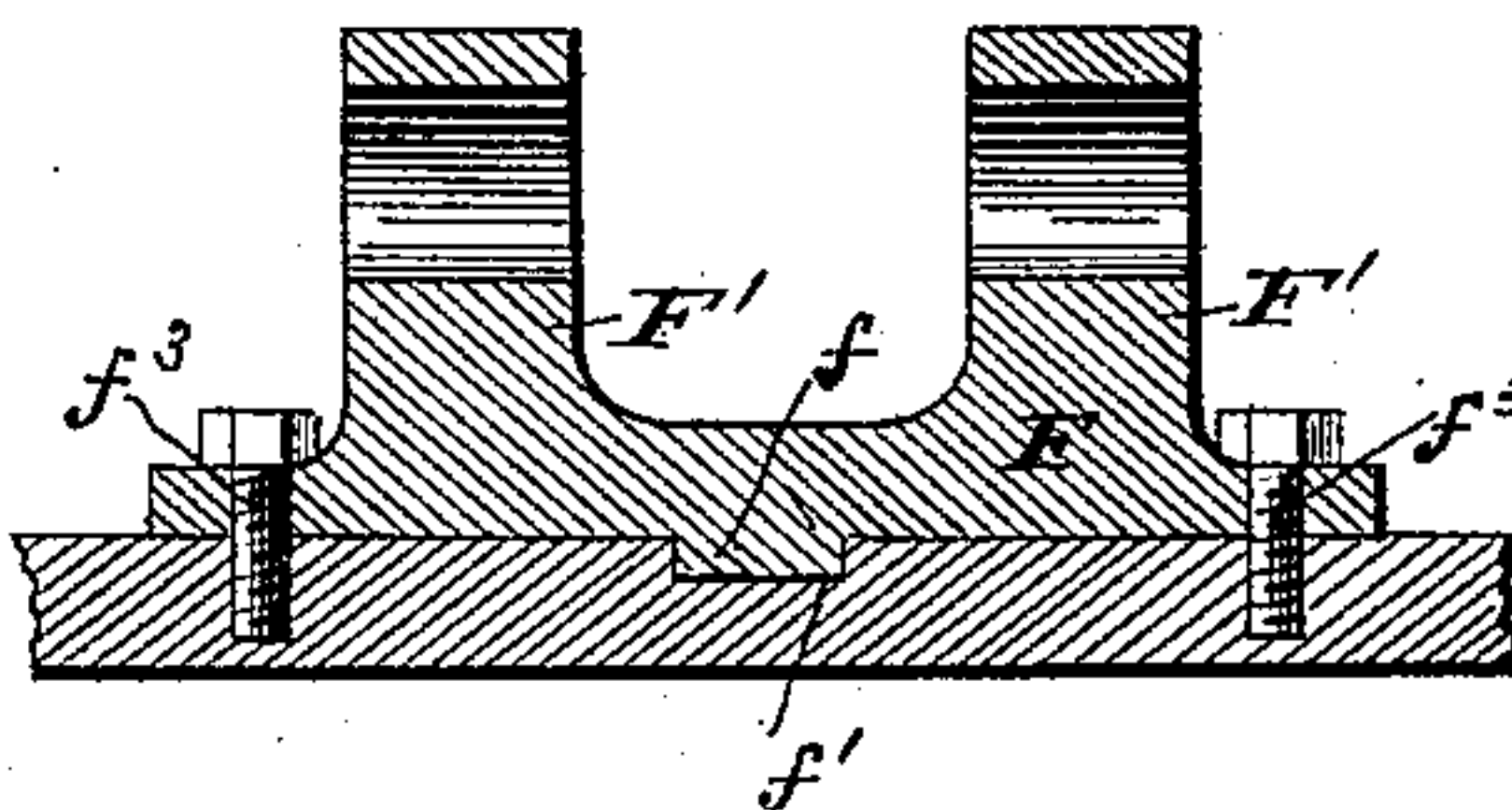


Fig. 9.

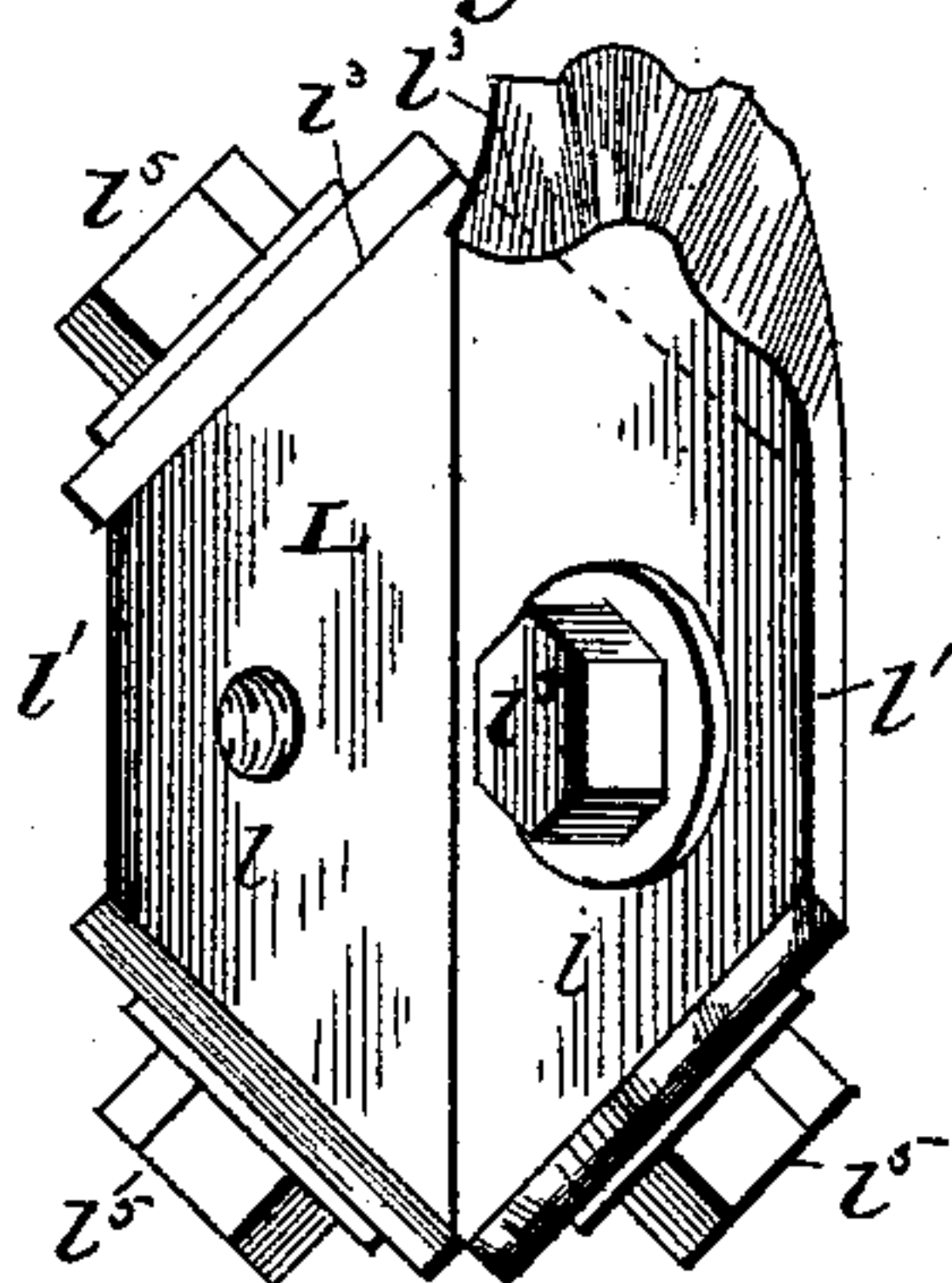


Fig. 8.

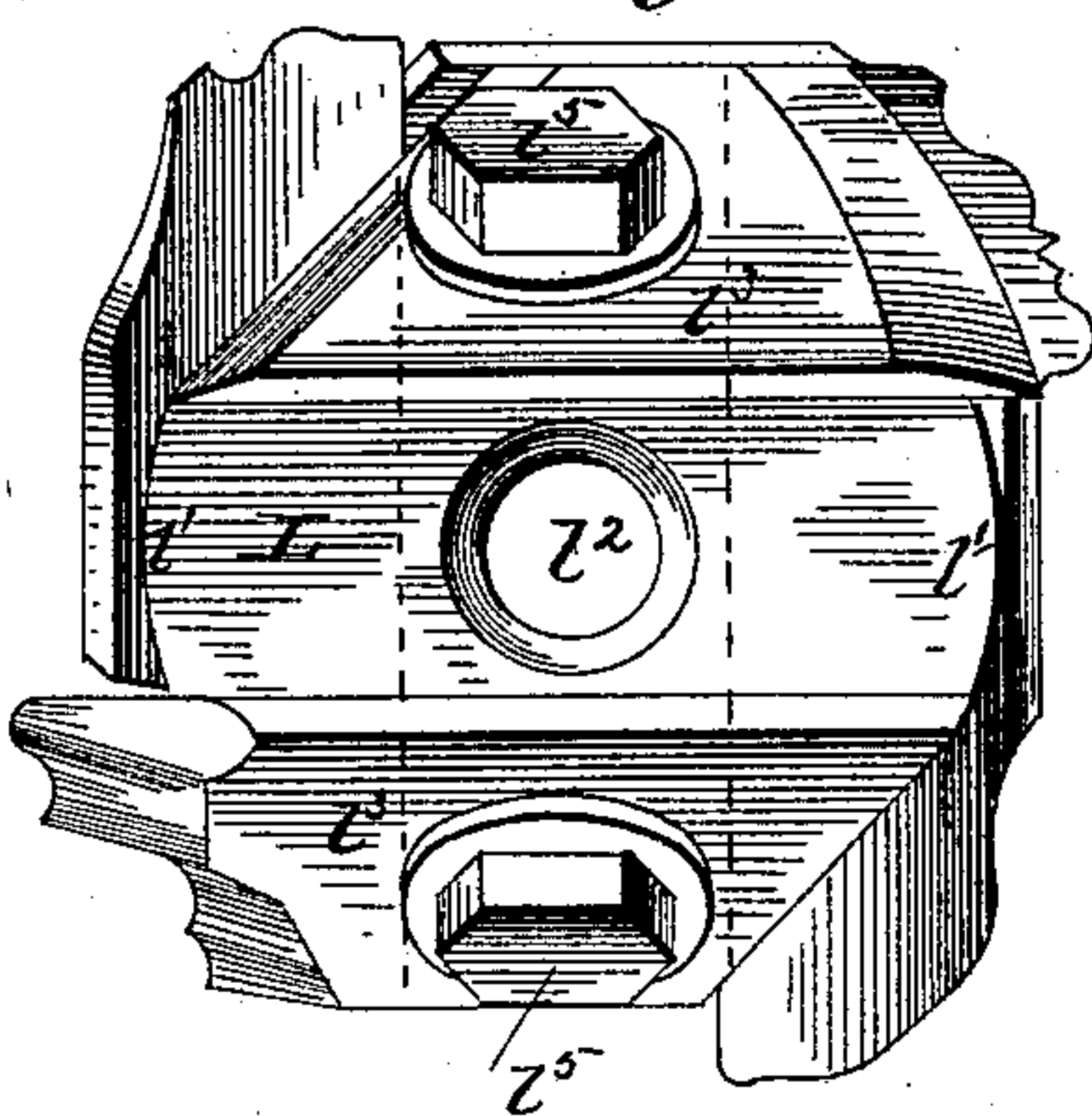
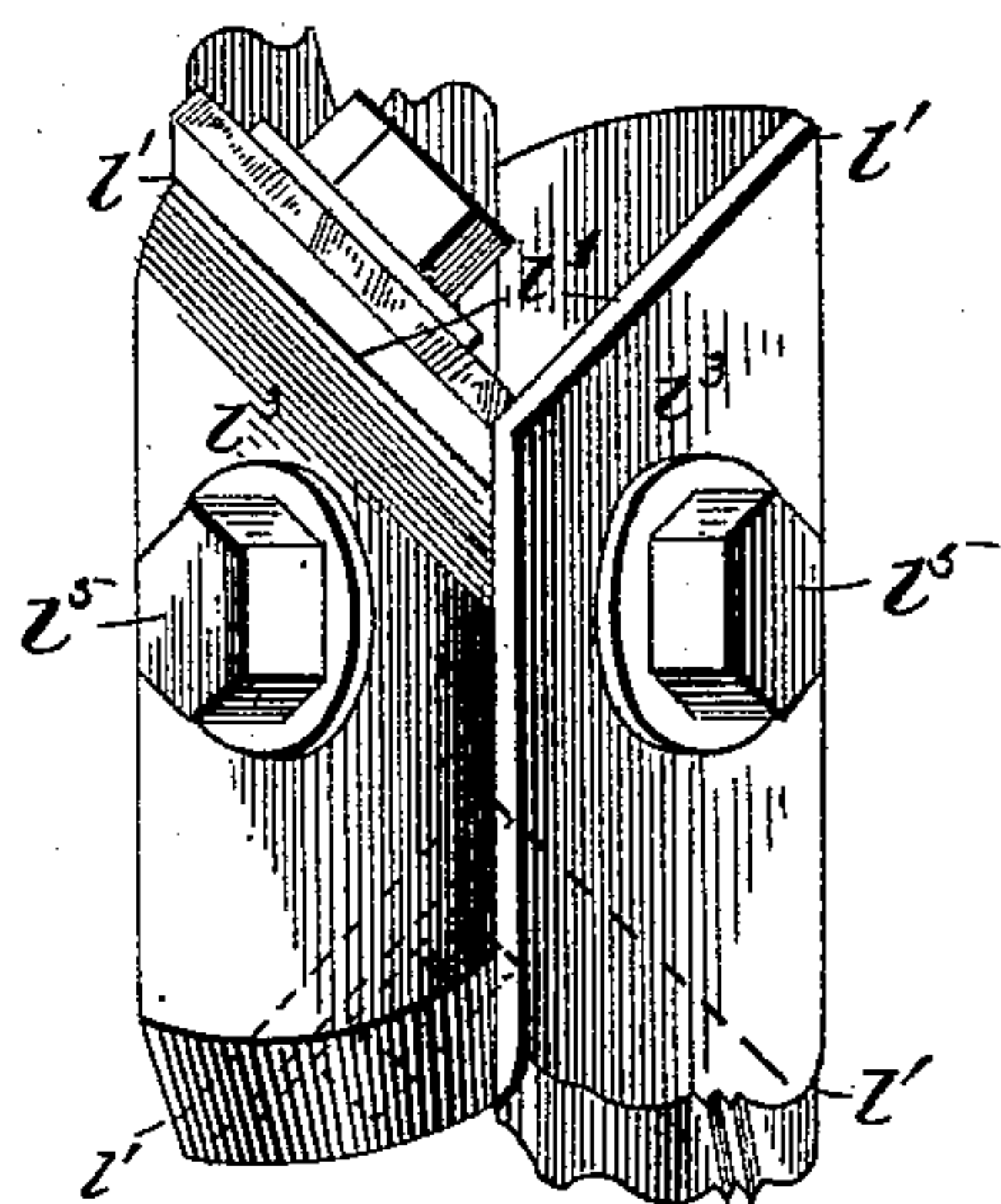


Fig. 10.



Witnesses;
F. H. Rutter
Wm. E. Dyer

Inventor
James Lee Simmons
by E. D. Walker
his Attorney

UNITED STATES PATENT OFFICE.

JAMES LEE SIMMONS, OF WASHINGTON, DISTRICT OF COLUMBIA.

TURNING-LATHE.

SPECIFICATION forming part of Letters Patent No. 444,465, dated January 13, 1891.

Application filed March 3, 1890. Serial No. 342,377. (No model.)

To all whom it may concern:

Be it known that I, JAMES LEE SIMMONS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Turning-Lathes for Turning Polygonal and Like Forms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to turning-lathes generally, but more especially to the class of lathes for turning objects of polygonal, oval, or like forms in cross-section.

The object of my invention is to provide a machine of the class described which will be cheap and simple in construction and in which the blanks to be operated on are presented one by one to the cutters and each blank being turned on all sides without removing the same from the machine or adjusting the same thereon during the operation, the sides or edges of the finished article being perfectly straight; also, to provide a machine which can be used either for turning objects having three or more straight or curved sides, as desired, without necessitating loss of time in changing the parts; and to this end my invention consists, first, in the combination, with stationary bearings and rotary cutters journaled therein, of a pivoted or rocking frame for feeding the material to the cutters and a pattern-plate and guide-roller for controlling the feed; second, in the combination, with the rotary cutters journaled in fixed bearings, of a vertically-pivoted frame carrying a horizontally pivoted or rocking frame for presenting the blank to be operated on to the cutters; third, in the combination, with the spur-centers mounted in a swing-frame, of a rotary pattern-shaft in line with the centering-screw and a longitudinally and laterally adjustable guide-roller for controlling the movement of the pattern-plate, and, finally, in certain other minor features of construction and combination of parts, which will be hereinafter more fully described, and distinctly pointed out in the claims.

In order that my invention may be more clearly understood, I have illustrated in the

accompanying drawings a machine which I am now using with practical success, and in which—

Figure 1 is a side elevation of my improved machine provided with cutters and patterns for turning hexagonal balusters. Fig. 2 is a top plan of the same. Fig. 3 is an end view looking toward the pattern end of the machine. Fig. 4 is a detached vertical section of the pattern, showing the manner of securing the same to the crank-shaft. Fig. 5 is a detached view of a hexagonal pattern, showing the spur-ended crank-shaft for centering the baluster or other object to be operated on. Fig. 6 is a plan view of the vertically-pivoted frame carrying the rocking blank-frame. Fig. 7 is a vertical section on the line $x x$ of Fig. 6. Fig. 8 is an end elevation of one of the cutter-heads. Fig. 9 is a side view of the cutter-head looking in the direction of the arrow. Fig. 10 is a similar view of the same looking at right angles to Fig. 9.

The same letters of reference indicate identical parts in all of the figures.

In the drawings, A represents the base or pedestal of the machine, at the top of which is secured the bed-plate B, provided with two standards $b b$. Journaled in bearings at the upper ends of said standards is a rotary cutter-shaft C, provided intermediate the standards with a pulley C', by which rotary motion is imparted to said shaft.

Mounted on the shaft C, outside the bearings $b' b'$, are two cutter-heads D D', the cutter-head D of which being of a size and shape suitable for cutting the base or larger molding of a baluster, while the cutter-head D' is located at the opposite end of the shaft C in position to cut the top or small molding of the baluster, and in order to firmly secure the cutter-heads to the shaft C, I provide said shaft near each end with a screw-thread adapted to receive a jam-nut $d d$, by which the cutter-heads may be clamped against the shoulders or collars formed on the shaft outside the bearings.

In order to prevent vibration of the ends of the cutter-shaft, I secure to the bed-plate B two movable standards E E, having bearings $e e$ at their upper ends adapted to slide

over the projecting ends of the shaft C and more firmly support the same.

A plate F, having two short standards F' F' formed thereon, is secured to the bed B, and in bearings in said standards is journaled a rock-shaft G, which is capable of longitudinal adjustment therein, and in order to retain said rock-shaft in a fixed position longitudinally I provide the same with adjustable collars g g and set-screws g' g' .

Mounted on the rock-shaft G are two sliding upright arms H H', forming, respectively, the head and tail stocks, as in ordinary wood-lathes, and provided with set-screws h h on their under sides, which engage a longitudinal groove g^2 in the under side of the shaft, by which means the head and tail stocks may be adjustably secured to said shaft at all times in the same radial line.

In the upper end of the tail-stock H' is an ordinary screw h^2 , provided at its inner end with the usual female back center and at its outer end with a jam-nut h^3 and hand-wheel or crank h^4 , and in the head-stock H is journaled a short shaft i , also provided at its inner end with the usual spur-centers i' and at its outer end with a hand-wheel or crank i^2 .

Mounted on the shaft i , just back of the spur end, is a disk i^3 , having an enlarged hub and set-screw by which it is secured to the shaft, and to this disk i^3 is removably secured a pattern-plate i^4 , as shown in Fig. 4, said pattern-plate being provided with a central opening i^5 , corresponding in shape and size to the cross-section of the blank to be operated on, and the periphery or outer contour of said blank corresponding in shape to the desired cross-section of the finished article.

In case it is desired to turn an article smaller at one end than at the other, I make the plate F, carrying the short standards F' F', adjustable on the bed-plate B, and in this connection I have found it both convenient and desirable to adjust one end of the blank-frame toward one cutter, while the other end is adjusted away from the opposite cutter, and to facilitate such adjustment I form on the under side of the plate F at a point midway between the standards F' F' and vertically in line with the axis of the shaft G a circular offset f , adapted to fit in a correspondingly-shaped cavity f' in the bed-plate B, and in the ends of said plate F, I form segmental slots f^2 , through which pass securing-bolts f^3 , screw-threaded into the bed B.

In order that the blank to be operated on may be held normally out of contact with or away from the cutter-heads, I secure to the rock-shaft G, preferably between the bearings, a collar or sleeve G', provided with forwardly and rearwardly projecting lever-arms G² G³, the short or forward arm of which is acted on by a spring G⁴ or its equivalent to hold the blank-frame away from the cutters, as shown in Fig. 3.

The end of the long or rearward arm is connected by means of a rod or flexible strap-

connection j with a foot-lever J, pivoted to the base of the machine near the lower end thereof.

Secured to the bed B, substantially in line with the pattern, is an upright arm k , having an elongated base k' extending across the bed B, in which base k' is a slot K, through which passes a clamping-nut K', having a T-shaped head fitting in a correspondingly-T-shaped longitudinal groove K² in the bed B, by which means the upright k can be adjusted both longitudinally and crosswise of the bed B, and at the upper end of the upright, in the horizontal plane of the axis of the cutter-shaft, is mounted a roller k^3 , adapted to rotate in contact with the edge of the blank pattern-plate i^4 and control the feeding of the blank to the cutters, and consequently the form of the finished article.

In turning circular objects on my improved machine I dispense with the use of a pattern-plate and guide-roller, the feeding of the blank to the cutters being limited by an adjusting-nut g^3 in the arm G³ in position to strike against the bed-plate B in its downward movement, the upward movement of the arm G³ being limited by said adjusting-nut striking against the bearing b' .

The cutter-head which I prefer to employ consists of a block L, having two of its opposite sides l l inclined inwardly at an angle of about forty-five degrees (45°) from each end l' l' toward the shaft-opening l^2 , midway between the two ends, and forming a V-shaped groove on two of its opposite sides, while the remaining two sides l^3 l^3 are inclined at a similar angle from the ends l' l' , but in a direction reverse to the sides l l —that is, away from the shaft-opening l^2 , forming a Λ -shaped projection on the two sides at right angles to the V-shaped sides. By this construction of the cutter-head block I am enabled by means of screw-bolts l^5 to secure the cutter-blades to the block L at an angle of forty-five degrees to the horizontal plane of the shaft, whereby a shearing or carving cut is obtained. I am also enabled by this construction to secure the knives on opposite sides of the block at right angles to each other, which arrangement is of special importance in turning moldings—such, for instance, as the upper and lower moldings on balusters—as the cutter or cutters on the right-hand side l^3 of the central line will cut one half of the molding, while the cutter or cutters on the left-hand side of said line will cut the remaining half of the molding.

In the drawings I have shown the cutter-head D of double the length of the cutter-head D' in order that a double molding may be cut, such as the large or base molding of a baluster.

While I have shown and described my improved machine as especially adapted for turning polygonal forms, I do not wish to be limited thereto, as other forms can be turned thereon without necessitating the change of

parts—such, for instance, as triangular, square, diamond, and any form of polygonal, circular, semicircular, oval, elliptical, or other forms—by simply changing the pattern-plate to correspond in shape to the cross-section of the article desired.

The operation of my invention is as follows:

A pattern-plate such as that shown in the drawings is secured centrally to the disk *i*, as shown in Fig. 4. One end of the blank is then inserted in the opening in the pattern-plate and clamped between the spur and back centers *i'* and *h'* in the usual manner. The cutter-heads having been previously set in motion, the operator presses down the foot-lever, which, through the medium of the connecting-rod *j* and lever *G*³, rocks the shaft *G* and head and tail stocks *H* and *H'* toward the cutters and presents the blank to the cutters until the pattern-plate strikes against the guide-roller *K*. As the blank is cut by the cutters the operator gradually turns the crank or hand-wheel *i'*, and with it the pattern-plate and blank, and as the angle of the pattern-plate passes the guide-roller *K* the blank-frame is forced away from the cutters, and as the guide-roller *K* gradually approaches the point on the pattern midway between the angles thereon the blank is gradually fed toward the cutter. As soon as the blank has made one revolution the foot-lever is released, and the spring acting on the opposite end of the lever *G* returns the blank-frame to its normal position away from the cutter, when the finished article is removed and a new blank inserted and the operation proceeded with as before. The guide-roller *K* being adjustable to and from the pattern-plate allows for the turning of articles of different sizes in cross-section by simply moving it toward the pattern when it is desired to turn articles of large dimension and from the pattern when a smaller article is to be turned. In case it is desired to turn articles of comparatively short length the head and tail stocks are slid on the shaft *G* toward the cutter-heads, the guide-roller *K* being correspondingly adjusted, so as to be in line with the pattern-plate. The standards *E E* being removable permits of the ready removal of one or both of the cutter-heads.

The advantages of my improved machine will be readily appreciated by those skilled in the art to which it appertains, as it is simple and cheap in construction and capable of turning a great variety of forms, can be operated by any apprentice boy, and in case of square or straight-edged forms the edges are absolutely straight, while in all the known machines for turning polygonal forms there is more or less curvature to the sides or edges.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a turning-lathe for turning balusters, &c., the combination, with the rotary cutter-

heads, of a vibrating blank-feeding frame horizontally journaled in a vertically-pivoted frame, a pattern carried by the blank-frame, and a laterally-adjustable guide-roller adapted to bear against the pattern, whereby on the adjustment of the guide-roller the blank may be turned more or less, as desired, substantially as and for the purposes described.

2. In a blank-frame for wood-working machines, the combination, with a rock-shaft horizontally adjustable about a fixed center, of head and tail stocks adjustable on said rock-shaft, a spur-centering shaft rotary on the head-stock, and means for rotating said shaft, substantially as described.

3. In a wood-working machine, the combination, with the cutters, of a rock-shaft, head and tail stocks adjustable on said shaft, a rotary spur-centering shaft journaled in the head-stock, a pattern-plate secured to the centering-shaft and having an opening surrounding said shaft and adapted to receive and center one end of the blank, and a guide-roller adapted to bear against said pattern-plate and control the feeding of the blank to the cutters, substantially as described.

4. In a wood-working machine, the combination, with the cutter-heads, of a blank-feed frame carrying head and tail stocks, a rotary spur-centering shaft mounted in one of said stocks, a removable pattern-plate on said frame, means for rotating the blank and pattern, and a longitudinally and laterally adjustable guide-roller adapted to bear against the pattern to control the feeding of the blank, substantially as described.

5. In a wood-working machine, the combination, with the blank-feeding frame provided with head and tail stocks, a spur-centering shaft journaled in the head-stock, and a pattern-plate secured to said centering-shaft and provided with a central opening corresponding in size and shape to the blank to be operated on, one face of said pattern projecting beyond the spur on said shaft, substantially as described.

6. In a turning-lathe for turning balusters and like articles, the combination, with the bed-plate having standards formed thereon, of a cutter-shaft journaled therein, one or more cutter-heads adjustably secured near the ends of said shaft, supplemental supports removably secured to the bed-plate and having bearings therein adapted to fit over the ends of said shaft, a vertically-pivoted frame adjustable on said bed, and a rocking blank-frame journaled in bearings on said frame, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES LEE SIMMONS.

Witnesses:

E. T. WALKER,
WM. E. DYRE.