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Patented Dec. 11, 1900.

J. L. GRAFFLIN.
KEY SEAT CUTTER.

(Application filed July 19, 1900)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

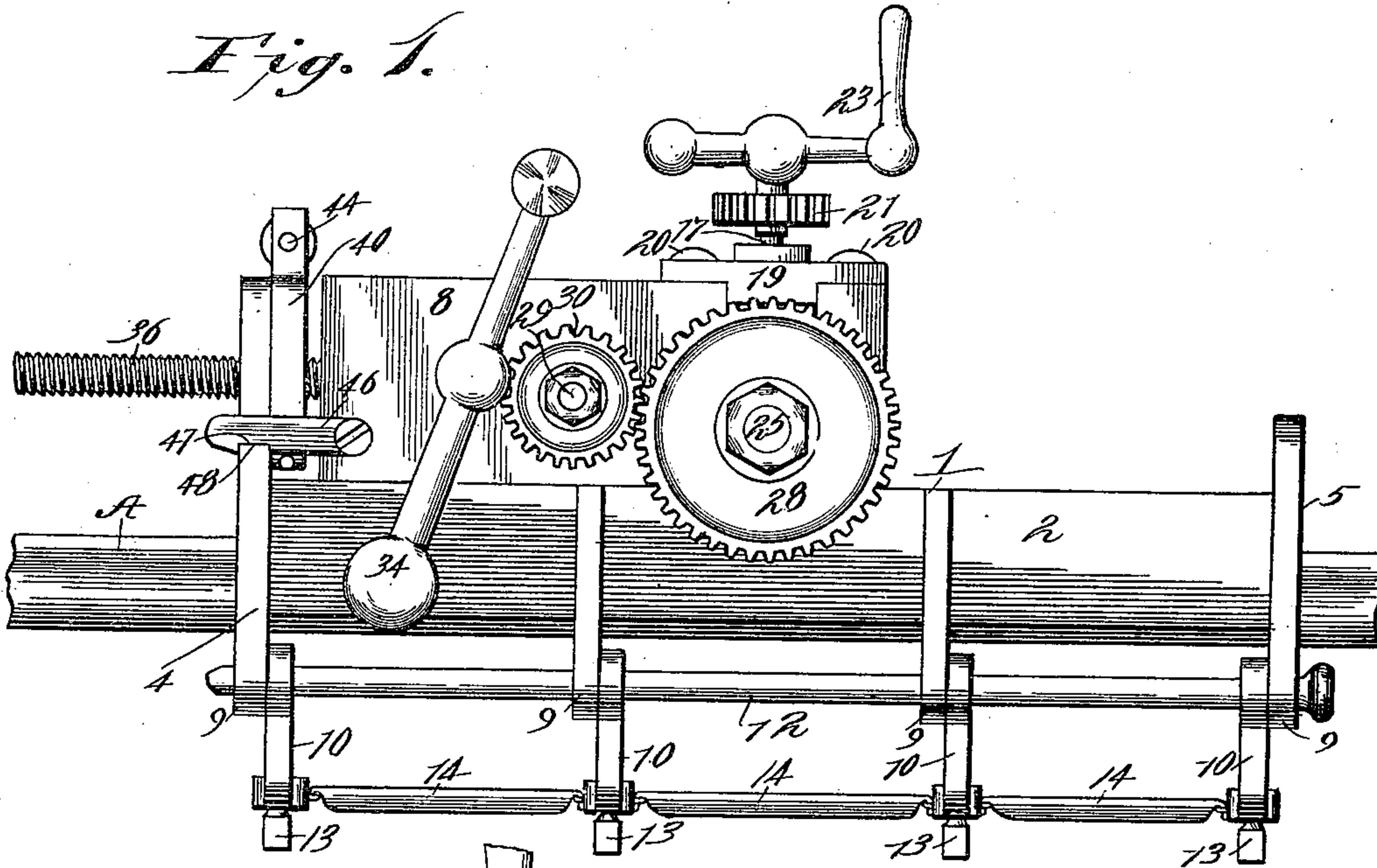
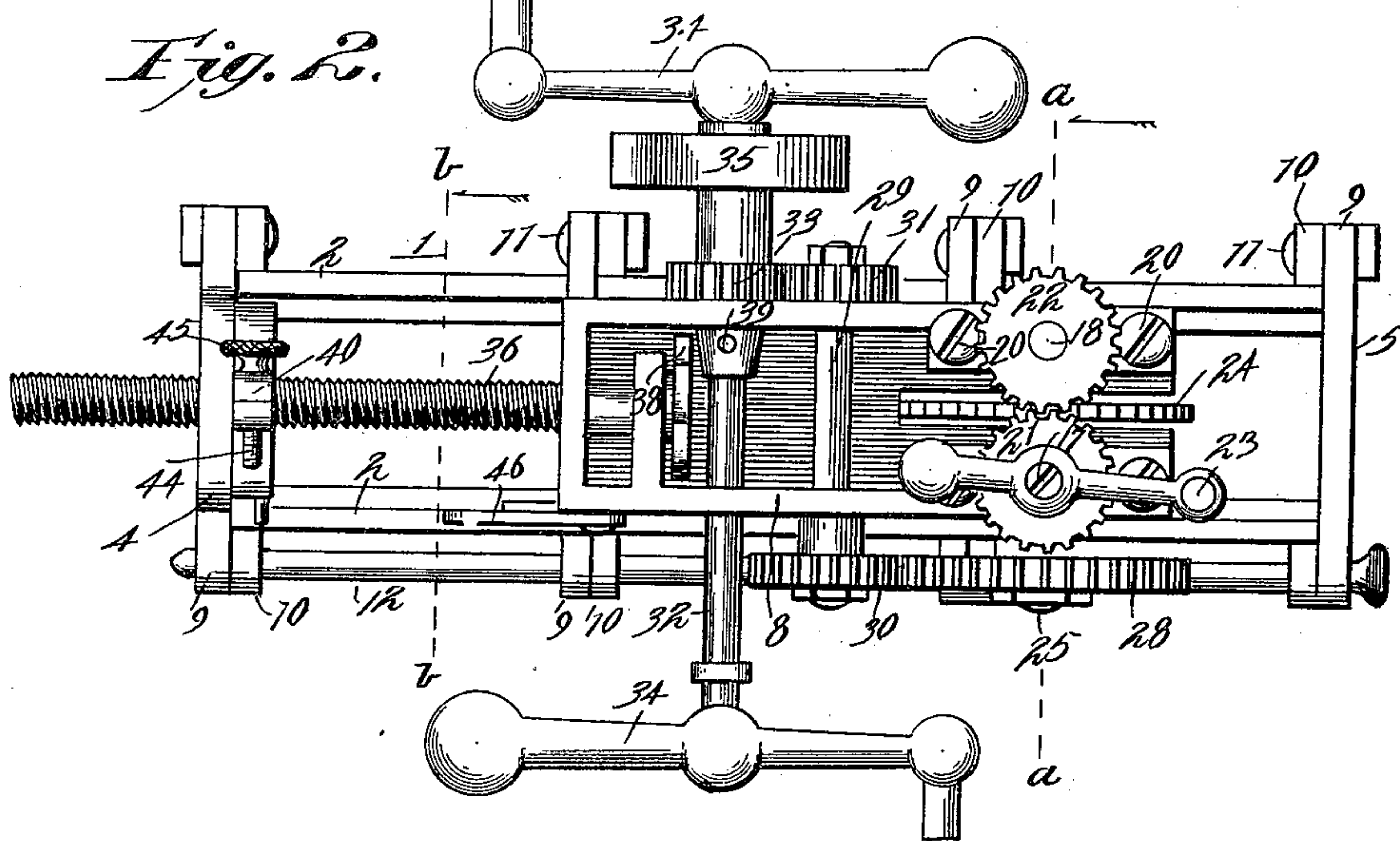


Fig. 2.



Witnesses
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2 Sheets—Sheet 2.

Fig. 3.

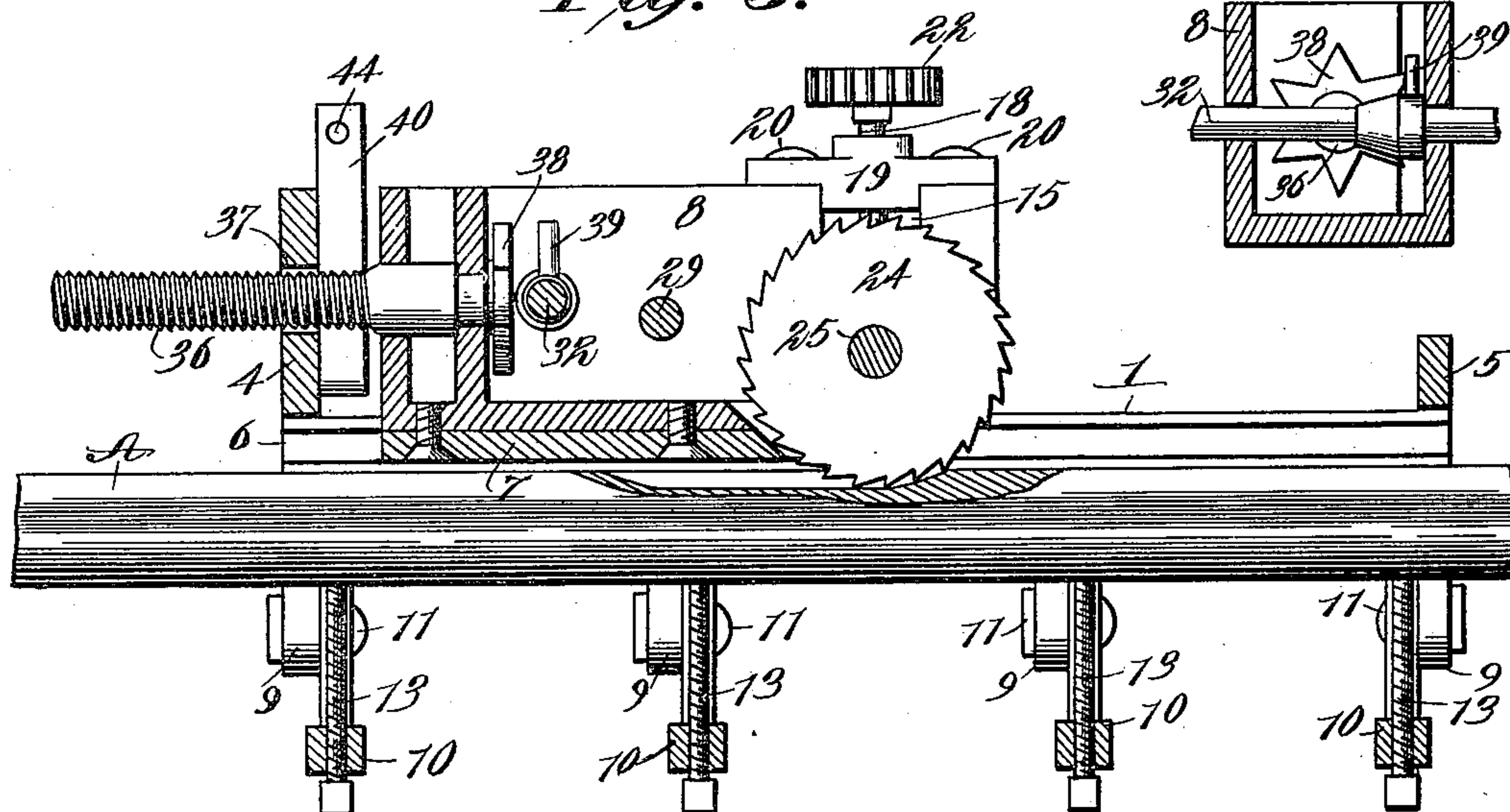


Fig. 6.

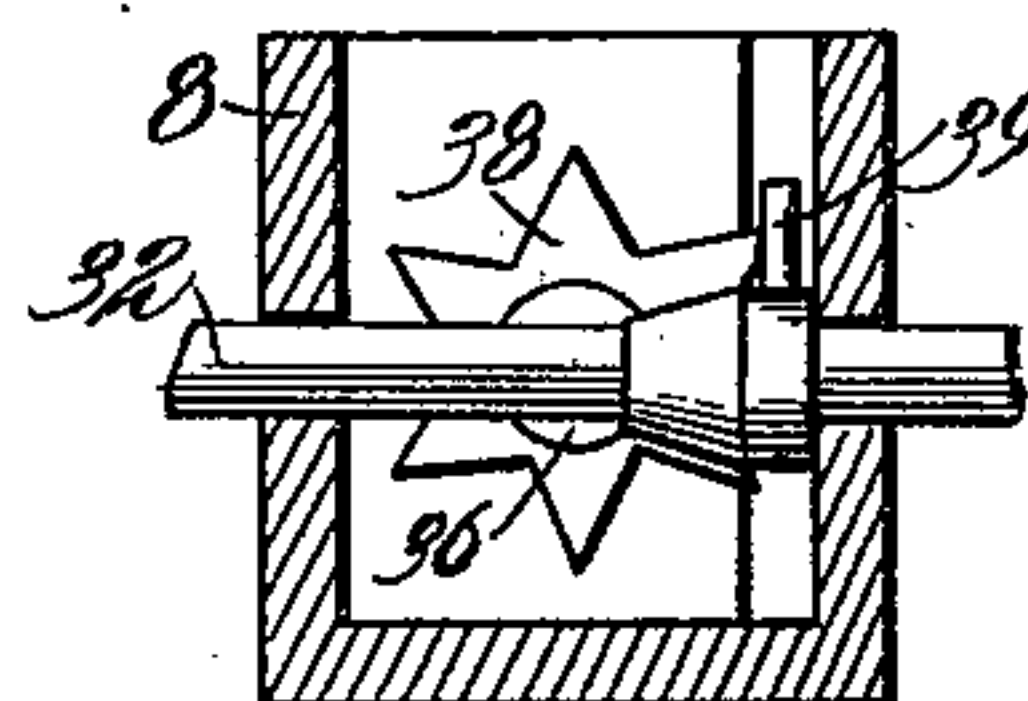


Fig. 4.

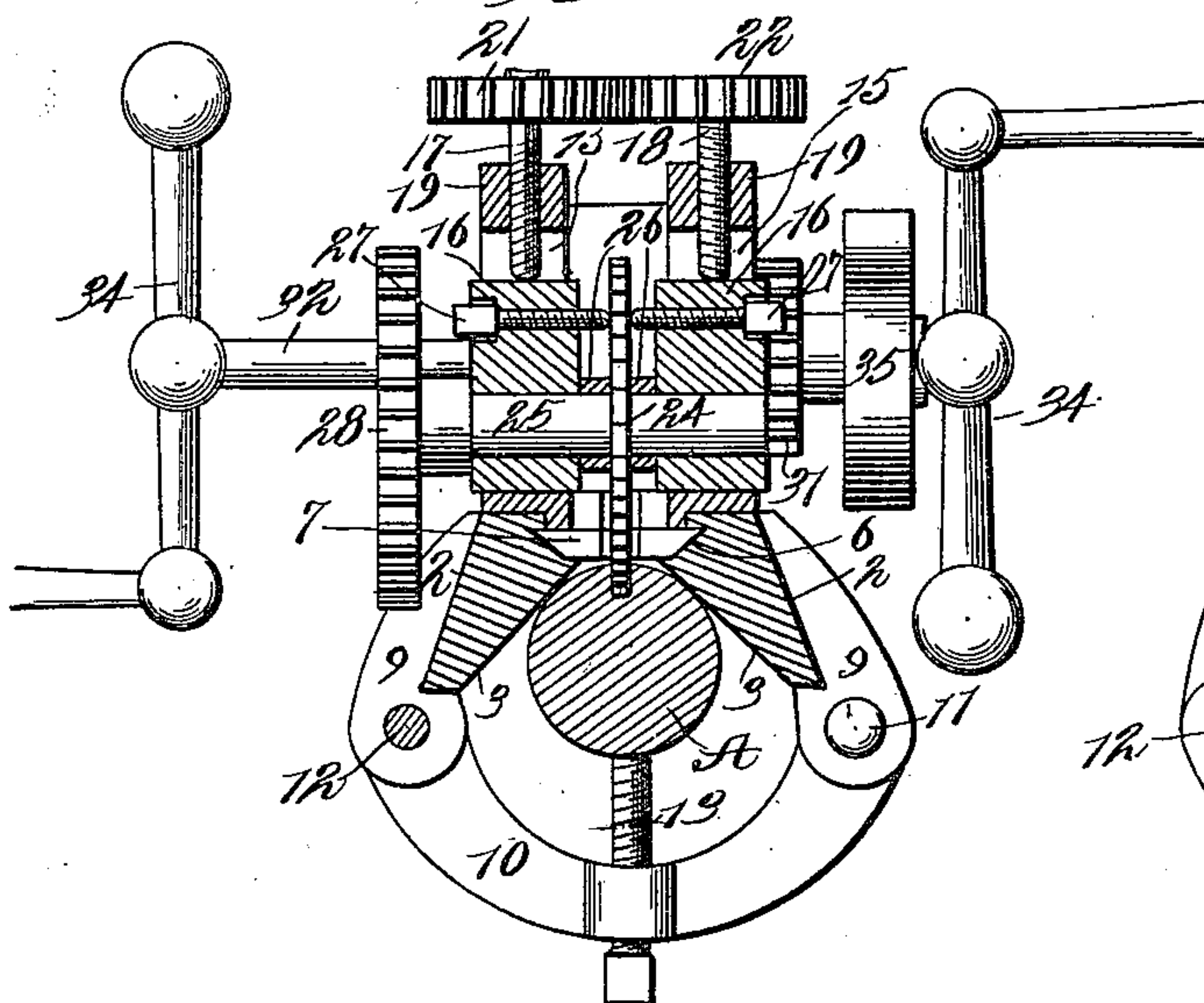
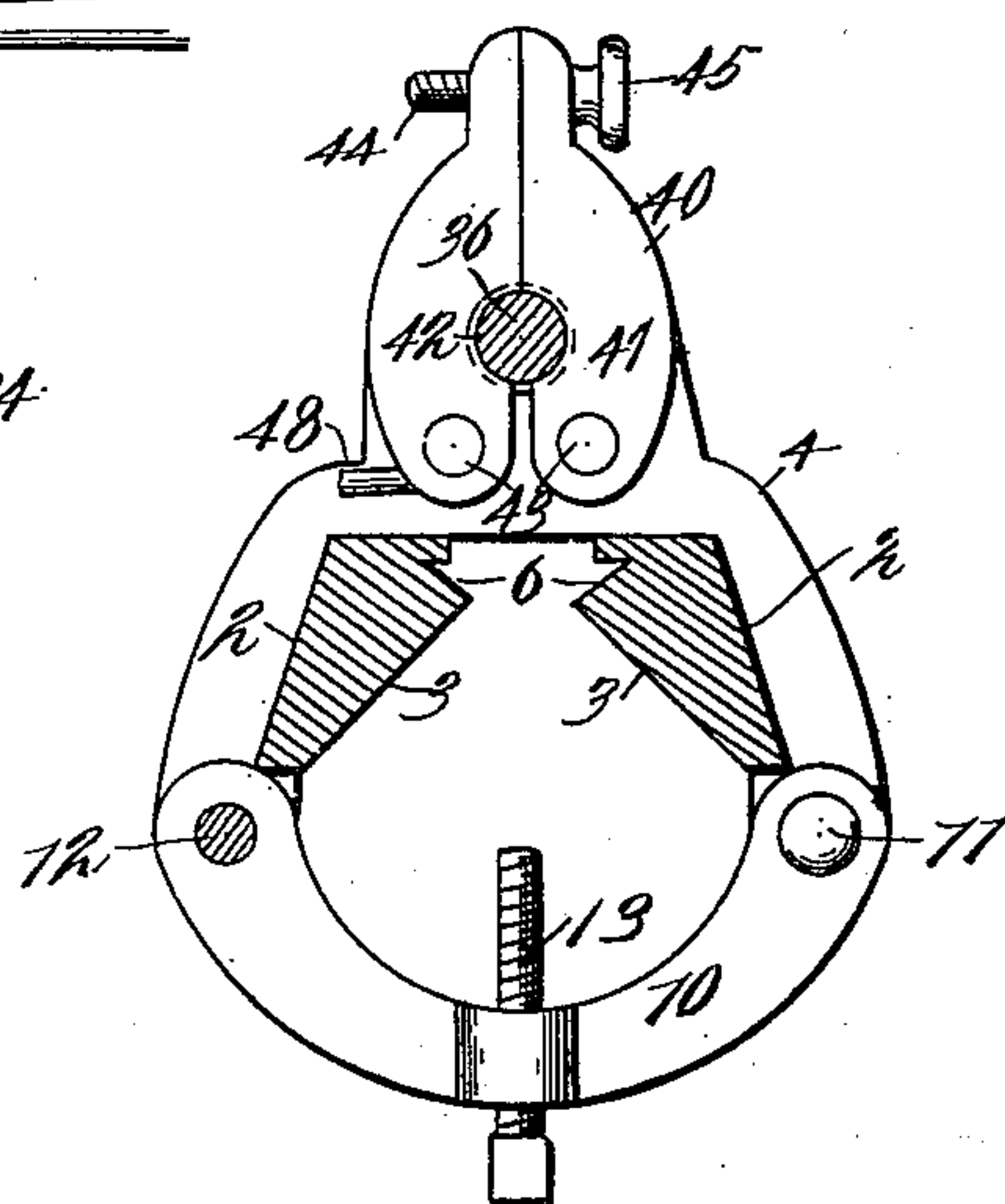


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN L. GRAFFLIN, OF WILMINGTON, NORTH CAROLINA.

KEY-SEAT CUTTER.

SPECIFICATION forming part of Letters Patent No. 663,569, dated December 11, 1900.

Application filed July 19, 1900. Serial No. 24,234. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. GRAFFLIN, a citizen of the United States, residing at Wilmington, in the county of New Hanover and State of North Carolina, have invented a new and useful Key-Seat Cutter, of which the following is a specification.

The invention is an improved machine for cutting key-seats on shafts, its object being to provide a simple and portable key-seat-cutting mechanism which is adapted to operate upon shafting placed in any position or of any diameter, the seat-forming devices having an automatic feed movement and being so controlled as to insure the formation of the key-seat in parallelism with the axis of the shaft operated upon.

The invention consists in the peculiar construction and combination of devices herein-after fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a machine for cutting key-seats constructed in accordance with my invention, the carriage being shown in its initial position attached to one end of the guide-frame and secured against longitudinal movement. Fig. 2 is a top plan view of the same, the carriage being shown in the position assumed thereby during the cutting of a key-seat after the carriage has been disconnected from the end of the guide-frame. Fig. 3 is a vertical longitudinal sectional view of the same, the carriage being in the same position as that shown in Fig. 1. Fig. 4 is a vertical transverse sectional view of the same, taken on the line *a a* of Fig. 2. Fig. 5 is a similar view taken on the line *b b* of Fig. 2. Fig. 6 is a detail view of the coacting mechanism for transmitting power from the crank-shaft to the feed-screw.

The guide-frame 1 comprises the parallel bars 2, having opposing faces 3 disposed at right angles to each other and adapted to fit upon a shaft A of any diameter. The said side bars are connected together at their ends by heads 4 5 and are provided upon their opposing sides with dovetailed grooves 6, which are engaged by the similarly-shaped sides of the plate 7, which is bolted or otherwise suitably secured to the bottom of the carriage 8. Thereby the said carriage is secured on the

guide-frame and is adapted to slide longitudinally thereon and to be maintained under all conditions in exact parallelism with the axis of the shaft on which the machine may be operating to cut a key-seat. Formed with the side bars 2, on the outer sides thereof, are lugs 9, which extend below the lower sides of the side bars, and to the said lugs are secured the ends of curved cross-braces 10 by means of pivotal bolts 11 on one side of the guide-frame and a locking-bolt 12 on the opposite side thereof, which locking-bolt when the crossed braces are closed, so as to dispose the shaft A between them and the guide-frame, passes through registering openings in the free ends of the cross-braces and in the lugs with which they coact, as shown in Figs. 1, 4, and 5. The said cross-braces carry clamping-screws 13, which by engagement with the shaft serve to clamp the frame firmly thereon. Suitable drip-pans 14 to receive the oil which drips from the shaft when a key-seat is being cut therein may be secured to the cross-braces, as shown in Fig. 1.

The carriage 8 is provided with guide-slots 15 in its sides, arranged opposite each other, which guide-slots are at right angles to the axis of the shaft. Bearing-blocks 16 are disposed in the said guide-slots and adapted to move therein toward and from the shaft, and a pair of oppositely-threaded screws 17 18 operate in threaded openings in spanner-blocks 19, which close the outer ends of the slots 15 and are bolted or otherwise secured on the sides of the carriage, as at 20. The screws 17 18 are respectively provided with gears 21 22 of like diameter, which are in engagement with each other, and thereby the said screws are caused to rotate in unison and at the same rate of speed, the respective screw-threads thereon being of the same pitch. The screw 17 is provided at its outer end with a crank-handle 23, whereby it may be rotated. The cutting-wheel 24, which may be of any required diameter, has its arbor 25 journaled in the blocks 16, and the said cutter-wheel is centered with relation to the sides of the frame 1 and coincides with a plane intersecting the axis of the shaft and parallel therewith. Any suitable means may be provided for thus centering the cutting-wheel. In the drawings, Fig. 4 thereof, I show collars 26 on the arbor

between the cutting-wheels and the opposing sides of the bearing-blocks 16, and also show centering-screws 27, which operate in threaded openings in said bearing-blocks and engage oppositesides of the cutting-wheel. The arbor 25 of the cutting-wheel is provided at one end with a spur gear-wheel 28.

An idle shaft 29 is journaled in bearings in the sides of the carriage 8, is provided at one end with a spur-gear 30, which engages the spur-gear 28, and is provided at its opposite end with a spur-gear 31. A crank-shaft 32, which is the power-shaft, is journaled in bearings in the sides of the carriage and is provided with a spur-gear 33, which engages the gear 31. On the ends of shaft 32 are crank-handles 34, whereby said shaft may be manually rotated, and, if preferred, pawl-and-ratchet mechanisms may be employed in connection with said shaft and said crank-handles, whereby said shaft may be rotated by oscillating the crank-handles alternately, thus enabling the machine to be operated in contracted spaces which would not admit of the rotation of the crank-handles. The crank-shaft is further provided with a power-pulley 35, by means of which power may be communicated to the shaft from an engine or other suitable source of power through an endless belt, as will be understood. A feed-screw 36 is swiveled in one end of the carriage. The said feed-screw passes through an unthreaded opening 37 in the head 4 of frame 1, which opening is of larger diameter than said feed-screw. To the inner end of the feed-screw is secured a star-wheel 38, which is rotated by a step-by-step movement by a pin 39, which projects from the crank-shaft 32 when the latter is turned. A split nut 40 has its sections 41 42 pivotally connected at their inner sides to the head 4, as at 43. The said split nut is adapted to engage the feed-screw 36 and to disengage the same when the sections of the split nut are moved from each other. A screw 44, which has a milled head 45, whereby it may be turned by the fingers of a machinist, connects the outer ends of the sections of the split nut, and by means of said screw the said split nut may be caused to engage or disengage the feed-screw, as will be understood.

A link 46 has one end pivotally attached to one side of the carriage 8, near the outer end of the carriage, and said link is provided on its under side near its outer end with a shouldered recess 47, which is adapted to engage a shoulder 48, formed on the head 4, in order to lock the carriage 8 to the said head when said carriage is at the inner limit of its movement on the frame 1 in its initial position. (Shown in Figs. 1 and 2.) When in this position, the split nut is opened and disengaged from the feed-screw.

The operation of my invention is as follows: When the machine has been secured on the shaft and the cutting-wheel appropriately disposed in relation thereto, the carriage be-

ing locked against longitudinal movement, as shown in Figs. 1 and 3 and hereinbefore described, the shaft 32 is rotated in such direction as to cause the arbor carrying the cutting-wheel to rotate the latter in the direction required to operate said cutting-wheel, and the crank 23 is turned from time to time, so as to move the cutting-wheel toward the center of the shaft, the cutting-wheel reaming out one end of the key-seat. The depth of the key-seat is determined by the size of the cutting-wheel, and in practice the machine will be provided with a number of such cutting-wheels of varying sizes, and hence adapted to cut key-seats of any required depth. Having thus cut one end of the key-seat, the link 46 is then unhooked from the head 4, thus freeing the carriage, the split nut is caused to engage the free screw, and thereafter as the shaft 32 is rotated the step-by-step rotation of the feed-screw causes the carriage, with its cutting-wheel, to move slowly in the direction indicated by the arrow in Fig. 1, thereby elongating the cut initially made in the shaft by the cutting-wheel, and hence cutting a key-seat of any required length.

It will be understood that the carriage may be provided with a suitable oil-can to supply lubricant to the cutting-wheel.

Having thus described my invention, I claim—

1. In a machine for cutting key-seats in shafting, the combination of a supporting guide-frame having means to clamp the same to a shaft, a carriage movable longitudinally on said supporting guide-frame, a feed-screw connected to said carriage, a nut secured to the supporting guide-frame, means to engage said nut with said feed-screw and disengage the same therefrom, a cutting-wheel having its arbor mounted in the carriage, a power-shaft and connections between the same and the feed-screw, to rotate the latter by a step-by-step movement, connections between said power-shaft and cutting-wheel arbor to rotate the latter, and means to lock the carriage to the guide-frame against longitudinal movement and release the same therefrom, substantially as described.

2. In a machine for cutting key-seats in shafting, the combination with a guide-frame and means to clamp the same to a shaft, of a carriage movable longitudinally on the guide-frame, movable bearing-blocks in guideways with which the carriage is provided, a cutting-wheel having its arbor journaled in said bearing-blocks, oppositely-threaded screws to move said bearing-blocks toward the shaft, and gears connecting said screws, whereby the latter are adapted to rotate in unison, substantially as described.

3. In a machine for cutting key-seats in shafting, the combination of a supporting guide-frame having means to clamp the same to a shaft, a carriage movable longitudinally on said supporting guide-frame, a feed-screw connected to said carriage and having a star-

5 wheel, a split nut secured to the supporting guide-frame and adapted to engage and disengage said feed-screw, a link to lock the carriage against longitudinal movement, a cutting-wheel having its arbor mounted in said carriage, a power-shaft having a pin coacting with said star-wheel to rotate said feed-screw by a step-by-step movement, and connections between said power-shaft and said cutting-

wheel arbor to rotate the latter, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN L. GRAFFLIN.

Witnesses:

FRANK H. STEDMAN,
JUSTIN M. BUNTING.