No. 731,121. PATENTED JUNE 16, 1903.

R. M. NUTTALL.

DIE HEAD FOR LATHES.

APPLICATION FILED JUNE 30, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

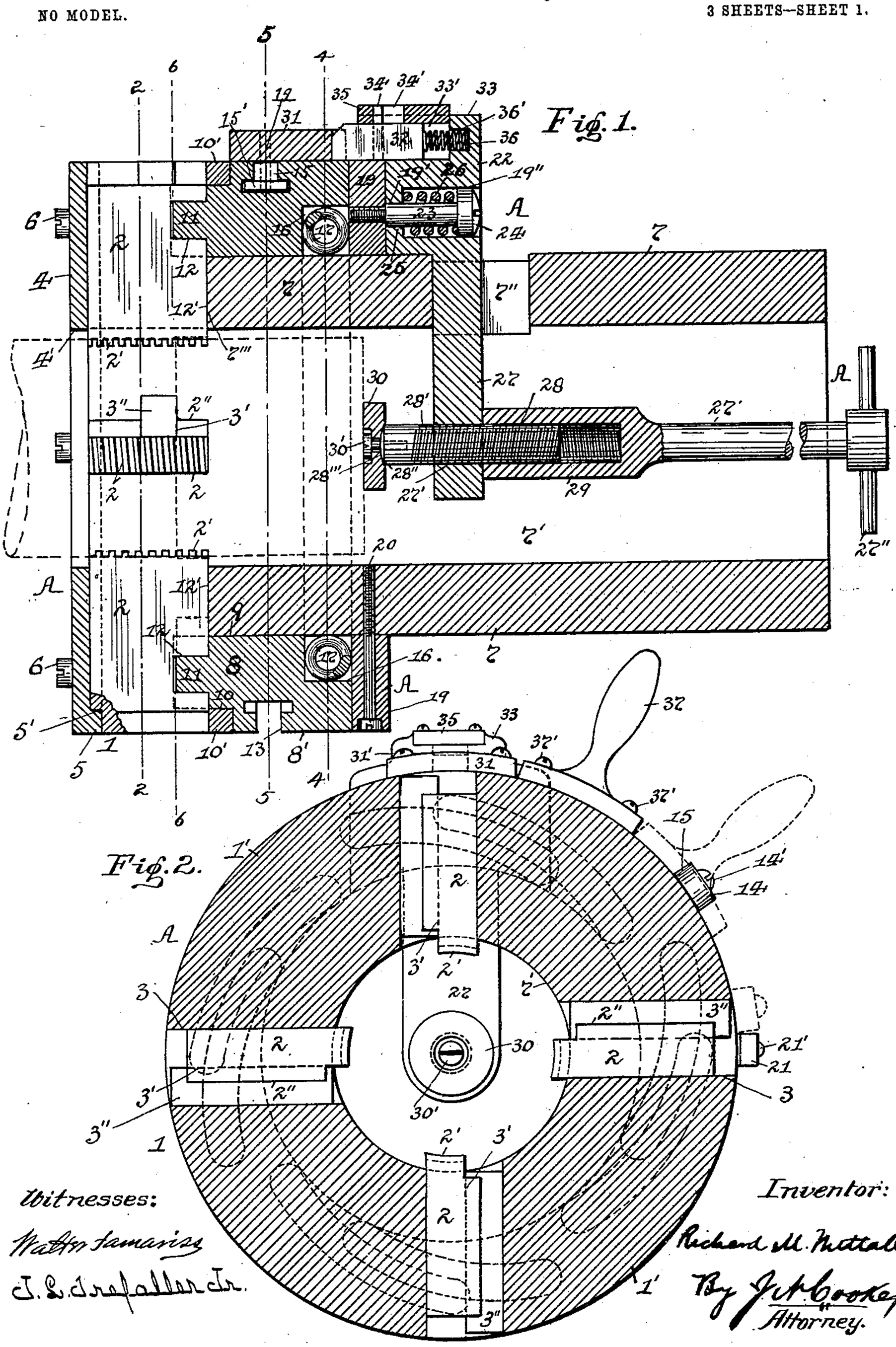

Fig. 2.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.

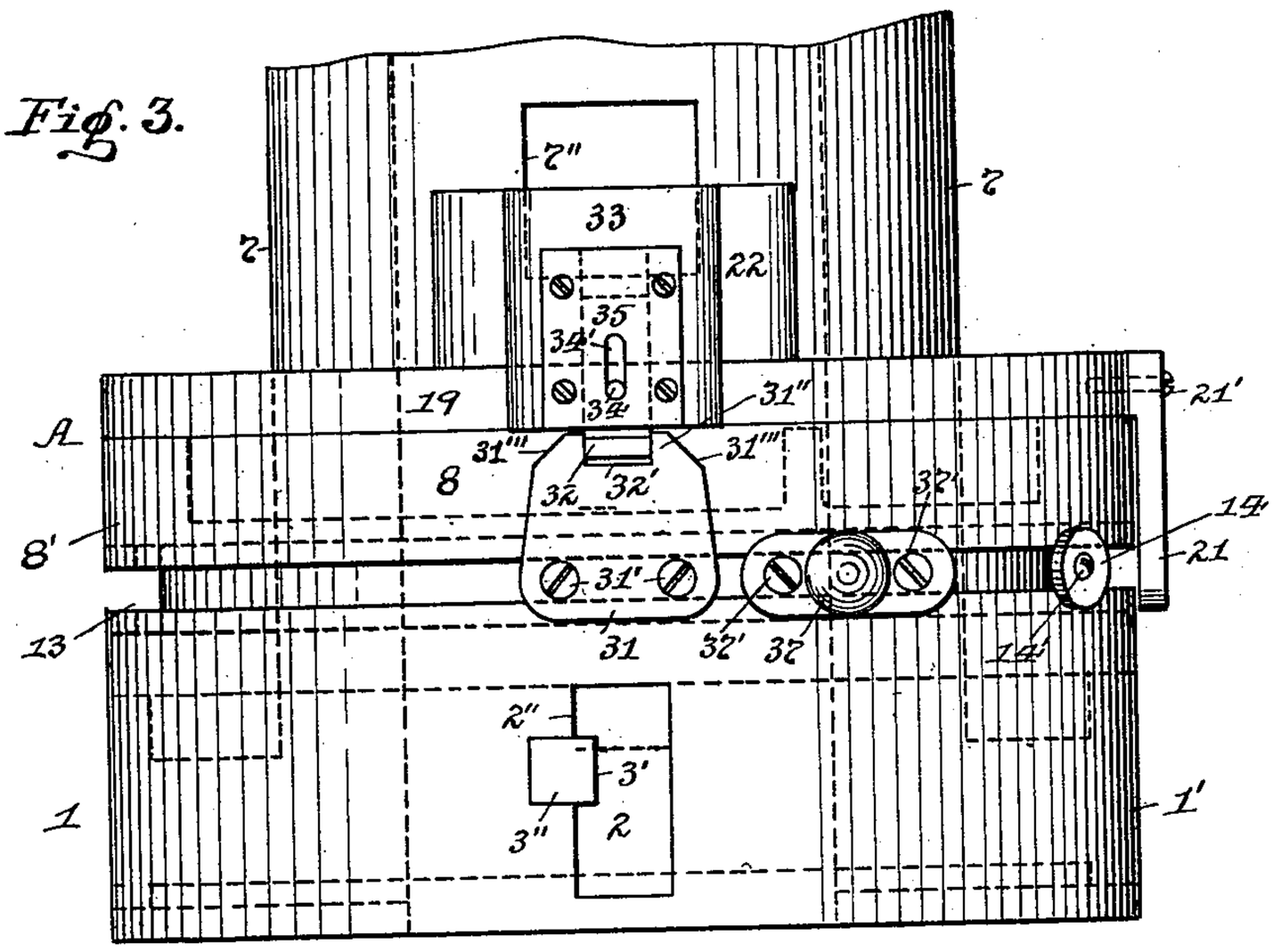


Fig. 4.

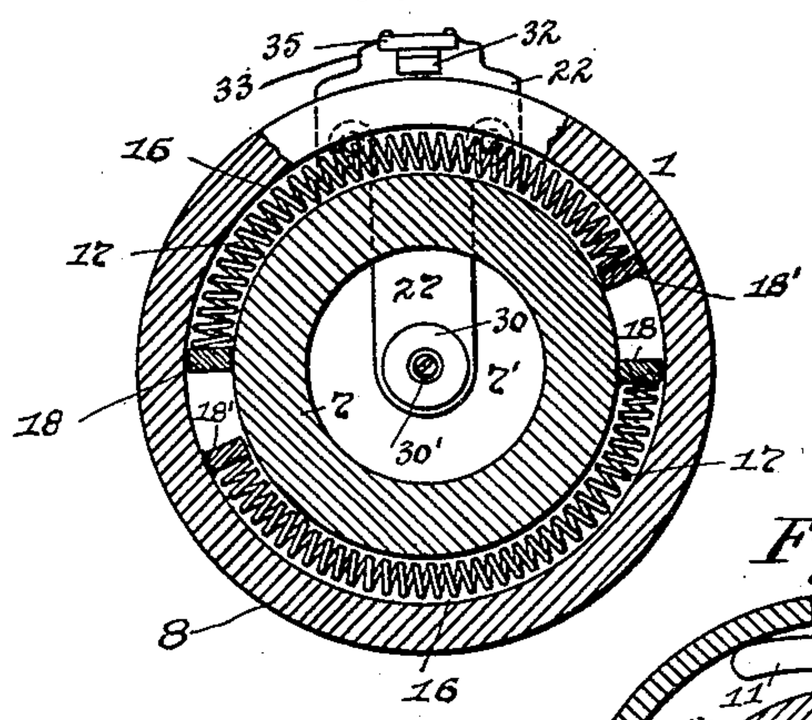


Fig. 5.

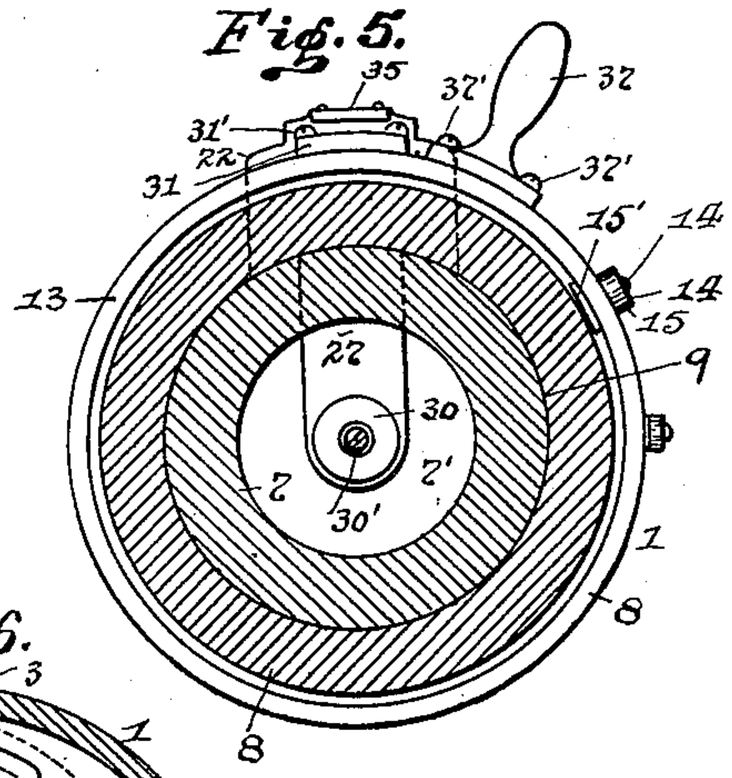
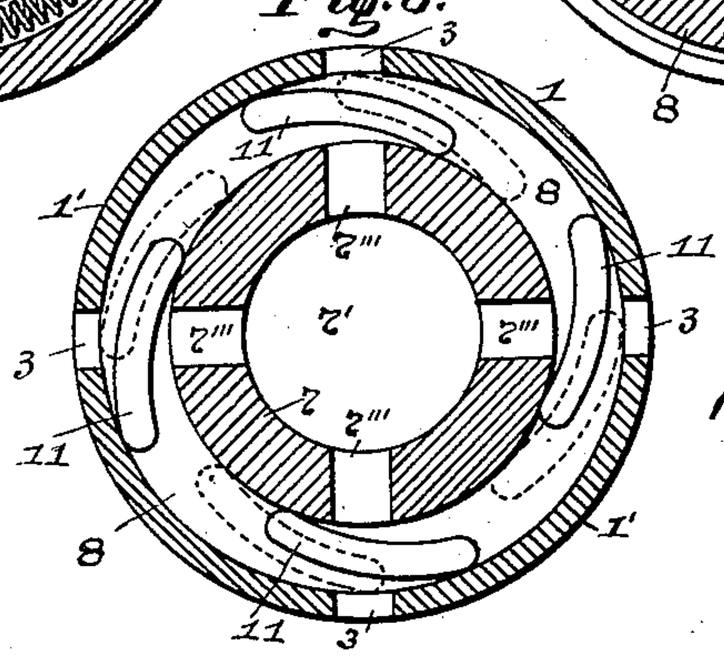


Fig. 6.



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NO MODEL. 3 SHEETS—SHEET 3.

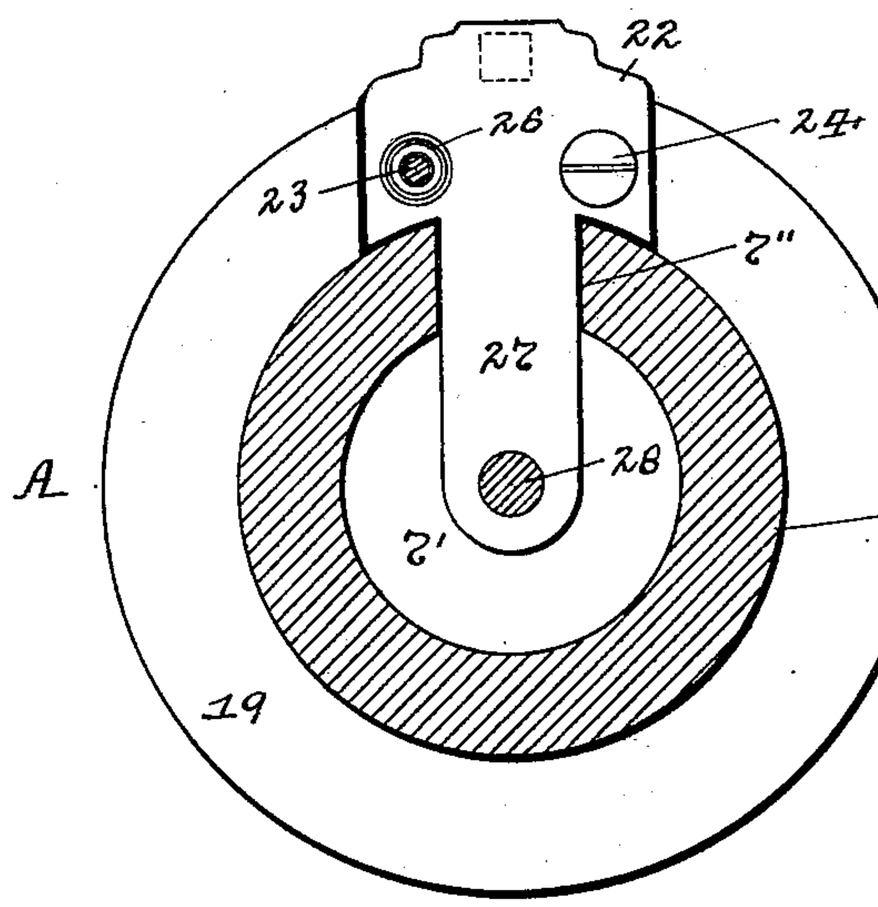


Fig. 7.

Fig. 8.

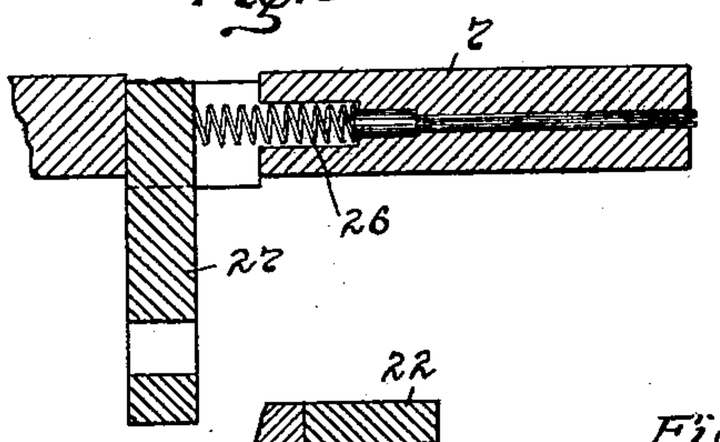


Fig. 9.

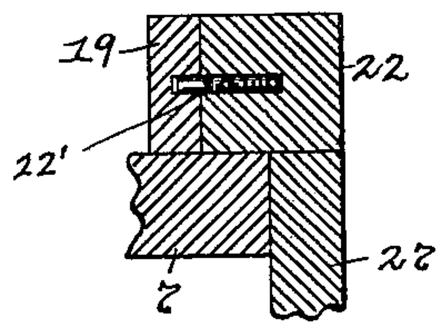


Fig. 10.

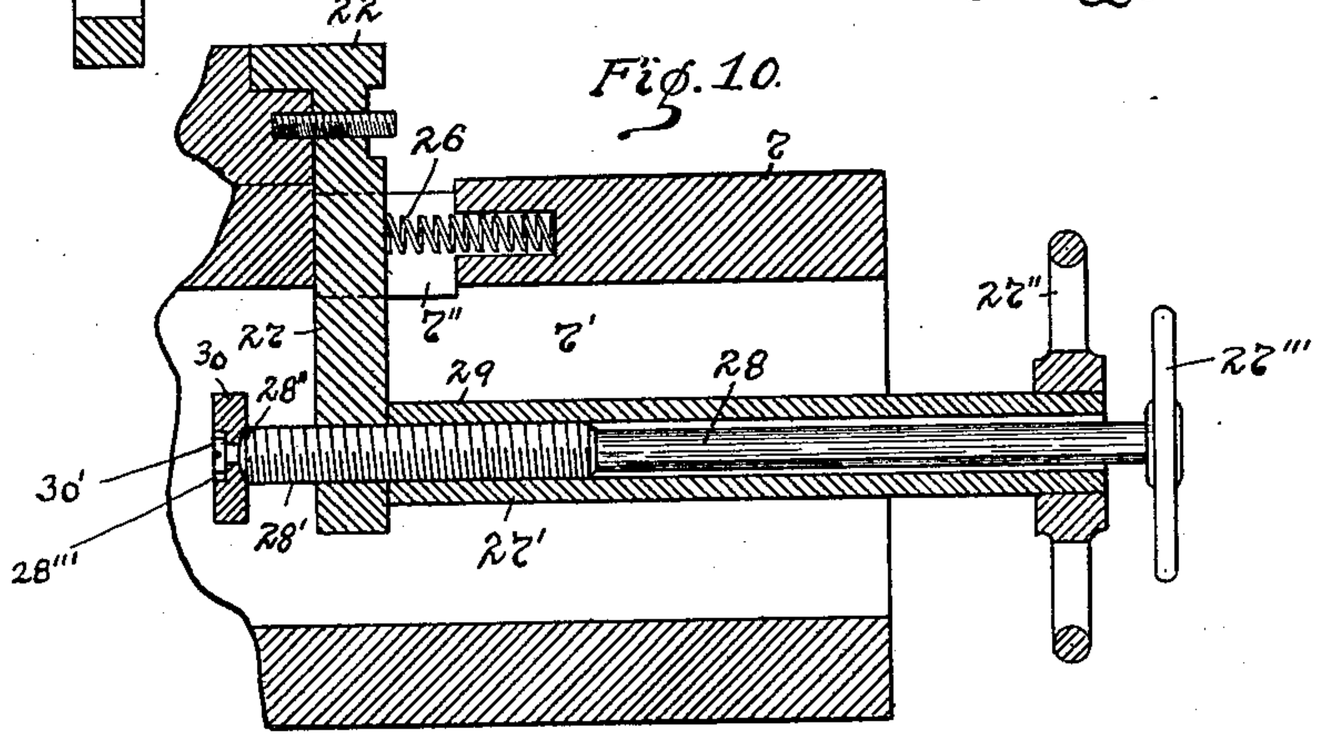
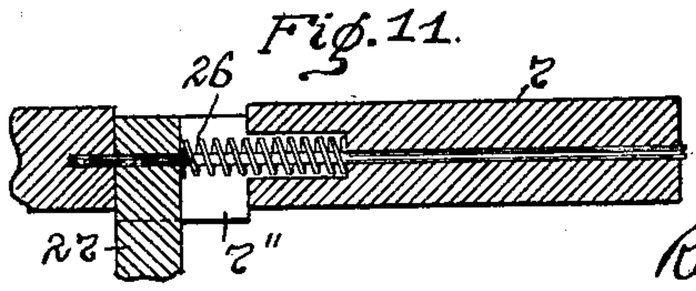


Fig. 11.



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No. 731,121. Patented June 16, 1903.

UNITED STATES PATENT OFFICE.

RICHARD M. NUTTALL, OF ALLEGHENY, PENNSYLVANIA.

DIE-HEAD FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 731,121, dated June 16, 1903.

Application filed June 30, 1902. Serial No. 113,703. (No model.)

To all whom it may concern:

Be it known that I, RICHARD M. NUTTALL, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Die-Heads for Lathes; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improvement in die-heads for lathes, &c., and has for its object to provide a single, compact, and effective device constructed with particular reference to capacity for adjustment and convenience of operation.

To these ends my invention consists, generally stated, in the novel arrangement, construction, and combination of parts, as hereinafter more specifically set forth and described, and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to construct and use my improved die-head, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal central section of my improved die-head for lathes. Fig. 2 is a cross-section through the cutters on the line 2 2, Fig. 1. Fig. 3 is a plan view of the die-head. Fig. 4 is a cross-section on the line 4 4, Fig. 1. Fig. 5 is a cross-section on the line 5 5, Fig. 1. Fig. 6 is a cross-section on the line 6 6, Fig. 1. Fig. 7 is an end view of the die-head, showing shank in section; and Figs. 8, 9, 10, and 11 are detail views of other forms or modifications of my improved die-head.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

As illustrated in the drawings, my improved die-head A has the cutters 2 therein, each of which is adapted to slide within a radial slot 3, formed in the outer end or carrier portion 1′ of the body 1 of the device, and each of which is provided with a groove 3′ in one of the faces 2″, which is adapted to fit around a tongue 3″, formed in the slot 3 of the carrier portion 1′. The cutters 2 are held in place by a plate or cap 4, formed with a central opening 4′ therein for the exposure of the inner cutting ends 2′ of said cutters 2, and has its outer edge turned inwardly to form the flanges 5, which fit over the shoulders 5′, formed at the extreme outer end of the carrier portion 1′ on the body 1, and such cap 4 being secured to said carrier 1′ by the bolts 6.

Extending back beyond the carrier portion 1′ of the body 1 is the barrel or shank portion 7, having the radial slots 7″ therein opposite the radial slots 3 in the carrier portion 1′ for the passage of the cutters 2, and such carrier and shank portions are provided with the cylindrical longitudinal chamber 7′, which extends throughout the length of the body 1 in order that when the screw cut is of sufficient length it may project into such shank 7, and the shank portion 7 permits such die-head A to be attached to the lathe, &c.

Placed adjacent to the carrier 1′ is the ring 8, which has a central opening 9 for the reception of the shank portion 7 and is provided with a seat 10 on its outer face 8′ for the reception of a flange 10′ on the carrier 1′. The ring 8 fits accurately against the rear face of the carrier 1′ and is provided on its front face with the cams 11, each of which is adapted to fit within a seat 12, formed in the back faces 12′ of the cutters 2, and extending through the outer face 8′ of the ring 8 is the T-shaped annular groove 13, within which is secured the adjustable stop 14, formed of the circular plate or washer 15, fitting against the face 8′ and having a bolt 14′ extending through the same and into a block 15′ within the groove 13.

On the rear face of the ring 8 is the annular groove or seat 16 for the reception of the spiral springs 17, the ends of which come in contact with and are confined between the lugs 18 18′, which are secured within the ring 8 and a plate or cap 19, respectively. The plate or cap 19 fits against the rear face of said ring 8 and is held in place by a bolt 20, extending through the same into the shank 7, while secured to the outer face of said cap 19 by a bolt 21′ is the bar 21 for engaging with the stop 14 on the ring 8.

Fitting against the rear face of the cap 19 is the sliding block 22, which is held in place by means of a bolt 23, secured to said cap 19 and extending through an opening 19′ in said block, said bolt 23 being provided with a head

24 thereon, which fits within an enlarged opening 19″ beyond the opening 19′ in said cap 19, and between which head 24 and a contracted portion 25, forming the opening 19′, a spiral spring 26 is interposed. An arm 27 is formed on the sliding block 22, which extends down through a slotted opening 7″ in the shank 7 into the chamber 7′ of said body 1 and has a bolt 28 fitting in the lower end thereof at about the center of the chamber 7′, which bolt 28 is adapted to be adjustably moved in a threaded opening 27′ in said arm 27 by means of screw-threads 28′ and is adapted to be held in place by means of a nut 29, which engages with said threads 28′ and fits against said arm 27, while said nut 29 is provided with an extension-rod 27′ thereon, which extends through the chamber 7′ of the shank 7 and support for said die-head A and has a suitable turning-handle 27″ at its end. The front end of said bolt 28 is provided with a movable head 30 thereon, which is held in place by a screw 30′ passing loosely through the same and is screwed into the bolt 28, while the rear face of said head is adapted to fit against a convex end 28″ on said bolt 28 by a concave seat 28‴ within the same, which permits said movable head 30 to overcome any unevenness on the end of the article to be cut.

Secured to the outer face 8′ of the ring 8 and held in place by bolts 31′ passing through the same and into the annular groove 13 is the plate 31, which is provided with the tapered faces 31‴ on the end 31″ thereof and has a seat 32′ therein for the reception of a locking-dog 32, which is confined in an opening 33′, formed in an extension 33 on the block 22, and is provided with a pin 34 thereon, which passes through a slotted opening 34′ in a cover-plate 35, extending over said dog 32, and said dog being adapted to be returned to its seat 32′ by a spiral spring 36, fitting against its rear end thereof and held within a seat 36′, formed in said extension 33. A handle 37 is also secured in the groove 13 of the ring 8 by bolts 37′ for turning said ring when desired.

The use and operation of my improved die-head for lathes, &c., are as follows: With the parts of my improved die-head A in the position shown in Fig. 1 and in the act of making threads upon the screw, bolt, or other article shown in dotted lines in said figure by the cutting ends 2′ of the cutters 2, the screw during the cutting and in its movement through the chamber 7′ of the body 1 will come in contact with the movable head 30 on the bolt 28 within said chamber 7′ and held by the arm 27 when about the desired length of cut has been made. After this is accomplished and it is desired to withdraw said cutters 2 the movement of the screw is continued through the chamber 7′ sufficiently to push back the arm 27 within the slotted opening 7″ by the contact of said screw with the movable head 30, which will cause the spiral spring 26 to be compressed within the block 22 between the head 24 on the bolt 23, held by the cap 19, and the contracted portion 25, forming the opening 19′. This movement of the arm 27, carrying the bolt 28, head 30, and nut 29, will cause the sliding dog 32 on the block 22, carrying the arm 27, to be freed from the seat 32′ in the plate 31, which will allow the ring 8 and handle 37 to be thrown back to the position shown in dotted lines, Fig. 2, by the releasing of the pressure previously put upon the springs 17, as hereinafter described, by the lugs 18 on the ring 8 and cap 19. When the ring 8 is thus thrown back, the stop 14, adjustably secured within the groove 13 of the ring 8, will come in contact with the bar 21 on the cap 19 to limit the movement of said ring 8, and the seats 12 in the cutters 2 will travel up the cams 11 on the ring 8, and so raise said cutters within the carrier portion 1′, so as to free the cutting ends 2′ of said cutters 2 and permit the threaded screw to be removed from the chamber 7′. After the dog 32 has been thus freed from the seat 32′ in the plate 31 and the ring 8 has thus been thrown back by the springs 17 the said dog 32 will be thrown forward to its normal position as soon as the end 31″ of the plate 31 passes the forward end of the dog 32 by the spiral spring 36 at the rear end thereof and held within the seat 36′ in the extension 33 on the block 22, and at the same time the sliding block 22, carrying said dog 32, and the arm 27 on said block 22, carrying the bolt 28, head 30, and nut 29, will also be thrown forward to their normal positions by the releasing of the compression on the spiral spring 26, fitting around the bolt 23 within said block 22 and secured within the plate or cap 19. When it is desired to continue the operations of threading, all that is necessary is for the operator to grasp the handle 37 and push the ring 8 forward to the position shown in full lines in Fig. 2, which will cause the dog 32 to be pushed back by the inclined faces 31‴ on the end 31′ of the plate 31 to permit said dog 32 to be pushed forward into its seat 32′ by the spiral spring 36 to hold said ring 8 in position and permit the cutters 2 to be dropped down into the chamber 7′ through the slots 3 in the carrier portion 1′ by the seats 12 in said cutters traveling down the cams 11 on the ring 8. During this dropping of the cutters 2 the spiral springs 17 within the ring 8 are being compressed by the lugs 18 on the ring 8 and cap 19, engaging with the ends thereof, as the ring 8 is thus pushed back to place and held by the dog 32, and after the cutters have been thus dropped and the ring 8 is held in position by the dog 32 the article to be threaded can be fed into the cutting ends 2′ of the cutters 2, and as it is threaded by such cutters and passes into the chamber 7′ it will strike the head 30 on the bolt 28 within the arm 27 to push back such arm and repeat the operations as before described.

It will thus be seen that my improved die-

head for lathes, &c., is cheap and simple in its construction and operation, contains few parts, avoids complicated mechanisms, and can be handled and operated easily and quickly by an unskilled person.

By the use of the device an article can be inserted, cut, and withdrawn rapidly and conveniently, so as to provide for a large capacity of the die-head, and the arrangement of the parts permits of a greater adjustment of the cutters than in the ordinary die-heads, and therefore dispensing with a number of different-size cutters usually employed in this class of work.

It will be evident that all the parts for performing the main operations are adjustable, so as to vary the movements of the cutters for different-sized articles to be threaded, and that all such parts are exposed, so as to be easily removed or repaired, as well as being within easy reach to be handled and adjusted when desired. It will also be obvious that, if desired, two bolts 23 and springs 26 can be used in the block 22, as shown in Fig. 7, and that the spiral spring 26 can be placed within the shank 7, so as to extend through the slotted opening 7″ and bear against the arm 27, instead of being located within the block 22, as shown in Figs. 8, 10, and 11, in which case a pin 22′ can be secured within such block, so as to engage with an opening or seat in the plate 19 and hold said block in position, as shown in Figs. 9 and 10, and that both the nut 29 and the bolt 28 can extend entirely through the shank 7 and the latter provided with a handle 27′ thereon beyond the handle 27″ on the nut 29, as shown in Fig. 10, so as to enable said bolt to be adjusted at the rear end of the support for the die-head.

Various other modifications and changes in the construction, design, and operation of parts of my improved die-head may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A die-head comprising radially-movable cutting-dies having seats therein, a spring-actuated rotatable ring having cams thereon for engaging with said seats, a sliding block in the rear of said ring, a lock on said block for engaging with the ring to hold the cutting-dies in position for operating, and a stop on said block adapted to be engaged by the article on which the screw is cut to move said stop and block so as to release said ring from the lock and allow the same to rotate.

2. A die-head comprising radially-movable cutting-dies having seats therein, a spring-actuated rotatable ring having cams thereon for engaging with said seats, a sliding block in the rear of said ring, a lock on said block for engaging with the ring to hold the cutting-dies in position for operating, a stop on said block adapted to be engaged by the article on which the screw is cut to move said stop and block so as to release said ring from the lock and allow the same to rotate, an adjustable stop or button on said ring, and a stationary bar adapted to engage with said adjustable stop or button to limit the movement of the ring after being released.

3. A die-head comprising radially-movable cutting-dies having seats therein, a spring-actuated rotatable ring having cams thereon for engaging with said seats, a stationary cap or plate in the rear of said ring, a block in the rear of said plate and slidably connected thereto, a lock on said block for engaging with the ring to hold the cutting-dies in position for operating, a stop on said block adapted to be engaged by the article on which the screw is cut to move said stop and block so as to release said ring from the lock and allow the same to rotate, an adjustable stop or button on said ring, and a stationary bar on said plate adapted to engage with said adjustable stop or button to limit the movement of the ring after being released.

4. A die-head comprising radially-movable cutting-dies having seats therein, a spring-actuated rotatable ring having a groove around the periphery thereof, cams on said ring for engaging with the seats in the cutting-dies, a sliding block in the rear of said ring, an adjustable plate removably secured within the groove in said ring and provided with a seat therein, a locking-dog on said block for engaging with the seat in said adjustable plate to hold the cutting-dies in position for operating, and a stop on said block adapted to be engaged by the article on which the screw is cut to move said stop and block so as to release the lock from the seat in said adjustable plate and allow the ring to rotate.

5. A die-head comprising radially-movable cutting-dies having seats therein, a spring-actuated rotatable ring having a groove around the periphery thereof, cams on said ring for engaging with the seats in the cutting-dies, a sliding block in the rear of said ring, a lock on said block for engaging with the ring to hold the cutting-dies in position for operating, a stop on said block adapted to be engaged by the article on which the screw is cut to move said stop and block so as to release said ring from the lock and allow the same to rotate, and an adjustable handle removably secured in the groove in said ring for returning said ring to its locked position.

6. A die-head comprising radially-movable cutting-dies having seats therein, a spring-actuated rotatable ring having cams thereon for engaging with said seats, a sliding block in the rear of said ring, a spring-actuated locking-dog on said block for engaging said ring to hold the cutting-dies in position for operating, a pin on said dog adapted to travel within a slotted opening in said block, and a stop on said block adapted to be engaged by the article on which the screw is cut so as to

release said ring from the locking-dog and allow the ring to rotate.

7. A die-head comprising a carrier for receiving the cutting-dies and provided with a shank thereon, a spring-actuated rotatable ring on said shank having cams thereon for engaging with seats in the cutting-dies, a sliding block on said shank in the rear of said ring, a lock on said block for engaging with the ring to hold the cutting-dies in position for operating, an arm on said block extending through a slotted opening in the shank, a threaded bolt adapted to be screwed into and held within said arm by a nut engaging therewith, and a movable head on said bolt adapted to be engaged by the article on which the screw is cut to move the same and block so as to release said ring from the lock and allow the same to rotate.

8. A die-head comprising a carrier for receiving the cutting-dies and provided with a shank thereon, a spring-actuated rotatable ring on said shank having cams thereon for engaging with seats in the cutting-dies, a sliding block on said shank in the rear of said ring, a lock on said block for engaging with the ring to hold the cutting-dies in position for operating, an arm on said block extending through a slotted opening in the shank, a threaded bolt adapted to be screwed into and held within said arm by a nut engaging therewith, said bolt being provided with a convex end, and a head having a concave rear face adapted to engage with the convex end on the bolt, said head being held in place by a screw passing loosely through the same and secured within the end of said bolt and being adapted to be engaged by the article on which the screw is cut to move the same and block so as to release said ring from the lock and allow the same to rotate.

In testimony whereof I, the said RICHARD M. NUTTALL, have hereunto set my hand.

RICHARD M. NUTTALL.

Witnesses:
J. N. COOKE,
J. L. TREFALLER, Jr.