June 6, 1933. J. E. LOVELY 1,912,987

WORK SUPPORTING AND DRIVING MECHANISM

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Fig. 1.

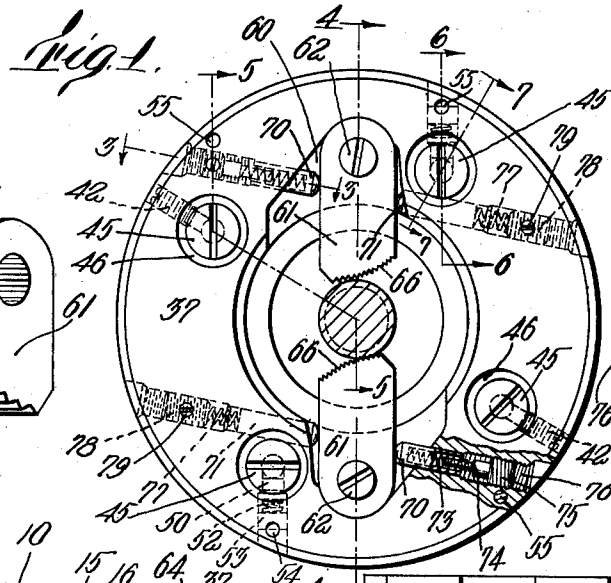


Fig. 2.

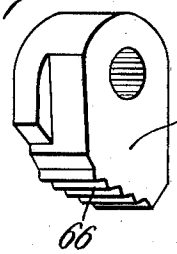


Fig. 3.

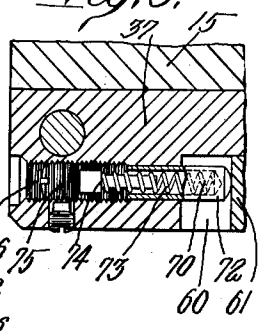


Fig. 4.

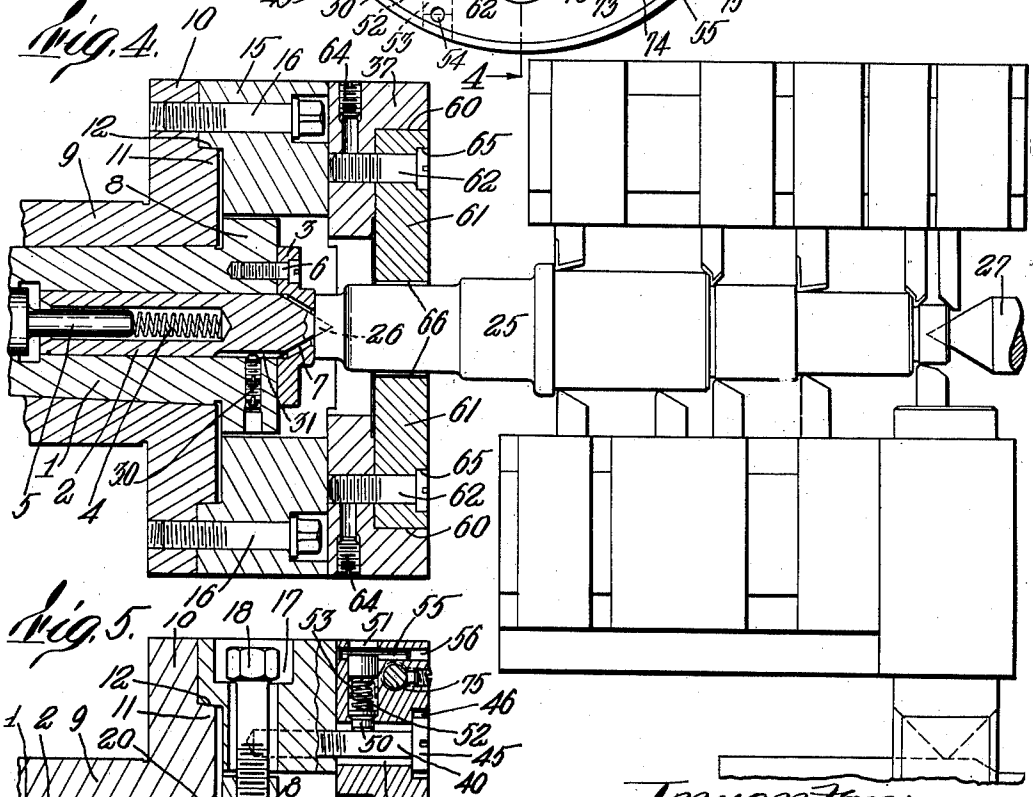
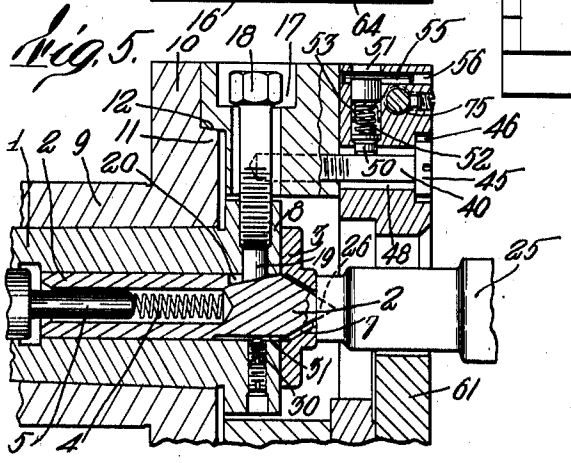


Fig. 5.



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Fig. 6.

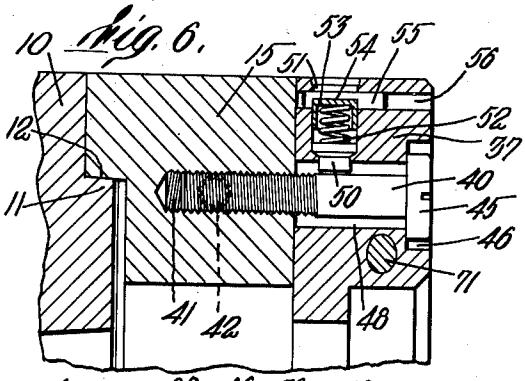


Fig. 7.

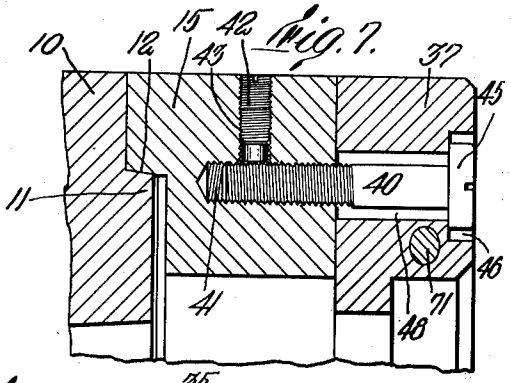


Fig. 8.

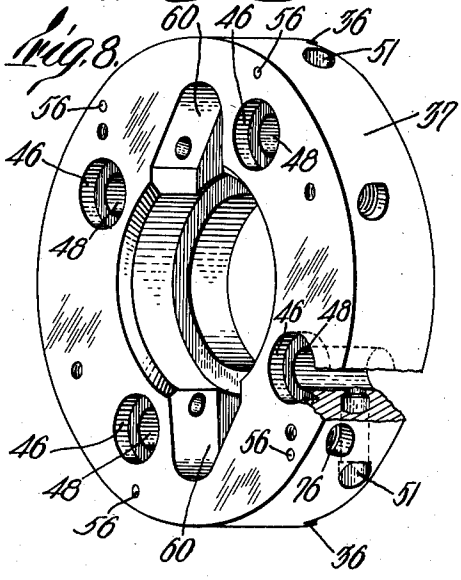
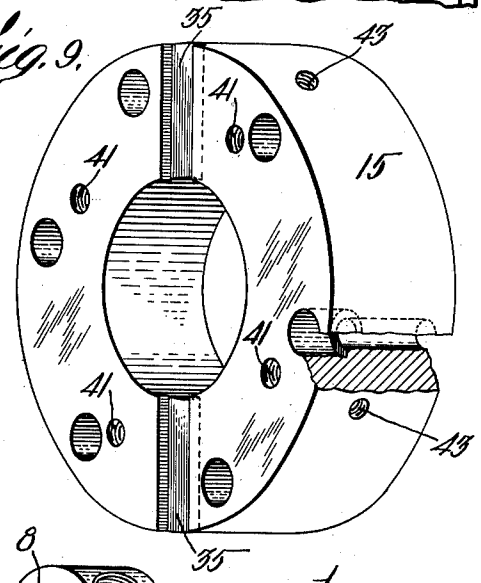
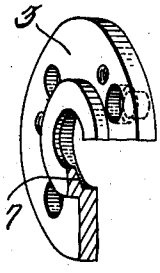


Fig. 9.





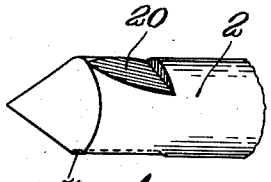


Fig. 11.

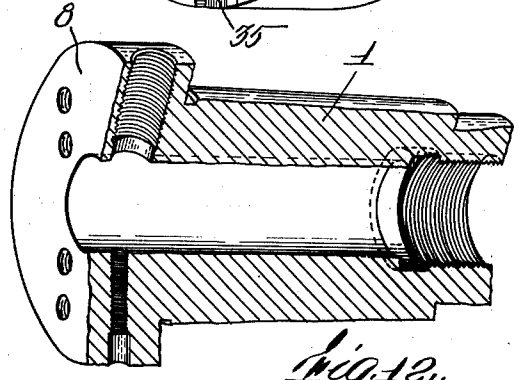


Fig. 12.

Fig. 10.

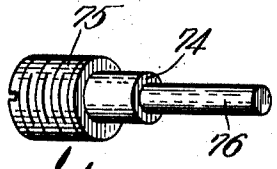


Fig. 13.

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UNITED STATES PATENT OFFICE

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WORK SUPPORTING AND DRIVING MECHANISM

Application filed April 8, 1930. Serial No. 442,562.

This invention relates to means for supporting and driving work from a rotary work spindle of a lathe or the like and by which the work is supported accurately and firmly, the gripping for driving being positive and sure and yet whereby the work may be completely and easily released when this is desired. To this end the work spindle is provided with a spring center so that the work while held centered thereby may be seated firmly against a stop plate and the driving is effected through a pair of eccentrically faced pivoted jaws mounted for floating movement to equalize their driving pressure on the work. While a spring center is preferable, certain of the desirable features of this invention may be realized with the ordinary rigid center.

For a more complete understanding of this invention, reference may be had to the accompanying drawings in which

Figure 1 is an end elevation of the mechanism, a piece of work being shown in cross section.

Figure 2 is a perspective of a work-engaging jaw.

Figure 3 is a detail section on line 3—3 of Figure 1.

Figure 4 is a cross section on line 4—4 of Figure 1 showing work in position between live and dead centers and various tools in working positions relative to the work.

Figures 5, 6 and 7 are detail sections on the correspondingly numbered section lines of Figure 1.

Figures 8 to 13 inclusive are perspective views of various elements, certain of these being partly broken away or in section.

Referring first to Figures 4 and 5, at 1 is indicated the end portion of a rotary work spindle having a spring center 2 therein. This spring center is normally pushed outwardly against a stop plate 3 on the end of the spindle by means of a spring 4 seated in a socket in the center 2 and reacting between the base of this socket and a plunger portion 5 seated in the spindle 1. The abutment plate 3 may be fixed to the spindle end, as by means of the screws 6, and may be provided with a conical seat 7 against which the conical end of the center 2 may engage. Secured to the spindle back of an end flange 8 thereon is a nose member 9 having an end flange 10 provided with a central extension 11 having a conical peripheral face 12. In engagement with this face is a mating tapered circular recess of a supporting ring member 15 which may be secured to the flange 10 as by means of the bolts 16. This ring 15 may have a radial opening 17 in which may ride an adjusting screw 18 bearing on a plug having a tapered inner end 19 which rides in an inclined seat 20 of the spring center, this screw 18 forming an abutment to limit the extent to which the spring center may be retracted against the pressure of the spring 4 by work engaging this center. The work is shown in Figures 4 and 5 at 25 and when in position is centered by the point 26 of the spring center, but firmly engages against the outer face of the abutment plate 3, being held in this position by its engagement with the tailstock center shown at 27 in Figure 4 in the usual well known manner. The spring center is held from rotation relative to the spindle by means of a threaded plug 30 having its inner end engaging in a slot 31 longitudinally in the center.

The forward face of the supporting ring 15 is provided with a diametrically arranged guide slot 35 which is shown best in Figure 9. Within this slot ride rearwardly extending guide lugs 36 of a jaw ring 37, shown detached in Figure 8. The jaw ring may thus be moved transversely to the axis of the work in one general diametrical direction only as limited by the engagement of the lugs 36 and the slot 35. The ring 37 is held in guided relation to the supporting ring 15 and as shown this is accomplished by means of headed posts or pins 40, the inner ends of which are shown as threaded and screwed into holes 41 in the supporting ring 15 and are fixed therein by set screws 42 inserted through the outer wall of the ring member 15 in threaded holes 43. The posts or pins 40, which are formed as screws, have their heads 45 loosely seated in enlarged sockets 46 in the outer face of the jaw ring 37 and their shank portions extend through en-

larged openings 48 therein. Thus the jaw ring 37 is held against the face of the supporting ring 15, the confronting faces of these rings being so formed as to limit relative sliding movement between the two ring members in one general direction. The jaw ring is normally held centered coaxially with the supporting ring and for this purpose the pins 40 are engaged by plugs 50 seated in sockets 51 transversely in the jaw ring 37 and urged against these pins by springs 52. These springs are shown as housed in hollow plug members 53 which are seated in flattened seats 54 in pins 55 positioned in openings 56 extending through and parallel to the axis of the jaw ring member 37. The ring member 37 is provided in its forward face remote from the supporting member 15 with a pair of oppositely disposed recesses 60 and within each of these recesses is pivoted a work-engaging jaw member 61, one of these being shown in perspective in Figure 2. The pivotal connection for each of these jaw members may comprise a screw 62 passed through an opening in the jaw and threaded into the ring 37 and these screws may be held in proper position by set screws 64. Preferably also the heads of the screw 62 are seated in counterbored portions 65 in the outer faces of the jaws. Each of these jaws has a work-engaging face as 66 preferably serrated to more firmly engage the work, these faces being formed eccentrically to the respective jaw pivots and oppositely disposed as shown in Figure 1, so that they both tend to grip the work by rotation of the member 37 relative to the work in the desired driving direction. These jaw members are normally held centered substantially in line with each other by spring pressed plunger elements 70 and 71 bearing on opposite edges of each of these jaws. As shown best in Figure 3 each of the plungers 70 may comprise a casing 72 having a closed end bearing on the jaw and housing a coil spring 73 which extends through the open end of the casing and reacts against a shoulder portion 74 of a threaded plug 75 shown detached in Figure 13. This threaded plug engages in a threaded perforation 76 extending inwardly from the edge face of the jaw ring 37. The plug 75 is also provided with a guiding stem portion 76 which passes within the coil spring 73 and acts to hold it in engagement with the seat 74. Each plunger 71 is solid and is engaged by a spring 77 stronger than the spring 73 which reacts against a solid threaded plug 78 held in position by a set screw 79. These heavier springs aid in freeing the work, the two sets of springs being balanced at such a point that rotation of the spindle in driving relation effects gripping of the work, which is released easily when the spindle is stationary. Thus the jaws are normally held yieldingly in engagement with the work and in the driving direction of rotation of the spindle they grip the work firmly. By a slight rotation of the work in the driving direction when the spindle is stationary, however, the work is readily freed from the jaws and can be easily removed.

From the foregoing description of an embodiment of this invention, it should be evident to those skilled in the art that various changes and modifications might be made without departing from its spirit or scope as defined by the appended claims.

I claim:

1. A device of the class described comprising a ring member having oppositely disposed recesses in one side face, jaws pivoted in said recesses and having faces for engagement with work within said ring member eccentric to their pivotal axes, spring plungers seated in sockets in said ring member and bearing on opposite edges of said jaws tending to center said jaws in said recesses, a supporting ring member, said ring members having confronting faces formed to permit relative motion transverse to their axes, means for securing said ring members together with capability of such movement, yielding means tending to maintain said ring members in coaxial relation, and means for securing said supporting ring member to a rotary work spindle.

2. In combination, a supporting ring having means for securing it coaxially to a rotary spindle, a jaw ring, said rings having mating portions on their confronting faces for guiding said jaw ring for movement diametrically of said supporting ring, said jaw ring having oppositely disposed recesses in its front face remote from said supporting ring, a pair of work-engaging jaws, one pivoted in each recess, said pivots being arranged in a plane substantially in the direction of movement of said jaw ring relative to said supporting ring, headed pins fixed in said supporting ring and engaging in enlarged openings through said jaw ring, the heads of said pins riding in enlarged recesses in the front face of said jaw ring, and spring means in said jaw ring engaging said pins for yieldingly centering said jaw ring relative to said supporting ring, said jaws having work-engaging faces eccentric to their pivots, and spring means engaging said jaws for yieldingly holding said jaws in engagement with work extending through said rings.

3. In combination a ring member, means for supporting said member from a rotary work spindle for yielding floating in one direction transverse to the axis of said spindle, a pair of opposed work-engaging jaws pivoted to said ring member and having work-engaging faces eccentric to their pivots, and opposed spring members engaging each jaw to hold said jaws in position relative to the

work to cause rotation of said spindle in driving direction to effect driving engagement of said jaws with the work, the spring members tending to release said jaws having stiffer springs than those tending to engage said jaws to facilitate release of the work when said spindle is stationary.

4. A device of the class described comprising a member, work-engaging means carried by said member including a pivoted jaw having a work-engaging face eccentric to its pivot and spring members engaging opposite edges of said jaw for yieldingly holding it in a definite angular position, said spring members being of unequal strength to cause resistance to turning of said jaw from said angular position in one direction to be opposed more strongly than turning of said jaw in the opposite direction from said position.

In testimony whereof I have affixed my signature.

JOHN E. LOVELY.